

Occupation, Business and Technology Education

Grade 6

Government of Nepal
Ministry of Education
Curriculum Development Center

Publisher: Government of Nepal
Ministry of Education
Curriculum Development Centre
Sanothimi, Bhaktapur

© Publisher

First Edition : 2016

Revised Edition : 2018

Price : 65/-

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Preface

The curriculum and curricular materials have been developed and revised on a regular basis with the aim of making education purposeful, practical, relevant and job-oriented. It is necessary to instill the feeling of nationalism, national integrity and democratic spirit in the students and equip them with morality, discipline and self-reliance so as to develop in them social and personal skills as well as the basic competencies of language, science, occupation, information and communication technology, environment and health, and life skills. It is also necessary to enable them to appreciate, preserve and promote arts and aesthetics, social norms and values and ideals. Moreover, in order to develop an equitable society, it is necessary to inculcate the students with respect for ethnicity, gender, disabilities, languages, religions, cultures and regional diversity. Likewise, education should also help them to be well-informed of human rights and social norms and values so as to make them capable of playing the role of responsible citizens. This textbook has been developed in this form based on the Basic Level Occupation, Business and Technology Education Curriculum, 2069 (Grade 6), incorporating the feedback obtained from various schools, workshops and seminars and interaction programmes attained by the teachers, students and parents.

This textbook was translated and edited by DR. Ashlesha Sharma Subba. In bringing out this text book in this form, the contribution of the Executive Director of CDC Mr. Khagaraj Baral, Deputy Directors Dr. Balkrishna Ranjit, Prakash Sapkota, Prof Dr. Tanka Nath Sharma, Sarala Paudel, Sarita Bajracharya, Bijaya Muli, Anil Acharya is highly commendable.

Language of this book was edited by Nim Prakash Sing Rathaur and Lalmani Joshi. The layout design of the book was done by Jayaram Kuikel and Bhawana Sharma. The illustration of the book was done by Sunil Ranjit and Gautam Manandhar. CDC extends sincere thanks to all those who have contributed in the development and revision of this text book.

Textbook is considered as an important tool of learning. Experienced teachers and curious students can use various learning resources and tools to achieve the competencies targeted by the curriculum. An attempt is made to make this textbook activity oriented and interesting as far as possible. The teachers, students and other stakeholders are expected to make constructive comments and suggestions to make this book a more useful learning material.

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Table of Content

SN	Content	Page Number
Unit -1	Occupational Education	1
Lesson 1	Introduction of Occupation and its important	1
Lesson 2	Traditional Occupation of Nepal	3
Lesson 3	Local Level Vocational Occupation	5
Lesson 4	Teaching related occupation	7
Lesson 5	Agriculture related occupation	9
Lesson 6	Trade related occupation	10
Lesson 7	Construction related Occupation	11
Lesson 8	Public service related Occupation	12
Lesson 9	Sewing, cutting and knitting	13
Unit -2	Employment, Training and Education	14
Lesson 1	Introduction of Employment and its Importance	14
Lesson 2	Relation between Employment and Education	17
Lesson 3	Relation between Employment and Training	18
Lesson 4	Introduction of Vocational Training Institutions and their Programme	21
Lesson 5	Technical Schools under Federation of Nepal Chamber of commerce and Industries	23
Lesson 6	Skill Development Training Center	25
Lesson 7	Cottage and Small Industries Development Committee	27
Unit -3	Employment Related Information	31
Lesson 1	Sources of getting information about local employment	31
Unit -4	General Vocational Skill	35
Lesson 1	Introduction of General Vocational Skill and its importance	35
Lesson 2	Use of General Vocational Skill	36
Lesson 3	Communication Skill	37

Lesson 4	Team work skill	39
Lesson 5	Interpersonal Skill	41
Unit -5	Business	42
Lesson 1	Introduction of Business and its Importance	42
Lesson 2	Introduction of Agriculture and non-agriculture based Traditional Business of Nepal	44
Lesson 3	Information about locally operated Small Business	46
Unit -6	Trade and Market Management	48
Lesson 1	Introduction of Trade	48
Lesson 2	Kinds of Trade and its Access	49
Lesson 3	Salesman Skill	51
Lesson 4	Hat Bazaar	52
Unit -7	Vegetable Cultivation	53
Lesson 1	Introduction of Kitchen garden	53
Unit - 8	Fruit Cultivation	58
Lesson 1	Introduction of local level fruit cultivation	58
Unit - 9	Dry Vegetables, Fruits and Food Stuff	67
Lesson 1	Methods of Making Dry Vegetables and Fruit	67
Lesson 2	Methods for Making some Food Stuff	72
Unit -10	Flower and Medicinal Herbs Cultivation	76
Lesson 1	Introduction of Floriculture	76
Lesson 2	Introduction of Medicinal Herbs and their Importance	81
Unit - 11	Care of Birds and Animals	87
Lesson 1	(A) Nurturing Sheep/Goat/Mountain Sheep	87
Lesson 2	(B) Cow/Buffalo farming	96
Lesson 3	(C) Poultry Farming	102
Lesson 4	(D) swine Farming	106
Lesson 5	(E) Fishery	112
Lesson 6	Bee Keeping	118
Unit - 12	Arts and Crafts	123
Lesson 1	Introduction to Paper and its Importance	123
Lesson 2	Origami & Kirigami	130

Lesson 3	Making of Goods from Bamboo, Straw, Babiyo, etc.	136
Lesson 4	Making Goods from Waste Materials	142
Unit -13	Clay Work	146
Lesson 1	Making Materials from Clay	146
Unit -14	Sewing and Knitting	153
Lesson 1	Sewing and Knitting	153
Lesson 2	Fabric Painting	158
Unit -15	Local Technology	161
Lesson 1	Our Local Technologies	161
Lesson 2	Locally used Common Tools	166
Unit -16	Modern Technology	172
Lesson 1	Introduction of Modern Technology and their Importance	172
Lesson 2	Introduction of Information Technology and its Importance	179
Lesson 3	Computer as the Source of Information	181
Lesson 4	Introduction of Alternative energy and its Importance	183

Unit - 1

Occupational Education

Lesson - 1

Introduction of Occupation and its importance

People live in society. Among these people, some work in the field. Some people make shoes, some make dresses or clothes. Some help sick people to be cured, some build houses, and some work with machines. All these kinds of works, which people do to earn enough for their living, are called 'occupation'. All the people in the society do not have same occupations. Rather, they have different occupations. These occupations are privately owned, vocational and employment oriented. People who are involved in an occupation get necessary knowledge, skill, ability, and qualification



by means of study, training or working with skilled or expert person. People use their skill and ability in their work. As a result, they get more experience and increase their abilities.

People who work in agriculture field, produce food-grain, vegetables, fruits, flowers etc. We make or cook varieties of dishes from these food-grains to fulfill our hunger when we feel hungry. We also become

healthy by eating the food made from these food-grains. In the same way, people who make clothes or dresses for us, have helped us to cover our body and keep ourselves safe from cold. People, who work with leather, make shoes, bags, belts etc. So, they have helped us to fulfill our needs of these things. People in health occupation help in the treatment of sick people, and also offer health services. There are other people who are involved in various occupations for serving people of the society. People can make income from their occupations for making themselves alive. In this way, people and the society are getting various benefits from occupations.



Activities

1. Discuss the occupations that your family members are involved in.
2. Discuss and make a list of the occupations that the people in your village or community are involved in.

Exercise

Answer the following questions:

1. What is an 'occupation'?
2. Why is an occupation needed? Give 3 points.
3. What kind of occupation will you take in future?
4. Find out what kind of occupation people of your village or community are involved in, and what benefits people are getting from these occupations. Write your answers in the table below:

S. N.	Occupations that people of your village or community are involved in	Person getting benefit	Types of benefit
1			
2			
3			

People are engaged in different occupations in our villages and communities since long ago. These are called 'traditional occupations.' In Nepal, people from different places have different traditional occupations. These traditional occupations are famous according to the native places. Such occupations require various knowledge, skills, and technologies. Local methods are used in traditional occupations. The traditional occupations are: agricultural farming, animal husbandry (breeding and rearing of farm animals), making furniture from bamboo, pottery making, house building, masonry, carving, and carpentry etc.

**Activities**

What types of traditional occupations are operated in your community? List them after discussion.

Types of Traditional Occupations

Some occupations are related to agriculture and others related to works other than agriculture. The occupations which are related to agriculture are known as agriculture based occupation. The other occupations which are related to the works other than agriculture are known as non agriculture occupations.

A. Agriculture based occupations

Agriculture based occupations are operated differently according to the places. For example agricultural farming, animal husbandry

(breeding and rearing of farm animals), making furniture from bamboo, pottery making, house building, masonry, carving and carpentry etc. are the examples of agriculture based occupations.

B. Non-agriculture occupations

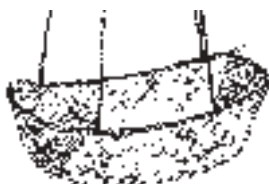
The occupations which are related to the works other than agriculture are known as non-agriculture occupations. The works like teaching, government or nongovernmental offices, banks, cooperatives etc. are non-agriculture occupations. For example: Teaching, employment of offices, making Duna (a plate made of leaves), Tapari (a dish made of leaves), Cot, Cushion made of maize leaves etc. are the examples of non-agriculture occupations.



Duna
(a plate made
of leaves)



Tapari
(a dish made of
leaves)



Cot



Cushion made of maize leaves

Activities

1. Discuss the agriculture-based materials that are used in your home.
2. Discuss what the materials used in your household are made from such as babbiyo, lokta (kind of herb from which paper is made), wood, khar (thatch), mud etc.
3. Discuss the kind of non-agriculture occupations that the people living around your community hold.

Exercise

Answer the following questions:

1. What is understood by 'Traditional Occupation'?
2. In how many parts can 'occupation' be classified?
3. List 5 non agriculture-based occupations.

Job or work done for a living is commonly called occupation. Vocational occupation is the business in which the entrepreneurs use their ability and qualification in running their occupation. Examples of business are: agriculture occupation, industrial occupation, tourism, trade etc. Such occupations help in operating trade and enterprise at the local, national and international level.

Man wants to do something for a living by using his knowledge, skill, and experience. They are even ready to invest in an occupation. Such desire pushes them to do any kind of occupation. In such case, local level vocational occupations can be operated in minimum investment, and locally available labor and technologies. Such local level occupations are agriculture and non-agriculture based. In this way, people can make an earning from these vocational occupations. Not only this, such occupations enhance skill development and use of technology in an individual, and also create employment at local level. Making of wicker basket (doko), basket (dalo), and furniture from bamboo and reed (nigalo); making of carpet, mat and sack from jute are examples of local level vocational occupations.

Activities

1. Study the following paragraph, discuss in the class and answer the questions given below the paragraph:

Sita had studied up to grade 8. She could not continue her study due to various reasons at home. So she wished to run her own enterprise. She discussed with her family members, relatives and teachers about her wish. But, she did not have any skill to start the business. She was worried about starting the business without having any skill. One day she read an advertisement in the newspaper about candle making training being offered free of charge. She received the training. After the training, she started a small enterprise by producing candles in her own house. She was benefitted from this business. There was a big demand of the

candles produced by Sita, from other neighboring villages also. She asked other interested people to get the training. Now, she has given employment to people of her village who received the training on her request. She has made her life vocational oriented from this occupation. These days, she advises all the people around that no work is big or small, rather any work is occupation oriented. The success of the occupation depends on the interest and hard work of an individual.

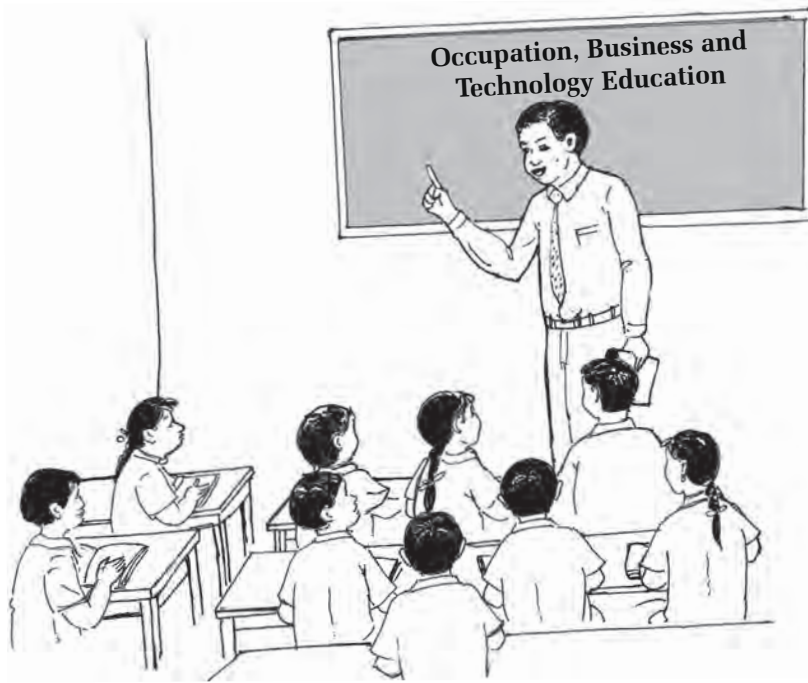
1. What are the reasons of Sita's success in the candle making? Discuss in class and write the answer.
2. List the people of your community who are involved in occupation like Sita's.

Exercise

Write answers to the following questions:

1. List out local level occupations in your community or village.
2. Describe the importance of local level vocational occupations.

Teaching Related Occupation



Children, we all know that the teacher teaches you in school. So, teaching is an occupation. It is the teaching of the teachers that produces capable, productive, and creative human resources. There are different levels of schools for the development of education in our society. The lowest level of school is child development centers. Children of 3-4 years of age are taught by a facilitator. The schools teach from grade 1 to 12. In colleges and universities, education of the Bachelor and Masters level is provided. In order to be qualified for teaching occupation, a teacher must have passed minimum grade 12 or I.Ed. to Masters Degree (M.A., M. Ed., or equivalent degree). All the people who teach in all these levels are 'teachers'. The person who teaches in child development centers is called a facilitator. In the same way, persons who teach in schools and universities are called teachers and professors respectively. All these people teach students different kinds of knowledge as well as discipline. The education provided at the school level is formal education.

Non-formal education program is run for those people who do not have an opportunity to learn in formal school. Literacy classes are opened for providing non-formal education. The assistant worker help learn to read and write in non-formal literacy classes. Adult literacy class, alternative schooling program, open school, and Grihini education program (education to the housewives) are provided within non-formal education program. A person must have specified qualification in order to be in teaching occupation.

Activities

Discuss with the teacher in the class and write a report about the educational qualification required for teaching occupation.

Exercise

Answer the following questions:

1. What kind of occupation is teaching occupation?
2. For whom the non-formal education program is operated?

In Nepal, agriculture is the main source of income. A large number of population still depends on agriculture. Therefore, agriculture based occupations are main basis of economic development of Nepal.

People have been in agriculture occupation traditionally from generations to generations. At present, agriculture is modernized

for the growth of production. The agriculture experts such as farmers, leader-farmer, technicians like Junior Technical Assistant (J.T.A) and J.T. are involved in agriculture-based occupations. In Nepal, agriculture has been expanded as business. For example: mushroom farming, fruit farming, vegetable farming, poultry, piggery, fishery etc. are occupations which have been adopted as business. We can do many things in agriculture occupation. We can do business of milk from rearing and breeding cattle; we can run beaten rice mill; we can make molasses or sugar from crushed sugarcane; and we can also make varieties of sweet from the flour of wheat. All these works fall under are agriculture occupation.

**Activities**

1. Discuss in the class and make a list about what kind of agriculture related occupations are done in your village or community?
2. Discuss in the class and make a list about development works that are being done in your ward or community.

Exercise

Write answer to the following questions:

1. Make a list of the technicians who are related to agriculture.
2. Explain the statement - 'Agriculture is the main occupation of Nepal'.

Trade Related Occupations

You must have seen that the products manufactured from agriculture and industry are sold and bought in the market. Such activity of buying and selling is called 'trade'. The person who sells goods is a salesperson or a vendor, and the person who buys goods is a buyer or customer.



There are many kinds of trades. The trade ranges from winnow or bamboo-tray shop, vegetable selling in a basket, small fruit shop, and small grocery store to big departmental shops. Trade avails necessary materials to common people for consumption. Trade can take place between individual to individual, firm to firm, and country to country. Trade includes both wholesaler and retailer. The wholesaler is the person who buys goods in large quantities and sells them in large quantity especially to retailers for resale. Retailer is the person who sells goods directly to customers in small amounts and without a discount. Normally, retail is like a family business and is operated by family members. In wholesale business other people are also involved besides the wholesaler. Some help in selling goods, some help in wrapping sold goods, some help in keeping accounts, and some help in billing for the sold goods. Some trade is carried out within the country, while some trade is carried out outside the country.

Activities

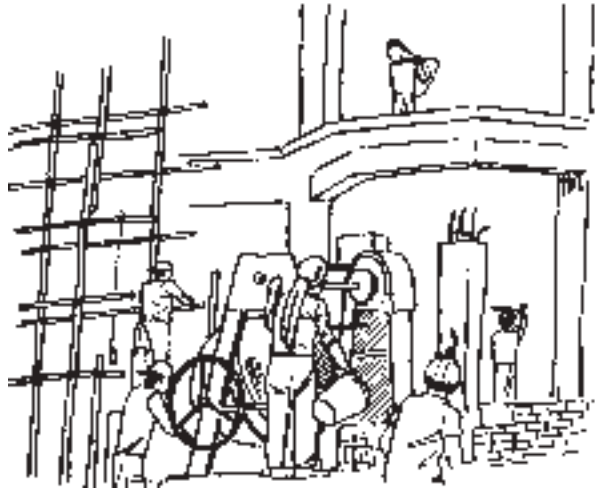
Discuss in the class and take a note about what skills are required in running a trade.

Exercise

Write answers to the following questions:

1. What is trade? What is the individual involved in trade called?
2. What are the different types of trades?
3. Write the differences between wholesaler and retailer.

You must have seen road, houses, buildings, school-buildings and bridges, etc. constructed in your village or in cities. All the work that is done in making roads, houses, buildings and bridges is construction work. Construction works include making of residential houses, highways, bridges, buildings, hospitals, hydroelectricity, power-house, turbines, etc. Personal and organized company or firms are established in order to carry



out such construction works. Engineers and contractors work in such construction firms or companies who build roads, bridges, hydroelectric-power plant and buildings through these firms and companies. There are carpenters, masons, plumbers, laborers, designers, draftsmen, sub-overseers, overseers, and engineers involved in construction work. Technicians such as consultants are also required for construction work. A technician is an individual with special skill and techniques in a field of technology. In technical work preparation of map, estimate, and prime- cost as well as monitoring is required.

Activities

1. Make a list and discuss in the class about people who are involved in building a house.
2. Discuss in the class about construction of public development work.

Exercise

1. "Technicians have great importance in construction work', clarify or explain this statement.
2. Describe what kind of work the technicians do.
3. Discuss the procedures for public construction work.

The occupations that are made available by the state to the general people for their benefit are called public occupations. The state makes various arrangement for providing education, health and security etc. to general public. The District Administrative Office makes arrangement for keeping peace and security in the district. It also provides passport to people according to their request as well as provides citizenship card to youths who have reached 16 years of age. There are offices in the districts opened for various services. For example: Schools and universities have been established for education. Hospitals, Health Post, and First Aid care Centers have been established for health services. There are army, police, and armed-police for the security of the general public. The tasks like birth, death, migration, marriage, registration are also public services. Various organizations have been doing developmental works.



All these services are provided by the state. Occupations are of private or corporate and public in nature. Teachers, health-workers, police, army and administrators are involved in public occupations. The other occupations, in which banks, telephones, television, radio broadcasting, health service, agriculture service etc. are involved, are also called public occupations.

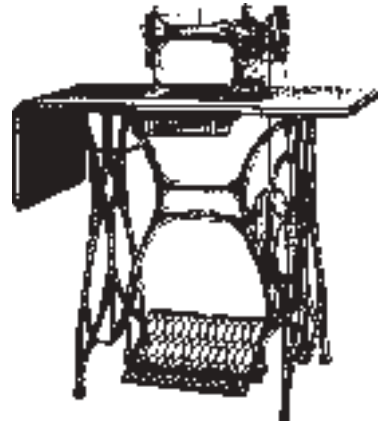
Activities

1. Discuss what kind of services are included in public service.
2. Visit public offices nearby your house and find out what kind of public services are being offered. Then, discuss in the class about your findings.

Exercise:

Write down the names of the organizations which are providing public services in your community. Write also the kind of service they are giving to the public.

The work of making or mending clothes is called sewing. Measurement of one's body is taken and the cloth is cut according to the measurement while making dresses. Likewise, a sweater is made by knitting woolen thread. Thus, sewing clothes is an occupation. Similarly, knitting a sweater is also an occupation. This occupation has spread from local level to international level. Today, we can see many different ready-made clothes of various measurements in the market. In order to prepare the ready-made garments, we need cutting and sewing work. People have got employment at the local level for such cutting and sewing work. Sewing work includes cloth-cutting, buttoning-up the clothes, and stitching clothes. Today the work of sewing clothes has been developed as an enterprise. Many people have got employment in large garment industries or enterprises. Many people have managed their daily living by sewing clothes and knitting sweaters.

**Activities**

1. Discuss who sews your clothes and where you take your clothes for sewing.
2. Discuss with the person involved in sewing work about the following areas of sewing.
 - a. What are the equipments required for regular sewing?
 - b. What skill is required for sewing work?
3. Discuss with the individual, family, and societies involved in sweater knitting and write a report on your findings.

**Exercise:**

Write two differences among sewing, cutting and sweater knitting.

Introduction of Employment and its Importance

People work in their fields, shops or factories. Some work in the enterprise or industry, while others work in the office. All these works that people do help them earn income for a living. Therefore, the occupation that provides you with an income is an employment. An individual or an organization provides employment which gives you work and income.

Employment can be divided into 3 types: unpaid personal employment, self-employment and wage employment. In personal employment one does his/her own work, which is not paid for income earning. In self-employment an individual starts his/her own business, and in wage employment, one does work in other's industry, enterprise or business. In return, he/she is paid for the work.

Employment can be at local, national and international levels. One gets an employment on the basis of his/her qualification and ability.

Activities

Read the following paragraph and discuss about it in the class:

Hasta Bahadur got his Bachelors degree in construction. He did not want to work in other people's factory or office. He wanted to do something by himself and become self-employed. He established an organization that dealt with construction. He required sub-overseers, overseers, and other people to do various work in his organization. He advertised for jobs and hired some people in his construction business. Thus, he became self-employed in his own organization, and other people got an employment in his organization. Hasta Bahadur gave them employment.

In the same way, following organizations could be a place for self-

employment to some people, and a place for wage employment to some people. For example:

- a. Saving and Credit Cooperative
- b. Cottage industry (small and spice industry)
- c. Tea farming/fruit and Vegetable farming
- d. Goat rearing and breeding
- e. Silk farming

In the above work, one individual is not enough to run the business. If an individual starts a business by himself, then he or she is self-employed. If that individual hires other people to work for him or her in the business, they are employed on wage basis. Employment is operated for wage. If one invests to start a business, it is called self-employment. The nature of self-employment is different depending on working time, weather etc. Some work is done year round, and some is done in special season only. Therefore, employment can be regular and seasonal employment.

1. Seasonal Employment

Demanding for workers for special work in special time or employing people for a particular work in particular time is seasonal employment. In seasonal employment people are employed to accomplish one work only. For example: hiring people during harvesting time of sugarcane, or hiring people in season when tourists start to come, is seasonal employment. People, who are employed in seasonal employment, have to look for another job after completing the work. In seasonal employment, some people are hired on the basis of their qualification, while some are hired for their special skill.

2. Regular Employment

Regular employment gives an opportunity to work for the whole year or for a long time. Such employment is classified according to qualification and ability. For example: employment in government service and employment in one's own enterprise or business can be regarded as regular employment. In such employment emphasis is given to regular work than to a particular work.

Activities

1. Make a list of seasonal employment opportunities in your community.
2. Discuss with your friends about the kind of works one has to do in the society. Discuss also whether all the works can be done by one single person.

Exercise

Write answers to the following questions:

1. How many types of employment are there? Give short introduction of each type.
2. What kind of employment opportunities are there in your community? Explain whether these opportunities are regular or seasonal employment.

Relation between Employment and Education

Occupation provides employment to people. But, it is required to have specified knowledge, skill and ability to get an employment. Only knowledge and ability are not enough to do certain work. Some works cannot be done without skills. For example: the doctor may not do the work that an engineer does and the engineer cannot do the work that a doctor does. Therefore, it is necessary to have knowledge, skill, and ability according to the work. Education gives you knowledge, skill and ability that are necessary to do a work. Many occupations require highly competent, skilled and trained persons. Education and training are necessary to fulfill all these requirements. Education and training provide benefit to both the individual and the enterprise. Individual will be benefitted from increased earning and the employer will be benefitted from increased productivity. Education helps to create following employment opportunities:

- a. Education opens ways for employment by providing as much as necessary knowledge for work.
- b. Employment oriented education builds base for development.
- c. Education facilitates produce able and skilled human resource who then can make developmental plans.
- d. We get education from the work that we do, and from the education we develop a habit for working hard.
- e. Education develops our brain, which we use in our job.

Education prepares human resource having high level knowledge, and employment makes this human resource accomplish the given work responsibility.

Activities

Discuss in the class that education facilitates to get employment.

Exercise

Write the answers to the following questions:

1. What is the relation between education and employment?
2. Make a list of the employment opportunity at the local level and required qualification for the employment.

Relation between Employment and Training

Training makes it possible to develop special skill in an individual. A trained person can perform his or her job well. An untrained person can do the job but the work may not meet the standard of the organization. Any employer looks for essential skill, ability and work related technical knowledge in the person that he or she is going to hire. In doing so, the employer also tries to find in the person how skillfully that person uses the tools and equipments while doing the work. In addition, the trained person becomes alert of any accident while doing the work. In this way, a trained person is knowledgeable about the work or occupation related information. Thus trained person easily gets an employment. So there is an important relation between employment and training.

In order to enter in an occupation or enterprise, one has to have knowledge and skill about it. It will be easy to a trained person who has enough occupational knowledge and skill, to give the service and contribute in the production. Therefore, it is necessary to get both

skill and knowledge to make it easy to do the job. The process of teaching and learning of job related skill and technical knowledge is called training. Any training has a definite objective. Instructors, laboratory or workshop, classroom including tools and equipments are used when giving or taking training.

Importance of Training

A trained person can do the job better than an untrained person. Because he or she can use



the knowledge and skill received from the training. A trained person can perform well in any occupation than an untrained person. The commodities produced by such trained persons are of good quality. He or she can give more service in less investment. So, training has great importance.

Types of training

Training is of different types. Generally, training can be divided into two categories:

- a. General skill Training
- b. Vocational skill Training

a. General Skill Training:

Any activity that is carried out using knowledge and skill is known as general skill training. Work related general training is given before starting an occupation or employment. More knowledge than skill is given in general skill training. General skill training is given not to work in an occupation by using specified skill, but it is given to run plan of business or keep cost estimation or for any other general work.

b. Vocational Skill Training:

Skill training is given to enter skill oriented employment and start-up skill oriented enterprise. Therefore, skill training is known as vocational skill training. Following things can be obtained from vocational skill training:

1. Skill related technical knowledge, which help to perform the skill well
2. Ability to understand technical drawing (draft) related to skill training
3. Keep account of measurement when at work
4. Identify market for providing service or market for consumption of the production from the business
5. To provide service from the learned skill or to provide market for produced goods

6. Keep account of possible profit and loss in the business
7. Be alert and careful from possible accident while at work.

An individual, who has taken vocational training, can be an entrepreneur, can start his or her own business, or work as a skilled worker in some industry or business.

Exercise

Write answers to the following questions:

1. What is training? Write importance of training.
2. Write 5 names of training that member of your family and your neighbors have undertaken.
3. What is vocational training? What is taught in vocational training?
4. What can a person who has undertaken vocational training do?

Introduction of Vocational Training Institutions and their Programs

There are government and affiliated private technical and vocational training institutions in Nepal that run approved training programs. They are running as government institutions, institutions under cottage industries and non-government institutions. The descriptions of the institutions and their programs are given below.

Training programs run under different ministries in Nepal are as follows:

S.N.	Training Institutions	Participants of the training
1	Department of Cottage and Small Industries	Interested Nepali citizens of 27 districts of the Terai region who want to take the training and be entrepreneur at local level, The program is conducted Under the entrepreneurship Development Program
2	Cottage and Small Industries Development Committee	Interested Nepali citizens of 48 districts of the Hilly region who want to take the training and be entrepreneur at local level. The program is conducted Under the entrepreneurship Development Program
3	Technical Schools	Nepali citizens who are interested to take skill training that is necessary for local enterprises and also for establishing enterprise in possible occupations
4	Labor Supply Centre	Nepali citizens who are interested to take skill training and work under local organizations at local level.
5	Skill for Employment Project	Nepali citizens who want employment at local, national, and international level, or want to be entrepreneur or self-employed.

Besides these, there are many private and non-government organizations, which conduct approved vocational skill training programs.

Exercise

Write answers to the following questions:

1. Write the name of 3 institutions that provide short -term skill training.
2. Write 5 names of training conducted under Cottage and Small Industries Development Committee.
3. Make a list of the trainings conducted by Skill for Employment Project.

Lesson - 5**Technical Schools (Ilam Kendra) under Federation of Nepal Chamber of Commerce and Industries**

The Federation of Nepal Chamber of Commerce and Industries (FNCCI) operates technical schools known as Ilam Kendra. These technical schools produce human resources for employment in enterprises and business by providing short-term training course to local people. The graduates of these technical schools can easily enter the job market. The training institutions also provide consultancy service about employment opportunity in the enterprises and business.

The following Ilam Kendras are in operation at present:

Damak, Jhapa, Dharan, Sunsari, Lahan, Saptari, Kalaiya, Bara, Bidhur, Nuwakot, Chahara, Gorkha, Parasi, Nawalparasi, Birendra Nagar (Surkhet), Bhimdutta Nagarpalik (Kanchanpur), and Kushma (Parbat). These Ilam Kendras provide training in the following subjects:

S.N.	Training subject	S.N.	Training subject
1	Electrical Appliance Repairer	2	Plumber
3	Community Agriculture Assistant	4	Jewelry Maker
5	Furniture Maker	6	Wood Carver
7	Steel Fabricator	8	Motorcycle Mechanic
9	Baker	10	Beautician
11	Hand Embroider	12	Brick Maker
13	Off Season Vegetable Farmer	14	Sawmill Operator
15	Mason	16	Bamboo Artisan
17	Spinning Operator	18	Electrician
19	Cellar mill Technician	20	Basic Welder
21	Fashion Designer	22	Offset Printing Operator
23	Cookery	24	Sewing Machine Operator
25	Computer Hardware (Basic)	26	Agriculture (Livestock)

S.N.	Training subject	S.N.	Training subject
27	Stone Block	28	Painting (Fabric, Wall, Board etc.)
29	AutoCAD	30	General Mechanic (Refrigerator, TV)
31	Mobile Repairing, Radio etc.	32	Herdsman

Activities

1. Find out if there is any training centre or any Ilam Kendra around your community, and find out also the kind of training the Ilam Kendra has been offering. Prepare a description on your findings and show the description to your teacher.
2. Write an application to any training center requesting for a participation in the training of your interest.

Exercise:

Write answers to the following questions:

1. What is the objective or aim of technical school (Ilam Kendra)?
2. What are the places where Ilam Kendras are being operated at present?
3. Make a list of 10 trainings being offered in the technical schools that are being operated under FNCCI.

There are training centers under Labor Department. Among the training centers, Skill Development Center provides employment oriented training in order to prepare semi-skilled and skilled workers. On the basis of local need assessment, the skill development center imparts skill training with the help of local experts. During selection of training, priority is given to that area, which has potentiality for entrepreneurship. Fifteen districts of the country have training centers in operation under labor department till now. These training centers produce human resources for local, national and international labor market. The training centers are running the following trainings:

- a. 7 days to 3 months short-term training course for entrepreneurial business.
- b. 6 months (600 hours) basic training for supplying skillful laborers
- c. 4 weeks special skill training course for laborer/workers, who want to go for foreign employment

Areas for basic training are as follows:

Bamboo work, Printed muslin (Dhacca) weaving, Sewing and cutting, Motorcycle repairing, Auto mechanics, Electricals, Hair dressing, Computer, General Mechanics, Residential Women's Skill Training.

Areas for 4 weeks special skill training course for those who want to go for foreign employment as follows:

Waiter / Waitress, Scaffolding, Steel Fixture, Shuttering Carpentry, Mason, Security Guard, Cook, Hotel Management, Caregiver, Bar-men, Baker, Front Office, Nursery Management, Mushroom Farming, Thanka Painting, Rural Animal Health Worker, Sales Person, Office Secretary, Housekeeping, Women Security Guard, etc.

Places where skill development training centers are situated:

Vocational and skill development training center, Bhaisepati, (Lalitpur), and Branch Office, Tripureshwor, Kathmandu.

The skill development centers are situated in different parts of Nepal

as zonal skill development training centers. They are as follows:

Jhapa, Itahari (Sunsari), Okhaldhunga, Janakpur, Dhanusa, Rauthat, Hetauda, Butwal, Bhairawa, Khalanga (Jumla), Dang, Nepalgunj (Banke), Dhangadi, Mahendranagar (Kanchanpur), Kushma (Parbat), Pokhara (Kaski).

Training in Partnership

Vocational and skill development training center has conducted vocational and skill oriented trainings in partnership with various other organizations. Rural municipality, Municipality, district co-ordination Committee, and other interested local training organizations, non-profit social organizations, non-government organizations and clubs are training partners of skill development training center. 6 months basic vocational and skill oriented trainings are conducted in partnership of the above mentioned partners. The training is conducted on the basis of the partners' proposal.

Activities

Visit a training centre in your community (if there is any), and get information about the kind of training the center offers, and also about the process on how you can take part in the training. Then, write a report on your findings.

Exercise

1. What is skill development training center?
2. Make a list of the basic training areas (subjects) offered in skill development center.
3. What are the areas of 4 weeks training offered for foreign employment?
4. Make a list of short-term training areas (subjects).
5. Write down the name of the places where skill development training centers are situated.

Cottage and Small Industries Development Committee

Cottage and Small Industries Development Committee is a committee, which is approved by government of Nepal. Its central office is located in Tripureshwor, Kathmandu. This was established with its main objective as to develop cottage and small industries. It runs both skill development training and self-employment development training. Cottage and Small Industries Development Committee has many offices in many different districts of Nepal. The Committee takes into consideration the local market, sources and resources and local interest when planning its program. The Committee operates its training program on the basis of potentially of running cottage and small industries at the local level according to local labor market needs and demand. At present the training of the Committee is operated for employment in both local cottage and small industries and abroad. Name of areas or topic of training conducted by the Committee are as follows:

Making Incense Sticks (Agarbatti)

Allo processing and spinning

weaving (Girandinia)

Embroidery

Printed Muslin (Dhakka) weaving

Woolen radi-pakhi weaving

Woolen cloth weaving

Fibre or filaments (resa) handicraft

Woolen thread spinning

Coffee Processing

Dyeing (clothes or threads)

Cloth weaving (using semi-automatic or automatic machine)

Wooden handicraft

Screw pine (ketuki) processing

Envelop, file and stationery making
Khukuri (Nepali knife) making
Carpet making (weaving)
Lapsi (sour fleshy fruit) candy making
Tomato ketchup making
Gents' hair cutting
Ladies beautician
Pote (beads) materials
Plumbing, Sanitary fitting
Fruit processing
Vegetable processing
Block printing
Fabric painting
Box making
Bakery
Bamboo materials (goods)
Bucket seat (Muda) making
Metal cookware (utensils) making
Silk cotton processing and knitting
Mechanical works
Spices making
Clay cookware or utensils
Candle making
Socks knitting
Tire repairing
Motor cycle repairing
Bee hive building (making)
Bee keeping and Honey processing
Radio / TV repairing

Pickle, Fermented and dried vegetable (Gundruk), small round lump of pounded pulse mixed with vegetable and dried (Masyaura), fermented and dried radish (Sinki) making

Chalk making

Chyuri ghee processing

Instant Noodles making

Leather goods making

Leather processing

Wheat stalk handicraft / basket weaving

Rope making

General Electrical Works

Jute Carpet weaving

Jute Bag weaving

Shoes making and repairing

Bag making

Tie dyeing process

Dairy Ghee

Mason or Brick layer

Cutting and sewing

Potato chip, Dalmoth making

Metal handicraft

Liu (kind of rug made of Yak's hairs) weaving

Cycle/ Rickshaw repairing

Sallebir (Pine leaf or tree) weaving

Sign board painting

Electricity fitting and maintenance

Soap making

Solar heater

Carpentry

Cement/tile fitting/construct

Cement hollow block making
Improved smokeless stove making
House wiring
Hand paper
house painting
Hosiery (sweater knitting)
Photography and videography
Murabba (a kind of sweet) making
Brush making
Tika (Bindi) making
Bhuja (Muri) making
Basic Computer training (Basic)
Knot Craft
Wood Carving
Silk thread spinning
Miscellaneous (according to local demand and feasibility)

Exercise

1. Give introduction of Cottage and Small Industries Development Committee.
2. What kind of trainings does Cottage and Small Industries Development Committee run?
3. Write the name of at least 10 training areas that use modern technology.
4. Write the names of 10 training areas that have possibility for foreign employment.

Unit - 3**Employment Related Information****Lesson - 1****Sources of getting information about local employment**

Various employment and business are provided at the local level. Skilled and capable workers are required to work in such businesses. We can get information about employment in a business from individuals, organizations and media. It is a legitimate arrangement to make an advertisement by the business for employment opportunities. It is the responsibility of the organization to make the information known to all about nature of work, qualification, number of required human resource

and basis of selection process of the candidate for the advertised post. Skilled and able workers are required, at local level, for traditionally run business, non-government organizations, and government offices. The employers of all the above mentioned business and organizations make advertisement and selection for employment at local and zonal levels.

**Activities**

What are the sources of getting information about opportunity of employment? Discuss in the class.

Government organization

Information about requirement of human resources in government offices on contract basis can be acquired from the District Administrative Office, District coordination committee and other organizations. Information about the requirement of human resource is posted on notice board of these offices.

Private and non-government Organization

Besides government organizations, there are private and non-government organizations working at local level. There are employment opportunities in these organizations also. We can get the information about job vacancy in these organizations from the web site, local newspapers and FM/ radio.

Locally operated community based organizations

There is possibility of employment opportunities in Consumers' Group, Saving Group and Cooperative Limited. We can know about job openings in these organizations from its information board, contact with the organizations, acquainted employees of these organizations, and local newspapers.

General Communication Media

Local newspapers are published with a view to develop communication media locally. Local FM has also been established for the same purpose. In the same way, the organizations publish their journals or magazines, in which they publish also the advertisement of employment opportunity in their organizations. Media is effective resource for flowing public communication.

Activities

- a. The entrepreneur needs various human resources in order to run small and cottage industries at local level. An entrepreneur needs some workers to establish a brick factory. Prepare an advertisement indicating that the entrepreneur needs the following workers:

Required workers / individuals for preparing bricks.

1. Mud digging (people)
2. Mud carrier (people)
3. Motor operator
4. Brick preparing persons
5. Brick burning persons

6. Brick takers from fire
 7. Brick counting persons
 8. Brick sellers (retailers)
 9. Accounting persons
 10. Supervisors
 11. Marketing officer (Marketing manager)
- b. Study the above advertisement and prepare a list of human resource for a Spice Industry.
 - c. What kind of human resource is needed in the business organization that is operated in your community? How do you make demand for the required human resource? Visit a nearby business organization and prepare a group report about that it.
 - d. Study the following advertisement and make a note about the information it has:

Employment Opportunity in Jagadamba Spice Industry, Sisaiya, Kanchanpur

Wanted Marketing Manager

A marketing manager with the following qualification and skill is required for Sri Jagadamba Spice Industry, which has been in operation for the last one decade. Qualified candidates are requested to send their applications within 15 days from the publication date of this advertisement.

Advertisement No.:	1/070/71
Position:	Marketing Manager
Academic Qualification:	SLC pass
Training:	Training on Account management, Knowledge in Computer operation
Experience:	5 years experience in related field
Salary:	As per agreement
Working Period:	One year on contract basis. Working period could be extended on the basis of performance evaluation

Discuss about the information given in the above advertisement. What qualification and experience are required to be eligible to become a marketing manager? Discuss with friends.

- e. Name any enterprise or business in a rural area that uses local resources for the production of goods. Prepare an advertisement for employment opportunity in that enterprise stating required qualification and experience of the human resource. Discuss what communication Medias could be used for the advertisement?

Exercise

Write answers to the following questions:

1. Make a list of the kind of communication Medias and other resources that can be used at local level to get information about employment opportunities.
2. Village Development Committee or City Metropolitan is public relation office. This is also a public place appropriate for all to contact each other. What information can be obtained from Village Development Committee or City Metropolitan office? Discuss with nearby Ward Chairperson or member of the Ward and write your findings.

Introduction of General Vocational Skill and its Importance

Education has great importance in the development of general vocational skills. General vocational skill is the combination of basic skill, vocational and entrepreneurship education. The development of work related skill is called vocational skill. Making clay cookware or utensils, doing farm business are examples of the occupations which is done with the use of vocational skills. But, general skill is very essential for the development of vocational skill in an individual. General education is necessary for the development of general skill. The general skill includes development of reading, writing, and listening skills. Such general skills enhance the development of problem solving skill, understanding the problem and decision making skills, which finally develop the vocational skills.

Education and training are bound with work and business in order to develop entrepreneurship skill. Such skills boost up creativity in work and development of the enterprise. General skills help develop knowledge and skill in an individual and vocational education and training is necessary to connect skill with work. Knowledge helps the entrepreneurship skill of an individual.

Activities

1. Discuss what skills are required to work as an entrepreneur or self-employed.
2. Discuss in the class about the importance of general vocational skill.

Exercise

Write answers to the following questions:

1. Make a list of general skills.
2. Write the importance of vocational (occupational) skill.
3. Write the importance of general vocational skill.

Use of General Vocational Skill

General vocational skill is developed by means of education and training. An individual can put on the job market the occupation related knowledge, skill, and ability that he or she possesses. An individual gets employment skills from the development of such skills. General vocational skill or soft skill is needed in order to convert knowledge into skill and skill into knowledge. General or soft skills can be integrated in our daily work activities, and also in teaching-learning process. Our education becomes worthwhile, when we can use the skill and knowledge that we have learnt in our daily life, in office or in our work.

General vocational skill or soft skills improve the following aspects:

- a. To get information about work or occupations. For example: Teaching is the work of a teacher.
- b. What skill do we have to get?
- c. Where do I get the skill?

Activities

1. Discuss with your teacher about the competition one has to face to enter in teaching occupation.
2. Discuss about the technique of using general vocational skill.
3. What general skills are required to be a teacher? Discuss about it with your teacher and write a report on it.

Exercise

Answer the following questions:

1. How do you use general occupational (vocational) skill?
2. In what occupations do you use general vocational skills?

Communication skill is one of the general or soft skills. Communication exchanges information and messages. Any individual and any organization need communication. Interpersonal skill is essential for effective communication. Communication skill helps an individual for effective decision making. This skill also helps to develop social skills.

**Activities**

1. Discuss what aspects an individual has to bear in mind to develop interpersonal skill for effective communication.
2. Discuss and prepare a report why communication skill is essential in professional (vocational) life.

An individual has to develop following skills within communication skill:

- | | |
|------------------------|---|
| 1. Listening Skill | : Ability to understand the message |
| 2. Comprehending skill | : Ability to react by understanding the message |
| 3. Speaking Skill | : Ability to speak in language that everybody understands, to speak respectful language |
| 4. Writing Skill | : Ability to express one's thoughts and ideas clearly in writing |
| 5. Communication Skill | : Ability to exchange thought and ideas with each other in order to solve the problems |
| 6. Coordination Skill | : Maintain understanding among individuals |

Discuss the following aspects of communication process:

1. Topic of communication and sender
2. Internal and external client
3. Medium
4. Information storage and development of habit for using communication
5. Receiver

Exercise:

1. What is communication skill?
2. How much does the interpersonal skill affect the communication skill?
3. Present four points about the significance of communication skill.
4. Write two aspects that help in developing communication skill.



Many individuals working together for a common goal is called a team. We can say that a team is made of many individuals. Therefore, the process of working together by many individuals for a common goal is team-work. An individual cannot do any work fast and effectively, so team is necessary for fast and effective work. A team is formed according to the individual's interest and aim. Team is formed on the basis of objective and interdependency. While working in a team, every individual has respect toward the interest and feeling of the team members. Team feeling was developed from the phrase 'Unity is strength.' The team leader should mobilize the team in an effective manner. Conflict may arise when working in a team. You need to take this in a positive way, understand others' thought, and prepare strategy to solve it.

Activities

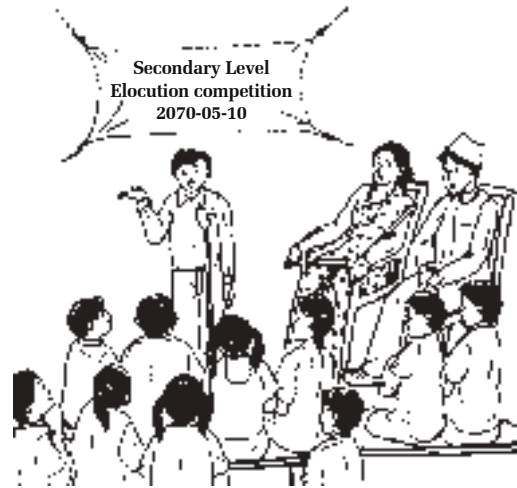
1. Discuss what aspects are to be considered when forming a team or group and when working in a team.
2. How can the team leader motivate or encourage the team members to mobilize the team?

Exercise

Write answers to the following questions:

1. What is a group or team?
2. What kind of skills are needed to work in a team?
3. State how team is formed and what are the responsibilities of team members?
4. What is the function of the team leader?

Interpersonal skill is one aspect of social skill. This helps an individual to take out his or her inner qualities. Some individuals are introvert, and some others are extrovert. The introvert people are self-centered. Open minded people are called extrovert. An individual develops relationship with another individual, group, and organization according to his or her nature and style.



Interpersonal relationship has great importance in business and social life of an individual. Interpersonal relationship makes deep connection with an individual and work. In managerial work also, interpersonal relationship motivates the workers and employees towards their work. The motivated employee become responsible towards his or her work and also can face problems and challenges.

Activities

Discuss about the aspects that an individual has to pay attention in order to develop interpersonal skill in him or her.

Exercise

Write answers to the following questions:

1. Individuals are introvert, or are extrovert. In which group do you think? Discuss with your friend about your nature and style in order to know in which group you are, and make a list about your nature and style.
2. Why does a manager need interpersonal skill to run a business or enterprise? Give your answer in 10 points.
3. If you are to evaluate the interpersonal skill of your friend, what aspects of your friend's interpersonal skill do you think are needed to improve?

Introduction of Business and its Importance

Business is an occupation or work in which money or some capital is invested. But not all works can be called a business. If money is invested on some work for the purpose of earning profit, then this work is regarded as business. Such works are related with production and exchange of goods and services. If any goods are bought and sold or if any service is provided with an objective of earning profit, then such activity is called business. Such work is independently done on regular basis through private or public organization.

The extended forms of business are enterprises, industries, and services. Business improves economy, and solves employment problem. Business helps us to use locally available resources, obtain revenue, improve our life style, and spend our lives in comfortable way. The



importance of business increases day by day, because it also helps in earning foreign currency.

These days the whole world has become business oriented. The more people of a country become businessperson the more developed a country is.

Activities

1. Make a list of the businesses that are operated in your community, and present the list in the class.
2. Visit a business person and discuss about the profit that can be got in a business. Present the result of your discussion in the class.

Exercise

Write answers to the following questions:

1. Give introduction of business.
2. Write importance of business.

Lesson - 2 Introduction of Agriculture and non-agriculture based Traditional Business of Nepal

(Ashis studies in grade six. Miss Deepa teaches occupation, business, and Technology subject. This is the dialogue that took place between the two during recess.)

Ashish: Miss, last week we learned many things about business. What is traditional business?

Deepa: Your friend Shiva's father makes clothes. Shivani's brother makes fali (blade of a plough), iron frying pan (tapke), pincers (chimta), tripod- three legged stand for putting a cooking vessel over fire (odan) etc. from iron. Harkaman's father makes shoes out of leather. Shekhar's father makes radipakhi (home spun woolen blanket) from sheep's wool. They have been doing this business from the period of their forefathers. Family members learn the business by participating in such business. The new generations also do the same. In this way, because such business was in operation since long, the business is called traditional business.

Ashish: Then, What does Agriculture and non-agriculture based Traditional Business mean, Miss?

Deepa: Various supplies are needed to run a business. For example, leather is required to make shoes, wool for making radipakhi (home spun woolen blanket), and iron for khukuri and knife. These materials are called raw materials. The business, which is based on the raw material that we get from agriculture farming and livestock, is called agriculture based business. The business, which is based on the raw material that we get from other sources, is called non-agriculture based business.

Ashish: In that case, Miss, making juice from fruit is agriculture based business and making khukuri from iron is non-agriculture business, right?

Deepa: You are absolutely right.

Ashish:OK Miss, the bell has rung. I have to go to the class now.

Deepa: OK.

Activities

1. Discuss about the agriculture based and non-agriculture based business that is in operation in your community.
2. Make a list of the businesses that have been run in your community.
3. Discuss in the class about the business that the family of the students of your class have taken up.
4. Observe the business that has been in operation locally and discuss with the owner of the business about it. Write a group report on the basis of the following points:
 - a. Acquiring of required materials
 - b. Machines and equipment that are used
 - c. Details of the goods that are produced
 - d. Place for sell and distribution of the produced goods

Exercise

Write answers to the following questions:

1. Give introduction of the agriculture based business.
2. Give introduction of the non-agriculture based business.
3. Classify the following businesses in agriculture based and non-agriculture based business:
 - a. Nepali Paper making
 - b. Rice Mill
 - c. Brick Factory
 - d. Vegetable farming
 - e. Shoes making
 - f. Dairy
 - g. Carpet Weaving
 - h. Stone Mine Operation

Lesson - 3 **Information about Locally Operated Small Business**

Lalbandi Bazaar, Sarlahi

2070/06/02

Dear Suman,
Lots of remembrance!

It has been almost two years since we migrated here. At present I am studying in grade six. I'm always missing you. So I am writing to you about the works that we did after I came here. We bought 5 kattha land (1 kattha equals to 1/20 Bigha of land) after we came here. We have planted vegetables in that land. The JTA sir of agriculture service center gives us suggestions and helps about which kind of seeds are good, use of pesticide for vegetable diseases, and seasons and timing for different vegetable planting. My parents always work in the field. We have grown varieties of vegetables in the field. After I come back from the school I calculate the morning and evening expense on vegetable farming of our house. When the vegetables are harvested we sell the vegetables in nearby market, and keep some profit from the expenses. We use the profit amount for my school and household expenses. We do not need to take help from others in time of need. We knew that the household waste, garbage from the kitchen, and discarded water can be very useful. I have also thought that when I grow up I will buy a big land and do vegetable and fruit farming business. I have become an expert in selling vegetables and calculating the expenses and profit. Your parents used to keep and raise buffalo and sell its milk. What business are they doing these days? How is your study going on? Write everything to me, ok? Bye for now. Thank you.

Your loving friend
Shishir

Activities

Just like Shishir's parents do vegetable production business, make a list of 5 businesses that your family and neighbors do. Discuss about it in the class.

Exercise

Write answers to the following questions:

1. Who helps Shishir's parents to do vegetable farming? What kind of help are they provided?
2. Write 5 benefits that we get from vegetable and fruit farming.

Suggestions for teaching

Divide the students in five groups having 5-6 members in each group. Let each group visit one local business and observe it. Let them ask the businessperson what benefit the business person himself or herself and the local community are getting from the business. Tell the students to prepare a report and present it in the class.

Introduction of Trade

We use various things in our daily life. We cannot produce all these things by ourselves. In fact, it is not possible to produce all these things. In this way, the system of trade was started. Thousand years ago, people used to trade by exchanging goods. Some people had rice, and some other people had vegetable. They used to solve their problems by exchanging rice with vegetables. In this way at the time of constructing a house, sewing clothes, and taking any other services, people used to give things including food grain in return of the services. In this way trade was done by exchanging goods with goods or service with goods. Such trade is called barter or goods exchange.



Necessities of people increased. They used to go far from their places for trading. Difficulties started to arise to trade through barter. Then people started to trade goods and services by taking money. In this way trade began to take place.

Activities

Find out, among the friends of your class, what kind of trades their families do. Then, according to the number of students, divide the students in 4-5 groups and go to the shops and get information on the basis of the following points. Then write a report to present in the class.

- | | |
|-------------------------------------|--------------------------|
| a. Required capital to run the shop | b. Availability of goods |
| c. Sell and distribution of goods | d. Profit from the shop |

Exercise

Write answers to the following questions:

1. Write in one paragraph about how people used to trade in the past.
2. What is the difference between the previous trade and present-day trade?

Dear students! we can find that, in our community, people are doing various kinds of trade. In the Hat (temporary market) bazaar near to our village we can see that people sell vegetables, fruits, lentils, rice, wicker basket (doko), small basket (tokari), jute band (namlo), cord for fettering beasts (damlo), clothes and dresses as well as foodstuff. This way, people sell the stuff, which they produce, in Hat bazaar, and they buy necessary things for themselves from the money they get after selling their stuff.

It is not always possible to get the things that we require in the local Hat bazaar of our community. In such circumstances, we go to nearby big cities for buying things of our needs. In these big cities, we can get goods produced from all over the country as well as goods imported from foreign countries. Besides, the goods that are produced in the village cannot be sold in the local Hat bazaar only. Therefore, these goods are taken to big cities for sale. It will be easy to take the produced goods to the market if there is provision of road and transportation. So it is very important that all the villages have access to road and market.

Activities

1. Divide the students in groups and take them to nearby Hat bazaar for observation. On the basis of the shops in the Hat bazaar, prepare a report about kinds of shops use the following points:
 - a. Clothing and dress shops
 - b. Food stuff or grocery shops
 - c. Vegetables and fruit shops
 - d. Hotel, restaurants, and tea shops
 - e. Others

2. Various goods are produced in your community. Discuss with one of the producers about his/her production. Ask him or her where they take the produced goods for selling and how much the annual profit is. Prepare detail information and present it in the class.

Exercise

Write answers to the following questions:

1. Make a list of the goods that your family buy and sell in the market.
2. Write how the goods that are produced in your community are taken to the market.

The place where goods are sold and bought is called bazaar. Goods are kept in the bazaar for selling. The person who sells the goods is called a salesman or retailer. They have different techniques to sell their goods to the customers. For example: keeping good of the shop in decorative way to attract customers, being clean, tidy and attractive, speaking politely and respectfully with the



customers, keeping goods in the shop according to the interest of the customers, taking reasonable profit etc. With all these techniques, the salesmen are successful to win the heart of the customers and sell their goods. Selling goods by using various skills and techniques to win the heart of the customers is called salesperson skill.

Activities

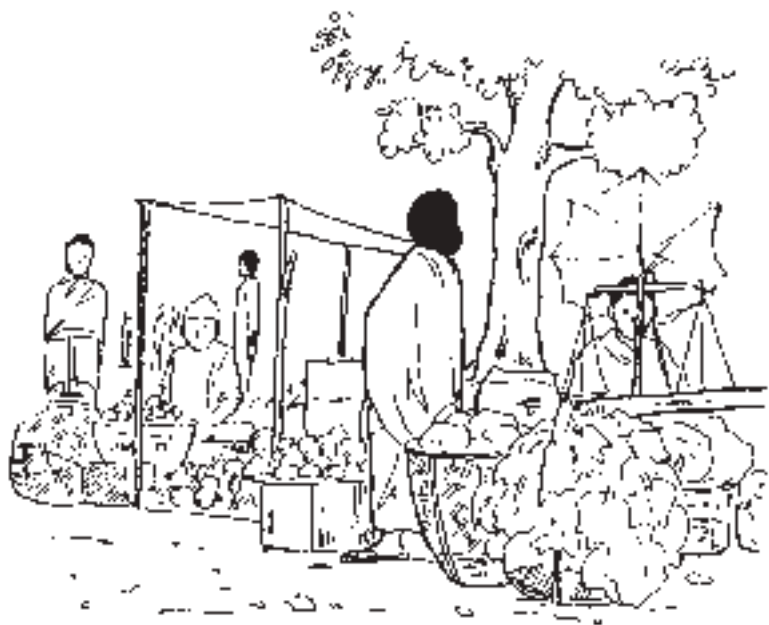
Visit the Hat bazaar that is around your community; observe the skills that the shopkeepers use to sell their goods. Show salespersons skill by mimic play in the class.

Exercise

Write answers to the following questions:

1. Make a list of the bazaar in your community.
2. What is salesperson skill? Write your answer.

Hat Bazaar



Lalgad, Bardibas bazaar is near Shyam's house. We can get various kinds of food such as rice, lentils, vegetables, snacks, sweets etc. in this bazaar. The shops of these bazaars are opened everyday and sell the goods to the customers. The place where such shops are situated is called bazaar. Likewise, a Hat bazaar takes place every Wednesday and Saturday near Bardibas bazaar. Vegetables, fruits, lentils,, rice, clothes and dresses etc. are kept for selling in Hat bazaar. The people of Shyam's village, surrounding villages, and bazaar go to the Hat bazaar and sell goods produced by them, and buy necessary things for them. In this way, the bazaar which takes place on a specified date and day is called Hat bazaar.

Activities

Discuss in the class and present about what day and date the Hat bazaar takes place in surrounding villages of your community.

Exercise

1. Describe what a Hat bazaar is.
2. Write the benefit we get from Hat bazaar in points.

Note: From among the following Unit 7 Vegetable Farming to Unit 14 Sewing and Knitting, teach any four units only.

Unit - 7

Vegetable Cultivation

Lesson - 1

Introduction of Kitchen Garden

We need fruits and vegetables for daily use. For this, we cultivate fruits and vegetables in surrounding areas of our house. We plant many kinds of fruits and vegetables in our kitchen garden according to the seasons. Thus, the place around the house where we plant different vegetables and fruits for domestic use is called kitchen garden. Cultivating in the kitchen garden is called kitchen garden farming.



Preparation of kitchen garden

For vegetable garden, fine loamy soil with enough fertilized substances is required. It can soak water easily. The small granules of stones and other unnecessary particles should be removed from the soil. Not all places have same type of weather nor they have same type of soil. Some vegetables give fruit under the soil, while some vegetables produce fruits above soil. The farmers need to identify the type of soil that will match with the kind of crops. The field should be ploughed minimum 15-20 centimeter deep. After ploughing, the field should be made even by breaking all the clod soil. Then, fertilizer or ripe compost should be mixed with the soil. According to the type of crop, the soil should be made even or row (dyang) should be made for planting seeds or seedlings. The planted seeds or seedlings should be watered or irrigated from time to time.

Selection of vegetables according to soil and weather

The soil on which we plant crops can be of many kinds, such as: red, domat, sandy, tough, and black. Sandy domat soil has more capacity for soaking water than sandy soil. So, such kind of soil is suitable for planting turnip, radish, carrot, onion, and garlic etc. Although tough soil is not suitable for planting vegetables, but if we use dung of cattle it will improve quality of soil and the soil will be suitable for planting vegetables. After identifying the type of soil, it will be appropriate to plant vegetables according to the weather.

Activities

What kinds of vegetables are planted in your kitchen garden or the kitchen garden of your community? Discuss and make a list.

Selection of seeds

Attention should be given to selection of seeds before planting vegetables. If the seeds are of good quality, production will also be good. If the seeds are of low quality, there will be no production or production will decrease. Therefore, at the time of selecting seeds, following aspects should be taken care of:

- a. Pure brand of seeds
- b. Free from diseases
- c. Big, heavy, uniform in size, and of original color
- d. Having minimum 90 percent productivity power
- e. Clean and not mixed with other seeds
- f. Have enough moisture (not dry)

Activities

1. Ask your parents or guardians and neighbor, who do vegetable farming, about the aspects that should be given attention while selecting seeds.
2. Collect seeds of the plants, which are planted in your house and community. Select good and bad seeds and plant them around your school premise.

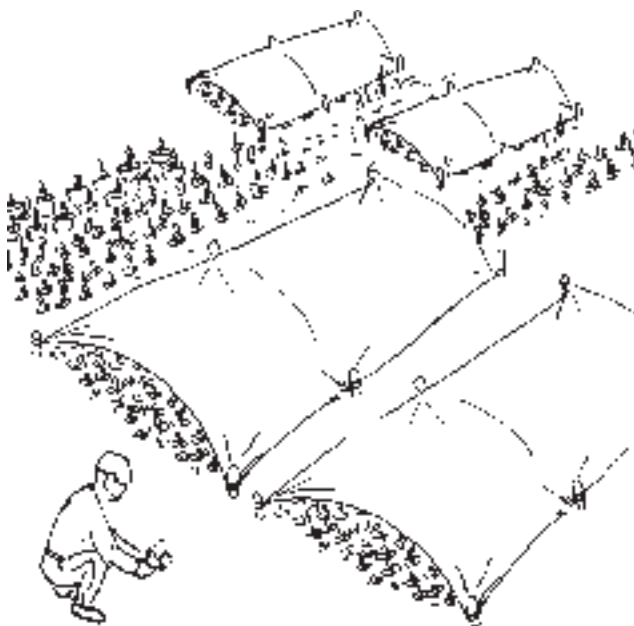
Preparation of nursery - bed

Soil should be tilled properly 3-4 times before preparing the nursery bed. The dry leaves, small stones, old roots should be removed and the soil should be made dust like. Then, mature or ripe manure or compost should be mixed. While the bed is prepared, it should be raised about 15 centimeters above the ground in rows. Generally bed is 6 meters long and 1 meter wide or the length and breadth should be according to need. If you need to make more than 1 bed, 30-40 centimeters gap should be left between two beds.

A bed is the ground field, which is made ready to plant flowers, vegetables, and food grains. Beds should be prepared according to the seeds you are going to cultivate.

Care of Seedlings

The distance of the rows should be 8-10 centimeters or according to needs. Seeds or seedlings should be planted in the rows in 1-2 centimeters deep. The beds should always be kept appropriately moisture. After the seeds become seedlings, it is very important to take care of them. The seedlings should be kept safe from sun-burn, heavy rain, hail, and frost. The seedlings should be kept safe from insects and diseases also. Seedlings need both sunlight and shade.



Method of irrigation in Beds and Seedlings

Light irrigation is necessary in the evening after seeds are sowed in beds. Considering type and structure of soil, and weather, light irrigation or watering with a sprinkler is necessary in the morning

and evening or once a day. When watering, make sure that the whole area of the bed is wet. After seeds become seedlings irrigation should be done with a sprinkler or fountain as required. In the same way, irrigation should be done properly 6 - 12 hours before removing the seedlings for transplanting. As a result when the seedling is plucked from the bed, enough mud will be stuck on the root so that it will be easy to plant the seedlings before they get flaccid.

Activities

Make a Time-table for irrigating nursery bed and the seedlings, and do according to the time-table. Make a list of aspects that need to be given attention at the time of irrigation.

Compost Manure

Compost manure is made from decomposed hay, dry leaves, husk, trash, wastage from cattle shed, useless items from home and kitchen. There are two methods to make compost manure. (a) by collecting all the above mentioned wastages and pile up to make a heap; (b) well managed compost pit. These two methods make the compost manure ready for use quickly; help protect all the necessary nutrients in manure, and make the compost very fine and of good quality. The two methods for making compost are as follows:

Pile up Method

The method of making compost, in which all the materials that are used for making compost are piled up, is called pile-up method. This method of making compost is mostly used in hill and high hill areas, where this method is useful too.

Pit Method

All the materials that are used to make compost manure are cut into small pieces. If the materials are cut into very small pieces, the manure will get rotten fast and easily. It will be better if, before putting the materials in the pit, they are used in cattle shed as *sottar* mixing with dung. After putting the materials in the pit, they should be overturned once a month. The compost manure will be ready for

use within 2.5 to 4 months by this method. The compost manure should not be put in the sun to dry. It should be taken out from the pit just before using in the field.

Activities

1. Have you ever seen people making compost that they need? How is compost or dung manure made in your villages or community? Make 2 groups and find out about the tools and equipment, ingredients and methods for making compost, and inform your teacher about your findings.
2. Mix compost manure with soil to make it fertile, and show it to your teacher.

Exercise

Write answers to the following questions:

1. Describe importance of kitchen garden.
2. How is the place for kitchen garden prepared?
3. Make a list of vegetable crops that are planted in winter.
4. Write method of making pit compost.

Practical Activity

1. Prepare a nursery bed in school premises for planting seedlings.
2. Observe the use of compost pit and management of irrigation in your kitchen garden, and describe about it in your exercise book (copy).
3. Have you ever seen in your house or village how compost is made? What methods are used to make compost manure? Divide in two groups, and one group will make compost by pit method; the other group will make compost manure using pile up method.



Fruit cultivation is done generally in all places of Nepal. Various fruits are cultivated according to weather, soil, temperature, humidity, and landscape. Apple, apricot, walnut etc. are cultivated in high mountain region. Likewise, banana, grapes, mango, jackfruit etc. are cultivated in the Terai region. In the valley and hill areas, oranges, grapefruit, pears, guava, peach, persimmon etc. are cultivated. Fruits are cultivated at local level also. Weather, temperature dampness, and rain have great significance from the cultivation of fruits.

Activities

Make a list of fruits that are cultivated in your hometown, village or community.

Introduction of fruit cultivation at local level

Different kinds of fruits are cultivated in all regions of Nepal. Following are the main fruit cultivation among other:

Apple: Apple is a popular fruit all over the world. Solokhumbu, Sindhupalchok, Rasuwa, Manag, Rukum, Rolpa, Jajarkot, Humla, Baitadi, Darchula etc. are the districts of Nepal, where apple is cultivated. Apple is produced in Jumla, Mustang, and Dolpa in the form of business. Varieties of apples are grown in northern part of Nepal, where the altitude is between 1200 - 3800 meters with cold

weather. Very cold place, where there is snowfall, is very appropriate for apple cultivation. Golden delicious, *Jonathan*, *binauri*, cox orange, Anna tropical beauty, red royal etc. are the species of apple cultivated in Nepal.

Pears: Pears have been cultivated in Nepal since early days. The cultivation of pears requires warmer weather than apple. Pears can be cultivated as business even at the altitude of 1200 - 2200 meters. Deep sandy domat soil is appropriate for pears cultivation.

Orange: Orange can be cultivated at the altitude of 800 - 1400 meters from the sea level and at the temperature of 5-35 degree Celsius. The cultivation of oranges requires fertile soil, which has 5-6.5 P.H., and a place which has a drainage system. Dhankuta, Pokhara local, Nagpuri, Satsuma, Let, Market etc. are the species of oranges cultivated in Nepal.

Mango: Mango is one of the hot climate fruits of Nepal. Mango is cultivated well at the place, which has the altitude upto 700 meters from sea level; temperature of 20-30 degree Celsius and annual rainfall of 160 - 250 centimeter. The cultivation of mango requires fertile soil with enough compost manure and good drainage system. It has been cultivated in eastern and western Terai region of Nepal. We can make juice, mara (stiff fruit juice, jelly type), and pickle from mango. We can also eat it raw. Although there are many species of mango, we can get the species of agaute green, Bombay yellow, Gopal bhoj, Dasahari, Maldah, Mallika, Amrapali, Chausa, Calcattia, Sipaya and Spari etc. in Nepal.

Banana: The cultivation of banana has been done traditionally in Nepal. Banana cultivation can be done from the level of the Terai to 1000 meter altitude of hill areas. The refined or advanced varieties of banana that are cultivated in Nepal are: Jhapali Malbhoj, William high breed, Harichhal, Barsai, Chini Champa and Rosta. Local varieties of Banana are: Mungre, Nagre, Ratuwal etc. Banana can be eaten in many ways, such as by cooking, making raw banana curry, and banana pickle. In present days people in the Terai areas cultivate banana as a business enterprise.

Guava: Guava is cultivated in the hill, inner madesh, and the terai areas. In Nepal, guava is being cultivated as business enterprise in

22 districts including Sankhuwasava, Kavre, Dhading, Bara, Chitwan, Tanahun, Nawalparasi, Rupandehi, Dang, and Kanchanpur. Guava can be successfully cultivated from the level of the Terai region to 1500 meters altitude. For guava cultivation the type of soil needed are: red, black, tough (hard, which is not easily washed away by water), and sandy. Advanced varieties of guava are: Alahabad, sapheda, Lulkhnow-49, Chinese guava, and Banarasi etc.

Activities

1. What fruits are cultivated in your village or community? Discuss in class.
2. In which months do the fruit trees bear fruits in your village or community? Draw a Table as follows in your note book and prepare a list:

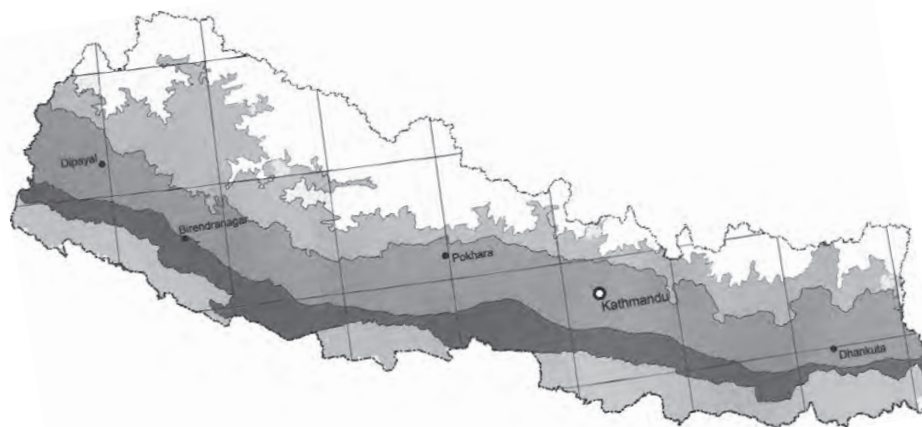
Name of fruit	Month	Name of fruit	Month	Name of fruit	Month

3. Which fruits are of local variety, and which fruits are of advanced variety? Draw a Table as follows and make a list:

Local variety fruit's	Advanced variety fruit's

Identification of fruit cultivation according to climate

Some fruit and flowers need hot climate, and some grow and give fruits in place which has very cold climate. As a result, the farmers can make good profit from the good production of fruits, and thus improve their life standard. Fruit cultivation can be done according to the following climate:



Fruits that are grown in tropical climate: Such hot climate is found in Madesh and Chure Bhawar areas of Nepal. In these areas the annual rainfall in average is 1200 - 2000 millimeter, and during summer the temperature goes up to 40-42 degree Celsius. In such hot places mango, banana, guava, pineapple, jackfruit, papaya, chinensis (Litchi), sarifa etc. are cultivated successfully.

Fruits that are grown in sub-tropical climate: Such kind of weather is found in places which are in 700 - 1300 meters altitude from sea level, and lower side of mid hill areas. In these areas, it is warm in summer with maximum temperature of 35 degree Celsius and minimum degree of 3-5 degree Celsius. The average yearly rainfall is 1500-2000 millimeters. Dhankuta, Chitlang, Ramechhap, Sindhuli, Gorkha, Pokhara, Parbat, Gulmi, Baglung, Surkhet, doti, and Dailekh districts have such utoshna weather. Citrus fruits such as oranges, muntala (a kind of orange but it is smaller than orange), shaddock, mausam, junar (orange like juicy fruit), nibuwa, bimiro are cultivated in these areas. Besides this, pineapple, guava, banana, papaya, pomegranate, mulberry, avocado, anjir etc are also cultivated in such areas.

Fruits that are grown in temperate climate: The area of northern part of Nepal has temperate climate. The areas, which have temperate climate, lie at the altitude of 1600 - 3000 meters. Jiri, Jumla, Humla, Daman, Rasuwa, Manag, Mustang, Dolpa districts have temperate climate. Apple, pears, peach, apricot, peanut, walnut etc. are found in these areas.

Care of Fruit Seedlings

Seedlings are small and tender. So they should be taken well care of. Following are some aspects, which should be given attention to, while taking care of the seedlings:

Seedlings should be protected from unfavorable weather when it is at the growing stage. In order to make seedlings in nursery or by using vegetative methods, seeds are planted or sowed in nursery bed or pots. Light irrigation needs to be done, after the seeds are germinated. In order to save the plant from fungus or mildew disease called damping off, bodo mixture should be sprinkled. Moisture should be maintained at the top level of soil. Weeding should be done in the nursery from time to time. To save the seedlings from frost and cold, plants should be mulched or covered lightly with dry leaves. Care should be taken everyday to save the seedlings from birds, people, and natural calamity, and irrigation should be done according to the weather.

Care of Fruit plant

Following things should be considered while taking care of fruit plants:

1. Administration of irrigation from time to time
2. Use of required fertilizer or manure
3. Weeding from time to time



Identifying diseases and insects in fruit plants and traditional way of its prevention

The farmers of our country are not getting good production from their fruit - gardens. The main cause of this is not being able to pay attention in controlling of the destructive insects or parasites and diseases in time. If the diseases and insects were identified and controlled in time, the production would have been two to three times more. Therefore, there are some techniques to lessen the diseases and insects from spreading. They are as follows:

1. Minimize the source of diseases and destructive insects
2. Ploughing the fruit garden
3. Destroy the branch or part which has been affected by diseases or insects
4. Destroy the suspicious and same kind of parasites

The parasites of diseases attack and harm the fruit tree in the following ways:

By eating: The insects such as caterpillar, worm (Khumre) etc. eat the leaves, flower, stalk, fruit, and suck the juice of tender leaves.

By laying eggs: The insects lay their eggs on the leaves and new shoot of a plant, so the plant does not grow.

By making hole in stem and branch: Many insects make hole on the braces and stalks of fruit trees. From the hole the plants get diseases, and slowly plants start to die.

Transfer of diseases: Generally insects transfer diseases from one plant to another. For example, a kind of insect which grows on green leafy vegetables, which is called lahi or lai transfers virus disease from one plant to another. Tick (sulsule) also harms the plants by sucking juice from leaves of plants.

Nematode (a worm with a slender unsegmented cylindrical shape, tiny, nearly invisible roundworm in and on belowground plant parts): It attacks the root and bottom of the plant. It is very tiny. It harms the plants by sitting in the inner and outer surface of the roots of the plants.

Diseases

Fungus: Fungus harms the plants by creating various diseases.

Bacteria: It makes the plants decayed by attacking the various tissues of the plants. It also brings diseases like canker and kalite.

Virus: It can affect the production of the plants, but plant does not die.

Conventional Methods of Prevention

Keeping fruit garden clean: It is very important to clean the fruit garden regularly to make the garden free from insects and bacteria. We can do this by the following ways:

- a. **Destroy weeds and plants affected by insects and diseases:** There are weeds scattered and grown everywhere in the garden and field. These weeds carry insects and diseases in them. At the time of ploughing, unnecessary weeds are destroyed. But bacteria do not die. During off season weeds provide shelter to insects. So weeds are the main cause of infection. Therefore fruit garden should always be kept weed free and clean.
- b. **Remove the infected plants and their parts:** As soon as you see virus infected plants, they should be plucked along with the root and be removed immediately. In the same way, if you see only some parts of the plant is infected, remove the infected part only. By doing so, number of contaminated bacteria will decrease. Not only this, by doing so, any harm to plants that would cause by insects such as flies and khumre will decrease to some extent and also infection on plants will decrease.
- c. **By ploughing the field:** In summer season when the garden is ploughed and the soil is overturned, the fungus; insects and its eggs; larva or pupa etc. are destroyed due to overheat.

Crop rotation: Crop rotation system will be effective for the control of the pests which always affect only one crop and also cannot go far. When you plan to use crop rotation system, you need to select the kind of crop that is not attacked by any pests.

Use of healthy seeds and plants: Seeds that you are going to plant in the nursery or in the garden should be free from insects or pests and diseases, because plants and seeds can transfer many diseases and pests. Virus free plants should be planted for virus control.

Change in seeds sowing and planting time: Generally diseases and insects attack plants in specific time. In course of time, if they get favorable environment, pests and diseases will increase, and will lead to disastrous situation. Therefore, by changing the timing for planting and sowing seeds we can control the disaster situation to some extent.

Use of diseases and pests controlling species of seeds and plants: There are varieties of fruit. Some are of advanced variety, and some are of local variety. The most practical way to control attack from disease and pest on fruit plants and seeds is to sow disease and pest

repressive variety of plants and seeds. This will make the plants free from disease, and the fruit cultivation can be successful.

Pests and disease control by soil treatment: Before planting or sowing plants, we can put insecticide or pesticides such as B. H. C.; Eldin, chlorine on soil, so that insects or pests like lahi or lai, khumre, red ants, gabharo (worm growing in the root of banana, arum maize, plants etc. and destroy the plant), termite or white ants are controlled. Likewise, if materials available in our villages such as ash, powder made from nim leaves, titepati, gahunt (cow's urine) are mixed with soil, insects and pests are controlled.

Fencing the stem of the plants: Various fruit plants can be protected from animals by fencing the plants with wire, small net, and cloth or paper. If animals such as rats and rabbits scratch or eat the bottom or stem of plants, insects and diseases may attack the plants from the scratched or eaten place. As a result plants may die.

Pruning: By cutting away branches, root, and stems that are affected by insects, parasites, and diseases, diseases like bacteria canker and fire blight can be controlled. When you do pruning of the branches and stems, they should be cut from below the affected area to whole part.

Organic control: Insects, diseases, rat family animals, and weeds are the enemies of plants. Birds eat many insects and destroy them. Some insects eat other insects. Such crop friendly insects and parasites should be identified and increased.

Use of Pheromone: Use of pheromone on male insects makes them impotent or sexless and makes the pest unable for reproduction. In this way, increase in their number can be controlled.

Activities

1. What are the insects or parasites that attack fruit trees or plants? How do they harm or affect the plant trees? Discuss and make a list.
2. Visit a fruit plants grower in your community and ask that person about the main diseases that attack the fruit cultivation. Discuss in the class about the findings and present the result in the class.

Exercise

Write answers to the following questions:

1. Give introduction of two main fruits that are produced in your village or community.
2. Explain the care of fruit seedlings.
3. Write how the insects damage the fruit plants.
4. The hilly region of Nepal is known as citrus fruit area, give reasons why is it so?

Practical Activity

Make a list of ten fruits that are grown locally, and collect their leaves.

Dry Vegetables, Fruits and Food Stuff

Methods of Making Dry Vegetables and Fruit

Due to geographical diversity and difficulty in transportation, vegetables and fruits of one place cannot be taken easily to another place. Neither can they be persevered for long period. Because they cannot be preserved for long time due to lack of big cold storage, traditional local technology has to be used for preserving vegetables and fruits.



We eat vegetables with our food. Generally the vegetables that we eat include green vegetables and lentils of pulse or split peas. When there is scarcity of green vegetables we cook dried vegetables. We can dry vegetables and fruits in deferent ways.

- A) Steaming and drying
- B) Normal drying
- C) Slicing or chipping and drying
- D) Local method

A) Steaming and drying: Green leafy vegetable, potatoes, cauliflower etc. should be cut into small pieces. Put them into water and baking powder and steam for 8-10 minutes. Dry the steamed vegetables in the sun well. In this way natural color will maintain in fruits and vegetables. After they are dried well, they should be kept in an air-tight container. Afterwards, they can be used whenever necessary.

B) Normal Drying: When the vegetable production is high or when the price of vegetables does down, we can dry them and use them later whenever necessary. We can also make an income

by selling the dried food. We cannot get green vegetables in all seasons. In such circumstances we need dry vegetables. If any guest arrives, and we do not have fresh green vegetables, at that time also we can save our reputation by serving dried vegetables to the guest.



Before drying vegetables, they should be washed well with clean water, and cut into small pieces. Then they should be put in the sun for 3-4 days for drying. We can make dried vegetables from cauliflower, cabbage, turnip, radish, tomatoes, mushrooms, beans, broccoli. Similarly, we can make dried fruits from apples, pineapples, mangoes, guavas, pears, peaches and plumps etc.

- C) Slicing or chipping and drying:** We can make slices or chips from radish, squash, potatoes, bottle gourd, and raw banana. We can either grate these vegetables in grater or make thin slice or chips, and dry in the sun for 3-4 days. We can preserve these dried vegetable slices or chips for later use. In the same way, we can make slices or chips from fruit and preserve them in an air-tight container. Such dried fruits and vegetables can either be used whenever we need, or we can run an enterprise of dried fruits and dried vegetables for economic benefit.
- D) Local Method:** In our village or community, the tradition of preserving vegetables and fruits using special techniques for later use is in practice for long time. For example: garlic with its stalk is made a bundle and hanged in a rope to be preserved for using afterward; ginger is kept in a pit covered with soil. Likewise, a pit is made and hey is laid in the pit; then squash, cabbage, oranges, apples are placed on the hey, and again the fruits are covered with hay. We have seen that after that the pit is covered with soil.

Activities

1. What methods are used to dry vegetables and fruit in your community? Ask your parents or guardians and write in your notebook about it.

2. If your community uses different methods apart from mentioned above for drying fruits and vegetable, discuss in class about the tools used for drying vegetables and its use.

Methods for making some dry vegetables

When there is plentiful amount of green vegetable production, they are dried to be eaten when there is scarcity of green vegetables. Dry vegetables are made from tomatoes, cabbage, cauliflower, edible green leaves (sag), radish, carrot, beans etc. Green vegetables must be fresh for drying; they must not be stale and rotten. The place for drying vegetables also must be clean and hygienic. Care must be taken when using cutting and grating tools. Edible green leaves, radish, carrot, onions should be either cut or grated, and dry on mat, bamboo mat, and winnow (bamboo tray). After they get dried, they should be kept in clean, hygienic, and air-tight container.

Activities

Which vegetables are used to make dry vegetables in your house? What activities are done to make these vegetables dry? Ask your family members and make a list of the vegetables that can be dried.

Methods for making slice or chips:

During the season of radish, cauliflower, kubindo (white gourd) if we dry and preserve them, we can make curry and pickle from dried radish, cauliflower, and kubindo during off-season. For this, slice or chips are made of these vegetables, and curry is made from these dried vegetables during off-season. But radish, cauliflower, and kubindo must be fresh for drying; they must not be stale and rotten. After slicing and grating these vegetables, cutting tools should be cleaned and kept in proper place. It is very necessary that the cutting tools and drying mats should be very clean. The container for keeping the dried vegetables must be clean and hygienic.

Activities

Which vegetables are used to make slice in your house? What activities are done to make slice from these vegetables? Ask your family members and make a list of the vegetables that can be made slices.

Methods for making potato chips:

We eat many different kinds of potato chips bought in the market. During potato growing season we can make potato chips to be eaten for snacks and khaja. In this way it will be easy at home, because we do not have to worry about khaja. Not only this, we can also run an enterprise of potato chips production for economic benefit. Local method of making potato chips is as follows:

Required ingredients:

1. Two kg appropriate sized potato (egg shaped)
2. Cutting knife or chulesi (curved kitchen knife)
3. Two big bowl or pot
4. Two spoonful salt
5. One spoon baking soda

Firstly, the potatoes should be peeled off and soaked in water. After that potatoes should be thinly cut in small round shape. The more the cutting is thin, the more the chips will be nice. After cutting all potatoes, the potatoes should be cooked for ten minutes in two liter water with two spoonful of salt. After that, they should be put in the sun to dry spreading thinly on a bamboo mat or plastic sheet for 3- 5 days. Then, they should be kept in clean, hygienic, and air-tight container. Later, if you need to eat the chips, heat oil in a karahi, then fry the chips until it is brown. This can be eaten with beaten rice and roasted grain or rice (bhuja).

Methods for making fermented and dried vegetable (gundruk):

Fermented and dried vegetable (gundruk) is used all over Nepal. This is used for its soup and pickle. Techniques for making fermented and dried vegetable (gundruk) is as follows:

The vegetable for making gundruk should be clean, but should not be rotten. The green leaves of mustard, turnip and rapeseed (rayo sag) should be thoroughly cleaned, and put in the sun for one day to become pale or slightly dry. The pale leaves should be crushed in a khal (stone pot for grinding), or a silauto (flat piece of stone for grinding spices). If water comes from the crushed leaves, water should be squeezed and thrown away. If water is not coming from the crushed leaves or if the crushed leaves are dry, they should not be squeezed. After that, the crushed leaves should be put in a clean pot and be compressed. The pot should be put upside down, so that rest of the water from the compressed leaves comes out. After 8-9 days the compressed gundruk should be taken out from the pot and spreaded it on a clean plastic sheet or bamboo mat (mandro), or a winnow (bamboo tray), and leave it in the sun to dry. After it is dried, it should be put in a clean container for storage. Method of making gundruk is different from place to place. In some places, the crushed leaves are put in a pit, while in some places it is pressed down.

Exercise

Write answers to the following questions:

1. Write the cautions that you would adopt when making the sag dry.
2. Write the steps or procedure for making slices from vegetables.
3. Ask your family members the method of making *gundruk* and write it on your notebook.

Practical Activities

1. Make a group in your class, make any dry vegetable, and show it to your teacher.
2. Make a group in your class, make any sliced vegetable, and show it to your teacher.
3. Which vegetables can be preserved for later use by steaming method? Discuss in the class.

We use different kinds of vegetables in our kitchen. Stuff that are produced for cooking and eating purposes are food stuff. For example: turmeric, sutho (dry ginger), masyaura (small round lump of pounded black pulse mixed with vegetables and dried), titaura (small dried balls made from ground pulse).



Method of making turmeric

Turmeric is a spice, which is always used in our kitchen. When we cook curry and other food stuff, we put turmeric in dal, curry and other food to give good color. This is also a medicine, so it is used for body pain or in case of small wound in our body. The fruit of turmeric should be clean. It should not be rotten or damaged. After peeling off the skin, turmeric should be washed well and dried in the sun in a clean place. After drying it should be ground in a machine or stone pot for grinding (khal) until it is powder like. Then the powdered turmeric should be put in a dry, clean, and air-tight container. This turmeric can be used daily as required.

Activities

1. How is turmeric powder made in your house? Ask your family members and make a list how it is prepared.
2. Make a group in your class, ask around about how turmeric is processed and discuss about it in the class.

Method of making Sutho (dry ginger)

Sutho is powdered ginger. The ginger which is used for making sutho must be clean and unspoiled. It will be easy to peel off its skin, if it is soaked in water overnight. After peeling off its skin, it should be dried in the sun for 3-4 days. After drying it should be grinded in a

machine or stone pot for grinding (*khal*) until it is powder like. Then the powdered ginger should be put in a dry, clean, and air-tight container. This *sutho* can be used daily as spice in our curry. It can also be put in tea as tea spice. This makes taste of tea more delicious. This can also be used as herbal medicine when suffering from cold and cough.



Activities

Make a group in your class, ask around about how *Sutho* is made and discuss about it in the class.

Method of making *Masyaura* (small round lump of pounded black pulse mixed with vegetables and dried)

Required ingredients for making *Masyaura* are as follows:

1. 1.5 kg arum plant (*Pindalu* or *karkalo*)
2. 1 kg Black lentil
3. 2 Pot or bowl
4. stone pot for grinding (*khal*) or grinder
5. Knife, *chulesi*, or grater

Method

First of all, the arum plant or arum root should be cut into small pieces with knife or grater and spreaded on a bamboo tray. After doing so, water in the cut arum gets dry and the cut pieces will not be spoiled. Then the husk should be removed from the soaked lentils, and grinded until it becomes paste like. Then the cut arum plant and grinded black pulses should be mixed thoroughly. Then small round piece should be made from the mixture and put in the sun for 3-4 days to dry well. After the pieces are dried well, they should be put in a dry, clean, and air-tight container. The *Masyaura* is ready for eating. It can be eaten as curry or dal, when there is no dal.

Besides arum plant, *Masyaura* can be made from beans, *bodi*, different kinds of lentils, pulses, pumpkins, white guard (*kuvindo*), squash etc.

Activities

How is *Masyaura* made in your home or community? What process is used to make *Masyaura*? Ask about it to your family members and write in your notebook.

Method of making *Titaura* (small dried balls made from ground pulse)

Titaura is made from Lapsi (sour fleshy fruit), apple, mango, *amala* (gooseberry), grapes, *imli* (tamarind) etc. If you want to make amala's titaura, you first boil it. When it is fully boiled and cooked, let it be cold. Then blend it well with salt, pepper, black pepper, coriander, and cumin according to taste. After it is well mixed or blended, make small balls and dry the balls in the sun for 2-3 days. When it is well dried, put them in air-tight container or in plastic bags, and keep them in a dry place. The method of making titaura from Lapsi (sour fleshy fruit), apple, mango, amala, grapes, imli differs from place to place.

Method of making *Slices* (chana) and *Sukuti* (dried fruit) from fruits

There is no facility of transportation in many places of our country. Therefore, in seasons when there are plenty of fruits such as apples, pears, papaya etc. it is not possible to store these fruits for long period of time. So if we make Slices (*Chana*) and *Sukuti* (dried fruits), they can be kept for long time. For this, the fruits should be washed well, cut in small slices, and dried in the sun for 2-3 days. When it is well dried, they should be put in air-tight container or in plastic bags, and keep them in a safe place.

Activities

1. Make a group in the class. Ask people around and find out the method of making *Titaura*, then discuss about it in the class.
2. What fruits do the family members of your house use to make *Titaura*? Ask your family members and make a list.
3. Discuss in the class about the local method of making Slices (*Chana*) or *Sukuti* (dried fruits).

Exercise

Write answers to the following questions:

1. Write the names of required tools and materials for making *Masyaura*.
2. What food stuffs do your family make? Prepare a list of them.
3. Write the steps of making *Titaura*.
4. Write the names of required tools and materials for making *Gundruk*.

Practical Activities

1. Make *Chana* (slices) or *Sukuti* (dried fruit or vegetable) from the fruits or vegetables that you can get in your community, and sell them. Establish student welfare fund with the money that you get after selling the *Chana* or *Sukuti* that you have made.
2. Make groups having 5 members in a group, and make *Gundruk* in a pot. Show it to your teacher.

Flower and Medicinal Herbs Cultivation

Introduction of Floriculture

There are various kinds of flowers blossomed in our fields and around our house. Some flowers blossom in rainy season and some in winter. Likewise, some flowers blossom in the Tarai, some in the hill area, and some in mountain region. So floriculture varies according to place and time. Now a days, people do flower cultivation not only for domestic use, but also for business.



Identification of Locally available flowers and their Species

We have seen different kinds of flowers in our garden. We have also seen that flowers are used in many auspicious occasions such as worshipping god, decoration, welcoming people, wedding, and birthday as well as to give as gift.

Activities

What kinds of flowers can we get around your house or your community? Make a list.

Identification of floriculture according to seasons

All flowers do not blossom all year round or for 12 months. Some flowers bloom for 12 months, and some flowers bloom in specific time or season. Therefore, in which season or time do the flowers that you know blossom, write in the following table. Ask your teachers,

parents, and other friends about the flowers of which you don't know anything, write about the flowers in your note copy according to the following Table.

S.N.	Flowers	well-known Varieties	Cultivation month
1.			
2.			
3.			
4.			

Selection of soil and preparation of flower-pot

Flower-pot: The material which is made of mud for planting flowers is called flower -pot (gamala). We plant flowers in flower-pot and put it around our house, on the veranda and on the roof of the house for decoration. We can plant different kinds of flowers by filling the flower-pots with soil. In the same way we can plant flowers in small plastic bags.



Soil: Generally loamy soil is appropriate for flower cultivation (floriculture). Sandy soil is also used to some extent. 20 to 30 parts sand could also be mixed with *chimtyailo* mud to prepare suitable soil for flower planting.

Selection of soil and preparation of flower-pot: All the small stones and mud-balls should be removed from the soil where you are going to plant flowers. There should be small holes in the flower-pot for excess water to come out. Soil should not be compressed when you prepare soil in the flower-pot. All the required materials should be mixed with soil and fill the flower-pot and plastic bag with that prepared soil.

Activities

How is the flower-pot or plastic filled for planting flowers in your house or your community? Discuss about it in the class.

Preparation of flower-bed and seedlings

The flower bed should be free from stone and lump. There should be enough provision of irrigation for flower-bed. The flower seeds should not be defective. Once the seeds are planted in the bed, they should not be stepped on or compressed. When seeds become seedlings and it is ready for transplantation, appropriate place should be made ready for transplanting.

Activities

What should be done while preparing flower-bed? Discuss and make a list, then show the list to the teacher.

Use of manure or fertilizer

Manure is plants' food. Plants cannot germinate and grow without manure. Therefore, condition of soil should be considered before putting manure in soil. It is necessary to know what kind of manure to be used and how much manure is to be put while mixing manure with soil. Care should be taken at the time of using manure. You should be careful not to get manure in your eyes and mouth. You should wash your hands and feet properly after using manure.

Activities

Make a list of the aspects that has to be given attention when using manure. Discuss about it in the class.

Transplanting the flower seedlings

The seedling which you are going to transplant should not be rotten, and stale. It should be free from insects and diseases. Soil should be ready before planting seedling. The flower-pot in which you are going to transplant the flower seedling should contain soil with properly mixed fertilizer. Do not forget to water the plant after transplanting it.

Activities

Discuss about the process of transplanting flower seedlings.

Care of Flower Plants

Plants should be regularly checked for taking care of manure and water. Weeds seen in the flower-should be plucked and covered under the soil. Weeding and watering the plants should be done from time to time. Similarly, manure should also be checked and put in the plant from time to time.

Activities

Take care of the flower plants that have been planted by your group. Make a list in your notebook of the activities that you did while taking care of the flower-plants, and show it to your teacher.

Flower Decoration

In religious festivals we decorate temples with different kinds of flowers. In the same way, we decorate our house with flowers on the occasions of birthdays, *pasni* (ceremony of feeding rice to a baby for the first time), *vratabandha* (tonsure ceremony), wedding, traditional cultural festivals etc. Besides these, we have seen decoration with flowers in fair and jatra (pageant or celebration with worship of God). In city areas flower business is done for decorating cars, buildings, hotels etc. Now-a- days, flower business has become very popular. We have seen that people make bouquet and garlands for decoration. Flower decoration is used for welcoming and honoring events. You can learn flower decoration skill and start your own flower business. You can do the business from home by taking orders from customers and work at home.

Activities

How can we make decorations from flowers? Discuss in the class.

Exercise

Write answers to the following questions:

1. Write about the process of soil selection and preparation of flower pot.

2. Write about the care that should be considered while making organic manure.
3. Write down the activities that are undertaken while taking care of flowers.
4. What do you understand by flower decoration?
5. Where can flower business be operated?
6. Where can the flower decoration business be run?

Practical Activities:

1. Decorate the classroom with the flowers that you have grown and show it to all the teachers and students of your school.
2. Form a group in the class and prepare soil with manure for planting the flower seedlings that you have grown.
3. Form a group in a class, prepare a flower bed and transplant the flower seedlings that you have grown.

Introduction of Medicinal Herbs and their Importance

Have you ever seen the people using leaves of tree and plants, roots, stalks, bark of trees and plants, fruits etc. as medicine? Medicinal herbs are the leaves, roots, stalks, stems, flowers and fruits of the plants. These medicinal herbs are used as organic matter to make medicines, cosmetics goods, scented oil, soap, incense sticks etc. Now-a-days medicinal herbs are cultivated from business viewpoint. In Nepal plenty of medicinal herbs are found in *bhir* (cliff), *pakha* (a sloping Space), *pakhera* (steep place), *khoch* (a long narrow



Aelovera



Holy Basil



Neem

valley), phant (open field, plain land), forest, jungle, and valleys. For example: silajit (bitumen), cinnamon, timur, titepati (mug-wort), dhaturu (kind of narcotic plant), bojho (a kind of medicinal plant), ghiukumari (aloe vera), yarsagumba, tulasi (basil), neem etc. By processing these medicinal herbs and selling them in national as well as foreign market, we can get plenty of economic benefit.

Introduction of some Medicinal Herbs and their Importance

Amala (Myrobalan Fruit): Amala is a tree, which is found in forest, *bhir* (cliff), and *pakheru* (steep place). It is the best natural source of 'vitamin C'. Its plant, root, leaves, flowers and fruit are very useful. In Ayurveda, while making *Triphala*, *amala*, *harro* and *barro* are mixed together (Mixture of three Myrobalans: The combination of Terminalia chebula; Terminalia belerica, and Eblica officinalis). This '*Triphala*' is used for diseases such as blood coming from gum and teeth, loose teeth, bad breath, *amlapitta* (acidity), hair falling etc. If we take one teaspoonful of *Triphala* in the morning and one teaspoonful of *Triphala* in the evening with water in empty stomach,

it will help increase our appetite. *Amala* is very important for making *Chwawanpras*. It is used as medicine for diarrhea, *kamalpitta* (jaundice), Dam (asthma) etc.

Gheeu Kumari (Aloe Vera): There is a greasy jelly like marrow (gudi) inside the leaves of Aloe Vera. The marrow (gudi) of the leaves of Aloe Vera helps lessen the pain caused by a wound. If the marrow from about 4 inches of the leaves of Aloe Vera is eaten by mixing with water, it does good to the body and gives relieve from acidity, indigestion, stomach pain during menstruation, headache etc. It also gives comfort from liver disease. This is a perfect medicine for blood pressure, and diabetes.

Ghodtapre (kind of plant, used in medicine): It is a kind of weed grown on the ground. While growing it spreads all over the ground. Its leaves have round shape, the plant is very tiny and threadlike. Its leaves are used as medicine. In case of ringworm in the body, if 4-5 pieces of *Ghodtapre* are taken in the morning in empty stomach, it will be helpful. In case of burning feeling during discharging urine, people in the village make medicine of leaves of *Ghodtapre* which is pressed and eaten with water. This medicinal herb helps increase our memory power.

Tulasi (Basil): Tulasi is a plant which is planted in courtyard of house or temple (math). Its leaves, when squeezed with both hands, give pleasant smell. The leaves, flowers, seeds, stalk, etc. of Tulasi are used. Tulasi is antibacterial, antiviral, and antifungal. If you take tulasi mixing with black pepper and turmeric, Tulasi gives quick relief from cold, cough, and it is also used for the relief of fever, blood disorder (rakta vicar), and *agnimand*.

Neem: Neem is a medicinal plant. The leaves, flowers, seeds, and oil of Neem can be used. Like Tulasi, Neem is also antibacterial, antiviral, and antifungal. Ointment (paste) or powder can be made from neem, which then can be used for skin diseases, diabetes, blood disorder (rakta vicar) etc. It would be very beneficial if we use neem plant toothbrush for blood coming from gum and teeth disease, loose teeth, bad breath etc. If we boil leaves of neem plant and bathe with that hot water in which neem's leaves were boiled, it will be very useful for scabies or body itching.

Bojho (a kind of medicinal plant): Bojho is a small evergreen plant and it is a kind of grass or fodder. Its root is called Rayajome, which is used as medicine. Bojho can be used as tonic for rheumatism, toothache, cough, dysentery, diarrhea, and healthy brain.

Barro: Barro is a very tall tree, which is found in hilly and mid-hilly area of Nepal. Its fruit and seed are used as medicine. It is used as a tonic for blood pressure, to lessen fever, to digest food, to cure ulcer, and to make teeth strong. It is also used to lessen headache.

Titepati (mud-wort): Titepati is the herbal, which is found everywhere in hilly area. The whole part of Titepati is used as medicine. It helps heal irregular fever, eye pain, wounds etc. It also helps remove the odor of shoes and feet. If shoes are worn continuously for few days with titepati in shoes, socks and feet stop to smell. If titepati is cooked and put on joint pain, pain will go. In order to destroy the defect of acupuncture or to do moxibustion, health professionals who do acupuncture use a different kind of parched titepati.

Asuro: Asuro is found from the Terai to 1200 meters altitude in the hilly area in the form of bushes. It is also planted as fence on all sides of the cultivated field. If we squeeze its green leaves, they give smell. Its leaves are 10-15 centimeters long. Its leaves and flowers are useful. It is used as medicine for cough, asthma, fever etc. Farmers use it as green manure, and insecticide.

Timur: Timur is a grain like herbal, which is found in high hills. Its useful parts are its outer part, flower, and fruit. It is used as medicine for toothache, skin disease, scabies, cholera, and indigestion. This is also used to specify the problem of blocked nose.

Activities

Of which medicinal herbs are root, stalk or stem, leaves, fruits, and flowers used as medicine? Make a list of the herbals and discuss in the class.

The Importance of Medicinal Herbs

Herbs have great importance in our lives. In Nepal, herbs have been in use from ancient period. In Ayurveda medicinal herbs are

used to make various kinds of medicines, cosmetic goods, perfumes etc. The roots, leaves, stalks, stem, juices of flowers and fruits are mixed in water and made medicine to put in the affected areas as ointment or eat as edible medicine. For example, the whole part of chiraito is soaked in water, and the water is drunk, which helps to control fever and worms. In the same way, if bojho is beaten to make powder like substance and if it is mixed in food and eaten, it will help cure cold and cough, throat pain, toothache, scabies, and lice in the cattle. Scented oil, perfume, cosmetic goods, incense sticks are also made. By processing medicinal herbs and exporting them in foreign countries, people will get economic benefit. It is estimated that there are seven hundred species of medicinal herbs in Nepal. Among these species, 219 varieties are perfumed vegetations.

Identification of Local Medicinal Herbs and their Collection

At the time of collecting any medicinal herbs, it is necessary to identify the useful part of the herbs. It is also necessary to pick up the herbs in specified time. The following aspects should be given attention while collecting the medicinal herbs that are grown by themselves in the jungle:

1. Identification of the appropriate part of the herb, which is used as medicinal herb
2. Knowledge of appropriate time for harvesting the herbs
3. Collecting the herbs only from the matured plants
4. Some roots, fruits, and seeds of the herbs should be left for preservation of the herbs for future collection

The person who is collecting the herbs must have complete knowledge about the herbs. Otherwise, during collection of the herbs it is possible that other weeds and grass will be mixed in the herbs, and this will make difference in the quality of the herbs.

Activities

Discuss about any two aspects that should be given attention while collecting medicinal herbs that are available at local level.

Preservation of local medicinal herbs

We should not let the medicinal herbs die out. Therefore various ways should be taken up for the preservation of local medicinal herbs. We can run cottage- enterprise by preserving and using the medicinal herbs that are available in our area. Following are some ways for preservation of the medicinal herbs at local level:

1. Make associations or organization at local level for the preservation of medicinal herbs
2. Encourage local people for cultivation of medicinal herbs. Establish coordination with government and non-government organizations and organize training on preservation of local medicinal herbs and new technology of cultivation of these herbs.
3. Bring awareness in the local people about the importance and preservation of the medicinal herbs through fair, workshops, and exhibition.
4. Develop improved technology about collection and processing of medicinal herbs.
5. Establish a medicinal herb nursery at local level and distribute the seeds and seedlings of slowly disappearing medicinal herbs, and also make advertisement about medicinal herbs.

Activities

1. Collect the parts of the plants that are used as medicinal herbs in our village or community, and show them to your teacher.
2. Discuss about the local ways for preserving medicinal herbs
3. Which medicinal herbs can be used for cough and cold, fever, diarrhea? Make a list and discuss in the class.

Exercise

Write answers to the questions:

1. Write in brief about 10 of the medicinal herbs that are found in your area.
2. Which parts of Amala are useful?
3. For which diseases is Gheukumari used?
4. For which purposes is Tulasi used?
5. Write the qualities of Neem. What benefits do we get by the use of Neem?
6. For what purposes do we use turmeric? Which part of the plant is used to make turmeric?
7. What are the medicinal herbs used in Triphala?

Practical Activities

1. Collect leaves, roots, stalk or stem, and flowers of ten of the medicinal herbs found around your area, and exhibit them in the class.
2. Collect ten medicinal herbs that are used as medicine. Stick them in your note book, and give their names.
3. Write names of two medicinal herbs which are used in your house when somebody in the village or community gets sick. Write also the process of using it.
4. How can the medicinal herbs found in your village or community be preserved? Discuss and collect suggestions.

Note: Teach only one among the following A to F

Unit -11

Care of Birds and Animals

Lesson - 1 (A) Nurturing Sheep/Goat/Mountain Sheep (Chyangra)

Sheep

Sheep is specially nurtured for wool. Sheep has to be protected from wild animals because they usually graze in open and dry, cliff, sloppy land, and ground. Sheep should be given grass and other green plants rather than grain and other food. Among the local species of sheep, Kage variety of sheep is nurtured in Kathmandu valley and mid-hilly areas. In the terai areas and warm places, *lampuchhare* (with long tail) variety is kept.



Kage Sheep: Kage sheep is found in mid hilly areas such as Pokhara, Banepa, Kathmandu, Trisuli and inner Madesh. Its weight is up to 25 kilogram. The male sheep (Thuma) has horns while the female sheep does not have horns. It gives 1-2 kilogram of wool in a year.

Baduwal: *Baduwal* species of sheep is found in northern part of Nepal at the altitude of 400 feet. Its wool is useful only for weaving carpert, and radi/pakhi. It gives 1.5 to 2.0 kilogram wool in a year. Its weight is 20 to 30 kilogram.

lampuchhare (with long tail): *Lampuchhare* species of sheep is found in the Terai areas of Nepal. It is bigger than Kage species. Annually 0.5 to 1 kilogram wool is produced from this kind of sheep.

Bhyanglung (A kind of Tibetan Sheep): *Bhyanglung* sheep was originated from Tibet. It is found in Mustang, Marpha, and other Himalayan or mountainous region of Nepal. Thuma or male sheep weighs 60 - 90 kilogram, while the female Bhyanglung weighs 40 - 60 kilogram. Its wool is regarded better than other sheep's' wool. In average a Bhyanglung gives about 2 kg wool per year.

Among the advanced sheep, Merino, Rambouillet, Border Leicester (breed a sheep with a white face and a long coat, belonging to a British breed valued for its wool and meat) are found in Nepal. These sheep give 10-15 kg wool each year from each of the sheep. These sheep have been brought from foreign countries for breed with Nepali sheep. There are two types of sheep nurtured in Nepal; local and advanced varieties. The local breed of sheep are: Kage, Baduwal, Lampuchhare, Bhyanglung (Tibetan sheep) etc.

Goat

In Nepal the goat has been nurtured for meat. It can be nurtured in all region of Nepal: the Terai, hill, valley with small resource. Goat can be domesticated near the house and good income can be made from it. Feed should be given from time to time. Medicines should be given to the goats time and often to protect them from worms and parasites.



Jamunapari: Jamunapari breed of goat is tall and has big body size with long feet, center of its nose is raised a little bit, and it has hanging ears. Generally, it is of white color. It weighs from 30 to 60 kilograms.

Barbari: Barbari breed goat has short and upright ears, small body size, and has red and white spotted color. It looks like a deer at a glance. This kind of goat is kept in a cage. Barbari goat weighs from 27 to 36 kilograms and castrated goat weighs from 32 to 41 kilograms.



Sannen: Sannen is a lactating goat. Its color is white or light cream. The face is slightly bowl-shaped and the ears point upward and forward. Average milk product is 2 - 5 liters per day during a lactation period of 8 -10 months. Milk fat is 3 - 5 percent. Sannen goat does not have horns. Female Sannen weighs 65 kg and the Bucks (intact male weighs 95 kg).

Beetal: This kind of goat is mostly found in black and brown color. Its head is huge and broad with an upright nose. The ears are long and flat, curled and drooping. The body is of medium-size. Adult male

Beetal weighs about 59 kg and female goat weighs 35 kg. Female Beetal produces kids twice a year. They mostly produce twins goats.

Boyer goat: Lead Farmers have been rearing Boyer goat for the past 5 years. The Boyer goats were imported from Australia and New Zealand. Boyer goat grows fast and it produces 2 kids at a time. It produces kids three times in three years. The amount of cholesterol is less in its meat. So, its meat is healthy to eat.

Local breed goats-Terai Goat: The goat that is found in the Terai areas of Nepal is called Terai Goat. This goat is also regarded as the crossbreed of Jamunapari goat. This goat is of medium size, brown in color with white stripe on the body. This goat is reared for both milk and meat. The body weight of Terai goat is from 15-18 kilograms.

Khari, Aunle Goat: Goats that are found in mid hilly region are called hilly or khari goat. These goats are mostly found in black and brown color. Its horns are turned upright or backward. The weight of female Khari is between 15-25 kg, and the weight of male Khari goat is 25-35 kg. It produces kids three times in 2 years. Usually, it gives two or more than two kids at a time. Therefore, it is very popular in hilly region.

Sinhal goat: This type of goat is found in high mountainous region. This goat has the largest body size than other Nepali breed goats. Short head, straight nose, ability to bear cold are the characteristics of this type of goat. Pashmina can be produced from its hair in small amount. Matured Sinhal goat weighs 30 to 35 kg.

Chyangra (Mountain Goat): The goat, which is reared in mountain region of Nepal is called Chyangra. Its body is covered with long and thick hair. Pashmina is laid in the inner part of its hair. Matured chyangra is reared for carrying loads. 50 to 500 kilogram pashmina is produced in a year from a matured chyangra. The Chyangras found in this region are of advanced breed.



Activities

1. What breed/kind of sheep/goat/chyangra are found in your village or community? Discuss in the class and write in your notebook.
2. For what purpose is goat/sheep/chyangra reared in your village or community? Discuss in the class.

Goat House management

It will be appropriate to make a goat house according to the breed of goat, local weather, and environment. While making the goat house, if we could use local resource with modern technology, appropriate cage would be made in less expenses. In the same way, while making a goat house, we should think about the situation of local place. Especially, attention should be given to protect the animal from continued rain, cloudy day, hot-wind, sunlight, ground dampness etc. Cross - ventilation for air, dry place, appropriate and enough space for feeding, potentiality of pasture and fodder cultivation, availability of clean drinking water, facility of transportation and market etc. should be considered while making the goat- house for goats. In the mountain area the goat house should be facing south or east, and in the Terai or warm region the goat house should be facing north or west. Similarly, in the terai or mid hilly area the platform of the goat house should be built at 3 feet height. There should be enough air and light inside the goat house.

Types of goat house (shed or barn)

Goat house construction on ground surface: In the hilly region of Nepal goat house is traditionally built on the ground surface for goat rearing. The shed is made of bamboo or wood, and the roof is made by hay, straw, thatch etc. On the floor of the shed straw, dry leaves from jungle, dry wheat straw, and husk are scattered to make bed for the goat. People keep on adding these materials until it is too smelly and need to be cleared out. Then the scattered materials are taken out from the shed and used as manure in the garden or are used to make compost.

Goat house construction above ground surface: In the Terai, inner madesh and mid hilly regions of Nepal shed for goat is built 90 centimeters above the ground surface for goat rearing. In many

places goats are taken to pastures for grazing during the day time and only during the night goats are kept in such shed. Because waste materials such as urine and excreta of the goat drop on the ground from the platform, the shed remains clean and dry.

In rearing goats for business, mother goat, male goat, and the kids should be kept in separate sheds. Requirements for this are as follows:

1. Goat house for herd of mother goat
2. Goat house for male goat
3. Space for delivery of kid goat
4. House or space for goat kids
5. House or space for sick goat
6. Arrangement of tatno (Hay feeder) for goat's feed

Activities

What kind of house or shed is required for sheep, goat, and chyangra (mountain goat)? What kind of arrangement is there in your village or community, observe the arrangement and write about it, then present in the class.

Feed Management

Like other animals sheep, goats, and Chyangra require carbohydrate, protein, fat, fiber, minerals, vitamins, and water. Goat rearing as business requires nourishing feed for goats. For its physical development and development of reproductive ability, it is necessary to feed them with green grass and fodder as well as different nutritious grains. According to recommended ratio, we mix some grains together such as maize, wheat, barley, rice, husk of lentils, cakes of mustard oil (pina), molasses, mineral mixtures, powdered fish, salt etc. to make feed for goats. If the feed prepared in this way is given together with green grass to the goats, income will be good.

For pregnant she goat: 14-16 percent protein mixed feed, daily 200-259 gram should be fed. Delivery will not be that critical if the birth weight of a kid is 2 kg or more. After birth of the kid, the mother goat should be fed nutritious feed for 8 weeks. For this, it should be

given 200 - 400 gram of balanced feed daily. In addition, nursing mother goat should also be feed green grass and plenty of clean water as required. 45 days before using, a male breeding goat, 300 to 500 gram balanced feed should be feed. In Nepal tree fodder is the main source of feed for animals. Budhar (kind of breadfruit tree, Tanki, Koiralo (kind of vegetable flower tree), kutmiro (Kind of fodder tree), kimbu (mulberry), nivarro (Kind of fodder tree), khaniu (Kind of fodder tree), kavro (kind of medicinal plant) etc. are tree fodder. Improved grass such as Rhodes, Paspalum, Rye, Cocksfoot, Desmodium, Stylo, Napier, Lucerne, Bajra, Teosinte can be planted and fed to the animals.

Activities

In your village or community, what things are used for feed? What is the ratio of the substances that are used for feed? Discuss in the class.

Pasture Management

In our country, another source of animal feed is public pasture, ridge or mound of the field, cliff, jungle, open field etc. Due to lack of well managed and productive pasture area, and scientific management, goats and other animals use the natural way of pasturing wherever they find green grass, trees and plants, and leaves. Following aspects should be given attention for the scientific scheme of pasture:

1. Management of pasturing area
2. Its preservation
3. Fodder management
4. Water Management
5. Track or path to pasturage
6. Fencing
7. Chopping of bushes
8. Destroying poisonous weed or wild plants
9. Development of mobile pasture

If we use the above stated scheme, the pasture for goats will be

improved and goat production will be increased.

Activities

What kind of pasture is necessary for goat rearing business? Discuss in the class about it, prepare a report and present the report in the class.

Main Diseases in Goat

P.P.R. (Peptides Peptitis Ruminant): P.P.R also known as ‘goat plague’, is a viral disease of goats and sheep characterized by fever, sores in the mouth, diarrhea, pneumonia, and sometimes death. If the disease is severe, goats suffer from high fever with temperature of 104 to 106 degree Fahrenheit, dry mouth, sore eyes, dripping nose, flowing pus, and miscarriage of pregnant goat. The body temperature starts to fall slowly and within 5 to 10 days of sickness, the animal will die. It's difficult to do the treatment once the animal suffers from this disease. For prevention of this disease, the animal should be given vaccination in two years period.

Diarrhea

Diarrhea is caused because of poison, germs of various kinds of diseases and internal parasites. the problems like: animal being thinner, giving less production, weakness of the animals, indigestion of animals etc. are seen because of diarrhea. We have to give the medicines like Nebbol, Purgocere as well as the pills of sulfa medicine to the goat suffering from diarrhea.

Pet fulne or dhadine: This is the stage of being a lot of air in the stomach of goats. Occasionally, there is the production of air in the digestive system of goat when it eats maize or grains, some grass of branches, grass with beans or poisonous grass.

Symptoms: Being left stomach bigger like a volleyball, throwing out saliva, feeling difficulty in breathing, stomach ache and crying, not releasing the dong and urine, getting animal fainted and getting to death because of difficulty in breathing.

Prevention:

1. Give avil vaccination

2. Stop feeding and put the front portion of the goat should be put in upright position
3. Use antibiotic by means of trocar cannula or thick needle
4. Use aphyranil, blotocil, and timpol
5. Inject vitamin 'B'

Pneumonia:

Parasites, fungus, or worms in the lungs become the causes of Pneumonia in goats. This disease is seen in kid goats during inappropriate cold weather. At first the goat has very fast breathing, later on they have difficulty in breathing, painful cough, fever, anorexia (loss of appetite), crackle like sounds from lungs, and mucopurulent discharge from nose.

1. During treatment period keep sick goats in a dry, well ventilated location away from the rest of the herd.
2. Apply anti-biotic vaccination for 3-5 days.

Treatment:

Plugged ducts or mastitis (inflammation of an animal's udder) (Thunaulo): A plugged, or clogged, duct is a sore, tender lump or knotty area in the udder. It occurs when a milk duct is not draining well, and inflammation builds up. In such condition, the animals' udder gets swollen, either blood or pus comes from the udder, and there will loss of milk production. If the animal does not get treatment in time, symptoms like the udder will stop to produce milk, will be seen.

Prevention of mastitis in the animal would be giving an antibiotic injection into the muscle or putting an ointment on the skin and udder of the animal.

The goat shed or barn should be kept clean.

The parasites that are infectious to a goat are Paramphistome, haemonchus, thread worm, moniezia tapeworm, fasciola hepatica etc.

Activities

What kind of diseases do goat, sheep, and chyangra (mountain goat) get in your village or community? Prepare a list.

Exercise

Write answers to the following questions:

1. Give good reasons for the statement, 'goat rearing has been the good foundation of economic improvement.'
2. Write about the diseases that goat, sheep, and chyangra (mountain goat) suffer from. Write also methods of their prevention.

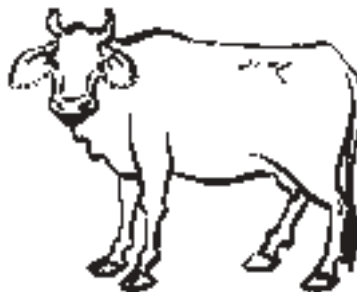
Practical activities

1. How has the shed or barn of goat, sheep, and chyangra (mountain goat) been managed in your community? Write a report about it.
2. How can balanced feed be prepared at the local level? Prepare a report on this topic and present in the class.
3. Discuss in the class about the method of treatment for sick goat, sheep, and chyangra at the local level, and present in the class.

(B) Cow/Buffalo Farming

Cow

In our country cow is reared for milk, cow dung, and gahunt (cow's urine, which is regarded as holy substance), and ox is raised for ploughing the field. If the local cow of Nepal is well cared, they give 500 to 1400 liters of milk in one time a calf is given birth to or in one time of lactating period. The yak cow of mountain region gives 500 to 600 liters milk in one lactating period.



Improved and local breed cows give adequate milk if they are reared and given feed well. Cow/buffalo require cowshed which is hygienic with good drainage system. Cows do not like to stay in dirty sheds where a lot of flies are. As a result milk production is also less. So the shed or barn should be cleaned from time to time with ammonia, lime or anti-bacteria liquid such as phenol. It is important that the provision of pasture for cow should be appropriate.

Identification of Local and Advanced Breed

Local breed of cow are hilly cow and yak. Likewise, improved varieties are Jersey, Holstein, Brown Swiss Cow, Haryana, Sahiwal, Angus, Hallikar, and Amritmahal.

Buffalo

Buffalo is one of the main domesticated animals which is reared for milk production. Milk producers have been producing a lot of milk and selling them for quite good money. In this way they have been employed by being entrepreneurs as well as they are doing good business as entrepreneurs. Like cow, buffalo also can give good amount of milk, if it is given good feed and a well managed shed or barn. Buffalo needs more feed than a cow. Milking buffalo needs more feed than non-milking buffalo. A buffalo that gives extra 2 liters of milk should be given



1 kg of additional mixture of grain. A buffalo needs bigger barn and wider space. In order to keep the space around the shed clean, dung and the wastes from the shed should be kept at a distance from the barn in well-managed way. In summer season buffalo should be given bath with clean water once a day or let buffalo play and sit in swamp once a day. If the buffalo be let sit in swamp, it gives more milk.

Local breed of Nepal

Wild Buffalo Arna: The wild buffalo found in nearby area of Koshi Tappu, which lies in Sunsari district of eastern Terai is mongrel of Arna. Light brown body color, black neck, white tail, about 200 centimeter long and strong horns are the characteristic of a wild buffalo. The weight of a matured buffalo is 900 kilogram. Its body is 450 centimeters long and its tail is 150 centimeters long. Its life expectancy is 20 to 25 years. Wild buffalo likes to stay in jungle, near the river, in swamp. Estimated number of existing wild buffaloes in Koshi Tappu is 200. They like to live in herd, play in wetland or swampy land, and pasture in tree fodder, bamboo leaves, and kansh. The people of that area have started crossbreeding wild buffalo with local domesticated buffalo, and rearing calf born from the crossbreed.

Lime Buffalo: Lime breed is found in Argakhanchi and Gulmi of hilly region of Nepal. The Lime buffaloes are light brown and relatively small in body size, and small sickle shaped horns curved towards the neck are their characteristics. They give 600 liters of milk in one time a calf is given birth to or in one time of lactating period. The milk contains 7.5 percent fat. In average, it gives 2 manas to 3 manas milk per day.

Parkote buffalo: Parkote is a local breed buffalo, which is found in Gulmi, Argakhanchi, Salyan and Palpa of hilly region of Nepal. Parkote buffaloes are dark in coat color and have heavily built body size, with sword-shaped horns directed laterally or towards the back of the body. They give 600 - 700 liters of milk in one time a calf is given birth to or in one time of lactating period. Farmers give feed to their buffaloes either at home or they take the buffaloes to pastures in near jungle. In average, Parkote buffalo gives 3 manas to 5 manas milk per day.

Improved Breed

The breed of buffalo that is reared in Nepal are: Murrah, Nilikhi, and Jafarabadi. These breeds of buffaloes are being reared because Nepal is close to India and the Terai has appropriate weather for the buffaloes.

Murrah Buffalo: Murrah buffalo is one of the most popular improved breed of buffaloes in Nepal. Murrah buffalo was originated in Punjab, Haryana, and nearby Delhi of India. In the villages of Nepal it is known as 'Lahure Bhainsi' (Which means buffalo coming from a foreign country). The Murrah buffalo is black in colour and has short and tightly curled horns. It has small and clean head, white spotted tail, soft body, beautiful and matured udder. In average, Murrah buffalo gives 5000 liters of milk in one time a calf is given birth to or in one time of lactating period. If it is well-cared with good feed, it gives 22 to 27 liters of milk per day. Cross breeding of local buffalo with Murrah buffalo bull has been a practice in the hills, bensi, inner Madesh and Terai at present.

Activities

Make a list of local and improved breed of cow/buffalo reared in your village or community.

Diseases in cows and buffaloes

Vyagute Disease: In this disease, the cattle have a sudden high fever with temperature of 106 to 107 degree Fahrenheit. The infected cattle have a swollen throat, difficulty in breathing, crackle like sounds from lungs, and running of saliva.

The infected animal is treated with dyrin, Mesadin, Orypi, and teramycin, or tetracycline from Sulph Drug group. In the month of Baisakh a H.S. vaccine against Vyagute Disease must be given under 3.5 milliliter of the animal's skin.

Black-quarter (Black-leg) (Charchare/Laggada): In this disease the animal has high fever of 104 to 106 degree Fahrenheit. The disease affects especially the part of the body which has muscles, e.g. thigh. There is hot painful swelling in the affected leg, and crepitating sound on pressing the affected part of muscle. The animal becomes lame

and death may occur in severe cases in 1 or 2 days. Administration of penicillin in every 6 hours doses may be effective if injected before muscle damage has been caused.

Foot-and-mouth disease (Khoret): At the beginning of this disease the animal has high fever followed by formation of vesicles and blisters in the mouth, udder, teats and on the skin between the toes and above the hoofs. Plentiful and continuous saliva hangs from mouth, and lameness can be observed in the affected animal.

The external application of antiseptics helps in the healing of the ulcers and attacks by flies. A common and inexpensive dressing of a mixture of coal-tar and copper sulphate in the proportion of 5:1 should be applied in the wound of the feet.

Rabies: This disease is transferred to people and animals through the bite of dogs, fox, cats, and mongoose.

Infection of the udder (mastitis) (Thunailo): Infection of the udder is called mastitis and is caused by germs. Symptoms of Mastitis are: The milk is not clean, the color is different and there may be lumps in the milk; the udder is hot, painful and swollen; The skin of the teats is cracked; The animal has occasional fever.

Activities

Discuss with a knowledgeable person of your community about the diseases that affect cow/buffalo, and note down the result of the discussion.

Feed for cows and buffaloes

Feed: Cows require balanced feed. Carbohydrate, protein, vitamins, fatty matter, and minerals should be included in the feed. Cattle should be fed on the basis of the dry materials found in fodder, hay, and grains. 2.5 kilogram dry material is required per 100 kg weight of the cow. Therefore, a cow should be fed according to it.

Green grass and leaves and tree fodder, and dry silage and hay or straw are not enough for nutritious matters. Therefore, the animal will be healthy and the production will be improved, if the animal is fed the mixture of grains, oil, oilseed cake, and molasses. The mixture should be fed according to the weight of the animal.

Buffalo needs more feed than a cow. Milking buffalo needs 1 kilogram

more feed than a cow, because the size of a buffalo is larger than of a cow. It would be better if the source of feed for cows and buffalo is the product of local agriculture farming.

Activities

1. How can feed be prepared for cows/buffaloes at the local level? Discuss about it in the class.
2. What substances and in what ratio do you mix to make feed for cows and buffaloes? Prepare a list.

Shed /Barn Management

There are different kinds of sheds for a cow/buffalo. Generally shed is made from locally available materials. The house made in the ground-floor, which protects the cattle from wind, storm, sun, rain, and enemy is called a shed or barn. Construction of cowshed depends on the decision about its length, breadth and number of cattle. The provision of feed and water should be their inside the barn. Shed should be well-ventilated, easy to clean, easy to clean the urine and cow dung, non-slippery, and protective from hot and very cold weather. In many places cows and buffaloes are taken outside the barn to the pasture during day time. In places where there is no provision of pasture, cows and buffaloes needs to be kept in the barn. Therefore, in that place where there is no provision of pastures, the barn should have all the required facilities. There need to be provision of separate space for each of the cattle such as the bull, ox, calf, and cow. The improved cowshed is constructed in such a way that all the animals in the shed face to same direction. The manger is made in the direction where the animals are facing. Likewise, the tail of all animals is towards the same direction. The shed made in this design makes it easy for milking the cow/buffalo and also for cleaning the barn. In this way, there is less possibility of transferring disease to each other.

The types of cow shed or buffalo shed are as follows:

1. **Rearing in Open space:** The shed is open where the cattle is kept
2. **Improved shed:** Animals are kept separately according to their age and health condition. For example:
 - a. **Barren/childless shed:** Unproductive cow/buffalo are kept
 - b. **Pregnant cow/buffalo shed:** animals which are to give birth

within 1-2 months are kept

- c. **calf/ heifer:** Less than one year old calf/heifer are kept
- d. **Lactating cow/buffalo shed:** After delivery lactating cow/ buffalo are kept
- e. **sick animals' shed:** This shed is built in a distance from the other animals' shed and sick animals are kept here for treatment

There are two types of improved sheds:

1. **Head facing to the same direction:** This type of shed is especially constructed in buffalo farms, where the heads of all the buffaloes kept in the shed are facing in the same direction. In such type of shed it will be easy to feed the animals
2. **Tails facing to the same direction:** In this type of shed the tail of all the buffaloes are towards the same direction. In such type of shed it will be easy to milk the buffalo, and also easy to clean the shed.

Activities

What kinds of cow/buffalo shed do the people in your village or community make for the cow/buffalo that are reared in their houses? Discuss with friends.

Exercise

Write answers to the following questions:

1. 'Rearing cow/buffalo for business purpose helps make economic benefit.' Give explanation for the statement.
2. Write the names of common diseases in cow/buffalo.

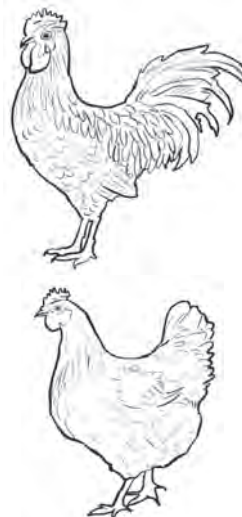
Practical Activities

1. Discuss and present the local method of treatment for the disease of cow/buffalo.
2. How is the balanced feed for cow and buffalo prepared at the local level? What substances are included in the feed? Prepare and show it to the teacher.
3. Observe the cow/buffalo shed nearby to your house and write a report on it.

Lesson - 3 (C) Poultry Farming

Chicken

Chicken is a domesticated bird. We get eggs and meat from chickens. Although chicken is a domesticated bird, a careful management is very important. A balanced feed, a cage with good facilities, provision of health care and cleanliness are very important for chickens. Left over or wastage food, oilseed cake, husk and fine husk are chicken's feed. The system of rearing 8 or 10 numbers of chickens is generally for eggs and meat. Chicken farming can be operated as a business by giving careful attention to its breed, procreation process, rearing process, feeding process, cage management, control of disease, and sell and distribution.



Duck

Just like chicken, ducks are also domesticated in areas around the house where there is a big fish pond. Ducks are kept in a common pond or fish pond. Feed should be fed regularly. They should be protected from jackals and other wild animals. Because ducks have more immunity power, they are not generally attacked by diseases and parasites. Ducks eat green grass, weeds, insects, small fish, and left over foods from the kitchen, and thus they help in controlling garbage.



Local breeds of chicken:

1. Sakini
2. Pwakh Ulte (Dumsi)(porcupine)
3. Ghanti Khuile

All these breeds have been domesticated for meat and eggs. The average weight of these breed is 1.5 kg for female (hen) and up to 2 kg for male (rooster). This breed of chicken gives 60 eggs annually in average.

Improved breed of chickens

New Hampshire: The color of this chicken breed is red, and the color of its egg is grey. The color of the lobe of the ear is red, and the color of its legs is yellow. The average weight of female New Hampshire chicken and male New Hampshire chicken is 3 and 3.9 kg respectively.

Austrolerp: The color of this breed of chicken is black, and the color of its egg is grey. The average weight of male Austrolerp chicken is 3.9 kg, and female Austrolerp chicken is 3 kg. The color of the lobe of the ear is red and the color of its legs is like the color of slate.

Leghorn: Leghorn chicken is white in color. It lays 250 to 300 eggs in a year. This breed of chicken is especially kept for egg production. Leghorn is the breed of chicken, which produces large amount of eggs. The color of its skin and legs is yellow.

Activities

What are the breeds of the chickens and ducks that are reared in your village or community? Discuss about it.

Management of the cell for chicken and ducks

Packed (deep) system: In this method 20 to 25 thousand chickens can be easily accommodate in one single cell under the care of one person. Food, feed and water and collection of eggs are systematically managed in this method of rearing chickens. This method is taken as improved method. Sottar (bed for cattle and chickens made from dried leaves) are laid flat on the ground of the cell. Corn husk; saw dust; peanuts husk; rice husk; chopped straw; sugarcane cinder; dried plants of soybean, lentils etc. should be used for Sottar. The sottar should be laid 5 centimeters above the ground level.

Semi-packed system: The method, in which chickens are kept inside the cell in a controlled manner and are left outside within the fenced area or outside cell in the sun freely to scratch in the green field, is called Semi-packed method. Feed and water should be managed in both inside and outside cell or house for the chickens. This method is suitable to be used in our villages.

External Fenced Area system: The method, in which chickens are

reared in the external fenced area where they move freely in the field looking for feed, is called External Fenced Area system. Generally, this system of rearing chickens is used for improvement of breeding and egg production. Especially the hatching hens are allowed to scratch in the green field after they are taken out of the room after hatching until they are ready to produce egg again. By using this method you can save 15 to 29 percent of the feed for chickens. Chickens can get abundant amount of vitamins and minerals from scratching in the green field.

Activities

What kind of house or cell is built for rearing or raising chickens and ducks in your village or community? Discuss with your friends.

Chicken Feed and water management

In the area of poultry farming, 60 to 70 percent of the total expenditure is required for chicken feed. Feed is necessary for physical development. Malnutrition in the chickens brings problems like decrease in physical development rate and increase in mortality rate, and decrease in egg production. Protection and development of the body, and maintaining eggs production ability are important functions of poultry feed.

Activities

1. What are the things that are used for poultry feed in your village or community?
2. What things and at what amount should be used to make balanced poultry feed?

Diseases and prevention from them

Ranikhet (Newcastle disease): Chicken that suffer from this disease becomes pale, has greenish yellow diarrhea; head twisting, high fever, and sudden death. Chickens that has this disease should be separated from the other healthy chickens for treatment. It should be given F-ONE vaccination against *Ranikhet* disease. The sick chickens should be given electrolyte and antibiotic.

Fowl Pox: Fowl pox causes round, raised lesions with “scabby” centers. Most skin lesions are located on the comb, wattle and face, and occasionally on the legs. Fowl pox can cause depression, reduced

appetite and poor growth or egg production. The course of the disease in the individual bird takes three to five weeks. Prevention is through vaccination. One application of fowl pox vaccine results in permanent immunity.

Coccidiosis: Chickens with Coccidiosis disease pass blood in their vomit, are droopy, lose weight, and drop in egg production. Salmet, super Cox, coxikil, and catrinol should be fed for its treatment.

Gumboro: Chickens with Gumboro pass whitish, watery or mucoid diarrhea. Many birds may be reluctant to move with a tendency to sit. There is slowness, dehydration, loss in weight and death in 30 percent baby chickens, and loss in ability to produce eggs in adult chickens.

Water with Electrolyte and/or Lemasol- 75 antibiotic should be given to the infected chickens. Good ventilation, warm temperatures and fresh water will help to reduce mortality.

Activities

What kinds of diseases are caught by the chickens and ducks of your village or community? What measures are taken for the treatment of the diseases? Discuss in the class.

Exercise

Write answers to the following questions:

1. Write the breed names of chickens.
2. What are the diseases that are caught by chickens? How can you prevent these diseases? Write all about this.
3. Describe the method of making chicken's house,

Practical Activity

1. Observe the poultry farm that is operated as an enterprise or business, and write a report on the management of chicken cultivation for meat and eggs.
2. Prepare a list about the required materials that are used to make feed at the local level for chickens, then prepare a balanced feed.
3. Observe a poultry farm, discuss with the owner of the poultry farm about production of eggs and rearing of the chickens in poultry farming. Present the result in the class.

(D) Swine Farming

In Nepal local breed pigs were being reared. However, at present its breed has been improved. Pigs give birth to many piglets in one delivery. Because pigs grow quickly, and it is big in size, its body weight is also more, and it delivers piglets 2 or 3 times in a year, pigs raising is more beneficial as an enterprise from the economic point of view. The pigs produced by Pakhribas Agriculture Center, Dhankuta have become very popular in Eastern Development Region. Place for pigs to live and play should not be dirty. The floor of the pig's house and feeding utensils should be cleaned daily by spraying water.



National Breed of pigs

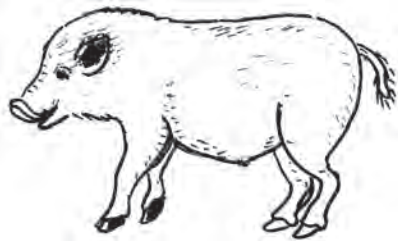
Wild boar (Bandel): Wild boars are grey and black in color having 200 to 250 kg body weight. Its body is covered with thick stiff bristles like hair. It has pointed mouth, long legs and two tusks pointing upward. Since the female wild boar lives with 2 to 3 generation offspring, the family has a group of 6 to 30 members. The group is called 'sounder', which is led by an older sow (female boar). The adult male boar likes to live alone and it is very wrathful in nature. Wild boars eat wild roots, fruits, nuts, fungi, insects, amphibians, reptiles, small mammals, birds, carrion, flesh left by tigers and leopards etc. They come to eat these foods at night, and they go to sleep during the day time.

Mingmi: Mingmi pig has thick stiff bristles like black hair with grey lines with short tail and small legs. It is the smallest of all the boars. They live in a group of 5 members and they also go in search of food in a group. This breed of boar is found in the forest of Terai area of Nepal.

Chwanche: This breed of pig is found in the hilly area of Nepal. The color of this pig is black. It gives 1 to 7 piglets in one birth delivery. The body weight of mature male Chwanche pig is 24 kg, and the female Chwanche pig weighs 38 kg. Porridge or gruel is made from

mixing flour with the residue of country liquor (Kat), taro (pindalu), leaves and stem of taro (karkalo) and nettle (sisnu), and bringing the mixture to a boil, and this porridge is given to pigs in the morning and in the evening. During day time the pig is left free to look for food around. There is a tradition of eating its meat during festivals.

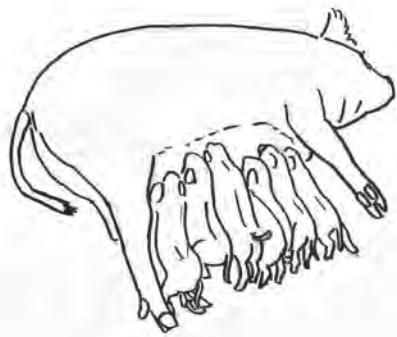
Hurrah: This breed of pig is specially reared in the Terai area of Nepal. Their coats have brown bristles on the neck portion. Their legs as well as the tail are long. Matured males weigh average 58 and female 49 kg. It gives 5 to 6 piglets in one birth delivery.



Pakhribas Black : The Pakhribas Black Pig was developed at Pakhribas Agriculture Centre, Dhankuta, Nepal through three ways crossing between Saddleback, Fayun and Tamworth. Its color is black. Its feed is prepared by the farmers locally. It gives birth to more piglets than the local pigs. It gives birth to 9 to 10 piglets in one birth delivery. Matured male weighs 170 kg and female weighs 160 kg live.

Advanced Breed of boars (Pigs)

Yorkshire: This is a British breed of boar. This is an exotic breed of boar. This type of pig is white in color with long body and erected ears. It has a long back fitting well from neck to the shoulders. It gives birth to 11 to 13 piglets in one delivery. Live weight of a mature male is 300 – 450 and female is 250 - 350 kg.



Landrace: This breed of pig was originated from Denmark. The color of this pig is white with black spot in some places. Long body, a little bit blown at the back side, short legs, and large drooping ears are the characteristics of this breed of pig. It gives birth to 10 to 11 piglets in one delivery. Average live weight of matured male is 310 – 400 kg and female is 250 – 330 kg.

Hampshire: Hampshire is a breed from United States of America.

The Hampshire pig is a domestic swine breed characterized by erected ears and a black body with a whitish band around the middle, covering the front legs. In average, the sow (adult female pig) gives birth to 8 - 9 piglets in one delivery. Average live weight of matured male is 300 kg and female is 250 kg. In Nepal, this breed of pig is found in eastern Terai.

Activities

What are the breed of pigs that are raised in your village or community? Discuss about it with your teacher and friends.

House/Pigsty

For commercial pig farming, appropriate place should be selected for making its house. Stone slates or bricks should be spread on the floor of the pig-house in such a way that damp from the ground or spilled water is not permeated. Floor of the pig house should also be made in the way that it can be easily cleaned. Because the pig-house needs to be cleaned regularly, place for feed should be made towards the way where one can easily come out and go inside the pig-house. The back part of the pig-house should have a place from where some matter should be easily washed away. The drainage should be made outside the wall of the house. The pig-house can be made in the manner so that both the outside coldness and hotness can come inside the house easily nor the inside hotness can go out easily. However, there should be good flow of air in the pig-house. The feces and urine of pigs have very strong foul odor. For pigs, there should be provision of plenty of water for cleaning and drinking purpose.

Activities

How does the pig-house that is locally made look like? Discuss about it.

Feed for pigs

Pigs should be fed a balance diet that includes carbohydrates, protein, fat, and other mineral and vitamins, according to their age. They can be fed with green grass, taro (pindalu), nettle (sisnu), and left over vegetables from the kitchen. As far as possible feed for pigs can be made from locally available food stuff such as: rice,

maize, wheat, millet, rice husk, buckwheat, wheat-husk, mustard or oilseed, oilseed cake (pina), Sunflower oilseed cake, oilseed cake of linseed, peas, roasted soybean, green vegetables, , taro (pindalu), nettle (sisnu) etc. A balanced feed can be made by mixing vitamins and necessary amount of minerals in these food stuffs.

Activities

Make a list of the materials required to make a balanced feed for pigs at the local level.

Diseases in Pigs

Mange Mites, Sarcoptes Scabies: Sarcoptes Scabies is irritant and uncomfortable for the pig, causing it to rub and damage the skin which becomes ugly. It affects more on ears, neck, and the back. In case of Sarcoptes Scabies, mix lindane lotion, himix, actomin 5 m.l. in 5 liter water and apply the mixture in the body of the pig. But, before applying the mixture, the body of the pig must be cleaned. Inject under the skin 1m.l. of Ivermectin (Ivomec) per 40 kg of live pig.

Vyagute Disease (Hemorrhagic septicemia): In this disease, the animal has swollen neck and tongue and finds difficulty in eating and breathing. The animal has fever of 104 to 106 degree. Death occurs if no treatment is done. Before rainy season starts, pigs of all age should be given 2 m.l. of H.S. Vaccine. The vaccine should be injected under the skin. When the animal suffers from the disease, tetracycline, Sulphademydin injection should be given to the animal continuously for 4-5 days.

Swine Fever (SF): Swine Fever is a highly infectious viral disease of domestic pigs marked by fever, a reddish patch on skin, loss of appetite and diarrhea (sometimes bloody), reddening or darkening of the skin, particularly the ears and nose, gummed-up eyes, difficulty in breathing and coughing, internal organs and internal bleeding of the gastrointestinal tract. Some pigs become constipated, while others may develop a bloody diarrhea. Sometimes they vomit; they tend to drink a lot of water after 4-5 days, and have high fever up to 104-106 degree Fahrenheit. The redness of the skin in white-skinned pigs may deepen to a bluish-purple color and there may be

bleeding under the skin. Mucous membranes are red and congested. A loss of consciousness due either to bleeding shock or to excessive fluid in the lungs may develop before death. It is necessary to give injection once a year to the young aged piglets and every year to the sow (adult female pig) at the rate of 1 ml.

Foot and Mouth Disease (FMD, Aphthous fever) in pigs

Since the mouth and tongue are affected by this disease, pigs have sore mouth and tongue and saliva is running all the time from their mouth. Therefore, salivation, wet nose, foot wound, and lameness are easily seen in the sick pigs, which have Foot and Mouth Disease. The pigs may walk on the tips of their toes and the feet may be muddy. Generally, the feet of the sick pig should be washed with mixture of water and 1 percent of fitkiri or clean the feet with phenyl liquid and Himax ointment should be applied on the wound. The wound in the mouth should be cleaned by mixture of water and baking power (soda). 2-3 ml of vaccine for Foot and Mouth Disease should be given to the sick pig every 4 months interval. The vaccine is given inside the skin.

Anthrax: In Anthrax disease, the pig has fever as high as 108 degree Fahrenheit and the animal dies within 8 to 10 hours. Human can also catch this disease. This disease can be prevented by vaccination.

Swine Flu: This disease makes respiration difficult. Swine flu is caused by both bacteria and virus. There is no treatment for this disease. Attention should be given to cleanliness for prevention of swine flu.

Brucellosis: Brucellosis in pigs exhibits abortion and infertility in sows, and heavy piglet mortality. It is caused by *Brucella suis*, which is found more often in adult pig. Human may catch this disease. There is no treatment for this disease as well.

Parasites: Pigs suffer from both external and internal parasites such as adult roundworms, whipworms, mange and lice, and bed bugs. Pigs suffer the most from roundworms. After two months of birth pigs should be given 1m.l. of Bimrajin per 5 kg live weight of pig. This should be given in every alternative month. 5 to 10 mg. of Albendazole, Fenbendazole, etc, should be fed at the rate of per kg.

Activities

What kinds of diseases are seen in the pigs that are reared in your village or community? What measures are taken for their treatment? Discuss in the class.

Exercise

Write answers to the following questions:

1. Write 5 benefits of pig farming.
2. Write about the pig diseases and their treatment.

Practical Activities

Visit nearby pig farm and on the basis of the following aspects, discuss with your teacher, guardians, and friends, and prepare a short report:

- a. The breeds of the pigs that are found in your village,
- b. Feeds for swine.
- c. Pigsty
- d. Cleanliness
- e. Diseases in pigs.

(E) Fishery

There is different type of topography in different parts of Nepal. Different species of fishes are being reared in the rivers, streams, ponds, lakes, swampy land, cold and hot water of the hilly and mountain regions of Nepal.



Small fries of fish (Bhura fish) are left in the natural and artificial (man-made) ponds and lakes, and are given required feed, treatment and security. In this way, the small fish are raised and developed for sale and distribution.

Fish can be raised in pond, lakes, cage, and rice field in a well managed technology. In Nepal, 3 among 185 local breed of fish, and 4 improved breed of fish are raised.

Local species of fish

Indian carp species rahu (Labeo rohita): Indian carp species rahu fish is found in the warm water of ponds, rivers, and lakes of the terai area and inner madesh of Nepal. These fish develop fast by eating microorganism and green lichen grown in water. The body of a rahu fish is covered with scale (small flat bony or horny overlapping plates that cover the bodies of fish). The body is long and rounded. The portion of its stomach is white and the center of its scale is reddish in color. Most people like to eat rahu fish. The fries become 1.5 kg in weight after 2-3 years of rearing.



Farmed Carp fish (Naini): Carp fish is also found in the places where same type of climate exists as for Rahu fish. The body of this fish is long, the upper portion of the body is brown and the lower portion is white. The growth of carp fish is same as of Rahu fish. Breeding of carp fish can be done in both natural and artificial method.

Buari : *Bauri* fish is found in the pond and clean river water. Because *buari* fish eats meat (it's a non-vegetarian fish), it eats its own and others fries (small children fish). The body of this fish is long



and flat with big head and teared mouth and long whiskers. It is grey in color.

Improved Species of Fish

Common Carp: There are two types of Common Carp raised in Nepal: they are Germany and Israeli carps. Common carp is a large omnivorous fish. They have large scales, small head, stretchable mouth a long fin (part of fish used for motion) at the back of the body, and two pairs of long whiskers in its upper jaw. This type of fish has been found having 50 cm. long and 18 kg weight. It grows very well in temperature of 20 to 32 degree Celsius. Being an omnivorous, common carps feed mostly in the mud, consuming worms, insect larvae, that are found under water, rotten weeds and plankton (a mass of tiny animals and plants floating in the sea or in lakes, usually near the surface). Within one year of rearing, it becomes as big as 1 to 1.5 kg.

Grass Carp: The grass carp has an oblong body with fairly large scales on the whole body except in the head which has no scales and no whiskers. The upper part of the body is grey and green in color. The lower part of the body of grass carp is silvery. Grass carp spawn in flowing water and do not reproduce in lakes and ponds. Therefore, breeding of this species is done by artificial technology. Reproductive success is largely dependent on an adequate flow of oxygen rich water to suspend the eggs until they hatch. Children grass carp rely on phytoplankton (one celled plants) for food. It grows rapidly in water which has a temperature of 20 to 30 degree Celsius. It can be 1 meter long and 50 kg in weight. Within one year of rearing, it becomes as big as 1 to 1.5 kg.

Rainbow Trout: The business of Rainbow Trout has been a success in Nepal. The upper part of the source of a stream and river is appropriate for rearing Rainbow Trout. The rearing of Rainbow Trout is appropriate in the temperature of 15 to 18 degree Celsius. In Nepal, 15 to 20 kg. of Rainbow Trout has been produced in 1 square meter large lake or pond. Because Rainbow Trout is boneless and is tasty, people have liked this fish most despite its higher price.

Activities

What are the species of fish that are found in your village or community? Discuss about it with your teacher and friends.

Types of Fish Ponds

Fries of various species of fish are kept in different ponds for its production and sell. A common, small, and cylindrical shaped pond, which is 1.5 to 2 meter deep, will be appropriate for fish rearing.

Ponds can be of various kinds: for example.

1. Nursery Pond
2. Fries rearing pond
3. Production pond
4. Reservoir pond

Activities

What things are to be considered while making fish pond at local level? Identify one resource person who owes a fish pond, and discuss with him in the class about things to be considered while making a fish pond.

Feed for Fish

Natural Feeds: Fish eats phytoplankton (plant based micro-organism) and zooplankton (animal based micro-organism), which are found in watery environment; snails and other small insects, and other weeds such as seaweeds and algae in the pound. Common Carp fish eats all kinds of food. The Silver Carp fish eats plant based micro-organisms. It is easy and less expensive to produce natural feed for fish. By using different kinds of manure we can make natural feeds for fish. Therefore, fish that eat natural feed should be raised. Compost such as cow dung, pig dung, chickens' and ducks' dung and oilseed cake etc. can be used in the pond for making natural feed for fish. In the same way, urea; DAP (diammonium phosphate) fertilizer; and TSP (triple superphosphate) fertilizer can also be used to make natural feed.

Artificial Feed: Only natural feeds are not enough for fast growth and more production of the fish fries that are relocated in the pond. Therefore, the fish farmers should feed nutritious artificial feeds to the fish regularly. Artificial feeds can be made from rice husk, wheat husk, maize flour, barley flour, millet flour, soybean flour or oilseed cake, linseed or peanut oilseed cake, lentil husk, different types of weeds grown in the field, fodder, leaves of banana and mulberry, and barsim grass etc.

Methods for preparing fish feeds

The main ingredients for producing fish feed such as husk, flour and/or oilseed cake should be made ready. Fish such as trout, magur, and prawn, which are raised in Nepal should be given feeds that contain more protein. The fries (bhura) of carp fish should be given 30 to 35 percent protein. The mother fish should be given 25 to 30 percent of protein, and a developing fish should be given 20 to 25 percent of protein. Therefore, feeds for all these categories of fish should be prepared according to the given percent of protein. Feeds should be prepared enough for 15 to 20 days. We can get 60 to 66 percent of protein in good quality dried fish.

Method of feeding fish

The fries (bhura) of fish should be fed as many times as they can consume or 4-5 times a day. The mother fish should be fed 3-4 percent of its weight, and the other fish should be fed 3-5 percent of its body weight. Grind the artificial feed to make it powder like or make small ball by mixing the powdered feed with water and kneading it, and give this feed to the fish 4-5 times a day. The feed should be given in a bowl or on the ground at a distance of 4-5 feet from the edge of the pond and 3-4 feet deep in water.

Activities

What materials are required to prepare natural and artificial feed for fish? Discuss in the class.

Diseases of fish

Ich (White Spot Disease)

In this disease, the fish gets small, sluggish, grain-like spots on its

body. Ich is also known as White Spot Disease. The fish may try to rub itself against the décor or the hard surfaces in the aquarium, giving an impression of scratching an itch. One of the effective ways to treat it is by adding salt to the water. The salt should be added gradually, slowly building up to 5-8 tsp per gallon / 4 L. Different fish have different tolerance level for salt. In the case of more sensitive fish, it is better to keep the level at 5 tsp. per gallon / 4 L. Malachite green 0.1 P.P.M. should be used.

Flukes (Gyrodactylus)

Gyrodactylus is a disease in fish that attacks skin or gill and fins, and can cause a great deal of damage. The fries (baby fish) of fish are greatly affected by this disease. Because there is itching in the skin, the fish may try to rub itself against the wall or crawl along the shore, and jump in the water. We can see change in behavior. In such disease, use 0.25 PPM. Dipterex.

E.U.S. (Epizootic ulcerative syndrome) Disease

At first, red spots are seen on the skin. Then, slowly the scales start to fall and erosions are seen, which later on form wound.

Trichodina Species

Trichodina spp are single-celled organism parasites of marine and freshwater species of finfish. They attack the skin, gill and fins of fish. While small numbers of these organisms on a fish generally do not cause much of a health problem, large numbers can cause moderate to serious condition and ultimately, death of fish. Small fish and fry are especially susceptible, and mortality can occur quickly if undiagnosed.

Argulus (Fish Lice)

Argulus sticks to the flesh of fish. Once attached, the parasite pierces the flesh using stinger (the sharp organ through which an insect or other animal injects poison) mouthparts and will suck the blood of the fish. Argulus inject a toxin (poison) that will kill smaller fish and leaves reddened, inflamed cut or wound on larger fish. This wound often becomes infected. The strong irritation brought on by the Argulus parasite causes fish to rub or scrape against objects in the aquarium. The fish even tries to jump out of the aquarium.

Lernaea (Anchorworms)

Lernaea species, commonly known as “anchorworms,” are crustacean (a backboneless animal with several pairs of jointed legs), parasites that can infect and cause disease and mortality in many types of freshwater fishes, especially wild-caught and pond-raised species. It grips into the flesh of a fish from the anchor part of its body and makes an open cut. If it reaches to the head of small fish hanging from the fish's body, it makes the fish turn round and round and finally the fish dies.

Activities

What diseases are caught by the fish that are raised in your village or community? What treatments are taken up for the diseases? Discuss in class.

Exercise

Write answers to the following questions:

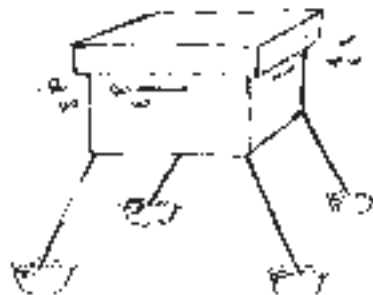
1. Write names of different fish species.
2. Write down how you can prepare natural feed for fish.
3. What materials are to be included to prepare artificial feed for fish? Make a list of the materials.

Practical Activity

Visit a fishing farm or fish hatchery; get information on the basis of following points; then discuss with your teacher, guardians and friends; and then prepare a report.

1. Fish species that are found or cultivated in your village or community.
2. Feed for fish
3. Ponds for fish
4. Diseases in fish

Nepal is rich in natural resources. Many kinds of organisms or living beings are found in Nepal. Among these living organisms insects are found in large number. Bee is a kind of insect. Some insects are advantageous to us, and some are harmful to us. Bee is an advantageous insect. Bee extracts the juice or sucks pollen from flowers and produces honey and wax, which are expensive in the market.



Bee keeping is both science and art. Bee keeping helps in holistic development of plants, vegetable farming and environment. It teaches people to make income by rearing bee in an organized way.



Queen



Drone



Worker

Types of bees

There are many species of bees found in Nepal. The species of bees can be divided in two categories: (1) Those living in people's control, and (2) those not living in people's control.

1. Bee species not living in human's control

(A) Kathyauri Bees: Kathyauri bees look like a fly. It is found in low area of the Terai and mid-hill of Nepal. It likes an open area where there is fewer crowd of people and animals. This species of bee makes a palm sized honeycomb in small plants or trees and bushes.

(B) Khago Bees: Khago Bees are also found in low area of the Terai and mid-hill of Nepal. It is about four times bigger than Kathyauri

bees. It is black in color. It makes the honeycomb, which is quite big in size, on the roof of tall houses or buildings or on the branches of trees. One swarm of bees makes only one honeycomb.

(C) Bheer (Cliff) Bees: Bheer Bees are bigger than khago bees, yellowish in color, and have less irritability. These bees make their hives on great face of rock. One group of bees makes only one honeycomb.

2. Bee species living in human's control

(A) Cerena Bees: Cerna bee is a little bit bigger than Kathyauri bee and is of light color. This species of bees have been raised in Nepal traditionally in the windows and khopa of the house.

(B) Meliphera Bees

At a glance, it looks like cliff bee. But it is bigger than cerana bee. This is also called European Bee. If properly taken care of, it can be raised in any place. However, the Terai and inner madesh have been regarded as the appropriate places for Melipheri a bee keeping.

Activities

What species of bees are found in your village or community?
Discuss in the class.

Management of Bees

The nest or place where bees are kept is called bee- hive (Ghaar). Cerena bee and Meliphera bee like to live in dark and warm place. Therefore, they are kept in a hive (ghaar). There are two types of bee-hives found in Nepal.

(A) Traditional Hive

In Nepal bees have domesticated for thousands of years. The bees hive which have been used from earlier time is called traditional hive (ghaar). Such traditional bee hives are less useful in comparison to modern hives. There are two types of traditional bee hive:

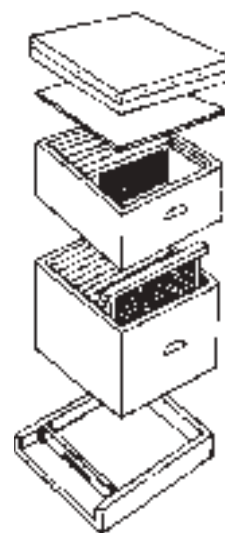
I. Khope (cavity or hollow space) Ghaar (hive): A hollow cavity or space made on the window of a house or in the animal shed, where bees are kept is called traditional bee- hive or khope ghaar.

II. Mude (Log) Ghaar (hive): A three feet long log of tree is cut into cylindrical shape and carefully scooped out to form hollow at the center. The two ends of the log are covered by flat stone or wooden plank. A small hole is made at the hollow place for the bees to pass through the hive. The bee hive made in this way is called log hive.

III. Modern Bee-hive: Modern beehive is made by cutting soft wood in different shapes and joining them together. There are two apartments in the wooden beehive: one is for collecting honey and the other is to raise the larvae of bee into worker bees.

Feed and pasture for bees

Things that are eaten by bees are called bee feeds. Honey and beeswax are the main food of bees. In order to eat and digest these feeds, bees need water. The queen bees and the drones (male bees) eat royal feed. Worker bees extract the juice of flowers from the flower plants for making honey and collect pollen of flowers to make beeswax. They store these feed in the honeycomb for later use when there is scarcity of flower juice and pollen. The place where there is availability of flower plants for juice and pollen is called bees pasture.

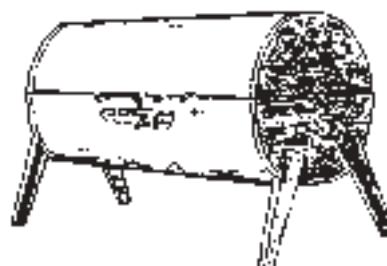


Activities

What kind of flower plants available in your village or community for bees pasture? Discuss and make a list.

Beehive Management

Improvement in log-hive: The log-hive (Mude ghaar), which has been in use for bee-keeping for traditions, can be improved with little effort. This improved log-hive is quite similar to the modern beehive. Production can be increased and bees can be protected by the use of equipment of modern bee keeping such as artificial honeycomb base, honey churning stick etc. Frames



can be removed from the beehive for inspection or checking. In this way, the improved beehive is called top-bar beehive.

Improved Log Beehive:

Put the log in slanting position and divide it into two parts towards the length. When making the log into two parts, cut the log with a saw in such a way that the lower part of the beehive has two parts and the upper part has one. The upper smaller portion is the lid of the beehive. The lower part of the log is the main beehive, which has compartment for honey and the larvae.

Improved Cavity or Hollow Beehive

Traditional cavity or hollow beehive is common in many places of the mid and high hilly regions of Nepal. A wooden rod which is 40 mm thick and 50 mm width is cut and attached on both left and right sides of the cavity or hollow beehive (Khope Ghaar). The wooden rod is equally long to the hollow beehive. In this method, the traditional beehive can be modernized to some extent. This type of beehive is less expensive and accessible beehive, which can be made from local resource and manpower.

Activities

What kind of beehives are used for bee keeping in your village or community? Discuss in class

Diseases and Enemies of Bees

Any kind of difficulties that come in the life period of bees is called diseases of bees. Such diseases can be mainly divided into two parts, (A) disease at larvae stage, and (B) disease at adulthood stage, for example: swallow, hornet, lizard, spider, ants, wasps etc.

Activities

What diseases and enemies do the bees of your village or community have? What measures or ways are taken to remove the diseases or enemies? Discuss in class

Exercise

Write answers to the following questions

1. Write three advantages of bee keeping.
2. Write about the Beehives and their types.

Practical Activity

Visit and observe a bee keeping farm. Discuss with your teacher, guardians and friends on the following issues; and then prepare a report.

- A) Species of bees found in your village or community
- B) Types of bee hive
- C) Feeds and pastures for bees
- D) Diseases of bees

Introduction to Paper and Its Importance

Paper is a special means to read and write, draw pictures, print written materials etc. In present age, paper has not been only a means to express our feelings and printing, but it is used for other various activities. High quality paper is used to prepare various pictures or paintings. Decorative items and children's toys are also made from paper. Paper is also used for making play items such as kites, dolls, house etc. It is also used for protecting materials. Paper box is used for transporting goods safely from one place to another. Goods made from paper such as envelopes, invitation cards, paper plates, napkins etc. have their own usefulness. Different news are printed in papers and carried to all over the world. In this way, paper has been used in every field.

Activities

As far as your understanding, for what purpose has paper been used? Make a list of them.

Things to be paid attention while working with paper

The following things should be considered while working with paper:

1. Select appropriate paper for the work you are going to do
2. Ensure the measurement of the thing you are going to make
3. Care should be taken while cutting paper
4. Make sure to adopt cleanliness when you use glue or gum
5. After completing work, all the tools and equipment should be put back in their assigned places.
6. The cut pieces can be used later. Therefore, select usable and unusable pieces from the cut pieces and put them in the assigned place.

7. Do not play with scissors, knife while working with them.
8. The working environment should be peaceful. So avoid disturbance in the working place.

Introduction of tools and equipment and their use

Various tools and equipment are required to make things from paper. The introduction of the tools and equipment and methods of using them are given below:

- | | | |
|---------------------------|-----------------|------------------|
| 1. Working board or table | 2. knife | 3. Scissors |
| 4. Smoother | 5. Compass | 6. Ruler |
| 7. L Square | 8. Pencil | 9. Brush |
| 10. Eraser | 11. Gum or glue | 12. piece of rag |
| 13. Gripping Clip | 14. Plastic | |

Working Board or table: The working table should be well leveled or smooth and clean. It will be easy to cut paper on the smooth table. Table can be used for putting on glue and marking on the paper.



Knife: Knife is also used for cutting papers. But there is possibility of cutting hands. So, the paper knife, which is easily available in the market, can be used instead of knife. If you need to use the knife, you should be very careful not to hurt your hand.



Scissors: Scissors are used for cutting papers. Special kind of scissors are used to cut the papers for making patterns.



Smoother: Smoother is used in order to mark a required fold on the paper. It is made of wood or bamboo.



Compass: It is easy to use a compass to divide a straight line into two equal parts or to draw circular drawing.



Ruler: Ruler is used in paper work for taking measurement. In some ruler sign in metric system is given, in some ruler sign is given in inch system, while in some ruler sign in both metric and inch system is given.



L Square: L Square is used to check whether the size or measurement of the paper is right angled or not.



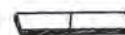
Pencils: Pencils are used to draw lines on the paper. Some pencils are hard (H) and some are soft (B). We use HB pencils for paper works. Pencils need to be sharpened from time to time to make them clean and easy to write.



Brush: Brush is used to paint color or gruel on the paper. But small tool of wool or bamboo can be used to put gruel on paper. Brush can be used for color painting only.



Eraser: Various shapes have to be drawn while working on paper. Therefore, sometimes we have to erase some shapes from the paper. In such situation we can use good quality of eraser to erase the drawing.



Glue or Gum: Gruel, ceres, mobikol, or gum should be used as per the nature of paper work. Gum is used for sticking only paper. For example: gum is used to stick an envelope or to stick many different papers on an invitation card. It is better to use mobicol to stick bamboo and paper while making a kite. Similarly, it is better to use movicol and ceres while making show-case and paintings.

Piece of rag: Soft piece of cloth is needed to wipe hands or sometimes ingredients used in doing paper work.

Gripping Clip: Gripping clips are used to keep papers safely in order.



Plastic: Plastic cover is used to protect the invitation cards and other useful items, which you make from the papers, from dust. Plastic cover is also used to have a show of the things made from paper.

Activities

1. Using scissors to practise to cut papers to make it in shape of a square, circle, straight and L shaped.

2. Practice to cut papers according to measurement by using scale, pencils, and a compass.

Protection of Tools and Equipment

The tools and equipment that are used for doing paper work should be kept back in their assigned places safely so that they could be easily found for later use.

Various items made from paper

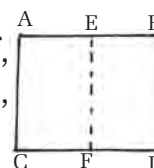
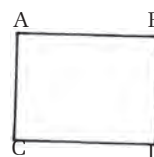
We can make various kinds of playing and decorative items from papers. It is not necessary that we need new and clean papers to make all these things. We can make various things in less expense by using old newspapers and other waste papers. We can make and use paper items such as container for keeping small things, playthings for children, small sacks etc.

Common Envelope:

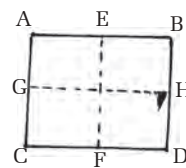
An envelope is necessary for sending letters. There is a custom of sending invitation and good wishes cards in an envelope. Rather than buying a ready made envelope in the market, our skill will be demonstrated if we could use enveloped made by ourselves as well as time and money is saved. If we know to make a good envelope, it could be a source of income too. An envelope with a size of 10/15 cm is enough to send regular letter. Envelope of above mentioned size can be made by following the methods given below:



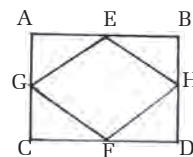
1. Take 33 cm long and 24 cm. wide plain paper
2. In each four corners of the paper, on the upper corners write A, B from right to left; and on the lower corners write C, D from left to right. Use a pencil to write the letters
3. Fold the paper so that A, B and C, D becomes half, and write E on the upper center of the folded part, and F on the lower center of the folded part



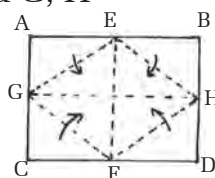
- From the length of the paper A and B, fold the paper so that it overlaps on C and D, or A and B are joined with C and D. The line becomes the center part of the paper after joining A, B with C, D. Mark the left of the line as G and the right of the line as H



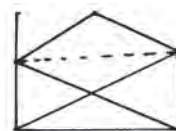
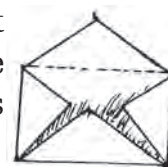
- Join G and E; E and H; H and F; and F and G



- Give the name I to the center of the lines E, F and G, H
- Now, fold G to I and H to I to make 9 x 9 cm. In the same way, fold E to I and F to I to make 7 x 7 cm. After folding from all four corners, cut the unnecessary paper with scissors.



- Fold F to I; G to I and H to I in such a way so that they overlap to each other. Now put glue to stick the overlapped portion. Do not put too much so that it is smeared.
- After it, fold E to I properly, Now your envelope is ready to put letter in it. Close the envelope by putting small amount of glue on the side or edge of the cover, close the cover.



As stated above, other envelopes with different measurement can be made. But if you have to make many envelopes, you can make fold one envelope with this method and cut it by its sides, and the rest of the paper can be used to make another envelope.

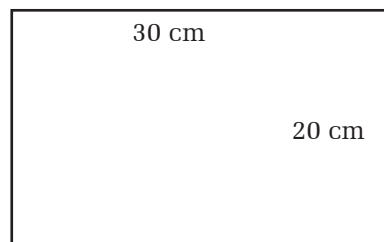
Activities

Using the above given method, make envelopes of different sizes.

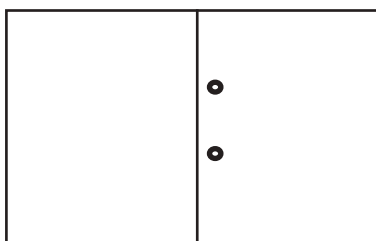
Paper File

We can make files for office and personal use from paper. We need newsprint cardboard paper, glue, scissors, marker and lace to make a file folder. Take two cardboards which are 30 cm. long and 20 cm

wide. Put glue on one side of the cardboard and stick any newspaper on it. Then stick the other cardboard on it to make it hard and firm. Leave it to dry. Then fold it from the length to make it half. Now make two small holes at the center of the lower part of the folded cardboard and insert the lace through the holes. The file folder is ready now. write 'Record File' on the outside part of the folder. You can use the file folder now.



Cardboard paper



Folding line

Record file File no. Name: Subject: ... since ... up to

Ready made file

Activities

Make a file folder according to the above given instruction.

Good Wishes Letter

Good wishes cards can also be made from thick cardboard paper. The words written to express good wishes can be appropriately decorated. There is a custom to exchange good wishes card on happy occasions such as birthdays, New Year, Dashain etc. This card can be folded in three layers or in any other ways.



While making a card, the cut point made after folding the paper can be made at the side edge of the card instead of at the center of the card. Sometimes it does not look nice if the cut is made in the center and the words are in the cut. To avoid this, we can adjust the paper from its length side.

Sample of Good Wishes Card

On the auspicious occasion of the New Year 2071, we wish all the students brothers and sisters hearty good wishes for a long life, good health and continuous progress.

Curriculum Development Center Family
Sanothimi, Bhaktapur

Activities

Make a good wishes card according to the above given instruction.

Exercise

Write answers to the following questions:

1. What is the importance of paper in our daily life?
2. Write five points about the things that need to be paid attention to while working with paper.
3. Make a list of the tools and equipment required for doing paper work.

In leisure time, people of all ages can entertain themselves by folding papers to make various things. This can be used to making gifts for friends and brothers, and also for making daily usable goods. Now-a-days, the custom of paper packing food has been increasing. This helps people to demonstrate their creativity, as well as use the leisure time. Not only this, making things by folding paper help people in income generation too.

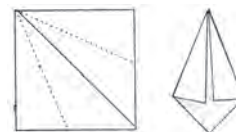
Various things made by origami

- A. Rabbit
- B. Cap
- C. Parrot

Activities

1. Rabbit

- a. Fold at the centre from both side of a square shaped paper



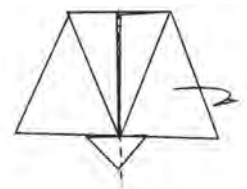
- b. Bring the paper lower by valley fold



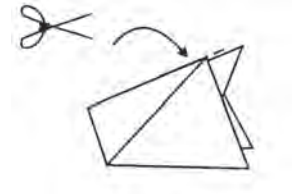
- c. take it to backside by mountain fold



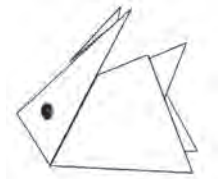
- d. It is seen like this from the back. Use mountain fold for the left and right side



- e. Cut at the place as shown by the scissors



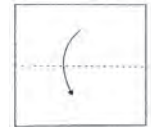
- f. Perform mountain fold in such a manner that the triangled portion is raised up



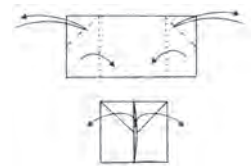
- g. Make the raised triangled portion ears and draw eyes and legs. Now, the rabbit is ready.

2. Cap/Hat

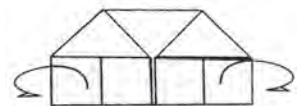
- a. Fold the rectangular paper into half



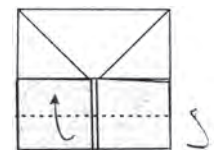
- b. As shown in the diagram, fold where there are dots and then open



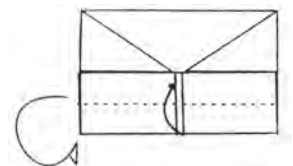
- c. Now, open at the place where the line is drawn



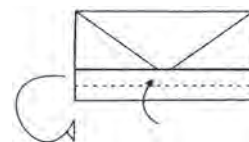
- d. As shown in the diagram, turn the two sides backward



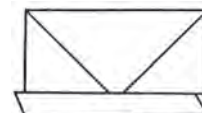
- e. Fold both front and back sides using mountain and valley fold



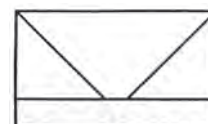
- f. Fold one more time front and back sides using valley fold



- g. Level the paper

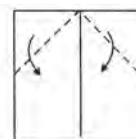


- h. The hat is ready



3. Parrot

- a. As shown in the diagram, open the folded paper into half.



- b. Bring the upper two corners to the center by folding them.



- c. Turn the half portion backward.



- d. Make edge for folding and then perform nakabaori.



- e. Fold the upper corner inside and make triangular shape and perform nakabaori.



- f. Parrot is ready from the folded paper.



Teacher suggestion

The following activities are only for example. You can also use the local material to make those type of things.

Kirigami

The word Kirigami is derived from Japanese language. In Japanese language, 'kiri' means 'to cut' and 'gami' means 'paper'. The art of making a long festoon of flowers and various decorative items by cutting paper is called Kirigami. It is a traditional art, which originated in Japan. Various decorative goods are made by cutting different colorful papers to decorate the house during festivals. In their leisure time people of all ages and from all places make various things by cutting colorful paper. Various decorative materials are made in schools on the occasion of Saraswati Puja. Various items are made from colorful papers and decorated during Dashain, Tihar, and Chhath Parwa etc. The art of making all these materials are called Kirigami.

A long festoon of flowers (Toran): We all have seen that on the occasion of wedding ceremony, Bratabandh, and worshipping ceremony (Puja) people make a long festoon of flowers (Toran) and hang it in front of their houses.

Activities

1. Discuss in class about the local method of making toran.
2. What decorative things were used that were made from paper, in our school on Sarswati Puja?
3. Fill in the following Table with the things mentioned in question number 2:

S.N.	Name of the things made by the students	Name of things bought from the market
1.		
2.		
3.		
4.		
5.		

4. Among the things made by the students or school, write the names of the things that you made.

- i.
- ii.
- iii.

Exercise

Write answers to the following questions:

1. Write five points about the importance of paper.
2. Write names of 10 things that are made using of paper.

Gift Decoration

Tradition of presenting gifts on the occasion of wedding, Bratbandh etc. has been regular practice in our society. The gift is not given like that. But people normally wrap the gift in a colorful paper and decorate the outside of the wrapping. This is called gift decoration. When we go to the shop to buy gifts, the shopkeeper wraps the gift with colorful paper for us. But if we have to present the gift that we already have then we should know to decorate the gift.

Activities

1. In order to present a gift to your friend on his/her birthday, decorate a copy and show it to the class.
2. What things have been given as gifts in any wedding or Brat bandha that you attended? How were the gifts decorated? Fill in the following Table:

S.N.	Name of gift materials	Methods of decorating
1.		
2.		
3.		

Exercise

Write answers to the following questions:

1. Why gifts are decorated? Write.
2. Write the names of the things that were made from papers and were used for decoration in school at Sarswati Puja.

Practical Activities

1. Discuss with your teacher and friends on the basis of the following:
 - a. Selection of paper for making things
 - b. Methods of protecting required materials for making paper goods
 - c. Importance of paper and its use
2. Using Origami and Kirigami technology, make five items from each group of technology and demonstrate them to the class.

Making of Goods from Bamboo, Wheat Stalk, Straw, Babiyo etc.

Nepal is rich in natural resources. Economic development is possible by the use of such resources. From these resources materials are made at the local level which are useful for domestic as well as occupational life. Doko, dalo (basket), mat, bag, winnow or bamboo tray can be made from bamboo, wheat stalk, babiyo (Kind of grass used for making ropes or thatching).

Because it has been easy to use since ancient period and also easily available everywhere, bamboo, wheat stalks, babiyo, corn husk, straw, kush etc have become more useful. Goods made from these materials can be developed as less expensive and more useful. At the same time traditional skill is encouraged. The making of these goods creates employment opportunity as well as encourages use of local tools and equipment. One can do agriculture business and also supports in income generation by making above mentioned goods.

Required tools and equipment for bamboo, wheat husk work

Hansiya (curved knife) / Khukuri: Khukuri, curved knife (hasiya) and scraper are used to cut bamboo, to prune branches of trees, to scrap trees bark, to cut into pieces etc. Knife or karda (small knife which is kept along with Khukuri, and used for sharpening Khukuri) are used to make split cane or wicker osier.



Axe: An axe is used to cut bamboo and to remove thick bushes.



Saw: Saw is used to cut bamboo while making items from bamboo. The tool which is used to cut things according to required measurement is called saw. This is a modern tool.



Others / miscellaneous: scissors, hacksaw, prong or long needle, and foot (measuring tape) are used to make things from bamboo as well as other materials.

Activities

Make a list of required tools and equipment that are used to make items from bamboo, Wheat Stalk, Straw, Babiyo etc.

Making of materials from Bamboo, Wheat Stalk, Straw, Babiyo etc.

Following things can be made at local and national level from the above materials

Pen-stand: Pen-stand can be made from wood, bamboo and plastic. A pen-stand helps keep pens and other things safely. Pen-stand can be made from bamboo in a less expensive and artistic manner. Tools like a knife, saw, hatebarma etc. are required to make a pen-stand.

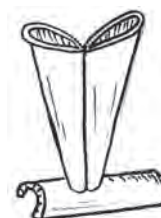


Flower-vase: An object, which is made for putting flowers for decoration in any office, rooms of a house, or in any other meetings and occasions is called flower-vase. A flower-vase can be made from clay, wood, metal, bamboo etc. A bamboo flower-vase can be made by simple cutting. Tools and equipment like saw, knife, blade of an iron cutting saw etc. are required to make a bamboo flower-vase.



Method of making flower-vase:

1. Take 8 cm thick and 20 cm long bamboo and cut vertically into two parts and clean inside of both pieces
2. Prepare a piece of 13 cm long plywood according to the pieces of bamboo and make a hole inside of the plywood for nails
3. Carve a shape outside of the bamboo according to your wish with an iron cutting saw (reti)
4. Clean the pieces of plywood and bamboo with sand paper, and put glue on them
5. Stick the plywood and bamboo together (as shown in the diagram) and leave them to dry



Thus, we can make a flower-vase, as shown in the diagram, by using bamboo only. For this, we should make a base of 13 cm long and 6 cm diameter, and stick the bamboo on the plywood at 70 degree angle. We can decorate the flower-vase with flowers which can be put in the space between two pieces of the vase. Make a hole at the center of the base. After the top of the vase is stuck together properly, stick the vase on the base with glue. You should practise to make this flower-vase.

Things made from babiyo: We can make the following things with babiyo. for example:

1. Broom
2. Rope
3. Others....

Broom: Broom is a necessary tool for cleaning the house and the courtyard in front of the house. Besides cleaning, it is used for coloring the house and plastering the house.

Rope: Rope is useful for household work, and other works. Rope is made from babiyo and other materials. In the villages, rope is used to carry bundle of grass, firewood, load and luggage. It is easy to make a rope. It is necessary to know the process of making it strong.



Activities

Discuss in your home and community about the process of making a rope and then discuss about it with your friends.

Wheat straw Fan: Wheat straw is cut into two layers in specific shape. Then the two layers of wheat straw are weaved in artistic way with a strong thread. Then lace made of cloth is put round on the three corners of the weaved straw. Thus fan from wheat straw is made. While giving shape of fan, the layers of wheat straw should be fitted tightly. While tightening, colorful pattern such as block shaped, circle, 'V' shape and 'X' shape come out. Equipment such as scissors, big needle etc. are required for making wheat straw fan.



Method or process of making wheat straw fan:

1. Dye 25 cm long wheat straw into two different colors.
2. Attach straw of different colors with each other, use two threads of different color than the wheat straw in two opposite direction, put the straw in between the two threads.
3. Entwine or entangle the straw with each other by the first (upper) thread, and tighten the straw with the coloured (lower) thread.
4. In the same way, sew the two parts, which have been made ready with different patterns, together to make one.
5. Cut the portion that has come out with scissors to maintain the size as 22 cm for both length and breadth
6. Make frill using piece of cloth of two colors. While making the frill, put blue or other color at the background, and put red color for frill
7. First sew frill on the base cloth by making pleats
8. While joining frill to the wheat straw cut from the back side, and then turn it and on the base, sew frill on three sides leaving 20 cm for both length and breadth
9. In order to make a handle on one side of the fan, make 30 cm long bamboo split with a knot, and join a 10 cm long pipe of bamboo or a branch from the knot side.
10. By cutting the splitted bamboo insert the fan and to make the handle firmly stand wrap it with string.
11. In order to make the wheat straw fan strong and firm, press the straw with each other and put small splitted bamboo around the four corner sides.

Thus after making the wheat straw fan clean it by cutting the unnecessary portion of the fan and then you can use it.

Bamboo Fan: A material which is made from splitted cane with various woven design on it, and which is made for the purpose of blowing air is called a fan. This kind of fan is strong. We can put various kind of weaving design in this fan. Among the weaving design, 2 knitting underneath



and 2 knitting above, 3 knitting underneath and 3 above, 'V' shape, 'block' shape and square shape are the main ones. Such fans can be made by knitting straight and putting frill or by knitting diagonal and finishing the brim with split cane. A handle is made in it so that it would be easy to blow air. Scraper, knife, and needle are required to make a bamboo fan.

Method of making bamboo fan:

1. Make uniformed split canes which have 30 cm length and 1 cm breadth.
2. Dye the split canes in 2 colors so that the layout could be clearly seen.
3. Prepare a mat which is 20 cm long and 15 cm wide by putting the layout shown in the diagram or any other knit.
4. Make 30 cm long split bamboo with knot on one side, smooth it by scraping well, and tear it at the center down to 20 cm to thrust in the fan.
5. Insert a bamboo tube of appropriate size from the bottom of so that the fan can rotate.
6. Join the handle and make frill on three sides.
7. While joining the handle insert the mat on the split bamboo and stick it with glue, and wrap it with choya.
8. For making the fan stand firm insert the split cane and wrap the edge of the mat.

Activities

1. Discuss in class about the method of making wheat straw fan or bamboo fan.
2. Besides the materials mentioned above, there might be other materials made in your village or community. What are those materials? What tools and equipment, skill, technology, capital (money) are required at local level to make these materials? Discuss with your teacher about this.

Exercise

Write answers to the following questions:

1. What things are made of bamboo in your house?
2. Mention names of the things that are made of babiyo and wheat straw. Mention the process or method of making these things.

Practical activities

1. Make a broom and a rope from babiyo and demonstrate in the class.
2. Describe the process of making mat, rope, sack from wheat straw, babiyo, and straw that can be used at home or in office.
3. In your group make and demonstrate in the class one thing from each of bamboo, wheat straw, babiyo, etc.

We have many things in our house that are lying in store without being used, which we even cannot throw out. They cannot be used in that forms. Therefore, the housewives can make something useful from these waste materials in their leisure time. For example: There are old clothes, saris, woolen clothes, unworn old bangles, glasses, plates, plastic utensils etc. in the house which are lying without being used. We can select these materials, clean them, and make other different things from these waste materials for reuse. In this way, the waste materials can be used again in a new form, and also leisure time is used in a productive work.

Making of materials from old clothes

Old fashioned saris which we do not like anymore are lying in our wardrobe or suitcases unused. These saris can be used considering their designs. If it is a thick silk sari, it can be used for sewing frock or kurtha for daughters. Printed with a uniformed design polyester sari can be used for making cushion or sofa cover. Plain sari can be made window curtains. In the same way, old sari can be used to make frill for beds. Likewise, if the fabric of old pants is still strong and good, it can be used to make children's pants, shorts etc. If the bed sheets are worn -out in the middle and the sides of it is still strong. Such strong parts of the worn out bed sheets can be used to make small cushions. We can also make pot-holders, and kitchen towels. We can also make small bags by sewing small pieces of the bed sheets. Thus we can economize the expenditure. If we work hard, we can also make ladies' bags. Thus, the housewife can support to raise and balance the domestic budget by doing such activities.

Old glass, cup, plates, which are lying unused can be brought into use again. For example:

A) Plastic Pouch: The plastic bag or cover of milk, instant noodle, oil, and wrappers can be used again. Collect all these waste materials and wash them thoroughly until they are clean. Cut them into very small thread like shape and using a crochet (a form of needlework) we can make key ring, tea mat, pen holder, cushion cover, bag etc.

B) Old newspaper or papers: We can make pulp by soaking the old papers and then make appropriate paper for reuse. We can make decorative pieces as well as stationary papers from waste papers.

C) Household waste: There are lot of household wastes produced by daily food and other objects. We can make compost by putting it in a pit or manure container. This compost is very appropriate for farming or flower-pots.

Broken glasses can be used as decorative pieces in your room by cutting, adjusting, and painting them. In the same way, we can adjust them as the photo-frame also. Broken glass or cup can be turned into flower-vase or pencil holder by painting it, and half-broken pots can be turned into flower-pot.

Old bangles can also be used for decoration by joining many bangles in a thread in various design and hanging on the wall. We can also use jute sack. We can make pattern on the jute sack with old woolen thread and make door mat and wall hanging bag which has 2-3 sections. In one of the sections of the wall hanging bag, we can put papers; we can put pens in another section, and in the next section we can put combs and so on. If the bag is sewed putting inner lining, the bag becomes firm and remains still on the wall.

After making various things from the pieces of clothes, there will be still some pieces left. We can stuff these pieces of clothes to make dolls for children. Other kinds of doll such as stuffed dog, rabbit can also be made. As a result, there is no need to buy such dolls from the market.

Majority of the people are farmers. Therefore, we can find straw, wheat straw, husk of maize etc. in their houses which are used in the stove as fuel when there is surplus of these materials. If properly used, a small cottage industry can be opened. Baskets, hats, bags can be made by coloring the wheat straw. This can be very useful for presenting as gifts as well as for our own use. These things can be set in the room for decoration.

Similarly, we can make many different things from the Khosta a maize. We can make colourful butterfly like small materials as well as other materials from it. Because of these sorts of materials we don't

have to spend money for buying butterfly to our children. When the children see the making of these sorts of materials, they get curious in making them which develops their skills of making the materials like butterfly. We can make many other materials to be used in the decoration of house walls from the Khostas of maize. They are easy to be used as gifts. In the same way where jute is found easily, we can make there various types of materials like bags, wall handlings etc.

Useful things made from waste materials

A lot of waste materials come out after we use things. But if we throw them haphazardly, there will be a pile of garbage. We can collect the waste materials, color them with different patterns, and use them as decorative pieces or use them to put things in, and also we can sell them. In the same way, if we throw the soft black plastic bags haphazardly, it will be chaotic and environmental pollution will also increase. Therefore, we can use them by putting them in a cloth-bag and making pillow. Following are some examples of waste materials that can be made usable things.



Used materials thrown haphazardly



Useful decoration materials made from waste materials

Activities

As shown above, make two from each group, decorative pieces by reusing waste materials.

Exercise

Write answers to the following questions:

1. Describe the usefulness of old and waste materials.
2. Make a list of the waste materials of your house.

Practical Activity:

Collect plastic covers and prepare two things that can be brought into use.

Flower and Medicinal Herbs Cultivation

Introduction of Floriculture

There are various kinds of flowers blossomed in our fields and around our house. Some flowers blossom in rainy season and some in winter. Likewise, some flowers blossom in the Tarai, some in the hill area, and some in mountain region. So floriculture varies according to place and time. Now a days, people do flower cultivation not only for domestic use, but also for business.



Identification of Locally available flowers and their Species

We have seen different kinds of flowers in our garden. We have also seen that flowers are used in many auspicious occasions such as worshipping god, decoration, welcoming people, wedding, and birthday as well as to give as gift.

Activities

What kinds of flowers can we get around your house or your community? Make a list.

Identification of floriculture according to seasons

All flowers do not blossom all year round or for 12 months. Some flowers bloom for 12 months, and some flowers bloom in specific time or season. Therefore, in which season or time do the flowers that you know blossom, write in the following table. Ask your teachers,

parents, and other friends about the flowers of which you don't know anything, write about the flowers in your note copy according to the following Table.

S.N.	Flowers	well-known Varieties	Cultivation month
1.			
2.			
3.			
4.			

Selection of soil and preparation of flower-pot

Flower-pot: The material which is made of mud for planting flowers is called flower -pot (gamala). We plant flowers in flower-pot and put it around our house, on the veranda and on the roof of the house for decoration. We can plant different kinds of flowers by filling the flower-pots with soil. In the same way we can plant flowers in small plastic bags.



Soil: Generally loamy soil is appropriate for flower cultivation (floriculture). Sandy soil is also used to some extent. 20 to 30 parts sand could also be mixed with *chimtyailo* mud to prepare suitable soil for flower planting.

Selection of soil and preparation of flower-pot: All the small stones and mud-balls should be removed from the soil where you are going to plant flowers. There should be small holes in the flower-pot for excess water to come out. Soil should not be compressed when you prepare soil in the flower-pot. All the required materials should be mixed with soil and fill the flower-pot and plastic bag with that prepared soil.

Activities

How is the flower-pot or plastic filled for planting flowers in your house or your community? Discuss about it in the class.

Preparation of flower-bed and seedlings

The flower bed should be free from stone and lump. There should be enough provision of irrigation for flower-bed. The flower seeds should not be defective. Once the seeds are planted in the bed, they should not be stepped on or compressed. When seeds become seedlings and it is ready for transplantation, appropriate place should be made ready for transplanting.

Activities

What should be done while preparing flower-bed? Discuss and make a list, then show the list to the teacher.

Use of manure or fertilizer

Manure is plants' food. Plants cannot germinate and grow without manure. Therefore, condition of soil should be considered before putting manure in soil. It is necessary to know what kind of manure to be used and how much manure is to be put while mixing manure with soil. Care should be taken at the time of using manure. You should be careful not to get manure in your eyes and mouth. You should wash your hands and feet properly after using manure.

Activities

Make a list of the aspects that has to be given attention when using manure. Discuss about it in the class.

Transplanting the flower seedlings

The seedling which you are going to transplant should not be rotten, and stale. It should be free from insects and diseases. Soil should be ready before planting seedling. The flower-pot in which you are going to transplant the flower seedling should contain soil with properly mixed fertilizer. Do not forget to water the plant after transplanting it.

Activities

Discuss about the process of transplanting flower seedlings.

Care of Flower Plants

Plants should be regularly checked for taking care of manure and water. Weeds seen in the flower-should be plucked and covered under the soil. Weeding and watering the plants should be done from time to time. Similarly, manure should also be checked and put in the plant from time to time.

Activities

Take care of the flower plants that have been planted by your group. Make a list in your notebook of the activities that you did while taking care of the flower-plants, and show it to your teacher.

Flower Decoration

In religious festivals we decorate temples with different kinds of flowers. In the same way, we decorate our house with flowers on the occasions of birthdays, *pasni* (ceremony of feeding rice to a baby for the first time), *vratabandha* (tonsure ceremony), wedding, traditional cultural festivals etc. Besides these, we have seen decoration with flowers in fair and jatra (pageant or celebration with worship of God). In city areas flower business is done for decorating cars, buildings, hotels etc. Now-a- days, flower business has become very popular. We have seen that people make bouquet and garlands for decoration. Flower decoration is used for welcoming and honoring events. You can learn flower decoration skill and start your own flower business. You can do the business from home by taking orders from customers and work at home.

Activities

How can we make decorations from flowers? Discuss in the class.

Exercise

Write answers to the following questions:

1. Write about the process of soil selection and preparation of flower pot.

2. Write about the care that should be considered while making organic manure.
3. Write down the activities that are undertaken while taking care of flowers.
4. What do you understand by flower decoration?
5. Where can flower business be operated?
6. Where can the flower decoration business be run?

Practical Activities:

1. Decorate the classroom with the flowers that you have grown and show it to all the teachers and students of your school.
2. Form a group in the class and prepare soil with manure for planting the flower seedlings that you have grown.
3. Form a group in a class, prepare a flower bed and transplant the flower seedlings that you have grown.

Introduction of Medicinal Herbs and their Importance

Have you ever seen the people using leaves of tree and plants, roots, stalks, bark of trees and plants, fruits etc. as medicine? Medicinal herbs are the leaves, roots, stalks, stems, flowers and fruits of the plants. These medicinal herbs are used as organic matter to make medicines, cosmetics goods, scented oil, soap, incense sticks etc. Now-a-days medicinal herbs are cultivated from business viewpoint. In Nepal plenty of medicinal herbs are found in *bhir* (cliff), *pakha* (a sloping Space), *pakhera* (steep place), *khoch* (a long narrow



Aelovera



Holy Basil



Neem

valley), phant (open field, plain land), forest, jungle, and valleys. For example: silajit (bitumen), cinnamon, timur, titepati (mug-wort), dhaturu (kind of narcotic plant), bojho (a kind of medicinal plant), ghiukumari (aloe vera), yarsagumba, tulasi (basil), neem etc. By processing these medicinal herbs and selling them in national as well as foreign market, we can get plenty of economic benefit.

Introduction of some Medicinal Herbs and their Importance

Amala (Myrobalan Fruit): Amala is a tree, which is found in forest, *bhir* (cliff), and *pakheru* (steep place). It is the best natural source of 'vitamin C'. Its plant, root, leaves, flowers and fruit are very useful. In Ayurveda, while making *Triphala*, *amala*, *harro* and *barro* are mixed together (Mixture of three Myrobalans: The combination of Terminalia chebula; Terminalia belerica, and Eblica officinalis). This '*Triphala*' is used for diseases such as blood coming from gum and teeth, loose teeth, bad breath, *amlapitta* (acidity), hair falling etc. If we take one teaspoonful of *Triphala* in the morning and one teaspoonful of *Triphala* in the evening with water in empty stomach,

it will help increase our appetite. *Amala* is very important for making *Chwawanpras*. It is used as medicine for diarrhea, *kamalpitta* (jaundice), Dam (asthma) etc.

Gheeu Kumari (Aloe Vera): There is a greasy jelly like marrow (gudi) inside the leaves of Aloe Vera. The marrow (gudi) of the leaves of Aloe Vera helps lessen the pain caused by a wound. If the marrow from about 4 inches of the leaves of Aloe Vera is eaten by mixing with water, it does good to the body and gives relieve from acidity, indigestion, stomach pain during menstruation, headache etc. It also gives comfort from liver disease. This is a perfect medicine for blood pressure, and diabetes.

Ghodtapre (kind of plant, used in medicine): It is a kind of weed grown on the ground. While growing it spreads all over the ground. Its leaves have round shape, the plant is very tiny and threadlike. Its leaves are used as medicine. In case of ringworm in the body, if 4-5 pieces of *Ghodtapre* are taken in the morning in empty stomach, it will be helpful. In case of burning feeling during discharging urine, people in the village make medicine of leaves of *Ghodtapre* which is pressed and eaten with water. This medicinal herb helps increase our memory power.

Tulasi (Basil): Tulasi is a plant which is planted in courtyard of house or temple (math). Its leaves, when squeezed with both hands, give pleasant smell. The leaves, flowers, seeds, stalk, etc. of Tulasi are used. Tulasi is antibacterial, antiviral, and antifungal. If you take tulasi mixing with black pepper and turmeric, Tulasi gives quick relief from cold, cough, and it is also used for the relief of fever, blood disorder (rakta vicar), and *agnimand*.

Neem: Neem is a medicinal plant. The leaves, flowers, seeds, and oil of Neem can be used. Like Tulasi, Neem is also antibacterial, antiviral, and antifungal. Ointment (paste) or powder can be made from neem, which then can be used for skin diseases, diabetes, blood disorder (rakta vicar) etc. It would be very beneficial if we use neem plant toothbrush for blood coming from gum and teeth disease, loose teeth, bad breath etc. If we boil leaves of neem plant and bathe with that hot water in which neem's leaves were boiled, it will be very useful for scabies or body itching.

Bojho (a kind of medicinal plant): Bojho is a small evergreen plant and it is a kind of grass or fodder. Its root is called Rayajome, which is used as medicine. Bojho can be used as tonic for rheumatism, toothache, cough, dysentery, diarrhea, and healthy brain.

Barro: Barro is a very tall tree, which is found in hilly and mid-hilly area of Nepal. Its fruit and seed are used as medicine. It is used as a tonic for blood pressure, to lessen fever, to digest food, to cure ulcer, and to make teeth strong. It is also used to lessen headache.

Titepati (mud-wort): Titepati is the herbal, which is found everywhere in hilly area. The whole part of Titepati is used as medicine. It helps heal irregular fever, eye pain, wounds etc. It also helps remove the odor of shoes and feet. If shoes are worn continuously for few days with titepati in shoes, socks and feet stop to smell. If titepati is cooked and put on joint pain, pain will go. In order to destroy the defect of acupuncture or to do moxibustion, health professionals who do acupuncture use a different kind of parched titepati.

Asuro: Asuro is found from the Terai to 1200 meters altitude in the hilly area in the form of bushes. It is also planted as fence on all sides of the cultivated field. If we squeeze its green leaves, they give smell. Its leaves are 10-15 centimeters long. Its leaves and flowers are useful. It is used as medicine for cough, asthma, fever etc. Farmers use it as green manure, and insecticide.

Timur: Timur is a grain like herbal, which is found in high hills. Its useful parts are its outer part, flower, and fruit. It is used as medicine for toothache, skin disease, scabies, cholera, and indigestion. This is also used to specify the problem of blocked nose.

Activities

Of which medicinal herbs are root, stalk or stem, leaves, fruits, and flowers used as medicine? Make a list of the herbals and discuss in the class.

The Importance of Medicinal Herbs

Herbs have great importance in our lives. In Nepal, herbs have been in use from ancient period. In Ayurveda medicinal herbs are

used to make various kinds of medicines, cosmetic goods, perfumes etc. The roots, leaves, stalks, stem, juices of flowers and fruits are mixed in water and made medicine to put in the affected areas as ointment or eat as edible medicine. For example, the whole part of chiraito is soaked in water, and the water is drunk, which helps to control fever and worms. In the same way, if bojho is beaten to make powder like substance and if it is mixed in food and eaten, it will help cure cold and cough, throat pain, toothache, scabies, and lice in the cattle. Scented oil, perfume, cosmetic goods, incense sticks are also made. By processing medicinal herbs and exporting them in foreign countries, people will get economic benefit. It is estimated that there are seven hundred species of medicinal herbs in Nepal. Among these species, 219 varieties are perfumed vegetations.

Identification of Local Medicinal Herbs and their Collection

At the time of collecting any medicinal herbs, it is necessary to identify the useful part of the herbs. It is also necessary to pick up the herbs in specified time. The following aspects should be given attention while collecting the medicinal herbs that are grown by themselves in the jungle:

1. Identification of the appropriate part of the herb, which is used as medicinal herb
2. Knowledge of appropriate time for harvesting the herbs
3. Collecting the herbs only from the matured plants
4. Some roots, fruits, and seeds of the herbs should be left for preservation of the herbs for future collection

The person who is collecting the herbs must have complete knowledge about the herbs. Otherwise, during collection of the herbs it is possible that other weeds and grass will be mixed in the herbs, and this will make difference in the quality of the herbs.

Activities

Discuss about any two aspects that should be given attention while collecting medicinal herbs that are available at local level.

Preservation of local medicinal herbs

We should not let the medicinal herbs die out. Therefore various ways should be taken up for the preservation of local medicinal herbs. We can run cottage- enterprise by preserving and using the medicinal herbs that are available in our area. Following are some ways for preservation of the medicinal herbs at local level:

1. Make associations or organization at local level for the preservation of medicinal herbs
2. Encourage local people for cultivation of medicinal herbs. Establish coordination with government and non-government organizations and organize training on preservation of local medicinal herbs and new technology of cultivation of these herbs.
3. Bring awareness in the local people about the importance and preservation of the medicinal herbs through fair, workshops, and exhibition.
4. Develop improved technology about collection and processing of medicinal herbs.
5. Establish a medicinal herb nursery at local level and distribute the seeds and seedlings of slowly disappearing medicinal herbs, and also make advertisement about medicinal herbs.

Activities

1. Collect the parts of the plants that are used as medicinal herbs in our village or community, and show them to your teacher.
2. Discuss about the local ways for preserving medicinal herbs
3. Which medicinal herbs can be used for cough and cold, fever, diarrhea? Make a list and discuss in the class.

Exercise

Write answers to the questions:

1. Write in brief about 10 of the medicinal herbs that are found in your area.
2. Which parts of Amala are useful?
3. For which diseases is Gheukumari used?
4. For which purposes is Tulasi used?
5. Write the qualities of Neem. What benefits do we get by the use of Neem?
6. For what purposes do we use turmeric? Which part of the plant is used to make turmeric?
7. What are the medicinal herbs used in Triphala?

Practical Activities

1. Collect leaves, roots, stalk or stem, and flowers of ten of the medicinal herbs found around your area, and exhibit them in the class.
2. Collect ten medicinal herbs that are used as medicine. Stick them in your note book, and give their names.
3. Write names of two medicinal herbs which are used in your house when somebody in the village or community gets sick. Write also the process of using it.
4. How can the medicinal herbs found in your village or community be preserved? Discuss and collect suggestions.

Note: Teach only one among the following A to F

Unit -11

Care of Birds and Animals

Lesson - 1 (A) Nurturing Sheep/Goat/Mountain Sheep (Chyangra)

Sheep

Sheep is specially nurtured for wool. Sheep has to be protected from wild animals because they usually graze in open and dry, cliff, sloppy land, and ground. Sheep should be given grass and other green plants rather than grain and other food. Among the local species of sheep, Kage variety of sheep is nurtured in Kathmandu valley and mid-hilly areas. In the terai areas and warm places, *lampuchhare* (with long tail) variety is kept.



Kage Sheep: Kage sheep is found in mid hilly areas such as Pokhara, Banepa, Kathmandu, Trisuli and inner Madesh. Its weight is up to 25 kilogram. The male sheep (Thuma) has horns while the female sheep does not have horns. It gives 1-2 kilogram of wool in a year.

Baduwal: *Baduwal* species of sheep is found in northern part of Nepal at the altitude of 400 feet. Its wool is useful only for weaving carpert, and radi/pakhi. It gives 1.5 to 2.0 kilogram wool in a year. Its weight is 20 to 30 kilogram.

lampuchhare (with long tail): *Lampuchhare* species of sheep is found in the Terai areas of Nepal. It is bigger than Kage species. Annually 0.5 to 1 kilogram wool is produced from this kind of sheep.

Bhyanglung (A kind of Tibetan Sheep): *Bhyanglung* sheep was originated from Tibet. It is found in Mustang, Marpha, and other Himalayan or mountainous region of Nepal. Thuma or male sheep weighs 60 - 90 kilogram, while the female Bhyanglung weighs 40 - 60 kilogram. Its wool is regarded better than other sheep's' wool. In average a Bhyanglung gives about 2 kg wool per year.

Among the advanced sheep, Merino, Rambouillet, Border Leicester (breed a sheep with a white face and a long coat, belonging to a British breed valued for its wool and meat) are found in Nepal. These sheep give 10-15 kg wool each year from each of the sheep. These sheep have been brought from foreign countries for breed with Nepali sheep. There are two types of sheep nurtured in Nepal; local and advanced varieties. The local breed of sheep are: Kage, Baduwal, Lampuchhare, Bhyanglung (Tibetan sheep) etc.

Goat

In Nepal the goat has been nurtured for meat. It can be nurtured in all region of Nepal: the Terai, hill, valley with small resource. Goat can be domesticated near the house and good income can be made from it. Feed should be given from time to time. Medicines should be given to the goats time and often to protect them from worms and parasites.



Jamunapari: Jamunapari breed of goat is tall and has big body size with long feet, center of its nose is raised a little bit, and it has hanging ears. Generally, it is of white color. It weighs from 30 to 60 kilograms.

Barbari: Barbari breed goat has short and upright ears, small body size, and has red and white spotted color. It looks like a deer at a glance. This kind of goat is kept in a cage. Barbari goat weighs from 27 to 36 kilograms and castrated goat weighs from 32 to 41 kilograms.



Sannen: Sannen is a lactating goat. Its color is white or light cream. The face is slightly bowl-shaped and the ears point upward and forward. Average milk product is 2 - 5 liters per day during a lactation period of 8 -10 months. Milk fat is 3 - 5 percent. Sannen goat does not have horns. Female Sannen weighs 65 kg and the Bucks (intact male weighs 95 kg).

Beetal: This kind of goat is mostly found in black and brown color. Its head is huge and broad with an upright nose. The ears are long and flat, curled and drooping. The body is of medium-size. Adult male

Beetal weighs about 59 kg and female goat weighs 35 kg. Female Beetal produces kids twice a year. They mostly produce twins goats.

Boyer goat: Lead Farmers have been rearing Boyer goat for the past 5 years. The Boyer goats were imported from Australia and New Zealand. Boyer goat grows fast and it produces 2 kids at a time. It produces kids three times in three years. The amount of cholesterol is less in its meat. So, its meat is healthy to eat.

Local breed goats-Terai Goat: The goat that is found in the Terai areas of Nepal is called Terai Goat. This goat is also regarded as the crossbreed of Jamunapari goat. This goat is of medium size, brown in color with white stripe on the body. This goat is reared for both milk and meat. The body weight of Terai goat is from 15-18 kilograms.

Khari, Aunle Goat: Goats that are found in mid hilly region are called hilly or khari goat. These goats are mostly found in black and brown color. Its horns are turned upright or backward. The weight of female Khari is between 15-25 kg, and the weight of male Khari goat is 25-35 kg. It produces kids three times in 2 years. Usually, it gives two or more than two kids at a time. Therefore, it is very popular in hilly region.

Sinhal goat: This type of goat is found in high mountainous region. This goat has the largest body size than other Nepali breed goats. Short head, straight nose, ability to bear cold are the characteristics of this type of goat. Pashmina can be produced from its hair in small amount. Matured Sinhal goat weighs 30 to 35 kg.

Chyangra (Mountain Goat): The goat, which is reared in mountain region of Nepal is called Chyangra. Its body is covered with long and thick hair. Pashmina is laid in the inner part of its hair. Matured chyangra is reared for carrying loads. 50 to 500 kilogram pashmina is produced in a year from a matured chyangra. The Chyangras found in this region are of advanced breed.



Activities

1. What breed/kind of sheep/goat/chyangra are found in your village or community? Discuss in the class and write in your notebook.
2. For what purpose is goat/sheep/chyangra reared in your village or community? Discuss in the class.

Goat House management

It will be appropriate to make a goat house according to the breed of goat, local weather, and environment. While making the goat house, if we could use local resource with modern technology, appropriate cage would be made in less expenses. In the same way, while making a goat house, we should think about the situation of local place. Especially, attention should be given to protect the animal from continued rain, cloudy day, hot-wind, sunlight, ground dampness etc. Cross - ventilation for air, dry place, appropriate and enough space for feeding, potentiality of pasture and fodder cultivation, availability of clean drinking water, facility of transportation and market etc. should be considered while making the goat- house for goats. In the mountain area the goat house should be facing south or east, and in the Terai or warm region the goat house should be facing north or west. Similarly, in the terai or mid hilly area the platform of the goat house should be built at 3 feet height. There should be enough air and light inside the goat house.

Types of goat house (shed or barn)

Goat house construction on ground surface: In the hilly region of Nepal goat house is traditionally built on the ground surface for goat rearing. The shed is made of bamboo or wood, and the roof is made by hay, straw, thatch etc. On the floor of the shed straw, dry leaves from jungle, dry wheat straw, and husk are scattered to make bed for the goat. People keep on adding these materials until it is too smelly and need to be cleared out. Then the scattered materials are taken out from the shed and used as manure in the garden or are used to make compost.

Goat house construction above ground surface: In the Terai, inner madesh and mid hilly regions of Nepal shed for goat is built 90 centimeters above the ground surface for goat rearing. In many

places goats are taken to pastures for grazing during the day time and only during the night goats are kept in such shed. Because waste materials such as urine and excreta of the goat drop on the ground from the platform, the shed remains clean and dry.

In rearing goats for business, mother goat, male goat, and the kids should be kept in separate sheds. Requirements for this are as follows:

1. Goat house for herd of mother goat
2. Goat house for male goat
3. Space for delivery of kid goat
4. House or space for goat kids
5. House or space for sick goat
6. Arrangement of tatno (Hay feeder) for goat's feed

Activities

What kind of house or shed is required for sheep, goat, and chyangra (mountain goat)? What kind of arrangement is there in your village or community, observe the arrangement and write about it, then present in the class.

Feed Management

Like other animals sheep, goats, and Chyangra require carbohydrate, protein, fat, fiber, minerals, vitamins, and water. Goat rearing as business requires nourishing feed for goats. For its physical development and development of reproductive ability, it is necessary to feed them with green grass and fodder as well as different nutritious grains. According to recommended ratio, we mix some grains together such as maize, wheat, barley, rice, husk of lentils, cakes of mustard oil (pina), molasses, mineral mixtures, powdered fish, salt etc. to make feed for goats. If the feed prepared in this way is given together with green grass to the goats, income will be good.

For pregnant she goat: 14-16 percent protein mixed feed, daily 200-259 gram should be fed. Delivery will not be that critical if the birth weight of a kid is 2 kg or more. After birth of the kid, the mother goat should be fed nutritious feed for 8 weeks. For this, it should be

given 200 - 400 gram of balanced feed daily. In addition, nursing mother goat should also be feed green grass and plenty of clean water as required. 45 days before using, a male breeding goat, 300 to 500 gram balanced feed should be feed. In Nepal tree fodder is the main source of feed for animals. Budhar (kind of breadfruit tree, Tanki, Koiralo (kind of vegetable flower tree), kutmiro (Kind of fodder tree), kimbu (mulberry), nivaro (Kind of fodder tree), khaniu (Kind of fodder tree), kavro (kind of medicinal plant) etc. are tree fodder. Improved grass such as Rhodes, Paspalum, Rye, Cocksfoot, Desmodium, Stylo, Napier, Lucerne, Bajra, Teosinte can be planted and fed to the animals.

Activities

In your village or community, what things are used for feed? What is the ratio of the substances that are used for feed? Discuss in the class.

Pasture Management

In our country, another source of animal feed is public pasture, ridge or mound of the field, cliff, jungle, open field etc. Due to lack of well managed and productive pasture area, and scientific management, goats and other animals use the natural way of pasturing wherever they find green grass, trees and plants, and leaves. Following aspects should be given attention for the scientific scheme of pasture:

1. Management of pasturing area
2. Its preservation
3. Fodder management
4. Water Management
5. Track or path to pasturage
6. Fencing
7. Chopping of bushes
8. Destroying poisonous weed or wild plants
9. Development of mobile pasture

If we use the above stated scheme, the pasture for goats will be

improved and goat production will be increased.

Activities

What kind of pasture is necessary for goat rearing business? Discuss in the class about it, prepare a report and present the report in the class.

Main Diseases in Goat

P.P.R. (Peptides Peptitis Ruminant): P.P.R also known as ‘goat plague’, is a viral disease of goats and sheep characterized by fever, sores in the mouth, diarrhea, pneumonia, and sometimes death. If the disease is severe, goats suffer from high fever with temperature of 104 to 106 degree Fahrenheit, dry mouth, sore eyes, dripping nose, flowing pus, and miscarriage of pregnant goat. The body temperature starts to fall slowly and within 5 to 10 days of sickness, the animal will die. It's difficult to do the treatment once the animal suffers from this disease. For prevention of this disease, the animal should be given vaccination in two years period.

Diarrhea

Diarrhea is caused because of poison, germs of various kinds of diseases and internal parasites. the problems like: animal being thinner, giving less production, weakness of the animals, indigestion of animals etc. are seen because of diarrhea. We have to give the medicines like Nebbol, Purgocere as well as the pills of sulfa medicine to the goat suffering from diarrhea.

Pet fulne or dhadine: This is the stage of being a lot of air in the stomach of goats. Occasionally, there is the production of air in the digestive system of goat when it eats maize or grains, some grass of branches, grass with beans or poisonous grass.

Symptoms: Being left stomach bigger like a volleyball, throwing out saliva, feeling difficulty in breathing, stomach ache and crying, not releasing the dong and urine, getting animal fainted and getting to death because of difficulty in breathing.

Prevention:

1. Give avil vaccination

2. Stop feeding and put the front portion of the goat should be put in upright position
3. Use antibiotic by means of trocar cannula or thick needle
4. Use aphyranil, blotocil, and timpol
5. Inject vitamin 'B'

Pneumonia:

Parasites, fungus, or worms in the lungs become the causes of Pneumonia in goats. This disease is seen in kid goats during inappropriate cold weather. At first the goat has very fast breathing, later on they have difficulty in breathing, painful cough, fever, anorexia (loss of appetite), crackle like sounds from lungs, and mucopurulent discharge from nose.

1. During treatment period keep sick goats in a dry, well ventilated location away from the rest of the herd.
2. Apply anti-biotic vaccination for 3-5 days.

Treatment:

Plugged ducts or mastitis (inflammation of an animal's udder) (Thunaulo): A plugged, or clogged, duct is a sore, tender lump or knotty area in the udder. It occurs when a milk duct is not draining well, and inflammation builds up. In such condition, the animals' udder gets swollen, either blood or pus comes from the udder, and there will loss of milk production. If the animal does not get treatment in time, symptoms like the udder will stop to produce milk, will be seen.

Prevention of mastitis in the animal would be giving an antibiotic injection into the muscle or putting an ointment on the skin and udder of the animal.

The goat shed or barn should be kept clean.

The parasites that are infectious to a goat are Paramphistome, haemonchus, thread worm, moniezia tapeworm, fasciola hepatica etc.

Activities

What kind of diseases do goat, sheep, and chyangra (mountain goat) get in your village or community? Prepare a list.

Exercise

Write answers to the following questions:

1. Give good reasons for the statement, 'goat rearing has been the good foundation of economic improvement.'
2. Write about the diseases that goat, sheep, and chyangra (mountain goat) suffer from. Write also methods of their prevention.

Practical activities

1. How has the shed or barn of goat, sheep, and chyangra (mountain goat) been managed in your community? Write a report about it.
2. How can balanced feed be prepared at the local level? Prepare a report on this topic and present in the class.
3. Discuss in the class about the method of treatment for sick goat, sheep, and chyangra at the local level, and present in the class.

(B) Cow/Buffalo Farming

Cow

In our country cow is reared for milk, cow dung, and gahunt (cow's urine, which is regarded as holy substance), and ox is raised for ploughing the field. If the local cow of Nepal is well cared, they give 500 to 1400 liters of milk in one time a calf is given birth to or in one time of lactating period. The yak cow of mountain region gives 500 to 600 liters milk in one lactating period.



Improved and local breed cows give adequate milk if they are reared and given feed well. Cow/buffalo require cowshed which is hygienic with good drainage system. Cows do not like to stay in dirty sheds where a lot of flies are. As a result milk production is also less. So the shed or barn should be cleaned from time to time with ammonia, lime or anti-bacteria liquid such as phenol. It is important that the provision of pasture for cow should be appropriate.

Identification of Local and Advanced Breed

Local breed of cow are hilly cow and yak. Likewise, improved varieties are Jersey, Holstein, Brown Swiss Cow, Haryana, Sahiwal, Angus, Hallikar, and Amritmahal.

Buffalo

Buffalo is one of the main domesticated animals which is reared for milk production. Milk producers have been producing a lot of milk and selling them for quite good money. In this way they have been employed by being entrepreneurs as well as they are doing good business as entrepreneurs. Like cow, buffalo also can give good amount of milk, if it is given good feed and a well managed shed or barn. Buffalo needs more feed than a cow. Milking buffalo needs more feed than non-milking buffalo. A buffalo that gives extra 2 liters of milk should be given



1 kg of additional mixture of grain. A buffalo needs bigger barn and wider space. In order to keep the space around the shed clean, dung and the wastes from the shed should be kept at a distance from the barn in well-managed way. In summer season buffalo should be given bath with clean water once a day or let buffalo play and sit in swamp once a day. If the buffalo be let sit in swamp, it gives more milk.

Local breed of Nepal

Wild Buffalo Arna: The wild buffalo found in nearby area of Koshi Tappu, which lies in Sunsari district of eastern Terai is mongrel of Arna. Light brown body color, black neck, white tail, about 200 centimeter long and strong horns are the characteristic of a wild buffalo. The weight of a matured buffalo is 900 kilogram. Its body is 450 centimeters long and its tail is 150 centimeters long. Its life expectancy is 20 to 25 years. Wild buffalo likes to stay in jungle, near the river, in swamp. Estimated number of existing wild buffaloes in Koshi Tappu is 200. They like to live in herd, play in wetland or swampy land, and pasture in tree fodder, bamboo leaves, and kansh. The people of that area have started crossbreeding wild buffalo with local domesticated buffalo, and rearing calf born from the crossbreed.

Lime Buffalo: Lime breed is found in Argakhanchi and Gulmi of hilly region of Nepal. The Lime buffaloes are light brown and relatively small in body size, and small sickle shaped horns curved towards the neck are their characteristics. They give 600 liters of milk in one time a calf is given birth to or in one time of lactating period. The milk contains 7.5 percent fat. In average, it gives 2 manas to 3 manas milk per day.

Parkote buffalo: Parkote is a local breed buffalo, which is found in Gulmi, Argakhanchi, Salyan and Palpa of hilly region of Nepal. Parkote buffaloes are dark in coat color and have heavily built body size, with sword-shaped horns directed laterally or towards the back of the body. They give 600 - 700 liters of milk in one time a calf is given birth to or in one time of lactating period. Farmers give feed to their buffaloes either at home or they take the buffaloes to pastures in near jungle. In average, Parkote buffalo gives 3 manas to 5 manas milk per day.

Improved Breed

The breed of buffalo that is reared in Nepal are: Murrah, Nilikhi, and Jafarabadi. These breeds of buffaloes are being reared because Nepal is close to India and the Terai has appropriate weather for the buffaloes.

Murrah Buffalo: Murrah buffalo is one of the most popular improved breed of buffaloes in Nepal. Murrah buffalo was originated in Punjab, Haryana, and nearby Delhi of India. In the villages of Nepal it is known as 'Lahure Bhainsi' (Which means buffalo coming from a foreign country). The Murrah buffalo is black in colour and has short and tightly curled horns. It has small and clean head, white spotted tail, soft body, beautiful and matured udder. In average, Murrah buffalo gives 5000 liters of milk in one time a calf is given birth to or in one time of lactating period. If it is well-cared with good feed, it gives 22 to 27 liters of milk per day. Cross breeding of local buffalo with Murrah buffalo bull has been a practice in the hills, bensi, inner Madesh and Terai at present.

Activities

Make a list of local and improved breed of cow/buffalo reared in your village or community.

Diseases in cows and buffaloes

Vyagute Disease: In this disease, the cattle have a sudden high fever with temperature of 106 to 107 degree Fahrenheit. The infected cattle have a swollen throat, difficulty in breathing, crackle like sounds from lungs, and running of saliva.

The infected animal is treated with dyrin, Mesadin, Orypi, and teramycin, or tetracycline from Sulph Drug group. In the month of Baisakh a H.S. vaccine against Vyagute Disease must be given under 3.5 milliliter of the animal's skin.

Black-quarter (Black-leg) (Charchare/Laggada): In this disease the animal has high fever of 104 to 106 degree Fahrenheit. The disease affects especially the part of the body which has muscles, e.g. thigh. There is hot painful swelling in the affected leg, and crepitating sound on pressing the affected part of muscle. The animal becomes lame

and death may occur in severe cases in 1 or 2 days. Administration of penicillin in every 6 hours doses may be effective if injected before muscle damage has been caused.

Foot-and-mouth disease (Khoret): At the beginning of this disease the animal has high fever followed by formation of vesicles and blisters in the mouth, udder, teats and on the skin between the toes and above the hoofs. Plentiful and continuous saliva hangs from mouth, and lameness can be observed in the affected animal.

The external application of antiseptics helps in the healing of the ulcers and attacks by flies. A common and inexpensive dressing of a mixture of coal-tar and copper sulphate in the proportion of 5:1 should be applied in the wound of the feet.

Rabies: This disease is transferred to people and animals through the bite of dogs, fox, cats, and mongoose.

Infection of the udder (mastitis) (Thunailo): Infection of the udder is called mastitis and is caused by germs. Symptoms of Mastitis are: The milk is not clean, the color is different and there may be lumps in the milk; the udder is hot, painful and swollen; The skin of the teats is cracked; The animal has occasional fever.

Activities

Discuss with a knowledgeable person of your community about the diseases that affect cow/buffalo, and note down the result of the discussion.

Feed for cows and buffaloes

Feed: Cows require balanced feed. Carbohydrate, protein, vitamins, fatty matter, and minerals should be included in the feed. Cattle should be fed on the basis of the dry materials found in fodder, hay, and grains. 2.5 kilogram dry material is required per 100 kg weight of the cow. Therefore, a cow should be fed according to it.

Green grass and leaves and tree fodder, and dry silage and hay or straw are not enough for nutritious matters. Therefore, the animal will be healthy and the production will be improved, if the animal is fed the mixture of grains, oil, oilseed cake, and molasses. The mixture should be fed according to the weight of the animal.

Buffalo needs more feed than a cow. Milking buffalo needs 1 kilogram

more feed than a cow, because the size of a buffalo is larger than of a cow. It would be better if the source of feed for cows and buffalo is the product of local agriculture farming.

Activities

1. How can feed be prepared for cows/buffaloes at the local level? Discuss about it in the class.
2. What substances and in what ratio do you mix to make feed for cows and buffaloes? Prepare a list.

Shed /Barn Management

There are different kinds of sheds for a cow/buffalo. Generally shed is made from locally available materials. The house made in the ground-floor, which protects the cattle from wind, storm, sun, rain, and enemy is called a shed or barn. Construction of cowshed depends on the decision about its length, breadth and number of cattle. The provision of feed and water should be their inside the barn. Shed should be well-ventilated, easy to clean, easy to clean the urine and cow dung, non-slippery, and protective from hot and very cold weather. In many places cows and buffaloes are taken outside the barn to the pasture during day time. In places where there is no provision of pasture, cows and buffaloes needs to be kept in the barn. Therefore, in that place where there is no provision of pastures, the barn should have all the required facilities. There need to be provision of separate space for each of the cattle such as the bull, ox, calf, and cow. The improved cowshed is constructed in such a way that all the animals in the shed face to same direction. The manger is made in the direction where the animals are facing. Likewise, the tail of all animals is towards the same direction. The shed made in this design makes it easy for milking the cow/buffalo and also for cleaning the barn. In this way, there is less possibility of transferring disease to each other.

The types of cow shed or buffalo shed are as follows:

1. **Rearing in Open space:** The shed is open where the cattle is kept
2. **Improved shed:** Animals are kept separately according to their age and health condition. For example:
 - a. **Barren/childless shed:** Unproductive cow/buffalo are kept
 - b. **Pregnant cow/buffalo shed:** animals which are to give birth

within 1-2 months are kept

- c. **calf/ heifer:** Less than one year old calf/heifer are kept
- d. **Lactating cow/buffalo shed:** After delivery lactating cow/ buffalo are kept
- e. **sick animals' shed:** This shed is built in a distance from the other animals' shed and sick animals are kept here for treatment

There are two types of improved sheds:

1. **Head facing to the same direction:** This type of shed is especially constructed in buffalo farms, where the heads of all the buffaloes kept in the shed are facing in the same direction. In such type of shed it will be easy to feed the animals
2. **Tails facing to the same direction:** In this type of shed the tail of all the buffaloes are towards the same direction. In such type of shed it will be easy to milk the buffalo, and also easy to clean the shed.

Activities

What kinds of cow/buffalo shed do the people in your village or community make for the cow/buffalo that are reared in their houses? Discuss with friends.

Exercise

Write answers to the following questions:

1. 'Rearing cow/buffalo for business purpose helps make economic benefit.' Give explanation for the statement.
2. Write the names of common diseases in cow/buffalo.

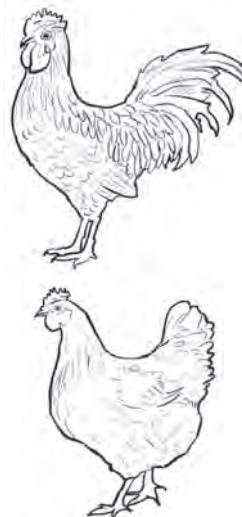
Practical Activities

1. Discuss and present the local method of treatment for the disease of cow/buffalo.
2. How is the balanced feed for cow and buffalo prepared at the local level? What substances are included in the feed? Prepare and show it to the teacher.
3. Observe the cow/buffalo shed nearby to your house and write a report on it.

Lesson - 3 (C) Poultry Farming

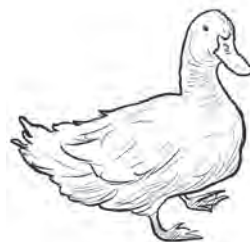
Chicken

Chicken is a domesticated bird. We get eggs and meat from chickens. Although chicken is a domesticated bird, a careful management is very important. A balanced feed, a cage with good facilities, provision of health care and cleanliness are very important for chickens. Left over or wastage food, oilseed cake, husk and fine husk are chicken's feed. The system of rearing 8 or 10 numbers of chickens is generally for eggs and meat. Chicken farming can be operated as a business by giving careful attention to its breed, procreation process, rearing process, feeding process, cage management, control of disease, and sell and distribution.



Duck

Just like chicken, ducks are also domesticated in areas around the house where there is a big fish pond. Ducks are kept in a common pond or fish pond. Feed should be fed regularly. They should be protected from jackals and other wild animals. Because ducks have more immunity power, they are not generally attacked by diseases and parasites. Ducks eat green grass, weeds, insects, small fish, and left over foods from the kitchen, and thus they help in controlling garbage.



Local breeds of chicken:

1. Sakini
2. Pwakh Ulte (Dumsi)(porcupine)
3. Ghanti Khuile

All these breeds have been domesticated for meat and eggs. The average weight of these breed is 1.5 kg for female (hen) and up to 2 kg for male (rooster). This breed of chicken gives 60 eggs annually in average.

Improved breed of chickens

New Hampshire: The color of this chicken breed is red, and the color of its egg is grey. The color of the lobe of the ear is red, and the color of its legs is yellow. The average weight of female New Hampshire chicken and male New Hampshire chicken is 3 and 3.9 kg respectively.

Austrolerp: The color of this breed of chicken is black, and the color of its egg is grey. The average weight of male Austrolerp chicken is 3.9 kg, and female Austrolerp chicken is 3 kg. The color of the lobe of the ear is red and the color of its legs is like the color of slate.

Leghorn: Leghorn chicken is white in color. It lays 250 to 300 eggs in a year. This breed of chicken is especially kept for egg production. Leghorn is the breed of chicken, which produces large amount of eggs. The color of its skin and legs is yellow.

Activities

What are the breeds of the chickens and ducks that are reared in your village or community? Discuss about it.

Management of the cell for chicken and ducks

Packed (deep) system: In this method 20 to 25 thousand chickens can be easily accommodate in one single cell under the care of one person. Food, feed and water and collection of eggs are systematically managed in this method of rearing chickens. This method is taken as improved method. Sottar (bed for cattle and chickens made from dried leaves) are laid flat on the ground of the cell. Corn husk; saw dust; peanuts husk; rice husk; chopped straw; sugarcane cinder; dried plants of soybean, lentils etc. should be used for Sottar. The sottar should be laid 5 centimeters above the ground level.

Semi-packed system: The method, in which chickens are kept inside the cell in a controlled manner and are left outside within the fenced area or outside cell in the sun freely to scratch in the green field, is called Semi-packed method. Feed and water should be managed in both inside and outside cell or house for the chickens. This method is suitable to be used in our villages.

External Fenced Area system: The method, in which chickens are

reared in the external fenced area where they move freely in the field looking for feed, is called External Fenced Area system. Generally, this system of rearing chickens is used for improvement of breeding and egg production. Especially the hatching hens are allowed to scratch in the green field after they are taken out of the room after hatching until they are ready to produce egg again. By using this method you can save 15 to 29 percent of the feed for chickens. Chickens can get abundant amount of vitamins and minerals from scratching in the green field.

Activities

What kind of house or cell is built for rearing or raising chickens and ducks in your village or community? Discuss with your friends.

Chicken Feed and water management

In the area of poultry farming, 60 to 70 percent of the total expenditure is required for chicken feed. Feed is necessary for physical development. Malnutrition in the chickens brings problems like decrease in physical development rate and increase in mortality rate, and decrease in egg production. Protection and development of the body, and maintaining eggs production ability are important functions of poultry feed.

Activities

1. What are the things that are used for poultry feed in your village or community?
2. What things and at what amount should be used to make balanced poultry feed?

Diseases and prevention from them

Ranikhet (Newcastle disease): Chicken that suffer from this disease becomes pale, has greenish yellow diarrhea; head twisting, high fever, and sudden death. Chickens that has this disease should be separated from the other healthy chickens for treatment. It should be given F-ONE vaccination against *Ranikhet* disease. The sick chickens should be given electrolyte and antibiotic.

Fowl Pox: Fowl pox causes round, raised lesions with “scabby” centers. Most skin lesions are located on the comb, wattle and face, and occasionally on the legs. Fowl pox can cause depression, reduced

appetite and poor growth or egg production. The course of the disease in the individual bird takes three to five weeks. Prevention is through vaccination. One application of fowl pox vaccine results in permanent immunity.

Coccidiosis: Chickens with Coccidiosis disease pass blood in their vomit, are droopy, lose weight, and drop in egg production. Salmet, super Cox, coxikil, and catrinol should be fed for its treatment.

Gumboro: Chickens with Gumboro pass whitish, watery or mucoid diarrhea. Many birds may be reluctant to move with a tendency to sit. There is slowness, dehydration, loss in weight and death in 30 percent baby chickens, and loss in ability to produce eggs in adult chickens.

Water with Electrolyte and/or Lemasol- 75 antibiotic should be given to the infected chickens. Good ventilation, warm temperatures and fresh water will help to reduce mortality.

Activities

What kinds of diseases are caught by the chickens and ducks of your village or community? What measures are taken for the treatment of the diseases? Discuss in the class.

Exercise

Write answers to the following questions:

1. Write the breed names of chickens.
2. What are the diseases that are caught by chickens? How can you prevent these diseases? Write all about this.
3. Describe the method of making chicken's house,

Practical Activity

1. Observe the poultry farm that is operated as an enterprise or business, and write a report on the management of chicken cultivation for meat and eggs.
2. Prepare a list about the required materials that are used to make feed at the local level for chickens, then prepare a balanced feed.
3. Observe a poultry farm, discuss with the owner of the poultry farm about production of eggs and rearing of the chickens in poultry farming. Present the result in the class.

(D) Swine Farming

In Nepal local breed pigs were being reared. However, at present its breed has been improved. Pigs give birth to many piglets in one delivery. Because pigs grow quickly, and it is big in size, its body weight is also more, and it delivers piglets 2 or 3 times in a year, pigs raising is more beneficial as an enterprise from the economic point of view. The pigs produced by Pakhribas Agriculture Center, Dhankuta have become very popular in Eastern Development Region. Place for pigs to live and play should not be dirty. The floor of the pig's house and feeding utensils should be cleaned daily by spraying water.



National Breed of pigs

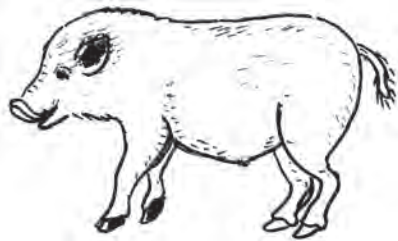
Wild boar (Bandel): Wild boars are grey and black in color having 200 to 250 kg body weight. Its body is covered with thick stiff bristles like hair. It has pointed mouth, long legs and two tusks pointing upward. Since the female wild boar lives with 2 to 3 generation offspring, the family has a group of 6 to 30 members. The group is called 'sounder', which is led by an older sow (female boar). The adult male boar likes to live alone and it is very wrathful in nature. Wild boars eat wild roots, fruits, nuts, fungi, insects, amphibians, reptiles, small mammals, birds, carrion, flesh left by tigers and leopards etc. They come to eat these foods at night, and they go to sleep during the day time.

Mingmi: Mingmi pig has thick stiff bristles like black hair with grey lines with short tail and small legs. It is the smallest of all the boars. They live in a group of 5 members and they also go in search of food in a group. This breed of boar is found in the forest of Terai area of Nepal.

Chwanche: This breed of pig is found in the hilly area of Nepal. The color of this pig is black. It gives 1 to 7 piglets in one birth delivery. The body weight of mature male Chwanche pig is 24 kg, and the female Chwanche pig weighs 38 kg. Porridge or gruel is made from

mixing flour with the residue of country liquor (Kat), taro (pindalu), leaves and stem of taro (karkalo) and nettle (sisnu), and bringing the mixture to a boil, and this porridge is given to pigs in the morning and in the evening. During day time the pig is left free to look for food around. There is a tradition of eating its meat during festivals.

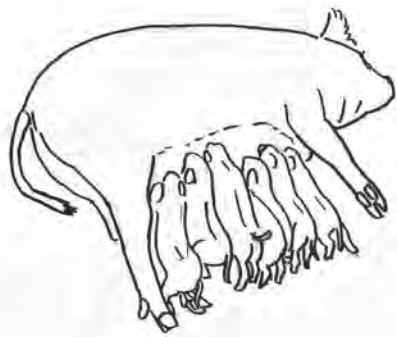
Hurrah: This breed of pig is specially reared in the Terai area of Nepal. Their coats have brown bristles on the neck portion. Their legs as well as the tail are long. Matured males weigh average 58 and female 49 kg. It gives 5 to 6 piglets in one birth delivery.



Pakhribas Black : The Pakhribas Black Pig was developed at Pakhribas Agriculture Centre, Dhankuta, Nepal through three ways crossing between Saddleback, Fayun and Tamworth. Its color is black. Its feed is prepared by the farmers locally. It gives birth to more piglets than the local pigs. It gives birth to 9 to 10 piglets in one birth delivery. Matured male weighs 170 kg and female weighs 160 kg live.

Advanced Breed of boars (Pigs)

Yorkshire: This is a British breed of boar. This is an exotic breed of boar. This type of pig is white in color with long body and erected ears. It has a long back fitting well from neck to the shoulders. It gives birth to 11 to 13 piglets in one delivery. Live weight of a mature male is 300 – 450 and female is 250 - 350 kg.



Landrace: This breed of pig was originated from Denmark. The color of this pig is white with black spot in some places. Long body, a little bit blown at the back side, short legs, and large drooping ears are the characteristics of this breed of pig. It gives birth to 10 to 11 piglets in one delivery. Average live weight of matured male is 310 – 400 kg and female is 250 – 330 kg.

Hampshire: Hampshire is a breed from United States of America.

The Hampshire pig is a domestic swine breed characterized by erected ears and a black body with a whitish band around the middle, covering the front legs. In average, the sow (adult female pig) gives birth to 8 - 9 piglets in one delivery. Average live weight of matured male is 300 kg and female is 250 kg. In Nepal, this breed of pig is found in eastern Terai.

Activities

What are the breed of pigs that are raised in your village or community? Discuss about it with your teacher and friends.

House/Pigsty

For commercial pig farming, appropriate place should be selected for making its house. Stone slates or bricks should be spread on the floor of the pig-house in such a way that damp from the ground or spilled water is not permeated. Floor of the pig house should also be made in the way that it can be easily cleaned. Because the pig-house needs to be cleaned regularly, place for feed should be made towards the way where one can easily come out and go inside the pig-house. The back part of the pig-house should have a place from where some matter should be easily washed away. The drainage should be made outside the wall of the house. The pig-house can be made in the manner so that both the outside coldness and hotness can come inside the house easily nor the inside hotness can go out easily. However, there should be good flow of air in the pig-house. The feces and urine of pigs have very strong foul odor. For pigs, there should be provision of plenty of water for cleaning and drinking purpose.

Activities

How does the pig-house that is locally made look like? Discuss about it.

Feed for pigs

Pigs should be fed a balance diet that includes carbohydrates, protein, fat, and other mineral and vitamins, according to their age. They can be fed with green grass, taro (pindalu), nettle (sisnu), and left over vegetables from the kitchen. As far as possible feed for pigs can be made from locally available food stuff such as: rice,

maize, wheat, millet, rice husk, buckwheat, wheat-husk, mustard or oilseed, oilseed cake (pina), Sunflower oilseed cake, oilseed cake of linseed, peas, roasted soybean, green vegetables, , taro (pindalu), nettle (sisnu) etc. A balanced feed can be made by mixing vitamins and necessary amount of minerals in these food stuffs.

Activities

Make a list of the materials required to make a balanced feed for pigs at the local level.

Diseases in Pigs

Mange Mites, Sarcoptes Scabies: Sarcoptes Scabies is irritant and uncomfortable for the pig, causing it to rub and damage the skin which becomes ugly. It affects more on ears, neck, and the back. In case of Sarcoptes Scabies, mix lindane lotion, himix, actomin 5 m.l. in 5 liter water and apply the mixture in the body of the pig. But, before applying the mixture, the body of the pig must be cleaned. Inject under the skin 1m.l. of Ivermectin (Ivomec) per 40 kg of live pig.

Vyagute Disease (Hemorrhagic septicemia): In this disease, the animal has swollen neck and tongue and finds difficulty in eating and breathing. The animal has fever of 104 to 106 degree. Death occurs if no treatment is done. Before rainy season starts, pigs of all age should be given 2 m.l. of H.S. Vaccine. The vaccine should be injected under the skin. When the animal suffers from the disease, tetracycline, Sulphademydin injection should be given to the animal continuously for 4-5 days.

Swine Fever (SF): Swine Fever is a highly infectious viral disease of domestic pigs marked by fever, a reddish patch on skin, loss of appetite and diarrhea (sometimes bloody), reddening or darkening of the skin, particularly the ears and nose, gummed-up eyes, difficulty in breathing and coughing, internal organs and internal bleeding of the gastrointestinal tract. Some pigs become constipated, while others may develop a bloody diarrhea. Sometimes they vomit; they tend to drink a lot of water after 4-5 days, and have high fever up to 104-106 degree Fahrenheit. The redness of the skin in white-skinned pigs may deepen to a bluish-purple color and there may be

bleeding under the skin. Mucous membranes are red and congested. A loss of consciousness due either to bleeding shock or to excessive fluid in the lungs may develop before death. It is necessary to give injection once a year to the young aged piglets and every year to the sow (adult female pig) at the rate of 1 ml.

Foot and Mouth Disease (FMD, Aphthous fever) in pigs

Since the mouth and tongue are affected by this disease, pigs have sore mouth and tongue and saliva is running all the time from their mouth. Therefore, salivation, wet nose, foot wound, and lameness are easily seen in the sick pigs, which have Foot and Mouth Disease. The pigs may walk on the tips of their toes and the feet may be muddy. Generally, the feet of the sick pig should be washed with mixture of water and 1 percent of fitkiri or clean the feet with phenyl liquid and Himax ointment should be applied on the wound. The wound in the mouth should be cleaned by mixture of water and baking power (soda). 2-3 ml of vaccine for Foot and Mouth Disease should be given to the sick pig every 4 months interval. The vaccine is given inside the skin.

Anthrax: In Anthrax disease, the pig has fever as high as 108 degree Fahrenheit and the animal dies within 8 to 10 hours. Human can also catch this disease. This disease can be prevented by vaccination.

Swine Flu: This disease makes respiration difficult. Swine flu is caused by both bacteria and virus. There is no treatment for this disease. Attention should be given to cleanliness for prevention of swine flu.

Brucellosis: Brucellosis in pigs exhibits abortion and infertility in sows, and heavy piglet mortality. It is caused by *Brucella suis*, which is found more often in adult pig. Human may catch this disease. There is no treatment for this disease as well.

Parasites: Pigs suffer from both external and internal parasites such as adult roundworms, whipworms, mange and lice, and bed bugs. Pigs suffer the most from roundworms. After two months of birth pigs should be given 1m.l. of Bimrajin per 5 kg live weight of pig. This should be given in every alternative month. 5 to 10 mg. of Albendazole, Fenbendazole, etc, should be fed at the rate of per kg.

Activities

What kinds of diseases are seen in the pigs that are reared in your village or community? What measures are taken for their treatment? Discuss in the class.

Exercise

Write answers to the following questions:

1. Write 5 benefits of pig farming.
2. Write about the pig diseases and their treatment.

Practical Activities

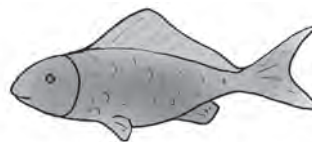
Visit nearby pig farm and on the basis of the following aspects, discuss with your teacher, guardians, and friends, and prepare a short report:

- a. The breeds of the pigs that are found in your village,
- b. Feeds for swine.
- c. Pigsty
- d. Cleanliness
- e. Diseases in pigs.

(E) Fishery

There is different type of topography in different parts of Nepal. Different species of fishes are being reared in the rivers, streams, ponds, lakes, swampy land, cold and hot water of the hilly and mountain regions of Nepal.

Small fries of fish (Bhura fish) are left in the natural and artificial (man-made) ponds and lakes, and are given required feed, treatment and security. In this way, the small fish are raised and developed for sale and distribution.



Fish can be raised in pond, lakes, cage, and rice field in a well managed technology. In Nepal, 3 among 185 local breed of fish, and 4 improved breed of fish are raised.

Local species of fish

Indian carp species rahu (Labeo rohita): Indian carp species rahu fish is found in the warm water of ponds, rivers, and lakes of the terai area and inner madesh of Nepal. These fish develop fast by eating microorganism and green lichen grown in water. The body of a rahu fish is covered with scale (small flat bony or horny overlapping plates that cover the bodies of fish). The body is long and rounded. The portion of its stomach is white and the center of its scale is reddish in color. Most people like to eat rahu fish. The fries become 1.5 kg in weight after 2-3 years of rearing.



Farmed Carp fish (Naini): Carp fish is also found in the places where same type of climate exists as for Rahu fish. The body of this fish is long, the upper portion of the body is brown and the lower portion is white. The growth of carp fish is same as of Rahu fish. Breeding of carp fish can be done in both natural and artificial method.

Buari : *Bauri* fish is found in the pond and clean river water. Because *buari* fish eats meat (it's a non-vegetarian fish), it eats its own and others fries (small children fish). The body of this fish is long



and flat with big head and teared mouth and long whiskers. It is grey in color.

Improved Species of Fish

Common Carp: There are two types of Common Carp raised in Nepal: they are Germany and Israeli carps. Common carp is a large omnivorous fish. They have large scales, small head, stretchable mouth a long fin (part of fish used for motion) at the back of the body, and two pairs of long whiskers in its upper jaw. This type of fish has been found having 50 cm. long and 18 kg weight. It grows very well in temperature of 20 to 32 degree Celsius. Being an omnivorous, common carps feed mostly in the mud, consuming worms, insect larvae, that are found under water, rotten weeds and plankton (a mass of tiny animals and plants floating in the sea or in lakes, usually near the surface). Within one year of rearing, it becomes as big as 1 to 1.5 kg.

Grass Carp: The grass carp has an oblong body with fairly large scales on the whole body except in the head which has no scales and no whiskers. The upper part of the body is grey and green in color. The lower part of the body of grass carp is silvery. Grass carp spawn in flowing water and do not reproduce in lakes and ponds. Therefore, breeding of this species is done by artificial technology. Reproductive success is largely dependent on an adequate flow of oxygen rich water to suspend the eggs until they hatch. Children grass carp rely on phytoplankton (one celled plants) for food. It grows rapidly in water which has a temperature of 20 to 30 degree Celsius. It can be 1 meter long and 50 kg in weight. Within one year of rearing, it becomes as big as 1 to 1.5 kg.

Rainbow Trout: The business of Rainbow Trout has been a success in Nepal. The upper part of the source of a stream and river is appropriate for rearing Rainbow Trout. The rearing of Rainbow Trout is appropriate in the temperature of 15 to 18 degree Celsius. In Nepal, 15 to 20 kg. of Rainbow Trout has been produced in 1 square meter large lake or pond. Because Rainbow Trout is boneless and is tasty, people have liked this fish most despite its higher price.

Activities

What are the species of fish that are found in your village or community? Discuss about it with your teacher and friends.

Types of Fish Ponds

Fries of various species of fish are kept in different ponds for its production and sell. A common, small, and cylindrical shaped pond, which is 1.5 to 2 meter deep, will be appropriate for fish rearing.

Ponds can be of various kinds: for example.

1. Nursery Pond
2. Fries rearing pond
3. Production pond
4. Reservoir pond

Activities

What things are to be considered while making fish pond at local level? Identify one resource person who owes a fish pond, and discuss with him in the class about things to be considered while making a fish pond.

Feed for Fish

Natural Feeds: Fish eats phytoplankton (plant based micro-organism) and zooplankton (animal based micro-organism), which are found in watery environment; snails and other small insects, and other weeds such as seaweeds and algae in the pound. Common Carp fish eats all kinds of food. The Silver Carp fish eats plant based micro-organisms. It is easy and less expensive to produce natural feed for fish. By using different kinds of manure we can make natural feeds for fish. Therefore, fish that eat natural feed should be raised. Compost such as cow dung, pig dung, chickens' and ducks' dung and oilseed cake etc. can be used in the pond for making natural feed for fish. In the same way, urea; DAP (diammonium phosphate) fertilizer; and TSP (triple superphosphate) fertilizer can also be used to make natural feed.

Artificial Feed: Only natural feeds are not enough for fast growth and more production of the fish fries that are relocated in the pond. Therefore, the fish farmers should feed nutritious artificial feeds to the fish regularly. Artificial feeds can be made from rice husk, wheat husk, maize flour, barley flour, millet flour, soybean flour or oilseed cake, linseed or peanut oilseed cake, lentil husk, different types of weeds grown in the field, fodder, leaves of banana and mulberry, and barsim grass etc.

Methods for preparing fish feeds

The main ingredients for producing fish feed such as husk, flour and/or oilseed cake should be made ready. Fish such as trout, magur, and prawn, which are raised in Nepal should be given feeds that contain more protein. The fries (bhura) of carp fish should be given 30 to 35 percent protein. The mother fish should be given 25 to 30 percent of protein, and a developing fish should be given 20 to 25 percent of protein. Therefore, feeds for all these categories of fish should be prepared according to the given percent of protein. Feeds should be prepared enough for 15 to 20 days. We can get 60 to 66 percent of protein in good quality dried fish.

Method of feeding fish

The fries (bhura) of fish should be fed as many times as they can consume or 4-5 times a day. The mother fish should be fed 3-4 percent of its weight, and the other fish should be fed 3-5 percent of its body weight. Grind the artificial feed to make it powder like or make small ball by mixing the powdered feed with water and kneading it, and give this feed to the fish 4-5 times a day. The feed should be given in a bowl or on the ground at a distance of 4-5 feet from the edge of the pond and 3-4 feet deep in water.

Activities

What materials are required to prepare natural and artificial feed for fish? Discuss in the class.

Diseases of fish

Ich (White Spot Disease)

In this disease, the fish gets small, sluggish, grain-like spots on its

body. Ich is also known as White Spot Disease. The fish may try to rub itself against the décor or the hard surfaces in the aquarium, giving an impression of scratching an itch. One of the effective ways to treat it is by adding salt to the water. The salt should be added gradually, slowly building up to 5-8 tsp per gallon / 4 L. Different fish have different tolerance level for salt. In the case of more sensitive fish, it is better to keep the level at 5 tsp. per gallon / 4 L. Malachite green 0.1 P.P.M. should be used.

Flukes (Gyrodactylus)

Gyrodactylus is a disease in fish that attacks skin or gill and fins, and can cause a great deal of damage. The fries (baby fish) of fish are greatly affected by this disease. Because there is itching in the skin, the fish may try to rub itself against the wall or crawl along the shore, and jump in the water. We can see change in behavior. In such disease, use 0.25 PPM. Dipterex.

E.U.S. (Epizootic ulcerative syndrome) Disease

At first, red spots are seen on the skin. Then, slowly the scales start to fall and erosions are seen, which later on form wound.

Trichodina Species

Trichodina spp are single-celled organism parasites of marine and freshwater species of finfish. They attack the skin, gill and fins of fish. While small numbers of these organisms on a fish generally do not cause much of a health problem, large numbers can cause moderate to serious condition and ultimately, death of fish. Small fish and fry are especially susceptible, and mortality can occur quickly if undiagnosed.

Argulus (Fish Lice)

Argulus sticks to the flesh of fish. Once attached, the parasite pierces the flesh using stinger (the sharp organ through which an insect or other animal injects poison) mouthparts and will suck the blood of the fish. Argulus inject a toxin (poison) that will kill smaller fish and leaves reddened, inflamed cut or wound on larger fish. This wound often becomes infected. The strong irritation brought on by the Argulus parasite causes fish to rub or scrape against objects in the aquarium. The fish even tries to jump out of the aquarium.

Lernaea (Anchorworms)

Lernaea species, commonly known as “anchorworms,” are crustacean (a backboneless animal with several pairs of jointed legs), parasites that can infect and cause disease and mortality in many types of freshwater fishes, especially wild-caught and pond-raised species. It grips into the flesh of a fish from the anchor part of its body and makes an open cut. If it reaches to the head of small fish hanging from the fish's body, it makes the fish turn round and round and finally the fish dies.

Activities

What diseases are caught by the fish that are raised in your village or community? What treatments are taken up for the diseases? Discuss in class.

Exercise

Write answers to the following questions:

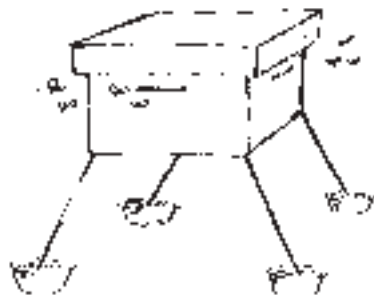
1. Write names of different fish species.
2. Write down how you can prepare natural feed for fish.
3. What materials are to be included to prepare artificial feed for fish? Make a list of the materials.

Practical Activity

Visit a fishing farm or fish hatchery; get information on the basis of following points; then discuss with your teacher, guardians and friends; and then prepare a report.

1. Fish species that are found or cultivated in your village or community.
2. Feed for fish
3. Ponds for fish
4. Diseases in fish

Nepal is rich in natural resources. Many kinds of organisms or living beings are found in Nepal. Among these living organisms insects are found in large number. Bee is a kind of insect. Some insects are advantageous to us, and some are harmful to us. Bee is an advantageous insect. Bee extracts the juice or sucks pollen from flowers and produces honey and wax, which are expensive in the market.



Bee keeping is both science and art. Bee keeping helps in holistic development of plants, vegetable farming and environment. It teaches people to make income by rearing bee in an organized way.



Queen



Drone



Worker

Types of bees

There are many species of bees found in Nepal. The species of bees can be divided in two categories: (1) Those living in people's control, and (2) those not living in people's control.

1. Bee species not living in human's control

(A) Kathyauri Bees: Kathyauri bees look like a fly. It is found in low area of the Terai and mid-hill of Nepal. It likes an open area where there is fewer crowd of people and animals. This species of bee makes a palm sized honeycomb in small plants or trees and bushes.

(B) Khago Bees: Khago Bees are also found in low area of the Terai and mid-hill of Nepal. It is about four times bigger than Kathyauri

bees. It is black in color. It makes the honeycomb, which is quite big in size, on the roof of tall houses or buildings or on the branches of trees. One swarm of bees makes only one honeycomb.

(C) Bheer (Cliff) Bees: Bheer Bees are bigger than khago bees, yellowish in color, and have less irritability. These bees make their hives on great face of rock. One group of bees makes only one honeycomb.

2. Bee species living in human's control

(A) Cerena Bees: Cerna bee is a little bit bigger than Kathyauri bee and is of light color. This species of bees have been raised in Nepal traditionally in the windows and khopa of the house.

(B) Meliphera Bees

At a glance, it looks like cliff bee. But it is bigger than cerana bee. This is also called European Bee. If properly taken care of, it can be raised in any place. However, the Terai and inner madesh have been regarded as the appropriate places for Meliphera bee keeping.

Activities

What species of bees are found in your village or community?
Discuss in the class.

Management of Bees

The nest or place where bees are kept is called bee- hive (Ghaar). Cerena bee and Meliphera bee like to live in dark and warm place. Therefore, they are kept in a hive (ghaar). There are two types of bee-hives found in Nepal.

(A) Traditional Hive

In Nepal bees have domesticated for thousands of years. The bees hive which have been used from earlier time is called traditional hive (ghaar). Such traditional bee hives are less useful in comparison to modern hives. There are two types of traditional bee hive:

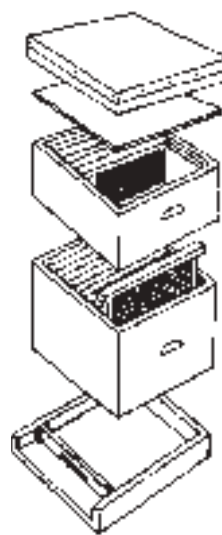
I. Khope (cavity or hollow space) Ghaar (hive): A hollow cavity or space made on the window of a house or in the animal shed, where bees are kept is called traditional bee- hive or khope ghaar.

II. Mude (Log) Ghaar (hive): A three feet long log of tree is cut into cylindrical shape and carefully scooped out to form hollow at the center. The two ends of the log are covered by flat stone or wooden plank. A small hole is made at the hollow place for the bees to pass through the hive. The bee hive made in this way is called log hive.

III. Modern Bee-hive: Modern beehive is made by cutting soft wood in different shapes and joining them together. There are two apartments in the wooden beehive: one is for collecting honey and the other is to raise the larvae of bee into worker bees.

Feed and pasture for bees

Things that are eaten by bees are called bee feeds. Honey and beeswax are the main food of bees. In order to eat and digest these feeds, bees need water. The queen bees and the drones (male bees) eat royal feed. Worker bees extract the juice of flowers from the flower plants for making honey and collect pollen of flowers to make beeswax. They store these feed in the honeycomb for later use when there is scarcity of flower juice and pollen. The place where there is availability of flower plants for juice and pollen is called bees pasture.

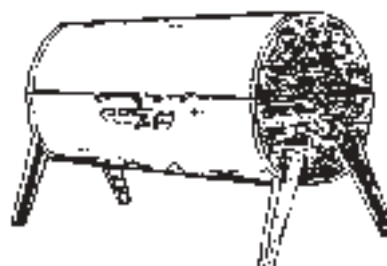


Activities

What kind of flower plants available in your village or community for bees pasture? Discuss and make a list.

Beehive Management

Improvement in log-hive: The log-hive (Mude ghaar), which has been in use for bee-keeping for traditions, can be improved with little effort. This improved log-hive is quite similar to the modern beehive. Production can be increased and bees can be protected by the use of equipment of modern bee keeping such as artificial honeycomb base, honey churning stick etc. Frames



can be removed from the beehive for inspection or checking. In this way, the improved beehive is called top-bar beehive.

Improved Log Beehive:

Put the log in slanting position and divide it into two parts towards the length. When making the log into two parts, cut the log with a saw in such a way that the lower part of the beehive has two parts and the upper part has one. The upper smaller portion is the lid of the beehive. The lower part of the log is the main beehive, which has compartment for honey and the larvae.

Improved Cavity or Hollow Beehive

Traditional cavity or hollow beehive is common in many places of the mid and high hilly regions of Nepal. A wooden rod which is 40 mm thick and 50 mm width is cut and attached on both left and right sides of the cavity or hollow beehive (Khope Ghaar). The wooden rod is equally long to the hollow beehive. In this method, the traditional beehive can be modernized to some extent. This type of beehive is less expensive and accessible beehive, which can be made from local resource and manpower.

Activities

What kind of beehives are used for bee keeping in your village or community? Discuss in class

Diseases and Enemies of Bees

Any kind of difficulties that come in the life period of bees is called diseases of bees. Such diseases can be mainly divided into two parts, (A) disease at larvae stage, and (B) disease at adulthood stage, for example: swallow, hornet, lizard, spider, ants, wasps etc.

Activities

What diseases and enemies do the bees of your village or community have? What measures or ways are taken to remove the diseases or enemies? Discuss in class

Exercise

Write answers to the following questions

1. Write three advantages of bee keeping.
2. Write about the Beehives and their types.

Practical Activity

Visit and observe a bee keeping farm. Discuss with your teacher, guardians and friends on the following issues; and then prepare a report.

- A) Species of bees found in your village or community
- B) Types of bee hive
- C) Feeds and pastures for bees
- D) Diseases of bees

Introduction to Paper and Its Importance

Paper is a special means to read and write, draw pictures, print written materials etc. In present age, paper has not been only a means to express our feelings and printing, but it is used for other various activities. High quality paper is used to prepare various pictures or paintings. Decorative items and children's toys are also made from paper. Paper is also used for making play items such as kites, dolls, house etc. It is also used for protecting materials. Paper box is used for transporting goods safely from one place to another. Goods made from paper such as envelopes, invitation cards, paper plates, napkins etc. have their own usefulness. Different news are printed in papers and carried to all over the world. In this way, paper has been used in every field.

Activities

As far as your understanding, for what purpose has paper been used? Make a list of them.

Things to be paid attention while working with paper

The following things should be considered while working with paper:

1. Select appropriate paper for the work you are going to do
2. Ensure the measurement of the thing you are going to make
3. Care should be taken while cutting paper
4. Make sure to adopt cleanliness when you use glue or gum
5. After completing work, all the tools and equipment should be put back in their assigned places.
6. The cut pieces can be used later. Therefore, select usable and unusable pieces from the cut pieces and put them in the assigned place.

7. Do not play with scissors, knife while working with them.
8. The working environment should be peaceful. So avoid disturbance in the working place.

Introduction of tools and equipment and their use

Various tools and equipment are required to make things from paper. The introduction of the tools and equipment and methods of using them are given below:

- | | | |
|---------------------------|-----------------|------------------|
| 1. Working board or table | 2. knife | 3. Scissors |
| 4. Smoother | 5. Compass | 6. Ruler |
| 7. L Square | 8. Pencil | 9. Brush |
| 10. Eraser | 11. Gum or glue | 12. piece of rag |
| 13. Gripping Clip | 14. Plastic | |

Working Board or table: The working table should be well leveled or smooth and clean. It will be easy to cut paper on the smooth table. Table can be used for putting on glue and marking on the paper.



Knife: Knife is also used for cutting papers. But there is possibility of cutting hands. So, the paper knife, which is easily available in the market, can be used instead of knife. If you need to use the knife, you should be very careful not to hurt your hand.



Scissors: Scissors are used for cutting papers. Special kind of scissors are used to cut the papers for making patterns.



Smoother: Smoother is used in order to mark a required fold on the paper. It is made of wood or bamboo.



Compass: It is easy to use a compass to divide a straight line into two equal parts or to draw circular drawing.



Ruler: Ruler is used in paper work for taking measurement. In some ruler sign in metric system is given, in some ruler sign is given in inch system, while in some ruler sign in both metric and inch system is given.



L Square: L Square is used to check whether the size or measurement of the paper is right angled or not.



Pencils: Pencils are used to draw lines on the paper. Some pencils are hard (H) and some are soft (B). We use HB pencils for paper works. Pencils need to be sharpened from time to time to make them clean and easy to write.



Brush: Brush is used to paint color or gruel on the paper. But small tool of wool or bamboo can be used to put gruel on paper. Brush can be used for color painting only.



Eraser: Various shapes have to be drawn while working on paper. Therefore, sometimes we have to erase some shapes from the paper. In such situation we can use good quality of eraser to erase the drawing.



Glue or Gum: Gruel, ceres, mobikol, or gum should be used as per the nature of paper work. Gum is used for sticking only paper. For example: gum is used to stick an envelope or to stick many different papers on an invitation card. It is better to use mobicol to stick bamboo and paper while making a kite. Similarly, it is better to use movicol and ceres while making show-case and paintings.

Piece of rag: Soft piece of cloth is needed to wipe hands or sometimes ingredients used in doing paper work.

Gripping Clip: Gripping clips are used to keep papers safely in order.



Plastic: Plastic cover is used to protect the invitation cards and other useful items, which you make from the papers, from dust. Plastic cover is also used to have a show of the things made from paper.

Activities

1. Using scissors to practise to cut papers to make it in shape of a square, circle, straight and L shaped.

2. Practice to cut papers according to measurement by using scale, pencils, and a compass.

Protection of Tools and Equipment

The tools and equipment that are used for doing paper work should be kept back in their assigned places safely so that they could be easily found for later use.

Various items made from paper

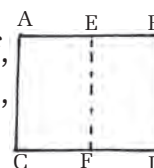
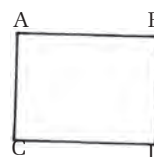
We can make various kinds of playing and decorative items from papers. It is not necessary that we need new and clean papers to make all these things. We can make various things in less expense by using old newspapers and other waste papers. We can make and use paper items such as container for keeping small things, playthings for children, small sacks etc.

Common Envelope:

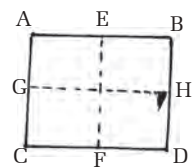
An envelope is necessary for sending letters. There is a custom of sending invitation and good wishes cards in an envelope. Rather than buying a ready made envelope in the market, our skill will be demonstrated if we could use enveloped made by ourselves as well as time and money is saved. If we know to make a good envelope, it could be a source of income too. An envelope with a size of 10/15 cm is enough to send regular letter. Envelope of above mentioned size can be made by following the methods given below:



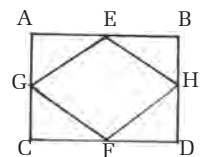
1. Take 33 cm long and 24 cm. wide plain paper
2. In each four corners of the paper, on the upper corners write A, B from right to left; and on the lower corners write C, D from left to right. Use a pencil to write the letters
3. Fold the paper so that A, B and C, D becomes half, and write E on the upper center of the folded part, and F on the lower center of the folded part



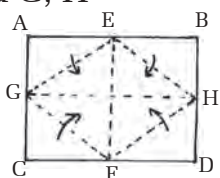
- From the length of the paper A and B, fold the paper so that it overlaps on C and D, or A and B are joined with C and D. The line becomes the center part of the paper after joining A, B with C, D. Mark the left of the line as G and the right of the line as H



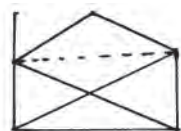
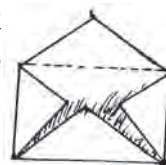
- Join G and E; E and H; H and F; and F and G



- Give the name I to the center of the lines E, F and G, H
- Now, fold G to I and H to I to make 9 x 9 cm. In the same way, fold E to I and F to I to make 7 x 7 cm. After folding from all four corners, cut the unnecessary paper with scissors.



- Fold F to I; G to I and H to I in such a way so that they overlap to each other. Now put glue to stick the overlapped portion. Do not put too much so that it is smeared.
- After it, fold E to I properly, Now your envelope is ready to put letter in it. Close the envelope by putting small amount of glue on the side or edge of the cover, close the cover.



As stated above, other envelopes with different measurement can be made. But if you have to make many envelopes, you can make fold one envelope with this method and cut it by its sides, and the rest of the paper can be used to make another envelope.

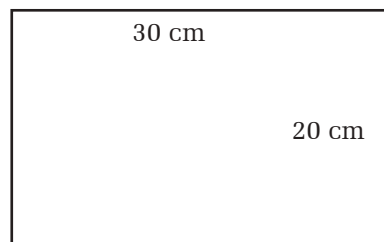
Activities

Using the above given method, make envelopes of different sizes.

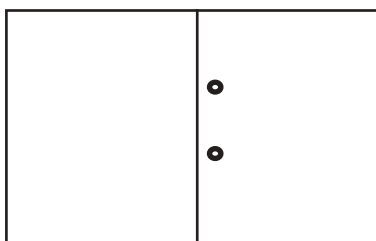
Paper File

We can make files for office and personal use from paper. We need newsprint cardboard paper, glue, scissors, marker and lace to make a file folder. Take two cardboards which are 30 cm. long and 20 cm

wide. Put glue on one side of the cardboard and stick any newspaper on it. Then stick the other cardboard on it to make it hard and firm. Leave it to dry. Then fold it from the length to make it half. Now make two small holes at the center of the lower part of the folded cardboard and insert the lace through the holes. The file folder is ready now. write 'Record File' on the outside part of the folder. You can use the file folder now.



Cardboard paper



Folding line

Record file
File no.
Name:
Subject:
... since ... up to

Ready made file

Activities

Make a file folder according to the above given instruction.

Good Wishes Letter

Good wishes cards can also be made from thick cardboard paper. The words written to express good wishes can be appropriately decorated. There is a custom to exchange good wishes card on happy occasions such as birthdays, New Year, Dashain etc. This card can be folded in three layers or in any other ways.



While making a card, the cut point made after folding the paper can be made at the side edge of the card instead of at the center of the card. Sometimes it does not look nice if the cut is made in the center and the words are in the cut. To avoid this, we can adjust the paper from its length side.

Sample of Good Wishes Card

On the auspicious occasion of the New Year 2071, we wish all the students brothers and sisters hearty good wishes for a long life, good health and continuous progress.

Curriculum Development Center Family
Sanothimi, Bhaktapur

Activities

Make a good wishes card according to the above given instruction.

Exercise

Write answers to the following questions:

1. What is the importance of paper in our daily life?
2. Write five points about the things that need to be paid attention to while working with paper.
3. Make a list of the tools and equipment required for doing paper work.

In leisure time, people of all ages can entertain themselves by folding papers to make various things. This can be used to making gifts for friends and brothers, and also for making daily usable goods. Now-a- days, the custom of paper packing food has been increasing. This helps people to demonstrate their creativity, as well as use the leisure time. Not only this, making things by folding paper help people in income generation too.

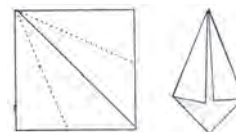
Various things made by origami

- A. Rabbit
- B. Cap
- C. Parrot

Activities

1. Rabbit

- a. Fold at the centre from both side of a square shaped paper



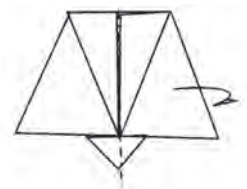
- b. Bring the paper lower by valley fold



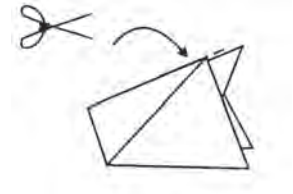
- c. take it to backside by mountain fold



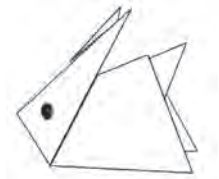
- d. It is seen like this from the back. Use mountain fold for the left and right side



- e. Cut at the place as shown by the scissors



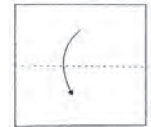
- f. Perform mountain fold in such a manner that the triangled portion is raised up



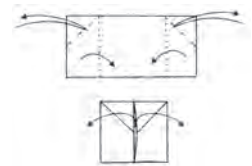
- g. Make the raised triangled portion ears and draw eyes and legs. Now, the rabbit is ready.

2. Cap/Hat

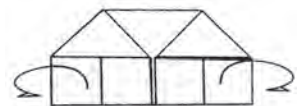
- a. Fold the rectangular paper into half



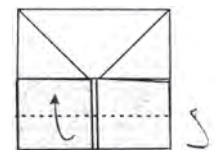
- b. As shown in the diagram, fold where there are dots and then open



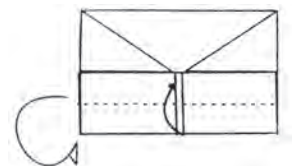
- c. Now, open at the place where the line is drawn



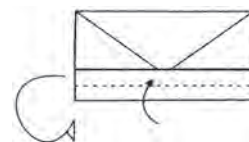
- d. As shown in the diagram, turn the two sides backward



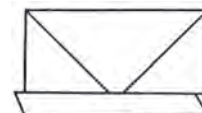
- e. Fold both front and back sides using mountain and valley fold



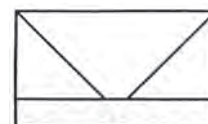
- f. Fold one more time front and back sides using valley fold



- g. Level the paper

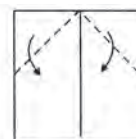


- h. The hat is ready



3. Parrot

- a. As shown in the diagram, open the folded paper into half.



- b. Bring the upper two corners to the center by folding them.



- c. Turn the half portion backward.



- d. Make edge for folding and then perform nakabaori.



- e. Fold the upper corner inside and make triangular shape and perform nakabaori.



- f. Parrot is ready from the folded paper.



Teacher suggestion

The following activities are only for example. You can also use the local material to make those type of things.

Kirigami

The word Kirigami is derived from Japanese language. In Japanese language, 'kiri' means 'to cut' and 'gami' means 'paper'. The art of making a long festoon of flowers and various decorative items by cutting paper is called Kirigami. It is a traditional art, which originated in Japan. Various decorative goods are made by cutting different colorful papers to decorate the house during festivals. In their leisure time people of all ages and from all places make various things by cutting colorful paper. Various decorative materials are made in schools on the occasion of Saraswati Puja. Various items are made from colorful papers and decorated during Dashain, Tihar, and Chhath Parwa etc. The art of making all these materials are called Kirigami.

A long festoon of flowers (Toran): We all have seen that on the occasion of wedding ceremony, Bratabandh, and worshipping ceremony (Puja) people make a long festoon of flowers (Toran) and hang it in front of their houses.

Activities

1. Discuss in class about the local method of making toran.
2. What decorative things were used that were made from paper, in our school on Sarswati Puja?
3. Fill in the following Table with the things mentioned in question number 2:

S.N.	Name of the things made by the students	Name of things bought from the market
1.		
2.		
3.		
4.		
5.		

4. Among the things made by the students or school, write the names of the things that you made.

- i.
- ii.
- iii.

Exercise

Write answers to the following questions:

1. Write five points about the importance of paper.
2. Write names of 10 things that are made using of paper.

Gift Decoration

Tradition of presenting gifts on the occasion of wedding, Bratbandh etc. has been regular practice in our society. The gift is not given like that. But people normally wrap the gift in a colorful paper and decorate the outside of the wrapping. This is called gift decoration. When we go to the shop to buy gifts, the shopkeeper wraps the gift with colorful paper for us. But if we have to present the gift that we already have then we should know to decorate the gift.

Activities

1. In order to present a gift to your friend on his/her birthday, decorate a copy and show it to the class.
2. What things have been given as gifts in any wedding or Brat bandha that you attended? How were the gifts decorated? Fill in the following Table:

S.N.	Name of gift materials	Methods of decorating
1.		
2.		
3.		

Exercise

Write answers to the following questions:

1. Why gifts are decorated? Write.
2. Write the names of the things that were made from papers and were used for decoration in school at Sarswati Puja.

Practical Activities

1. Discuss with your teacher and friends on the basis of the following:
 - a. Selection of paper for making things
 - b. Methods of protecting required materials for making paper goods
 - c. Importance of paper and its use
2. Using Origami and Kirigami technology, make five items from each group of technology and demonstrate them to the class.

Making of Goods from Bamboo, Wheat Stalk, Straw, Babiyo etc.

Nepal is rich in natural resources. Economic development is possible by the use of such resources. From these resources materials are made at the local level which are useful for domestic as well as occupational life. Doko, dalo (basket), mat, bag, winnow or bamboo tray can be made from bamboo, wheat stalk, babiyo (Kind of grass used for making ropes or thatching).

Because it has been easy to use since ancient period and also easily available everywhere, bamboo, wheat stalks, babiyo, corn husk, straw, kush etc have become more useful. Goods made from these materials can be developed as less expensive and more useful. At the same time traditional skill is encouraged. The making of these goods creates employment opportunity as well as encourages use of local tools and equipment. One can do agriculture business and also supports in income generation by making above mentioned goods.

Required tools and equipment for bamboo, wheat husk work

Hansiya (curved knife) / Khukuri: Khukuri, curved knife (hasiya) and scraper are used to cut bamboo, to prune branches of trees, to scrap trees bark, to cut into pieces etc. Knife or karda (small knife which is kept along with Khukuri, and used for sharpening Khukuri) are used to make split cane or wicker osier.



Axe: An axe is used to cut bamboo and to remove thick bushes.



Saw: Saw is used to cut bamboo while making items from bamboo. The tool which is used to cut things according to required measurement is called saw. This is a modern tool.



Others / miscellaneous: scissors, hacksaw, prong or long needle, and foot (measuring tape) are used to make things from bamboo as well as other materials.

Activities

Make a list of required tools and equipment that are used to make items from bamboo, Wheat Stalk, Straw, Babiyo etc.

Making of materials from Bamboo, Wheat Stalk, Straw, Babiyo etc.

Following things can be made at local and national level from the above materials

Pen-stand: Pen-stand can be made from wood, bamboo and plastic. A pen-stand helps keep pens and other things safely. Pen-stand can be made from bamboo in a less expensive and artistic manner. Tools like a knife, saw, hatebarma etc. are required to make a pen-stand.

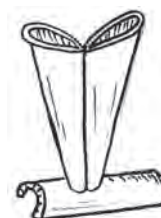


Flower-vase: An object, which is made for putting flowers for decoration in any office, rooms of a house, or in any other meetings and occasions is called flower-vase. A flower-vase can be made from clay, wood, metal, bamboo etc. A bamboo flower-vase can be made by simple cutting. Tools and equipment like saw, knife, blade of an iron cutting saw etc. are required to make a bamboo flower-vase.



Method of making flower-vase:

1. Take 8 cm thick and 20 cm long bamboo and cut vertically into two parts and clean inside of both pieces
2. Prepare a piece of 13 cm long plywood according to the pieces of bamboo and make a hole inside of the plywood for nails
3. Carve a shape outside of the bamboo according to your wish with an iron cutting saw (reti)
4. Clean the pieces of plywood and bamboo with sand paper, and put glue on them
5. Stick the plywood and bamboo together (as shown in the diagram) and leave them to dry



Thus, we can make a flower-vase, as shown in the diagram, by using bamboo only. For this, we should make a base of 13 cm long and 6 cm diameter, and stick the bamboo on the plywood at 70 degree angle. We can decorate the flower-vase with flowers which can be put in the space between two pieces of the vase. Make a hole at the center of the base. After the top of the vase is stuck together properly, stick the vase on the base with glue. You should practise to make this flower-vase.

Things made from babiyo: We can make the following things with babiyo. for example:

1. Broom
2. Rope
3. Others....

Broom: Broom is a necessary tool for cleaning the house and the courtyard in front of the house. Besides cleaning, it is used for coloring the house and plastering the house.

Rope: Rope is useful for household work, and other works. Rope is made from babiyo and other materials. In the villages, rope is used to carry bundle of grass, firewood, load and luggage. It is easy to make a rope. It is necessary to know the process of making it strong.



Activities

Discuss in your home and community about the process of making a rope and then discuss about it with your friends.

Wheat straw Fan: Wheat straw is cut into two layers in specific shape. Then the two layers of wheat straw are weaved in artistic way with a strong thread. Then lace made of cloth is put round on the three corners of the weaved straw. Thus fan from wheat straw is made. While giving shape of fan, the layers of wheat straw should be fitted tightly. While tightening, colorful pattern such as block shaped, circle, 'V' shape and 'X' shape come out. Equipment such as scissors, big needle etc. are required for making wheat straw fan.



Method or process of making wheat straw fan:

1. Dye 25 cm long wheat straw into two different colors.
2. Attach straw of different colors with each other, use two threads of different color than the wheat straw in two opposite direction, put the straw in between the two threads.
3. Entwine or entangle the straw with each other by the first (upper) thread, and tighten the straw with the coloured (lower) thread.
4. In the same way, sew the two parts, which have been made ready with different patterns, together to make one.
5. Cut the portion that has come out with scissors to maintain the size as 22 cm for both length and breadth
6. Make frill using piece of cloth of two colors. While making the frill, put blue or other color at the background, and put red color for frill
7. First sew frill on the base cloth by making pleats
8. While joining frill to the wheat straw cut from the back side, and then turn it and on the base, sew frill on three sides leaving 20 cm for both length and breadth
9. In order to make a handle on one side of the fan, make 30 cm long bamboo split with a knot, and join a 10 cm long pipe of bamboo or a branch from the knot side.
10. By cutting the splitted bamboo insert the fan and to make the handle firmly stand wrap it with string.
11. In order to make the wheat straw fan strong and firm, press the straw with each other and put small splitted bamboo around the four corner sides.

Thus after making the wheat straw fan clean it by cutting the unnecessary portion of the fan and then you can use it.

Bamboo Fan: A material which is made from splitted cane with various woven design on it, and which is made for the purpose of blowing air is called a fan. This kind of fan is strong. We can put various kind of weaving design in this fan. Among the weaving design, 2 knitting underneath



and 2 knitting above, 3 knitting underneath and 3 above, 'V' shape, 'block' shape and square shape are the main ones. Such fans can be made by knitting straight and putting frill or by knitting diagonal and finishing the brim with split cane. A handle is made in it so that it would be easy to blow air. Scraper, knife, and needle are required to make a bamboo fan.

Method of making bamboo fan:

1. Make uniformed split canes which have 30 cm length and 1 cm breadth.
2. Dye the split canes in 2 colors so that the layout could be clearly seen.
3. Prepare a mat which is 20 cm long and 15 cm wide by putting the layout shown in the diagram or any other knit.
4. Make 30 cm long split bamboo with knot on one side, smooth it by scraping well, and tear it at the center down to 20 cm to thrust in the fan.
5. Insert a bamboo tube of appropriate size from the bottom of so that the fan can rotate.
6. Join the handle and make frill on three sides.
7. While joining the handle insert the mat on the split bamboo and stick it with glue, and wrap it with choya.
8. For making the fan stand firm insert the split cane and wrap the edge of the mat.

Activities

1. Discuss in class about the method of making wheat straw fan or bamboo fan.
2. Besides the materials mentioned above, there might be other materials made in your village or community. What are those materials? What tools and equipment, skill, technology, capital (money) are required at local level to make these materials? Discuss with your teacher about this.

Exercise

Write answers to the following questions:

1. What things are made of bamboo in your house?
2. Mention names of the things that are made of babiyo and wheat straw. Mention the process or method of making these things.

Practical activities

1. Make a broom and a rope from babiyo and demonstrate in the class.
2. Describe the process of making mat, rope, sack from wheat straw, babiyo, and straw that can be used at home or in office.
3. In your group make and demonstrate in the class one thing from each of bamboo, wheat straw, babiyo, etc.

We have many things in our house that are lying in store without being used, which we even cannot throw out. They cannot be used in that forms. Therefore, the housewives can make something useful from these waste materials in their leisure time. For example: There are old clothes, saris, woolen clothes, unworn old bangles, glasses, plates, plastic utensils etc. in the house which are lying without being used. We can select these materials, clean them, and make other different things from these waste materials for reuse. In this way, the waste materials can be used again in a new form, and also leisure time is used in a productive work.

Making of materials from old clothes

Old fashioned saris which we do not like anymore are lying in our wardrobe or suitcases unused. These saris can be used considering their designs. If it is a thick silk sari, it can be used for sewing frock or kurtha for daughters. Printed with a uniformed design polyester sari can be used for making cushion or sofa cover. Plain sari can be made window curtains. In the same way, old sari can be used to make frill for beds. Likewise, if the fabric of old pants is still strong and good, it can be used to make children's pants, shorts etc. If the bed sheets are worn -out in the middle and the sides of it is still strong. Such strong parts of the worn out bed sheets can be used to make small cushions. We can also make pot-holders, and kitchen towels. We can also make small bags by sewing small pieces of the bed sheets. Thus we can economize the expenditure. If we work hard, we can also make ladies' bags. Thus, the housewife can support to raise and balance the domestic budget by doing such activities.

Old glass, cup, plates, which are lying unused can be brought into use again. For example:

A) Plastic Pouch: The plastic bag or cover of milk, instant noodle, oil, and wrappers can be used again. Collect all these waste materials and wash them thoroughly until they are clean. Cut them into very small thread like shape and using a crochet (a form of needlework) we can make key ring, tea mat, pen holder, cushion cover, bag etc.

B) Old newspaper or papers: We can make pulp by soaking the old papers and then make appropriate paper for reuse. We can make decorative pieces as well as stationary papers from waste papers.

C) Household waste: There are lot of household wastes produced by daily food and other objects. We can make compost by putting it in a pit or manure container. This compost is very appropriate for farming or flower-pots.

Broken glasses can be used as decorative pieces in your room by cutting, adjusting, and painting them. In the same way, we can adjust them as the photo-frame also. Broken glass or cup can be turned into flower-vase or pencil holder by painting it, and half-broken pots can be turned into flower-pot.

Old bangles can also be used for decoration by joining many bangles in a thread in various design and hanging on the wall. We can also use jute sack. We can make pattern on the jute sack with old woolen thread and make door mat and wall hanging bag which has 2-3 sections. In one of the sections of the wall hanging bag, we can put papers; we can put pens in another section, and in the next section we can put combs and so on. If the bag is sewed putting inner lining, the bag becomes firm and remains still on the wall.

After making various things from the pieces of clothes, there will be still some pieces left. We can stuff these pieces of clothes to make dolls for children. Other kinds of doll such as stuffed dog, rabbit can also be made. As a result, there is no need to buy such dolls from the market.

Majority of the people are farmers. Therefore, we can find straw, wheat straw, husk of maize etc. in their houses which are used in the stove as fuel when there is surplus of these materials. If properly used, a small cottage industry can be opened. Baskets, hats, bags can be made by coloring the wheat straw. This can be very useful for presenting as gifts as well as for our own use. These things can be set in the room for decoration.

Similarly, we can make many different things from the Khosta a maize. We can make colourful butterfly like small materials as well as other materials from it. Because of these sorts of materials we don't

have to spend money for buying butterfly to our children. When the children see the making of these sorts of materials, they get curious in making them which develops their skills of making the materials like butterfly. We can make many other materials to be used in the decoration of house walls from the Khostas of maize. They are easy to be used as gifts. In the same way where jute is found easily, we can make there various types of materials like bags, wall handlings etc.

Useful things made from waste materials

A lot of waste materials come out after we use things. But if we throw them haphazardly, there will be a pile of garbage. We can collect the waste materials, color them with different patterns, and use them as decorative pieces or use them to put things in, and also we can sell them. In the same way, if we throw the soft black plastic bags haphazardly, it will be chaotic and environmental pollution will also increase. Therefore, we can use them by putting them in a cloth-bag and making pillow. Following are some examples of waste materials that can be made usable things.



Used materials thrown haphazardly



Useful decoration materials made from waste materials

Activities

As shown above, make two from each group, decorative pieces by reusing waste materials.

Exercise

Write answers to the following questions:

1. Describe the usefulness of old and waste materials.
2. Make a list of the waste materials of your house.

Practical Activity:

Collect plastic covers and prepare two things that can be brought into use.

Making Materials from Clay

Children! We all have seen clay. Clay is found all over the world. Clay is very essential for us, but we want to keep ourselves away from it. In many years of time rocks become ragged by geographical and chemical process and become clay. The fine and soft dust that is

found in the outer surface of the earth is clay. It takes hundreds of years for the rocks that are in the earth, to change into dust.

**Identifying clay**

In order to make materials from clay, we need the clay which is *ardra yukta*. Therefore, the clay should be taken out from the depth of 2-3 feet from the ground level. This type of clay is found in most of the places of Nepal. If the clay is fine and has fissure (so that water can go inside easily) it will be easy to make pots. The pot will also be strong, and it will not easily break or crack. Potters and other people have to select clay which is soft and which easily dissolves. After making clay pot, it should be left in bright sunlight, and should be safe from wind, to dry well. If there are no holes in the clay, pots will crack and break. If adequate amount of husk and sand are mixed with clay, it will be slimy or sticky. Pots, idols and other things are made from the sticky clay and clay that has holes.

Things be paid attention while making clay materials

While making clay materials or While mixing or kneading clay, there is possibility of being dirty or wounded. Therefore, following things need to be paid attention:

Putting on Apron: If you are in your school uniform and you have to do some work using clay, it is possible that your dress will get dirty. So you can save your dress from getting dirty by putting on an apron,

or any other cloth, or newspaper during practical activity. You can protect yourself from being dirty, if you work very carefully.

Selection of tools and equipments for clay work and their use:

We need various kinds of tools and equipment while digging and mixing clay. We should carefully handle small and large tools and equipment in practical activities. When we make clay pots, idols and other things, we should be very careful. Otherwise, we could be injured. If injured accidentally, calmly perform first-aid and the injured person should be taken to the hospital.

Observation of sample or model: Before making any thing from clay, the natural objects, tools and equipments should be observed well. The clay work done only after observing and collecting required tools and equipments, makes the finished product good.

Well managed storing: After completing the work of making clay materials, tools and equipments used and the finished product should be appropriately stored in assigned places. If the tools and equipments are kept in the appropriate place after use, they will be easily accessible later. The produced things should also be kept in order. Otherwise, they will fall, break, and be a waste.

Management of soap, water, and towel: Hands and feet get dirty while working with clay and mud. Only after making arrangement of soap, towel and water, face, hands, and feet should be washed properly in queue. Nails may have mud in them. So they should be washed properly.

Activities

What kind of clay is easy to use? Discuss in class about the things that need to be given attention while making things from clay, and present the conclusion.

Introduction of tools and equipment, use and safety

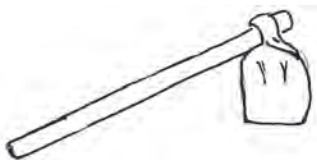
Different kinds of tools and equipments are required for practical activities of clay work. Because of the softness of clay, we use our hands mostly. We make things from clay by pressing, kneading, twisting, and making it into pieces. However, while working with

clay, required tools and equipment are to be used carefully. The product will look attractive and artistic from the use of tools and equipment.

After doing practical work, tools and equipment used for practical work should be washed and dried properly and kept in their assigned places. Tools, which have sharp edge can cause damage, so with the help of the teacher put oil or grease as required and put the tools in the toolbox carefully. In this way, tools and equipment will be safe and can easily be found afterward. Generally, following tools and equipment are used for clay work:

1. Mattock (kuto) (a tool like a pickaxe with one end of its blade flattened at right angles to its handle, used for loosening soil and cutting through roots)
2. Spade
3. Wooden hammer
4. Strainer (Chalni)
5. Wooden stool
6. Wooden pastry roller
7. Bucket and mug
8. Iron wire
9. Knife
10. Bamboo knife or needle
11. Foot (scale)
12. Others as required

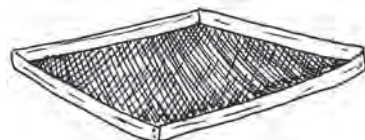
Mattock, Spade, Faruwa, Khurpi: These tools are required to make the soil out from the ground by digging. It is necessary to dig out the clay from depth of the ground. So with the help of these hand tools soil can be taken out easily.



Wooden Hammer: It is made of wood. It is used to break chunk of clay and make it dusty. It is required to make kneaded clay soft by beating the mud.



Strainer / colander / Iron net: We can make a strainer by putting iron net in a wooden frame. After breaking chunk of clay and make's it dusty, it is strained in the iron net in order to remove small stones and other unnecessary things.



Wooden Stool: It is made of wood and its upper part is smooth. It is used for kneading, pressing, rolling clay and making long ropelike clay.



Wooden pastry roller: Roller is used to give the kneaded clay bread like shape, and make it flat. Roller is used to make kneaded clay of uniform shape by rolling it.



Bucket and Mug: In order to put required amount of water in clay for kneading, and also to wash hands and legs bucket is required to carry water and mug is required to pour water.



Iron wire: An iron wire is used to check fissure in the kneaded clay by cutting the kneaded clay with the iron wire. In doing so, if there is no fissure found inside the kneaded clay, it means it does not need more kneading. Iron wire is also used to make the clay product attractive and artistic as necessary.



Bamboo knife or long needle: Bamboo knife or long needle is used to put pattern or design on the clay materials. It is also used to make the clay product attractive and artistic as necessary.



Foot (Scale): Scale is used to make the clay materials in appropriate size. It is better to use a scale to make the clay materials in the same size.



Activities

Make a list of tools and equipment that are required for doing clay work, and discuss in class.

Clay Kneading, Protecting and Drying Method

Clay Kneading Process

There are unnecessary stones and pebbles mixed in clay. After selecting clay, and after removing the unnecessary stones and pebbles from the clay with help of strainer, the uniformed fine clay should be used for making clay goods. If the clay is not appropriate and glutinous, there is great possibility that the clay product will crack and break. That is why the clay should be taken out from the depth of 2-3 feet from the ground level, which is soft and easily dissolvable. The following process should be used to knead the selected clay:

1. Break the clay well with wooden hammer to make it dust like, then separate fine dust like clay with the help of a strainer.
2. Put the find dust like clay into a bucket, and knead the clay by putting water as required and make a ball of the clay.
3. Put the clay ball on the wooden stool, and beat it with wooden hammer. Check fissure in the kneaded clay by cutting it with the iron wire, until there is no fissure found inside the kneaded clay , and the clay ball becomes soft. Clay product can be made only from such clay.



Activities

Make groups in class, and demonstrate to knead clay following above stated process.

Protection of Clay: The kneaded clay may not be used all at a time. If the kneaded clay is left after making clay materials, the left over clay should be kept safely for later use. The left over kneaded clay should be put in a plastic bag, sack or wrapped in a cloth and should be kept cool. In this way, the kneaded clay will not dry. If the kneaded clay is to be kept for long period, it should be kept in a damp place away from sunlight and wind. Water should be sprinkled on the sack or cloth from time to time to keep the kneaded clay cool. Later, this clay can be used taking out straight from the sack. Thus, the kneaded clay can be protected in other plastic or sack available in specified place.



Method of drying: After making materials from clay, it should be dried in shade where there is less wind. It should not be dried in the sun. If it is dried in the sun, the clay materials will crack and break. If the mushy (gilo) clay materials are laid to dry in shade where there is no blowing wind, water will slowly come out from the surface of the clay material in the form of steam. Thus because water will slowly come out from the inside portion, the material will dry uniformly. If the mushy clay material is dried in the bright sunlight where there is blowing wind, the outside of the materials will dry fast. The inside water cannot come out in the same ratio. Because the inside part and outside part of the clay material cannot dry uniformly, the material will crack and break. That is why, it is better to dry the product in shade or inside the house.



Making of simple object from clay: We can make different things or objects or shapes that we like from clay. Such objects can also be used as teaching materials in teaching learning activities. We can also make income by making these objects attractive by painting and selling them. Following are some of such objects:

- A) Round (golo) and oval (lamcho) shape
- B) Spherical (dallo) and flat (Chyapto) shape
- C) Triangle (tinkune) and square (charkune) shape
- D) Cylindrical shape or Cone



Activities

Discuss with teacher, guardians, and friends on the basis of the following points and prepare a report:

- Selection of clay for making of an object
- Method of clay kneading and its protection
- Sell-distribution and management of produced materials

Exercise

Write answers to the following questions:

- Tell method of selection of clay for making clay materials.
- What things are to be paid attention while working with clay?
- Write names of materials that are required while working with clay.
- Make list of five things that you can make from clay.
- Write methods of protecting clay.

Practical Activities

- Make five shapes that you like from clay and show them to your teacher in class.
- Visit the place near to your home or school, where clay work is done, observe making of clay pots and other clay objects. Prepare a report on your observation.
- Take prepared clay for making clay materials. Put the clay on the wooden stool, and make different shapes kneading the clay slowly. Your teacher will facilitate while making shapes. Each of the students should make five common shapes that can be used as teaching materials.

Suggestions for teachers:

Either by the teacher himself or herself perform making of clay materials, or ask other resource persons from the community to perform the task.

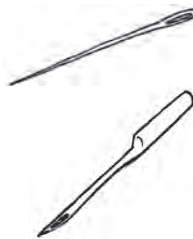
Sewing and Knitting

Before sewing any clothes (outfits) it is very important to have knowledge about the tools and equipment required for sewing and different stitches. After having knowledge about different stitches it also becomes necessary to know about the kind of cloth and what stitch is suitable for the cloth. One should know how and where the basic stitches should be used.

Required tools for sewing

The followings are the necessary tools for cutting and stitching cloths.

Needle: The main and important means of sewing is needle. We can sew only after inserting thread into needle. We can find needles with different numbers in the market. Among them, needles numbered 6, 7, 8 are suitable for hand sewing. Needle numbered 14, 16, 18 and 20 are used for sewing cloth using machine and they are used according to the type of cloth. Needles with number 18 and 20 are used for thick cloth and jeans.



Thread: Threads should be selected according to the color and kind of cloth. When sewing polyester and silk fabric, the thread should also be of polyester. If cotton thread is used to sew polyester and silk fabric, there is risk of shrinkage.



Measuring Tape (Inchi Tape): Measuring tape is used to take accurate measurement of different parts of body or measure the fabric according to body measurement. 152 centimeter is written on one side of the measuring tape, and 60 inch is written on the other side. Its length is 5 feet and breadth is 1½ to 2 centimeter.



Table or Stool (pirka): A table or stool is necessary in order to cut the fabric according to measurement. If you like to sit and cut the fabric, the cutting table



should be at least 6 inches tall, and if you like to stand, the cutting table should be 2.5 to 3 feet tall or up to your elbow so that the cutting of fabric could be comfortably done. The surface of the table should be clean. When hot iron is put on the table for ironing, color of the table should not be washed away by heat or the color should not transfer to the fabric.



Pencil and Eraser: A sample paper is made before cutting the fabric, and a pencil is required to make the sample. The pencil is of light color. In case the sign made by the pencil is not correct, an eraser is used to correct it.



Tailoring Chalk: Before cutting the fabric, it is necessary to mark on the fabric according to the sample. A special kind and color chalk is found in the market for this purpose. It is made from fine clay. It helps to draw straight and clean line on the fabric. While drawing lines if it becomes large, it should be scraped with a knife. The print of this chalk can easily be removed from the fabric later on and no stain is left on the fabric. So this type of chalk is used for marking on fabrics.

Scissors: It is better to have 8 or 9 inches long scissors for cutting fabric. Long scissors make it easy to cut the cloth. We can cut straight in the fabric with long scissors. If the blade of scissors is not sharp, it will be difficult to cut the fabric. The blade of scissors can be mended. Small scissors are also needed to cut fabrics. Such small scissors are used to cut the neck, roundness, and button holes. However, different kinds of scissors can be found for cutting button holes. We should use a separate scissors for cutting papers. We should not use same scissors to cut fabrics and papers. It is difficult to cut fabrics with the scissors with which we cut papers.



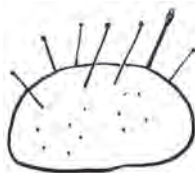
Thimble (cover for finger when sewing) / Lakhkhu / auterno: When sewing fabrics by hand, in the central finger of the right hand a small protective cap (which is called thimble) is put on. It is used to push a needle through fabric. Thimble is a cover for finger when sewing. It protects the finger from being pricked by needle when sewing by hand. It makes easy to



push the needle through fabrics. There are two types of thimble: one that shows tip of the finger and the other that does not show the tip of the finger. Considering thickness of thimble, we can get thimble number 6 to 11 in the market. When sewing by hand, we should put on thimble according to the size of our finger.

Pin or Pin Cushion: We use a pin to make fabrics stick to one place at the time of sewing or cutting fabrics. When cutting or sewing slippery or silky fabric, we should use pin to make the fabric stick to one place.

The tip of the pin should be sharp. In order to make pins easily accessible, they should be put on pin cushion after finishing work.



Ruler: There are different kinds and sizes of ruler. Rulers with size of 6 inches and 24 inches



are used for cutting fabrics. One side of the ruler has measurement in centimeter and the other side of it has measurement in inches. It helps in making a draft of outfit to be sewed, and also for drawing a straight line.

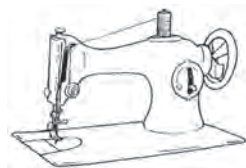
Tracing Heel: In order to copy the sign on the upper fabric to the lower fabric, tracing heel is used.



Iron (Istri): Iron is used to stretch or to smooth the wrinkled fabrics as required.



Sewing Machine: There are two types of sewing machine: one that is operated by hand and the other, which is operated by the feet. Now-a-days, we can find electricity operated sewing machine. However, hand operated and feet operated sewing machines are commonly used.



Activities

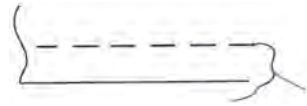
1. Visit a person (tailor) who does sewing work in your community, ask the person about the things that are necessary for sewing. Make a list of the things required for sewing work.
2. Take thread and needle in your hands and practise to insert the thread into the needle by each of the student.

Types of Stitches

1. Basic |stitches
2. Decorative stitches

Basic Stitches

Temporary (Kachcha) Stitch: Temporary stitch (Kachcha Tanka) is used to adjust the fabric before doing the permanent stitching either by hand or by machine. This stitch is used to join fabrics or to adjust or to make pleats in the dresses. We also use this stitch to adjust curved cutting. When making pleats in clothes we use this stitch to make the pleats uniformed. Before sewing coat, temporary stitch is used to join each part of the coat. This stitch helps the fabric to stay together, which makes it easy to sew in that area of fabric where we intend to sew. After sewing the clothe using this stitch, we can put the dress in our body to test whether it fits. Then we do permanent stitch by machine. After completing the machine sewing, the thread used for temporary stitch needs to be pulled out. Temporary (kachcha) stitch is used to check whether the outfit fits in the body or not.



Simple or Running Stitch: After inserting the thread into the needle, normal stitching is done in which the thread is seen from outside and inside. The running stitch or straight stitch is the basic stitch in hand-sewing. The stitch is worked by passing the needle in and out of the fabric. Running stitches may be of varying length, but typically more thread is visible on the top of the sewing than on the underside. Generally, this stitch is used for joining pieces of cloth. This stitch is used especially for putting falls in saris. This is also used when sewing frocks, making pleats, and mending torn clothes. This stitch is mostly used for hand sewing.



Hemming Stitch: A hem in sewing is a garment finishing method, where the edge of a piece of cloth is folded narrowly and sewn to prevent unraveling of the fabric. The most common hem folds up a cut edge, folds it up again, and then sews it down. The style of hemming thus



completely encloses the cut edge in cloth, so that it cannot unravel. In this stitch more stitch is seen on the wrong side and less thread is seen on right side. This stitch is used in sewing edge or hem of frock, pants, suruwal, sleeves, neck etc. It is also used for sewing the edge of handkerchief.

Back Stitch: It is an excellent hand stitch to sew a seam because it is one of the strongest stitch.

A back stitch is a strong stitch to join two pieces of fabric. Thread a needle, a piece of thread that is no longer than a yard long. Longer pieces of thread tend to get tangled. Thread your needle and knot the end of the threads. Bring the needle up through the back or wrong side of the fabric until you hit the knot. Take a small stitch to the right or left. When the needle goes back through the wrong side, you'll be bringing it up through the fabric one stitch away from the last stitch. You will then push the needle through the fabric right next to the end of the first stitch. The backstitch can be used to produce a relatively strong joint. Back stitch looks like machine stitching in appearance. Although it looks like machine stitching on the right side, it does not look nice on the wrong side. We use this stitch in places where there is no sewing machine.



Back stitch is of two types:

Full Back Stitch: Stitches that is done without leaving space between stitches but stitch is done joining each stitch is called full back stitch.

Half Back Stitch: Stitch is done leaving some space. This is weaker stitch than full back stitch.

Activities

Take one 12 x 12 size cloth and practice the basic stitches. Show it to your teacher to check whether they are correctly done or not.

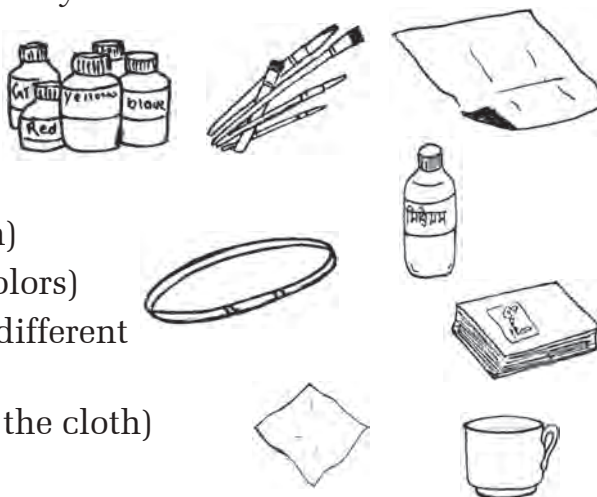
Exercise

1. Write the names of basic stitches and write where they are used.
2. Draw a diagram of hemming stitch and write where it is used.

Fabric Painting

The act of coloring on a fabric or cloth is called Fabric Painting. In course of room decoration, fabric painting was developed. Various shapes or designs are made on a cloth or fabric, and the designs are colored with the help of a brush. Fabric paints can be done in bangles, flower pots, pillow cases, table cloths, sofa cover, cushion, handkerchief, TV cover etc. In the same way, fabric color can be done on T- shirts, border of saris, kurtha etc. Various materials are required for fabric painting. They are as follows:

1. Different colors
2. Brushes of different sizes
3. Cloth
4. Ring (for stretching cloth)
5. Medium (for balancing colors)
6. Design book (containing different designs and shapes)
7. Carbon paper (matching the cloth)
8. Water and cup



Fabric painting needs cleanliness and hard work. If fabric painting is done in a hurried manner or hurriedly, you might spilled the color all over. This will not look good. If the color you want is not available, you can develop color by mixing different colors. If you do not have any idea about colors, then you have to think about it.

Activities

Make a list of the materials required for fabric painting and discuss about it with your friends.

Things to be paid attention before designing in fabric

1. You need to think on what kind of fabric, for what purpose and what pattern is to be used. If you want to do fabric painting in bed sheets, table pose, bed pose etc them large design or pattern

is suitable. If you want to do fabric painting in handkerchief, small pattern will be appropriate. Large pattern is for large size fabric, and small pattern is for small fabric.

2. You should be very careful while tracing the pattern or design on the cloth. The tracing of design should be straight, it should not be curved. Otherwise it does not look nice.
3. When coloring the design or the pattern, you should do it very carefully. Choose appropriate brush to color the design.

Making Handkerchief with Fabric painting

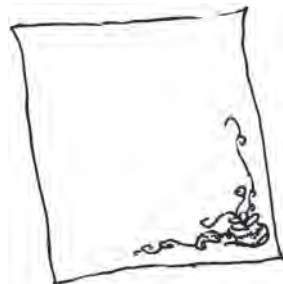
1. First of all, take a specified size cloth or fabric. With the help of a carbon paper, trace a design on the cloth from design book
2. Put the ring on the cloth and draw shape or outline of the design with the smallest brush. The outline should be drawn very carefully one time only. If you draw the outline 2-3 times, it will not look nice. When you draw the outline, use appropriate color for the parts of the pattern. For example: For leaves, use green color.
3. After that, fill up color slowly using a thick brush. For shading, use different type of brush. Shading is given in two ways. First, using the same color that you have filled up the design, pull the color lightly with a thick brush. Second, fill half of the pattern with color appropriately to the design and half of it with white color pulling from upper side. This will make the pattern look nice.

Activities

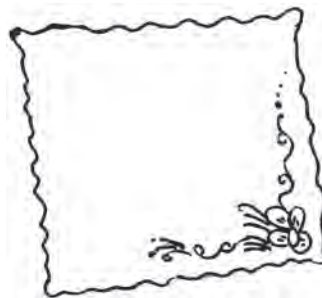
Discuss about the method of doing fabric painting.
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Method of making design or pattern in handkerchief

First of all, take a square cloth with specified size or measurement. Print suitable pattern or design on the cloth. Make an outline of the design with a thin brush. Then, fill the design with appropriate color with the help of a thick brush. When filling up the color, consider that the design should look



natural in color. For example: green color for the leaves, red for flower or the natural color of flower. Apply some shading to make the pattern look more beautiful. For shading, put deep color in half of the design, and light color in the other half. In this way, you can save color as well as you make the design or pattern look nice.



Likewise, you can adjust the edge of the handkerchief. You can cut the four edges of the handkerchief with scissors in an artistic way and paint the edges. If you practice this again and again, the object that you make looks beautiful.

Exercise

Write answers to the following questions:

1. Write name of materials required for fabric painting.
2. State method of doing fabric painting in handkerchief.

Practical Activity

1. Carry out fabric painting in a handkerchief and demonstrate it in the class.

Suggestions for Instruction:

For making handkerchief, tell all to do hemming stitch on the four edges of the handkerchief and then tell them to fill up color in the design. Repeat this activity until the design looks clean and attractive. Invite guardian or expert resource person from the community to perform this activity.

Our Local Technologies

Each country has its own types of technology. People have developed their own technologies and have brought them into practice in order to spend a simple life. Such technologies are the local technologies. For example: In some places people use a mortar (khal), and in other places they use dhiki (wooden machine for rice mill) for rice beating purpose. In some places people use bamboo tube for making gundruk (fermented and dried vegetable), while in other places people make gundruk by burying it under the ground. Special technologies have taken an important place in all areas of the hill, the valley, madesh of our country. For example: Making of guitha (dried cow dung) or briquette has played an important role in the Terai area, while making of plough (Halo), radi (home spun woolen blanket), pakhi (home spun woolen blanket), watermill etc. have played an important role in the hilly region of Nepal. Likewise, technologies such as making of metal idol and clay pots are very popular in Kathmandu valley.



Traditional technologies that are based on the weather, culture, geographical structure, and available natural resources may be appropriate for country like ours. Local technologies are not only less expensive, but they may be more durable and reliable because they are based on local resources and skills. Such technologies do not need fuel and they are environment friendly.

Activities

What are the local technologies that are in practice in your community? What are they used for? Discuss about it.

Local level Technologies in use

Many kinds of local technologies have been developed in our country. Among them, some are still to be investigated and some are about to disappear. Some have already disappeared. Among the technologies, a short introduction and importance of the main technologies that are in practice today are given below:



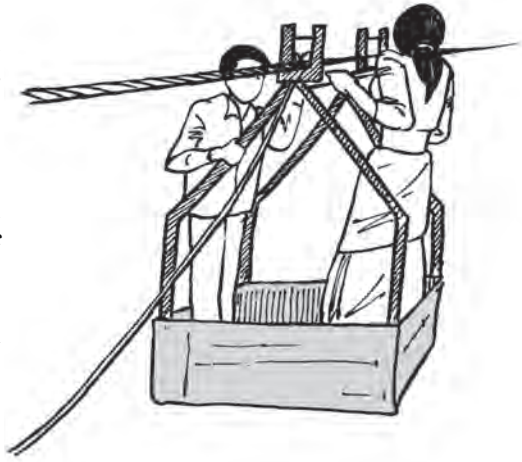
Anvil or smithy (Aran): Long time ago people used to excavate iron and bronze mine in different parts of our country. The ore extracted from the metals that were taken out from the mines were processed and various metal idols and metal pots were made from it. A smithy or an anvil was used in order to sharpen the blade of iron tools and equipment.



Although metal processing practice has been disappeared, now-a-days an anvil or smithy is used to make metal pots and metal tools, and for sharpening the blade of iron tools. In fact, a Smithy is a kind of forge (a workshop where metal is heated and shaped into objects by hammering). A 2-3 ft long and wide and 6-8 inches deep pit is made on the ground. On its one side (as shown in the diagram) is a small opening (khal) where a sack like object is connected. This object is called bellow (a piece of equipment with a chamber that can be expanded to draw air in and compressed to by a hammer to give the shape of pots. Now-a-days instead of bellow a manually operated means is used.

Tuin: In places where there is no bridge to cross the river, and stream a tuin is built. Perhaps you have seen that in places where there is no bridge over the river, people cross the river sitting in a wooden

box which is pulled by a rope or iron pole. This technology is called Tuin. On both sides of the river an iron pole is firmly suspended. A wooden box is hanged on this pole with the help a pulley. When people want to go to other side of the river or want to come over this side, they sit in the wooden box and hold the rope firmly with both hands and push the box with full strength and reach the other side. In some places, other people pull the wooden box from both sides of the river, and in some places people pull the rope by themselves.



This means is very useful to cross the river from both sides in places where there is no bridge. It takes the whole day to travel in narrow valley by going down and climbing up, in such places tuin is very useful to travel from this end to the other. This can be built in minimum expense. In a country like ours where there are high hills, deep valley, ravine etc, this is very important and necessary technology.

Clay pots making: In different parts of our country, especially in Kathmandu, clay pots have been made for traditions. After selecting appropriate clay, it is kneaded and pot is made in a spinning or revolving wheel.



The first thing that has to be done for making clay pots is preparation of a spin. Such spin is usually made of wood. Such wooden spin is made stand on an iron rod which is buried in the ground. There is a hole at the side of the top of the wooden spin, where a stick is inserted and with its help the spin is revolved. The kneaded clay is piled in the middle of the spin. As the spin revolves, the pile of clay is given the shape of a pot holding with both hands and sprinkling water to make it smooth.

After pot is made, it is cut clay by a string or a wire at the bottom of the pot and is separated from the pile of clay. Then it is dried in the sun for several days. After that it is burnt in fire and pot is made ready. Now-a-days people have started to use plastic pots because they are cheaper and easy to use. So the clay pot making occupation is at risk. Such clay pots are our cultural assets. It has great significance from the perspective of tourism. Because we use national resources and skills for making such pots, it helps us to be self-sufficient.

Activities

What pots that are made from clay are being used in your house? Make a list and discuss about it.

Water Mill

We have to grind rice, wheat, maize, and millet into flour in order to make varieties of food from them. There are many streams, and rivers in our country. The people of hilly area of such country have developed a water mill by using water energy. These water mills grind more grains in less time. Such water mills are still in use in the hilly area.



There is a big wooden fan or churning stick (madani) in watermill. The upper side of churning stick is joined with the upper panel of millstone (janto) which is made of stone. As the waterfall strikes on the churning stick with force, the churning stick spins, as well as the millstone also spins which is joined with the stick. At the upper side of the millstone there is a way made for the grains to drop in the millstone. So when the millstone spins, the grains that drop in the millstone is grinded and become flour. Thus the water mill turns the grains into flour. In this way, human do not have to spend their energy. The stone panel of millstone is bigger than the stone panel of hand mill (janto of villages), so it does a lot of work in less time.

Exercise

Write answers to the following questions

1. What is local technology? Give its introduction.
2. Write three importance of local technology.
3. Give general introduction of Anvil or smithy technology.
4. “Tuin technology is very important in hilly region”. Confirm this statement.
5. How is pot made from clay? Explain in brief.

Practical Activities

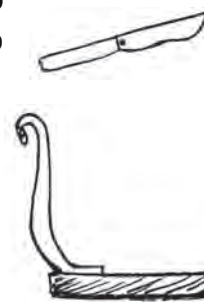
1. What kind of local level technologies were used or are used in your village or community? Investigate its structure and working system and make list.
2. Prepare a model of tuin.
3. Make a model of the spin that is used for making clay pots.
4. What were the local technologies that were used in your community? What are used today? Discuss in class and prepare a report.

Our country is based on agriculture. Various kinds of tools are used to work in the field. Earlier, these tools made locally. These tools are available according to the particular place. In the same way tools used in the kitchen for cooking purpose are still traditional tools. We will study about the traditional tools that are used in our kitchen and in the field for farming purpose. In traditional Nepali kitchen various tools are used to cook variety of food. Tools used in the kitchen are of different types based on culture, life style, and locally available resources. Generally in almost all Nepali kitchen tools like knife or curved kitchen knife (Chulesi), stone pestle (lohoru), flat piece of stone (silauto); metal pot (lohota), flat stab of wood (chauka); wooden roller (belna); forcep; big wooden vessel (theko); churning stick (madani); stone or iron pot for grinding (khal); pan (for cooking round bread [sel roti]) etc. are found to be in practice. Among them we will study about curved kitchen knife (Chulesi); knife; stone pestle (lohoru); flat piece of stone (silauto); flat stab of wood (chauka); and wooden roller (belna) in this lesson.

1. Tools used in home and kitchen

Knife or curved kitchen knife (Chulesi)

In order to cook vegetables in the kitchen we need to cut cauliflower, cabbage, beans, potatoes etc. in to pieces. These vegetables are made curry and achar after cutting them into small pieces. Thus, we use knife or curved kitchen knife (Chulesi) to cut these vegetables into pieces. The structure of knife or curved kitchen knife (Chulesi) is just like the diagram shown. Generally we put vegetables on a wooden or plastic chopping board to cut the vegetables. The method of using a curved knife is quite different. When we use curved knife for cutting vegetables, we press the wood which is at the lower part of the curved knife and hold the knife with our feet. The upper sharp part of the knife is turned towards your face and then we cut the vegetable holding with both hands.



Stone pestle (lohor), flat piece of stone (silauto)

When we cook varieties of food, we need Stone pestle (lohor), flat piece of stone (silauto) to grind the spices that we use in the food. Ginger, garlic, timur, coriander, black pepper, the sesame seeds etc. are grinded with the help



of Stone pestle (lohor), flat piece of stone (silauto). For making achar we need to grind tomatoes and turnip with the help of Stone pestle (lohor), flat piece of stone (silauto). Stone pestle (lohor), and flat piece of stone (silauto) are a set of hand grinder. We use Stone pestle (lohor) for pressing and flat piece of stone (silauto) is for putting the thing to be pressed on it. Both of these are made from very hard stone. Their structure is just like shown in the picture.

For grinding spices, we put it on flat piece of stone (silauto). Then with the help of Stone pestle (lohor) we powder the spice by pressing it hard and moving the Stone pestle to and fro. After some time the spice is pressed and become dusty. If we have to grind turnip, ginger, garlic, we cut them into very small pieces and put them on the flat piece of stone (silauto), and then with the help of Stone pestle (lohor) we press them, but not so hard.

Flat slab of wood (chauka); and wooden roller (belna)

Especially Flat slab of wood (chauka); and wooden roller (belna) are very useful for making various items of roti chapatti made from wheat flour. In one set there is one flat slab of wood (chauka); and one



wooden roller (belna). Both of them are made of wood. Flat slab of wood (chauka) is circular in shape which has smooth upper part. Wooden roller (belna) is a wooden rod of one foot length. Both ends of this are used for holding. For making bread with flat slab of wood (chauka) and wooden roller (belna), first wheat flour has to be kneaded to make it soft. After that small balls are made from the kneaded flour. One of the balls is put on the flat slab of wood (chauka) and is pressed and rolled lightly by wooden roller (belna) until it becomes round in shape. This round shape kneaded flour is cooked on a pan on fire.

Activities

Discuss in class about the other tools that are used in your kitchen.

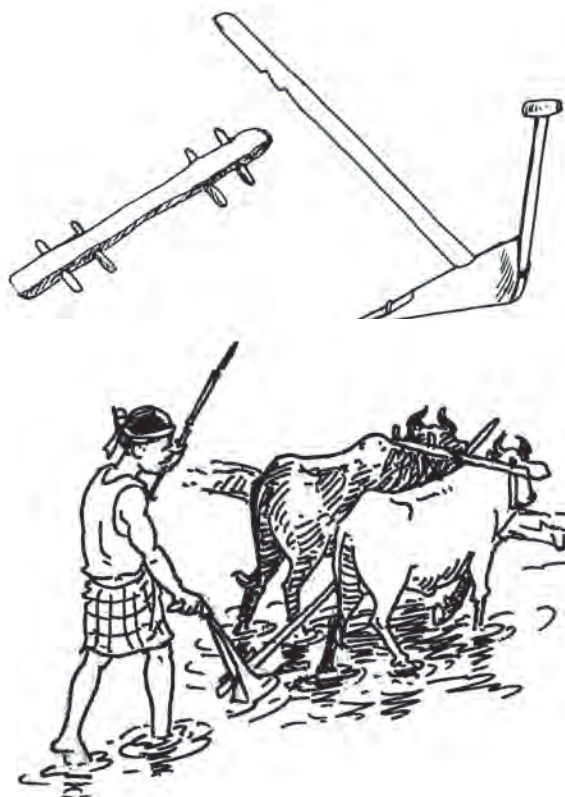
2. Tools used for Agricultural Activities

Our country is dependent on agriculture for many years. Agriculture work is done on the basis of required field, nature of soil, culture, locally available resources etc. However, the means of doing agriculture are of different style according to the required field, nature of soil, culture, locally available resources. Generally, plough (halo) and yoke pole of cart (Juwa), lidulko, rake (dalltho), sickle, large knife (dau), spade, adze (basilo) (a tool similar to an ax, with an arched blade set at right angles to the handle used for trimming and shaping wood), Daate (agriculture tool), faruwa, crowbar (gal), digger (khanti) etc. are traditional tools used for agricultural activities. Among these we will discuss about plough (halo) and yoke pole of cart (Juwa), sickle and spade.

Plough and Yoke (halo and juwa)

For any kind of agricultural farming the field needs to be ploughed in order to make the soil loose. Plough is used for this purpose. Now-a-days ploughing field using a tractor has been a practice in the Terai area. However, in hilly region generally it is impossible to do agriculture work without plough and yoke.

As shown in the figure at the lower part of the plough towards the pointed area is carved a little bit and an iron sheet or ploughshare (blade of a plough) is put, then it is pressed by a three-pronged nail. This pointed part is the



one that enters under the ground. There is a wooden handle of the plough which is about 1 meter high. The center of the wood is pierced and about 3 meter long wooden shaft of the plough is inserted. A wooden pin is put in the part which is a little bit lower from the top of the shaft. This is joined with yoke. Yoke of the plough is a long wood. The yoke is pierced in four places and four wooden bars are inserted in such a manner that the bar can be put on the neck of two oxen. With the help of nara (rope attached to the yoke of a plough), the plough is attached to the centre of the yoke and each ox is tied on two ends of the yoke and chased. When the oxen start to walk ahead the plough is pulled with the shaft. The person who is ploughing should hold the handle firmly and forcefully insert the plough under the ground. In this way, the field is ploughed as the oxen walk.

Activities

What kind of plough is used in your community? How does it work? Discuss about it.

Sickle: Another important means or tool in agriculture work is sickle (hasiya). It is also called ansi. It is used to cut stalk of rice and maize, wheat, grass, firewood, dry grass etc.



The shape of the sickle is like a question mark (?). The upper part of sickle is curved and the inner side of the sickle is sharp edged which is made sharp by applying whet. The lower part of the sickle is covered by wooden handle, which is used for holding at the time of cutting things.

Activities

Using sickle or other tools, cut the grown grass and branches of trees around your school, and write a report to discuss in class mentioning the following points:

1. Work description
 - a) Name
 - b) Work completed area

- c) Number of tools
- d) Work responsibilities
- 2) Process
 - a) How was the work done?
 - b) Where was the cut grass kept?
- 3. Accomplishment
 - a) What happened?
 - b) How much happened?

Spade (bauso/kodalo)

Although it has different names according to shape and place, the main function of spade is digging the field. Bauso is narrow iron sheet, while kodalo is made of wider sheet. One thick iron sheet is flattened and one side of it is whetted, while the other side is connected with loop. A wooden bar is inserted through the loop and the spade is made tight. The other side of the bar is for holding the spade. This is called the handle. When using the spade (bauso), the spade is held at the handle with both hands and the field is dug.

In the field this tool is very important during planting time, digging the field, bed making, leveling, weeding, harvesting (potato harvesting).



Exercise

Write answers to the following questions:

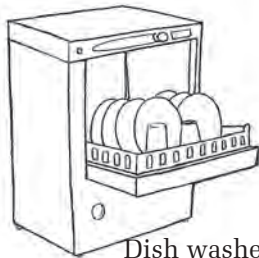
1. Make list of the different tools that are used in the kitchen.
2. What are lohero and silauto made of? What are they used for? Write.
3. Describe with diagram the structure of Belana and chauki.
4. Describe with diagram about the structure of plough.
5. What is a sickle used for?
6. Describe in brief about the structure and function of spade.
7. “Our local technologies are environment friendly”. Justify this statement with examples.

Practical Activities

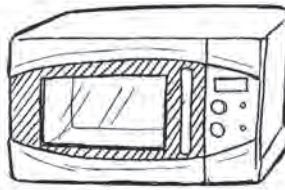
1. If the tools are available in the school, visit and observe the tools that are used for agricultural activities. Observe the structure of the tools and make diagram of each of the tool. OR
If the tools are not available at school then, visit a farmer’s house/ field and observe the tools that are used for agricultural activities. Observe the structure of the tools and make diagram of each of the tool. Observe how these tools are being used.
2. Ask your mother and father about the various tools that are used in the kitchen. Observe how the tools are being used. Draw the sketch of these tools in your practical class.

Introduction of Modern Technology and Their Importance

Now-a-days we use various machines so that our job is done fast and in an easy way. For example: for washing clothes we use washing machine; for dish cleaning we use dishwasher machine; for cooking food we use micro oven etc. The technology used in such modern machines is called modern technology.



Dish washer



Micro- oven



Washing machine

Modern Tools for Domestic Use

We use different tools and equipment to do our work quickly and easily. For example: we use pressure cooker to save energy and to cook food fast. We use phone or mobile phone to talk with our relatives who stay away from us. Likewise, to listen or to watch the news from all over the world, we use television or computer.

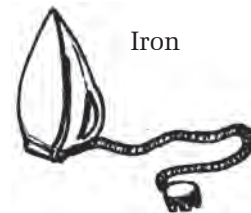
The tools that are in use today and the technology used in them is called modern technology. The use of modern technology makes the work done fast and well.

A. Iron

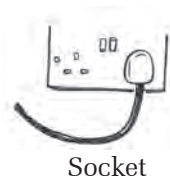
We use an iron to make the wrinkled clothes smooth and good looking.

Method of use:

1. Plug in the iron plug in the electricity socket of your house.
2. According to the type of clothe written on the iron (e.g. cotton, linen, nylon, woollen) adjust the temperature in the iron.



3. Make the switch on of the socket where the iron is plugged in
4. When the iron is heated and the red light goes off, iron the clothe
5. After completing the work, make the switch off.



Socket

Things to be paid attention

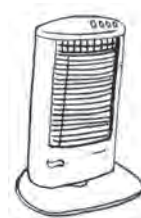
1. The temperature should be increased or decreased according to the type of cloth.
2. Because it is an electrical appliance, do not touch the naked wire, you might get electric shock
3. The iron in use might be hot, so you should be careful while using it. Similarly, iron used with coal can be used where there is no electricity, because it does not need electricity

B. Heater

We use heater to keep ourselves and our rooms warm during winter season. Electricity operated heater is called electric heater and gas operated heater is called gas heater.

Method of use (Electric Heater):

1. Plug in the cord of heater in the electric socket of house.
2. Switch the heater on
3. Select the temperature you want
4. After use, put the heater off.



Electric Heater

Method of use (Gas Heater):

1. Join the gas cylinder to the gas heater properly
2. To burn the heater, press the knob of heater down and turn left
3. After the heater is burned, adjust the temperature
4. After use, turn the knob to the right to put the heater off.



Gas Heater

Things to pay attention

1. Do not touch the naked wire, you might get electric shock
2. Do not touch the electric wire with wet hands
3. When you are using a gas heater, if there is a leakage of gas, it smells. In such situation, put the gas off.
4. When the heater is on, it uses the oxygen in the room. Therefore, the amount of oxygen decreases and the amount of carbon dioxide increases. In such situation, people have a headache and death may occur. That is why, when the heater is in use, all the doors and windows should be left open

C. Pressure Cooker

We use pressure cooker to cook food in less time with less fuel.

Method of use

1. Put the food material to be cooked in the pressure cooker and pour water according to need
2. Cover the lid and put the pressure cooker on the stove
3. Due to heat the pressure inside the cooker increases and it starts to whistle
4. According to the nature of food, after 2-3 whistle, put the stove off
5. Take the pressure cooker off the stove



Pressure cooker

Things to be paid attention

1. Before covering the pressure cooker with its lid, take off the pressure regulator and check whether the vent pipe is open. If there is anything blocking the hole, take it out
2. In case of high pressure, the automatic vent pipe explodes and accident can happen. If the air vent explodes, do not touch the pressure cooker immediately.

Activities

What are the similarities and differences between the method of cooking food in a brass pot or aluminum pot by firewood and in pressure cooker on a gas stove. Ask your teacher or guardians about advantages and disadvantages of the two methods and present according to the table below:

Similarities	Differences	Cooking in a brass pot		Cooking in pressure cooker	
		Advantages	Disadvantages	Advantages	Disadvantages

D. Rice Cooker

Rice cooker is used to cook food by means of electricity.

Method of use

1. Put rice in the pot that is inside the rice cooker, and put water as required and cover the rice cooker with the lid.
2. Plug in the cord of rice cooker in the house electric socket, and make the switch on of the socket.
3. Press the 'cook' button of rice cooker. The rice cooker will be on and slowly rice starts to be cooked.



Rice cooker

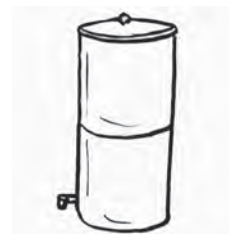
After rice is cooked, the 'cook' button on rice cooker automatically goes up and keeps rice warm.

Things to be paid attention

1. Do not touch the wire with wet hand
2. The outer part of the pot that is inside the rice cooker should always be dry

E. Water Filter

Water is very essential object for our body. Therefore, the water that we drink should be pure and clean. Water becomes impure and undrinkable if germs



Water filter

soluble harmful salt and other insoluble things are mixed in it. We use filter to separate insoluble objects from water.

Method of use

1. Boil water for 20 minutes to kill the germs in water. Then, open the lid of filter and pour boiled water in the filter as shown in the diagram.
2. After pouring water close the filter with lid.
3. Water will slowly drop in the lower chamber of the filter through the small holes of the filter candles and gets collected.
4. Water that is collected in the lower chamber can be drunk from the connected tap.



Things to be paid attention

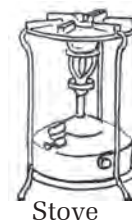
1. The candles inside the filter should be cleaned from time to time.
2. Since the filter candle is weak, it should be cleaned very carefully.

Observe the structure of the filter that is in use in your school, the water filtering process, method of taking care and keeping the filter clean. Make a note of your observation and discuss in class about it.

F. Stove

We use kerosene stove to cook food by the use of kerosene. There are two types of kerosene stoves:

1. Stove with wick
2. Stove without wick



The stove without wick is mostly in use. So the description is given about the stove without wick.

Method of use

1. As shown in the figure, fill the stove with kerosene. After filling up kerosene close the lid of the stove
2. Pump the stove a little.
3. Oil starts to come out from the burner of the stove. Stop giving pump, and light the oil with a match stick

4. Let it burn for some time. After the burner is heated, pump the stove again. Stove will start to burn well
5. If the stove does not burn properly, prick the hole of the burner with a stove pin as shown in the picture. Stove will start to burn.

Things to be paid attention

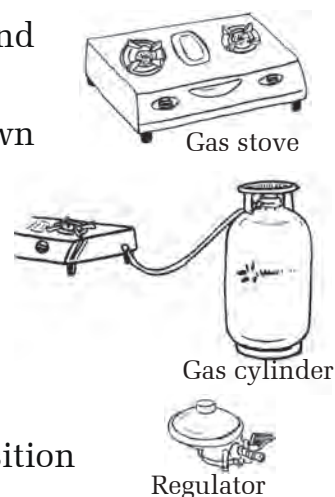
1. When you fill the stove with kerosene oil strain it.
2. Do not pump the stove more than it requires. Accident might happen due to maximum pump pressure

G. Gas Stove

Use of gas stove is being increased due to lack of firewood.

Method of use

1. Connect gas cylinder, regulator, gas pipe, and gas stove properly
2. In order to burn the stove, press the knob down and turn left. If the stove is an automatic one, it will start to burn. If it is not an automatic one, light the stove with the gas lighter
3. After use, turn the knob to the right, the stove turns off.
4. After use, put the stove regulator in off position



Things to be paid attention

1. There is a bad smell of gas if there is a gas leakage. In such situation, switch the gas regulator off and open the doors and windows of the room. If maintenance required, take help of a skilled person
2. The regulator and gas pipe should be of good quality
3. The stove should be kept above the gas cylinder

Activities

1. Among the friends in your class, whose parents or other people at home use pressure cooker. Discuss in class and write on the notebook
2. Tell in the class about the experience of your friend who use rice cooker at home. Everyone should hear you.
3. Demonstrate the use of filter

Exercise

Write answers to the following questions

1. Write names of any two tools that are being used in your home based on modern technology.
2. List the things that should be paid attention while using a gas stove.
3. Why is iron necessary? Write the method of its use.
4. What things should be paid attention while using a pressure cooker?
5. Write the importance of filter.

Lesson - 2 Introduction of Information Technology and Its Importance

This is the age of information technology. By information technology, we mean collection of data using a computer, processing of collected data, transferring it into information, processing information, storing the information and making the information available to its users.

Due to the development of information technology, we can immediately communicate and talk with our relatives who are living in any part of the world, by means of telephone, mobile phones, computer, and internet. We can also see them live with the help of the camera connected to the computer. Due to the speedy development of information technology, the world has become like a global village.

Some areas where information technology is used:

A. Education: Computer acts as audio-visual aids in information technology. By use of this technology in teaching learning process, students can easily learn the information they are given. Therefore, instead of blackboard, use of computer and internet connected interactive board is being increased in today's' modern classroom. Information technology has a great role in making distance learning widespread and effective.

B. Transportation: Information technology is used for the booking and reservation of railway and airplane tickets at international level, as well as for controlling the railways and airways traffic.

C. Medical field: In this field, information technology is used in patients' operation; exchanging information about patients; conducting research on medicines etc.

Besides this, information technology can be used in the area of science, entertainment, agriculture etc.

General Information about Computer and its Use:

Main Parts of a Computer

This is the age of information technology. In order to make information technology widespread and accessible to all, computer has mainly 3 functions. First, taking information and instruction from outside world; second, processing the information according to instruction; and third, displaying processed data to the users in the form of information.

There are three different parts of computer to do these three different functions. These three parts are called: input device; processing device; and output device.

Input Device



Input devices are used to give data and instruction to the computer from outside. Input device gives information to the processing device of computer. Key board, mouse, joystick, webcam, etc. are important input devices of computer.

Processing Device

Processing Device is the most important part of computer. It processes and transforms the data sent by input device according to the instruction. We use the processed information.



Output Device

Computer gives the processed information to the users through output device. Screen, printer, and speaker are the examples of output device.

Method of turning the computer on

When we press the power button at the processing devices computer gets on due to the flow of electricity.

Method of shutting the computer down

1. Click the 'start' button which is at the lower right side of computer screen, and click the 'shut down' button. Computer will automatically be off.

Activities

Discuss in class about the main parts of computer.

Exercise

1. Write point wise, the importance of computer in information technology.

Practical Activity

Using computer, collect information about any one of the natural resources of Nepal.

Computer as the Source of Information

The networking of computers all over the world is called Internet. The networking computers can exchange information to one another rapidly.

We can connect our computer with this networking by means of internet. In this way our computer, which is connected with this networking, can exchange information by connecting to any computer within the networking. Once we connect our computer with the internet, we can search any information we need by means of web browser, fire fox, Google etc.

Some Web Browsers

(a) Explorer (b) Mozilla Fire Fox (c) Google chrome

Method of opening information in Internet

1. Using the mouse select any browser of the computer and double click it. The browser will open
2. Type the information you want on the 'search' box of Google or any other browser and click the search button.

The source of information that we want and other similar source of information will be seen on the computer screen. We can read or hear newspapers and other papers by means of internet and computer. For example: If we type <http://nepalnews.com> and press enter key, we can read and listen news from our country on our computer screen. In this way, the computer which is connected to Internet gives any information that we want. So, we can take computer as the source of information.

Telephone, Mobile phone and their use

We use telephone to talk with our relatives who live away from us.

Method of use

1. Lift the telephone receiver and check for dial tone (the continued tu.....sound means Dial tone is ok. If the sound is tu..tu..tu..., you understand that the telephone is busy and someone is using the



- telephone) If you hear the Dial tone, press the number you want
2. If anyone picks up the phone from the other side, start talking to that person
 3. After finishing the talk, put the receiver back on cradle (the part of a telephone on which the handset rests or hangs).

Mobile Phone

Mobile phone is a wireless phone. So, its use is increasing now-a-days. It is easy to carry it wherever you go. Therefore, its use has reached to maximum point.

Method of use

1. After pressing the number you want to talk to, press the green button
2. When the person you want to connect picks up the mobile, start talking.
3. After completing the talk, press the red button to disconnect the mobile



Mobile phone

Things to be paid attention to

1. Speak politely and use polite language while speaking on phone.
2. Talk only necessary and important things.
3. Do not use the mobile when it is being charged.



Telephone

Activities

1. On your computer Browser, type <http://en.wikipedia.org> and search Chitwan National Park
2. Search from Web site the description of tourist area of your district and present in class

Exercise

Write answers to the following questions:

1. Write the method of using a telephone
2. What are the things to be paid attention while using a mobile phone?

Practical Activity

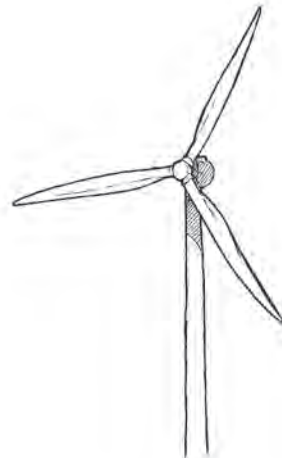
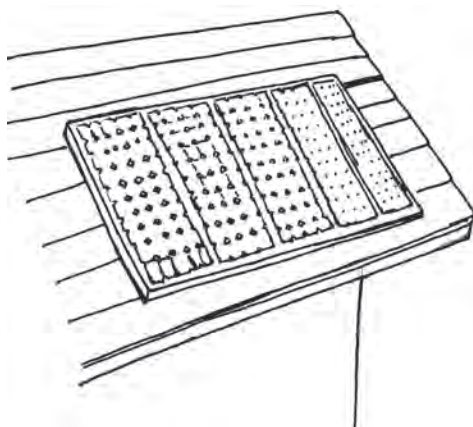
Using computer, collect information about Swayambu Stupa.

Introduction of Alternative Energy and its Importance

In our daily life activities we need one or other type of energy. This energy supports us to do daily productive work. For example:

1. We get heat energy for cooking food from firewood, kerosene, gas or electricity
2. Energy for running bus comes from diesel and petrol
3. Energy for light at night comes from kerosene and electricity
4. Energy for using computer and TV comes from electricity

Above mentioned things like firewood, kerosene, diesel, petrol, gas, electricity, and wood lamp (Diyalo) are all sources of energy. If we study the sources of energy seriously, we will find that some sources stay in the earth for some time, and some of them continuously provide energy. In this way on the basis of the sources of energy, we can divide them in to two groups:



1. Non-renewable Energy or Conventional Energy
2. Renewable Energy or Alternative Energy

1. Non-renewable Energy:

The naturally constructed and stored resources which are in the lowest layer of the earth for thousand years are called mineral fuel. For example: petrol, diesel, minerals, gas, coal etc. resources are obtained from minerals. The sources of such fuels lie in the special areas of the earth. Human cannot create or develop such sources. Therefore, if such sources of mineral fuels are continuously used, they will be finished after some time.

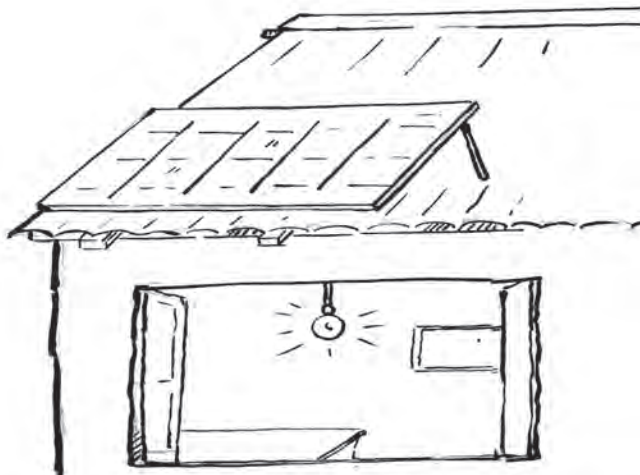
2. Renewable Energy:

Renewable energy is the energy which is obtained from continuously available sources. Such sources never become empty. We can get as many energy as we want from continuously available sources. For example: solar energy, hydropower (water energy), wind energy, organic energy etc. are sources of Renewable Energy. Such sources of energy are present in all parts of the earth in any kind of form. Renewable Energy is used as an alternative form of Non-renewable Energy. So Renewable Energy is also called alternative energy.

Necessity of Alternative Energy and Its Importance

The sources of mineral fuels are slowly becoming empty worldwide. In such situation, the importance of continuously available renewable energy is increasing day by day. Gases like Carbon Monoxides, Sulphur dioxide, which are created by the use of mineral fuels have been causing environmental problems. The environmental problems are : Global warming, natural downpour (Heavy rain), drought, and acid rain. For these reasons importance of renewable energy is increasing. Renewable Energy can continuously be consumed and it is also environment friendly.

In the context of Nepal, the sources of renewable energy is seen to be effective than the sources



of mineral energy. It is not possible for an under developed country like Nepal from economic perspective for the excavation of such mineral energy. At present, the country is importing the mineral energy, which means sending its capital away from home. Nepal is naturally a country with extensive possibility of having renewable energy. Nepal is the second richest country in water resources. Nepal has natural resource like thick forest in the terai. These show that Nepal has a lot of possibilities for the use of renewable energy.

Like in other countries of the world, Nepal can produce enough energy from renewable energy sources. There is possibility of extension of alternative energy in the rural areas also. Various studies show that from the small streams and rivers of 55 districts of the country we can establish micro hydro power station to develop 14 megawatt electricity. In the same way, from solar power electricity system we can develop 9 megawatt electricity every day. Nepal has the ability to develop over 19 lakh domestic cow dung gas (gobargas) plant from the available cow dung. It has been estimated that more than 31 lakh metric ton organic oil will be produced from 16 different plants available in the country. There is still to be estimated the ability of wind energy production. From the study of solar radiation and energy mapping we can get information about the ability to produce wind energy.

The country has not been able to use all the above stated renewable energy sources which are available at the local level. The sources, which are in use at present, have not been fully used. However, there is possibility of producing alternate energy from the renewable energy sources that are available in our villages, and thus fulfill the needs of rural people. The expenditure for national grid extension is more than the expenditure for rural energy program. The renewable energy is more reliable than the imported energy such as diesel, kerosene, petrol etc. The beginning estimated expenditure of renewable energy technology is more but in the long run the cost is not that much. The renewable energy technologies are environmental friendly and affordable for the rural people. Therefore, if the rural energy could bring into use, the accessibility to energy will be increased.

Activities

1. Collect examples of non-renewable energy and present in class.
2. Discuss about the renewable energy that is available in your village or city/town.

Exercise

Write answers to the following questions

1. What is alternative energy? What are its sources?
2. Give an introduction of non-renewable energy and the renewable energy.
3. Write the names of sources of non-renewable energy.
4. What is the importance of alternative energy in our country? Write

Practical Activities

1. Observe the sources of alternative energy that are used around your house and make a list.
2. 'We should decrease the use of non-renewable energy sources and increase the use of renewable or alternative energy sources'. Give different examples for this statement and write a report.