

4
Term 1

Colors

An Integrated Term Course

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PREFACE

Colors Integrated Term Book series comprises a set of twenty-one books from LKG to Class V. The pre-primary books in this course focus on English, Mathematics, and Environmental Studies (EVS). The books for Classes I to V deal with the core curricular subjects—English, Mathematics, EVS, Science, Social Studies, and General Knowledge.

The course is broadly based on the guidelines given in the National Curriculum Framework for School Education 2005. It attempts to meet the varied needs of enthusiastic learners at the primary level. Simple exercises and hands-on learning activities have been given to encourage students and motivate them to participate, and become self-reliant. The course focuses on applying the concepts learnt in one's daily life and makes learning a pleasurable experience.

Key features of this course are:

- **Warm-up**—Thought-provoking chapter-opening exercises that kindle the young learner's mind.
- **Snippets** (in text) in each chapter:
 - Let's learn** provides some interesting facts on English, EVS, Science, and Social Studies.
 - Let's think and answer** provides thought-provoking questions. These encourage the students to think beyond the text.
- **Maths Lab activities and Project work** enable students to have a meaningful hands-on learning experience.
- **Life skills** enable the students to acquire the necessary skills needed in life. The focus of this series is on reinforcing learning through sufficient recall and revision.
- **Links to the Internet** encourage students to explore the vast plethora of information available to get more insight on the subject.

Approaching a child's mind to enable learning different subjects is a complex task—as complex as organizing a child's day at school. We live in a rich traditional educational system from the Vedic age which was based on adapting life skills and activity-centric learning closely related to nature and life, and not confined to memorizing some information. A conscious effort has been made by us to encourage the urge to be active and to strengthen the natural drive to learn in a child's mind by providing exercises that integrate two or different subjects.

The course is patterned on the lines of a-book-a-term format and the content of the books in all three terms have been planned carefully based on the available number of teaching days in an academic year. Special emphasis has been laid to incorporate life skills and moral value nuances.



English

When we teach English, we are not teaching a subject, we are honing language skills. The effective environment of communication created in this series, helps the learner to acquire, learn, and practice these language skills, thereby equipping, enabling, and empowering the learner to apply the skills acquired in real life situations. Apart from the focus on Listening, Speaking, Reading, Writing skills, the components of grammar, vocabulary and pronunciation have been dealt with in great detail. This series also offers snippets, in text questions, exciting warm-up activities, and life skills which are interlinked to widen the scope of learning.

Mathematics

This section comprises seven significant zones where the chapters are divided into—start zone, knowledge zone, word zone, activity zone, exploration zone, e-zone, and recap zone. Each chapter comprises explanation of the various topics and subtopics through interesting examples, stories, and solved examples. Once the topic is explained, plenty of exercises are there for students to practice. Student's interest in expanding his/her knowledge beyond the concepts learnt is developed through various hands-on activities and exercises which are related to their real life. The chapters are also designed in a creative and interesting manner to take out the fear of mathematics from the child's mind and make learning enjoyable.

Science

The science sections of classes III, IV, and V encourage the child to understand the scientific phenomena in their natural environment. This section comprises various features like— Let's start, Activity, Fact zone, Let's recall, Let's learn new words, Life skills and Let's login. These features provide knowledge of facts, terminology, and concepts that help to examine and analyse everyday experiences.

Social Studies

To ensure that the child gradually develops as a competent and socially adjustable individual, the concepts of social studies in classes III, IV, and V are selected to meet this aim. Children are able to understand and comprehend the world they live in, respect their history and legacy, and imbibe the tenets of humanity. The exercises, activities and life skills enhance easy grasping of concepts and make learning an enjoyable activity.

General Knowledge

Interesting quizzes, fact zones, activities encourage the child to learn more about their surroundings and daily events. The general knowledge section also encourages children to understand some common daily phenomena and know the reasons for such occurrences.

Digital Support (Interactive Teacher's e-book)

The digital resource pack which supplements this series contains delightful animations, pronunciation of difficult words, interactive exercises, lesson plans, worksheets and activities.

Look at some of the mascots/icons used across the different subjects of the Colors Integrated Course.

The little duckling makes English language more interactive.



Bunny, the rabbit makes Maths more exploratory.



Leafy, the leaf makes Social Studies more interesting.



The little scientist makes Science activities more enjoyable.



Aquaman, the water mark helps to build general awareness.



The little exclamation mark makes difficult words in the text easy to understand.



The little question mark enables to activate thinking skills.



The life skills tree strengthens the roots of learning.

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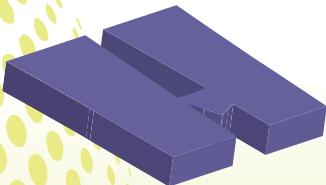
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English



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LANGUAGE SYLLABUS

SCHOLASTIC AREA						CO-SCHOLASTIC AREA		
UNIT	READING	VOCABULARY	PRONUNCIATION	LISTENING SKILLS	GRAMMAR	SPEAKING SKILLS	WRITING SKILLS	LIFE SKILLS
1. The King's Condition Theme: Presence of mind	Competing the sentences Ticking the correct statements Wh-questions	Making sentences Opposites of words	Words ending with letter 'd'	Listening to a passage from a story	Four kinds of sentences Punctuation	Creating a dialogue	Writing about reactions	Coping with emotions Sense of humour
2. Daddy Fell into the Pond Theme: Merriment	Wh-questions Think and answer questions			Rhyming words				Effective communication skills Laughter
3. The Ends of the Earth Theme: Exploration	Ticking, the correct statements Completing the sentences Wh-questions	Putting the words in alphabetical order	Words ending with letter 't'	Listening to an article-Pair work	Exclamatory sentences Subject and predicate	Creating a dialogue	Writing a comparison of situations	Critical thinking skills Adaptation
4. The Rumour Theme: Communication	Putting events in a correct sequence Correct answers Wh-questions Who said to whom	Silent letters in words Word meanings	Pronouncing the words beginning with letters 'qu'	Listening to a conversation	Common nouns Proper nouns Collective nouns Making plurals	Speaking about any rumour	Imagination in writing	Proper interpretation
5. The Pedlar's Caravan Theme: Fascination	Wh-questions Think and answer questions			Rhyming words				Effective communication skills Travelling
6. Disney's World of Imagination Theme: Determination	Writing in a sequence Filling in the blanks Wh-questions	Homophones Making sentences	Words ending with letters 'ed'	Phrases of polite requests	Nouns or verbs Subject-verb agreement Completing the sentences using verbs	Creating a dialogue	Ticking the right traits Deep thought questions	Coping and self management skills Passion and determination

1

The King's Condition

Let's start

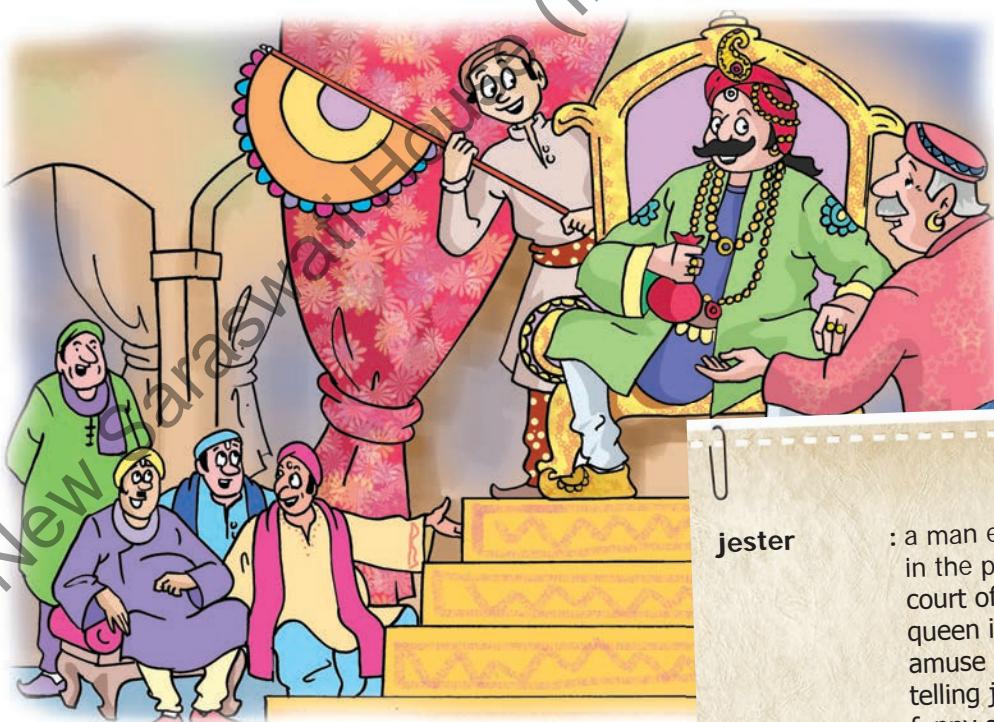
Answer this riddle.

1. It has a neck without a head and it wears a cap.
2. It doesn't ask questions but has to be answered.
3. It's a soda but you cannot drink it.

Answers: 1. bottle 2. doorbell 3. baking soda

This is a story about Tenali Rama, a court *jester* in the court of King Krishnadevaraya of the Vijayanagaram empire in the 16th century.

King Krishnadevaraya was in a good mood one day. He called his **courtiers** and gave each of them a bag filled with fifty gold coins. The courtiers were **thrilled**. But the king **immediately** put forth a condition. The king told the courtiers, "I'm giving you just one week to spend all these gold coins. After a week you have to show me all that have you bought with them. Listen to my condition carefully. Every time you spend these gold coins, you have to see my face."



The courtiers thought it was not a difficult condition to fulfil and the left the court happily. They went to the market to buy things with the gold coins. But when they had to buy something, they remembered

jester

: a man employed in the past at the court of a king or queen in order to amuse people by telling jokes or funny stories

courtiers

: persons who were a part of the court of a king or queen.

thrilled

: excited

immediately : at once





the king's condition. How was it possible to see the king's face in a busy market? And if they didn't see the king's face, how could they spend the gold coins?

The courtiers were **puzzled** and helpless. Many of them roamed around the **entire** week hoping the king would come to the market. They thought, "Oh, if the king comes to the market then we can see his face and spend the gold coins."

Let's learn

Long ago when kings ruled, they appointed a court jester. The court jester's job was to crack jokes and entertain the court. Usually they were smart and they had the right answer to whatever be the situation. Tenali Rama was one such example of a court jester.

Unfortunately for the courtiers, the king did not come to the market at all. The whole week passed this way. After a week, the courtiers **assembled** at the king's court. The king asked them, "So, what did you all buy with the gold coins that I gave you?"

The royal **priest** arose from his seat and spoke on behalf of the courtiers, "Your Majesty, we went to the market with great **enthusiasm** and excitement. We hoped to buy many things with the gold coins you gave us. But the condition you laid was so difficult! How could we see your face while buying things? So, we did not buy anything at all!"

The royal priest pointed to the bags of gold coins the courtiers had brought back and said, "Since we didn't see your face in the market, we did not spend a single gold coin."

The king started to laugh. He turned to

Tenali Rama
and asked him, "Did you manage to buy anything?"

Let's learn

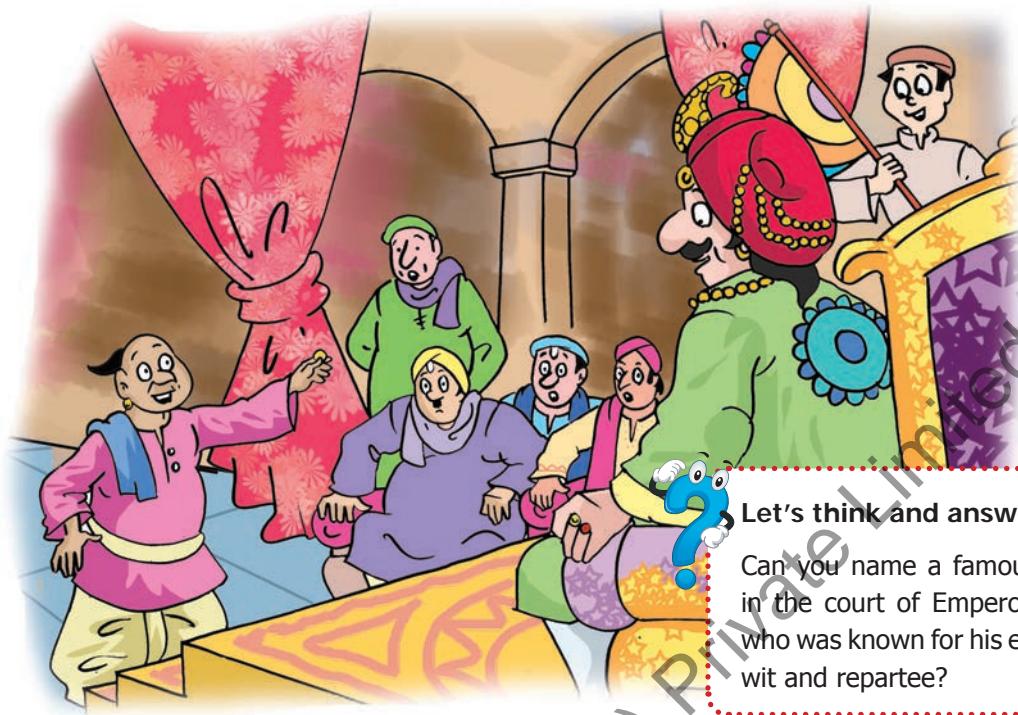
In the olden days, coins had a picture of the ruling king or queen. Today, there's a national figure or symbol on one side of a coin or currency note. Take a close look at a ten-rupee note. On one side, you will see an impression of Gandhiji's face.

That day, Tenali Rama had come to the court wearing new clothes and **ornaments**. He replied, "Your Majesty, look at my new *dhoti*, silk *kurta* and scarf. And here's my shining new ring. I bought all of these with the gold coins you gave me."

The courtiers were thrilled that Tenali Rama would now be punished by the king. They thought, "How could Tenali Rama have bought things without seeing the king's face? He has spent the gold coins without fulfilling the king's condition. He will surely be punished today."

puzzled
entire
unfortunately
assembled
priest
arose
enthusiasm
ornaments

: confused
: full
: unluckily
: got together
: a person who performs religious ceremonies
: got up
: strong feeling of interest (in something)
: jewellery



Let's think and answer

Can you name a famous jewel in the court of Emperor Akbar who was known for his excellent wit and repartee?

The king said, "Tenali Rama! You did not see my face while spending the gold coins. So you have not **fulfilled** the condition that I had laid before you. And yet, you **dared** to spend the gold coins and buy new clothes and ornaments?"

Tenali Rama replied **calmly**, "Your Majesty, I spent every single gold coin only after seeing your face."

The king was surprised. He said, "That's impossible!"

Tenali Rama said, "Your Majesty! How can you forget that every single gold coin bears an **imprint** of your face?"

"Oh...that's right," said the king very pleased with Tenali Rama's **wit**." All the courtiers were left **speechless**.

	fulfilled	: satisfied
	dared	: had the courage
	calmly	: without getting excited, quietly
	imprint	: mark, image (made by stamping)
	wit	: clever and amusing replies
	speechless	: unable to speak due to extreme surprise

EXERCISES



Let's understand

A. Complete the following sentences appropriately.

1. The courtiers received in the court.
2. The courtiers went to the market with





3. Tenali Rama came to the court wearing
.....
4. The courtiers were very happy
5. Tenali Rama replied to the king that

B. Tick (✓) the correct statements and cross (✗) the wrong ones.

1. The king gave his courtiers one month to spend the gold coins.
2. The king started to laugh when he heard the royal priest's reply.
3. The courtiers were sad that Tenali Rama would be punished by the king.
4. The king was speechless on hearing the reply from his courtiers.
5. The king was not pleased with Tenali Rama's answer.

C. Answer the following questions briefly.

1. What was the king's condition?
2. Why were the courtiers unable to buy anything?
3. What did Tenali Rama buy with the gold coins?
4. Why were the courtiers pleased on hearing that Tenali Rama had bought things with the gold coins?
5. How did Tenali Rama fulfil the king's condition?



Let's learn words

A. Make sentences with the words given below. Write them in your notebook.

1. fulfilled
2. puzzled
3. assembled
4. shining
5. ornaments



B. Give the opposites of the following words.

1. difficult
2. calm
3. busy
4. remember
5. possible





C. The word 'courtier' means a person belonging to the royal court. Match the following people to the places where they work.

- | | |
|-------------|-------------|
| 1. nurse | a. kitchen |
| 2. crew | b. school |
| 3. teachers | c. ship |
| 4. mechanic | d. hospital |
| 5. chef | f. garage |



Let's pronounce words

Practise saying the following words aloud which end with the letter 'd'. Repeat those words after your teacher.

assembled fulfilled wrinkled thrilled puzzled opened carried



Let's listen

Your teacher will read out some sentences aloud. Listen carefully and fill in the blanks.

1. The king's courtiers were given gold coins.
2. He gave them a to spend them.
3. The courtiers left the happily as they felt that it was not a condition to fulfil.
4. The courtiers waited in the market for the to come, so that they could see
5. The spoke on behalf of the courtiers.



Let's learn grammar

Sentences are of four kinds:

1. **Statement:** A sentence that says or states something is called a statement. Example: It is a beautiful day.
2. **Question:** A sentence that asks for some information is called a question. Example: What are you eating?
3. **Imperative sentence:** A sentence that expresses a command, instruction, request, or advice is called an imperative sentence.





Example: 1. Keep off the field. (command)

2. Put this letter in a folder. (instruction)

3. Pass me the file, please. (request)

4. You must go to bed on time. (advice)

4. **Exclamatory sentence:** A sentence that expresses a strong feeling of either joy, sorrow or anger, is called an exclamatory sentence.

Examples: Hello! what a surprise.

What a nuisance it is!

A. Write three simple statements.

1.
2.
3.

B. Write suitable questions for these answers.

1. Q.
A. No, it is not. It's my sisters.
2. Q.
A. No, the postman hasn't come.
3. Q.
A. My mother was busy with housework the whole day.
4. Q.
A. No, Ramu doesn't know he has passed the exam.
5. Q.
A. The car runs on petrol.



C. Write whether these imperative sentences are a command, advice, suggestion or a request.

1. Don't move from there.
2. Go and park the car in the garage.
3. You must not disobey your elders.
4. Please help me.
5. He should start eating healthy food.





D. Correct the sentences given below by adding exclamation marks, full stops and capital letters wherever appropriate.

1. what a crazy plan
2. oh, i never thought i could do that
3. ah what a bad choice
4. may you find peace and happiness
5. what you lost the car.



Let's speak

What do you think the courtiers would have talked amongst themselves after they had heard Tenali Rama's reply to the king? Form pairs and create a dialogue.



Think and write

The courtiers showed four kinds of reactions. Their reactions were as follows:

1.
2.
3.
4.



Let's learn more

For more folk stories, visit this website:

<http://raja-thatha-corner.bizhat.com/Stories.html>



Coping with Emotions

It is good to have a sense of humour and laugh at things happening around us. Form groups of five and make a list of five things that make you laugh. Share it with your class. Remember not to laugh when bad things happen to people or when they are hurt.



2

Daddy Fell into the Pond

Let's start

Tick (✓) the picture that shows a pond.



This poem describes a funny situation when Daddy accidentally falls into a pond.



Everyone **grumbled**. The sky was grey.
We had nothing to do and nothing to say.
We were nearing the end of a **dismal** day,
And there seemed to be nothing beyond,
THEN

Daddy fell into the pond!

And everyone's face grew **merry** and bright,
And Timothy danced for **sheer delight**.
"Give me the camera, quick, oh quick!
He's **crawling** out of the **duckweed**."
Click!

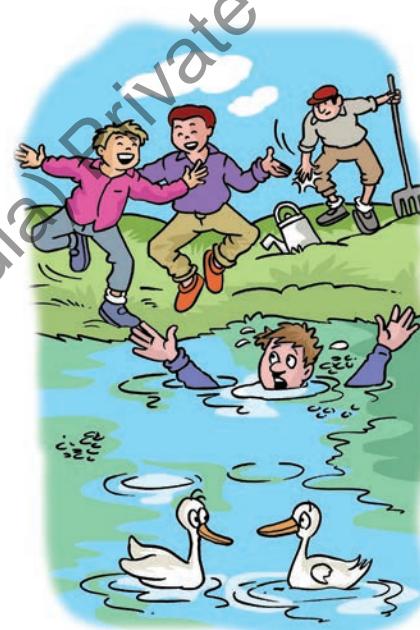
Then the gardener suddenly **slapped**
his knee,
And **doubled up**, shaking silently,
And the ducks all **quacked** as if they were
daft
And it sounded as if the old **drake** laughed.
O, there wasn't a thing that didn't respond
WHEN

Daddy fell into the pond!

Alfred Noyes

Let's learn

Duckweeds are flowering plants that float on still or slow-moving bodies of freshwater.



grumbled	: complained due to bad mood
dismal	: gloomy
merry	: happy
sheer	: extreme
delight	: joy
crawling	: moving forward on hands and knees
duckweed	: a very small waterplant
slapped	: hit with hand
doubled up	: make the body bend quickly over
quacked	: sounds produced by ducks
daft	: stupid
drake	: male duck

EXERCISES



Let's understand

A. Answer the following questions briefly.

1. What did everyone do when Daddy fell into the pond?
2. What did the ducks do then?
3. What did Timothy do then?

B. Think and answer

1. What kind of weather does a 'grey sky' indicate?
2. Why did everyone grumble?
3. Did the old drake really laugh?
4. How did the dismal day change suddenly?
5. What did the poet mean by saying 'there wasn't a thing that didn't respond'?



Let's enjoy

A. Read the poem and write all the words that rhyme with each other.

Example: beyond - pond

.....
.....
.....
.....



Life Skills

Coping with Emotions

It's good to laugh because it makes you feel happy and light-hearted. Write four ways in which you can find reasons to laugh and share it with your class.



3

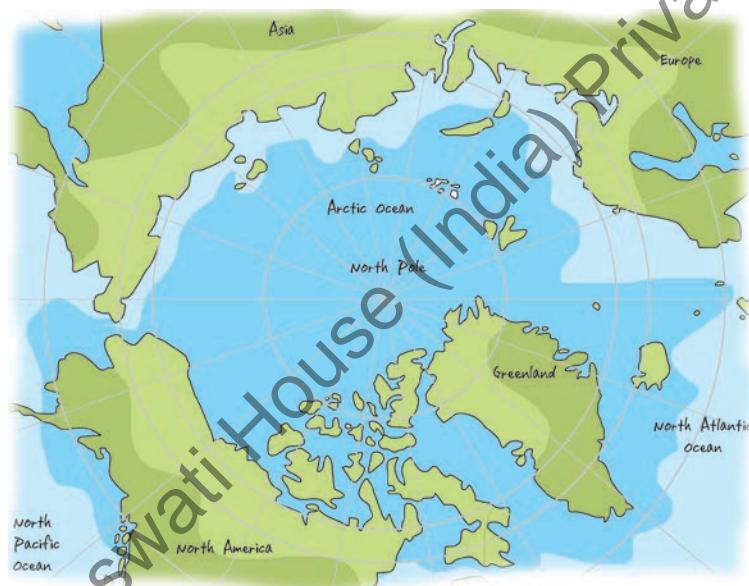
The Ends of the Earth

Let's start

Given below are the names of some animals found in hilly areas, cold regions, deserts, forests etc. Unscramble them and write them in the blanks.

1. *kay*
2. *mcale*
3. *leas*
4. *ntherap*

This lesson is about the North and South Poles—their location, climate and living conditions.
The Poles form the two ends of the earth.



Have you ever wondered about the north and the south end of our earth i.e. the Poles? You may not be able to go to the Poles but you can know about the life there right from where you are!

The North Pole, the roof of our world, is known as the Arctic region and the South Pole is known as the Antarctica. Do you know there's no place called 'Arctica'? This is because the topmost portion of the world is the **frozen** Arctic Ocean which is almost surrounded by land. Antarctica is a **vast** stretch of land as big as the USA and Europe put together.



frozen
vast

: in ice form
: very large sized

If you want to stand at the North Pole, think again! The North Pole is almost at the centre of the Arctic Ocean which is about 10,000



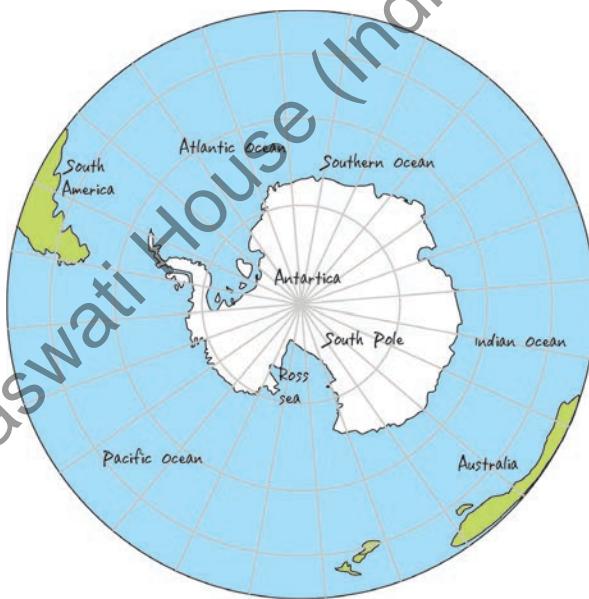
feet deep. The Arctic Ocean is surrounded by the northern most areas of Canada, Alaska, Scotland, the Coasts of Labrador and Europe, and the Polar islands of Greenland, Iceland and Spitzbergen. The South Pole is in the middle of Antarctica which is 19,000 feet above the sea level. The **continent** is **isolated** and covered by an icecap thousands of feet thick.

The only similarity between the Arctic and the Antarctic regions is the long winter nights and the long summer days when the sun never sets. And the only familiar sight in these two poles is a vast **expanse** of white ice and snow. Otherwise, there's a lot of difference between the two Poles. Explorers have always changed their **techniques** while **approaching** these two regions.



Let's learn

About 99% of the world's ice is said to be in Antarctica. If this ice were to melt, then the sea level all over the world would rise by two hundred to three hundred feet!



Both the Poles are **extremely** cold. But the winters in the Antarctic or the Land of the Far South, are the coldest on the earth - it is 10° F colder than the Arctic! In summer, at the North Pole, the temperature stays near the **freezing point** as the ice melts. But at the South Pole, even during the warmest summer days, the

continent	: a huge land mass	
isolated	: far away from any other place	
expanse	: huge land mass	
techniques	: methods used (to do something)	
approaching	: nearing	
extremely	: terribly	
freezing point	: the temperature at which a liquid freezes	





temperature remains far below the freezing point. In 1983, a low of -128° F was recorded in the South Pole.

You will not find crowds, busy streets and markets in these regions. The main population of the Arctic region is made up of **Eskimos**, polar bears, reindeers, seals, caribous and a large variety of birds. Pine forests grow in some parts of the Arctic region. When the ice melts, Eskimos take their boats called *kayaks* and go hunting and fishing in the ice-cold water.

On the other hand, Antarctica is like a cold desert without any plants or shrubs growing on it. You will find only ice and no human beings. But along the shores, there are a few varieties of birds such as penguins, **albatross** and some species of petrels. In the surrounding waters and islands one can spot seals. There are no polar bears in Antarctica. Seals are the only **mammals** found here! Instead of people, penguins live in colonies. It is said that sometimes they visit human camps out of sheer curiosity!

The cold, harsh climate of the Poles is no **obstacle** for **explorers** and scientists. Since a long time, the **mystery** of the Poles has continued to attract man's **curiosity**. Some go there to know more about the earth, some to hunt minerals, some to study the weather or animals. You may also want to move to the ends of the earth when the places we live in get hotter.



Let's think and answer

The reasons attributed for the success of explorers who reached the poles are focus, and flexibility. What other reasons can you give?



Eskimos	: a race of people who live in parts of Greenland, Alaska, Siberia, etc.
albatross	: a very large web-footed white bird with long wings
mammals	: animals who give birth to young ones
obstacle	: hindrance , barrier
explorers	: persons who travel to unknown places to discover more about them
mystery	: something that is difficult to understand or explain
curiosity	: keenness to know (something)



EXERCISES



Let's understand

A. Tick (✓) the correct statements and cross (✗) the wrong ones.

1. Antarctica is a heavily populated continent.
2. In summers the temperature in the Arctic region reaches the freezing point.
3. Polar bears are popular in the Antarctic region.
4. The South Pole is at the centre of the Arctic Ocean.
5. Scientists and explorers are always interested in visiting the Poles.

B. Complete the following sentences appropriately.

1. Antarctica is a vast stretch of
2. The Arctic region and Antarctica have long
3. The Poles are extremely
4. The boats used by the Eskimos are called
5. Penguins live in

C. Answer the following questions briefly.

1. Why do you think there's no place called 'Arctica'?
2. How do you know the South Pole is colder than the North Pole?
3. Name the animals found in the Arctic region.
4. Why do you think penguins visit human camps?
5. Why do explorers and scientists go to the polar regions?



Let's learn words

A. Write the words given below in alphabetical order.

mystery	variety	stretch	coldest	island
---------	---------	---------	---------	--------

Example:

windy	soil	astronaut
-------	------	-----------

 will be arranged thus:

astronaut	soil	windy
-----------	------	-------





In case of words beginning with the same letter, consider the second or third letter.

Example: **brain box bottle** will be arranged in this order: **brain bottle box**

Write the following words in alphabetical order, as shown above.

polar	bear	penguin	petrel
-------	------	---------	--------



Let's pronounce words

Practise saying these words which end with the letter 't'. Some of them end with the letter 'd' but they also produce a 't' sound. Repeat them after your teacher.

pleased	wept	erased	bent	asked
---------	------	--------	------	-------



Let's listen

Listen to your teacher read out an article from a newspaper and answer the questions given below. Do this activity in pairs.

1. Whom is the newspaper article about?

.....

2. What was the prince preparing for?

.....

3. What do the team do for four hours a day? Why was it important?

.....

4. How cold is the South Pole?

.....

5. When will the polar expedition take place?

.....





Let's spell well

Fill in the two middle letters that are missing in the words taken from the lesson.

1. car _____ ou
2. sh _____ es
3. re _____ on
4. fr _____ en
5. iso _____ ted



Let's learn grammar

A. Change these statements into exclamatory sentences.

1. He is a very mean person.

.....

2. The weather is so horrible.

.....

3. Our soldiers are really brave.

.....

4. We won the match.

.....

5. This is a beautiful flower.

.....

B. Subject and Predicate

You've already studied about sentences. A sentence has two parts: the the **subject** and the **predicate**.

The person who does the action is called the subject.

Example: The boy went to school.

In this sentence, **The boy** is the subject.

The **predicate** is what happens to the subject or what the subject has, is or does. In the above sentence **went to school** is the predicate.



Underline the subject in these sentences.

1. Geeta's father is in the office .
2. The earth rotates on its axis.
3. My mother is cooking in the kitchen.
4. The wind is blowing hard.
5. Farmers are sowing the seeds.

C. Match the subject with the predicate suitably.

- | | |
|--------------|--------------------------------|
| 1. The bread | a. barked at the stranger. |
| 2. Birds | b. comes after November. |
| 3. The dog | c. are grazing in the pasture. |
| 4. December | d. is in the shopping cart. |
| 5. Sheep | e. fly in the air. |



Let's speak

Do this activity in groups. Continue the imaginary dialogue between two Eskimos and enact it. You can add characters if necessary.

Eskimo 1: Thank God! The long, cold winter nights are over.

Eskimo 2: Hurrah! The sun's out.

Eskimo 1:

Eskimo 2:



Think and write

Write the similarities and the differences between the Arctic region and the Antarctic region in the table given below.

Similarities and Differences		
	Arctic region	Antarctic region
Location		
Summer Temperature		
Winter Temperature		
Plants		
Animals		
Population		



Let's learn more

To know more about the Poles, visit the website:
<http://climatekids.nasa.gov/polar-temperatures/>

Life Skills

Look at the pictures and write two sentences on how polar bears and Eskimos protect themselves from the harsh wind and cold. What's common between them? Had you been in such a condition, how would you have managed?

.....
.....
.....

Critical Thinking



4

The Rumour

Let's start

Draw in your notebook a bird that spreads its beautiful feathers and dances when dark clouds appear in the sky before rain starts. What is this bird called?

This folktale is about how easily a rumour spreads among people.



Long ago there lived a **priest** in a temple in a village. One day, the priest was crossing a field. He felt that there was something in his mouth, so he spat it out. It turned out to be a heron's feather!

The priest was **perplexed**, "How did this bird's feather get into my mouth?"

When he reached home, he discussed it with his wife. Then he told her, "Don't tell

anyone about this; who knows somebody may **interpret** it, in a wrong way."

The priest's wife wondered about the strange **occurrence** and wanted to **confide** in

	priest : a person who performs sacred rituals
	perplexed : confused and anxious
	interpret : bring out the meaning
	occurrence : happening
	confide : reveal in private

Let's learn

A heron is a wading bird with a long neck, slim body and grey or white plumage. It feeds on fish, reptiles, aquatic insects etc.



someone. She made her neighbour swear that she would keep it a secret and told her about the **incident**.

The priest's wife probably **related** the incident in a way which left an impression that several feathers had come out of the priest's mouth. The neighbour was shocked but **assured** her that there was nothing to worry about.

"Please don't tell anyone," said the priest's wife. "My lips are sealed," said the neighbour. But she was **longing** to tell someone!

When the neighbour saw the washerman's wife walking past, she called her and told her the whole story. She made it sound as if a whole heron had come out of the priest's mouth. "Oh! I've never heard of such a thing before!" the washerman's wife's eyes popped out in excitement. "And he's a vegetarian but one can never tell...", she said.



She went away promising not to tell anyone but on the way she met her friend. And the whole story **tumbled** out of her mouth. Probably, in her excitement, the washerman's wife said herons instead of heron or maybe that's how it sounded to the friend.

incident	: something that happened
related	: gave an account, told
assured	: made it certain (guaranteed)
longing	: needing badly
tumbled	: came out rapidly





After sometime, when the friend told her husband the story, she made him believe that a whole flock of herons had **emerged** from the priest's mouth!

So, as the story spread, a whole flock of herons became hundreds of birds of all shapes and sizes.

By evening, the entire village and even some **neighbouring** villages had heard the story! People arrived in **droves** at the priest's house to **witness** that miracle.

The priest **steadfastly denied** that any bird had come out of his mouth but nobody believed him. "Please **demonstrate** this wonderful power of producing birds from your mouth," they begged.

Finally, **exasperated** by the **rumour**, the priest requested the people to sit in front of his house. Then he quickly ran out from the back door of his house and hid in the jungle. He stayed there for several days till the excitement died down and the people realised that the news was false.

emerged	: came out
neighbouring	: surrounding
droves	: in large numbers
witness	: see, look at
steadfastly	: firmly
denied	: disagreed
demonstrate	: show
exasperated	: extremely annoyed
rumour	: a piece of information, or a story, that people talk about, but may not be true.



Let's think and answer

One of your friends wants to hurt someone by spreading a false rumour. What should you do in such a situation?

Adapted from a Bengali folktale



Let's understand

EXERCISES

A. The people who were involved in spreading the rumour are given below, in a jumbled manner. Put them in the correct order.

1. the friend's husband
2. the washerman's wife
3. the priest's neighbour
4. the washerman's wife's friend
5. the priest's wife



B. Tick (✓) the correct answers from the given options.

1. When the priest spat out the heron's feather, he was

- a. happy.
- b. perplexed.
- c. not bothered.

2. When people begged the priest to demonstrate his power, he was

- a. excited.
- b. exasperated.
- c. curious.



C. Answer the following questions briefly.

1. Why did the priest ask his wife not to relate the incident to anyone?

2. What was the washerman's wife hinting at when she said that the priest was a vegetarian?

3. Why did people arrive in droves at the priest's house?

4. What did the priest hope to do by hiding in the jungle?

5. Do you think the rumour could have been stopped from spreading? How?

D. Who said to whom?

1. Oh! I've never heard of such a thing before!"

2. "How did it get into my mouth?"

3. "Please don't tell anyone."



4. "Please demonstrate that wonderful power of producing birds from your mouth."



Let's learn words

Some words have silent letters. You cannot hear them when you say these words. But they are there when you write the words. Example: In the word 'comb', the letter 'b' is silent. In the word 'column', the letter 'n' is silent.

A. Write five words having silent letters in them.

1.
2.
3.
4.
5.





B. Match the following words to their meanings.

- | | |
|----------------|--------------|
| 1. perplexed | a. happening |
| 2. steadfast | b. refused |
| 3. demonstrate | c. irritated |
| 4. exasperated | d. firm |
| 5. denied | e. confused |
| 6. occurrence | f. show |



Let's pronounce words

Say these words aloud. In the words given below, the letters 'qu' are pronounced as 'kw'. Repeat them after your teacher.

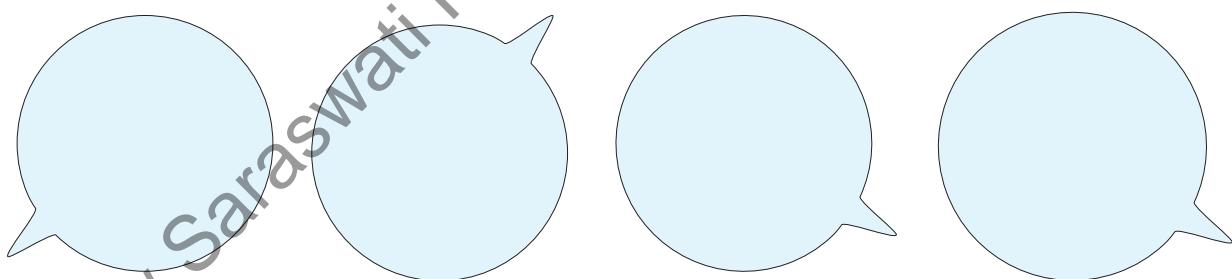
quiet	queer	quack	question	query
quiz	quiver	quake	quill	queue



Let's listen

Listen to the conversation read out by your teacher.

1. Write them in these speech bubbles.
2. Discuss the conversation that sounds like gossip.



Let's spell well

Tick (✓) the right spellings in the following sentences.

1. He sat by the (sea/see) all day long.
2. The (principal/principle) asked the students to be (quiet/quite).
3. This dress is a little (lose/loose) for me.
4. Are you going (to/too)?
5. Everyone left for the film (except/accept) Leela.





Let's learn grammar

A. Choose five common nouns from the lesson and write them below.

1.
2.
3.
4.
5.



B. Write suitable proper nouns in the blanks.

1. Name of a city in India
2. Name of an icy continent
3. Name of India's current Prime Minister
4. Name of a mountain
5. Name of the country where Queen Elizabeth lives

C. Fill in the blanks with collective nouns from the box.

flock swarm bouquet crew bunch

1. Sita gave me a beautiful of flowers.
2. Mr. Lal bought a of grapes.
3. A of sheep came rushing down the hill.
4. The airline got ready for the flight.
5. A of bees was seen in the garden.



D. Add the letter 's' or 'es' to the singular nouns given below to form their plurals.

1. watch
2. bush
3. glove
4. oasis
5. wife



Let's speak

Speak about any rumour that you may have heard. It could be from your daily life or something that has been mentioned in a newspaper.





Think and Write

Imagine you were the priest who was a victim of rumour. Write how you felt when people arrived in droves at your house hoping to witness a miracle. Also mention, what you decided to do then.



Let's learn more

It's always good to speak the truth. Read a story on honesty. Visit the site:
<http://www.preservearticles.com/2011082511780/story-of-an-honest-wood-cutter-moral-honesty-is-the-best-policy.html>

Life Skills

Effective Communication

Interpreting a message

The first person in the row whispers a message in his partner's ear. The next person whispers the same thing in another partner's ear. Finally, the last person in the row will say the message aloud. The first person should confirm if the message is the same as it was said originally or it had changed on the way. Try this and find out how a message can be misinterpreted or misunderstood when it is passed on to many people.

Discuss what you can do to avoid this misinterpretation and misunderstanding.



5 The Pedlar's Caravan

Let's start

Class discussion

- Have you seen vendors on the roadside? What things do they sell?
- Have you ever seen a caravan? What do the people in them do for a living?



In the poem the poet wishes to be a pedlar. He seems to be fascinated by a pedlar's life.

Wish I lived in a **caravan**,
With a horse to drive, like the **pedlar**-man!
Where he comes from nobody knows,
Or where he goes to, but on he goes!

His caravan has windows, two,
And a **chimney** of tin, that the smoke comes
through;
He has a wife, with a baby brown,
And they go riding from town to town!

"Chairs to mend and **delf** to sell"
He clashes the basins like a bell;
Tea-trays, baskets, **ranged** in order,
Plates with the alphabet round the border!

The roads are brown, and the sea is green,
But his house is just like a bathing machine;
The world is round, and he can ride,
Rumble and splash, to the other side!

With the pedlar-man I should like to roam,
And write a book when I come home;
All the people would read my book,
Just like the Travels of Captain Cook!

W.B. Rands



caravan	: a large covered wagon drawn by a horse
pedlar	: a person who goes from one place to another, selling small articles
chimney	: a tall structure in a building through which smoke exits
delf	: earthenware with a blue decoration on a white background
ranged	: arranged
rumble	: to move with a loud, heavy sound

Let's learn

Peddling is still the preferred occupation of the poor people in India. All that is necessary to enter this business is the money to purchase a daily stock of goods (like fruits, vegetables) and a wheeled wooden cart to transport their goods from home to home. The poorest peddlers carry their goods in a basket on their head.

EXERCISES



Let's understand

A. Answer the following questions briefly.

1. What does the poet wish?
2. What is not known about the pedlar-man?
3. Describe the pedlar's caravan.
4. What does the pedlar sell?
5. What does the poet want to do?

B. Think and answer

1. Why does the pedlar clash his basins?
2. What kind of book does the poet wish to write?



Let's enjoy

Work in pairs and write the words that rhyme with each other in the poem.

.....
.....
.....

Life Skills

Effective Communication

What does travelling mean to you? Tick (✓) the appropriate views.

Travelling is....

- discovering a new place.
- meeting new people.
- not at all exciting.
- learning about new customs and lifestyles.
- fear of strangers.
- eating different varieties of food.
- learning a new language.
- carrying luggage and waiting at railway stations and bus stops.



6

Disney's World of Imagination

Let's start

Name these famous cartoon characters.



This lesson is about a man named Walt Disney who created several world-famous cartoon characters. Let's take a look at his life history.

Early years

Walter Elias Disney was born on December 5, 1901. He grew up on a farm in Missouri, USA. Much before he created cartoons, he did a lot of other things.

As a boy, Walt Disney worked for a barber. He did a short course on drawing and painting in Chicago and Kansas City. During World War I, he worked as an **ambulance** driver for the Red Cross in France. In the year 1919, he worked in **advertising** and produced cartoon **slides** which were called 'Laugh-o-Grams'.

Moving to California with a dream

When his **animation** business did not do well, Disney moved to California. All he had was a half-filled suitcase and unfulfilled dreams in his head. He stayed with his Uncle Robert who lived in a small house. He visited studios and took up few parts as an **extra**. When he had no money left, he borrowed from his brother Roy and paid Uncle Robert \$5 a week as rent for a room in his house.



ambulance	: a vehicle fitted with special equipment, used for taking sick or injured people to a hospital
advertising	: to give information to the public about a product or service through newspaper, radio or television
slides	: pictures or text that move smoothly
animation	: the technique used in production of cartoons
extra	: a person who plays a small role





Birth of the Walt Disney Company

Disney's brother Roy, **encouraged** him to start his animation business again. But Disney was unsure, "I'm already too late." He felt he could not **compete** with the experts in New York. However, he did not give up.

In Uncle Robert's garage, Disney **constructed** a camera stand with some wooden boxes and logs of wood. He made cartoon reels which were just stick figures that **delivered** jokes in balloons. Then suddenly, he got a **contract** from New York to produce six animated cartoons. Soon after, the Walt Disney Company was formed.

Let's learn

You have seen several of Walt Disney's cartoons. A number of toys, games and dolls have been made based on them and sold across the world. The famous Disney cartoon character, Donald Duck has had a line of foods named after him.

Birth of Mickey Mouse and other cartoons

One day in the spring of 1928, Disney asked his animator Ub Iwerks to draw a new cartoon character. Iwerks tried sketches of dogs and cats but it did not **appeal** to Disney. Finally after many attempts, Mickey, a funny animal cartoon was created at the Walt Disney Studios. He was **officially** introduced in a short film called Steamboat Willie as one of the first sound cartoons. Then he appeared in 130 films. Minnie Mouse was also created in the year 1928 as Mickey's friend. Donald Duck was created in 1934 as a friend for Mickey Mouse. Goofy, a close friend of Mickey Mouse and Donald Duck, was created in 1932. Daisy Duck, Donald Duck's friend was created in 1940.

Disney went on to create several other cartoon characters but he never forgot that Mickey had brought him success. He said, "I only hope that we never **lose sight of** one thing – that it was all started by a mouse."

Disneyland opens to the world

In 1955, Disneyland, an **amusement** park, was opened in California, USA. The young, the old, presidents, **royalty** and even the heads of states from other countries visit this park. Every year, new **attractions**

encouraged	: supported
compete	: outdo
constructed	: built
delivered	: sent
contract	: order, business deal
appeal	: attract, find with
officially	: formally
lose sight of	: fail to see
amusement	: enjoyment, fun
royalty	: royal people like kings, queens
attractions	: captivating features



Let's think and answer

What lessons can one learn from Walt Disney, one of the most successful entrepreneurs in history?





are added in this park. Disney said about Disneyland, "It will never be finished. It will grow as long as there is imagination left in the world." Would you like to visit this world of imagination someday?

Let's learn

Walt Disney has won a total of 32 Oscar Awards during his 43 years' career, more than anyone else ever has. He was indeed a record breaking Oscar Award winner.

EXERCISES



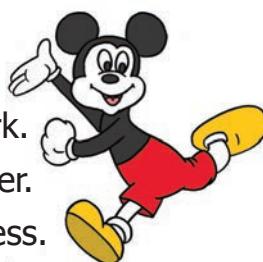
Let's understand

A. Rewrite the cartoon characters in the order they were created by Walt Disney.

1. Daisy Duck
2. Mickey Mouse
3. Donald Duck
4. Minnie Mouse
5. Goofy

B. Fill in the blanks with suitable words.

1. Disneyland is an park.
2. Donald Duck is a character.
3. Walt Disney was in business.
4. Mickey Mouse was, introduced in 1928.
5. Walt Disney and Ub Iwerks Mickey Mouse.



C. Answer the following questions briefly.

1. What were the things that Walt Disney did before he created cartoons?
2. What did he do in Uncle Robert's garage?
3. Why was he unsure of his ability to create cartoons at one point of time?
4. Name the cartoon characters created by Walt Disney?
5. Who all visit Disneyland?



Let's learn words

There are some words that sound the same but have different meanings. Such words are called homophones.

Example: hole, whole see, sea

A. Write the homophones of the following words.

- | | |
|----------------|----------------|
| 1. rode | 6. rose |
| 2. pane | 7. right |
| 3. rays | 8. plain |
| 4. waste | 9. meet |
| 5. bean | 10. made |

B. Make sentences using the following words taken from the lesson. Write them in your notebook.

constructed lose sight of appeal officially attractions



Let's pronounce words

The words given below are pronounced with 'ed' endings. Say these words aloud. Repeat them after your teacher.

created nodded suggested completed visited shouted recalled



Let's listen

Your teacher will read out some sentences. Listen carefully and fill in the blanks with suitable words of polite requests.

1.close the door; it is cold outside.
2.borrow your book for a day?



3.go out to play?
4.use your cellphone?
5.have another piece of cake?
6.give me a lift to the bus stop?
7.come in, please?
8.lend me your box?
9.love a bigger pillow, please?
10.go out and see who is outside the door?



Let's spell well

Add the letters 'er' and 'est' to the words given below and write them. The spellings will change slightly.

1. wise
2. happy
3. strong
4. witty
5. lovely



Let's learn grammar

Some words can be nouns or verbs. The words showing action are verbs. Nouns are words that name a person, place, animal, thing or quality.



A. Write whether the highlighted words are nouns or verbs.

1. I left my **book** in the library.
Please **book** your tickets right away.
2. Sheila bought a new **brush**.
Do you **brush** your teeth every night?
3. The manager had a good **plan**.
We must always **plan** our trips.
4. She has some **land** in the village.
Will the plane **land** on time?
5. Don't **waste** time in the class.
There's so much **waste** in the backyard.





B. A verb must agree with its subject in number and person.

Examples: I am, We are, He is.

Rewrite the sentences using the correct verbs.

1. John were with the children all day.
2. I am in my grandmother's house last sunday.
3. The little boy have a cupboard full of toys in his home.
4. The parrots is kept in a big cage.
5. I are so tired today.



C. Underline the verbs in the paragraph.

"They are your brothers," my wife told me. "I have changed them into dogs and they will remain like that for ten years. After ten years, bring them to me and I will change them back into men." She told me the place where I could find her in ten years' time. Then she disappeared. "The ten years are over. I am now on my way to find her," said the old man.

D. Complete the following sentences using suitable verbs.

1. There was a king who.....
2. The athlete was.....
3. One morning, the fishermen.....
4. The boy was.....
5. I like to



Let's speak

Imagine you are a boy named Tom. You are going to meet Mickey Mouse. Write a short dialogue between Mickey Mouse and yourself. You can start like this:

Tom: Hello Mickey! I am so glad to meet you.



Mickey:

.....

Tom:

Mickey:

Tom:



Think and write

- A. Circle Walt Disney's character traits from the box given below.

hard-working	careless	determined	imaginative	boring
proud	lazy	creative	humble	visionary

- B. What did Walt Disney mean when he said about his amusement park, "It will never be finished. It will grow as long as there is imagination left in the world?"



Let's learn more

To know more about the attractions in Disneyland, California, USA, visit the website:

<https://disneyland.disney.go.com/attractions/>

Life Skills

Critical Thinking

In a difficult situation, most people would just quit and take whatever they can out of what's left. But Walt Disney was different; he did not believe in calling it quits. Failures never deterred him; he pursued his passion relentlessly. What do these attributes convey to you about him?



Practice Worksheets

1. The King's Condition

Worksheet 1

A. Complete the following sentences suitably.

1. The courtiers were

.....

2. The king said that

.....

3. Tenali Rama bought

.....

B. Rewrite these exclamatory sentences as statements.

1. Hurrah! We won the basketball match.

.....

2. What a lovely dress!

.....

3. May you be happy and safe!

.....

4. Long live the minister!

.....



Worksheet 2

Comprehension

Read the invitation given below.

Dear Friend,

I am turning ten soon!

Please do attend my birthday party on Sunday, October 20, at 4 p.m. at my residence:
C-130, Pearl Apartments, LP. Nagar, Saket, Hyderabad.

With love

Rajan

Ph: 98431607685



Now answer the following questions based on the given invitation.

1. Who is celebrating his birthday?
2. How old is Rajan going to be?
3. When is the birthday?
4. Where will the birthday party be held?
5. Who are being invited?
6. What is written on the bottom left side of the invitation?



Worksheet 3

Did any funny incident ever take place in your life? Use the hints given below to write it in your notebook.

- When did the incident occur?
 - Who was involved?
 - What was the situation?
-
.....
.....

3. The Ends of the Earth

Worksheet 1

Subject and Predicate

- A. Write one sentence below each picture. It must say something about the picture. In these sentences write 'S' above the Subject and 'P' above the Predicate.



1.
.....
.....

2.
.....
.....





3.
....
....

4.
....
....

Worksheet 2

Comprehension

Read the following story carefully.

Once upon a time there lived an old farmer. He had four sons who were always quarrelling with each other. He was unhappy to see them fight. He often advised them to live peacefully but they never paid attention to his advice.

Many years later, the farmer fell ill. He sensed he would not live for long. He wanted to put an end to the disunity among his sons. Though he was weak and old he thought of a plan and called his sons. He said, " Dear sons, I'm going to depart from this world soon. I want to tell you something. Bring me a bundle of wooden sticks tied together."



The four sons brought the bundle of sticks to their father. The old farmer asked his eldest son to break the bundle of sticks. His eldest son tried his best but he could not break it. Each of the three remaining sons also tried, but in vain. Then the old farmer asked them to untie the bundle and break a stick each. They were able to do it.





Now the old farmer explained, "My sons, if you remain divided, you can be broken just like this stick. But you can become strong as this bundle of sticks if you remain united." The sons soon realized their mistake and vowed never to quarrel among themselves again. On the basis of your reading of the story, answer the following questions:

1. Why was the old farmer unhappy?
2. What did he ask his sons to do?
3. Were the sons able to break the bundle of sticks? Why not?
4. What lesson do you learn from this story?



4. The Rumour

Worksheet 1

Noun

- A. Write the plurals of the following nouns suitably. One has been done for you as an example.

1. One leaf but several leaves
2. Many loaves but one
3. One grape but a bunch of
4. One half but two
5. Few calves but one

- B. Write the common nouns (given in the box) before the proper nouns given below.

man	capital	day	river	country	author
-----	---------	-----	-------	---------	--------

1. Delhi
2. Mr Lal
3. Ruskin Bond
4. Monday
5. India
6. Ganga



Worksheet 2

Comprehension

Read the stanza from the poem named "From a Railway Carriage".

Faster than fairies, faster than witches,





Bridges and houses, hedges and ditches;
And charging along like troops in a battle,
All through the meadows, the horses and cattle:
All of the sights of the hill and the plain
Fly as thick as driving rain;
And ever again, in the wink of an eye
Painted stations whistle by.



A. On the basis of your reading of the above poem, answer the following questions.

1. What was faster than fairies and witches?
2. What charged along like troops in a battle?
3. What does 'wink of an eye' mean?

B. Write down all the common nouns used in the poem.

.....
.....

C. Describe all that the poet saw from the railway carriage.

.....
.....
.....
.....

6. Disney's World of Imagination

Worksheet 1

A. List down at least eight verbs ending with the letters 'ed' from the lesson "Disney's World of Imagination".

1.
2.
3.
4.
5.





6.
7.
8.

B. Correct the following sentences and write them in the lines given below.

1. She says she was eating now.

.....

2. They was going to the market early in the morning.

.....

3. How were the old lady managing all alone?

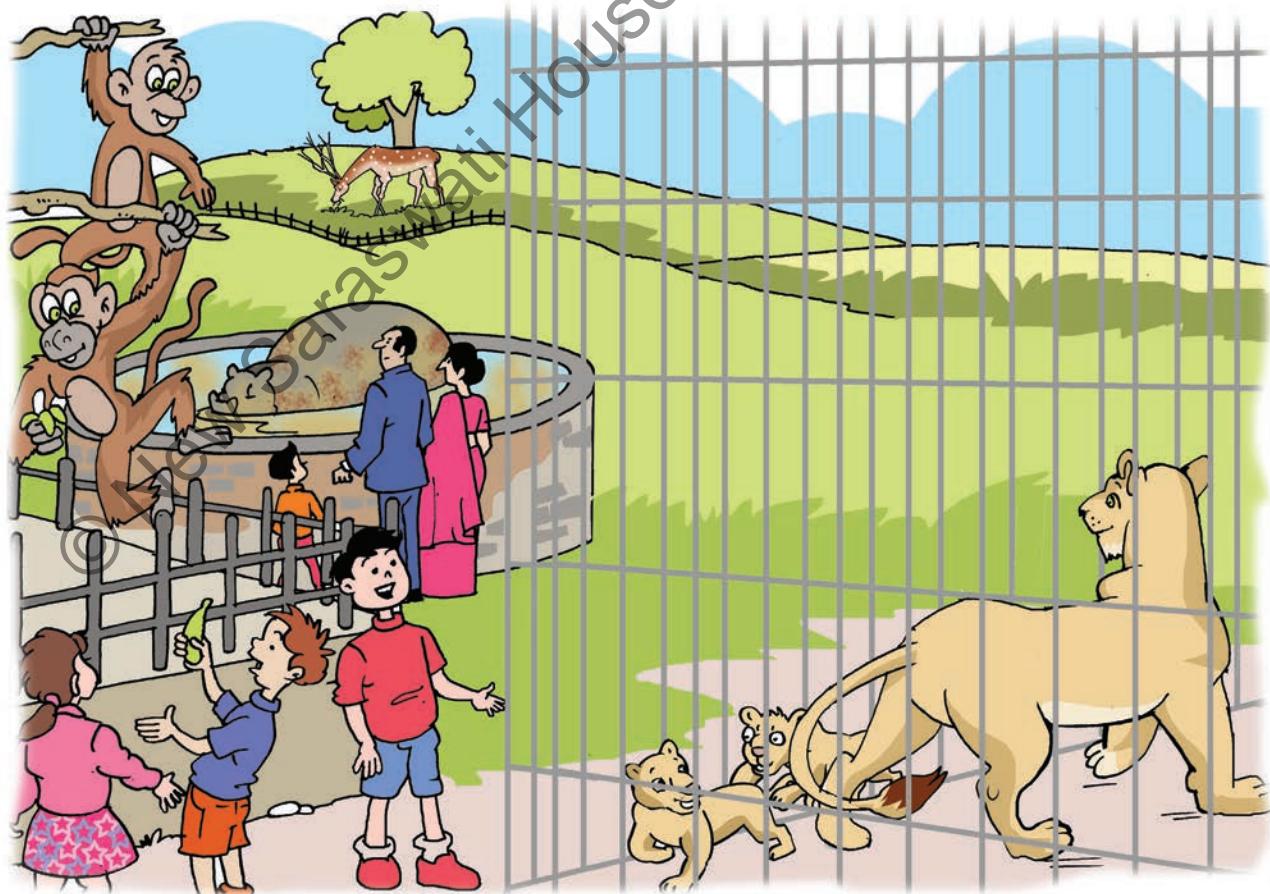
.....



Worksheet 2

Picture Composition

Observe this picture carefully and answer the following questions.





Questions

1. A place where wild animals are kept for people to see is called a.....
.....
2. What is the lion's young one called?
.....
3. What is the boy giving to the monkey?
.....
4. What is the hippo covered with?
.....
5. What is the deer doing near the tree?
.....

Worksheet 3

Write homonyms of the following words. Make sentences using them to show their difference. The first one has been done for you as an example.

1. Desert : Camel is a very useful animal in the desert.
Dessert : We will have ice cream for dessert at night.
2. Check :
:
3. Floor :
:
4. Pain :
5. Main :
6. Pail :



Let's Revise

A. Match the words with their meanings.

- | | |
|---------------|----------------------------|
| 1. enthusiasm | a. gloomy |
| 2. isolated | b. carried out |
| 3. dismal | c. to want something badly |
| 4. perplexed | d. total |
| 5. fulfilled | e. kept apart |
| 6. sheer | f. keen interest |
| 7. longing | g. confused |

B. Who said the following?

1. "Chairs to mend and delf to sell."

.....

2. "Please demonstrate that wonderful power of producing birds from your mouth."

.....

3. "How can you forget that every single gold coin bears an imprint of your face?"

.....

4. "Give me the camera, quick, oh quick!"

.....

5. "How did it get into my mouth?"

.....

C. Tick (✓) the correct answers from the given options.

1. The gardener

a. fell into the pond.

b. doubled up, shaking silently.

c. danced in sheer delight.





2. The Antarctic region
- a. is colder than the Arctic region.
 - b. is home to the Eskimos.
 - c. has polar bears and seals.
3. The priest spat out
- a. in anger.
 - b. in frustration.
 - c. a heron's feather.
4. The courtiers were pleased that Tenali Rama would be
- a. punished.
 - b. rewarded.
 - c. ignored.

D. Write the answers for the following questions briefly.

1. Why did the poet want to write a book like Captain Cook?

.....
.....

2. How did Tenali Rama win the king's favour?

.....
.....

3. How did a dismal day suddenly change?

.....
.....

4. Where is the North Pole?

.....
.....

5. What did the priest do to escape from the crowd?

.....
.....

Listening Texts



1. The King's Condition

1. The King's courtiers were given fifty gold coins.
2. He gave them a week to spend them.
3. The courtiers left the court happily as they felt that it was not a difficult condition to fulfil.
4. The courtiers waited in the market for the king to come, so that they could see his face.
5. The priest spoke on behalf of the courtiers.

3. The Ends of the Earth

"Prince Harry prepares for the Polar expedition by chilling out in a –35°C cold chamber for 24 hours"

17 Sep 2013

Prince Harry spent yesterday chilling in a –35°C cold chamber as he prepared for his South Pole trek. He and his teammates from the "Walking With The Wounded Challenge" spent 24 hours in a freezing weather simulator, practising putting up tents and hiking in 60 miles per hour winds.

A spokesman for the charity raising money for injured servicemen and servicewomen said: "The team will spend four hours a day making and breaking the camp. It is important this activity is rehearsed to save time."

The 29-year-old prince and his comrades wore brightly coloured matching coats with fur-lined hoods and used cross-trainers to simulate skiing in tough conditions.

The training at Mira in Nuneaton, Warwickshire, will help Harry and his team of injured military personnel prepare for the 200-mile trek to the South Pole in extremely cold –40°C conditions.

The expedition will be setting off in November 2013.

Source

Mirror News, UK





Note for the teacher: Please explain the meaning of simulation to the students. It's a device or machine that creates a condition similar to that of the real process.

4. The Rumour



6. Disney's World of Imagination

1. Can you please close the door as it is cold outside?
2. May I please borrow your book for a day?
3. Can we go out to play, please?
4. May I use your cellphone, please?
5. Can Asha have another piece of cake please?
6. Will you please give me a lift to the bus stop?
7. May I come in, please?
8. Would you please lend me your box?
9. Can I have a bigger pillow, please?
10. Could you please go out and see who is outside the door?



Mathematics



1.	Large Numbers and Roman Numerals	54
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LARGE NUMBERS AND ROMAN NUMERALS

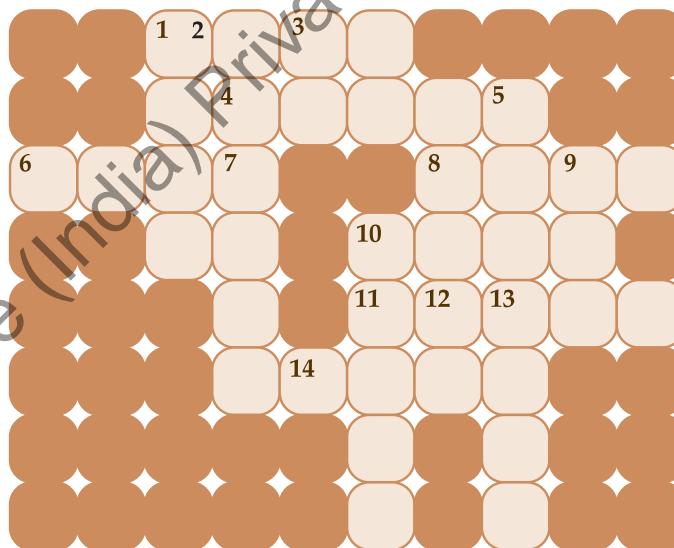


Start Zone

You all are familiar with the numbers upto four digits. Let us recall them now.
Use the clues given below and put the numbers in the crossword.

Across

- Numeral for nine thousand eight hundred and fifty-nine
- The smallest four-digit number
- Predecessor of 5400
- Standard form of $5000 + 400 + 70 + 5$
- Middle number, if the numbers 1234, 3000, 1235, 2436 and 3413 are arranged in ascending order
- Successor of 3457
- The smallest three-digit odd number



Down

- The greatest four-digit number
- Place value of 5 in 3752
- Larger number between 2434 and 2432
- The greatest four-digit even number
- Number just after 764
- Number between 7000 and 7010 whose sum of digits is 9
- A number more than 4000 and less than 5000 whose all digits are same

Across 1. 9859	4. 1000	6. 5399	8. 5475	10. 2436	12. 3458	14. 101	Down 2. 9999	3. 50	5. 2434	7. 9998	9. 765	11. 7002	13. 4444
----------------	---------	---------	---------	----------	----------	---------	--------------	-------	---------	---------	--------	----------	----------

Answers



Knowledge Zone

Large Numbers

Numbers make the counting of things easy. When we count a small group of objects, we need smaller numbers. For example, number of girls and boys in a class. But when we count the number of girls in a state, population of a country etc., we need rather larger numbers.

In the previous class, you have learnt upto four-digit numbers. In this chapter you will learn upto seven-digit numbers. Numbers 1, 2, 3, 4, 5, ... are called **natural numbers**. Numbers are endless as every number is followed by a number greater than it by 1.

Systems of Numeration

Usually, numbers are expressed using two systems of numeration—(i) Indian system of numeration and (ii) International system or Western system of numeration. Both of these systems use place value chart which help us to represent numbers. Let us first know the Indian system of numeration and its place value chart.

Indian system of numeration

In this system numbers are written using the digits 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 with each digit getting a value depending on the place it occupies in the place value chart. This place value chart is known as Indian place value chart.

Periods and commas in Indian place value chart

The place value chart shown below is known as **Indian place value chart**. It has been separated by two periods—ones period and thousands period. Starting from the right, ones period has three places—ones, tens and hundreds. The thousands period has two places—thousands and ten thousands. Consider the number 53679 and let us place its digits in the place value chart.

Periods	Thousands		Ones		
Places	Ten Thousands (TTh)	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)
Number	5	3	6	7	9

Use of comma

To read and write large numbers easily, we use a comma to separate the periods. In Indian system, first comma comes after three digits from the right (i.e., after ones period), next comma comes after next two digits (i.e., after thousands period) and then after every two digits and so on.



Example : Mark the periods using commas at appropriate places in the following numbers.

- a. 45203 b. 64320 c. 83645 d. 4360

Solution : a. 45,203 b. 64,320 c. 83,645 d. 4,360

Five-digit numbers

We know that the greatest four-digit number is 9,999. If we add 1 to it, we get the smallest five-digit number.

(greatest four-digit number) $9999 + 1 = 10000$ (smallest five-digit number)

We read the smallest five-digit number 10,000 as ten thousand. A five-digit number begins with the ten thousands place in thousands period of place value chart.

Look at the following place value chart. It will help you understand how to read five-digit numbers.

Number	Thousands			Ones		
	Ten Thousands (TTh)	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)	
45932	4	5	9	3	2	
83047	8	3	0	4	7	

In a five-digit number, we use a comma between thousands and hundreds places to separate ones and thousands periods.

The number 45932 is written as 45,932 and read as forty-five thousand nine hundred and thirty-two.

The number 83047 is written as 83,047 and read as eighty-three thousand and forty-seven.

Six-digit numbers

The greatest five-digit number is 99,999. If we add 1 to it, we get the smallest six-digit number.

(greatest five-digit number) $99999 + 1 = 100000$ (smallest six-digit number)

We read the smallest six-digit number 1,00,000 as one lakh. A six-digit number begins with the lakhs place in lakhs period of the place value chart.

Look at the place value chart given below. Using this, we read six-digit numbers easily.

Number	Lakhs		Thousands		Ones		
	Ten Lakhs (TL)	Lakhs (L)	Ten Thousands (TTh)	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)
936453	0	9	3	6	4	5	3
849364	0	8	4	9	3	6	4

In a six-digit number, we use two commas—one between hundreds and thousands places to separate ones and thousands periods and second between lakhs and ten thousands places to separate thousands and lakhs periods.

The number 936453 is written as 9,36,453 and read as nine lakh thirty-six thousand four hundred and fifty-three.

The number 849364 is written as 8,49,364 and read as eight lakh forty-nine thousand three hundred and sixty-four.

Seven-digit numbers

The greatest six-digit number is 999999. If we add 1 to it, we get the smallest seven-digit number.

(greatest six-digit number) $999999 + 1 = 1000000$ (smallest seven-digit number)

We read the smallest seven-digit number 10,00,000 as ten lakh. A seven-digit number begins with ten lakhs place in lakhs period of the place value chart.

Observe the following place value chart. It will help you to read seven-digit numbers easily.

Number	Periods			Lakhs			Thousands			Ones		
	Ten Lakhs (TL)	Lakhs (L)	Ten Thousands (TTh)	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)					
5436867	5	4	3	6	8	6	7					
8493064	8	4	9	3	0	6	4					

In a seven-digit number also, we use two commas—one between hundreds and thousands places and second between ten thousands and lakhs places.

The number 5436867 is written as 54,36,867 and read as fifty-four lakh thirty-six thousand eight hundred and sixty-seven.

Similarly, we write 8493064 as 84,93,064 and read as eighty-four lakh ninety-three thousand and sixty-four.

Example: Read the following numbers.

- a. 43,672 b. 2,48,974 c. 36,93,009 d. 28,70,402

- Solution :**
- a. 43,672 – Forty-three thousand six hundred and seventy-two.
 - b. 2,48,974 – Two lakh forty-eight thousand nine hundred and seventy-four.
 - c. 36,93,009 – Thirty-six lakh ninety-three thousand and nine.
 - d. 28,70,402 – Twenty-eight lakh seventy thousand four hundred and two.



Representation of Large Numbers on Abacus

In the previous class, you learnt the use of abacus. You know that each spike of the abacus shows a particular place. For example, the first spike from right shows ones and second shows tens and so on. The beads placed in each spike show the digits. For example, if 4 beads are placed in the spike of ones place, it means they show the digit 4.

To represent five-digit, six-digit, seven-digit numbers, we require the abacus of 5, 6 and 7 spikes respectively.

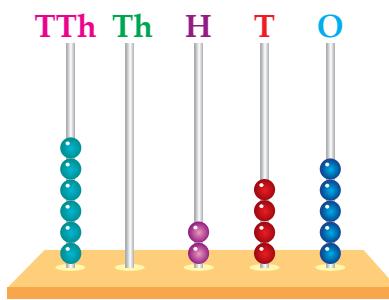
Example : Represent the following numbers on the abacus.

a. 60,245

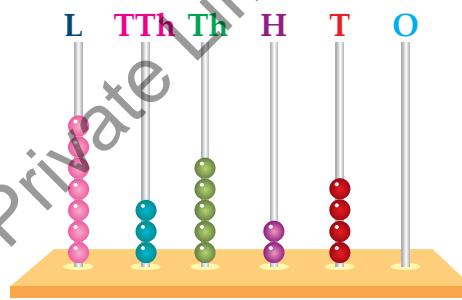
b. 7,35,240

c. 28,64,935

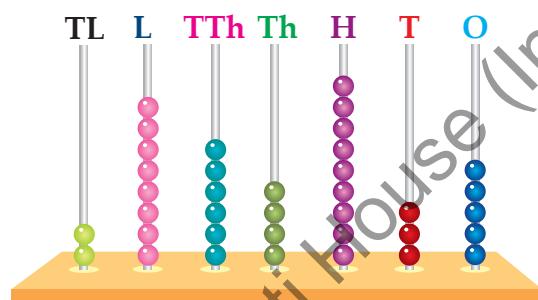
a.



b.



c.



» Absence of beads in spikes represents zero.

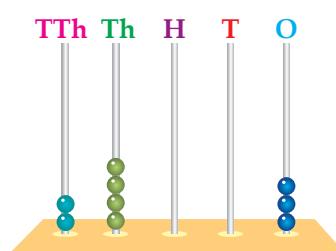
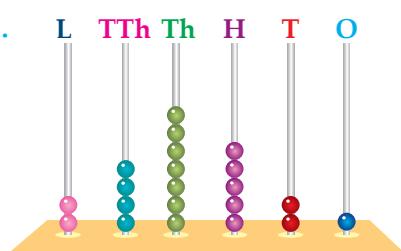
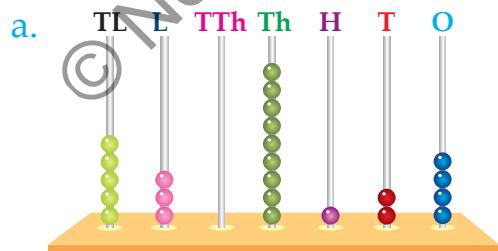


Similarly, any large number can be represented on an abacus.



Exercise I.I

1. Read the abacus carefully. Write the number and number name.



2. Represent the following numbers on the abacus.

a. 2,04,572

b. 23,024

c. 5,99,398

d. 38,33,313

e. 23,28,348

f. 64,297

g. 7,00,934

h. 8,96,452

3. Write the number names for the following numerals.

- a. 18,69,436 b. 2,07,575 c. 63,11,206 d. 45,009
 e. 39,99,990 f. 5,80,336 g. 99,99,998 h. 7,30,064

4. Write the numerals for the following number names:

- a. Six lakh eight thousand nine hundred fourteen.
 b. Twenty-two lakh eighty-four thousand one hundred and sixty-eight.
 c. Ninety thousand six hundred twenty-eight.
 d. Eighteen lakh seventy thousand four hundred two.

Place Value and Face Value of Digits

Place Value: Place value of a digit in a given number is the value of the digit because of the place or the position of the digit in the number.

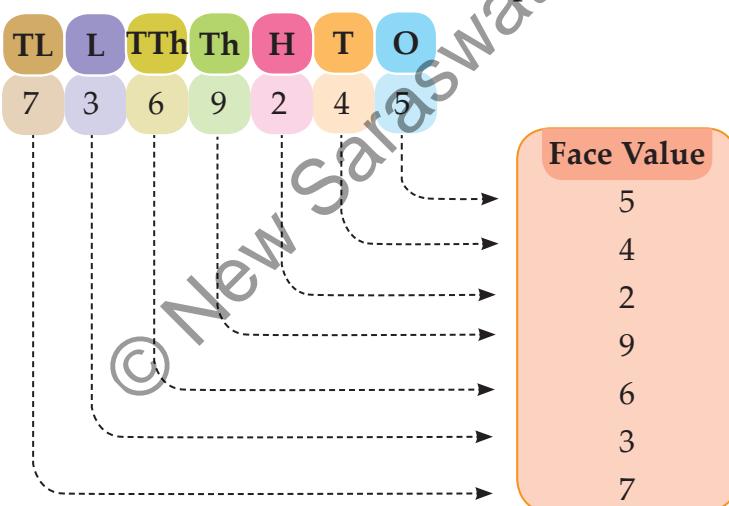
Let us take a number, for example, 45,83,695.



Place Value
$5 \times 1 = 5$
$9 \times 10 = 90$
$6 \times 100 = 600$
$3 \times 1000 = 3000$
$8 \times 10000 = 80000$
$5 \times 100000 = 500000$
$4 \times 1000000 = 4000000$

Face Value: The face value of a digit is always the digit itself.

Let us take a number, for example, 73,69,245.



» We can find a relation between place values of digits of a number.

Remember!

- 10 ones = 1 ten
- 10 tens = 1 hundred
- 10 hundreds = 1 thousand
- 10 thousands = 1 ten thousand
- 10 ten thousands = 1 lakh
- 10 lakhs = 1 ten lakh
- 10 ten lakhs = 1 crore.

Thus, place value of left digit of a numeral is 10 times that of the digit on its right side.

Standard Form and Expanded Notation

A number is said to be in the **standard form** when it is written in its original form. A number is in the **expanded form** when it is written as the sum of the place values of all the digits of that number.



Let us take a number **65,43,637**.

We can represent it in the following ways:

$$65,43,637 = 6 \text{ ten lakhs} + 5 \text{ lakhs} + 4 \text{ ten thousands} + 3 \text{ thousands} + 6 \text{ hundreds} \\ + 3 \text{ tens} + 7 \text{ ones}$$

$$65,43,637 = (6 \times 10,00,000) + (5 \times 1,00,000) + (4 \times 10,000) + (3 \times 1,000) + (6 \times 100) \\ + (3 \times 10) + (7 \times 1)$$

$$65,43,637 = 60,00,000 + 5,00,000 + 40,000 + 3,000 + 600 + 30 + 7$$

These three forms are the expanded forms of the number 65,43,637. In each form, the coloured numbers represent the standard form.

Thus, the standard form of $60,00,000 + 5,00,000 + 40,000 + 3,000 + 600 + 30 + 7$ is 65,43,637.

Example 1 : Find the place values of the underlined digits.

- a. 9364587 b. 100045 c. 936007

Solution : a. Place value of 6 in 9364587 = $6 \times 10000 = 60000$
b. Place value of 1 in 100045 = $1 \times 100000 = 100000$
c. Place value of 7 in 936007 = $7 \times 1 = 7$

Example 2 : Write the following numbers in expanded form.

- a. 4,33,522 b. 9,01,080 c. 2,90,846

Solution : a. 4,33,522 = $400000 + 30000 + 3000 + 500 + 20 + 2$
b. 9,01,080 = $900000 + 1000 + 80$
c. 2,90,846 = $200000 + 90000 + 800 + 40 + 6$

Exercise I.2

1. Find the place value and the face value of the coloured digits.

- a. 5,67,380 b. 93,643 c. 8,00,364 d. 31,09,533
e. 3,80,500 f. 6,84,976 g. 57,40,264 h. 36,00,845

2. Find the sum of the place values of 5 in:

- a. 95,60,456 b. 3,556 c. 25,593 d. 53,265

3. Fill in the blanks.

- a. 9,38,025 = lakhs + ten thousands + thousands
+ hundreds + tens + ones.
b. 59,783 = \times 10000 + \times 1000 + \times 100 + \times 10 + \times 1
c. 87,84,920 = + 700000 + 80000 + + + +

4. Write expanded forms of the following numbers.

- a. 23,21,123 b. 60,20,734 c. 85,98,645 d. 79,536
e. 20,638 f. 2,21,321 g. 5,43,692 h. 70,03,648

5. Write standard form of the following expanded notations.

- a. $5,00,000 + 80,000 + 9,000 + 0 + 60 + 8$
b. $40,00,000 + 8,00,000 + 70,000 + 500 + 80 + 9$
c. $80,000 + 9,000 + 500 + 40 + 8$
d. 9 ten lakhs + 8 lakhs + 7 ten thousands + 6 thousands + 3 hundreds + 2 tens + 1 ones

Comparison of Numbers

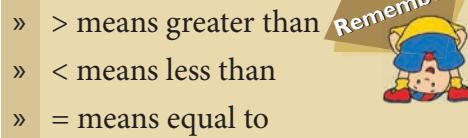
To find a greater or smaller number from a set of numbers, we use the method of comparing the given numbers. We have already learnt the method of comparing numbers up to four digits in class 3. The rules are same even for larger numbers.

Rule 1. The greater the number of digits, the greater is the number.

Example : Which is greater—86,56,372 or 9,36,809?

Solution : 86,56,372 is greater than 9,36,809 because 86,56,372 has seven digits and 9,36,809 has six digits.

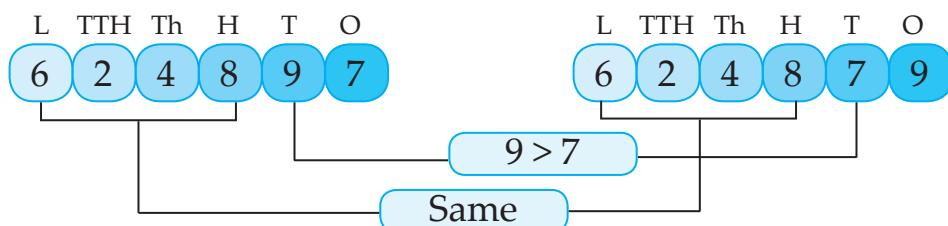
So, $86,56,372 > 9,36,809$



Rule 2. If the number of digits is the same, we start comparing from the greatest place value. If the digits are equal then we compare next digits. Continue comparing until we find two different digits with the same place value. The number with the greater digit on the same place value is greater.

Example : Compare the numbers 6,24,897 and 6,24,879.

Solution : Both the numbers have six digits. So, we start comparing from the greatest place value, i.e., lakhs. Digits in the lakhs, ten thousands, thousands and hundreds places of both the numbers are same. So, we compare the digits in the tens place. Since, $9 > 7$, so $6,24,897$ is greater than $6,24,879$ or $6,24,897 > 6,24,879$.



Ascending and descending order

We can arrange a set of numbers by using a comparison. When the numbers are arranged from the **smallest to the greatest**, the numbers are said to be in **ascending order**. When the numbers are arranged from the **greatest to the smallest**, the numbers are said to be in **descending order**.

Example 1 : Arrange the given numbers in ascending order.

8,72,544; 8,91,133; 8,93,131; 8,91,313; 8,91,311

Solution : All the numbers have six digits. So, comparing from the greatest place value, we find

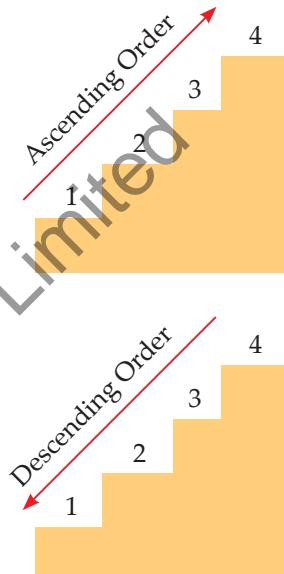
$8,72,544 < 8,91,133 < 8,91,311 < 8,91,313 < 8,93,131$.

Example 2 : Arrange the following numbers in descending order:

4,879; 12,742; 1,39,722; 1,16,464; 1,49,255

Solution : 4,879 is the smallest number and 1,49,255 is the greatest number. So, the descending order is:

$1,49,255 > 1,39,722 > 1,16,464 > 12,742 > 4,879$



Successor and Predecessor

The **successor** of a given number is the number that comes **just after** the given number. We add 1 to the number to get its successor.

The **predecessor** of a given number is the number that comes **just before** the given number. We subtract 1 from the number to get its predecessor.

Example : Write the successor and predecessor of the following numbers.

- a. 24,559 b. 7,56,400 c. 35,999 d. 2,39,100

Solution :

Number	a. 24,559	b. 7,56,400	c. 35,999	d. 2,39,100
Successor (+1)	24,560	7,56,401	36,000	2,39,101
Predecessor (-1)	24,558	7,56,399	35,998	2,39,099

Exercise 1.3

1. Fill in the boxes using $>$, $<$ or $=$.

- | | | | | | |
|-------------|----------------------|----------|-------------|----------------------|----------|
| a. 2,90,888 | <input type="text"/> | 2,90,888 | b. 6,65,789 | <input type="text"/> | 6,65,790 |
| c. 2,22,200 | <input type="text"/> | 2,20,200 | d. 4,00,400 | <input type="text"/> | 4,00,440 |
| e. 36,787 | <input type="text"/> | 36,778 | f. 7,24,080 | <input type="text"/> | 7,24,008 |
| g. 5,55,890 | <input type="text"/> | 5,54,890 | h. 3,65,678 | <input type="text"/> | 3,64,567 |

2. Ring the greatest number in the given sets.

- | | | | | | |
|-----------|--------|--------|-----------|--------|--------|
| a. 33,289 | 32,289 | 33,298 | b. 20,819 | 29,819 | 20,891 |
| c. 10,500 | 10,005 | 10,050 | d. 29,838 | 28,946 | 28,964 |

3. Ring the smallest number in the given sets.

- | | | | | | |
|-----------|--------|--------|-------------|----------|----------|
| a. 61,349 | 61,359 | 61,249 | b. 90,828 | 90,868 | 90,882 |
| c. 34,653 | 37,543 | 35,421 | d. 8,90,220 | 8,90,120 | 8,90,219 |

4. Write the following numbers in ascending order.

- a. 13,462; 31,642; 13,246; 33,426; 13,335
- b. 55,555; 44,444; 33,333; 88,888; 39,946
- c. 6,27,129; 62,399; 62,319; 6,27,912; 6,27,910
- d. 1,39,389; 99,993; 99,393; 1,39,398; 1,38,498

5. Write the following numbers in descending order.

- a. 9,85,818; 8,15,999; 5,08,919; 9,98,850; 5,08,909
- b. 40,296; 14,961; 14,691; 40,961; 14,681
- c. 86,931; 89,631; 86,139; 86,316; 89,361
- d. 5,91,114; 5,81,156; 5,81,740; 5,95,216; 5,91,110

6. Complete the series.

- a. Count in tens: 54,059; 54,069;;;;
- b. Count in hundreds: 33,159; 33,259;;;;
- c. Count in thousands: 43,216; 44,216;;;;
- d. Count in ten thousands: 56,008; 66,008;;;

7. Write the successors of the following numbers.

- a. 58,110 b. 1,62,339 c. 14,39,999 d. 11,82,400

8. Write the predecessors of the following numbers.

- a. 84,059 b. 13,810 c. 1,79,999 d. 5,07,600

Formation of Numbers without Repetition of Digits

We can form many numbers by using the given digits. For example, let's form the numbers using 3, 4 and 6. We can form 346, 364, 643, 634, 436 and 463. Out of these 643 is the greatest number and 346 is the smallest number.



The rules of forming numbers are as follows:

Rule 1. To form the greatest number, write the digits in descending order i.e., greatest to smallest.

Example : Form the greatest number using the digits given below.

- a. 3, 4, 6, 8 and 5. b. 5, 7, 2, 0, 8

Solution : a. The descending order of the given digits is 86543.

So, 86543 is the greatest possible number using these digits.

- b. The descending order of the given digits is 87520.

So, 87520 is the greatest possible number using these digits.

Rule 2 (a). To form the smallest number, write the digits in ascending order if none of the given digits is 0.

Example : Form the smallest number using 4, 5, 9, 7.

Solution : The ascending order of these digits is 4579. So, 4579 is the smallest possible number using these digits.

Rule 2 (b). To form the smallest number, write the digits (except 0) in the ascending order if one of the given digits is 0. The zero (0) always occupies the second place from the left.

Example : Form the smallest number using 9, 3, 0, 7 and 8.

Solution : Except 0, the ascending order of these digits is 3789. So, the smallest number using these digits (including 0) is 30789.

Formation of Numbers with Repetition of Digits

If the given digits are less, we repeat the digits. Suppose we are given less number of digits and if we have to form the smallest and the greatest five-digit numbers, we follow these rules:

Rule 1. To form the smallest number using the given digits, arrange the digits in ascending order and then repeat the smallest digit at the starting of the number.

Example : Form the smallest five-digit number using the digits 5, 4 and 6.

Solution : The smallest five-digit number using these digits = 44456.

Rule 2. To form the greatest number using the given digits, arrange the digits in descending order and then repeat the greatest digit at the starting of the number.

Example : Use 6, 5, 1 and 3 to form the greatest five-digit number.

Solution : The greatest five-digit number using these digits = 66531.



Exercise 1.4

1. Use the given digits to form the smallest and the greatest possible numbers (do not repeat the digits).

Digits	Greatest	Smallest
a. 7, 1, 8, 9, 2		
b. 9, 7, 0, 8, 6		
c. 7, 2, 3, 5, 4		
d. 7, 1, 0, 6, 4, 3		
e. 5, 2, 4, 1, 3, 9		
f. 6, 8, 2, 1		

2. Use the given digits to form the greatest and the smallest five- and six-digit numbers (you may repeat the digits).

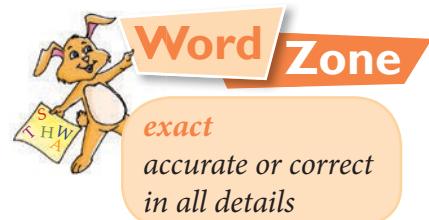
Digits	Five-digit numbers		Six-digit Numbers	
	Greatest	Smallest	Greatest	Smallest
a. 2, 1, 6				
b. 7, 5, 6				
c. 3, 6, 9, 5				
d. 2, 1, 4, 3				
e. 7, 8, 9, 5				
f. 3, 2, 4, 9				

Rounding Off Numbers

We use **rounding off** when we want to estimate or say about how many. Consider the following statement.

Approximately 42000 spectators watched the world cup 2011 final cricket match played between India and Sri Lanka at the Wankhede Stadium, Mumbai.

The number given above does not represent the **exact** number of spectators. This number is only approximation. The number of spectators might have been between 41,499 and 42,499.



Now consider another statement given below.

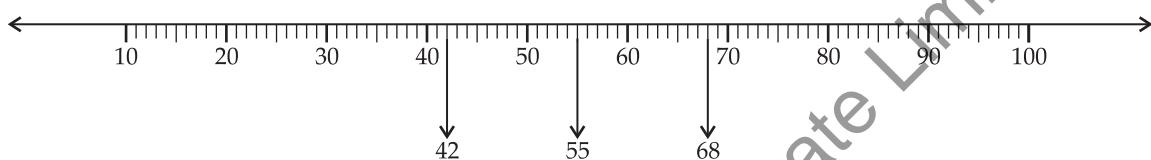
On Sunday, the number of visitors for the Delhi Book Fair 2013 was found to be around 50,000. The number of visitors do not give the exact number of visitors. The number of visitors have been between 44,999 and 54,999. Words approximately, around, about more than, nearly etc. give an idea of rounding off.

Rounding off numbers is very simple. Numbers can be rounded off to the nearest 10, nearest 100, nearest 1000 etc.

Rounding off to the nearest 10

Example : Round 42, 68 and 55 to the nearest 10.

Solution :



- 42 is between 40 and 50. 42 is closer to 40. So, 42 is rounded down to 40.
- 68 is between 60 and 70. 68 is closer to 70. So, 68 is rounded up to 70.
- 55 is between 50 and 60. 55 is midway so it is rounded up to 60.

Working steps

Step 1 : If the ones digit of the given number is less than 5, replace the ones digit by 0 and retain the other digits. For example, ones digit of 42 i.e., $2 < 5$, so, 42 rounded to the nearest 10 is 40.

Step 2 : If the ones digit is 5 or more than 5, increase the tens digit by 1, replace the ones digit by 0, and retain the other digits as such. For example, ones digit of 68 i.e., $8 > 5$, so, 68 rounded to the nearest 10 is 70. Similarly, ones digit of 55 is 5, so, 55 rounded to the nearest 10 is 60.

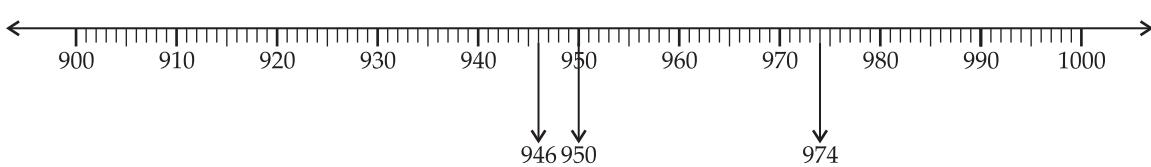
» To round off a number to the nearest 10, observe its ones digit.



Rounding off to the nearest 100

Example : Round 946, 974 and 950 to the nearest 100.

Solution :



- 946 is between 900 and 1000. 946 is closer to 900, so, 946 is rounded down to 900.
- 974 is between 900 and 1000. 974 is closer to 1000, so, 974 is rounded up to 1000.
- 950 is between 900 and 1000. 950 is midway, so, it is rounded up to 1000.

Working steps

Step 1 : If the tens digit is less than 5, replace the tens and ones digits by 0 and retain the other digits as such. For example, tens digit of 946 i.e., $4 < 5$, so, 946 rounded to the nearest 100 is 900.

» To round off a number to the nearest 100, observe its tens digit.

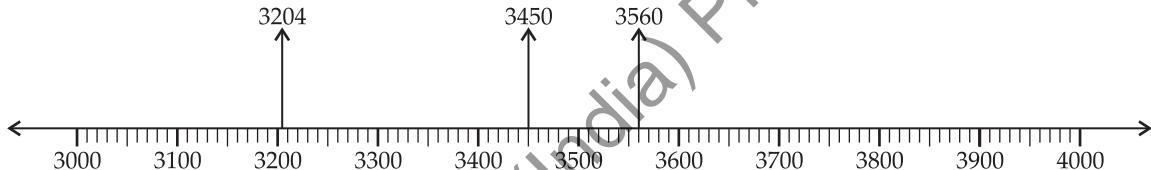


Step 2 : If the tens digit is 5 or greater than 5, increase the hundreds digit by 1, replace the tens and ones digits by 0 and retain the other digits as such. For example, tens digit of 974 i.e., $7 > 5$, so 974 rounded to the nearest 100 is 1000. Similarly, tens digit of 950 is 5, so, it is rounded to the nearest 100 i.e., 1000.

Rounding off to the nearest 1000

Example : Round off the numbers 3204, 3450 and 3560 using number line.

Solution :



- 3204 is between 3000 and 4000.
3204 is closer to 3000, so, it is rounded down to 3000.
- 3450 is between 3000 and 4000.
3450 is closer to 3000, so, it is rounded down to 3000.
- 3560 is between 3000 and 4000.
3560 is closer to 4000, so, it is rounded up to 4000.

Working steps

Step 1 : If the hundreds digit is less than 5, replace the hundreds, tens and ones digit by 0 and retain the other digits. For example, the hundreds digit of 3204 i.e., $2 < 5$, so, 3204 rounded to the nearest 1000 is 3000. Similarly, hundreds digit of 3450 i.e., $4 < 5$, so 3450 rounded to the nearest 1000 is 3000.

» To round off a number to the nearest 1000, observe its hundreds digit.



Step 2 : If the hundreds digit is 5 or more than 5, increase the thousands digit by 1, replace the hundreds, tens and ones digit by 0 and retain the other digits as such. For example, hundreds digit of 3560 is 5, so, 3560 rounded to the nearest 1000 is 4000.





Exercise 1.5

1. Round off the following numbers to the nearest 10.

- | | | | |
|--------|----------|--------|----------|
| a. 75 | b. 81 | c. 68 | d. 415 |
| e. 113 | f. 1,833 | g. 438 | h. 6,014 |

2. Round off the following numbers to the nearest 100.

- | | | | |
|----------|--------|----------|--------|
| a. 5,436 | b. 752 | c. 8,326 | d. 849 |
| e. 6,650 | f. 432 | g. 1,385 | h. 80 |

3. Round off the following numbers to the nearest 1000.

- | | | | |
|----------|-----------|-----------|----------|
| a. 8,348 | b. 516 | c. 7,500 | d. 2,288 |
| e. 8,047 | f. 12,648 | g. 30,181 | h. 7,394 |

International System of Numeration

There is another place value system known as International place value system which is used in most of the other countries of the world. In this system also number are written by using the digits 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 with each digit getting a value depending on the place it occupies in the place value chart. This place value chart is known as International place value chart.

Periods and commas in International place value chart

In this system also, the digits of a number are grouped in periods and each period has three digits. Ones is the first period and it has three places—ones, tens and hundreds. Thousands is the second period and it also has three places—thousands, ten thousands and hundred thousands. Million is the third period and it has three places—millions, ten millions and hundred millions. Observe the following International Place Value Chart. Let us write number 8465678 in it.

Periods	Millions			Thousands			Ones		
Places	Hundred Millions (HM) 100000000	Ten Millions (TM) 10000000	Millions (M) 1000000	Hundred Thousands (H Th) 100000	Ten Thousands (T Th) 10000	Thousands (Th) 1000	Hundreds (H) 100	Tens (T) 10	Ones (O) 1
Number	0	0	8	4	6	5	6	7	8

Use of comma

We use commas to separate the periods after every three digits from the right in this system.

- Examples :**
- Using commas, 5067152 will be written as 5,067,152 and read as five million sixty-seven thousand one hundred fifty-two.
 - Using commas, 9379648 will be written as 9,379,648 and read as nine million three hundred seventy-nine thousand six hundred forty-eight.

- » The first three places from the right are the same in both the Indian and the International system of numerations.
- » To read a numeral in the International system, all the digits and names of the period (except ones) are read together.
- » Five-digit numbers are read the same way in both the systems.



Now, we write 8756532 in both the Indian and the International Place Value Chart.

Indian Place Value Chart

Lakhs		Thousands		Ones		
TL (1000000)	L (100000)	TTh (10000)	Th (1000)	H (100)	T (10)	O (1)
8	7	5	6	5	3	2

International Place Value Chart

Millions			Thousands			Ones		
HM (100000000)	TM (10000000)	M (1000000)	HTh (100000)	TTh (10000)	Th (1000)	H (100)	T (10)	O (1)
		8	7	5	6	5	3	2

On comparing the two charts, we find that

$$100 \text{ thousand} = 1 \text{ lakh}$$

$$1 \text{ million} = 10 \text{ lakhs}$$



Exercise 1.6

- Rewrite the following numbers according to the periods of the International place value chart:
 - 86,96,356
 - 54,83,005
 - 54,07,375
 - 32,84,376
 - 6,04,964
 - 6,87,504
 - 7,93409
 - 36,00,896
- Write the number names according to the International place value chart.
 - 5,809,468
 - 3,865,980
 - 875,243
 - 6,573,921
 - 480,289
 - 6,573,826
 - 300,764
 - 9,990,435

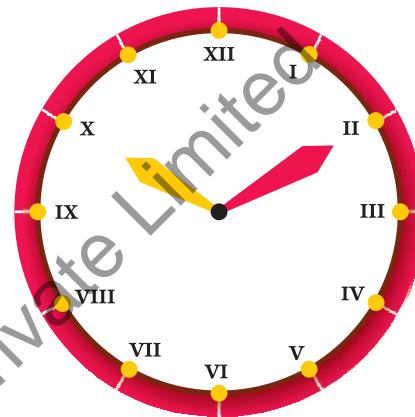


3. Write the numerals:

- Six million two hundred sixty-five thousand five hundred and twenty-one.
- Three million sixty-nine thousand two hundred and five.
- Nine million two hundred thousand and nine.

Roman Numerals

In the Indian system and the International system of numeration, numbers are written using the digits 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. The numbers formed with these digits are called **Hindu-Arabic numerals**. The Romans used seven letters of the English alphabet in place of numbers. But, there is no symbol for 0. These symbols are called **Roman numerals**. Sometimes, we see these symbols on the faces of clocks, at railway stations, in books, in classrooms etc. The Roman number system did not use place value. The basic symbols used to write Roman numerals with their corresponding Hindu-Arabic numerals are given below:



Roman Numerals	I	V	X	L	C	D	M
Hindu Arabic Numerals	1	5	10	50	100	500	1000

Rules for writing Roman numerals

To write the Roman Numerals, we use the following rules:

Rule 1. A symbol can be repeated up to a maximum of three times and its value is added.

Examples : $II = 1 + 1 = 2$, $III = 1 + 1 + 1 = 3$, $XX = 10 + 10 = 20$, $XXX = 10 + 10 + 10 = 30$

Rule 2. The symbols V, L and D are not repeated.

Rule 3. When a symbol of lower value is placed on the right of a symbol of higher value, its value is added.

Examples : $VI = 5 + 1 = 6$, $XII = 10 + 1 + 1 = 12$

Rule 4. When a symbol of lower value is placed on the left of a symbol of higher value, then its value is subtracted.

Examples : $IV = 5 - 1 = 4$, $XL = 50 - 10 = 40$

Rule 5. I can be subtracted only from V and X.

Examples : $IX = 10 - 1 = 9$

» When a bar is placed over a symbol (letter) it means to multiply the value by 1000. For example,

$$\overline{V} = V \times 1000 = 5 \times 1000 \\ = 5000$$

$$\overline{X} = X \times 1000 = 10 \times 1000 \\ = 10000$$



Rule 6. X can be subtracted only from L and C.

Examples : XC = $100 - 10 = 90$

Rule 7. C can be subtracted only from D and M.

Examples : CD = $500 - 100 = 400$,

$$CM = 1000 - 100 = 900.$$

Some common errors

Number	Incorrect (X)	Correct (✓)
25	VXX	XXV
16	XIV	XVI
36	XXXIV	XXXVI
49	IL	XLIX
50	XXXXX	L

Example 1 : Write the following numbers in Roman numerals.

- a. 48 b. 106 c. 568 d. 1045

Solution : a. $48 = XLVIII$

c. $568 = DLXVIII$

b. $106 = CVI$

d. $1045 = MXLV$

Example 2 : Write the following Roman numerals in Hindu-Arabic form:

- a. MDCL b. CDI c. MMCC d. CXXXIX

Solution : a. $MDCL = 1650$

b. $CDI = 401$

c. $MMCC = 2200$

d. $CXXXIX = 139$



Exercise 1.7

1. Write the Roman numerals for the following numbers:

- a. 310 b. 468 c. 992 d. 2,010 e. 1,200 f. 1,945

2. Convert the following Roman numerals into Hindu-Arabic numerals:

- a. CDIV b. CDXXI c. LXIII d. CCCX
e. MD f. MDXC g. CM h. MCXVII

3. Fill in the blanks with Roman numerals.

- a. Neha had (95) marbles. She gave (30) marbles to Puja.
Now, Neha has marbles left.



- b. Mahatma Gandhi was born in (1869).
- c. Our country became independent in (1947).
- d. Indian parliament (Lok Sabha) has (545) members.
- e. The greatest three-digit number is (999).
- f. The first world war happened in (1914).



Activity Zone

Fun with Numbers

Objective: To find out the place value of a five-digit number through abacus

Materials Required: Drawing Sheets, Coloured tapes, Sticker, bindis

Type of Activity: Individual (✓)/Pair ()/Group ()



Procedure:

Let us find out the place value of each digit of 24361 on the abacus.

- Take a drawing sheet and paste five coloured tapes at equal gaps having equal lengths.
- Mark the five coloured tapes as different place values; i.e., Ones, Tens, Hundreds, Thousands and Ten Thousands.
- Now, put 1 bindi at ones tape, 6 at tens, 3 at hundreds, 4 at thousands and 2 at ten thousands as is shown in the figure.
- Thus, from the abacus made here, we can find the place values of different digits of the number 24361.

From the abacus, we find that,

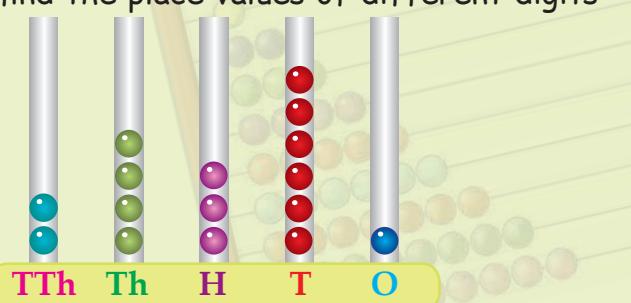
Place value of 1 is 1.

Place value of 6 is 60.

Place value of 3 is 300.

Place value of 4 is 4000.

Place value of 2 is 20000.

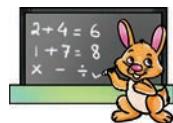


Exploration Zone

- Collect the following information from a newspaper or an old magazine and write them in words in Indian as well as International numeration system.
 1. Population of villages/cities or towns.
 2. Expenditure on village programmes by the Government of India.
- Collect the data of the population of any five Indian states and estimate them in ones, tens, hundreds and thousands.

- Go through the given link and expand your knowledge about the numbers.

<http://www.mathsisfun.com/numbers/numbers-numerals-digits.html>



Recap Zone

- The smallest five-digit number is 10000 and the greatest five-digit number is 99999.
- The smallest six-digit number is 100000 and the greatest six-digit number is 999999.
- The smallest seven-digit number is 1000000 and the greatest seven-digit number is 9999999.
- In Indian place value chart, ones period has three places (ones, tens and hundreds), thousands period has two places (thousands and ten thousands).
- The place value of a digit depends on its position in the number.
- The face value of a digit in a number is the value of the digit itself.
- The number with more digits is greater.
- When the numbers have equal digits, compare the digit at extreme left. If they are equal, compare next digit and so on. The number having the greatest digit in corresponding place is a greater number.
- The successor of a number is 1 more than the number.
- The predecessor of a number is 1 less than the number.
- To form the greatest number, rearrange the digits in descending order and to form the smallest number, rearrange the digits in ascending order.
- To round off a number to the nearest tens, hundreds and thousands, we look at the digits at ones, tens and hundreds places respectively.
- In Roman numerals, numbers are written using symbols I, V, X, L, C, D and M.
- Symbols I, X, C and M are repeated only three times but V, L and D are never repeated.
- If a smaller symbol is placed just after a bigger symbol, it is added; but if it is placed just before a bigger symbol, it is subtracted.
- V, L and D are never inserted before a bigger symbol.
- I is subtracted from V and X only.
- X is subtracted from L, M and C only.



2

ADDITION AND SUBTRACTION



Start Zone

Mr. Sharma with his children, Swati and Avinav was watching the final cricket match of World Cup 2011. The match was being played between India and Sri Lanka at the Wankhede Stadium, Mumbai. The commentator announced that 8868 people were sitting in Sunil Gavaskar Pavilion and 7198 people in Vijay Merchant Pavilion. Suddenly, Swati exclaimed, "The number of onlookers in both the pavilions is 16060". Avinav said, "No, it is not". Can you say who was right?

The Sri Lankan team made total 272 runs in 50 overs and the Indian team made 276 runs and won the trophy. How many more runs were made by the Indian team?

Total numbers of people in the stadium = _____

More runs made by the Indian team = _____



Knowledge Zone

You have just seen now you added and subtracted to find out the correct answers. Let us now learn more about addition and subtraction.

Addition of Large Numbers

We have already learnt addition of four-digit numbers. Addition of large numbers is the same as the addition of smaller numbers.

We know that the numbers that we add are called **addends** and the resulting number after addition is called the **sum**. The symbol '+' is used to show the addition. '+' is called the **addition**.

$$\begin{array}{r}
 70 \\
 + 24 \\
 \hline
 94
 \end{array}$$

Addends
Sum

Addition without regrouping

Example 1 : Add 52,246 to 43,321.

Solution :

Step 1 : Write the numbers in column form.

Step 2 : Add ones and write the sum under ones column.

$$6 + 1 = 7$$

Step 3 : Add tens and write the sum under tens column.

$$4 + 2 = 6$$

Step 4 : Add hundreds and write the sum under hundreds column. $2 + 3 = 5$

Step 5 : Add thousands and write the sum under thousands column. $2 + 3 = 5$

Step 6 : Add ten thousands and write the sum under ten thousands column.

$$5 + 4 = 9$$

Thus, $52246 + 43321 = 95567$.

T	T	H	T	O
5	2	2	4	6
+ 4	3	3	2	1
9	5	5	6	7

» Write the digits at their correct place value. Always start adding from ones digits.



Example 2 : Find the sum of the following numbers:

- a. 736456 and 110123 b. 2345676 and 3542312

Solution : a. Write the numbers in columns and add them together.

L	T	T	h	H	T	O
7	3	6	4	5	6	
+ 1	1	0	1	2	3	
8	4	6	5	7	9	

$7 + 1 = 8$				$6 + 3 = 9$
$3 + 1 = 4$				$5 + 2 = 7$
$6 + 0 = 6$				$4 + 1 = 5$

- b. Write the numbers in column form and add them together.

TL	L	T	T	h	H	T	O
2	3	4	5	6	7	6	
+ 3	5	4	2	3	1	2	
5	8	8	7	9	8	8	

$2 + 3 = 5$				$6 + 2 = 8$		
$3 + 5 = 8$				$7 + 1 = 8$		
$4 + 4 = 8$				$6 + 3 = 9$		
$5 + 2 = 7$						



Common Error

Incorrect (✗)

TTh	Th	H	T	O
3	4	5	6	4
+	2	2	3	
5	6	8	6	4

Correct (✓)

TTh	Th	H	T	O
3	4	5	6	4
+	2	2	2	3
3	4	7	8	7

Addition with regrouping

Follow the steps given below to add five-, six- and seven-digit numbers.

Example 1: Add 36,534 and 56,987 together.

Solution :

Step 1 : Write the numbers in columns as shown here.

Step 2 : Add ones: $4 + 7 = 11$. Write 1 under ones column and carry 1 to the tens column.

Step 3 : Add tens: $1 + 3 + 8 = 12$. Write 2 under tens column and carry 1 to the hundreds column.

Step 4 : Add hundreds: $1 + 5 + 9 = 15$. Write 5 under hundreds column and carry 1 to the thousands column.

Step 5 : Add thousands: $1 + 6 + 6 = 13$. Write 3 under thousands column and carry 1 to the ten thousands column.

Step 6 : Add ten thousands: $1 + 3 + 5 = 9$. Write 9 under ten thousands column.

Thus, $36534 + 56987 = 93521$.

TTh	Th	H	T	O
(1)	(1)	(1)	(1)	
3	6	5	3	4
+	5	6	9	8
9	3	5	2	1

» Carry over is also known as 'Regrouping'.



Teacher's Tip

Once the children have learnt addition with and without regrouping, encourage them to do the addition sum by reversing the order of the numbers and repeating the addition. First, from the top, add downwards. Then, from below, add upwards. In both the cases, the sum should be the same.

Example 2 : Add the following:

a. 4,72,052 and 4,81,758

b. 43,32,159; 38,65,824 and 12,34,501

Solution :

L	TTh	Th	H	T	O
(1)			(1) (1)		
4	7	2	0	5	2
+ 4	8	1	7	5	8
9	5	3	8	1	0

b.

TL	L	TTh	Th	H	T	O
(1)	(1)	(1)	(1)	(1)	(1)	
4	3	3	2	1	5	9
3	8	6	5	8	2	4
+ 1	2	3	4	5	0	1
9	4	3	2	4	8	4

Properties of Addition

- If two or more than two numbers are added in any order, their sum remains the same.

Example :

4	3	5	3	2	+ 2 7 4 2 3	2 7 4 2 3	+ 4 3 5 3 2			
7	0	9	5	5		7	0	9	5	5

- When zero is added to any number, we get the number itself.

Example : $93645 + 0 = 93645$

- To add 10 to any number, we add 1 to the tens digit.

Example :

$$\begin{array}{r} \overline{6+1} \\ 84369 + 10 = 84379 \end{array}$$

- To add 100 to any number, we add 1 to the hundreds digit.

Example :

$$\begin{array}{r} \overline{6+1} \\ 93645 + 100 = 93745 \end{array}$$

- To add 1000 to any number, we add 1 to the thousands digit.

Example :

$$\begin{array}{r} \overline{6+1} \\ 436936 + 1000 = 437936 \end{array}$$

Word Problems

Example 1 : Pawan's school is 16478 metres away from house. The zoo is 2304 metres away from his school. Find the distance between Pawan's house and the zoo.



16478 m



2304 m



Solution :

Distance between Pawan's house and the school

TTh	Th	H	T	O
1	6	4	7	m
+ 2	3	0	4	m
1	8	7	8	2 m

Distance between the school and the zoo

So, distance between Pawan's house and the zoo



Exercise 2.I

1. Add the following numbers together.

a.
$$\begin{array}{r} 2 \ 5 \ 3 \ 6 \ 0 \ 5 \\ + 2 \ 3 \ 4 \ 3 \ 3 \ 2 \\ \hline \end{array}$$

b.
$$\begin{array}{r} 7 \ 3 \ 8 \ 9 \ 5 \ 2 \\ + 2 \ 4 \ 0 \ 0 \ 1 \ 3 \\ \hline \end{array}$$

c.
$$\begin{array}{r} 9 \ 7 \ 3 \ 2 \ 6 \ 5 \ 2 \\ + 2 \ 3 \ 4 \ 3 \ 2 \ 7 \\ \hline \end{array}$$

d.
$$\begin{array}{r} 6 \ 3 \ 9 \ 3 \ 6 \ 3 \\ + 1 \ 3 \ 4 \ 6 \ 9 \ 8 \\ \hline \end{array}$$

e.
$$\begin{array}{r} 9 \ 3 \ 2 \ 6 \ 9 \\ + 3 \ 1 \ 6 \ 9 \ 8 \\ \hline \end{array}$$

f.
$$\begin{array}{r} 6 \ 4 \ 9 \ 3 \ 6 \ 6 \ 3 \\ + 3 \ 2 \ 3 \ 1 \ 8 \ 4 \ 2 \\ \hline \end{array}$$

g.
$$\begin{array}{r} 5 \ 3 \ 4 \ 2 \ 6 \ 3 \\ 2 \ 4 \ 3 \ 2 \\ + 5 \ 3 \ 2 \ 4 \ 3 \\ \hline \end{array}$$

h.
$$\begin{array}{r} 6 \ 3 \ 2 \ 4 \\ 3 \ 6 \ 4 \ 3 \ 2 \\ + 5 \ 3 \ 2 \ 3 \ 2 \ 4 \\ \hline \end{array}$$

i.
$$\begin{array}{r} 9 \ 0 \ 0 \ 0 \ 4 \\ 5 \ 6 \ 0 \\ + 8 \ 9 \ 6 \ 8 \\ \hline \end{array}$$

2. Write in columns and find the sum of the following numbers.

a. 76,968 and 28,708

b. 2,93,468 and 12,578

c. 8,72,062 and 49,489

d. 5,23,458 and 19,36,964

e. 45,643; 8,73,963 and 12,64,730

f. 99,999; 8,00,364 and 91,24,730

3. Find the missing numbers in each of the following additions.

a.
$$\begin{array}{r} 7 \ 9 \ 6 \ 4 \ 3 \ 6 \\ + 1 \ 4 \ \square \ 3 \ 2 \ 1 \\ \hline \square \ \square \ 4 \ \square \ 5 \ \square \end{array}$$

b.
$$\begin{array}{r} \square \ 4 \ \square \ 8 \ 9 \ 6 \\ + 5 \ \square \ 6 \ 7 \ 8 \ \square \\ \hline 7 \ 4 \ 3 \ \square \ \square \ 4 \end{array}$$

4. Fill in the blanks.

- a. 2,793 more than 99,999 is
- b. 8,100 added to 9,87,408 is
- c. 8 lakh increase by 5,500 is
- d. $68,764 + 24,310 = 24,310 + \dots$
- e. + 16,760 = 17,760.
- f. $98,768 + \dots = 98,768$.
- g. + 26,24,340 = 26,24,340.
- h. $64,836 + \dots = 64,846$.
- i. $4200 + 4800 + 1000 = \dots$
- j. $9,48,928 + 100 = \dots$

5. Find the sum of the smallest five-digit, six-digit and seven-digit numbers.

6. Find the sum of the greatest five-digit number and the smallest seven-digit number.

7. In a town, there are 76,843 men; 57,698 women and 20,527 children. What is the total population of the town?

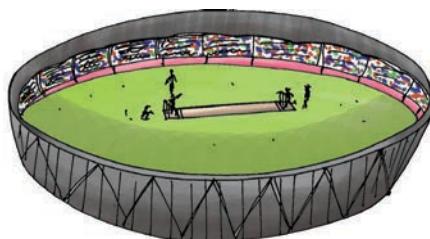
8. A company earned ₹ 49,63,247 in the year 2011. Next year the earning increased by ₹ 8,84,626. How much did the factory earn in the year 2012?

9. A dairy sold 5,088 litres; 7,910 litres and 12,220 litres milk in three months. How much milk did the dairy sell in the three months?



10. A library has 6550 English books, 7288 Hindi books and 5640 Mathematics books. How many books are there altogether in the library?

11. At a cricket match there were 28,980 spectators in stand A; 20,504 in stand B and 12,660 in stand C. What was the total number of spectators in these three stands of the stadium?



12. In a Book Fair, 29980 persons visited on Monday, 14410 on Tuesday and 28405 on Wednesday. Find the number of persons who visited the Book Fair in all the three days.





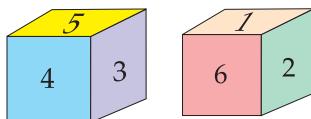
Activity Zone

Fun with Addition

Objective: To understand addition of large numbers

Materials Required:

Game sheets for two players as shown, two dice and pencil



L	TTh	Th	H	T	O
+					
=					

Row 1
Row 2

Type of Activity: Individual ()/Pair (✓)/Group ()

Procedure:

- Divide the class into pairs. Choose any one pair for the activity. Give each of them the above mentioned materials. One player of the pair rolls two dice and both the players write the numbers in two blanks of their choice (above two rows) in their sheets. For example, at first time the numbers on the two dice are 5 and 3.

Player-1

L	TTh	Th	H	T	O
			5		
+				3	
=					

Row 1
Row 2

Player-2

L	TTh	Th	H	T	O
			3		5
+					
=					

Row 1
Row 2

- Now, the other player rolls the dice and again both the players write the numbers in two blanks.
- Now, again the first player rolls the dice and both the players write the numbers ones more. Taking turns, repeat till all the blanks of the first two rows in the sheets are filled. Now, find the sum of numbers formed in the first row and the second row. The player with the greater sum is the winner.

Subtraction of Large Numbers

Taking away some objects or numbers from a group or collection is called subtraction. The greater number is called **minuend** and the smaller number is called the **subtrahend**. The result of subtraction is called the **difference**.

The symbol ‘-’ (minus) is used to show the subtraction. ‘-’ is called subtraction.

9	3	6	4	→ Minuend	
-	1	4	2	3	→ Subtrahend
7	9	4	1		→ Difference



Subtraction without regrouping

Example 1: Subtract 72465 from 96867.

Solution :

Step 1 : Write the given numbers in column form with the greater number above and the smaller number below.

Step 2 : Subtract ones : $7 - 5 = 2$.

Step 3 : Subtract tens : $6 - 6 = 0$.

Step 4 : Subtract hundreds : $8 - 4 = 4$.

Step 5 : Subtract thousands : $6 - 2 = 4$.

Step 6 : Subtract ten thousands : $9 - 7 = 2$.

Thus, $96867 - 72465 = 24402$.

T	T	H	T	O
9	6	8	6	7
- 7	2	4	6	5

2 4 4 0 2

Example 2 : Subtract the following:

a. $968899 - 534455$

b. $8364960 - 2143610$

Solution :

a.

L	T	T	H	H	T	O
9	6	8	8	9	9	9
- 5	3	4	4	5	5	5

$9 - 5 = 4$

4 3 4 4 4 4

$9 - 5 = 4$

$6 - 3 = 3$

$9 - 5 = 4$

$8 - 4 = 4$

$8 - 4 = 4$

- » Minuend
– Subtrahend
= Difference.
- » Minuend – Difference
= Subtrahend.
- » Difference + Subtrahend
= Minuend.



b.

T	L	T	T	H	H	T	O
8	3	6	4	9	6	0	0
- 2	1	4	3	6	1	0	0

$8 - 2 = 6$

6 2 2 1 3 5 0

$0 - 0 = 0$

$3 - 1 = 2$

$6 - 1 = 5$

$6 - 4 = 2$

$9 - 6 = 3$

Subtraction with regrouping

Example 1 : Subtract 75,638 from 93,420.

Solution :

Step 1 : Write the given numbers in column form with the greater number above and the smaller number below.

Step 2 : Subtract ones. Since $0 < 8$, so, regroup tens into tens and ones.

2 tens = 1 tens and 10 ones. Now, $10 - 8 = 2$.

Step 3 : Subtract tens. Since $1 < 3$, so, regroup hundreds into hundreds and tens.

4 hundreds = 3 hundreds and 10 tens. Now, 10 tens + 1 tens = 11 tens.
So, $11 - 3 = 8$.

Step 4 : Subtract hundreds. Since $3 < 6$, so regroup thousands.

3 thousands = 2 thousands + 10 hundreds.

Now, 10 hundreds + 3 hundreds = 13 hundreds. So, $13 - 6 = 7$.

Step 5 : Subtract thousands. Since $2 < 5$, so, regroup ten thousands in ten thousands and thousands.

9 ten thousands = 8 ten thousands + 10 thousands.

Now, 10 thousands + 2 thousands = 12 thousands. So, $12 - 5 = 7$

Step 6 : Subtract ten thousands: $8 - 7 = 1$.

Thus, $93420 - 75638 = 17782$.

TTh	Th	H	T	O
(12)	(13)	(11)		
(8)	2	3	4	(10)
9	3	4	2	0
- 7	5	6	3	8
1	7	7	8	2

Common Error

Incorrect (✗)

TTh	Th	H	T	O
9	7	8	4	1
- 2	6	5	2	8
7	1	3	1	2

Correct (✓)

TTh	Th	H	T	O
9	7	8	4	1
- 2	6	5	2	8
7	1	3	1	3

Example 2 : Find the difference between the following numbers:

a. $873645 - 437584$

b. $8103649 - 3198761$

Solution :

L	TTh	Th	H	T	O
(6)	(13)	(5)	(14)		
8	7	3	6	4	5
- 4	3	7	5	8	4
4	3	6	0	6	1

TL	L	TTh	Th	H	T	O
(7)	(10)	(9)	(12)	(15)	(14)	
8	0	10	2	5		
8	X	0	3	6	4	9
- 3	1	9	8	7	6	1
4	9	0	4	8	8	8

Teacher's Tip

Once the children have learnt subtraction, encourage them to do the checking right away by adding upward the difference and the smaller number and see whether the sum is correct and correct it if they find it wrong.

Properties of subtraction

- When subtracting one number from an other number, we should write greater number above or before and smaller number below or after.

Example :

$$\begin{array}{r} 9 & 6 & 4 & 3 & 2 \\ - 7 & 3 & 2 & 4 & 5 \\ \hline 2 & 3 & 1 & 8 & 7 \end{array}$$

or $96432 - 73245 = 23187$

- When zero is subtracted from a number, we get the same number as the difference.
Example : $86524 - 0 = 86524$
- When any number is subtracted from itself, we always get 0 as the difference.
Example : $753643 - 753643 = 0$
- To subtract 10 from any number, we subtract 1 from tens digit.

Example :

$$\begin{array}{r} \boxed{4-1} \\ 683645 - 10 = 683635 \end{array}$$

- To subtract 100 from any number, we subtract 1 from hundreds digit.

Example :

$$\begin{array}{r} \boxed{6-1} \\ 9365678 - 100 = 9365578 \end{array}$$

- To subtract 1000 from any number, we subtract 1 from thousands digit.

Example :

$$\begin{array}{r} \boxed{5-1} \\ 65839 - 1000 = 64839 \end{array}$$

Word Problems

Example 1 : There are 5645 bags of rice and 55375 bags of sugar in a godown. Find the difference between both types of bags.

Solution : Number of bags of sugar =

Number of bags of rice =

Difference =

$$\begin{array}{r} 5 & 5 & 3 & 7 & 5 \\ - 5 & 6 & 4 & 5 \\ \hline 4 & 9 & 7 & 3 & 0 \end{array}$$

Thus, number of bags of sugar is 49730 more than that of rice.



Example 2 : There are 9,07,364 children below 14 years of age in a state. If the number of boys is 4,70,560; find out the number of girls.

Solution : Total number of children =
$$\begin{array}{r} 9 & 0 & 7 & 3 & 6 & 4 \\ - 4 & 7 & 0 & 5 & 6 & 0 \\ \hline 4 & 3 & 6 & 8 & 0 & 4 \end{array}$$

Number of boys =
$$\begin{array}{r} 9 & 0 & 7 & 3 & 6 & 4 \\ - 4 & 7 & 0 & 5 & 6 & 0 \\ \hline 4 & 3 & 6 & 8 & 0 & 4 \end{array}$$

So, number of girls =
$$\begin{array}{r} 9 & 0 & 7 & 3 & 6 & 4 \\ - 4 & 7 & 0 & 5 & 6 & 0 \\ \hline 4 & 3 & 6 & 8 & 0 & 4 \end{array}$$



Exercise 2.2

1. Find the difference of the following numbers.

a.
$$\begin{array}{r} 8 & 9 & 9 & 6 & 4 \\ - 2 & 3 & 4 & 6 & 3 \\ \hline \end{array}$$

b.
$$\begin{array}{r} 6 & 4 & 3 & 6 & 8 & 2 \\ - 1 & 4 & 3 & 4 & 3 & 1 \\ \hline \end{array}$$

c.
$$\begin{array}{r} 8 & 4 & 7 & 9 & 2 & 6 & 5 \\ - 3 & 1 & 3 & 4 & 1 & 2 & 3 \\ \hline \end{array}$$

d.
$$\begin{array}{r} 9 & 5 & 4 & 0 & 8 & 0 \\ - 8 & 3 & 4 & 9 & 8 & 9 \\ \hline \end{array}$$

e.
$$\begin{array}{r} 5 & 1 & 9 & 2 & 4 & 0 \\ - 1 & 1 & 8 & 9 & 8 & 0 \\ \hline \end{array}$$

f.
$$\begin{array}{r} 8 & 9 & 6 & 9 & 8 & 3 & 9 \\ - 4 & 1 & 2 & 3 & 9 & 9 & 9 \\ \hline \end{array}$$

2. Write in columns and subtract.

a. $89364 - 5434$

b. $90001 - 9999$

c. $864896 - 326985$

d. $573648 - 10003$

e. $6431785 - 936968$

f. $850496 - 32999$

3. Find the missing numbers in each of the following.

a.
$$\begin{array}{r} 9 & \square & \square & 2 & \square \\ - \square & 8 & 7 & \square & 2 \\ \hline 2 & 8 & 6 & 3 & 3 \end{array}$$

b.
$$\begin{array}{r} \square & \square & \square & \square & \square \\ - 9 & 9 & 9 & 9 & 9 \\ \hline 0 & 0 & 0 & 1 \end{array}$$

c.
$$\begin{array}{r} 9 & 8 & 7 & 6 & 5 \\ - \square & 0 & 4 & \square & 3 \\ \hline 3 & 8 & \square & 9 & \square \end{array}$$

d.
$$\begin{array}{r} 9 & 3 & 0 & 0 & 0 \\ - 3 & \square & \square & 8 & 0 \\ \hline \square & 6 & 8 & 2 & \square \end{array}$$

e.
$$\begin{array}{r} 7 & 4 & 9 & 3 & 2 & \square \\ - 2 & \square & 4 & \square & 9 & 8 \\ \hline 4 & 8 & \square & 0 & \square & 4 \end{array}$$

f.
$$\begin{array}{r} 8 & 0 & \square & 4 & 8 & \square \\ - \square & 9 & 8 & 4 & \square & 9 \\ \hline 3 & \square & 3 & \square & 9 & 1 \end{array}$$

4. Fill in the blanks.

a. 10000 less than 2829404 is

b. $88736 - 88736 = \dots$

c. $24836 - 0 = \dots$

d. $536489 - \dots = 536488$

e. $3393 - 10 = \dots$

f. $956483 - 100 = \dots$

g. $827593 - \dots = 826593$

5. Find the difference between the smallest seven-digit number and the greatest six-digit number.

6. Subtract the difference of 98,736 and 64,388 from 2,87,368.

7. What must be added to 9,73,645 to get 78,36,456?
8. Mr. Rahman deposited ₹ 3,40,550 in his account. He withdrew ₹ 1,97,364 for his **expenditure**. Find the balance amount in his account.
9. Two candidates A and B contested in an election. Candidate A got 93,645 votes and the candidate B got 99,940 votes. Who won the election and by how many votes?
10. There were 34,460 cans of cold drink out of which 12,790 cans were sold. Find the number of cans left.
11. Mr. Mohit earned ₹ 1,35,000 per month. He spent ₹ 75,000 on repairing his house, ₹ 16,000 to purchase a TV set and ₹ 28,900 to buy a computer in a particular month. How much money is now left with him?
12. If the sum of two numbers is 99,009 and one of the numbers is 35,729; find the other number.
13. The capacity of Firoz Shah Kotla stadium is 55,000. If during a one-day cricket match, 34,937 people have entered before lunch time and 16,640 people after lunch time, find how many people can enter the field till it is filled to its full capacity.



Word Zone

expenditure

the amount of money spent



Exploration Zone

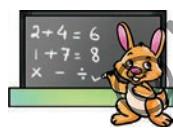
- In our country, every area has a particular pin code which is used for sending letters and parcels. Ask about the other uses of pin code from your parents. Make a list of pin codes of three different areas and find their sum.
- Make a list of the birth years of your family members and by using subtraction find the difference of their ages.



e Zone

- To know more go through the given link and expand your knowledge about addition and subtraction

<http://www.aaamath.com/pro74ax2.htm>
<http://www.aaamath.com/fra66ex2.htm>



Recap Zone

- Putting together two or more numbers or collections is called addition.
- Taking away some object(s) or number(s) from a group is called subtraction.
- The numbers that are added are called addends and the result of addition is called the sum.
- In subtraction, larger number is called minuend and smaller number is called subtrahend. The result of subtraction is called the difference.
- If we add 1 to a number, we get the successor of the number.
- If we subtract 1 from a number, we get the predecessor of the number.



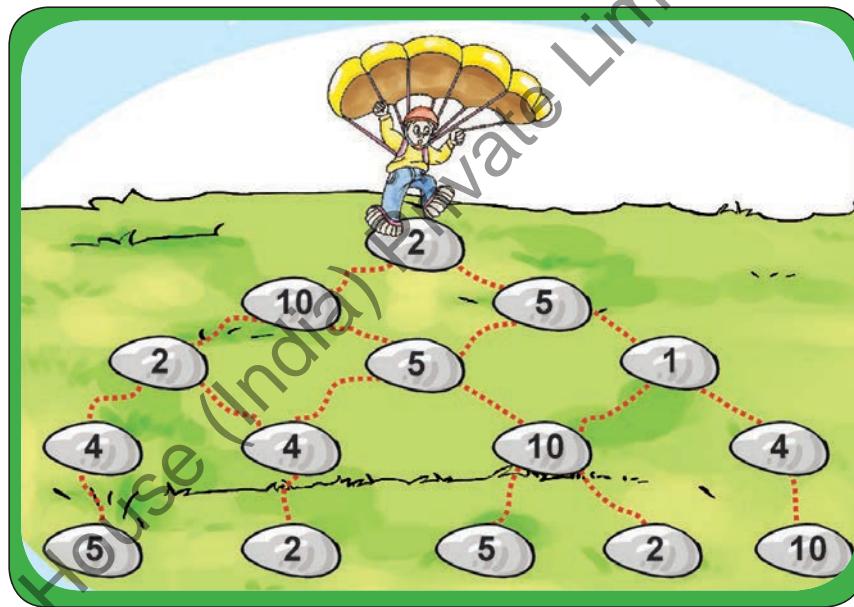
3

MULTIPLICATION



Start Zone

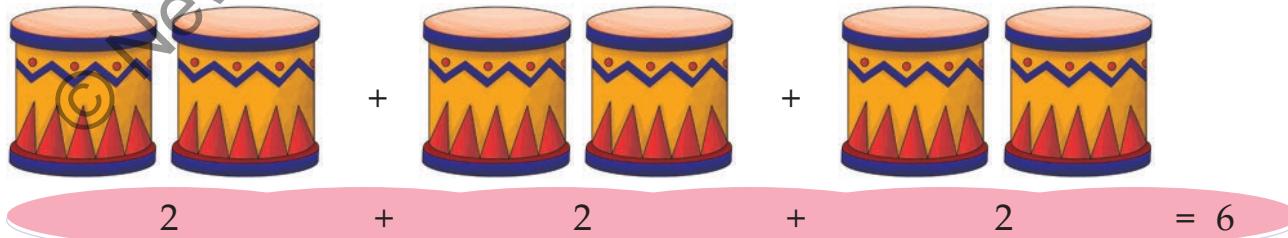
A parachutist participating in a race has just jumped off a plane. He may win only if he follows a particular path down on the ground. The product of the numbers in the winning path leads to the product 5,000. He is free to move in any direction. Find his winning path by tracing the dotted lines along the numbers whose product is 5000.



Knowledge Zone

Multiplication means repeated addition. Let's understand this with the help of an example.

There are three groups of two drums each.



or 3 times 2 = 6

or 3 \times 2 = 6 (Total number of objects)
 (Number of groups) (Number of objects
 in each group)

We read $3 \times 2 = 6$ as 3 into 2 is 6.

$3 \times 2 = 6$ is called multiplication fact.

3	→ Multiplicand
\times 2	→ Multiplier
6	→ Product

The number to be multiplied is called the **multiplicand**. Here 3 is multiplicand.

The number by which we multiply is called the **multiplier**. Here, 2 is the multiplier.

The result of multiplication is called the **product**. Here, 6 is the product.

We use the sign ' \times ' to represent multiplication. The multiplicand and the multiplier are also called the **factors**.

Multiplication by a One-digit Number

Example : Multiply 143 with 5.

Solution :

H	T	O
(2)	(1)	
1	4	3
	\times	5
7	1	5

Step 1 : Multiply 5 with ones digit of 143 i.e., 3; $5 \times 3 = 15$.

Step 2 : Put 5 in the ones place and carry 1 to the tens column.

Step 3 : Multiply 5 with tens digit of 143 i.e., 4; $5 \times 4 = 20$. Add 1 that was carried over; $20 + 1 = 21$.

Step 4 : Put 1 in the tens place and carry 2 to the hundreds column.

Step 5 : Multiply 5 with hundreds digit of 143 i.e., 1; $5 \times 1 = 5$. Add 2 that was carried over; $5 + 2 = 7$.

Step 6 : Put 7 in the hundreds place.

Answer : $143 \times 5 = 715$.





Exercise 3.1

1. Multiply the following numbers.

a.
$$\begin{array}{r} 3 & 2 & 9 \\ \times & 3 \\ \hline \end{array}$$

b.
$$\begin{array}{r} 1 & 2 & 5 \\ \times & 5 \\ \hline \end{array}$$

c.
$$\begin{array}{r} 6 & 5 & 0 \\ \times & 7 \\ \hline \end{array}$$

d.
$$\begin{array}{r} 2 & 5 & 1 \\ \times & 9 \\ \hline \end{array}$$

e.
$$\begin{array}{r} 4 & 3 & 2 \\ \times & 7 \\ \hline \end{array}$$

f.
$$\begin{array}{r} 8 & 4 & 3 \\ \times & 2 \\ \hline \end{array}$$

g.
$$\begin{array}{r} 2 & 4 & 5 \\ \times & 4 \\ \hline \end{array}$$

h.
$$\begin{array}{r} 4 & 5 & 1 \\ \times & 4 \\ \hline \end{array}$$

i.
$$\begin{array}{r} 6 & 4 & 3 \\ \times & 2 \\ \hline \end{array}$$

j.
$$\begin{array}{r} 3 & 4 & 3 \\ \times & 3 \\ \hline \end{array}$$

k.
$$\begin{array}{r} 8 & 0 & 0 \\ \times & 2 \\ \hline \end{array}$$

l.
$$\begin{array}{r} 5 & 4 & 6 \\ \times & 1 \\ \hline \end{array}$$

2. Copy and complete in your notebook. Write in columns.

a. 324×6

b. 543×2

c. 306×3

d. 852×5

e. 425×2

f. 362×7

g. 643×4

h. 311×9

Multiplication by a Two-digit Number

Example 1 : Multiply 83 by 24.

Solution :

$$\begin{array}{r}
 & 8 & 3 \\
 \times & 2 & 4 \\
 \hline
 & 3 & 3 & 2 \\
 + & 1 & 6 & 6 & 0 \\
 \hline
 & 1 & 9 & 9 & 2
 \end{array}$$

» A two-digit number multiplied by another two-digit number cannot give product of more than four digits.



Step 1 : Multiply the number with ones digit. 83×4 ones = 332 ones = 332

Step 2 : Multiply the number with tens digit. 83×2 tens = 166 tens = 1660

Step 3 : Add the products obtained in steps 1 and 2. $332 + 1660 = 1992$

Answer : $83 \times 24 = 1992$.



Example 2 : Multiply the following numbers.

a. 243×56

b. 5243×12

Solution :

a.

$$\begin{array}{r} 2\ 4\ 3 \\ \times 5\ 6 \\ \hline 1\ 4\ 5\ 8 \\ + 1\ 2\ 1\ 5\ 0 \\ \hline 1\ 3\ 6\ 0\ 8 \end{array}$$

(Expanding the multiplier)

b.

$$\begin{array}{r} 5\ 2\ 4\ 3 \\ \times 1\ 2 \\ \hline 1\ 0\ 4\ 8\ 6 \\ + 5\ 2\ 4\ 3\ 0 \\ \hline 6\ 2\ 9\ 1\ 6 \end{array}$$

(Expanding the multiplier)

Multiplication by a Three-digit Number

Example 1 : Multiply 713 by 314.

Solution :

$$\begin{array}{r} 7\ 1\ 3 \\ \times 3\ 1\ 4 \\ \hline 2\ 8\ 5\ 2 \\ 7\ 1\ 3\ 0 \\ + 2\ 1\ 3\ 9\ 0\ 0 \\ \hline 2\ 2\ 3\ 8\ 8\ 2 \end{array}$$

(Expanding the multiplier)

Step 1 : Multiply the number by the ones digit.

$$713 \times 4 \text{ ones} = 2,852 \text{ ones} = 2,852$$

Step 2 : Multiply the number by the tens digit.

$$713 \times 1 \text{ tens} = 713 \text{ tens} = 7,130$$

Step 3 : Multiply the number by the hundreds digit.

$$713 \times 3 \text{ hundreds} = 2,139 \text{ hundreds} = 2,13,900$$

Step 4 : Add the products obtained in steps 1, 2 and 3.

$$2,852 + 7,130 + 2,13,900 = 2,23,882$$

Answer : $713 \times 314 = 2,23,882$.



Example 2 : Multiply: 2594×492 .

Solution :

$$\begin{array}{r}
 2\ 5\ 9\ 4 \\
 \times\ 4\ 9\ 2 \\
 \hline
 5\ 1\ 8\ 8 \\
 2\ 3\ 3\ 4\ 6\ 0 \\
 +\ 1\ 0\ 3\ 7\ 6\ 0\ 0 \\
 \hline
 1\ 2\ 7\ 6\ 2\ 4\ 8
 \end{array}$$

(Expanding the multiplier)



Exercise 3.2

1. Find the products of the following figures.

a. $\begin{array}{r}
 7\ 4\ 3\ 6 \\
 \times\ 5
 \end{array}$

b. $\begin{array}{r}
 5\ 6\ 7 \\
 \times\ 4
 \end{array}$

c. $\begin{array}{r}
 9\ 3\ 2\ 4 \\
 \times\ 8
 \end{array}$

d. $\begin{array}{r}
 7\ 0\ 2\ 5 \\
 \times\ 2\ 3
 \end{array}$

e. $\begin{array}{r}
 8\ 4\ 1\ 6 \\
 \times\ 3\ 3\ 2
 \end{array}$

f. $\begin{array}{r}
 1\ 4\ 3\ 2 \\
 \times\ 3\ 1\ 2
 \end{array}$

g. $\begin{array}{r}
 5\ 4\ 3\ 6 \\
 \times\ 2\ 3
 \end{array}$

h. $\begin{array}{r}
 8\ 3\ 2\ 4 \\
 \times\ 3\ 1\ 2
 \end{array}$

i. $\begin{array}{r}
 2\ 3\ 2\ 7 \\
 \times\ 2\ 3
 \end{array}$

j. $\begin{array}{r}
 5\ 0\ 0\ 3 \\
 \times\ 2\ 4
 \end{array}$

k. $\begin{array}{r}
 1\ 4\ 3\ 6 \\
 \times\ 4\ 2\ 3
 \end{array}$

l. $\begin{array}{r}
 5\ 6\ 4\ 3 \\
 \times\ 1\ 2\ 0
 \end{array}$

Word Problems

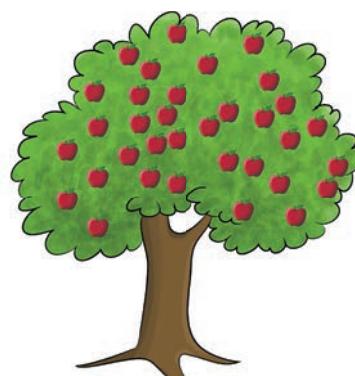
Example : Mr. Bhagat has an orchard in which there are 213 apple trees. Each tree gives 212 apples. How many apples will all the trees in the orchard give?

Solution : Number of apple trees in the orchard = 213

Number of apples given by each tree = 212

Therefore, the number of apples given by 213 trees in orchard = $213 \times 212 = 45156$.

$$\begin{array}{r}
 2\ 1\ 3 \\
 \times\ 2\ 1\ 2 \\
 \hline
 4\ 2\ 6 \\
 2\ 1\ 3\ 0 \\
 +\ 4\ 2\ 6\ 0\ 0 \\
 \hline
 4\ 5\ 1\ 5\ 6
 \end{array}$$





Exercise 3.3

1. How many hours are there in 1 leap year?
- » Leap year has 366 days
2. There are 50 fruits in a basket. How many fruits are there in 38 such baskets?
-
3. A bag contains 48 kg rice. Find the weight of 216 such bags.
4. Weight of a tennis ball is 288 g. Find the weight of 1245 such balls?
-
5. A story-book contains 275 pages. How many pages will 755 such story-books contain?
-
6. 165 mangoes can be packed in one carton. Find the number of mangoes in 1245 such cartons.
7. A labourer earns ₹ 430 in one day. How many rupees can he earn in 145 days?

Multiplication by 10, 100, 1000

(i) When a number is multiplied by 10, the product is obtained by placing one zero (0) to the right of the multiplicand.

Examples : $18 \times 10 = 180$; $148 \times 10 = 1480$; $925 \times 10 = 9250$

» When a digit moves from ones place to the tens place, it becomes 10 times.



(ii) When a number is multiplied by 100, the product is obtained by placing two zeros (00) to the right of the multiplicand.

Examples : $124 \times 100 = 12400$; $1376 \times 100 = 137600$

» When a digit moves from ones place to hundreds place, it becomes 100 times.



(iii) When a number is multiplied by 1000, the product is obtained by placing three zeros (000) to the right of the multiplicand.

Examples : $75 \times 1000 = 75000$; $364 \times 1000 = 364000$

» When a digit moves from ones place to thousands place, it becomes 1000 times.



Properties of Multiplication

- When a number is multiplied by 1, the product is the number itself.

Examples : $17 \times 1 = 17$; $245 \times 1 = 245$

- When a number is multiplied by 0, the product is always 0.

Examples : $24 \times 0 = 0$; $355 \times 0 = 0$

- If the order of numbers is changed in a multiplication, the product does not change at all.

Examples : a. $15 \times 8 = 120$, and $8 \times 15 = 120$.

b. $124 \times 5 = 620$, and $5 \times 124 = 620$.

- The product of three numbers does not change on changing the method of grouping the numbers.

Examples : $5 \times 8 \times 6 = (5 \times 8) \times 6 = 40 \times 6 = 240$

and also $5 \times 8 \times 6 = 5 \times (8 \times 6) = 5 \times 48 = 240$



Exercise 3.4

1. Fill in the boxes.

a. $45 \times 10 =$

b. $\times 100 = 72,400$

c. $245 \times 1000 =$

d. $\times 1000 = 84000$

e. $130 \times 100 =$

f. $360 \times 100 =$

g. $135 \times 1 =$

h. $\times 1 = 575$

i. $748 \times 0 =$

j. $930 \times 0 =$

k. $318 \times 270 = 318 \times$

l. $24 \times$ $= 475 \times 24$

m. $35 \times (300 \times 60) = (35 \times 300) \times$

n. $544 \times 20 =$

o. $2873 \times 10 \times 1 =$

p. $845 \times 100 \times 0 =$

q. $5436 \times 200 =$





Activity Zone

Fun with Multiplication

Objective: To find the products of more than two numbers

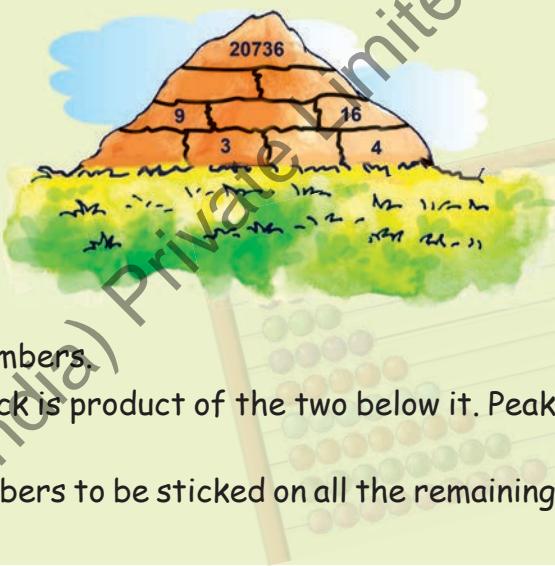
Materials Required: Cardboard, pencil, a pair of scissors, colour sketch, double tape

Type of Activity: Individual (✓)/Pair ()/Group ()



Procedure:

- Cut out a triangle from the cardboard with the scissors as shown here.
- Draw 4 rocks along the bottom, 3 rocks in the second row and 2 in the third row as shown.
- Stick some cotton on the peak to show snow.
- Stick two or three triangular cardboards on the back for support.
- Write 3, 4, 9 and 16 on small pieces of paper and stick double tape at the back of these numbers.
- Stick these on the rocks as number on each rock is product of the two below it. Peak should have the number 20736 as shown.
- Now using multiplication, find the required numbers to be stucked on all the remaining rocks.



Exploration Zone

- Have you ever counted the number of biscuits in a carton?

Visit a general store. Ask the shopkeeper about the number of biscuits of any brand in a packet or purchase a packet and then count the number of biscuits in the packet. Now, observe the carton that contains the packets of this type of biscuit. From the carton, note down the number of packets. Now, find the total number of biscuits in a carton using multiplication.

Further, also find the number of biscuits in more than one cartons.

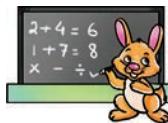


e Zone

- Go through the given link and expand your knowledge about multiplication.

<http://www.aaamath.com/pro74bx2.htm>





Recap Zone

- In multiplication fact, the number that is to be multiplied is called the multiplicand and the number by which we multiply is called the multiplier. The result of multiplication is called their product.
- $\text{Multiplicand} \times \text{Multiplier} = \text{Product}$.
- The multiplicand and multiplier are also called factors.
- Any number multiplied by zero is always zero.
- Any number multiplied by 1 is always that number itself.
- If the order of the multiplicand and multiplier is changed in multiplication, the product remains the same.
- A change in the grouping of numbers does not change the product of these numbers.
- When we multiply a number with 10, 100 or 1000, the product is obtained by placing as many zeros to the right of multiplicand as the number of zeros in the multiplier.

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4

DIVISION



Start Zone

Amit has won an interschool chess championship. So, his family has decided to have a pizza party. They have ordered a pizza weighing 960 grams. His mother cut the pizza into 8 equal parts. Each part is of equal weight.

Amit took 1 piece of the pizza. What was the weight of the piece of pizza taken by Amit? _____

If Amit's mother had cut the pizza into 10 equal parts and Manu, a friend of Amit, would have taken one piece, what would be the weight of the pizza taken by Manu? _____

And if the pizza is cut into 12 equal parts, what will be the weight of each piece? _____



Knowledge Zone

Division as Repeated Subtraction

Division is a process of repeated subtraction. Let's understand this with the help of an example.

Neha has 12 crayons. She distributes them among her four friends—Nidhi, Ruchi, Abhinav and Alok. She starts distributing as shown on the next page:



Neha gives 1 crayon to each friend i.e., she distributes 4 crayons.

Neha is left with $12 - 4 = 8$ crayons.



Then, Neha again gives 1 crayon to each of her friends; i.e., she distributes 4 crayons. She is now left with $8 - 4 = 4$ crayons.



Neha again gives 1 crayon to each friend; i.e., she distributes the left over 4 crayons. Now, she is left with $4 - 4 = 0$ crayons.

Each time an equal number of crayons is distributed by Neha, that is, she has repeatedly subtracted 4 from 12, 3 times to get 0 as the remainder.

12 – 4 = 8 (first time)

8 – 4 = 4 (second time)

4 – 4 = 0 (third time)

This repeated subtraction is written as a division fact:

$$\begin{array}{r} 12 \\ \downarrow \\ \text{Dividend} \end{array} \div \begin{array}{r} 4 \\ \downarrow \\ \text{Divisor} \end{array} = \begin{array}{r} 3 \\ \downarrow \\ \text{Quotient} \end{array}$$

Thus, when something is distributed equally, we say that it has been divided. The symbol for division is ' \div '. The number which is to be divided is called the **dividend**. In the above division fact, 12 is the dividend. The number by which the dividend is divided is called the **divisor**. Here, 4 is the divisor. The result of division is called the **quotient**. In the above division fact, 3 is the quotient.

Division by a One-digit Number

Example 1: Divide 964 by 4.

Solution :

$$\begin{array}{r} 241 \\ \text{Quotient} \\ \text{Divisor} \rightarrow 4 \overline{)964} \leftarrow \text{Dividend} \\ - 8 \downarrow \\ 16 \\ - 16 \downarrow \\ 004 \\ \quad 4 \\ \quad 0 \leftarrow \text{Remainder} \end{array}$$

» For every multiplication fact having different factors, there are two division facts.



Examples:

(a) $7 \times 8 = 56$: $56 \div 7 = 8$ and

$$56 \div 8 = 7$$

(b) $9 \times 7 = 63$: $63 \div 9 = 7$ and

$$63 \div 7 = 9$$

Answer : Quotient = 241

Remainder = 0

Step 1 : Since $9 > 4$, so, divide 9 by 4. Recall the 4 times table. As $4 \times 2 = 8 < 9$ and $4 \times 3 = 12 > 9$, so, 4 divides 9 two times.

Step 2 : Write 2 on top of the 9 and 8 below 9. Subtract 8 from 9. $9 - 8 = 1$.

Step 3 : Bring down 6. Divide number formed i.e., 16 by 4. As $4 \times 4 = 16$, so, 4 divides 16 four times. Write 4 on the top of 6 and 16 below 16 and subtract. $16 - 16 = 0$.

Step 4 : Bring down 4. Divide 4 by 4. As $4 \times 1 = 4$, so, 4 divides 4 one time. Write 1 on the top of 4 and 4 below 4 and subtract. $4 - 4 = 0$.

We can verify any division using following formula called **Division Algorithm**:

$$\text{Dividend} = \text{Divisor} \times \text{Quotient} + \text{Remainder}$$

Verification

$$\text{Dividend} = \text{Divisor} \times \text{Quotient} + \text{Remainder}$$

$$964 = 4 \times 241 + 0$$

$$964 = 964 + 0$$

$$964 = 964.$$

» Dividend = Quotient \times Divisor + Remainder

This is called the Division Algorithm.



Word Zone

algorithm

a process of set of rules to be followed in calculation or any other problem-solving operation



Example 2 : Divide 625 by 6.

Solution :

$$\begin{array}{r} 104 \\ 6 \overline{)625} \\ -6 \\ \hline 025 \\ -24 \\ \hline 01 \end{array}$$

Answer : Quotient = 104
Remainder = 1

Watch out for the zero in the quotient.



Division by a Two-digit Number

Example 1 : Divide 9645 by 15.

Solution :

$$\begin{array}{r} 643 \\ 15 \overline{)9645} \\ -90 \\ \hline 064 \\ -60 \\ \hline 045 \\ -45 \\ \hline 00 \end{array}$$

Answer : Quotient = 643
Remainder = 0



Step 1 : Since, $9 < 15$, so divide the number formed by the first two digits i.e., 96 by 15.

$$96 \div 15 = 6 \text{ (quotient), } 6 \text{ (remainder).}$$

Step 2 : Bring down the next digit 4 alongside the remainder 6, to make this 64.

Step 3 : Divide 64 by 15. $64 \div 15 = 4$ (quotient), 4 (remainder).

Step 4 : Bring down the next digit 5 alongside the remainder 4, to make this 45.

Step 5 : Divide 45 by 15. $45 \div 15 = 3$ (quotient), 0 (remainder).

Verification

$$\text{Dividend} = \text{Quotient} \times \text{Divisor} + \text{Remainder}$$

$$9645 = 643 \times 15 + 0$$

$$9645 = 9645 + 0$$

$$9645 = 9645$$

Example 2 : Divide 8743 by 18.

Solution :

$$\begin{array}{r} 485 \\ 18)8743 \\ -72 \\ \hline 154 \\ -144 \\ \hline 103 \\ -90 \\ \hline 13 \end{array}$$

Answer : Quotient = 485
Remainder = 13

» See that the remainder at every step is less than the divisor.



Step 1 : Since, $8 < 18$; so, consider the number formed by the first two digits i.e., 87.

Step 2 : Divide 87 by 18. $87 \div 18 = 4$ (quotient), 15 (remainder).

Step 3 : Write 4 on the top of 7 and 72 below 87. Subtract 72 from 87, as $87 - 72 = 15$.

Step 4 : Bring down 4 next to 15, to make this 154.

Step 5 : Divide 154 by 18. $154 \div 18 = 8$ (quotient), 10 (remainder).

Step 6 : Write 8 on the top of 4 and 144 below 154. Subtract 144 from 154, as $154 - 144 = 10$.

Step 7 : Bring down 3 next to 10, to make this 103.

Step 8 : Divide 103 by 18. $103 \div 18 = 5$ (quotient), 13 (remainder).

Verification

$$\text{Dividend} = \text{Quotient} \times \text{Divisor} + \text{Remainder}$$

$$8743 = 485 \times 18 + 13$$

$$8743 = 8730 + 13$$

$$8743 = 8743$$



Exercise 4.1

1. Divide the following and verify your division by using division algorithm.

a. $2396 \div 7$	b. $8403 \div 3$	c. $1696 \div 8$	d. $8642 \div 9$
e. $6436 \div 8$	f. $2090 \div 5$	g. $8248 \div 8$	h. $983 \div 2$

2. Divide the following figures.

a. $867 \div 12$	b. $6058 \div 16$	c. $5535 \div 25$	d. $1097 \div 12$
e. $4506 \div 12$	f. $1544 \div 23$	g. $5739 \div 18$	h. $8888 \div 11$

Word Problems

Example 1 : There are 2575 birds in a zoo. If there are 25 large cages and each cage has equal number of birds, how many birds are there in each cage?

Solution : Total number of birds in 25 cages = 2575
The number of birds in 1 cage = $2575 \div 25$

$$\begin{array}{r} 103 \\ 25)2575 \\ -25 \downarrow \\ \hline 075 \\ -75 \\ \hline 0 \end{array}$$

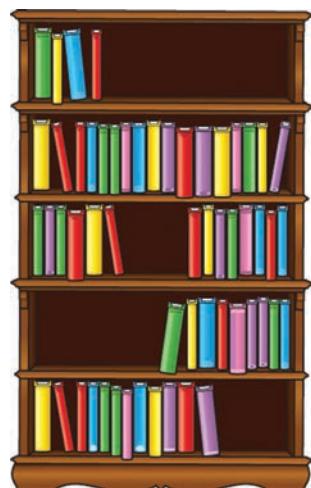


Answer : There are 103 birds in each cage.

Example 2 : 9270 books were equally arranged in 15 book-shelves. How many books were there in each book-shelf?

Solution : Total number of books arranged in 15 book-shelves = 9270
Total number of book-shelves = 15
So, the number of books in each book-shelf = $9270 \div 15$

$$\begin{array}{r} 618 \\ 15)9270 \\ -90 \downarrow \\ \hline 027 \\ -15 \downarrow \\ \hline 120 \\ -120 \\ \hline 0 \end{array}$$



Answer : There are 618 books in each book-shelf.



Exercise 4.2

1. One necklace consists of 19 beads. How many necklaces can be made from 988 beads?
2. Rocky runs 11 kilometres in a day. How many days will he take to cover 121 kilometres?
3. Raj wants to distribute 3264 toffees among 24 children. How many toffees will each of the children get?
4. A number when divided by 28 gives quotient 63 and remainder 5. Find the number.
5. 4060 mango trees are in 29 rows of a garden. If each row has the same number of trees, how many trees have been planted in each row?



Division by 10, 100 and 1000

To divide the number by 10, 100 and 1000, follow the following rules:

- (i) When a number is divided by 10, the digit at the ones place of the number is the remainder and the number formed by the remaining digits is the quotient.

Examples : a. $37 \div 10 = 3$ (quotient), 7 (remainder)

b. $273 \div 10 = 27$ (quotient), 3 (remainder)

- (ii) When a number is divided by 100, the number formed by the ones and tens digits is the remainder and the remaining digits of the dividend form the quotient.

Examples : a. $693 \div 100 = 6$ (quotient), 93 (remainder)

b. $5724 \div 100 = 57$ (quotient), 24 (remainder)



- (iii) When a number is divided by 1000, the number formed by the ones, tens and hundreds digits is the remainder and the remaining digits of the dividend form the quotient.

Examples : a. $7925 \div 1000 = 7$ (quotient), 925 (remainder)

b. $24357 \div 1000 = 24$ (quotient), 357 (remainder)

Properties of Division

- When a **non-zero** number is divided by 1, the quotient is the number itself.

Examples : a. $16 \div 1 = 16$; b. $243 \div 1 = 243$.

- When a non-zero number is divided by itself, the quotient is 1.

Examples : a. $735 \div 735 = 1$; b. $243 \div 243 = 1$

- When zero is divided with any non-zero number, the quotient is zero.

Examples : a. $0 \div 27 = 0$; b. $0 \div 245 = 0$

- Dividing any number by zero is meaningless.

- $\text{Dividend} = \text{Divisor} \times \text{Quotient} + \text{Remainder}$

This is known as division algorithm.



Word Zone

non-zero
not zero. It can be other than zero



Exercise 4.3

1. Find the quotient and remainder of the following figures.

- a. $75 \div 10$
d. ~~4376~~ $\div 100$
g. $4364 \div 10$
j. $100 \div 10$

- b. $245 \div 10$
e. $9634 \div 1000$
h. $8364 \div 100$
k. $1000 \div 100$

- c. $328 \div 100$
f. $83643 \div 1000$
i. $93645 \div 1000$
l. $10000 \div 100$

2. Fill in the boxes.

- a. $64 \div 1 =$
d. $0 \div 24 =$
g. $508 \div 508 =$

- b. $362 \div 1 =$
e. $0 \div 965 =$
h. $6243 \div 6243 =$

- c. $245 \div 245 =$
f. $4364 \div 4364 =$





Activity Zone

Fun with Division

Objective: To understand division as the inverse process of multiplication

Materials Required: Same size squares of two different colours with double tape and cardboard

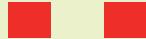
Type of Activity: Individual (✓)/Pair ()/Group ()



Procedure:

- Let us divide 12 by 4; i.e., find the quotient of $12 \div 4$. The quotient of $12 \div 4$ means number of times 4 is added so that the sum could be equal to 12.

- Suppose that one red square represents 4.
- Take one red square and stick this on a cardboard with double tape.
- Take the second red square and paste this along previous red square.



- Now, there are two red squares that collectively represent $4 + 4 = 8$.
- Take the third red square and paste this along the two pasted red squares as has been shown in figure.



$$4 + 4 + 4 = 12 \text{ i.e., } 3 \times 4 = 12 \text{ or } 12 \div 4 = 3$$

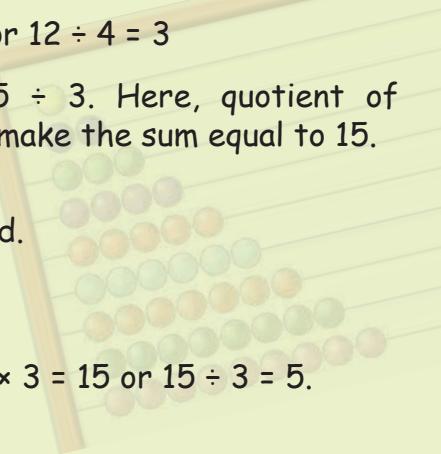
- Let us divide 15 by 3; i.e., find the quotient of $15 \div 3$. Here, quotient of $15 \div 3$ means how many times 3 is continuously added to make the sum equal to 15.

- Let one blue square represents 3.
- Take one blue square and paste this on the cardboard.
- Continue the process until you obtain the sum of 15.



$$3 + 3 + 3 + 3 + 3 = 15 \text{ or } 5 \times 3 = 15 \text{ or } 15 \div 3 = 5.$$

- Division is the inverse process of multiplication.



Exploration Zone

- Collect the data of yearly expenditure on different commodities like grocery, electricity bill, water bill, entertainment etc. of your family for all the months. What is the **average** amount spent by your family on each commodity each month?



Word Zone

average

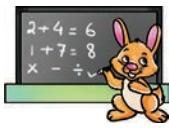
the result obtained by adding several amounts together and then dividing the total by the number of amounts





- Go through the given link and have fun with division.

<http://in.ixl.com/math/class-iv>



Recap Zone

- The number which is divided is called the dividend.
- The number by which we divide is called the divisor.
- When a dividend is divided by a divisor, the answer we get is called the quotient.
- The number left over after division is called the remainder.
- When we divide any number by 1, we get the quotient as the number itself.
- When we divide any number by itself, we always get the quotient as 1.
- When the divisor is zero, division is not possible. When we divide 0 by any number, we get the quotient 0.
- Dividend = (Divisor × Quotient) + Remainder
- When a number is divided by 10, the digit at the ones place of the number is the remainder and the number formed by the remaining digits is the quotient.
- When a number is divided by 100, the number formed by the digits at the ones and tens places of the number is the remainder and the number formed by the remaining digits is the quotient.
- When a number is divided by 1000, the number formed by the digits at the ones, tens and hundreds places of the number is the remainder and the number formed by the remaining digits is the quotient.



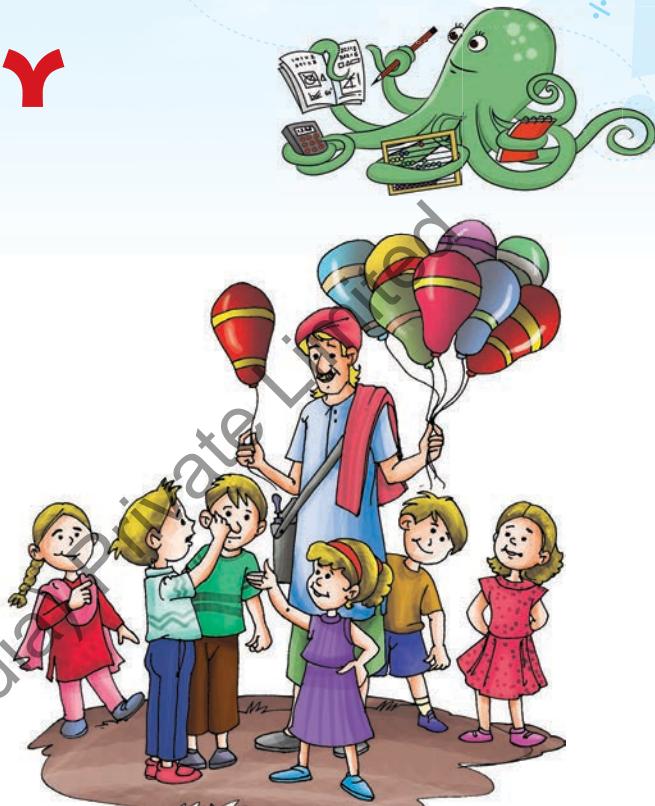
5

TESTS OF DIVISIBILITY



Start Zone

Ramu was a balloon-seller. He had balloons of different colours. Each packet had 5 balloons. On the occasion of Children's Day, he sold many balloons to Ruchi, Renu, Priya, Rajan, Naveen and Nishant. The number of coloured balloons sold by Ramu to these six children are given below.



Name of children	Colour of balloons			
	Red	Blue	Green	Yellow
Ruchi	8	6	3	4
Renu	12	9	6	5
Priya	4	8	2	6
Rajan	6	2	4	2
Naveen	9	8	5	8
Nishant	1	2	5	5
Total	40	35	25	30

At the end of the day, Ramu is confused about the number of packets of balloons of each colour. Sara, Ramu's daughter is a student of class 4. Ramu asks Sara to find the number of the packets. Can you help Sara? Using division you can easily find the number of packets.

Number of packets of red balloons = _____

Number of packets of blue balloons = _____

Number of packets of green balloons = _____

Number of packets of yellow balloons = _____



Knowledge Zone

Divisibility Tests

Before we learn the divisibility tests, let's first study the even and odd numbers.

Even numbers: All the numbers that have 2, 4, 6, 8 and 0 in the ones place are called even numbers.

Examples : 20, 28, 36, 42, 134, 158 are even numbers.

Odd numbers: All the numbers that have 1, 3, 5, 7 and 9 in the ones place are called odd numbers.

Examples : 41, 93, 155, 3457, 9999 are odd numbers.

Let us do an activity that will help to identify even and odd numbers.



Activity Zone

Fun with Numbers

Objective: To understand the concept of even or odd numbers

Materials Required: Buttons/beads/bean seeds (100 in numbers), two trays, sketch pens, white sheet of paper, fevicol and a pair of scissors

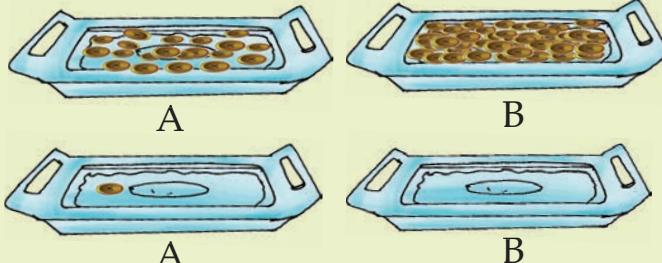
Type of Activity: Individual (✓)/Pair ()/Group ()



Procedure:

Let us identify among 35 and 60, which one is an even number and which is an odd one.

- With the help of scissors cut two slips from white sheet of paper and mark A on one slip and B on the other. Applying fevicol paste slip A on one tray and B on the other. Put 35 buttons in tray A and 60 in tray B.
- Now, count two buttons at one time forming pairs and remove from tray A. In tray A 1 button is left unpaired. So, 35 is an odd number. Then, from tray B, all the buttons have been removed to form pairs and no button is left unpaired. So, 60 is an even number.



Conclusion:

- All those numbers that can be put into pairs; i.e., are divisible by 2, are called even numbers.
- All those numbers that cannot be put into pairs; i.e., are not divisible by 2, are called odd numbers.

As you are familiar with the even and odd numbers, so you can easily understand the tests of divisibility.



Without actual division, we can find if a number is divisible by 2, 3, 4, 5, 6, 9, 10 and any other numbers or not, with the help of divisibility tests. Observe the following tests:

Divisibility by 2: A number is divisible by 2 if the digits in its ones place is an even number.

Examples : 36, 418, 2112, 1654

All these numbers are divisible by 2 because the digits in their ones places are even numbers.

Divisibility by 3: A number is divisible by 3 if the sum of its digits is divisible by 3.

Example : 32,745 is divisible by 3 as the sum of its digits; i.e., $3 + 2 + 7 + 4 + 5 = 21$ is divisible by 3.

Divisibility by 4: A number is divisible by 4 if the number formed by its last two digits is divisible by 4 or its last two digits are 00.

Examples :

- 2,816 is divisible by 4 because the number formed by its last two digits; i.e., 16 is divisible by 4.
- 300 is divisible by 4 because its last two digits are 00.

Divisibility by 5: A number having either 0 or 5 at its ones place is divisible by 5.

Examples :

- 125 is divisible by 5 as its unit digit is 5.
- 1,020 is divisible by 5 as its unit digit is 0.

Divisibility by 6: A number is divisible by 6 if it is divisible by 2 and 3 both.

Example : 8,172 is divisible by 6 because its ones digit is even. Hence, the number is divisible by 2 and the sum of its digits; i.e., $8 + 1 + 7 + 2 = 18$ is divisible by 3, hence number is divisible by 3.

8,172 is divisible by 2 and 3 both, so it is divisible by 6.

Divisibility by 8: A number is divisible by 8 if the number formed by the last three digits is divisible by 8 or its last three digits are 000.

Examples :

- 13,408 is divisible by 8 because the number formed by the last three digits; i.e., 408 is exactly divisible by 8.
- 1,000 is divisible by 8 because its last three digits are 000.



Divisibility by 9: A number is divisible by 9 if the sum of its digits is divisible by 9.

Examples : 2,268 is divisible by 9 because $2 + 2 + 6 + 8 = 18$ is divisible by 9.

Divisibility by 10: A number is divisible by 10 if the digit at its ones place is zero.

Examples : 82,050 and 5,69,230 are divisible by 10.



Exercise 5.1

1. Check the divisibility of the following numbers by 2, 3, 5 and 10. Complete the table by putting tick (\checkmark) for yes and cross (\times) for no.

Numbers	Divisible by			
	2	3	5	10
a. 40810				
b. 42314				
c. 936				
d. 7252				
e. 5865				
f. 37026				

2. By using tests of divisibility, check which of the following numbers are divisible by 4.
- a. 3541 b. 723 c. 172 d. 672
e. 2083 f. 21546 g. 4028 h. 4500
3. Which of the following numbers are divisible by 8?
- a. 4081 b. 5056 c. 1524 d. 6214
e. 5832 f. 7000 g. 2158 h. 3952
4. Which of the following numbers are divisible by 9?
- a. 369 b. 1008 c. 753 d. 321
e. 1152 f. 6285 g. 92088 h. 15227
5. Write all the two-digit numbers which are divisible both by:
- a. 2 and 5 b. 4 and 5 c. 3 and 10 d. 3 and 4
6. Find all the numbers between 30 and 60 which are divisible by:
- a. 2 b. 3 c. 4 d. 5
e. 10 f. 2 and 5 g. 2 and 3 h. 5 and 10





Activity Zone

Fun with Divisibility Rules

Objective: To reinforce the concept of divisibility rules

Materials Required: Number cards ($3\text{ cm} \times 5\text{ cm}$)

Preparation: Make two sets of 20 cards. Name these as Dividend card and Divisor card. Write the following numbers on Dividend cards: For example; write 101 on one Dividend card and 102 on the other Dividend card and so on upto 120.

Write 2, 3, 4, 5, 6, 8, 9 and 10 separately on each Divisor card.

Type of Activity: Individual ()/Pair (✓)/Group ()

Procedure:

- Mix up the set of Dividend cards and place them on the table with their face down and put the Divisor cards on the other side of the table. Now pick up one card at a time from both the sets and tick (✓) the numbers on Divisor cards which completely divide the number written on Dividend card. If they don't divide, write not divisible on Dividend card. For each correct ticking, the player will get one point and for each wrong, one point will be deducted. For each "not divisible", 2 points will be added to the total of that player. Turn can be decided by toss. The time limit for one turn is 30 seconds.
- The game will be over if all the cards have been paired. Now, add the total points. The player who get the maximum points will be declared as the winner.



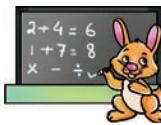
Exploration Zone

- Have you ever applied the divisibility rules on large numbers? Collect the information of Pin Codes of different areas of your state or phone numbers and apply the divisibility rules to check if they can be divided exactly or not.



e Zone

- Go through the given link and expand your knowledge about the divisibility rules.
www.mathsisfun.com/divisibility-rules.html



Recap Zone

- The numbers that have 0, 2, 4, 6, 8 in ones place are even numbers.
- The numbers that have 1, 3, 5, 7, 9 in ones place are odd numbers.
- A number is divisible by 2 if its last digit is 0, 2, 4, 6 or 8.
- A number is divisible by 5 if its last digit is 0 or 5.
- A number is divisible by 10 if its last digit is 0.
- A number is divisible by 3 if the sum of all the digits is divisible by 3.
- A number is divisible by 9 if the sum of all the digits is divisible by 9.
- A number is divisible by 4 if the number formed with the last two digits of the number is divisible by 4 or its last two digits are 00.
- A number is divisible by 6 if the number is divisible by both 2 and 3.
- A number is divisible by 8 if the number formed with the last three digits of the number is divisible by 8 or its last three digits are 000.

6

MULTIPLES AND FACTORS



Start Zone

Soni loves gardening. She has planted many plants in her garden. She makes a time schedule to water the plants. The schedule for the month of October is given below:

Marigold	After every 4 days starting from the 4 th of October.
Rose	After every 5 days starting from the 5 th of October.
Cactus	After every 6 days starting from the 6 th of October.
Dahlia	After every 7 days starting from the 7 th of October.

Can you tell on which dates of October she watered

Marigold? _____

Rose? _____

Cactus? _____

Dahlia? _____

Using multiplication tables you can easily find these dates.



Knowledge Zone

Multiples

Recall the multiplication table of 5.

We know, $1 \times 5 = 5$; $2 \times 5 = 10$; $3 \times 5 = 15$; $4 \times 5 = 20$ and so on.

From the above table, we observe that when 5 is multiplied by 1, 2, 3, 4, ..., we get 5, 10, 15, 20, ... respectively. Products 5, 10, 15, 20, ... are called **multiples** of 5.

Now, recall multiplication table of 8. We know, $1 \times 8 = 8$; $2 \times 8 = 16$; $3 \times 8 = 24$; $4 \times 8 = 32$ and so on. Numbers 8, 16, 24, 32, ... are **multiples** of 8.



October 2014						
Mo	Tu	We	Th	Fr	Sa	Su
1	2	3	4	5		
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		



Thus, **multiples** are products of a number with the natural numbers 1, 2, 3, 4, ... and so on.

Example 1 : List the first 4 multiples of 9.

Solution : In order to find the first four multiples of 9, we multiply it by 1, 2, 3 and 4.

$$9 \times 1 = 9; 9 \times 2 = 18; 9 \times 3 = 27; 9 \times 4 = 36.$$

So, the first four multiples of 9 are: 9, 18, 27 and 36.



» The multiples of a number can be found by writing the multiplication table or doing by skip counting.

Example 2 : Write the 8th multiple of 12.

Solution : The 8th multiple of 12 = $12 \times 8 = 96$.

Properties of multiples

- Every number is a multiple of 1.

Examples : $1 \times 2 = 2$; $1 \times 3 = 3$; $1 \times 4 = 4$; $1 \times 23 = 23$.

- Every number is a multiple of itself.

Examples : $6 \times 1 = 6$; 6 is the multiple of 6, and $5 \times 1 = 5$; 5 is the multiple of 5.

- Every number has infinitely many multiples.

Examples : $1 \times 2 = 2$; $2 \times 2 = 4$; $2 \times 3 = 6$; $2 \times 4 = 8$; $2 \times 5 = 10$; $2 \times 20 = 40$; $2 \times 500 = 1000$,

We can find a multiple of 2 as large as possible.

- Every multiple of a number is greater than or equal to that number.

Examples : Multiples of 3 are: 3, 6, 9, 12, 15, ... Obviously 3 is equal to 3 and other multiples are greater than 3.

- The first multiple of a number is the number itself.

Examples : $5 \times 1 = 5$; $7 \times 1 = 7$; $11 \times 1 = 11$.

First multiple of 5 is 5; of 7 is 7 and of 11 is 11.

- When two or more numbers are multiplied, the product is also a multiple of those numbers.

Examples : $3 \times 4 \times 5 = 60$; here 60 is the multiple of 3, 4 and 5 each.

» All multiples of 2 are called even numbers.
» Numbers which are not multiples of 2 are called odd numbers.



Exercise 6.1

1. Write the first five multiples of each of the following numbers.

- a. 8 b. 9 c. 15 d. 18 e. 20



2. Do as per the following directions.

- Write the 5th multiple of 6.
- Write the multiples of 8 between 80 and 100.
- Write the multiples of 3 between 20 and 50.
- Write the first eight multiples of 5 which are exactly divisible by 10.

3. State whether the following statements are true or false.

- 2, 5, 6, 12, 18, 24 are all multiples of 6.
- 1 is a multiple of every number.
- 5, 10, 15, 20, 25 are multiples of 5.
- 7 is a multiple of 63.
- $8 \times 4 = 32$, 32 is a multiple of both 8 and 4.

Factors

Ishika loves to collect postage stamps of different countries. She has 12 postage stamps of India. She has to paste them in her album. She can arrange them in different blocks like this:

1.



1 row of 12 postage stamps.

We can show this arrangement as 1×12 .

2.



2 rows of 6 postage stamps.

We can show this arrangement as 2×6 .

3.



3 rows of 4 postage stamps.

This arrangement is shown as 3×4 .



1, 12, 2, 6, 3, 4 are all the numbers we have multiplied to get 12.

So, 1, 2, 3, 4, 6 and 12 are **factors** of 12.

The numbers that are multiplied together to find the product are called **factors** of the product. The product is called the **multiple**.

Consider the following:

$$15 \times 8 = 120$$

↑ ↑
Factors of 120 Multiple of 8 and 15

Example 1 : Find all the factors of 48.

Solution : We find the numbers which will give product 48.

$1 \times 48 = 48$. Therefore, 1 and 48 are factors.

$2 \times 24 = 48$. Therefore, 2 and 24 are factors.

$3 \times 16 = 48$. Therefore, 3 and 16 are factors.

$4 \times 12 = 48$. Therefore, 4 and 12 are factors.

$6 \times 8 = 48$. Therefore, 6 and 8 are factors.

Thus, the factors of 48 are 1, 2, 3, 4, 6, 8, 12, 16, 24 and 48.

» Factors of a number can be found either by using division or multiplication.



Note: If we divide 48 by the factors, we get the remainder 0.

So, a factor of a number divides that number completely without leaving any remainder.

Example 2 : Find all the factors of 64.

Solution : We divide 64 completely by all possible divisors.

$$64 \div 1 = 64$$

$$64 \div 2 = 32$$

$$64 \div 4 = 16$$

$$64 \div 8 = 8$$

» All the divisors and quotients are factors of the numbers.
When factors are repeated, no further division takes place.



Thus, the factors of 64 are: 1, 2, 4, 8, 16, 32 and 64.

Example 3 : Is 8 a factor of 130?

Solution :

$$\begin{array}{r} 16 \\ 8 \overline{) 130} \\ -8 \\ \hline 50 \\ -48 \\ \hline 02 \end{array}$$

On dividing 130 by 8, the remainder is not zero.

So, 8 is not a factor of 130.

Properties of factors

- 1 is a factor of every number.
Examples : $5 = 1 \times 5$; $9 = 1 \times 9$; $19 = 1 \times 19$.
- Every number is a factor of itself.
Examples : $7 = 7 \times 1$; $9 = 9 \times 1$; $15 = 15 \times 1$.
- Every factor of a number is less than or at the most equal to the given number.
Examples : $6 = 3 \times 2$, $6 = 6 \times 1$
Here 1, 2, 3 and 6 are factors of 6.
1, 2 and 3 are all less than 6 and 6 is equal to 6.
- 1 is the smallest factor of any number and the number itself is the largest.
Examples : Factors of 4 are 1, 2 and 4. 1 is the smallest factor and 4 is the largest factor.
- A number has limited number of factors.
- Every number except 1 has at least two factors—1 and the number itself.



Activity Zone

Fun with Factors

Objective: To understand the concept of factors

Materials Required: Paper, pencil

Type of Activity: Individual ()/Pair (✓)/Group ()



Procedure:

- Ask all the students present in the class to assemble in a hall and to make all the possible arrangements. For each arrangement tell the class leader to write factors. Suppose the class has 60 students. Then, all the possible arrangements will be:
- $1 \times 60 = 60$; $2 \times 30 = 60$; $3 \times 20 = 60$; $4 \times 15 = 60$; $5 \times 12 = 60$; $6 \times 10 = 60$.
- So, factors of 60 are : 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 and 60.



Exercise 6.2

1. Find the factors of each of the following numbers through multiplication.
a. 18 b. 24 c. 32 d. 44 e. 56
2. Find the factors of each of the following numbers through division.
a. 30 b. 52 c. 91 d. 36 e. 66
3. Answer the following questions.
a. Is 9 a factor of 32?
c. Is 6 a factor of 48?
b. Is 7 a factor of 42?
d. Is 8 a factor of 56?



4. State whether the following statements are true or false.

- a. 8 is a factor of 24.
- b. 6 is a factor of 15.
- c. 1 is a factor of every number.
- d. Every number is a factor of itself.
- e. Every number has countless number of factors.

Types of Numbers

Prime number

A number is called a prime number if it has no other factor except 1 and itself.

For example, 2 has only two factors 1 and 2. Similarly, 5 also has only two factors 1 and 5.

So, 2 and 5 are prime numbers.

Composite number

A number is called a composite number if it has at least three factors i.e., if it has at least one factor more besides 1 and the number itself.

For example, 4 has three factors—1, 2 and 4. Here, factor 2 is besides 1 and 4 itself.

Similarly, the number 6 has four factors—1, 2, 3 and 6. Factors 2 and 3 are in addition to factors 1 and 6 itself.

So, 4 and 6 are composite numbers.

Using the following table, we can understand prime numbers and composite numbers more clearly.

Numbers	Factor(s)	Prime Number	Composite Number
1	1		
2	1, 2	✓	
3	1, 3	✓	
4	1, 2, 4		✓
5	1, 5	✓	
6	1, 2, 3, 6		✓
7	1, 7	✓	
8	1, 2, 4, 8		✓
9	1, 3, 9		✓
10	1, 2, 5, 10		✓
11	1, 11	✓	
12	1, 2, 3, 4, 6, 12		✓
13	1, 13	✓	
14	1, 2, 7, 14		✓
15	1, 3, 5, 15		✓

From the table given above, we observe that numbers 2, 3, 5, 7, 11 and 13 have exactly two factors. So, these are prime numbers.

Similarly, numbers 4, 6, 8, 9, 10, 12, 14 and 15 have more than two factors. So these are composite numbers.

- » Number 1 is neither prime nor composite as it has only one factor. So, it is called a unique number.



The Sieve of Eratosthenes

Eratosthenes, the Greek Mathematician, gave a very simple method of finding the prime and the composite numbers. This method is known as the sieve of Eratosthenes. To find the prime numbers from 1 to 100 by this method, we will have to follow the following steps:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Step 1 : Prepare a list of natural numbers from 1 to 100.

Step 2 : As we know that 1 is neither a prime nor a composite number. So, draw a square around it.

Step 3 : Encircle '2' as a prime number and cross out all its multiples in the table i.e., 4, 6, 8, 10, ..., 98, 100.

Step 4 : Encircle the next uncrossed number 3 as a prime number and cross out all its multiples i.e., 6, 9, 15, ..., 99.

Step 5 : Continue this process of encircling the next uncrossed prime number and crossing out all its multiples until all the numbers in the list are either encircled or crossed.

Step 6 : List all the encircled numbers in the table as prime and all crossed out numbers as composite numbers leaving 1 aside.

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97 are the prime numbers between 1 and 100.



Twin primes

Two prime numbers having only one composite number between them or having a difference of 2 are known as twin primes.

3 and 5 are prime numbers and between them only one composite number is 4. So, 3 and 5 are twin primes. Similarly 5, 7; 11, 13 and so on are twin primes.

Pairs of twin primes between 1 and 100 are 3, 5; 5, 7; 11, 13; 17, 19; 29, 31; 41, 43; 59, 61; 71, 73.

Prime triplet

A set of three consecutive prime numbers, differing by 2 is called a prime triplet. The only prime triplet is (3, 5, 7).

Co-prime

Two numbers are said to be co-prime if they do not have a common factor other than 1. For example, 2, 3; 3, 4; 5, 6; 8, 13; 12, 23 etc. are pairs of co-primes.



- » 2 is the smallest prime number.
- » 2 is the only even prime number. All the other even numbers are composite numbers.
- » 1 is neither a prime nor a composite number.
- » There are infinitely many primes.
- » There is no largest prime number.
- » 4 is the smallest composite number.
- » 9 is the smallest odd composite number.



Exercise 6.3

1. Write all the prime numbers between.

- a. 15 and 35 b. 40 and 60 c. 60 and 100

2. Find the possible missing twins for the following numbers so that they could become twin prime.

- a. 31 b. 41 c. 19

3. Fill in the blanks.

- is the smallest prime number.
- is a unique number as it is neither prime nor a composite number.
- is the smallest composite number.
- Composite numbers have or factors.
- A prime number has only factors.



4. Find the number and colour the bunny using the colours noted next to your answer.

 - The smallest number divisible by 2 and 3
both = White
 - Successor of the even prime number
= Pink
 - Composite numbers less than 10 other than 6 = Brown
 - Neither prime nor composite = Green
 - Prime numbers between 10 and 25
= Blue
 - The smallest prime number = Red (Eyes also in red)
 - Successor of 6 = Purple
 - Prime numbers between 25 and 30
= Yellow



Prime Factorisation

When a number is expressed as a product of prime factors only, this type of factorisation is called **prime factorisation** of the given number.

The prime factorisation of a number can be found by two methods:

(i) Factor tree method (ii) Division method

Factor tree method

When prime factorisation of a number is obtained by writing the factors in the form of an inverted tree, this type of presentation is called the factor tree method.

Example : Write prime factorisation of 75.

Solution:

Step 1: Express 75 as product of 3 and 25.

Step 2 : 3 is a prime number and 25 is a composite number.

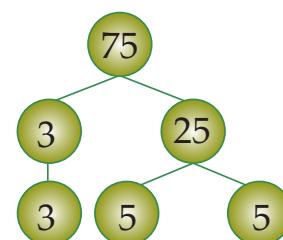
Step 3 : Bring down 3 as it is but express 25 further as product of 5 and 5.

Step 4 : Now, 3, 5 and 5 are prime numbers.
So, the prime factorisation of 75 is complete.



- » If a prime number is a factor of a given number, it is called its prime factor.

For example, factors of 6 are 1, 2, 3 and 6. But only 2 and 3 are prime factors of 6.



- » Always start from the bigger and move down to the smaller.



Division method

In this method, we divide a given number by prime numbers only.

Example 1 : Using division method, write prime factorisation of 96.

Solution :

2	96
2	48
2	24
2	12
2	6
	3

Step 1 : Check if 96 is divisible by the least prime i.e., 2 using divisibility rule.

Step 2 : 96 is divisible by 2; $96 \div 2 = 48$. Write 48 under 96.

Step 3 : 48 is also divisible by 2; $48 \div 2 = 24$. Write 24 under 48.

Step 4 : 24 is divisible by 2; $24 \div 2 = 12$. Write 12 under 24.

Step 5 : Divide 12 by 2; because it is also divisible by 2; $12 \div 2 = 6$.

Step 6 : Divide 6 by 2; $6 \div 2 = 3$.

3 is a prime number. So, stop here.

Example 2 : Using division method, write prime factorisation of the following numbers.

a. 45

b. 75

c. 90

Solution :

a.

3	45
3	15
	5

$$45 = 3 \times 3 \times 5$$

b.

3	75
5	25
	5

$$75 = 3 \times 5 \times 5$$

c.

2	90
3	45
3	15
	5

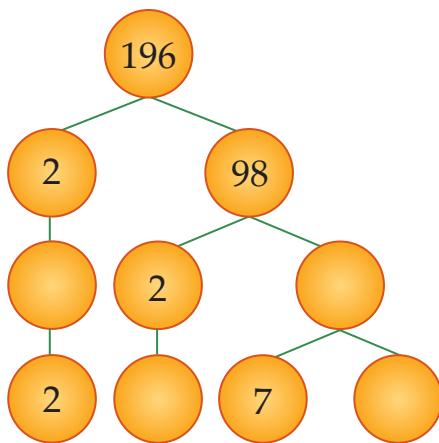
$$90 = 2 \times 3 \times 3 \times 5$$

Exercise 6.4

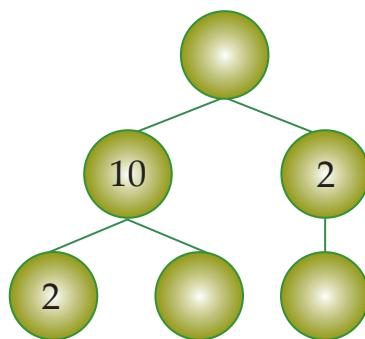
- Using factor tree method, express all the following numbers as the product of prime factors.
 - 54
 - 72
 - 24
 - 42
 - 90
 - 162
 - 100
 - 150
- Using division method, find the prime factors of each of the following numbers.
 - 84
 - 50
 - 32
 - 36
 - 65
 - 30
 - 56
 - 18

3. Here are two factor trees. Write the missing numbers.

a.



b.



Highest Common Factor (HCF)

The greatest factor that divides two or more numbers is called the **Highest Common Factor (HCF)** or the **Greatest Common Divisor (GCD)**.

There are three methods of finding HCF of given numbers:

- Listing out the factors
- Prime factorisation method (short division method)
- Division method.

Finding HCF by listing out the factors

Example : Find HCF of 30 and 36.

Solution : Factors of 30 = $\{1, 2, 3, 5, 6, \cancel{10}, \cancel{15}, 30\}$

Factors of 36 = $\{1, \cancel{2}, \cancel{3}, 4, \cancel{6}, 9, 12, 18, 36\}$

Common factors = 1, 2, 3, 6

Highest Common Factor = 6.

Thus, HCF of 30 and 36 = 6.

» By comparing the factors of two numbers, we can find out the common factors between the two numbers. Same factors of two or more numbers are called **common factors**.



Step 1 : List out the factors of given numbers.

Step 2 : Circle the common factors of the given numbers.

Step 3 : The greatest common factor is the required result.

Finding HCF by prime factorisation method (short division method)

Example : Find HCF of 24 and 32.

Solution :

2		24
2		12
2		6
		3

2		32
2		16
2		8
2		4
		2

Prime factorisation of 24 = $(2 \times 2) \times (2 \times 3)$
Prime factorisation of 32 = $(2 \times 2) \times (2 \times 2 \times 2)$

Common prime factors = 2, 2, 2

Product of common prime factors = $2 \times 2 \times 2 = 8$

Thus, HCF of 24 and 32 = 8

Step 1 : Write the prime factorisation of each of the given numbers.

Step 2 : Identify common factors.

Step 3 : Multiply all the common factors to find out the HCF.

Finding HCF by long division method

Example : Find the HCF of 18 and 81 by long division method.

Solution :

$$\begin{array}{r} 4 \\ 18 \overline{)81} \\ -72 \\ \hline 9 \overline{)18} \end{array}$$

So, HCF = 18

Step 1 : Divide the greater number by the smaller number.

Step 2 : Take remainder as divisor and the divisor as dividend.

Step 3 : Continue the process till we get 0 as the remainder.

Step 4 : The last divisor will be the required HCF of the given numbers.

Properties of HCF

- The HCF of the given numbers is not greater than any of the numbers.
For example, HCF of 16 and 24 is 8, and 8 is smaller than 16 and 24.
- If two numbers have their HCF as 1, they are known as co-prime numbers.



Exercise 6.5

1. Find the HCF of the following numbers by listing the common factors.

- | | | | |
|-----------|-------------|-----------|-------------|
| a. 12, 15 | b. 16, 28 | c. 35, 45 | d. 25, 40 |
| e. 30, 50 | f. 100, 140 | g. 62, 92 | h. 140, 260 |

2. Find the HCF of the following numbers by prime factorisation method.

- | | | | |
|-----------|-----------|------------|-------------|
| a. 18, 28 | b. 24, 45 | c. 36, 54 | d. 36, 80 |
| e. 21, 30 | f. 27, 39 | g. 81, 142 | h. 288, 540 |

3. Find the HCF of the following numbers by long division method.

- | | | | |
|-------------|------------|-------------|-------------|
| a. 18, 38 | b. 28, 35 | c. 56, 70 | d. 26, 40 |
| e. 144, 180 | f. 75, 108 | g. 108, 140 | h. 84, 120. |

Lowest Common Multiple (LCM)

The Lowest Common Multiple (LCM) of two or more numbers is the smallest number which is a multiple of each of the numbers. The lowest common multiple is also called the least common multiple.

There are three methods of finding the LCM of the given numbers:

- (i) Listing the multiples
- (ii) Prime factorisation method
- (iii) Division method

LCM by listing multiples

Example : Find the LCM of 12 and 16.

Solution : Multiples of 12 are 12, 24, 36, 48, 60, 72, 84, 96, 108,

Multiples of 16 are 16, 32, 48, 64, 80, 96, 112, 128,

Common multiples of 12 and 16 are 48, 96,

The smallest common multiple or LCM of 12 and 16 is 48.

» The multiples that are common in a list of multiples of two or more numbers are called common multiples.



Step 1 : Find the multiples of the given numbers.

Step 2 : List the common multiples.

Step 3 : Consider the smallest or the least of the common multiples.

LCM by prime factorisation method

Example : Find the LCM of 28 and 36.

Solution :

$$\begin{array}{r} 2 | 28 \\ \hline 2 | 14 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 2 | 36 \\ \hline 2 | 18 \\ \hline 3 | 9 \\ \hline 3 \end{array}$$

Prime factors of 28 = $2 \times 2 \times 7$

Prime factors of 36 = $2 \times 2 \times 3 \times 3$

LCM of 28 and 36 = Product of the common factors and the remaining prime factors.
= $2 \times 2 \times 3 \times 3 \times 7 = 252$

Step 1 : Express the given numbers as the product of prime numbers.

Step 2 : Identify the common factors.

Step 3 : Multiply the common factor(s) and the remaining prime factors.

LCM by division method

Example 1 : Find LCM of 72 and 90.

Solution :

2	72, 90
3	36, 45
3	12, 15
	4, 5

$$\text{LCM} = 2 \times 3 \times 3 \times 4 \times 5 = 360$$

Step 1 : Arrange all the given numbers in a row separated by comma(s).

Step 2 : Divide by the smallest prime number that can divide both numbers. Here, divide 72 and 90 by 2. Write the quotients 36 and 45 as shown.

Step 3 : Now, divide 36 and 45 by the common prime divisor i.e., 3. Write the quotients 12 and 15 as shown.

Step 4 : Divide 12 and 15 again by the least common prime divisor i.e., 3. Write the quotients 4 and 5 as shown.

Step 5 : As 4 and 5 are co-primes, stop here.

Step 6 : Multiply all the factors and the numbers in the last row to get the LCM.

Example 2 : Find LCM of 12, 16 and 20.

Solution :

2	12, 16, 20
2	6, 8, 10
	3, 4, 5

$$\text{LCM} = 2 \times 2 \times 3 \times 4 \times 5 = 240.$$

Properties of LCM

- The LCM of given numbers is not less than any of the numbers.
For example, LCM of 8 and 24 is 24, and 24 is not less than both 8 and 24.
- The LCM of two co-prime numbers is equal to their products.
For example, 6 and 7 are co-primes.
 $\text{LCM of } 6 \text{ and } 7 = 6 \times 7 = 42.$
- If out of two given numbers, the smaller number is a factor of the bigger one, the smaller number is the HCF of the two, and the bigger number is the LCM of the two.
For example, consider the numbers 3 and 12.
As 3 is a factor of 12, so, HCF of 3 and 12 is 3 and LCM is 12.



Exercise 6.6

- 1. Find the LCM of the following numbers by listing the multiples.**
 - a. 10, 15
 - b. 16, 20
 - c. 12, 18
 - d. 4, 9, 12
 - e. 15, 25, 30
 - f. 24, 36, 48
 - g. 15, 30, 90
 - h. 16, 28, 32.

- 2. Find the LCM of the following numbers by using prime factorisation method.**
 - a. 8, 10
 - b. 12, 10
 - c. 88, 216
 - d. 84, 168
 - e. 15, 30, 90
 - f. 84, 90, 96
 - g. 12, 16, 24
 - h. 48, 64, 80

- 3. Find the LCM of the following numbers by using division method.**
 - a. 18, 24
 - b. 24, 36, 45
 - c. 325, 450
 - d. 78, 80, 100
 - e. 69, 115, 250
 - f. 100, 240, 300

- 4. Fill in the blanks in the following table.**

	First number	Second number	Are they prime?	LCM	HCF
a.	5	7
b.	16	28
c.	11	13
d.	32	96
e.	15	105
f.	13	53
g.	12	18
h.	2	9
i.	20	100
j.	21	30





Activity Zone

Fun with HCF

Objective: To find the HCF of two given numbers

Materials Required: Two chart papers of different colours (say, green and yellow), a cardboard, a ruler, a pencil, an eraser, a pair of scissors, fevistick

Type of Activity: Individual (✓)/Pair ()/Group ()



Procedure:

Let us find the HCF of 8 and 12.

- Take a green chart paper and draw a rectangle of dimension $12 \text{ cm} \times 1 \text{ cm}$ on it.
- Cut this rectangular strip and place it on the cardboard as shown in Fig. 1.

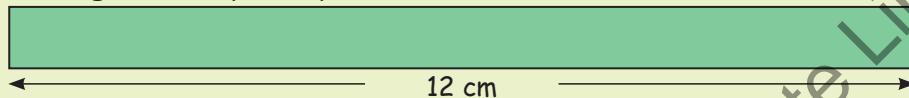


Fig. 1

- Similarly, draw a rectangle of dimension $8 \text{ cm} \times 1 \text{ cm}$ on yellow chart paper.
- Cut this rectangular strip and place it on the cardboard as shown in Fig. 2.



Fig. 2

- Now the green strip represents number 12 and the yellow strip represents 8. To find HCF of 12 and 8, we have to find the greatest length which divides both the green and the yellow strips exactly.
- Take both the green and the yellow strips, and measure the bigger with the smaller one as shown in Fig 3. Here, the green cardboard is bigger than the yellow cardboard, and it measures one time only.

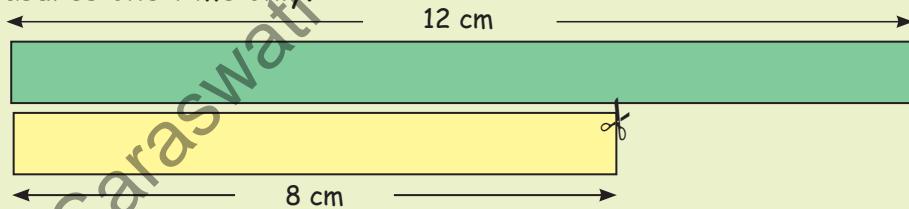


Fig. 3

- Cut out the remaining 4 cm green strip as shown in Fig. 3. Out of these two green strips, put aside the large one.
- Now measure the yellow strip, having length 8 cm with the cutouts of green strip having length 4 cm as shown in Fig. 4. Here, yellow strip is bigger than green strip and it measures by two times.

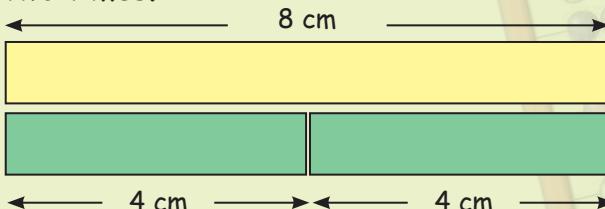


Fig. 4

- We observe that 4 cm strip measures 12 cm and 8 cm strips exactly. Thus, HCF of 8 and 12 is 4.



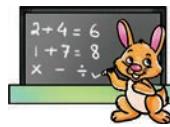
Exploration Zone

- Make a chart of the factor tree representing the years of birth of your family members with their stamp size photographs.
- Count the students of classes VI, VII, VIII and find their HCF.
- Find the LCM of the numbers of boys and girls of your class.



e Zone

- To know more go through the given link and have fun with multiples and factors.
<http://www.math-play.com/Factors-and-Multiples-Jeopardy/Factors-and-Multiples-Jeopardy.html>



Recap Zone

- A factor of a number is an exact divisor of that number.
- Every number is a factor of itself and 1 is a factor of every number.
- No one factor of a number is more than the given number.
- A number divisible by the given number is called its multiple.
- Every number is a multiple of itself.
- Every multiple of a number is equal to or greater than the given number.
- The number having only two factors i.e., 1 and the number itself, is called a prime number.
- The number 1 is neither prime nor a composite number as it has only one factor.
- The number 2 is the smallest prime number and is even. Every prime number except 2 is odd number.
- Two prime numbers which differ by 2 are called twin primes.
- The two numbers with only 1 as a common factor are called co-prime numbers.
- HCF of two or more given numbers is the highest of their common factors.
- LCM of two or more given numbers is the lowest of their common multiples.
- The HCF of two co-primes is 1 and the LCM is their product.
- HCF of two or more numbers is a factor of their LCM.



7

GEOMETRY: POINTS, LINES AND LINE SEGMENTS



Start Zone

Robota is a factory-worker robot. One day, as usual, it walked towards its factory, but to its surprise, it found the way filled with points, lines, line segments and rays. Help the robot reach the factory by following the codes given below:

- Cover all the points by making  around them.
- Cover all the lines by making  around them.
- Cover all the line segments by making  around them.
- Cover all the rays by making  around them.

Now, count the number of points, lines, line segments and rays in his path by counting the different shapes.

Number of points	=	
Number of lines	=	
Number of line segments	=	
Number of rays	=	



Knowledge Zone

You have already identified the different concepts in Geometry in the above section. Let us now learn about the same in details.

Point

- A dot given alongside is called a point.
- Each vertex of a square, rectangle, triangle, cube or cuboid defines a point.
- A

» A point is the basic unit of geometry and is used for showing the exact location of an object.

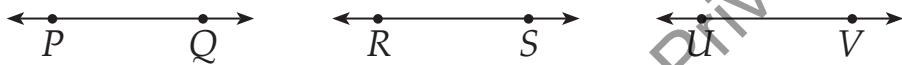


- We can plot a point on a paper by putting a dot with a sharp pencil.
- A point has no length, breadth, height, size or shape.
- It has only position.
- A point is always denoted by a capital letter A, B, C, P or Q, etc.

Line

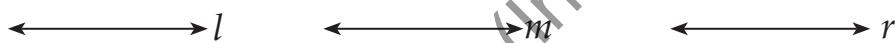
- A line is a collection of points extended in both the directions indefinitely.
- It has neither any beginning nor any end.
- It has unlimited length, no end point and, of course, no width.
- A line is represented by the arrow heads on both the sides. For example, \overleftrightarrow{AB} ; where A and B are two points on the line.
- It is denoted by marking two points by capital letters. Observe the following lines:

» We cannot sketch or draw a line completely on a sheet of paper. Only a part of it can be drawn.



We name these lines as \overleftrightarrow{PQ} , \overleftrightarrow{RS} , and \overleftrightarrow{UV} .

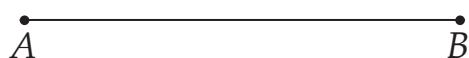
- It can also be denoted by a small letter say l , m , p , q , or r , etc.



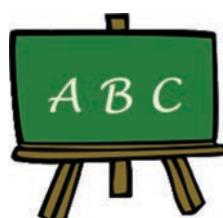
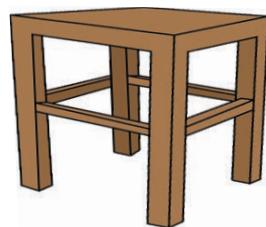
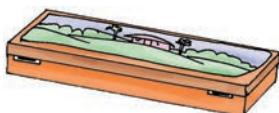
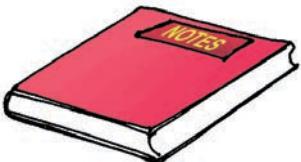
We name these lines as line l , line m and line r .

Line Segment

- The part of a straight line that joins two points together is called a line segment.
- Each edge of a cube, cuboid, square, rectangle or triangle defines a line segment.
- It has two end points—a beginning and an end.
- It cannot be extended. So, it has a fixed length.
- It has no width.
- A line segment can be measured.
- We can draw a line segment on a paper.
- If two end points of a line segment are marked by A and B, we name it as AB or BA . AB or BA represents the same line segment.



Look at different line segments from these objects.



Ray

- The part of a straight line extending from a point indefinitely in one direction is called a ray.
- A ray has only one end point.
- It has unlimited length and no width.
- We cannot measure a ray.
- The endpoint of a ray is called the initial point.
- The symbol for a ray is ' \rightarrow '.

Observe the following rays:



Rays AB and CD are represented by \overrightarrow{AB} and \overleftarrow{CD} . Arrow heads denote the direction in which it can be extended indefinitely.

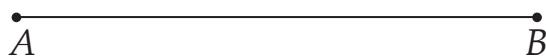
Observe the sun or an electric bulb or a torch. What do they all give us? They all give us rays of light. The light is originating from a fixed point in these sources and moves in the form of rays.



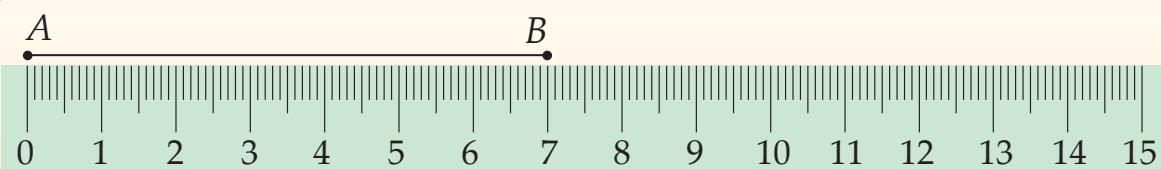
Measuring Line Segment

To measure a line segment we need a ruler and a well-sharpened pencil.

Example : Let us measure the following line segment AB .



Step 1 : Place the ruler on a line segment in such a way that one end of it could match with the '0' mark on the ruler.



Step 2 : Observe which other division on the ruler matches the other end of the line segment.

Step 3 : Thus, length of line segment $AB = 7$ cm.

Construction of a Line Segment

A line segment can be constructed with the help of a ruler and a well-sharpened pencil.

Example : Construct a line segment of length 5 cm.

Solution :

Step 1 : Place the ruler on the paper and hold it firmly.

Step 2 : Using pencil, mark point A with the 0 mark and point B with the 5 mark on the ruler.

Step 3 : Now, join the points together with the help of a ruler and a pencil.

Step 4 : AB is the required line segment.



Exercise 7.1

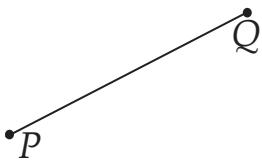
1. Identify the following figures and by using symbols give them names. One has been done here for your help.

a.

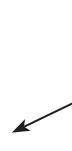


Line MN or \overleftrightarrow{MN}

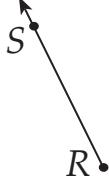
b.



c.



d.



2. Write the number of rays in the given line. Also name them.

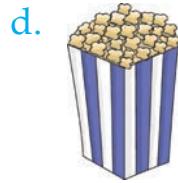


3. Fill in the blanks.

- A does not have any endpoint and a fixed length.
- A has one end point.
- A has no length or breadth.
- A has a fixed length.
- Ray \overrightarrow{PQ} has as its initial point.



4. Measure the length of the following items.



5. Construct line segments of the following lengths.

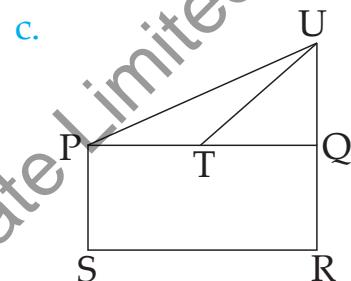
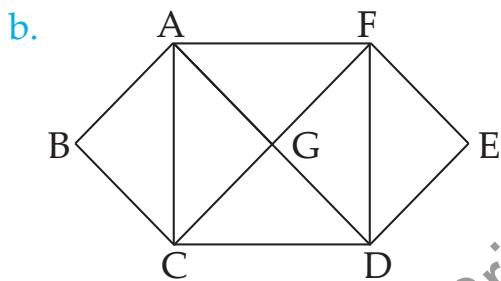
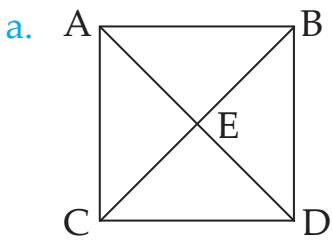
a. 7 cm

b. 6 cm

c. 8 cm 5 mm

d. 9 cm

6. Count the number of line segments in the following figures, and name them.



Activity Zone

Fun with Lines

Objective: To use some of basic geometrical concepts i.e., line segment and point, in daily life, and to build a five-pointed star

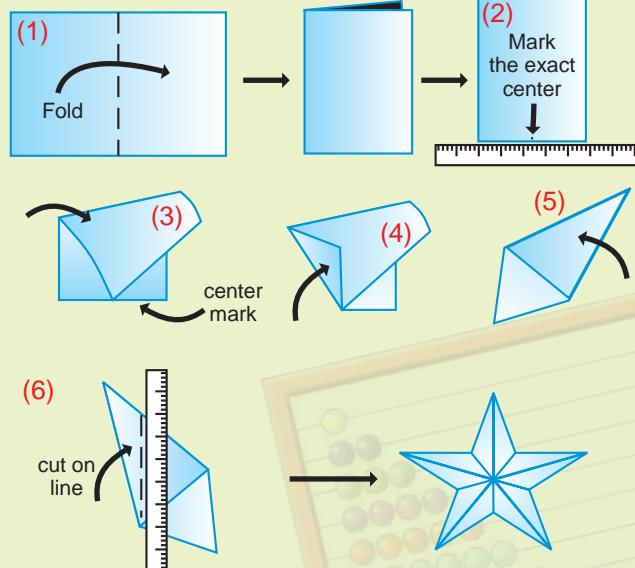
Materials Required: Paper, sketchpens, scale, thread, and a pair of scissors

Type of Activity: Individual (✓)/Pair ()/Group ()



Procedure:

- Take a sheet of paper and hold it horizontally. Fold the left side of the sheet over the right.
- Use a ruler to find the exact center of the bottom edge of your folded sheet. Make a mark at that point.
- Fold the top-left-hand corner down, so that it touches the mark.
- Fold the lower-left-hand corner up over the diagonal edge of the last fold.
- Fold the upper-right-hand corner down over the diagonal of the last fold.
- Use your ruler to draw a diagonal line across your folded shape. Cut across the line. Unfold the shape to see your star! Make more stars and tape them to a window, or tape a piece of thread to one of the points and hang them. They make great decorations for any celebration!



(7) The Five-Pointed Star



Exploration Zone

- ▶ Look around your surroundings and observe some objects such as your study table, laptop, point of well-sharpened pencil or pointed pen, side of notebooks, rays of light from bulb, torch or sun; view of star, etc. What do they all give us? They all give us the idea of point, ray, line segment and line etc. Write your observations and show that in your class.



e Zone

- ▶ To know more go through the given link and have fun with points, lines and line segments.

www.mathsisfun.com/geometry



Recap Zone

- ▶ A very small dot made with well-sharpened pencil or a pen is called a point. It is named with a capital letter.
- ▶ A point shows only position. It has no length, no breadth and no thickness.
- ▶ A line has no end points and it has no fixed length. It extends indefinitely in any direction.
- ▶ A line has no breadth and no thickness.
- ▶ A line segment has a fixed length and two fixed end points.
- ▶ A ray is a part of a line and has only one endpoint. It cannot be measured.
- ▶ A ray can be extended endlessly in only one direction.





REVISION

3



4

1. Match the following.

Column A

- Numeral for six lakh ninety-three thousand eight hundred forty-two
- The place value of 3 in 84,23,721
- The short form of $9000000 + 900 + 8$
- The greatest 7-digit number
- Number name for 7,630,956
- Successor of 78,39,600
- $3 \text{ million} =$
- The smallest 6-digit number using the digits 4, 7, 3, 0, 2, 9

Column B

- 3,000,000
- 90,00,908
- 99,99,999
- 78,39,601
- 3,000
- 2,03,479
- 6,93,842
- Seven million six hundred thirty thousand nine hundred fifty-six

2. Solve the following.

- $5343649 + 3396024 - 2486460$
- $8760982 - 6589429$

- $9876504 - 432693 + 64364$
- $6436983 + 543643 + 26430$

3. Fill in the missing digits.

a.

7	□	3	8	7	□	9
+ 1 9 □ 7 7 1 □						
□ 8 8 6 □ 1 3						

b.

6	6	3	9	□	5	4
- 2	□	3	1	8	9	□
□ 8 0 □ 0 6 0						

4. Multiply.

- 3456 by 4
- 2643 by 6
- 1543 by 38
- 964 by 124

- 8463 by 24
- 765 by 340



5. Fill in the boxes with the correct digits.

a.

9	□	5	□
× 3 7 2			
1	9	5	□ 4
6	8	2	□ 4 0
+ 2	9	2	□ 6 □ □
3 □ 2 7 7 □ □			

b.

5	9	□	3
× 6 0 □			
2	3	□	3 2
□	□	□	□ □
+ 3	5	5	□ □ □
3 5 □ 3 □ 3 2			

6. Divide and check your answer.

a. $478 \div 8$

b. $680 \div 5$

c. $9845 \div 7$

d. $694 \div 16$

e. $775 \div 15$

f. $429 \div 22$

g. $43273 \div 14$

h. $34496 \div 62$

i. $32769 \div 25$

7. Fill in the missing digits.

a.

3	□	
25)	9	□ 6
-	□ 5	
2	4	□
-	2	2
□ 1		

b.

□	5	□		
5)	3	2	9	1
-	□ 0			
2	□			
-	2	5		
4	□			
-	4	0		
□				

8. Solve the following word problems.

- A cold storage has 29,876 baskets of grapes, 19,248 baskets of mangoes and 25,628 baskets of other fruits. What is the total number of fruit baskets in the cold storage?
- From 90,286 m long rope, two pieces measuring 14,345 m and 32,678 m are cut off. Find the length of the remaining rope.
- In a school, there were 545 students. Each student contributed ₹ 45 for the Flood Relief Fund. How much money did the school collect?
- A baker bakes 8730 loaves of bread in 5 days. How many loaves of bread does he bake in 1 day?

9. Use divisibility rules to find out which of the following numbers are divisible by 2, 3, 6, 9 and 10.

a. 801

b. 204

c. 954

d. 700

e. 999

f. 450

g. 965

h. 2580



10. Which of the following numbers are divisible by 3, 4 and 5?

- a. 30
- b. 42
- c. 49
- d. 73
- e. 210
- f. 640
- g. 985
- h. 2480

11. Find the first five multiples of 4, 5 and 9.

12. Find the factors of 21, 64, 90 and 100.

13. Write all the prime numbers between 20 and 50.

14. List the composite numbers between 50 and 80.

15. Write the prime factorisation of 420.

16. Draw a factor tree for 298.

17. Using prime factorisation method, find the HCF of 21 and 96.

18. Find the LCM of 27, 36 and 49 by long division method.

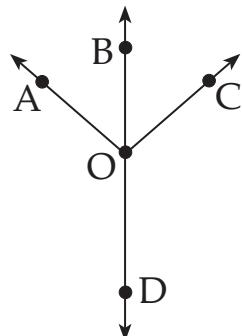
19. Observe the given figure and answer the following questions.



- a. Name the three points
- b. Name the three line segments

20. In the adjacent figure, name:

- a. a line
- b. four rays
- c. five points
- d. two points on a ray but not on the line



ANSWERS

Exercise 1.1

1. a. 5309124 b. 247521 c. 24003
2. a.
-
- b.
-
- c.
-
- d.
-
- e.
-
- f.
-
- g.
-
- h.
-

3. a. Eighteen lakh sixty-nine thousand four hundred thirty-six
 b. Two lakh seven thousand five hundred seventy-five
 c. Sixty-three lakh eleven thousand two hundred six.
 d. Forty-five thousand nine.
 e. Thirty-nine lakh ninety-nine thousand nine hundred ninety.
 f. Five lakh eighty thousand three hundred thirty-six.
 g. Ninety-nine lakh ninety-nine thousand nine hundred ninety-eight.
 h. Seven lakh thirty thousand sixty-four.
4. a. 6,08,914 b. 22,84,168 c. 90,628 d. 18,70,402

Exercise 1.2

	a.	b.	c.	d.	e.	f.	g.	h.
Place value	300	90000	800000	0	500	70	700000	3000000
Face value	3	9	8	0	5	7	7	3

2. a. $500000 + 50 = 500050$ b. $500 + 50 = 550$
 c. $5000 + 500 = 5500$ d. $50000 + 5 = 50005$
3. a. 9 lakhs + 3 ten thousands + 8 thousands
 + 0 hundreds + 2 tens + 5 ones
 b. $5 \times 10000 + 9 \times 1000 + 7 \times 100 + 8 \times 10 + 3 \times 1$
 c. $80,00,000 + 7,00,000 + 80,000 + 4,000 + 900 + 20 + 0$
4. a. $2000000 + 300000 + 20000 + 1000 + 100 + 20 + 3$
 b. $6000000 + 20000 + 700 + 30 + 4$

- c. $8000000 + 500000 + 90000 + 8000 + 600 + 40 + 5$
 d. $70000 + 9000 + 500 + 30 + 6$
 e. $20000 + 600 + 30 + 8$
 f. $200000 + 20000 + 1000 + 300 + 20 + 1$
 g. $500000 + 40000 + 3000 + 600 + 90 + 2$
 h. $7000000 + 3000 + 600 + 40 + 8$

5. a. 589068 b. 4870589 c. 89548 d. 9876321

Exercise 1.3

1. a. = b. < c. > d. < e. >
 f. > g. > h. >
2. a. 33,298 b. 29,819 c. 10,500 d. 29,838
3. a. 61,249 b. 90,828 c. 34,653 d. 8,90,120
4. a. 13,246; 13,335; 13,462; 31,642; 33,426
 b. 33,333; 39,946; 44,444; 55,555; 88,888
 c. 62,319; 62,399; 6,27,129; 6,27,910; 6,27,912
 d. 99,393; 99,993; 1,38,498; 1,39,389; 1,39,398
5. a. 9,98,850; 9,85,818; 8,15,999; 5,08,919; 5,08,909
 b. 40,961; 40,296; 14,961; 14,691; 14,681
 c. 89,631; 89,361; 86,931; 86,316; 86,139
 d. 5,95,216; 5,91,114; 5,91,110; 5,81,740; 5,81,156
6. a. 54,079; 54,089; 54,099; 54,109
 b. 33,359; 33,459; 33,559; 33,659
 c. 45,216; 46,216; 47,216; 48,216
 d. 76,008; 86,008; 96,008; 1,06,008
7. a. 58,111 b. 1,62,340 c. 14,40,000 d. 11,82,401
8. a. 84,058 b. 13,809 c. 1,79,998 d. 5,07,599

Exercise 1.4

	a.	b.	c.	d.	e.	f.
Greatest number	98721	98760	75432	764310	954321	8621
Smallest number	12789	60789	23457	103467	123459	1268

	Five-digit numbers	Six-digit numbers
Greatest	Smallest	Greatest
a. 66621	11126	666621
b. 77765	55567	777765
c. 99653	33569	999653
d. 44321	11234	444321
e. 99875	55789	999875
f. 99432	22349	999432
		555789
		222349

Exercise 1.5

1. a. 80 b. 80 c. 70 d. 420
 e. 110 f. 1,830 g. 440 h. 6,010
2. a. 5,400 b. 800 c. 8,300 d. 800
 e. 6,700 f. 400 g. 1,400 h. 100



3. a. 8,000 b. 1,000 c. 8,000 d. 2,000
e. 8,000 f. 13,000 g. 30,000 h. 7,000

Exercise 1.6

1. a. 8,696,356 b. 5,483,005 c. 5,407,375 d. 3,284,376
e. 604,964 f. 687,504 g. 793,409 h. 3,600,896
2. a. Five million eight hundred nine thousand four hundred sixty-eight
b. Three million eight hundred sixty-five thousand nine hundred eighty
c. Eight hundred seventy-five thousand two hundred forty-three
d. Six million five hundred seventy-three thousand nine hundred twenty-one
e. Four hundred eighty thousand two hundred eighty-nine
f. Six million five hundred seventy-three thousand eight hundred twenty-six
g. Three hundred thousand seven hundred sixty-four
h. Nine million nine hundred ninety thousand four hundred thirty-five
3. a. 6,265,521 b. 3,069,205 c. 9,200,009

Exercise 1.7

1. a. CCCX b. CDLXVIII c. CMXCII d. MMX
e. MCC f. MCMXLV
2. a. 404 b. 421 c. 63 d. 310
e. 1500 f. 1590 g. 900 h. 1117
3. a. XCV, XXX, LXV b. MDCCCLXIX
c. MCMXLVII d. DXLV
e. CMXCIX f. MCMXIV

Exercise 2.1

1. a. 487937 b. 978965 c. 9966979
d. 774061 e. 124967 f. 9725505
g. 589938 h. 575080 i. 99532
2. a. 105676 b. 306046 c. 921551
d. 2460422 e. 2184386 f. 10025093
3. a.
$$\begin{array}{r} 7 & 9 & 6 & 4 & 3 & 6 \\ + & 1 & 4 & 8 & 3 & 2 & 1 \\ \hline 9 & 4 & 4 & 7 & 5 & 7 \end{array}$$
 b.
$$\begin{array}{r} 1 & 4 & 6 & 8 & 9 & 6 \\ + & 5 & 9 & 6 & 7 & 8 & 8 \\ \hline 7 & 4 & 3 & 6 & 8 & 4 \end{array}$$

4. a. 102792 b. 995508 c. 805500 d. 68,764
e. 1000 f. 0 g. 0 h. 10
i. 10000 j. 949028
5. 1110000 6. 1099999 7. 155068 8. ₹ 5847873
9. 25218 litres 10. 19478 books
11. 62144 spectators 12. 72795 persons

Exercise 2.2

1. a. 66501 b. 500251 c. 5345142
d. 119091 e. 400260 f. 4845840
2. a. 83930 b. 80002 c. 537911
d. 563645 e. 5494817 f. 817497

3. a.
$$\begin{array}{r} 9 & 7 & 4 & 2 & 5 \\ - & 6 & 8 & 7 & 9 & 2 \\ \hline 2 & 8 & 6 & 3 & 3 \end{array}$$

b.
$$\begin{array}{r} 1 & 0 & 0 & 0 & 0 \\ - & 9 & 9 & 9 & 9 \\ \hline 0 & 0 & 0 & 1 \end{array}$$

c.
$$\begin{array}{r} 9 & 8 & 7 & 6 & 5 \\ - & 6 & 0 & 4 & 7 & 3 \\ \hline 3 & 8 & 2 & 9 & 2 \end{array}$$

d.
$$\begin{array}{r} 9 & 3 & 0 & 0 & 0 \\ - & 3 & 6 & 1 & 8 & 0 \\ \hline 5 & 6 & 8 & 2 & 0 \end{array}$$

e.
$$\begin{array}{r} 7 & 4 & 9 & 3 & 2 & 2 \\ - & 2 & 6 & 4 & 2 & 9 & 8 \\ \hline 4 & 8 & 5 & 0 & 2 & 4 \end{array}$$

f.
$$\begin{array}{r} 8 & 0 & 2 & 4 & 8 & 0 \\ - & 4 & 9 & 8 & 4 & 8 & 9 \\ \hline 3 & 0 & 3 & 9 & 9 & 1 \end{array}$$

4. a. 2819404 b. 0 c. 24836 d. 1
e. 3383 f. 956383 g. 1000
5. 1 6. 253020 7. 6862811 8. ₹ 143186
9. Candidate B by 6295 votes
10. 21670 cans 11. ₹ 15100 12. 63280 13. 3423

Exercise 3.1

1. a. 987 b. 625 c. 4550 d. 2259 e. 3024
f. 1686 g. 980 h. 1804 i. 1286 j. 1029
k. 1600 l. 546
2. a. 1944 b. 1086 c. 918 d. 4260 e. 850
f. 2534 g. 2572 h. 2799

Exercise 3.2

1. a. 37180 b. 2268 c. 74592 d. 161575
e. 2794112 f. 446784 g. 125028 h. 2597088
i. 53521 j. 120072 k. 607428 l. 677160

Exercise 3.3

1. 8784 hours 2. 1900 fruits 3. 10,368
4. 358560 grams 5. 207625 pages
6. 205425 mangoes 7. ₹ 62350

Exercise 3.4

1. a. 450 b. 724 c. 245000 d. 84 e. 13000
f. 36000 g. 135 h. 575 i. 0 j. 0
k. 270 l. 475 m. 60 n. 10880 o. 28730
p. 0 q. 1087200

Exercise 4.1

1. a. $Q = 342, R = 2$ b. $Q = 2801, R = 0$
c. $Q = 212, R = 0$ d. $Q = 960, R = 2$
e. $Q = 804, R = 4$ f. $Q = 418, R = 0$
g. $Q = 1031, R = 0$ h. $Q = 491, R = 1$
2. a. $Q = 72, R = 3$ b. $Q = 378, R = 10$
c. $Q = 221, R = 10$ d. $Q = 91, R = 5$
e. $Q = 375, R = 6$ f. $Q = 67, R = 3$
g. $Q = 318, R = 15$ h. $Q = 808, R = 0$

Exercise 4.2

1. 52 beads 2. 11 days 3. 136 toffees
4. 1769 5. 140 trees

Exercise 4.3

1. a. $Q = 7, R = 5$ b. $Q = 24, R = 5$ c. $Q = 3, R = 28$
d. $Q = 43, R = 76$ e. $Q = 9, R = 634$ f. $Q = 83, R = 643$
g. $Q = 436, R = 4$ h. $Q = 83, R = 64$ i. $Q = 93, R = 645$
j. $Q = 10, R = 0$ k. $Q = 10, R = 0$ l. $Q = 100, R = 0$
2. a. 64 b. 362 c. 1 d. 0 e. 0
f. 1 g. 1 h. 1

Exercise 5.1

1. Divisible by 2: a., b., c., d. and f.
Divisible by 3: c., e. and f.
Divisible by 5: a. and e.
Divisible by 10: a.
2. c., d., g., h. 3. b., e., f., h. 4. a., b., e. and g.
5. a. 10, 20, 30, 40, 50, 60, 70, 80, 90
b. 20, 40, 60, 80 c. 30, 60, 90
d. 12, 24, 36, 48, 60, 72, 84, 96
6. a. 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58
b. 33, 36, 39, 42, 45, 48, 51, 54, 57
c. 32, 36, 40, 44, 48, 52, 56
d. 35, 40, 45, 50, 55
e. 40, 50 f. 40, 50 g. 36, 42 h. 40, 50

Exercise 6.1

1. a. 8, 16, 24, 32 and 40 b. 9, 18, 27, 36 and 45
c. 15, 30, 45, 60 and 75 d. 18, 36, 54, 72 and 90
e. 20, 40, 60, 80 and 100
2. a. 30 b. 88 and 96
c. 21, 24, 27, 30, 33, 36, 39, 42, 45 and 48
d. 10, 20, 30, 40 and 50
3. a. False b. False c. True d. False e. True

Exercise 6.2

1. a. 1, 2, 3, 6, 9 and 18 b. 1, 2, 3, 4, 6, 8, 12 and 24
c. 1, 2, 4, 8, 16 and 32 d. 1, 2, 4, 11, 22 and 44
e. 1, 2, 4, 7, 8, 14, 28 and 56
2. a. 1, 2, 3, 5, 6, 10, 15 and 30 b. 1, 2, 4, 13, 26 and 52.
c. 1, 7, 13 and 91.
d. 1, 2, 3, 4, 6, 9, 12, 18 and 36.
e. 1, 2, 3, 6, 11, 22, 33 and 66.
3. a. No b. Yes c. Yes d. Yes
4. a. True b. False c. True d. True e. False

Exercise 6.3

1. a. 17, 19, 23, 29 and 31 b. 41, 43, 47, 53 and 59
c. 61, 67, 71, 73, 79, 83, 89 and 97
2. a. 29 b. 43 c. 17
3. a. 2 b. 1 c. 4 d. three or more e. two
- 4.



Exercise 6.4

1. a.


```

        graph TD
        A((54)) --- B((2))
        A --- C((27))
        B --- D((3))
        B --- E((9))
        C --- F((3))
        C --- G((3))
      
```

$$54 = 2 \times 3 \times 3 \times 3$$
- b.


```

        graph TD
        A((72)) --- B((2))
        A --- C((36))
        B --- D((2))
        B --- E((18))
        C --- F((2))
        C --- G((9))
        E --- H((3))
        E --- I((3))
      
```

$$72 = 2 \times 2 \times 2 \times 3 \times 3$$
- c.


```

        graph TD
        A((24)) --- B((2))
        A --- C((12))
        B --- D((2))
        B --- E((6))
        C --- F((2))
        C --- G((3))
      
```

$$24 = 2 \times 2 \times 2 \times 3$$
- d.


```

        graph TD
        A((42)) --- B((2))
        A --- C((21))
        B --- D((3))
        B --- E((7))
      
```

$$42 = 2 \times 3 \times 7$$
- e.


```

        graph TD
        A((90)) --- B((2))
        A --- C((45))
        B --- D((3))
        B --- E((15))
        C --- F((3))
        C --- G((5))
      
```

$$90 = 2 \times 3 \times 3 \times 5$$
- f.


```

        graph TD
        A((162)) --- B((2))
        A --- C((81))
        B --- D((3))
        B --- E((27))
        C --- F((3))
        C --- G((9))
        E --- H((3))
        E --- I((3))
      
```

$$162 = 2 \times 3 \times 3 \times 3 \times 3$$
- g.


```

        graph TD
        A((100)) --- B((2))
        A --- C((50))
        B --- D((2))
        B --- E((25))
        C --- F((5))
        C --- G((5))
      
```

$$100 = 2 \times 2 \times 5 \times 5$$
- h.


```

        graph TD
        A((150)) --- B((2))
        A --- C((75))
        B --- D((3))
        B --- E((25))
        C --- F((5))
        C --- G((5))
      
```

$$150 = 2 \times 3 \times 5 \times 5$$
2. a. $84 = 2 \times 2 \times 3 \times 7$
b. $50 = 2 \times 5 \times 5$
c. $32 = 2 \times 2 \times 2 \times 2 \times 2$
e. $65 = 5 \times 13$
g. $56 = 2 \times 2 \times 2 \times 7$
h. $18 = 2 \times 3 \times 3$
3. a.


```

        graph TD
        A((196)) --- B((2))
        A --- C((98))
        B --- D((2))
        B --- E((2))
        C --- F((7))
        C --- G((7))
      
```
- b.


```

        graph TD
        A((20)) --- B((10))
        A --- C((2))
        B --- D((2))
        B --- E((5))
        B --- F((2))
      
```

Exercise 6.5

1. a. 3 b. 4 c. 5 d. 5 e. 10
 f. 20 g. 2 h. 20
 2. a. 2 b. 3 c. 18 d. 4 e. 3
 f. 3 g. 1 h. 36
 3. a. 2 b. 7 c. 14 d. 2 e. 36
 f. 3 g. 4 h. 12

Exercise 6.6

1. a. 30 b. 80 c. 36 d. 36 e. 150
 f. 144 g. 90 h. 224
 2. a. 40 b. 60 c. 2376 d. 168 e. 90
 f. 2520 g. 48 h. 960
 3. a. 72 b. 360 c. 5850 d. 15600 e. 17250 f. 1200
 4. a. Yes, 35, 1 b. No, 112, 4 c. Yes, 143, 1
 d. No, 96, 32 e. No, 105, 15 f. Yes, 689, 1
 g. No, 36, 6 h. No, 18, 1 i. No, 100, 20
 j. No, 210, 3

Exercise 7.1

1. b. Line segment PQ or \overline{PQ} c. line l d. Ray RS or \overrightarrow{RS}
 2. 6 rays, \overline{PQ} , \overline{PR} , \overline{QR} , \overline{RQ} , \overline{RP} , \overline{QP}
 3. a. line b. ray c. point d. line segment e. P
 4. a. 2.5 cm b. 1.5 cm c. 2 cm d. 2.4 cm
 5. Do yourself
 6. a. 10 line segments; \overline{AB} , \overline{AE} , \overline{BE} , \overline{BC} , \overline{CD} , \overline{CE} , \overline{DE} , \overline{AD} and \overline{BD}
 b. 14 line segments; \overline{AB} , \overline{AC} , \overline{AD} , \overline{AG} , \overline{AF} , \overline{BC} , \overline{CF} , \overline{CG} , \overline{CD} , \overline{DG} , \overline{DF} , \overline{DE} , \overline{EF} , \overline{FG}
 c. 10 line segments; \overline{IE} , \overline{IJ} , \overline{IF} , \overline{EJ} , \overline{EH} , \overline{EF} , \overline{FG} , \overline{FJ} , \overline{HG} and \overline{IG}

Revision

1. a. (vii) b. (v) c. (ii) d. (iii)
 e. (viii) f. (iv) g. (i) h. (vi)
 2. a. 6253213 b. 9508175 c. 2171553 d. 7007056
 3. a.
$$\begin{array}{r} 7 & 9 & 3 & 8 & 7 & 9 & 9 \\ + & 1 & 9 & 4 & 7 & 7 & 1 & 4 \\ \hline 9 & 8 & 8 & 6 & 5 & 1 & 3 \end{array}$$
 b.
$$\begin{array}{r} 6 & 6 & 3 & 9 & 9 & 5 & 4 \\ - & 2 & 8 & 3 & 1 & 8 & 9 & 4 \\ \hline 3 & 8 & 0 & 8 & 0 & 6 & 0 \end{array}$$

 4. a. 13824 b. 15858 c. 203112 d. 58634
 e. 119536 f. 260100
 5. a.
$$\begin{array}{r} 9 & 7 & 5 & 2 \\ \times & 3 & 7 & 2 \\ \hline 1 & 9 & 5 & 0 & 4 \\ 6 & 8 & 2 & 6 & 4 & 0 \\ + & 2 & 9 & 2 & 5 & 6 & 0 & 0 \\ \hline 3 & 6 & 2 & 7 & 7 & 4 & 4 \end{array}$$

b.

$$\begin{array}{r} 5 & 9 & 3 & 3 \\ \times & 6 & 0 & 4 \\ \hline 2 & 3 & 7 & 3 & 2 \\ 0 & 0 & 0 & 0 & 0 \\ + 3 & 5 & 5 & 9 & 8 & 0 & 0 \\ \hline 3 & 5 & 8 & 3 & 5 & 3 & 2 \end{array}$$

6. a. $Q = 59$, $R = 6$ b. $Q = 136$, $R = 0$
 c. $Q = 1406$, $R = 3$ d. $Q = 43$, $R = 6$
 e. $Q = 51$, $R = 10$ f. $Q = 19$, $R = 11$
 g. $Q = 3090$, $R = 13$ h. $Q = 556$, $R = 24$
 i. $Q = 1310$, $R = 19$

7. a.
$$\begin{array}{r} 3 & 9 \\ 25) 9 & 9 & 6 \\ - 7 & 5 \\ \hline 2 & 4 & 6 \\ - 2 & 2 & 5 \\ \hline 2 & 1 \end{array}$$
 b.
$$\begin{array}{r} 6 & 5 & 8 \\ 5) 3 & 2 & 9 & 1 \\ - 3 & 0 \\ \hline 2 & 9 \\ - 2 & 5 \\ \hline 4 & 1 \\ - 4 & 0 \\ \hline 1 \end{array}$$

8. a. 74752 baskets b. 43263 m c. ₹ 24525
 d. 1746 loaves of bread

9. Divisible by 2: b., c., d., f., h.
 Divisible by 3: a., b., c., e., f., h
 Divisible by 9: a., c., e., f.
 Divisible by 10: d., f., h.

10. Divisible by 3: a., b., e.
 Divisible by 4: f., h.
 Divisible by 5: a., e., f., g., h.

11. First five multiples of 4 = 4, 8, 12, 16, 20
 First five multiples of 5 = 5, 10, 15, 20, 25
 First five multiples of 9 = 9, 18, 27, 36, 45

12. Factors of 21 = 1, 3, 7, 21
 Factors of 64 = 1, 2, 4, 8, 16, 32, 64
 Factors of 90 = 1, 2, 3, 5, 6, 9, 10, 15, 18, 30, 45, 90
 Factors of 100 = 1, 2, 4, 5, 10, 20, 25, 50, 100

13. 23, 29, 31, 37, 41, 43, 47
 14. 51, 52, 54, 55, 56, 57, 58, 60, 62, 63, 64, 65, 66, 68, 69, 70, 72, 74, 75, 76, 77, 78, 80.

15. $2 \times 2 \times 3 \times 5 \times 7$ 16.
$$\begin{array}{c} 298 \\ \swarrow \quad \searrow \\ 2 \quad 149 \end{array}$$
 17. 3

18. 5292

19. Points: P, Q, R

Line segments = \overline{PQ} , \overline{QR} and \overline{PR}

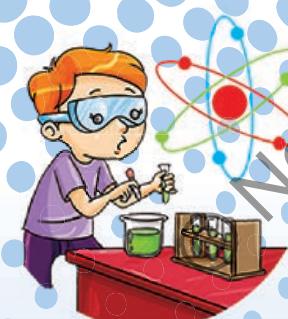
20. a. \overrightarrow{BD} b. \overrightarrow{OB} , \overrightarrow{OA} , \overrightarrow{OC} , \overrightarrow{OD} c. A, B, C, O, D
 d. A and C



Science



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1

PLANTS AND THEIR PARTS



Let's start

Look at the pictures given below and arrange their names.



OLFEWR



EALF



RUFIT



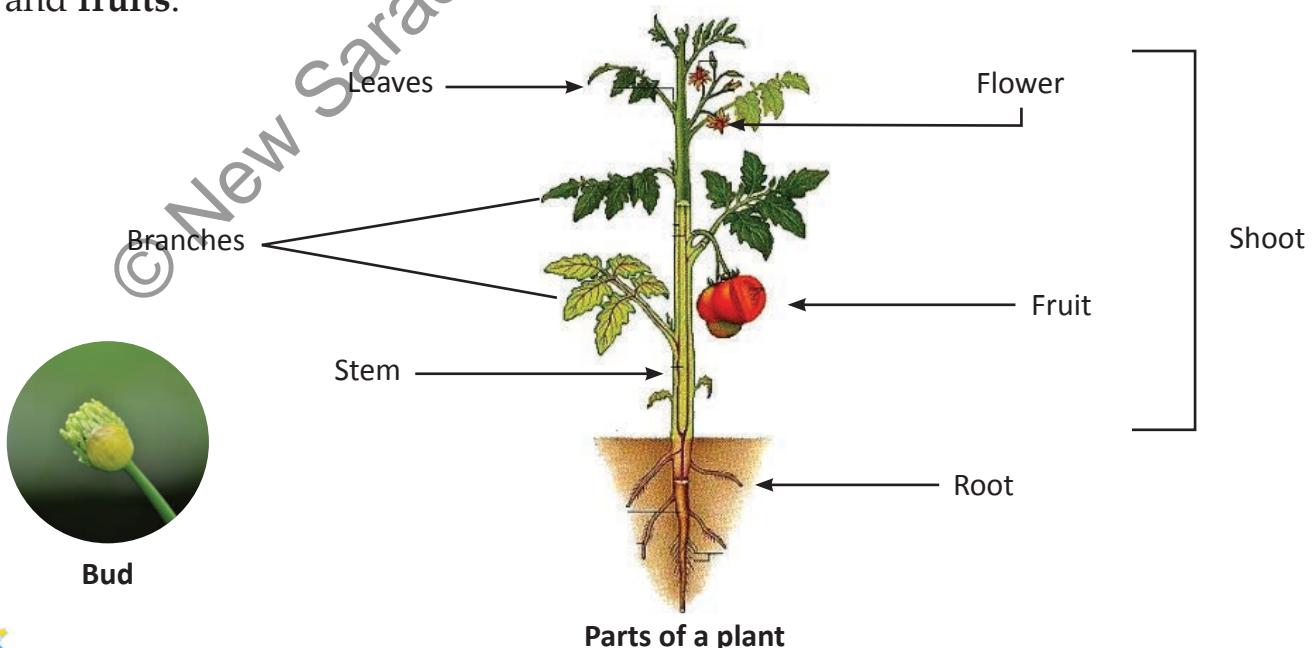
ORTO



TMES

We can see many types of plants around us. A plant is divided into two main parts—the **root system** and the **shoot system**. Part of a plant that grows under the soil is called the **root**.

The part of a plant that grows above the soil is called the **shoot**. Shoot bears **stem**, **branches**, **leaves**, **buds**, **flowers** and **fruits**.



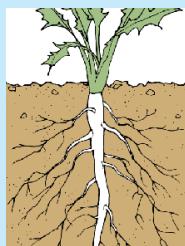
Root System

There are two types of roots, namely **tap root** and **fibrous root**.

Tap Root

A root that has a main root which further divides into many branches is called a **tap root**. These branches have hair on them called **root hair**.

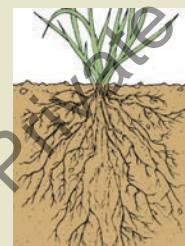
Some examples of plants having tap root are rose, mustard, tomato and bean.



Fibrous Root

A root that has a number of roots of the same size which grow from the end of the stem is called a **fibrous root**.

Some examples of plants having fibrous root are wheat, rice, sugarcane and onion.



Functions of a Root

1. Root fixes the plant **firmly** into the soil.
2. It absorbs water and minerals from the soil that helps the plants to prepare their food.
3. Some plants store food in their roots. Such type of roots can be eaten. For example, radish, turnip and carrot.

Fact zone

► Carrots were purple in colour before the 17th century.

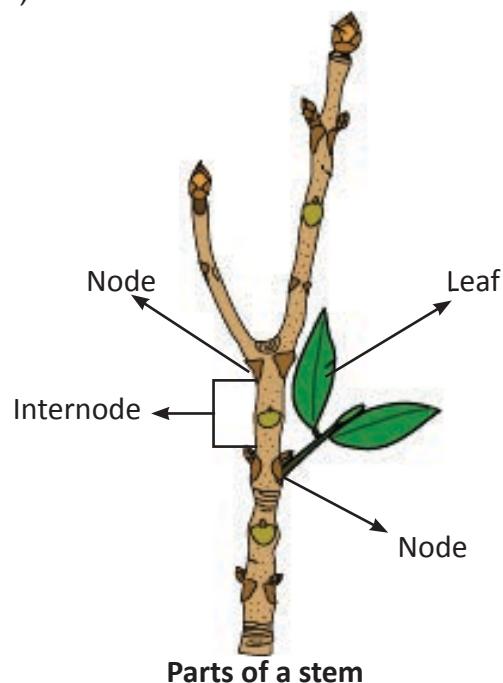


Shoot System

Stem

Some plants have a strong stem. For example, banyan and peepal whereas some plants have a weak stem, for example, grapevine and bean.

The point at which branches grow from a stem is called a **node** and the space between the two nodes is called an **internode**.

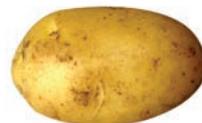


Functions of stem

1. Stem keeps the plant upright and supports its branches.
2. It carries water and minerals from the root to the other parts of the plant.
3. Some plants also store food in their stem. Such type of stems can be eaten. For example, potato, ginger and onion are some underground stems that we eat.



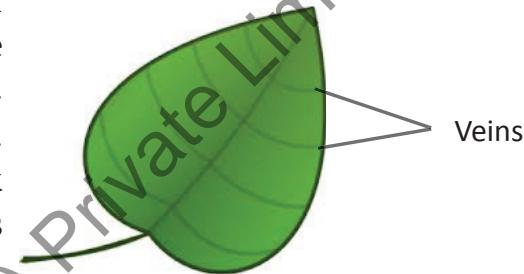
Ginger



Potato

Leaves

There are different kinds of leaves. Leaves are of different shapes and sizes. Leaves store food in the form of starch. We may find leaves in various colours, but most of them are green. Look carefully at a leaf. Hold it up against the light. You will see a network of thin lines on the leaf. These are called **veins**. Veins are small tubes which carry food to the stem and bring water to the leaf.



Functions of Leaves

1. Leaves help the plant to prepare food in the presence of chlorophyll, sunlight, carbon dioxide from the air and water from the soil by the process known as **photosynthesis**.
2. Leaves have tiny holes or openings in them which are known as **stomata**. These help in exchange of gases between the atmosphere and the plant body.
3. Some of the leaves modify themselves for different purposes such as giving support to the climbing plants, for example, tendrils in a garden pea.



Stomata

Tendrils

Aim : To show the presence of starch in a leaf. (Adult supervision required)

We need : A green leaf, water, alcohol, plate, burner, iodine solution.

Method :

- Put the leaf in hot water and boil it for few seconds.
- Strain the water and put a spoon of alcohol on the leaf.
- Place the leaf on a plate.
- Put some iodine solution over it.

Observation :

- The leaf becomes colourless when it is first boiled in water or when alcohol is poured over it.
- The leaf turns blue-black when iodine solution is poured over it.

Result : The leaf contains starch.



Note

Never heat alcohol directly on a flame, it will catch fire.

Flower

Flower is the seed-bearing part of a plant. Flowers are of different shapes, sizes and colours. Most of the flowers have **fragrance**.



Lily



Sunflower



Rose

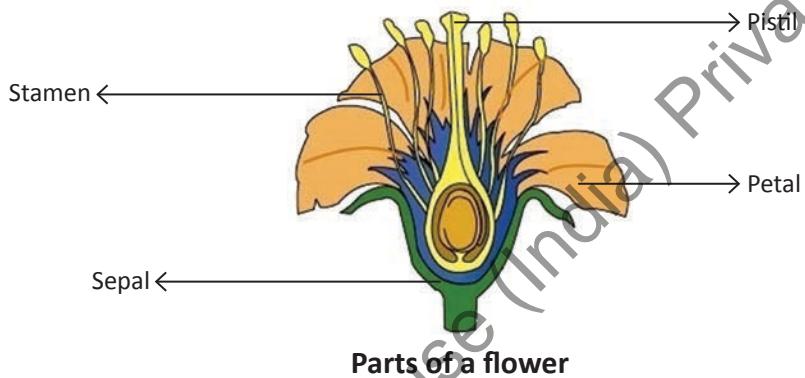
Fact zone

The flowers that bloom during the night are usually not very colourful but they have a good fragrance.



Parts of a Flower

A flower has four main parts, namely **petals**, **sepals**, **stamens** and **pistils**.



Petals are the outermost part of a flower. They help to attract insects for pollination. **Sepals** are green leaf-like parts of a flower which support the petals. Sepals protect the flower when it is a bud. **Stamens** and **pistils** are present inside a flower. Stamen is the male reproductive organ of a flower and pistil is the female reproductive organ present in the centre of a flower.



Pollination

Fact zone

When petals and sepals look alike, they are known as tepals. For example, tulips



Functions of a Flower

The main function of a flower is reproduction. They attract insects for pollination i.e., transfer of pollen grains from one plant to another.

Uses of a Flower

- They are also used for decoration purposes and also in making perfumes, etc.
- Some flowers are also eaten as food. For example, cauliflower and broccoli.



Fruits and Seeds

Flowers change into fruits. Fruits have seeds inside them. Some fruits have one seed, some have many. Mango and peach have one seed each. Custard apple, orange, apple and water melon have many seeds. A seed grows into a plant.



Mango



Peach



Apple



Orange

Fact zone

► Strawberry is the only fruit that bears seeds on the outside.



Functions of Fruits

1. Fruits protect the seeds.
2. Fruits store excess food prepared by the leaves.

Structure of a Seed

A seed grows into a plant. Some plants may grow from roots or stems. A seed has a baby plant inside it called the **embryo**. It stores food inside it for the baby plants. When the seed gets air, water and sunlight, the baby plant begins to grow. Most of the seeds have leaves called **cotyledons**. The protective covering outside a seed is called **seed coat**.



Activity



Aim : To show the parts of a seed.

We need : 2-3 beans or gram seeds, water to soak and toothpick.

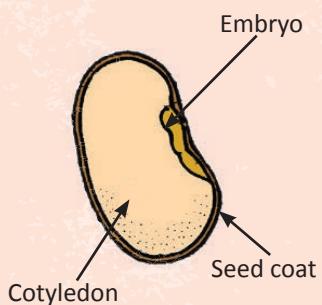
Method :

- Take some bean/gram seeds and soak them overnight in water. Now take out one seed from water and first remove the transparent layer on it.
- Now open the seed with a toothpick and observe the parts of the seed.

Observation :

- The transparent layer on the seed is the seed coat.
- The other parts of seed are embryo and cotyledons.

Result : The parts of a seed are seed coat, cotyledons and embryo.





Let's learn new words

surrounding

: environment

firml y

: strongly, rigidly

fragrance

: pleasant or sweet smell

chlorophyll

: green coloured pigment present in the leaves

photosynthesis: process by which green plants prepare their food



Let's recall

- ★ The main parts of a plant are—roots, stem, leaves, flowers, fruits and seeds.
 - ★ The part of a plant that grows below the ground is called the root.
 - ★ There are two types of roots—Tap root and Fibrous root.
 - ★ The root absorbs water and minerals from the soil.
 - ★ The part of a plant that grows above the soil is called a shoot.
 - ★ Most of the leaves are green in colour.
 - ★ The main parts of a flower are petals, sepals, stamens and pistils.
 - ★ Flowers change into fruits.
 - ★ Fruits protect their seeds.

Assessment

A Tick (✓) the correct option.



B State True or False.

1. The part of plant that grows above the ground is called the root. _____
2. Coriander is a leaf that we eat. _____
3. Seeds protect the fruit. _____
4. Stamen is the male reproductive organ in a flower. _____

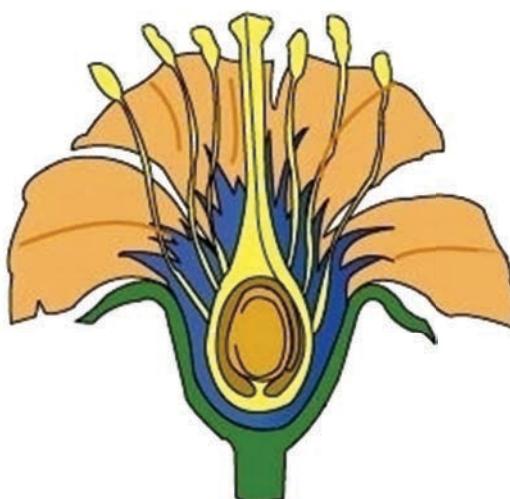
C Fill in the blanks.

1. A _____ keeps the plant upright.
2. _____, _____, _____ and _____ are the main parts of a flower.
3. _____ have seeds inside them.
4. _____ is an example of modification of leaves.
5. The seed has _____ inside it.

D Answer the following questions.

1. Write two functions each of flowers and leaves.
2. What is a tap root? Give two examples.
3. What is a fibrous root? Give two examples.
4. Define node and internode.
5. What is photosynthesis?

E Label the parts of a flower given below.





Activity

- Take two potted plants A and B. Water plant A daily and do not water the plant B for 7 days. What do you observe after seven days?

Pot-A _____

Pot-B _____

- Make a list of some fruits that you eat and classify them as 'fruits with one seed' and 'fruits with many seeds.'



Project work

- Collect some bean seeds, gram seeds, rajma seeds, etc. and paste them in your scrapbook and write their names.
- Take a flower, dry it and then remove all its parts. Paste these parts of the flower in your scrapbook and write their names.



Creative thinking

Things you can do to keep the environment green.

- Gift plants on birthdays and occasions.
- Take care of plants at home.
- Form nature clubs to do environment-friendly activities.



Let's login

http://www.softschools.com/science/plants/plant_parts/



2

DISPERSAL OF SEEDS



Let's start

Write the names of the seeds shown below.



We have already learnt that flowers change into fruits, and fruits contain seeds. These seeds germinate into new plants.

Seeds germinate either by dispersal or we have to sow them in soil.

What is germination?

The process by which a seed grows into a new plant under favourable conditions is called **germination**.

The favourable conditions needed by a plant to germinate are

1. Fertile soil
2. Healthy seed
3. Adequate sunlight
4. Sufficient air and water

The young plant that grows after germination is known as a **seedling**.

Fact zone

► Seeds can travel as far as across the countries.



Seed growing into a new plant

Dispersal of Seeds

The movement of seeds away from the parent plant is known as **dispersal of seeds**. There are various modes of seed dispersal such as **wind**, **water**, **explosion** and by **animals/human beings**.

Why is dispersal of seeds important?

If the seeds do not get dispersed and fall at one place, they will not get sufficient water, minerals, sunlight and space to grow. So, they will not be able to grow into healthy plants.

Dispersal of seeds by wind

Some seeds like cotton, dandelion, maple and drumstick have wings or hair-like structures for dispersal. These are carried away by the wind to far off places. These seeds are very light, so they can float in wind.



Dispersal by wind



Dispersal by water

Dispersal of seeds by water

Seeds of some plants like coconut that grow in or near water are carried away by water to different places. They can remain afloat in water for many days and when they reach the shore, they grow into new plants. Coconut trees grow near coastal areas. The ripened nut of a coconut falls in water and it may travel thousands of kilometres to reach the land. It starts germinating as soon as it reaches the land.

Dispersal of seeds by animals/human beings

Some seeds like mango, papaya and guava have hooks or spines. They stick to the hair of animals or feathers of birds and are carried away to far off places.



Dispersal by animals



Dispersal by human beings

Birds eat fruits like guavas, berries, etc. along with their seeds. The seeds of such fruits cannot be digested by the birds. So, they come out with the droppings of birds and thus get dispersed in various places. Seeds of some plants have hooks or spines on their surface. They stick to fur of animals and birds or clothes of human beings and are carried away to various places.



Dispersal by bird

In some plants like lady finger, balsam and peas, when the fruit gets dried up, it explodes spreading the seeds away from the parent plant.



Dispersal by explosion

Let's learn new words



germinate : begin to grow

favourable : suitable

adequate : sufficient

explode : burst out



Let's recall

- ★ Seeds germinate into new plants.
- ★ The process by which seed germinates into new plants is called germination.
- ★ The young plant that grows after germination is known as a seedling.
- ★ The movement of seeds away from its parent plant is known as dispersal of seeds.
- ★ Dispersal of seeds occur due to external agents like wind, water, explosion and animals/human beings.
- ★ Dispersal of seeds helps them to grow into healthy plants.

Assessment

A Tick (✓) the correct option.

B State True or False.

1. The flowers germinate into new plants.
 2. Healthy seeds are necessary for germination.
 3. Coconut seeds are dispersed by air.
 4. Seeds will not get dispersed if they fall down at one place.
 5. Seeds of lady finger get dispersed by explosion.

C Fill in the blanks.

1. Seeds germinate by _____ of seeds through various agents.
 2. Seeds of _____ are very light, so they can float in wind.
 3. Seeds of dried fruits and vegetables disperse by _____ .
 4. _____ is an example of dispersal of seeds by water.

D Answer the following questions.

1. Define germination.
 2. Why is dispersal of seeds important?
 3. How does the seed of a coconut get dispersed?
 4. How do seeds get dispersed through birds and human beings? Explain.





Activity

1. Take a tumbler. Put some soil in it and sow few bean seeds in it. Keep it in sunlight and water it daily to keep the soil moist. What do you observe after few days?

2. Take few seeds and sow them in healthy soil, keep it in a closed room and water it daily to keep the soil moist. Will the seeds grow into a new plant? Give reason to support your answer.



Project work

Collect cereals like beans, rajma and pulses; and spices like mustard seeds, cumin seeds and coriander seeds. Now draw various patterns or designs in your scrapbook and decorate them with these seeds.



Critical thinking

1. Why do farmers sow seeds in rows at proper intervals? Discuss with your teacher in class.



Let's login

<http://revolution.caret.cam.ac.uk/flash/seeds.swf>



3

PLANTS AND THEIR USES



Let's start

Tick (✓) the food items that we get from plants.



Apple



Rice



Meat



Spinach

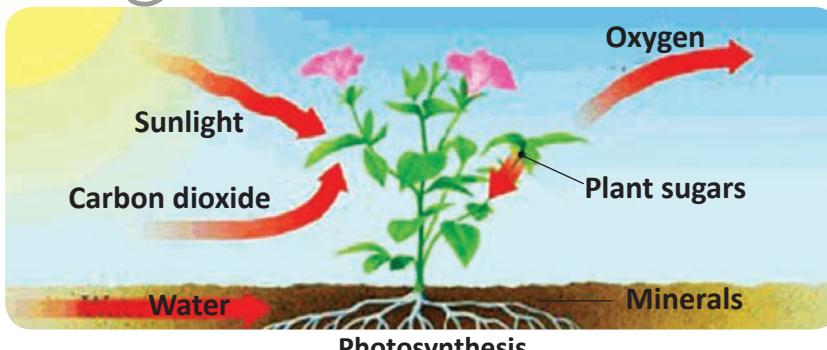


Milk

Can you think of life without plants? In fact, life would not be possible without plants on the Earth. Plants are the primary source of food for all organisms. This is because plants can make their own food.

What gives green colour to leaves?

A plant prepares its food in its leaves. Leaves are green because they contain a green pigment called **chlorophyll**. Plants prepare food with the help of chlorophyll. They also need sunlight, carbon dioxide, water and minerals to prepare food. The roots absorb water and minerals from the soil and the stem carries them to the leaves. The leaves take in carbon dioxide from the air through pores present on them called **stomata**. Thus, the process by which plants prepare their food with the help of chlorophyll, water, minerals and carbon dioxide in the presence of sunlight is known as **photosynthesis**. Photosynthesis provides us with most of the oxygen we need in order to breathe. We, in turn, exhale carbon dioxide needed by the plants.



Fact zone

- Leaves prepare food for plants, that is why they are known as kitchen or food factories of a plant.



Activity



Aim : To test that chlorophyll is necessary for photosynthesis.

We need : a leaf of a coleus plant, a sheet of paper, pen, water, alcohol, burner and iodine solution

Method :

- Take a leaf of a coleus plant. It contains some non-green areas also.
- Draw the outline on a sheet of paper showing the green and non-green patches.
- Now boil the leaf first in water then in alcohol, to bleach it.
- Now pour a few drops of iodine solution over the leaf.

Observation :

- The parts of the leaf that are green in colour turned blue-black.
- The non-green part of the leaf does not change colour.

Result :

- This shows that photosynthesis (formation of starch) can take place only in the presence of chlorophyll.



Boiling of leaf in water and alcohol



Pouring of iodine solution over the leaf.

How do plants use their food?

Plants prepare their food in the form of sugar. It can be used in many ways by the plants.

1. Food is used to produce energy in plants.
2. Food is used for the growth of plants.
3. The extra food is stored in the form of sugar or it gets converted into starch. This starch and sugar are stored in different parts of the plant like fruits, seeds, leaves, stems or roots. The parts of plants that have food stored in them are usually eaten by us.

For example, fruit of mango, seeds of pea, leaves of spinach, stem of a sugarcane and onion.



Mango (fruit)



Spinach (leaves)



Peas (seeds)



Onion (root)



Sugarcane (stem)

Plants that depend on others for food

Some plants have little or no chlorophyll in them, such type of plants cannot prepare their own food, so they depend on other plants and animals for food.

Parasites

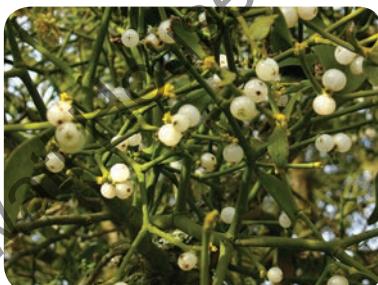
Some plants like **cuscuta** cannot make their own food as they do not have chlorophyll. They totally depend on other plants for food and water. They kill the plants on which they grow. Such types of plants are known as **total parasites**.

Some plants like **mistletoe** have chlorophyll and make some of its food but it depends on other plants for water and nutrients. Such types of plants are known as **partial parasites**.

Mistletoe is a common parasite that grows on trees such as mango and teak.



Cuscuta (total parasite)



Mistletoe (partial parasite)

Fact zone

- Rafflesia arnoldii is a parasitic plant that produces the world's largest flower. It has a strong smell of rotten flesh that attracts insects for pollination.

Insectivorous plants

Insectivorous plants (carnivorous plants) any of several plants that have purely developed root system and are often found in nitrogen deficient sandy soils. They obtain the missing nutrients by feeding on insects. For example, pitcher plant and venus fly trap.

Pitcher plant

A pitcher plant has a pitcher (pot like structure) with nectar filled in it. When an insect enters the pitcher for nectar, it sticks to the hair like structures in it and the flap of the pitcher gets closed. The insect gets trapped inside and finally gets digested by the plant.



Uses of plants

Plants are very important for us in everyday life. They give us many useful things. We get food, medicine, fibres, wood and many other useful products from plants.

Fact zone



► Onions contain a mild antibiotic that soothes, burns and fights against infections.

Food

We get cereals, pulses, fruits, vegetables, oilseeds, sugar, beverages, nuts and spices from plants.



Cereals



Fruits



Vegetables



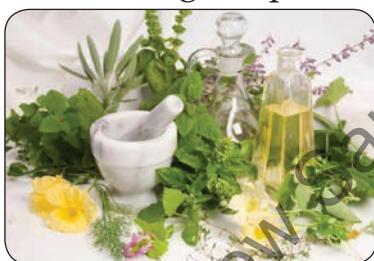
Spices

Medicines

Many medicines can be made from plants like neem, tulsi, garlic and turmeric. Tulsi leaves are used in the treatment of cough and cold. Neem leaves are used for the treatment of skin problems. Turmeric is used as an antiseptic.

Fibres

Cotton, jute, flax and hemp are some fibres that we get from plants. Cotton plant gives us cotton. Jute gives us jute fibre. Flax gives us linen. Fibres are used to make clothes, bags, ropes, etc.



Medicines



Cotton



Jute



Flax

Other products that we get from plants

1. We get paper from the bark of trees like bamboo.
2. Some flowers and leaves are used for decoration purposes and in making perfumes.
3. We get latex from the rubber tree that is used in making rubber tyres, tubes and erasers.
4. We also get gum, resins and turpentine oil from plants.

Fact zone



► Bamboo is the fastest growing plant in the world. It can grow up to 35 inches in one day.



Let's learn new words

pigment : a natural colouring matter of plant or animal tissue

starch : food prepared by plants

nectar : a sugary fluid secreted by flowers

antiseptic : substances that prevent infection

resins : a sticky substance produced by trees



Let's recall

- ★ Plants are the primary source of food for all organisms either directly or indirectly.
 - ★ Leaves are green because they contain a substance called chlorophyll.
 - ★ The leaves take in carbon dioxide from the air through pores on them called stomata.
 - ★ The process by which plants prepare their food with the help of chlorophyll, water, minerals and carbon dioxide in the presence of sunlight is known as photosynthesis.
 - ★ Plants prepare their food in the form of sugar.
 - ★ Some plants have little or no chlorophyll in them, such type of plants cannot prepare their own food, so they depend on other plants and animals for food.
 - ★ Some plants feed on insects for food, such plants are known as insectivorous plants.
 - ★ We get food, medicine, fibre, wood, and many other useful products from plants.

Assessment

A Tick (✓) the correct option.



B State True / False.

1. The green coloured pigment in the leaf is called stomata. _____
2. A non-green leaf cannot make food. _____
3. Parasites feed on insects. _____
4. Plants prepare food in the form of sugar. _____
5. Neem leaves are used in the treatment of cough and cold. _____
6. Venus fly trap is a partial parasite. _____

C Fill in the blanks.

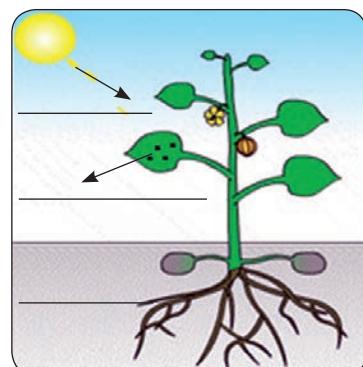
1. We get _____ from the bark of a bamboo tree.
2. _____ is used as an antiseptic.
3. _____ is a total parasitic plant.
4. The _____ absorbs water and minerals from the soil.
5. _____ is filled inside the pitcher of a pitcher plant.
6. The extra food in plants is stored in the form of _____ or gets converted into _____.

D Answer the following questions.

1. How do plants use the food prepared by them?
2. Why are leaves of most of the plants green in colour?
3. How does a pitcher plant trap insects inside it?
4. Write any four uses of plants.



1. Write the names of the things that are needed by plants during photosynthesis.
2. Draw/Paste pictures of any three medicinal plants in your scrapbook. Also, write one line about the health benefits of those plants.





Project work

1. Take a potato and cut it into pieces with the help of your parents or an elder and keep them for sometime. What happens to the colour of the potato? Note it down.

2. Colour the picture given below and write the slogan "SAVE TREES" on it.



Life Skills

Empathy

Suppose you are going on a vacation for 2-3 days with your family leaving the indoor plants in your house. What steps will you take to prevent the plants from drying?



Let's login

<http://www.neok12.com/Plants.htm>



4

USES OF ANIMALS



Let's start

Write (P) for the food items that we get from plants and (A) for the food items that we get from animals.



Animals are very useful to us. Some animals are kept as pets whereas some are domesticated and reared. Some animals are also used for carrying loads.



Cat



Dog



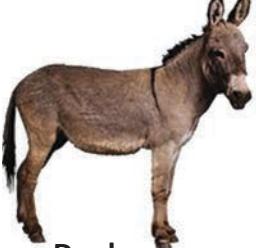
Goat



Sheep



Camel



Donkey



Cow



Horse

Animals that are kept as pets

Some pets are usually animals like dogs and cats that share our homes, providing us with companionship and love in return for our care of them. Dogs are kept as guards in our houses. They have a good sense of smell and are intelligent. They are considered as man's best friend. Cats chase away the mouse in our house.



Dog



Cat

Animals that are reared for dairy products and poultry

Some animals like cow, hen, goat and buffalo are kept in farms and reared to obtain milk, meat and eggs from them. Rearing of animals that give us milk and milk products is called **dairy farming**. Cows, goats and buffaloes are reared for milk. Rearing of birds for eggs and meat is called **poultry farming**. Hens, ducks and turkeys are reared for eggs and meat.



Cow



Hen



Buffalo



Goat



Turkey



Duck

Fact zone

► Worldwide, about 70 billion farm animals are reared for food every year.



Animals that are used to carry loads

Some animals like camel, donkey, bull and horse are used to carry loads and people to be transported from one place to another.



A camel cart



A donkey carrying load



A bullock cart



Silk farming

Silkworms are reared to obtain silk from them. Silkworms feed on mulberry leaves and grow on it. It spins a shell of silk thread around itself called the **cocoon**. Silk is obtained from these cocoons.



Silkworm



Cocoon



Silk thread

Sheep farming

Animals like yak and sheep are reared for wool. The thick hair of these animals is reared once a year and is processed into woollen thread. We make sweaters, shawls, blankets and woollen clothes from woollen fibres. The process of removing hair from these animals is called **shearing**.



Yak



Sheep



Sweater



Shawl

Fact zone

Australia has huge sheep farms and is the largest exporter of woolens all over the world.



Other products that we get from animals

1. Horns of some animals are used to make knives, ornaments, combs and many other items.



Comb



Knife



Ornament

2. Cow dung is used as a manure. It is used by farmers to improve the fertility of the soil.
3. The skin of some animals like buffalo, cow, snake, crocodile, camel and sheep is used to make leather which is further used for making shoes, bags, purses, belts, etc.

Fact zone

Squirrel hair were earlier used to make bristles of paint brush but now it is not permitted by law.



4. Fur of animals like squirrels was used to make coats, shawls, caps, etc.



Cap



Coat



Shawl



Purse

5. Ivory, a very valuable product is obtained from elephant tusks. It is used to make ornaments. But now it has been banned to stop large scale killing of elephants.
6. Insects are used in many ways. We get lac from lac insect. Bees give us honey and bee wax.



Lac Insect



Lac



Ornament made from ivory



Let's learn new words

rearing : process of breeding animals or birds and caring for them

cocoon : a protective covering around some insects

shearing : process of removing hair of animal's

processed : convert or change something through a process



Let's recall

- ★ Rearing of animals that give us milk and milk products is called dairy farming. Cows, goats and buffaloes are reared for milk.
- ★ Rearing of birds for eggs and meat is called poultry farming.
- ★ The process of removing hair from skin of animals like sheep and yak is called shearing.
- ★ We get many other things like honey, wax, leather, etc, from animals.

Assessment

A Tick (✓) the correct option.

B Name the following.

1. Any two animals that are kept as pet. _____, _____
 2. Any two animals that are used to obtain milk. _____, _____
 3. Any two animals that are used to carry load. _____, _____

C Answer the following questions.

1. Why are dogs kept as guards in our houses?
 2. Define poultry farming. Give examples.
 3. Define dairy farming. Give examples.
 4. What is shearing?
 5. What is silk farming?

D Complete the table given below.

Names of animals	Body parts	Products obtained from these parts of body
Elephant		Ornaments
	Horn	
Squirrel		
	Skin	Leather



Activity

Collect pictures of some things that we see in our daily life and paste them in your scrapbook. Also, write the source from where it can be obtained.

Life Skills

What will you do if you see someone ill-treating an animal?

1. Stand and watch.
2. Throw stones at them.
3. Draw the attention of an adult or people around you.
4. Call the Blue Cross.
5. Call the SPCA (Society for Prevention of Cruelty to Animals).
6. Try to stop them by talking to them.
7. Walk away quietly, it does not concern you.
8. Protect the animal.



Empathy



Let's login

http://www.msnucleus.org/membership/html/k-6/lc/organ/1/lco1--_6a.html
http://www.ehow.com/about_5349359_importance-animals-human-lives.html

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5

PROTECTION OF ANIMALS AND OUR ENVIRONMENT



Let's start

Look at the pictures shown below and discuss about them with your teacher or parents



We have studied in previous chapters that plants and animals are very useful for us. So we must take care of them and protect our environment. We should not cut down trees and destroy forests because they are homes of wild animals.

Care of Pet animals and Domestic animals

1. The domestic animals should be kept in a proper shelter, for example, horses in stables, cows in sheds, etc.
2. The homes of animals should be cleaned everyday to maintain hygiene.
3. There should be sufficient space for animals to move in their homes.
4. Animals should be taken to a veterinary doctor, if they fall sick.
5. They should be given healthy food and clean water to drink.



Stable



Shed



Kennel



Sty

Conservation of wildlife

Nowadays, many animals are killed to obtain various things from them. Human beings kill animals to obtain meat, fibre, skin, horns, etc.

- The skin of cow, snake, buffalo, etc. is used to make leather.
- The tusk of elephants is used to make ivory ornaments.
- The cocoon of silkworms is used to make silk.
- The horns of rhinoceros are used to make knife, combs, etc.



Leather



Snake leather



Silkworm



Cocoon



Ivory ornament



Comb



Knife handle

Many animals are under the threat of getting reduced in number and may become extinct; such animals are called **endangered** animals, for example, tiger, rhinoceros and peacock. Some animals have already become extinct. So, we have laws that protect conservation of endangered species such forbidding hunting, restricting land development and creating preserves



Tiger



Rhinoceros



Peacock

National Parks and Wildlife Sanctuaries

National Parks

National park is an area which is set aside by the government for the protection and conservation of plants and animals, where hunting, killing or capturing of animals is prohibited.



The government has set up many national parks and sanctuaries to protect the life of animals. Some of the national parks in India are:

1. Jim Corbett National Park in Uttarakhand
2. Kanha National Park in Madhya Pradesh
3. Mudumalai National Park in Tamil Nadu
4. Sundarban National Park in West Bengal
5. Dudhwa National Park in Uttar Pradesh
6. Guindy National Park in Tamil Nadu
7. Anshi National Park in Karnataka
8. Ranthambore National Park in Rajasthan

Wildlife Sanctuaries

A wildlife sanctuary is a place where animals are made to live in their own natural habitat for the preservation of wildlife. They are run by the government where authorised people supervise the area to ensure that no one hunts or harasses the animals.

The list of some wildlife sanctuaries in India are:

1. Nagarjunasagar Sanctuary in Andhra Pradesh is famous for Tiger, Leopard, Sloth bear and Hyena.
2. Hazaribagh sanctuary in Jharkhand is famous for Wild boar and Sloth bear.
3. Kaziranga Sanctuary in Assam is famous for One-horned rhino.
4. Eravikulam Sanctuary in Kerala is famous for Nilgiri tahr and South Indian goat.
5. Sariska Sanctuary in Rajasthan is famous for Cheetah.

List of some Bird Sanctuaries

1. Vedanthangal Bird Sanctuary in Tamil Nadu
2. Ranganathittu Bird Sanctuary in Karnataka
3. Chilka Lake Bird Sanctuary in Odisha
4. Porbandar Bird Sanctuary in Gujarat
5. ——————



Vedanthangal Bird Sanctuary



Ranganathittu Bird Sanctuary



Chilka Bird Sanctuary



Porbandar Bird Sanctuary

Project Tiger

Tiger is the national animal of India. It has become an endangered animal. So, the government of India has started a project called **Project Tiger** to save the tigers. This project was launched in 1973 by the government of India to save tigers from extinction. There are about 28 tiger reserves in India to check the population of tiger. After the launch of Project tiger, tiger became a protected animal. Hunting of tiger is a punishable offence.



Importance of forests

Forests impact on our daily lives in so many ways. They help us live. Without forests, most of the areas would have been deserts.

1. **Forests keep up the natural balance.** The trees keep up the balance between the plant and the animal life. The forests are a natural preserve of wild animals like lions, tigers and panthers. These animals depend for their food on animals like deer, antelopes, stags and other animals which get food and shelter from forests. In turn these animals depend on plants. Similarly, some birds feed on smaller birds who live on insects and plants. Thus, the forests help in maintaining the natural balance and ecosystem around us..

Fact zone

► Forest areas have more rainfall than the other areas.



Forests protect birds and animals

2. **Forests cause rains.** Trees cool down the winds which have water vapour. Thus, forests help in causing rainfall. Forests prevent floods. The roots of the trees soak a lot of rain water. The rainwater does not flow down quickly and cause floods. In this way the forests prevent soil erosion.



- Forests purify the air.** The trees break up carbon dioxide into carbon and oxygen in the presence of the sunlight. They consume carbon as their food and release oxygen in the atmosphere. Thus, the trees help in keeping the air clean.
- Forests provide us fuel and timber.** In many parts of India, wood is used as fuel for cooking food and for many other purposes. Timber is used for making houses, furniture and railway coaches.



Timber



Fuel for cooking



Forests purify air

- Forests provide us agroproducts.** Hundreds of industries depend on forests, for example, paper industry, plywood industry, paint, varnish, rubber goods, match sticks and many other industries.

Chipko Movement

The chipko movement was started in early 1970s by a group of women from a village called Reni in Chamoli district, **Uttarakhand**. The name of the movement comes from the word embrace as these women hugged the trees and stopped the woodcutters from cutting the trees and thus, helped to conserve the forests.



Chipko movement

Van Mahotsav Programme

The government of India in 1953 launched the annual festival of tree planting called the **Van Mahotsav**. It was started to protect the greenery of our environment. Gujarat

was the first state to implement this programme. It is usually organized during the first week of the year which is known as the **forest week**. During this period, government supplies many saplings and the people plant them.



Van Mahotsav

Conservation of natural resources

The resources that occur naturally, for example, land, forest, water and minerals are called **natural resources**. Forests are called as the 'Lungs of the

Earth' because they purify the air we breath. Forests provide us many useful products like wood, timber, etc. and also check soil erosion.

We've all begun to experience the effects of the depletion of natural resources. To live comfortably in future, conservation of natural resources is essential.

International Union for Conservation of Nature and Natural resources (IUCN) is an organization which is actively involved in the process of conservation of natural resources.



Our Natural resources



Fact zone

The headquarter of IUCN is situated in Switzerland.



Let's learn new words



veterinary doctor	: a doctor that treats animals
endangered animals	: animals that are at the risk of extinction
public property	: property owned by a government
natural habitat	: a natural environment in which an organism lives.
extinct	: no longer in existence
punishable offence	: an act punishable by law
natural balance	: balance of organisms and their environment
agroproducts	: products obtained from agriculture
annual festival	: festival that is celebrated once in a year
conservation	: preservation or protection



Let's recall

- ★ Human beings kill animals to obtain meat, skin, horns, etc.
- ★ Many animals are under the threat of reducing in number and become extinct; such animals are called endangered animals.
- ★ A national park is an area of land that is declared as a public property by the central government which is protected from human development and pollution.
- ★ A wildlife sanctuary is a place where animals are made to live in their own natural habitat for the preservation of wildlife.
- ★ The government of India has started a project called "Project Tiger" to save the tigers.
- ★ Forests are called the 'Lungs of the Earth' because they purify air.



Assessment

A Tick (✓) the correct option.

B Fill in the blanks.

1. The skin of _____ is used to make leather.
 2. Forests prevent _____.
 3. Project Tiger was launched in _____ by the government of India.
 4. The resources that occur naturally are called _____.

C Match the following.

- | | |
|------------------------------|-------------------|
| 1. Jim Corbett National Park | a. Uttarakhand |
| 2. Mudumalai National | b. Madhya pradesh |
| 3. Ranthambore National Park | c. Tamil nadu |
| 4. Sundarbans National Park | d. West Bengal |
| 5. Anshi National Park | e. Uttar Pradesh |
| 6. Dudhwa National Park | f. Tamil Nadu |
| 7. Kanha National Park | g. Karnataka |
| 8. Guindy National Park | h. Rajasthan |

D Answer the following questions.

1. How can we take care of pet and domestic animals?
 2. Why are many animals killed by human beings? Give some examples.
 3. What are endangered animals? Name any two.
 4. Define-
 - a. A wildlife sanctuary b. A national park
 5. What is Project Tiger?
 6. What is Chipko movement?
 7. Write the full form of IUCN.
 8. Why are forests known as the 'Lungs of the Earth'?

E Complete the table given below.

Name of Wildlife Sanctuary	State where it is situated	Animals found
Hazaribagh		
		One horned rhino
Eravikulam		
	Rajasthan	Cheetah and Panther
	Andhra Pradesh	



Activity

Make a poster showing “Protection of our environment” and write few lines about it.



Project work

- ❖ Collect some pictures of our natural resources. Search some information about how these natural resources are being destroyed and note them down. Now write some of the ways that you think can help in conserving our natural resources.



Critical thinking

1. Why should we conserve water and fossil fuels? Give reasons for your answer.



Let's login

http://www.myenglishpages.com/site_php_files/reading-7-ways-to-protect-the-environment.php#

Ul4oiNL-Gwg

<http://eschooltoday.com/forests/importance-of-forests.html>



Let's Revise

A Tick (✓) the correct option.

B State True or False. Correct the statements that are wrong.

1. Stamen is the female reproductive part of a flower.
 2. Overwatering the plants spoils the seeds in the soil and the plants will not grow.
 3. Cotton, jute and hemp are some fibres that we get from animals.
 4. Cow dung is used by the farmers to improve the fertility of the soil.
 5. The horns of some animals are used to make ivory ornaments.

C Answer the following questions.

1. Write the functions of a fruit.
 2. Define: (a) Germination (b) Seedling (c) Seed Dispersal
 3. Differentiate between total parasites and partial parasites. Give examples.
 4. Define: (a) Rearing (b) Shearing
 5. Write down the importance of forests.

D Draw the following.

1. Stages of germination
 2. Veins in a Leaf.

Social Studies



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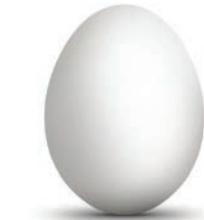
1

OUR WORLD AND ITS FEATURES



Let's start

Circle the object which has a similar shape like our earth?



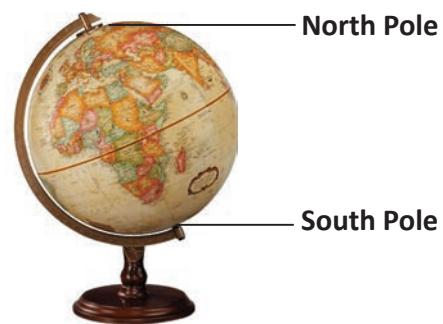
The shape of the earth is round. But in earlier days people used to believe that earth was flat. They thought that if they travel too far, they may fall off the edge. To prove them wrong, Portuguese explorer **Ferdinand Magellan** travelled around the world and reached at the same point from where he had started.

Representation of Earth

The spherical shape of earth is best represented by a **globe**. A globe is a small model of the earth. Globe is slightly tilted and it is fixed at one point.

Advantages of a Globe

1. It gives a good usual indication of the earth's surface.
2. It shows names, location and size of continents, oceans and countries.
3. Latitudes and longitudes are drawn on it.
4. A globe also shows the North pole and the South Pole as shown in the picture.



Fact zone

The largest globe on Earth is at display in Yarmouth, USA. It is named 'Eartha.'

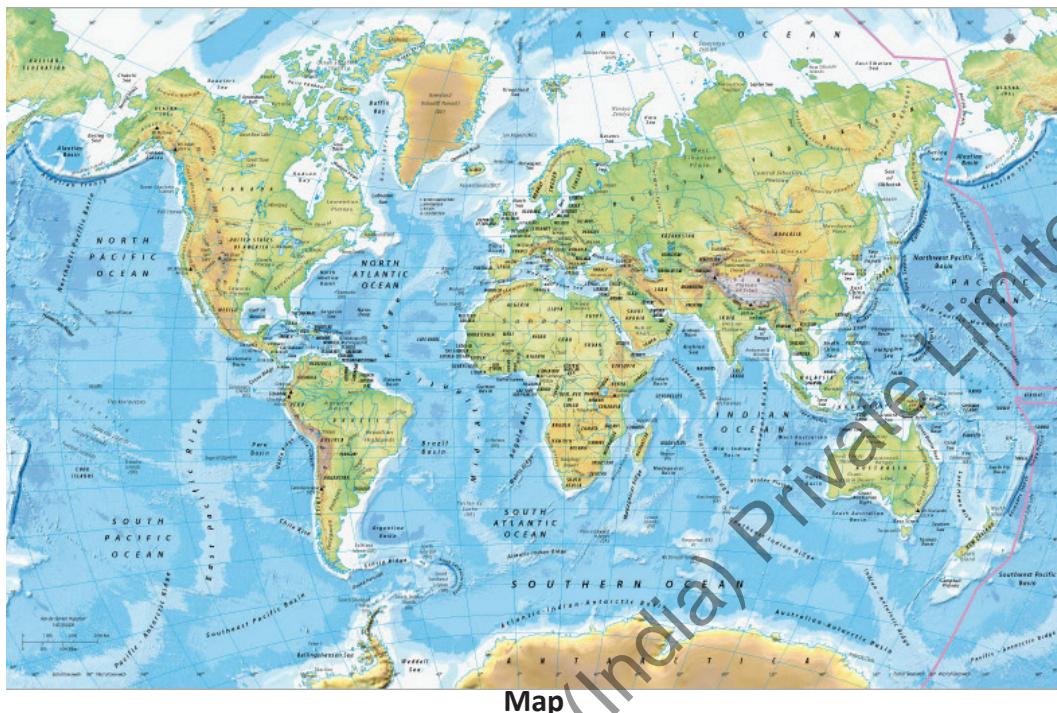


Disadvantages of a Globe

1. It is difficult to carry a globe from one place to another.
2. A globe doesn't show the detailed information about an area.

Maps

A map is a drawing of the whole earth or of a small part of the earth on a flat surface. The word map comes from the Latin word '*mappa*' which means cloth. In earlier days, maps were drawn on a piece of cloth or leather. A book of maps is called an **atlas**.



Map

Advantages of Maps

1. A map provides detailed information about a place.
2. It can be rolled or folded and is easy to carry.
3. It is used to show location of places as well as it gives information about forests, rivers, landforms, etc.
4. Maps can also be modified easily as physical and political situations change.

Disadvantages of a Map

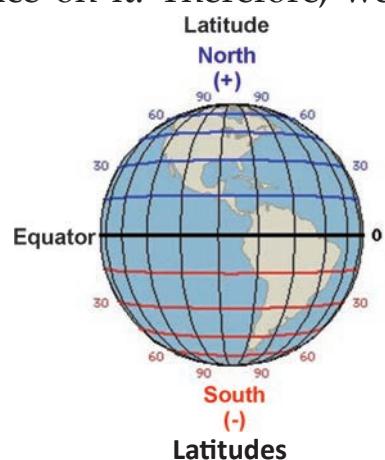
1. A map does not represent the accurate shape of the earth as it is drawn on a flat surface.

As earth is spherical in shape, it is difficult to locate a place on it. Therefore, we use some imaginary lines which help us to locate a place easily.

The horizontally drawn lines are called **latitudes** and vertically drawn lines are called **longitudes**.

Latitudes

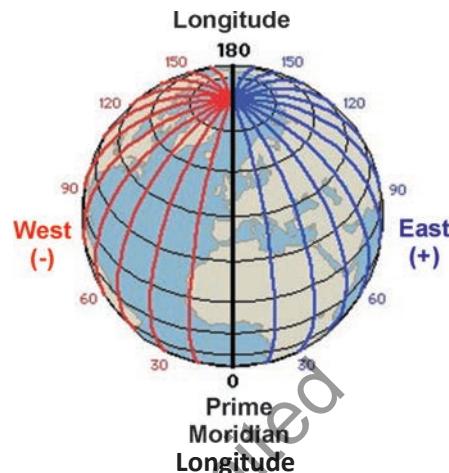
Latitudes are circular lines which are drawn parallel to each other and they run from east to west. Therefore, they are also referred to as '**parallels**'. The **Equator** is the longest latitude as it is drawn at the centre. It divides the earth into Northern and Southern Hemispheres.



Longitudes

Longitudes are lines which are drawn from north to south and they meet at the poles. The important longitude is the **Prime Meridian** which divides earth into Eastern and Western hemispheres. It passes through a place namely **Greenwich** near London.

International Date Line is situated opposite to the Prime Meridian and passes through Pacific Ocean. The date changes when we cross this line.



Differences Between Latitudes and Longitudes.

Latitudes	Longitudes
They are drawn parallel to each other.	They are drawn vertical to each other.
Their length keeps decreasing as they move away from the equator.	Their length remain same throughout.
The latitudes help to discover the facts about the climate of any area.	The longitudes help to calculate time for any area.
There are 180 latitudes which never meet.	There are 360 longitudes which meet at the poles.

When latitudes and longitudes meet each other at 90° , they form squares. This pattern is called a grid. It helps us to locate the places on the globe.



Numbering of Latitudes

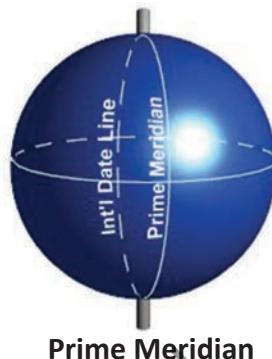
- We start from the Equator and mark it as 0° .
- Each latitude is separated by a distance of 1° .
- Then, we start moving upward or downward.
- As we move towards north, latitude is written as ${}^{\circ}\text{N}$. (Degree north is written as ${}^{\circ}\text{N}$.)
- As we move towards south, latitude is written as ${}^{\circ}\text{S}$. (Degree south is written as ${}^{\circ}\text{S}$.)

Some Important Latitudes are as Follows

The North Pole	90°N
The Arctic Circle	$66\frac{1}{2}^\circ\text{ N}$
The Tropic of Cancer	$23\frac{1}{2}^\circ\text{ N}$
The Equator	0°
The Tropic of Capricorn	$23\frac{1}{2}^\circ\text{ S}$
The Antarctic Circle	$66\frac{1}{2}^\circ\text{ S}$
The South Pole	90° S

Numbering of Longitudes

- We start from Prime Meridian and mark it as 0° .
- Longitudes are drawn at an interval of 1° .
- As we move towards east, longitudes are written as $^{\circ}\text{E}$.
- As we move towards west, longitudes are written as $^{\circ}\text{W}$.
- The longitudes 180°E and 180°W are counted separately, though they are a same line.



Continents and Oceans

Look at the picture of globe carefully. The blue coloured portion represents water. The brown, green or yellow coloured portion represents the continents.

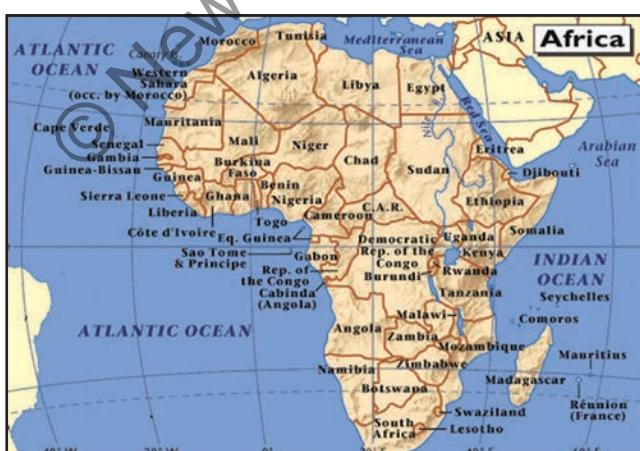
Continents are large masses of land on Earth. There are seven continents on Earth. They are usually separated by oceans. According to the size, the continents are as follows:

Asia: It is the largest and the most populated continent. It was a home to some of the earliest civilizations. It is separated from Europe by Ural mountains and Ural river.



Map of Asia

Africa: It is the second largest continent. The Equator, the Tropic of Cancer and the Tropic of Capricorn runs through this continent. It has the world's largest desert, the Sahara Desert.



Map of Africa

Fact zone



- ▶ Africa receives direct sunlight throughout the year and hence it has hot climate.
- ▶ Ethiopia records highest temperature on earth.

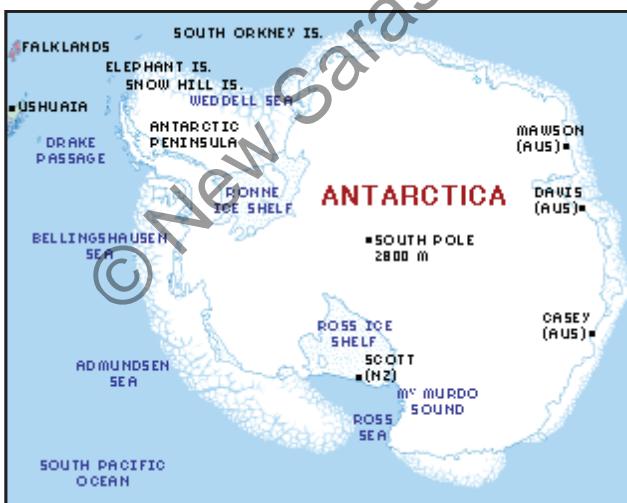


North America: The North America is the third largest continent. Canada, USA and Mexico are the countries in this continent.



Map of North America

Antarctica: It is located in the South Pole and also called the '**White Continent**'. It is covered with snow throughout the year. This is the only place where we can find **Emperor Penguins**.



Map of Antarctica

South America: It lies in the Southern hemisphere. It was connected to North America through Isthmus of Panama. It is carved out to make **Panama Canal**.



Map of South America

Europe: It is a small continent. It is surrounded by water on three sides and land on one side, hence it is also called as peninsula. Russia is the largest country in Europe and Vatican City is the smallest country in it.



Map of Europe

Australia: It is usually called the 'island continent'. Australia is the only continent which is a country. Originally it was inhabited by 'aborigines' before the British arrived. It is home to many unusual animals like kangaroo, koala, etc.



Map of Australia

Oceans

Oceans are mass of salt water which cover a major portion of the earth. There are five oceans.

Pacific Ocean: It is the largest and the deepest ocean. It separates America from Asia.

Atlantic Ocean: It is the second largest ocean. It separates Europe and America.

Indian Ocean: It lies to the south of India.

Antarctic Ocean: It lies around Antarctica and now is called as the Southern Ocean.

Arctic Ocean: It is the smallest and the shallowest ocean. It lies around the Arctic region.



Fact zone

The Pacific ocean was named by Ferdinand Magellan which means peaceful.



Seas

Seas are salt water bodies that covers the earth's surface and are usually connected to oceans. Some oceans like the Caspian Sea and the Dead Sea are actually large salt water lakes. Dead sea has so much salt that you can float on it. Seas and oceans are home to many animals and plants.

In a nutshell, we can conclude that the earth is not just a heavenly body, but it is also diverse and beautiful. We, humans are always captivated by the size of our planet and have always tried to present an accurate account of earth through globes, maps, imaginary lines, etc. The more we know about earth the more, it awakens our curiosity to explore its diversity.





Let's learn new words

parallel : straight lines moving in the same direction which never meet

vertical : straight lines moving from top to bottom

civilisation : the development of human society

inhabited : occupied with people or animals living there

captivated : enchanted



Let's recall

- ★ A globe is a model of the earth.
- ★ A map is a drawing of the whole earth or a part of the earth.
- ★ Latitudes and Longitudes are imaginary lines which help to locate places on earth.
- ★ Latitudes are horizontal lines and longitudes are vertical lines.
- ★ Continents are large masses of land on earth.
- ★ There are seven continents: Asia, Africa, North America, South America, Antarctica, Europe and Australia.
- ★ Oceans are a huge mass of salt water.
- ★ There are five oceans on earth: Pacific, Atlantic, Indian, Antarctic and Arctic oceans.
- ★ Seas are smaller than oceans.

Assessment

A Choose the correct option.

1. Which of the following best represents the shape of the earth?

- (a) globe (b) map (c) latitudes (d) longitudes

2. Which of the following is the longest latitude?

- (a) Prime Meridian (b) Equator
(c) Asia (d) Tropic of Cancer

3. What is formed when latitudes and longitudes meet at 90°?

- (a) Map (b) Scale (c) Grid (d) Globe

4. Which of these is the most populated continent?
 (a) Africa (b) Antarctica (c) Australia (d) Asia
5. Which of these is the shallowest ocean?
 (a) Pacific (b) Arctic (c) Atlantic (d) Indian

B Fill in the blanks.

1. _____ mountains separate the continent of Asia and Europe.
2. Antarctica is the only place where we can find _____.
3. _____ is the only continent which is also a country.
4. Whenever we cross _____ date changes.
5. The Caspian Sea and the Dead Sea are actually _____.

C Match the following for each statement.

Column A	Column B
1. Equator	a. Island Continent
2. Latitudes	b. Book of maps
3. Longitudes	c. Parallel lines
4. Atlas	d. Vertical lines
5. Australia	e. Longest latitude

D Write true or false.

1. The equator divides the earth into Northern and Southern hemispheres.
2. The smallest ocean is the Pacific Ocean.
3. Longitudes meet each other at the poles.
4. A globe can be folded and easily carried.
5. The meridians 180°E and 180°W are same line.

E Answer the following questions.

1. What are the differences between latitudes and longitudes?
2. Explain the advantages and disadvantages of using globes and maps.
3. Explain the process of numbering latitudes.
4. Explain the process of numbering longitudes.
5. Make a list of the continents and arrange them in descending order of size.





Activity

1. In the map of India, try to locate the city of Mirzapur, near Allahabad, Uttar Pradesh. Carefully observe and mention the longitude which passes through it.
2. Mention the place where you live. Locate the place on the map. Find out the latitude and longitude which passes through your city.
3. Have you heard about a popular application called 'Google Maps'? With the help of your elders, find out how does it help us to locate our destination.



Map of India

Life Skills

Critical thinking

1. Have you heard about the term IST? Find out, what does it mean? How does it help us in our daily life?
2. While visiting a new place or a city, try to find your destination on a map. Do you think without the help of a map you could have reached your destination easily?



Let's login

<http://www.kidsgeo.com/geography-games/latitude-longitude-map-game.php>



2

MOVEMENTS OF THE EARTH



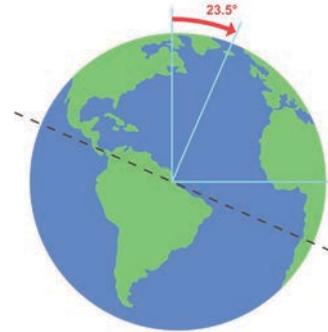
Let's start

Take a coin and keep the coin on its edge. Now spin the coin. What do you observe? Can you name two objects which can spin like this coin?

The Earth is a planet which moves around the sun. Sun is the source of the entire natural phenomenon. The Earth shows two kinds of movements: **rotation** and **revolution**.

Rotation of Earth: The Earth completes its rotation in 24 hours. It rotates on its imaginary **axis**. The Earth is slightly tilted on its axis.

Rotation of earth on its axis causes day and night. Let us understand how day and night are formed with the help of this activity.



Activity

Aim : To demonstrate the formation of day and night.

We need : a globe, torch, marker and a dark room.

Method :

- ★ Make a point on globe.
- ★ Close all the windows and door to make the room dark.
- ★ Now focus the torch light on the globe.
- ★ Slowly turn the globe and observe.

Result :

The part of the globe which receives light has day.

The part of the globe which remains in dark has night.

Half of the globe receives light at a time while the other part remains dark.

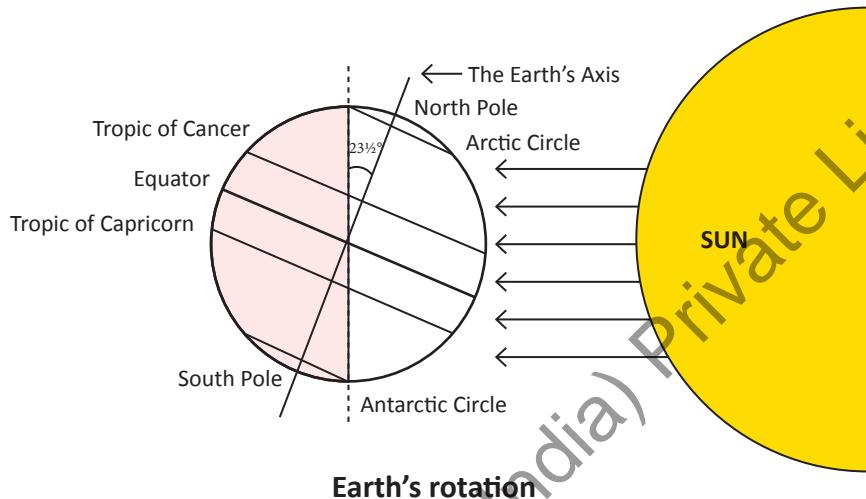


Just like this experiment, our Earth rotates on its axis from west to east. The part of the earth which receives sunlight has **day** and the part of the Earth which doesn't receive sunlight has **night**. Since India and USA are located opposite to each other, when it is day time in India, it is night time in the USA. One day comprises of 24 hours.

Fact zone

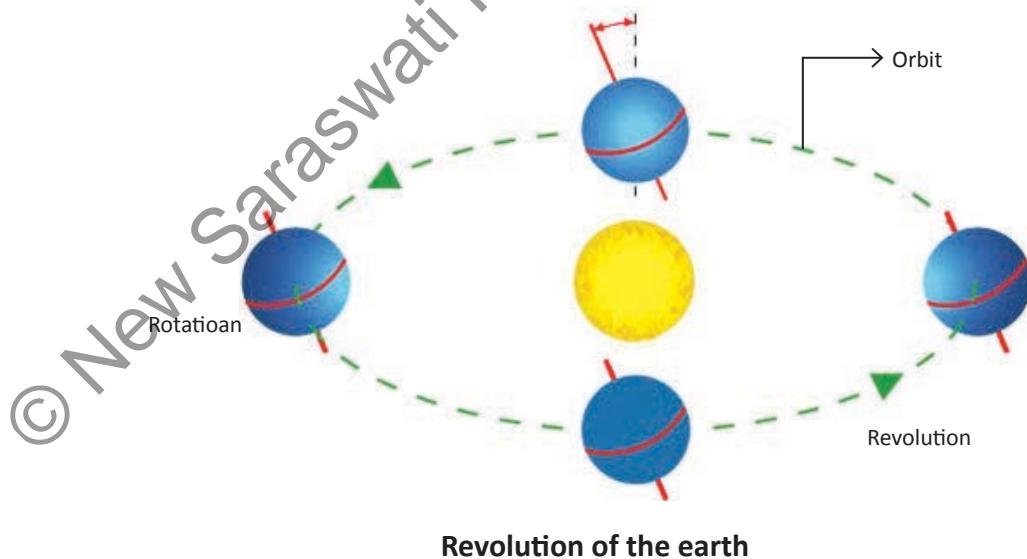


- Days and nights are of same duration twice every year. These are called **equinox**. The spring equinox generally happens in **March** and the autumn equinox happens in **September**.



Revolution

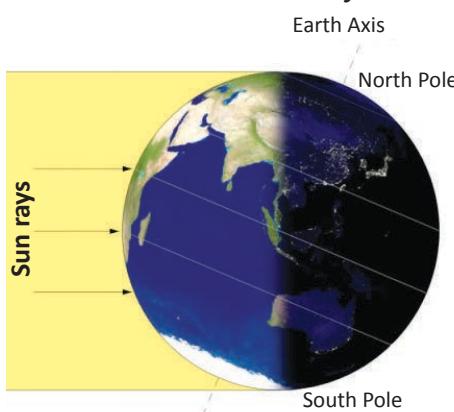
The Earth also moves around the sun in its fixed path called the **orbit**. The orbit is **elliptical** or shaped like an egg. One revolution is completed in $365\frac{1}{4}$ days. This time period is also called a **Solar year**. Due to revolution of the earth, seasons change.



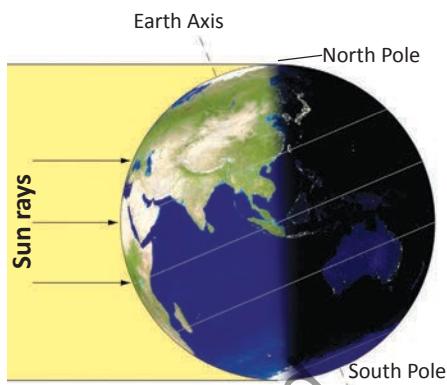
Change of Seasons

Due to revolution of the earth, seasons change. When the earth is near the Sun, it experiences **summer**. When the earth is far away from the sun, it experiences **winter**.

We also know that the Earth is tilted at an axis. When the Northern Hemisphere is tilted towards the sun during the months of May, June and July, it receives direct sunlight and hence it has summer whereas Southern Hemisphere has winter.



When Southern Hemisphere is tilted towards sun during the months of December, January and February, it receives direct sunlight. Thus it has summer whereas, the Northern Hemisphere has winter during these months.



Effect of Change of Seasons on People

Season change affects the different aspects of our lives such as farming, food habits, clothing and festivals.

Farmers decide the crops to be grown in a particular season and the correct time to harvest them. According to the seasons of a place, crops are grown by farmers which decide the food habits of the people living there.

We dress up according to the season. People who live in areas which have winter season wear woollen clothes. When the season changes to summer, they wear light cotton clothes.

Fact zone

The Sun rays fall twice in a year, directly on the tropics. On 21st June, the sun rays fall directly on Tropic of Cancer. On this day, it is **summer solstice** and the longest day in northern hemisphere and **winter solstice** and the shortest day in southern hemisphere.

► On 21st December, the sun rays fall directly on Tropic of Capricorn and it is winter solstice and the shortest day in northern hemisphere. It is the longest day and summer solstice in southern hemisphere.



Cotton clothes



Woollen clothes



We celebrate many festivals which mark the change **in season**. For example, festivals like Holi, Basant Panchami, etc. mark the change **in seasons**.

A very significant effect of season change is noted in the behaviour of some other living beings also. Due to onset of winter season, animals like polar bears enter **hibernation**, a state of deep sleep. During this time, they do not eat anything and wake up when the spring season starts.

When season changes from summer to winter, many birds, insects and animals move from their regions to warmer places. This process is called **migration**. India receives many species of birds during the months of winter season. Insects like butterflies also migrate to those places which have favourable season and can travel thousands of kilometres.

Movement of the earth affects every living being. Day and night regulate our daily lives and activities. Similarly, revolution of the earth causes change in seasons.



Let's learn new words

axis

: *an imaginary line used as the reference for the earth's movement*

elliptical

: *oval shaped*

hibernate

: *to pass winter in an inactive state*

migrate

: *to move from one place to another periodically*

orbit

: *a fixed path for movement of the earth*



Let's recall

- ★ The Earth completes rotation on its own axis in 24 hours.
- ★ Days and nights are formed due to the rotation of earth.
- ★ Earth revolves around the sun in its fixed path called the orbit.
- ★ The Earth takes $365\frac{1}{4}$ days to complete one revolution around the sun.
- ★ Revolution of the earth causes change in seasons.
- ★ Season change affects our clothing and festivals.
- ★ Change in season also affects animals, birds and insects which move to places having favourable climate.

Assessment

A Choose the correct option.

1. How much time is taken by the earth to complete one rotation?
(a) 24 hours (b) 26 hours (c) 27 hours (d) 28 hours
2. Name the fixed path in which the earth travels around the sun.
(a) Axis (b) Orbit (c) Solar year (d) Season
3. Which of the following happens due to revolution of the earth?
(a) Day and night (b) Solar year
(c) Seasons (d) Orbit
4. Which of the following are equal on an equinox?
(a) Day and night (b) rotation and revolution
(c) summer and winter (d) hours and minutes
5. When it is night time in India, what will it be in the USA?
(a) Day (b) Night (c) Evening (d) Dusk

B Fill in the blanks.

1. The Earth moves around the _____.
2. The Earth takes _____ hours to complete one revolution.
3. The orbit is shaped like an _____.
4. Change in _____ affects our life.
5. On an _____ days and nights are equal.

C Match the following.

Column A	Column B
1. Orbit	a. Migration of insects
2. Axis	b. Equal duration of day and night
3. Equinox	c. Seasonal festival
4. Holi	d. Rotation
5. Season change	e. Fixed path



D Give one word for the following.

1. The fixed path in which the earth travels around the sun.
2. A state of deep sleep in which animals like polar bear enter.
3. The time taken by the earth to complete one revolution around the sun.
4. When day and night is of equal duration.
5. The spinning of the earth on its axis.

E Answer the following questions.

1. Define orbit and axis.
2. What is rotation?
3. What is revolution?
4. How are days and nights formed?
5. How are seasons changed?



Activity

1. Take a globe and mark the position of India. In a dimly lit room, light a torch and hold it in front of India on the globe. Now note down the name of countries which have day along with India. Observe and list those countries which have night at that time.



Life Skills

Observation skills

1. With help of an elder, list all the festivals celebrated in our country which mark the change of seasons.
2. Observe and mention how does your clothing change with the season?



Let's login

<http://www.kidsknowit.com/educational-songs/play-educational-song.php?song=Why%20Do%20We%20Have%20Seasons>

http://www.teachersdomain.org/assets/wgbh/ess05/ess05_int_seasonsgame/index.html

3

MAJOR LANDFORMS OF THE WORLD



Let's start

Look at the pictures below.

Which of the following do you see in your surroundings? Circle them



Our earth is covered with 70 per cent water. Only 30 per cent of the land mass is present on the earth. Yet there is great variety of land seen in the form of landforms. Let's learn about some important landforms which are discussed in this chapter.

Mountains

Mountains are huge land masses which rise 900 meters above the sea level. They have steep slopes. If a mountain is young, such as **Himalayas**, then it will have a sharp peak. If mountain is old such as **Aravallis**, it will have low and rounded peaks. Many mountains may join together to form a **mountain range**. Around the world there are many long and famous mountain ranges such as the Andes, the Himalayas, and the Rocky.



Himalayas



Aravalli



Mountains are formed due to the movement of the earth. On the basis of their formation, there are three types of mountains— **Fold Mountains**, **Block Mountains** and **Volcanic Mountains**.

Fold Mountains: These were formed when two large land masses collided with each other. As a result of their collision, fold mountains were formed. For example, **Himalayas** in India and **Alps** in Europe.



Alps



Mt. Fuji

Volcanic Mountains: The temperature inside the earth is very hot and the rocks are in molten state called **lava**. When they find an opening or a rupture in the surface of earth, then a volcano erupts. When lava cools down, it forms solid rock. Thus, volcanic mountains are formed. Examples: **Mt. Fuji** in Japan and **Mt. Vesuvius** in Italy. These mountains

can form on land as well as in oceans (eg. Hawauan Islands)

Block Mountains: Block mountains are formed when the land between two cracks or faults get pushed up.

Examples: **Black Forest Mountain** in Germany and **Nilgiris** in India.

When the land between cracks sinks down, it forms a **rift valley**.



Block mountain

Peak, Pass and Valley: The pointed top of a mountain is called a **peak**. the **Mt. Everest** is the highest peak in the world.



Peak

Fact zone

- Landforms are acted upon by natural forces due to which they change with time. Example, the Himalaya Mountains are still rising in their height due to the movement in the earth's layers.



A narrow passage or a gap between the mountains is known as **pass**. These help people to move through the mountain ranges. The **Khyber Pass**, **Rohtang Pass** and the **Bolan Pass** are some of the famous mountain pass as.

A low lying area between two mountains or hills is called a **valley**. Usually, a river flows through them which make them fertile. Kashmir is a beautiful valley which is present in the northern parts of India.



Pass



Valley

Fact zone



► Hills are raised parts of the earth's surface and have a peak but they are smaller than mountains. You can find hills in your nearby places also.

Plains: These are flat areas which have gentle slopes. Rivers flow through them and deposit silt to make **alluvial soil** which is very fertile. Due to this, plains are best suited for agriculture. In India, the Indo-Gangetic plains have been made by the deposition of silt by the rivers—Indus, Ganga, Brahmaputra, Satluj and their tributaries. Therefore, these plains are also referred as the **food bowl of India**. These areas have been thickly populated for many years.

Coastal Plains

Coastal plain are flat, low-lying areas which are present near a sea coast. The coastal plains are formed when the ocean shore ruses up and becomes exposed as a flat plain land. In India, coastal plain are divided into Eastern coastal plains and Western coastal plains. Both the plains meet at Kanyakumari, the southern most tip of Indian peninsula.

Plateaus

Plateaus are flat land areas which are slightly higher than the land around. They are also called **tableland areas**. A plateau has steep slopes. The **Tibetan plateau** is world's highest and largest plateau. It is also referred as the '**roof of the world**'. In India, the **Great plateau**, **Deccan plateau**, **Malwa plateau** and the **Chota Nagpur plateau** are present.

Deserts

Deserts are dry and arid areas with few plants and very little rainfall. These areas are generally barren, have very hot days and cold nights. Therefore, these areas are not suitable for human habitation. High speed winds and dust storms are common in these areas. Small heaps of sand called **sand dunes** are commonly seen here. Desert plants like cactus can grow in these areas, and desert animals like camels can go on for days without food and water. Small



Physiographic map of India



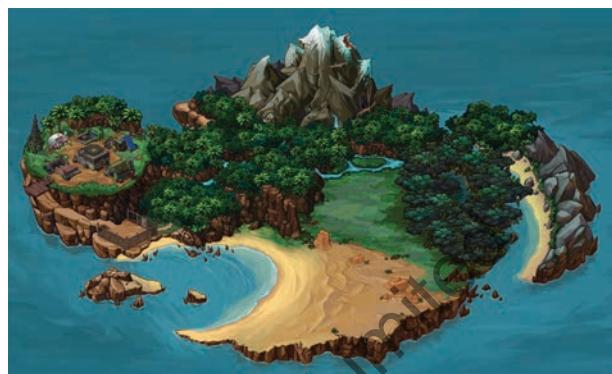
Desert

areas in deserts have fertile soil and a perennial supply of fresh water.

These are called **oasis**. The **Sahara Desert** in Africa is the largest desert in the world. The **Atacama Desert** is the driest desert as it receives little rainfall. In India the **Thar** desert is spread over some parts of Rajasthan.

Island

Island is a land mass which is surrounded by water on all sides. **Australia** is an island continent. **Greenland** is the largest island in the world. **Lakshadweep** and **Andaman** and **Nicobar** are islands in India.



A group of islands is called an **archipelago**.



Peninsula

Peninsula

It is a part of land which is surrounded by water on three sides and land on one side. Southern India is a peninsula. The largest peninsula in the world is the Arabian Peninsula which includes Saudi Arabia.

Rivers

Long streams of water are called rivers. Rivers get their supply of water through melting of ice or rainwater.

Rivers which are fed by melting of ice have water in them round the year and are called as '**perennial rivers**'. The Ganga, Indus and Bramhaputra are perennial rivers systems in India.

Rivers which are fed by rain are called **seasonal rivers** as they have water in them during the rainy season. Seasonal rivers of India are Godavari, Krishna, Cavery, etc. The small rivers which join the main river are called **tributaries**. For example the main tributaries of the Indus. India are Jhelum, Chenab, River, Beas and satluj. **Nile** is the longest river in the world which flows through Africa.

Delta

As the river approaches a sea or an ocean, its flow decreases and it deposits the remaining silt. As a result a triangle shaped land is formed which is called **delta**



after the Greek symbol (Δ) delta. This area is fertile and swampy. It is the place where mangrove trees can grow. In India, **Sunderban delta** is formed by Ganga and Brahmaputra rivers. It is the largest delta in the world.



Sunderban delta map

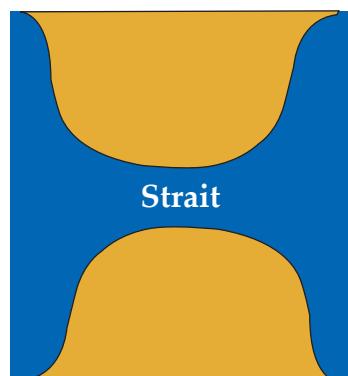
Estuary

When a river flows directly into a sea or an ocean without forming a delta, it is called an **estuary**. Notable rivers around the world such as Hudson and Amazon make estuary systems.

Strait and Isthmus

Strait is a narrow channel of water which joins two huge water bodies such as oceans or seas. They separate two land masses. The **Palk Strait** joins the Bay of Bengal with the Indian Ocean and separates India from Sri Lanka.

A narrow strip of land which joins two large land masses is called an **isthmus**. The North America and the South America are joined by the **Isthmus of Panama**.



Let's learn new words



arid	: <i>excessively dry</i>
silt	: <i>sediment of river</i>
steep	: <i>very sharp slope</i>
swampy	: <i>wet land</i>





Let's recall

- ★ Mountains are huge land masses which have steep slopes.
- ★ There are three types of mountains—fold mountains, volcanic mountains and block mountains.
- ★ Plains are flat and fertile areas.
- ★ Coastal plains are flat areas near a coast.
- ★ Plateaus are raised areas which are flat on the top.
- ★ Deserts are dry and arid areas with fewer plants.
- ★ An island is a land mass which is surrounded by water on all sides.
- ★ Peninsula is a land mass which is surrounded by water on three sides and land on one side.
- ★ Long streams of water are called rivers which are supplied either with water by melting of ice or from rain.
- ★ Delta is a triangular land mass formed due to deposition of river silt before merging in to a sea.
- ★ Merging of river directly into a sea or ocean without forming a delta is called an estuary.
- ★ A narrow water channel which joins two water bodies is called a strait.
- ★ A narrow land strip joining two large land masses is called an isthmus.

Assessment

A Choose the correct option.

1. The highest point on a mountain is _____.

- (a) peak (b) pass (c) valley (d) range

2. A group of islands is called _____.

- (a) isthmus (b) archipelago (c) strait (d) delta

3. An area which is dry and sandy is called _____.
 (a) plains (b) mountains (c) desert (d) island
4. Deccan, Malwa and Chota Nagpur are examples of _____.
 (a) peaks (b) rivers (c) islands (d) plateaus
5. The longest river in the world is _____.
 (a) Ganga (b) Amazon (c) Nile (d) Brahmaputra

B Give two examples of each of the following.

1. Island _____
2. Mountain _____
3. Fold Mountains _____
4. River _____
5. Isthmus _____

C Match the following.

Column A	Column B
1. Desert	a. Saudi Arabia
2. Mountain	b. Delta
3. River	c. Australia
4. Island	d. Peaks
5. Peninsula	e. Oasis

D Give one word for the following.

1. A triangle shaped land area formed due to deposition of river silt before merging in to a sea.
2. Flat areas with gentle slopes.
3. Raised areas with steep slopes and flat tops.
4. Small rivers which join the main river.
5. A low lying area between two mountains.

E Answer the following questions.

1. Explain the plains and coastal plains with examples.
2. Why do we refer to the plains of India as the food bowl of our country?
3. What is an oasis?
4. Explain the formation of fold mountains, volcanic mountains and block mountains.
5. How is a delta different from an estuary?



Activity

Use an atlas and locate the following on the world map.

1. Largest island
2. Largest peninsula
3. Coastal plains of India
4. Strait
5. World's largest desert



Life Skills

1. List the different landforms found in India. Does our climate vary according to the different landforms? Find out and mention the climate differences in those areas.
2. With the help of your elders, find out which landforms of India are most populous and which areas are less populated. Think and list the possible reasons for such diversity.

Critical thinking skill



Let's login

<http://www.totally3rdgrade.com/landforms.html>

<http://www.brainpopjr.com/science/land/landforms/grownups.weml>

4

PHYSICAL FEATURES OF INDIA-I



Let's start

Identify the place where you can find the following.



In the previous chapter, we had a great time learning about various landforms of the earth. You will be delighted to know that our country has most of these landforms. The physical features of our country are divided into:

- The Himalayas
- The Desert
- The Coastal Plains
- The Northern Plains
- The Southern Plateaus
- The Islands.

Fact zone

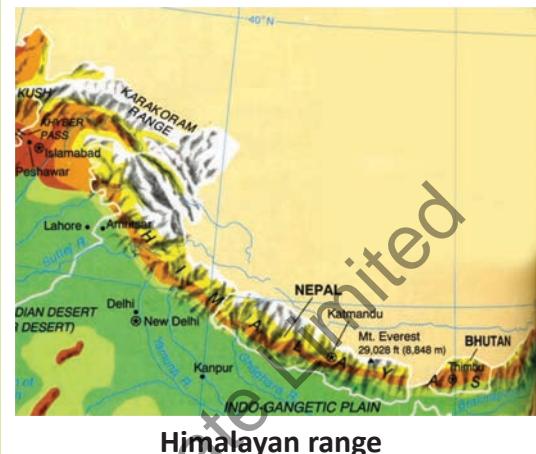
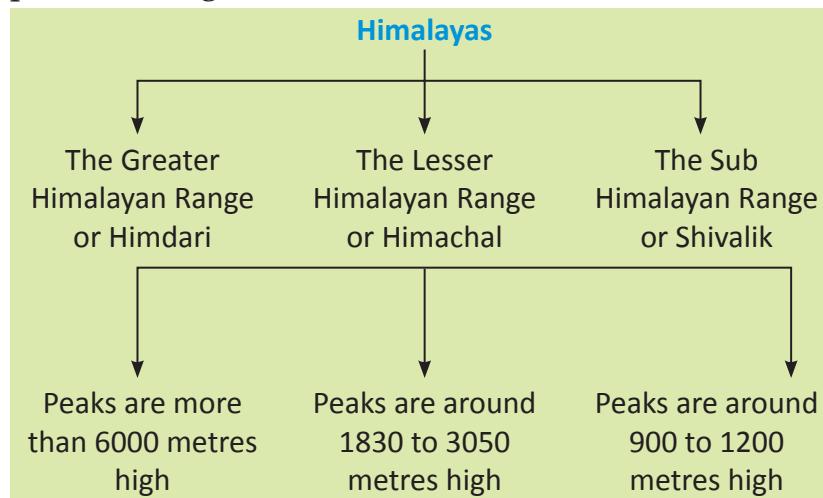
► Himalayas have the third largest deposit of glaciers after Antarctica and the Arctic.



The Himalayas

The Himalayan mountain range extends from Pakistan, across Northern India, Nepal, Bhutan and up to Arunachal Pradesh. Its total length is around 2500 km.

Most of the peaks of the Himalayas are covered in snow throughout the year. The highest peak is Mt. Everest which is 8,848 meters. The Himalayas consists of three parallel ranges. Its classification is as follows:



The Greater Himalayan Range: It is the northernmost range. This region is very cold and covered with snow throughout the year. **Mt. Everest** is the tallest peak in the world and **Godwin Austin (Mt. K2)** is the highest peak in India.



Himalayas



Godwin Austin (Mt. K2)

The Lesser Himalayan Range: It is the middle range and it is about 80 km wide. The climate is cold. Pine and Deodar forests are a common sight. This region of Himalayas has many tourist spots such as Srinagar, Shimla, Mussourie and Darjeeling.



Pine forest



Deodar forest

The Sub Himalayan Range: This is the lowest range of Himalayas. It is also known as the '**Terai region**'. This area is covered with thick forests and are a source of wood.

These forests also serve as a home for many wild animals. The **Corbett National Park** in Uttarakhand is well known for its large variety of wildlife.

Importance of Himalayas

- The Himalayas act as a barrier to cold winds from Central Asia.
- It is an important source of water. Many rivers originate from the Himalayan glaciers.
- They are the source of great river system. The rivers bring fertile soil from the mountains and deposit them in the plains.
- These mountains are a storehouse of minerals.
- By value of its location and height. The Himalayas stop the monsoon winds from moving to Central Asia and help to cause rainfall in the country. Without the Himalayas, our country would have been a dry land.



National Corbett Park

Life in the Himalayan Region

The Himalayan region is famous for many tourist places. Kashmir valley is beautiful and attracts tourists from all around the world. The Dal and Wular are famous lakes in Kashmir.

Apart from tourists, these mountains lure a number of adventurers and mountaineers. In India, the **Himalayas, Leh, Ladakh in Jammu and Kashmir, Garhwal and Kumaon hills in Uttarakhand, Kullu valley and Lahaul and Spiti in Himachal Pradesh** as well as **Sikkim** provide an exciting mountaineering experience.

Mt. Everest has been scaled by some famous mountaineers such as **Edmund Hillary, Tenzing Norgay, Bachendri Pal and Santosh Yadav**.



Edmund Hillary



Tenzing Norgay



Bachendri Pal



Santosh Yadav

The Northern Plains

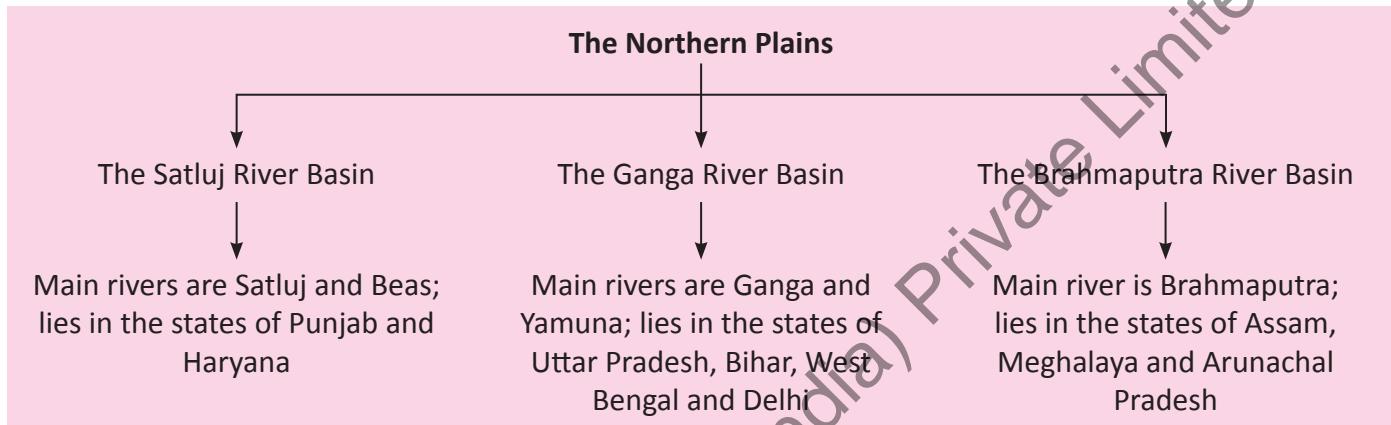
The Northern Plains stretch from Punjab in the west to Assam in the east. It stretches to the length of 2400 kilometres. Major cities of our country such as Delhi, Kolkata, Allahabad, and Agra lie in the northern plains.

The northern plains are fed by mountain rivers such as Ganga, Indus and Brahmaputra. They bring rich and fertile silt with them which is deposited in the plains. This soil

is called **alluvium**. Alluvial soil is good for farming and the major occupation of people in this area is agriculture. Therefore, the northern plains are also referred as the **food bowl of India**. The northern plains are made up of river basins. A **basin** is an area which is watered by a river and its tributaries.



Northern plains



Bhakhra Nangal Dam

These river basins are used not only for agriculture but for other purposes as well. The **Bhakhra Nangal** dam is built on Satluj river. This dam provides electricity and supplies water for agriculture to many states in our country.

The Yamuna river joins Ganga and Saraswati in Allahabad and this place is called Sangam. Every 12 years, the Kumbh mela is celebrated here which is attended by billions of people from all over the country and the world.

The **Sunderban delta** is formed when Ganga and Brahmaputra rivers join before merging into the Bay of Bengal. It is a home to mangrove or tidal forests and the Royal Bengal Tiger.

Fact zone

- ▶ Northern plains of India are the most populous areas on earth. Almost 1/7th of the World's total population resides here.



Kumbh Mela



Mangrove forest



Royal Bengal Tiger

Life in the Northern Plains

As the Northern Plains are the most fertile region of our country, it is also densely populated. The major occupation of people is farming. Rice, wheat, sugarcane, jute, etc. are grown in this region. Apart from farming, it is a home to many major industrial and tourist places. The capital of our country, New Delhi is also located in the Northern Plains.



Let's learn new words

glacier : a large body of ice which moves slowly

fertile : rich soil favourable for agriculture

silt : small particles of soil deposited by the river

merge : to join together



Let's recall

- ★ The northern mountain range consists of Himalayas and its various ranges.
- ★ The Himalayan range is divided into the Greater Himalayas, the Lesser Himalayas and the Shivalik range.
- ★ The Himalayan range mountains protect our country from cold winds, cause rainfall and are a storehouse of minerals.
- ★ The Himalayan mountains have famous tourist spots and attract mountaineers from all over the world.
- ★ The Northern Plains stretch from Punjab to Assam.
- ★ These plains are supplied by major rivers like Satluj, Ganga and Brahmaputra which form important river basins.

Assessment

A Choose the correct option.

1. The country through which the Himalayan mountain range does not pass is _____.
(a) Pakistan (b) India (c) Bangladesh (d) Nepal
2. The total extent of the Himalayan mountain range is _____.
(a) 2000 km (b) 2500 km (c) 3500 km (d) 4000 km
3. Which of the following is the highest mountain peak in India?
(a) Mt. Everest (b) Godwin Austen
(c) Mt. Kilimanjaro (d) Mt. Logan
4. Which of the following states is not a part of the Northern plains?
(a) Maharashtra (b) Delhi
(c) Haryana (d) Punjab
5. The river basin which lies in the states of Arunachal Pradesh, Assam, etc. is _____.
(a) Ganga (b) Satluj (c) Krishna (d) Brahmaputra

B Give one word for each of the following.

1. This mountain peak is the highest peak in the world.
2. The lowest range of Himalayas.
3. The place where the rivers Ganga and Yamuna meet.
4. The mela which is held every 12 years in the city of Allahabad.
5. This place is the home of mangrove forests.

C Match the following.

Column A	Column B
1. Bachendri Pal	a. Royal Bengal Tiger
2. Alluvial soil	b. Satluj river
3. Sunderban	c. Sangam
4. Allahabad	d. Northern Plains
5. Bhakhra Nangal Dam	e. Mountaineer

D Answer the following questions.

1. Explain the importance of Himalayas for our country.
2. Explain in detail about the different ranges of Himalayas.
3. What are the special features of the 'Terai' region of Himalayas?
4. What is the importance of Northern Plains for our country?
5. What is a river basin? Explain in detail about the different river basin areas in our country.



Activity

Use an atlas and locate the following on the map of India.

1. Three cities which are located in the Lesser Himalayan Range.
2. Three cities which are located in the Shivalik Range.
3. Sunderban delta



1. Observe a map of India which shows population distribution and decide why the Greater Himalayan range is less populated compared to the Northern plains of India?



Let's login

http://www.ehow.com/info_8632745_himalayas-kids.html

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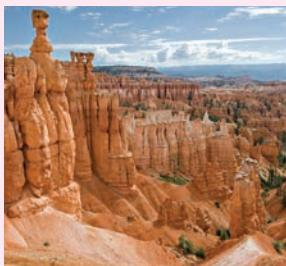
5

PHYSICAL FEATURES OF INDIA-II



Let's start

Look at these pictures. Can you name these landforms? Do you know where we find them in our country?

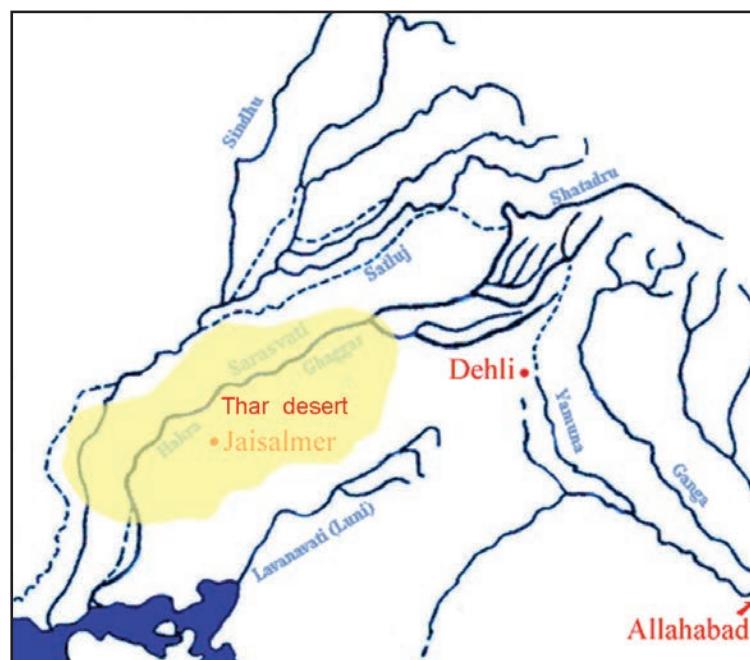


We have learnt about the important physical features of our country in the previous chapter. Let us learn about the other physical features of our country.

The Desert Region

The Indian desert is also known by the name of **Thar** and it extends from the Rann of Kutch in Gujarat to the borders of Haryana and covers a large part of Rajasthan. It is located in the north-west of the **Aravali hills**.

The climate is hot and dry. As sand heats up quickly and cools down fast, this region has hot days and cold nights. The area is covered with loose sand. Due to winds, small hills of sand called **sand dunes** are formed.



Map of Thar Desert

Camels can survive in this climate and can walk easily on the sand. Therefore, they are used to carry people and load from one place to another. Important towns located in the Thar desert are Jaisalmer, Jodhpur and Bikaner.



Camel

The Southern Plateau

The Southern Plateau covers a large part of the southern peninsula. It is 1600 km in length and 1400 km in breadth. Some major rivers flow through this plateau. The **Jog fall** in Karnataka is the highest waterfall in India.

River Narmada divides the Southern plateau into **Central Highlands** and **Deccan Plateau**.

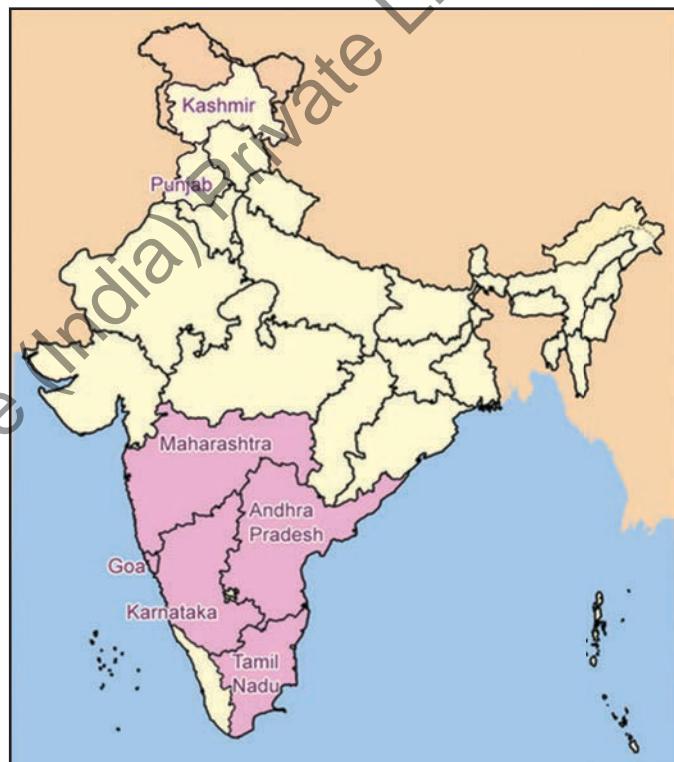
Major rivers which flow through this plateau are **Godavari, Krishna, Kaveri, Tapti, Narmada, Chambal, Betwa** and **Son**.

These plateaus are rich in minerals; **coal, iron, mica, manganese**, etc. are extracted from here. The important cities in this region are Pune, Hyderabad, Bengaluru and Mysore.

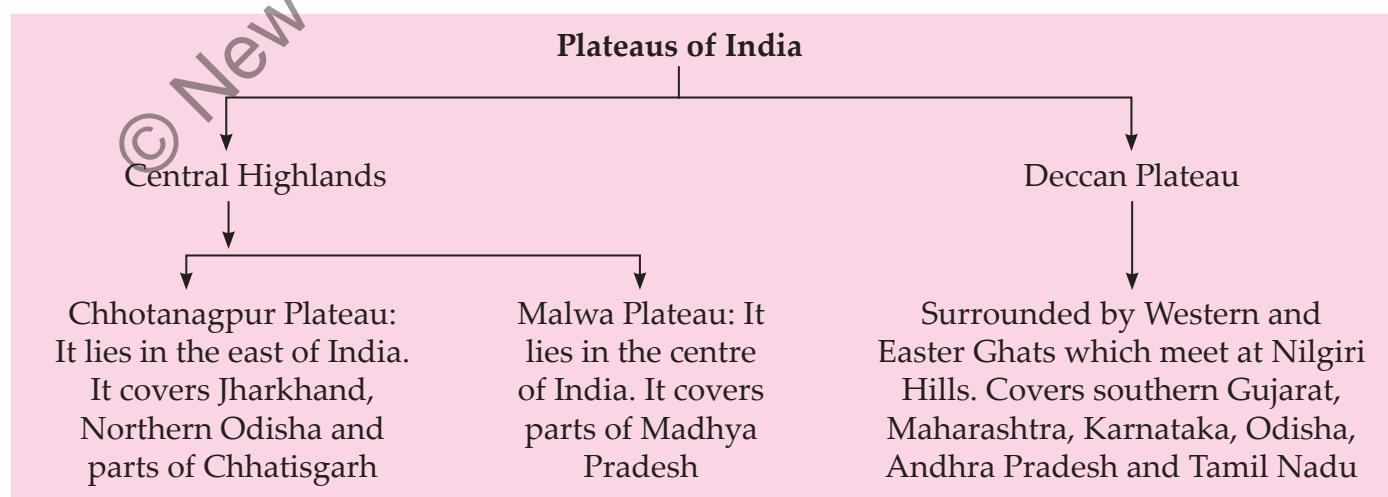
Fact zone



- The Deccan Plateau was formed due to volcanic eruptions. When the volcanoes became extinct, they left behind a table like region. Due to this, the soil of this area is black in colour which is good for growing cotton.



Map of Deccan Plateau



The Western and Eastern Ghats

The Eastern and Western Ghats are a range of mountains that run along the coasts of Indian Peninsula.

The **Western Ghats** are unbroken chain of mountains. They start from Maharashtra and run for 1600 km upto Kanyakumari. The **Sahyadri range, Nilgiri, Anaimalai and Cardamom hills** form the western ghat range. A narrow strip of coastal plain called '**Konkan**' separates the Western Ghats from the Arabian Sea. The Western Ghat is a home to diverse groups of animals.

The **Eastern Ghats** are a range of discontinuous mountains which start in West Bengal and run through Odisha, Andhra Pradesh, Tamil Nadu and Karnataka. They are older than the Western Ghats and are eroded and cut through by many rivers which flow and fall into the Bay of Bengal.

The coastal plains separate the Eastern Ghats from the Bay of Bengal. The Eastern and Western Ghats meet at the **Nilgiri hills**. **Anai Mudi** is the highest peak which is in Kerala.

The Coastal Plains

India has a vast coastline which is spread along the Deccan plateau as a narrow strip. The coastal plains can be classified as shown below.

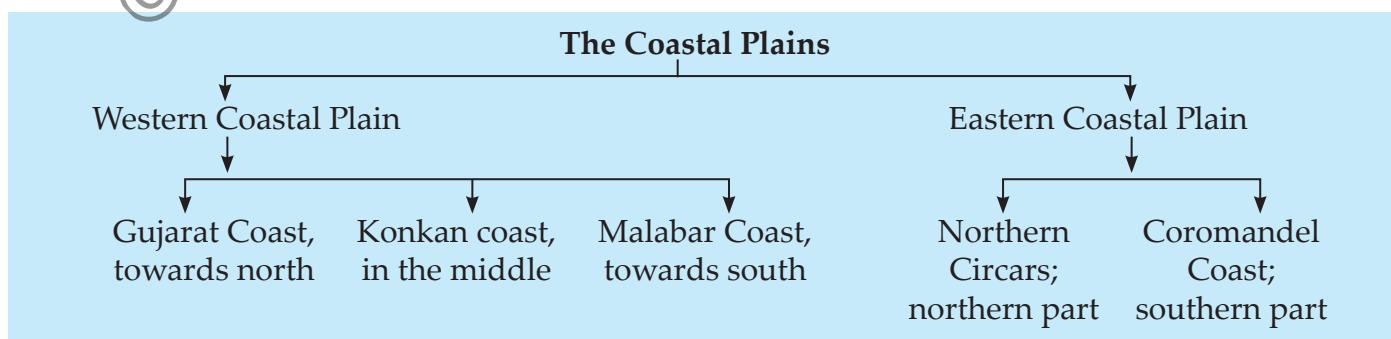


Map of Western and Eastern Ghats

Fact zone



The Eastern Ghats is also an abode of several famous Hindu pilgrimage temples such as Tirumala Venkateshwara temple and Simhachalam temple. The Eastern Ghats also serves as a home for diverse groups of animals, insects and plants.



The western coastal plains lie between the **Western Ghats and the Arabian Sea**. They are narrow. The major rivers which flow through these plains are Narmada, Tapti, Zuari and Mandovi.

The eastern coastal plains lie between the **Eastern Ghats and the Bay of Bengal**. These are wide. The major rivers which flow through these plains are Mahanadi, Godavari, Krishna and Kaveri.



Western coastal plains

The Islands

The landmass surrounded by water on all sides is called an **island**.

Two big groups of islands lie on either side of our country. On the east lies the **Andaman and Nicobar Islands**. It is a group of 300 islands but only few of them are inhabited by people. It is surrounded by Bay of Bengal. Its capital is **Port Blair**.

Lakshadweep is another group of islands which lies on the western side of the country. It is surrounded by the Arabian Sea. It is a group of 36 islands. Its capital is **Kavaratti**.

On the basis of the various landforms of India, it can be called a **subcontinent**. It has almost every variety of landform which is found in other parts of the world. This influences the way people live, eat and dress. The size of our country, the diversity of landforms and the climate makes it a subcontinent.

Fact zone



► The Chilka Lake lies in the state of Odisha and it is world's second largest lagoon. The Chilka Lake has rich diversity of marine animals and it also attracts rare migratory birds from all over the world.



Islands in India



Let's learn new words

<i>abode</i>	:	<i>the place where one stays or lives</i>
<i>erode</i>	:	<i>to wear away</i>
<i>erupt</i>	:	<i>to burst out</i>
<i>extinct</i>	:	<i>no longer in existence</i>
<i>migratory</i>	:	<i>moving from one place to another</i>



Let's recall

- ★ The Indian desert is also known by the name of Thar and spreads in Gujarat and large parts of Rajasthan.
- ★ The Southern Plateau covers most part of the Southern Peninsula.
- ★ The Southern Plateau is divided into Central Highlands and Deccan plateau.
- ★ The Eastern and Western Ghats are a range of mountains which run along the coasts of Indian Peninsula.
- ★ The coastal plains are a thin strip of plains which lie along the coastline of our country.
- ★ Andaman and Nicobar islands lie on the eastern side of our country, and the Lakshadweep islands lie on the western side of our country.
- ★ Due to the presence of different landforms in our country, it is also called a subcontinent.

Assessment

A Choose the correct option.

1. The state in which Thar Desert is present.

(a) West Bengal (b) Odisha (c) Rajasthan (d) Kerala

2. The total length of the Southern Plateau is _____.

(a) 2000 km (b) 2500 km (c) 1600 km (d) 2100 km



B Give one word for each.

1. The landmass surrounded by water on all sides.
 2. The range of mountains which run along the western coastline of our country.
 3. The landmass which has all the landforms which are found around the world.
 4. The group of 300 islands which is present in the Bay of Bengal.
 5. The highest peak of the Eastern Ghats and the Western Ghats.

C Match the following.

Column A	Column B
1. Sand Dunes	a. Northern Circars
2. Southern Plateau	b. Kavaratti
3. Eastern Coastal Plains	c. Migratory birds
4. Lakshadweep	d. Rich in minerals
5. Chilka lake	e. Desert

D Answer the following questions.

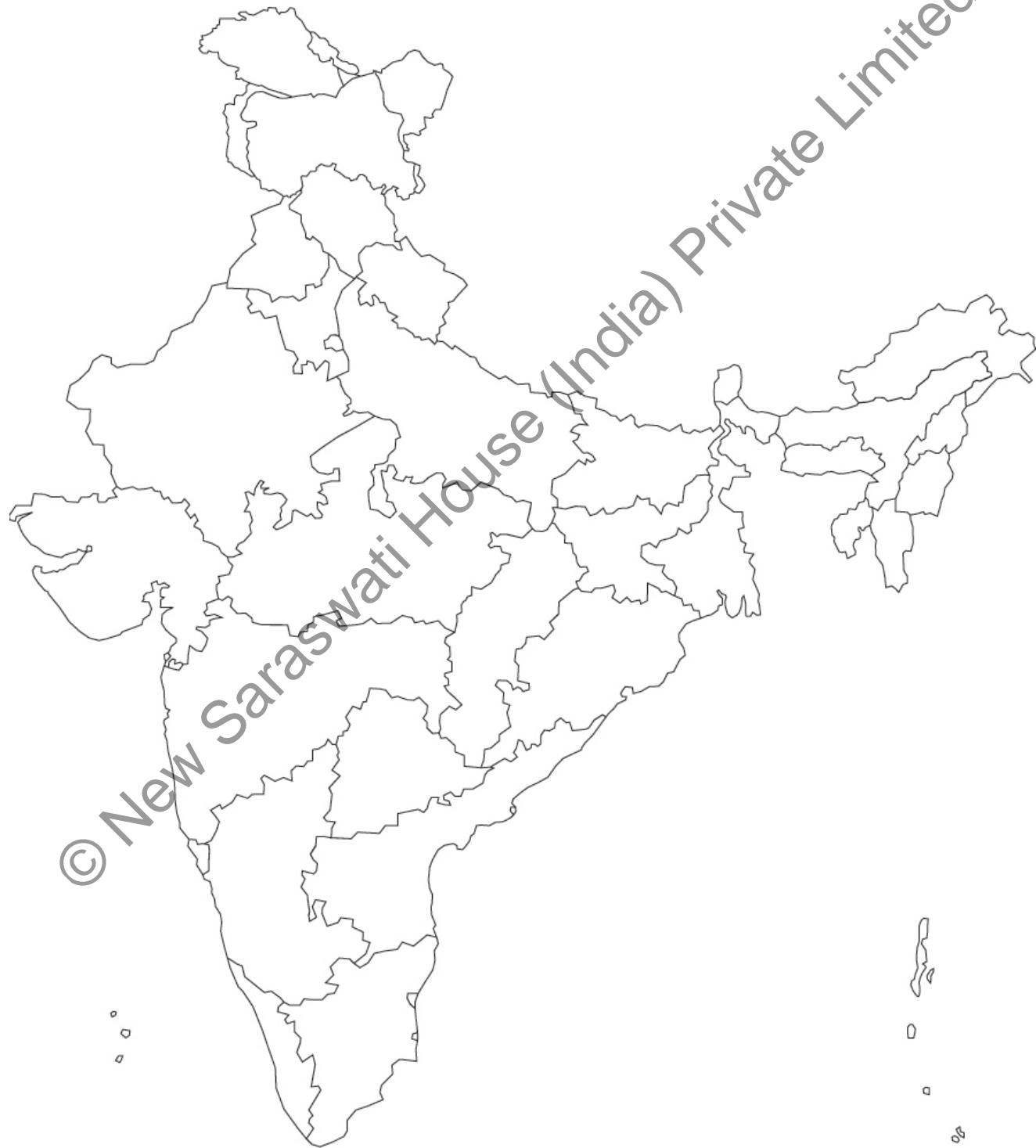
1. Why do people use camels to carry people or load in the desert region?
 2. Explain in detail about the different parts of the Southern Plateau.
 3. What are the special features of the Western Ghats and the Eastern Ghats?
 4. Why is India called a Subcontinent?
 5. Where are coastal plains located in our country? Explain them in detail.
 6. Which mountain range is present in the Thar Desert?



Activity

In the map of India, locate the following:

- Thar Desert
- Chhotanagpur Plateau
- Lakshadweep Islands
- Central Highlands
- Andaman and Nicobar Islands



1. Observe a map of India which shows several coal mines and iron industries. Why are these industries mostly located in the southern plateau of India?
2. Have you heard about the 'Konkan Railways'? Gather information from your elders and look at a map and find out the physical landforms of India through which it runs.

**Konkan railway****Let's login**

<http://www.authorstream.com/Presentation/Pratikgadhiya22-1067096-the-physical-features-of-india/>

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Let's Revise

A Fill in the blanks.

1. _____ travelled around the world and proved that the earth is round in shape.
2. Latitudes are also called as _____.
3. _____ is the second largest continent on earth.
4. The time period required for the earth to complete one revolution around the sun is called _____.
5. The part of the earth which receives direct sunlight has _____ season.

B Match the following.

Column A	Column B
1. Orbit	a. Old mountain
2. Rotation	b. Terai
3. Aravallis	c. Group of islands
4. Archipelago	d. Day and night
5. Shivalik	e. Fixed path

C Answer the following questions.

1. Explain in detail about the different ranges of Himalayas.
2. Why are Northern Plains important for our country?
3. What is a river basin? Explain the different river basins present in our country.
4. Explain in detail about the plateaus of India.
5. What is green revolution? What was its effect?

D Define the following terms.

1. Equinox
2. Fold mountains
3. Estuary



E In the map of India, locate the following:

1. Desert
2. Islands
3. Eastern coastal plains



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General Knowledge



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1

ANIMAL KINGDOM

There are different kinds of animals in this world. They have been categorised into different groups on the basis of their characteristics. Given below are different groups of animals. There is one animal that does not belong to the group. Cross out that animal.

1. Herbivores



3. Insects



2. Carnivores



4. Reptiles



Fact zone

- Whale is not a fish. It is a mammal. But it lives in water and looks like a fish.



Test Your

I.Q.

How much water can an elephant's trunk hold?

2

THE WILD WORLD

Many animals have become 'extinct'. It means that they are no more found in this world. Many animals face the threat of extinction. Such animals have been protected by keeping them in various national parks and sanctuaries.

Given below are names of some of the national parks and sanctuaries with the pictures of the animals that are protected there. Can you name the states where they are located?

Kanha National Park



1

Gir Forest National Park



2

Sunderbans National Park



3

State :

Kaziranga National Park



4

Sariska Tiger Reserve



5

State :

Periyar National Park



6

State :

Jim Corbett National Park



7

Bandipur National Park



8

State :

Mudumalai Sanctuary



9

State :

State :

State :

Fact zone

Dudhwa National Park in Uttar Pradesh is a famous reserve for Tiger, Panther, Sambar, Deer, Cheetah and Barking Deer.



West Bengal, Kerala, Uttarakhand, Assam, Gujarat, Karnataka, Madhya Pradesh, Rajasthan, Tamil Nadu

3

LESSER KNOWN ANIMALS

There are some animals that we have rarely seen. Given below are the descriptions of such animals. Name them with the help of the given clues:

1. This is the largest lizard in the world. It is found in the Komodo Island of Indonesia. It is
2. This animal lives in seawater. It has the biggest eyes among all the sea animals. Its eyes are as big as a basketball. It is
3. This is a large carnivorous sea animal. It lives in the ice cold waters of the Arctic ocean. It has two long tusks like that of elephants. It is
4. This animal lives in the cold regions of Tibet in the north of Himalayas. It eats ice and snow to quench its thirst even if there is plenty of water available. It is
5. This bear-like animal is a native of Australia. It lives on tree tops and feeds especially on eucalyptus leaves. It is
6. This is a very clever sea animal. It changes its body colour according to the colour of the seabed where it lives. This saves it from its enemies. It is
7. This fish uses its fins to glide in air just above the surface of water. It can glide for over a kilometre. It is
8. This small pig-like animal is found in Central America and Southeast Asia. Its snout is like a short, thick trunk which it uses for putting leaves into its mouth. It is



Fact zone

The campaign launched by India and Nepal jointly to conserve vultures is named as SAVE (Saving Asia's Vultures from Extinction).



Yak, Walrus, Komodo dragon, Tapir, Giant Squid, Koala, Cuttlefish, Flying fish

4

THE GREEN WORLD

The places where different plants are grown have different names. Some of them are given below. Can you match these descriptions with their correct names? Try now!

Column A

1. A place where plants are grown and sold.
2. A large piece of land where crops of tea, coffee and rubber are grown.
3. A place where crops are grown or animals are reared.
4. A glass building in which plants are grown to save them from bad weather.
5. A place where grapevines are grown.
6. A place where rice is grown.
7. A place where fruit trees are grown.
8. A place adjacent to a house where vegetables are grown.



Column B

(a) Greenhouse

(b) Nursery

(c) Vineyard

(d) Plantation

(e) Orchard

(f) Kitchen garden

(g) Paddy field

(h) Farm

Fact zone



► A group of trees planted and cultivated together is known as a grove.

Researches indicate that plants grow healthier when they are stroked.

Test Your
I.Q.

Name the plant which stores water in its trunk.



5

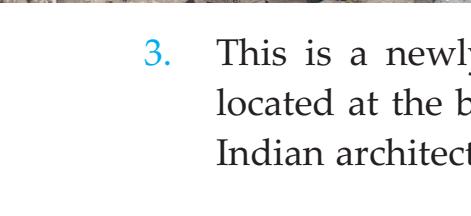
HERITAGE OF INDIA

Given below are the pictures of famous places in India. Read the description and write the names of the states where they are located.

- This is a 2000 years old statue of Gomateshwara. It is the highest statue in India. It is in the state of



- This is the picture of Ellora Cave Temple. It is the biggest cave temple. It is in the state of



- This is a newly constructed Akshardham temple which is located at the banks of river Yamuna. It is a fine example of Indian architecture. It is located in



- This is the temple of Lord Jagannath at Puri which is a famous Hindu pilgrim centre. A large Rath Yatra takes place here every year. It is located in

Fact zone

- The Sun Temple was built by King Narasimhadeva in the shape of a chariot with 24 wheels which was drawn by seven horses.



Delhi, Karnataka,
Delhi,
Maharashtra, Odisha

6

INDIAN STATES AND THEIR LANGUAGES

Write the languages spoken in these states

1. Andhra Pradesh
2. Assam
3. Goa
4. Gujarat
5. Jammu and Kashmir
6. Jharkhand
7. Karnataka
8. Kerala
9. Maharashtra
10. Manipur
11. Mizoram
12. Nagaland
13. Odisha
14. Punjab
15. Sikkim
16. Tamil Nadu
17. Tripura
18. West Bengal



Bengali,
Telugu, Urdu,
Bengali,
Assamese,
Bhutia,
Nepali,
Hindi,
Punjabi,
Konkani,
Marathi,
Oriya,
Gujarati,
Kashmiri,
Dogri,
Urdu,
Santhali,
Hindi,
Ao, Angami,
Kannada,
Mizo,
Malayalam,
Marathi,
Manipuri, Tamil

Fact zone

- ▶ Indians speak different languages and dialects.
- ▶ Hindi is spoken by 181 million people all over the world.



7

CITIES ON RIVERBANKS

Many Indian cities are located on the banks of rivers. Rivers were the main source of water in the past, that is why cities were established near them. Given below are some famous cities. Can you name the rivers near which these cities are located.

City

River

- | | |
|-------------------|-------|
| 1. Haridwar | |
| 2. Agra | |
| 3. Kolkata | |
| 4. Jabalpur | |
| 5. Tiruchirapalli | |
| 6. Varanasi | |
| 7. Srinagar | |
| 8. Lucknow | |
| 9. Cuttack | |
| 10. Nashik | |
| 11. Surat | |
| 12. Delhi | |
| 13. Ahmedabad | |
| 14. Guwahati | |
| 15. Vijaywada | |



Fact zone

- ▶ Ganga is the holiest and the longest river flowing through India.
- ▶ Allahabad is situated at the meeting point of the rivers Ganga, Yamuna and Saraswati.



Yamuna, Mahanadi, Brahmaputra, Sabarmati, Krishna, Jhelum, Hoogli, Ganga, Gomti, Yamuna, Godavari, Tapti, Narmada, Kaveri, Ganga

8

IMPORTANT DAYS

Some days and dates become important because of some reasons. Due to their significance, these days are known throughout the country. Some such days and their dates are given below. Match the days with their dates.

Day

1. Army Day
2. Air Force Day
3. Children's Day
4. Teacher's Day
5. Hindi Day
6. Martyr's Day
7. National Science Day
8. National Maritime Day
9. Flag Day
10. Navy Day
11. Independence Day
12. Republic Day
13. Gandhi Jayanti
14. World Earth Day
15. World AIDS Day



- 5th September
- 14th November
- 8th October
- 15th January
- 5th April
- 28th February
- 30th January
- 14th September
- 26th January
- 15th August
- 4th December
- 7th December
- 1st December
- 22nd April
- 2nd October

Date



Fact zone

- Children's Day is celebrated on the birthday of Pandit Jawaharlal Nehru because he loved children very much. Children called him 'Chacha Nehru'.



Test Your
I.Q.

Whose birthday is
celebrated as the
Teacher's Day?

9

INDIA'S SUPERLATIVES

Following are some of the superlatives of India. Choose the correct words from the clue box and write them against their sobriquets.

1. First nobel prize winner
2. Largest cave
3. Highest dam
4. First airlines of the country
5. Longest river
6. First newspaper
7. Fastest train
8. First talkie film
9. First woman Prime Minister
10. Highest mountain peak
11. Highest airport
12. Largest prison
13. Largest cave temple
14. Largest gurudwara
15. First train steamed off from
16. Longest dam
17. First test tube baby
18. First Indian to go into space

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CLUE BOX

Bori Bunder to Thane (34 km), Tata Airlines (now Air India), Rabindranath Tagore, Leh Laddakh Airport, Hirakud Dam, Shatabdi Express, Tihar Jail (Delhi), Rakesh Sharma, Ellora (34 Caves), Golden Temple, Bengal Gazette, Alam Ara, Baby Harsha, Amarnath, Kanchenjanga, Bhakra Dam, Indira Gandhi, Ganga

10

ROAD SAFETY SIGNS

Road is a place where chances of accidents are maximum. So we should be very careful while crossing the road. To keep us safe, there are various signs along the roadside which guide us. Given below are some road safety signs. Can you tell what they stand for?



1.



2.



3.



4.



5.



6.



7.



8.



9.



No horns,
Petrol pump ahead,
Narrow bridge ahead,
School ahead,
U-turn,
No right turn,
Zebra crossing,
Speed breakers ahead,
Railway crossing ahead

ANSWERS

- Page :218** ➤ Fox. 2. Cow. 3. Duck. 4. Macaw.
- Page :219** ➤ 1. Madhya Pradesh. 2. Gujarat. 3. West Bengal. 4. Assam. 5. Rajasthan. 6. Kerala. 7. Uttarakhand. 8. Karnataka. 9. Tamil Nadu
- Page :220** ➤ Komodo Dragon. 2. Giant Squid. 3. Walrus. 4. Yak. 5. Koala. 6. Cuttlefish. 7. Flying fish. 8. Tapir.
- Page :221** ➤ 1. (b) 2. (d), 3. (h), 4.(a), 5.(c), 6. (g), 7. (e), 8.(f).
- Page :222** ➤ 1. Karnataka. 2. Maharashtra. 3. Delhi. 4. Odisha. 5. Delhi.
- Page :223** ➤ 1. Telugu, Urdu. 2. Assamese, 3. Konkani. 4. Gujarati. 5. Dogri, Kashmiri. 6. Santhali, Hindi. 7. Kannada. 8. Malayalam. 9. Marathi. 10. Manipuri. 11. Mizo. 12. Ao, Angami. 13. Oriya. 14. Punjabi. 15. Bhutia. 16. Tamil. 17. Bengali. 18. Bengali
- Page :224** ➤ 1. Ganga. 2. Yamuna. 3. Hoogli. 4. Narmada. 5. Kaveri. 6. Ganga. 7. Jhelum. 8. Gomti. 9. Mahanadi. 10. Godavari. 11. Tapti. 12. Yamuna. 13. Sabarmati. 14. Brahmaputra. 15. Krishna.
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