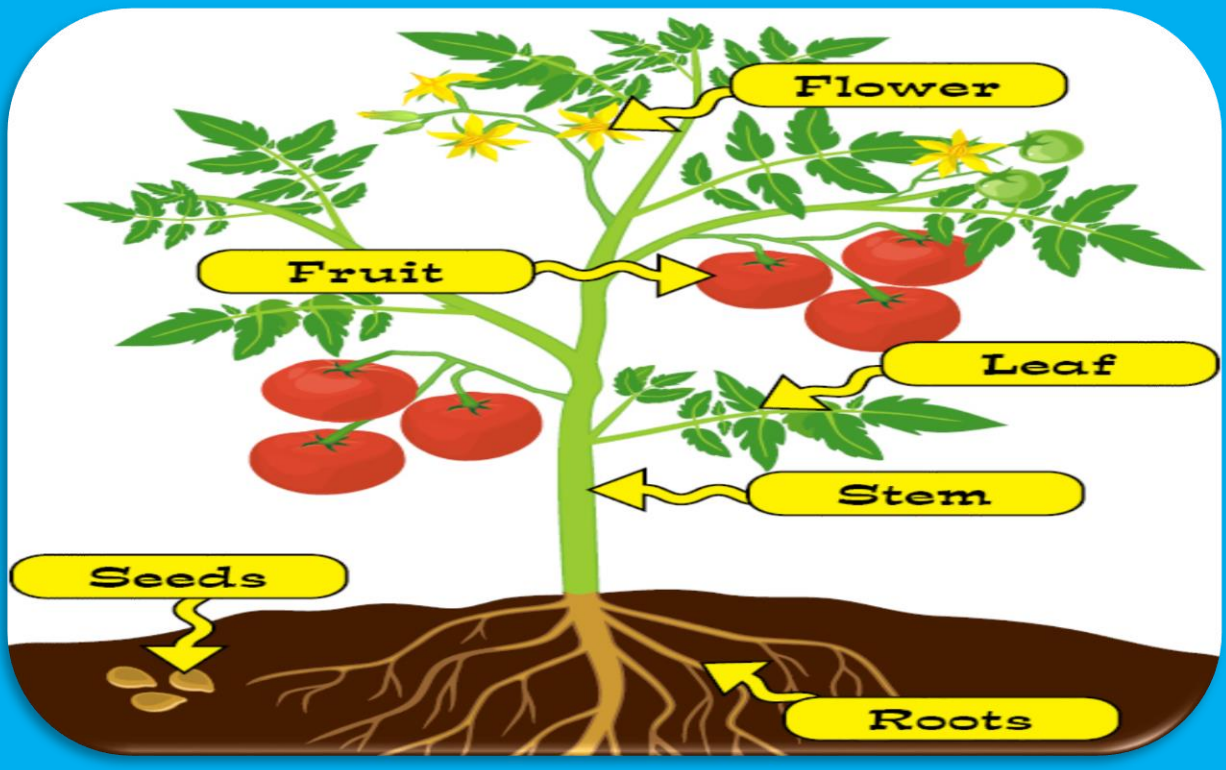
OSEB EDUCATIONAL CONSULT-KAMPALA

2024

SCIENCE

Teachers' Handbook

P.4 LESSON NOTES



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Name:

Class:

STANDARD CURRICULUM

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QUALITY WORK

Week four lesson six.

GROWING CROPS

Types of crops
1. Cereals
2. Legumes
3. Root crops
4. Fruit crops
5. Vegetables
6. Plantation crops

Cereals

Examples
1. Maize
2. Millet
3. Rice
4. Sorghum
5. Wheat
6. Oats

Legumes
These are plants with nodules on their roots and seeds in pods.

Examples
1. Beans
2. Peas
3. Soya beans

Legumes have root nodules that keep nitrogen fixing bacteria.
Legumes make the soil fertile.

Root crops
They are i) root tubers
Ii) stem tubers

Root tubers
These are plants which store food in swollen underground roots.
Examples
1. Cassava
2. Sweet potatoes
3. Carrots
4. Yams

Stem tubers
These are plants which store their food in swollen underground stems.
Examples

1. Cocoyam
2. Irish potatoes

Fruit crop
A fruit is a well developed fertilised ovary.

Examples of fruit crops
1. Jackfruit
2. Mango
3. Oranges
4. Pineapple
5. Apple
6. Bananas
7. Avocado
8. Grapes
9. Guavas
10. Pawpaw

Vegetable crops
Types of vegetable crops

a) Leafy vegetables

Examples
1. Cabbage
2. Spinach
3. Amaranthus (dodo)
4. Bbuga

b) Fruit vegetables

Examples
1. Tomatoes
2. Egg plants
3. Pepper
4. Bitter berries (Sodom's apple)

c) Root vegetables

Examples
1. Carrots

Plantation crops

Examples
1. Coffee
2. Cocoa
3. Tea
4. Cotton

Week four lesson seven.

Groups of crops
There are three groups of crops namely;
1. Annual crops
2. Perennial crops
3. Bi-annual crops.

Annual crops
These are crops that grow and die within a year.

Examples
1. Maize
2. Sorghum
3. Peas
4. Ground nuts
5. Cassava
6. Beans
7. Tomatoes
8. Cabbage
9. Spinach

Perennial crops:
Crops that last for many years

Examples
1. Coffee
2. Tea
3. Cocoa
4. Bananas

Garden tools

	GARDEN TOOL	**USE**
1	Hoe	· Digging · Planting · Weeding · Harvesting
2	Spade	· Mixing manure · Lifting soil
3	Rake	· Leveling soil · Collecting weeds
4	Wheel burrow	· Carrying soil · Carrying manure · Carrying harvest

	GARDEN TOOL	**USE**

5	Slasher	· Cutting grass · Cutting weeds
6	Axe	· Cutting big trees · Chopping wood
7	Panga	· Cutting small branches · Cutting trees · Harvesting sugar cane
8	Forked hoe	· Digging hard ground · Digging stony ground
9	Watering can	· Watering crops · Watering seedlings
10	Garden fork	· Mixing manure
11	Shovel	· Transplanting · Carrying seedlings
12	Pick axe	· Digging in rocky ground · Digging in stony soils
13	Secateur	· Pruning crops
14	Pruner	· Pruning crops
15	Hand fork	· Light weeding · Removing seedlings from soil
	GARDEN TOOL	**USE**
16	Sprayer	· Spraying crops

17	Knives	· Harvesting · Pruning · Peeling
18	Tape measure	· Spacing crops in the garden

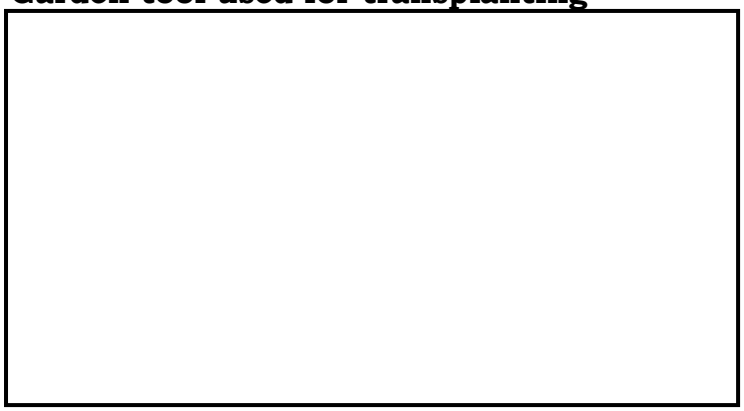
Examples of plants grown in a nursery bed.
1. Tomatoes
2. Coffee
3. Onions
4. Passion fruits.

Transplanting
Transplanting is the transfer of seedlings from a nursery bed to the main garden.

Transplanting is always done in the evening.

Why seedlings should be transplanted in the evening.
1. It prevents wilting of the seedlings.
2. There is little loss of water from the soil through evaporation.

Garden tool used for transplanting



Gap filling
The planting of seeds or seedlings where they did not germinate in the garden.

Caring for crops
These are ways in which farmers care for their crops in the garden
1. Thinning
2. Watering
3. Weeding
4. Manuring
5. Applying fertilizers
6. Staking
7. Mulching
8. Providing shade
9. Pruning

Thinning
The removal of excess seedlings from a planting hole or nursery bed.

Importance of thinning
1. Reduces competition for sunlight, nutrients, space and water

Watering
The providing of water to crops or seedlings during the dry season or soon after transplanting

Importance of water to plants
1. For seed germination
2. For making food
3. For dissolving nutrients for roots to taken in

Activity: Draw the garden tool for watering crops.

Crop growing practices
1. Land preparation
   It is done in the dry season to;
   - Prevent the weeds from germinating again after digging and ploughing.
   - Avoid the soil from sticking onto the how or plough

Ways of preparing land
- Digging
- Ploughing
- Slashing/clearing
- Cutting big trees
- Harrowing
- De-trashing

Garden tools / implements used in preparing land
- Hoes
- Ox ploughs
- Tractors
- Slashers
- Rakes
- Panga
- Axe

Importance of preparing land
1. To soften the soil
2. Digging and ploughing allows water into the soil.
3. It makes planting easy.
4. Digging and ploughing allows air into the soil.
5. Cutting away big trees opens space for crops to get enough sunlight.

2) Selecting viable planting materials

a) Examples of planting materials

1. Seeds
2. Suckers
3. Stem cuttings
4. Rhizomes
5. Bulbs.

b) Quality of good planting materials.

1. They should be mature.
2. They should not be damaged.
3. They should be free from pests.
4. They should be free from diseases.
5. They should not be too old.
6. They should be of the same variety.

Importance of selecting planting materials.

1. It prevents wastage of land
2. It ensures quality plants.
3. It prevents wastage of time.
4. It prevents wastage of labour

Planting and sowing

- This is the putting of planting materials in the soil to germinate.
- Planting is done during wet/rainy season.

Reasons for planting crops in wet season.

- There is enough water for seed germination.
- The soil is soft for easy growth of roots.

Methods of planting

1. Planting in rows
2. Broadcasting method

Row planting

This is when planting materials are put in the soil in lines.

Illustration

Advantages of row planting

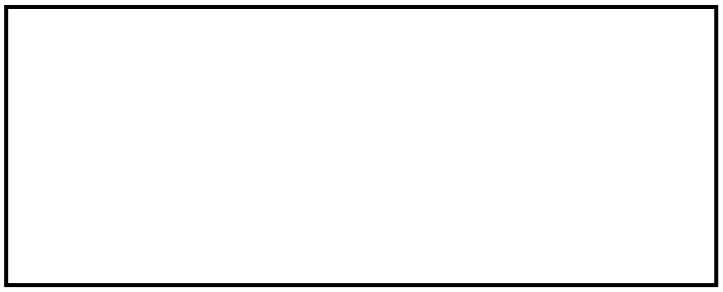
It makes it weeding easy.
It makes harvesting easy.
It controls the easy spread of pests and diseases.
It avoids wastage of seeds and other planting materials.

It allows proper spacing of crops.

Disadvantages of row planting
It needs a lot of labour.
It is time consuming.

Examples of plants planted by row planting.
Maize
Cassava
Beans
Pineapples
Potatoes.

Broad casting method
This is the putting of seeds in the soil while scattering them.



Advantages of broadcasting methods
1. It saves time.
2. It does not need a lot of labour.
3. It does not waste nutrients in soil.

Disadvantages broadcasting method.
1. It makes weeding difficult.
2. It makes harvesting difficult.
3. Pests and diseases can easily spread.

Nursery bed
A nursery bed is a small garden where seedlings are grown before they are transplanted.

Importance of a nursery bed
1. It gives a farmer time to prepare the main garden.
2. It protects seedlings from heavy rain drops.
3. It protects seedlings from strong sunshine.
4. It helps farmers to select healthy seedlings.

Weeding
It is the removal of unwanted plants from the garden.

A weed
A weed is an unwanted plant in a garden.

Examples of weeds
1. Spear grass
2. Elephant grass

3. Black jack
4. Star grass
5. Wandering Jew
6. Couch grass
7. Guinea grass
8. Star grass

Activity: Draw a garden tool for weeding

Dangers of weeds in a garden

1. They compete for light, water, nutrients and space with the crops.
2. They encourage easy spread of pests.
3. There encourage easy spread of crop diseases.
4. They make harvesting difficult

Ways of controlling weeds

1. Slashing
2. Spraying /using herbicides
3. Uprooting
4. Crop rotation
5. Mulching
6. Digging

Advantages of weeding a garden

1. It reduces the competition for light, nutrients, water and space in the garden.
2. It makes harvesting easy.
3. It controls the easy spread of pests.
4. It prevents the easy spread of crop diseases.

Uses of weeds to people

1. Some weeds are used as mulches
2. Some weeds are used as herbal medicine.
3. Some weeds are used to feed animals like cattle e.g. elephant grass.

Manuring

It is the putting of fertilizers in the soil to make it more fertile.

Sources of manure

· Animal dung and urine
· Plant remains
· Green plants

Types of manure (natural fertilizers)

Compost manure

It is got from plant materials and animal wastes.

Green manure

It is got from ploughed buried and rotten green materials like legumes.

Farm yard manure

It is got from farm animal wastes, urine and decayed material.

Organic mulches
It is got through mulching using dry plant materials.
Mulching
· Mulching is the covering of top soil with dry plant materials.
· Mulches are plant materials used for mulching.

Examples of mulches
- Elephant grass
- Coffee husks
- Banana leaves
- Chopped stems of bananas

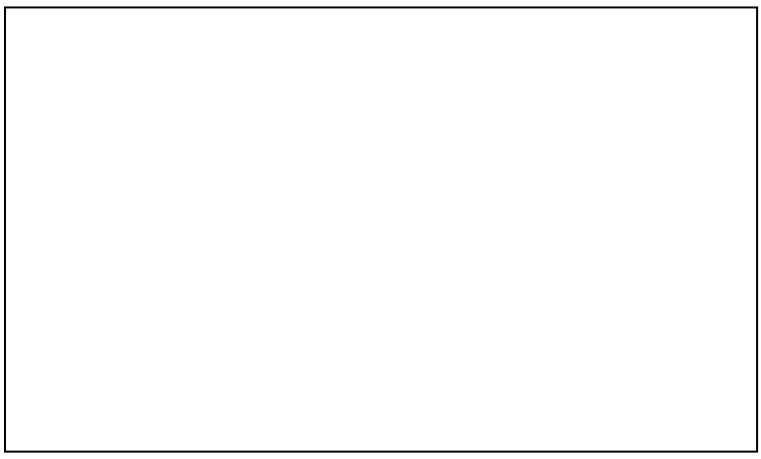
Advantages of mulching
- It keeps water (moisture) in the soil.
- It controls soil erosion.
- It makes the soil fertile.
- It controls the rapid growth of weeds.

Disadvantages of mulching
- Mulching keeps pests
- Some mulches can grow into weeds
- Mulching is a fire hazard
- It is tiresome

Pruning
Pruning is the removal of unwanted parts from a plant.

Advantages of pruning
- It reduces the easy spread of crop diseases.
- It reduces competition for sunlight,water,nutrients and air.
- It improves on crop yields.

Activity: Draw the garden tool used for pruning



Thinning
It is the removal of excess plants in the garden/nursery bed.

Advantages of thinning
- It reduces competition for crop nutrients.
- It reduces the easy spread of pests
- It reduces the spread of crop diseases.
- It improves on crop yields.

Control of pests
A pest is an animal that destroys crops.

Examples of crop pests
- Army worms
- Birds
- Rats
- Termites
- Maize stalk bore
- Locusts
- Squirrels
- Aphids
- Cotton stainer
- Snails
- Banana weevil
- Maize weevil

Dangers of pests to crops
- They weaken plants
- They lead to low produce
- They lead to poor growth of crops
- They destroy crops

Ways of controlling crop pests
- Spraying pesticides
- Using scare crows
- By crop rotation
- Planting pest free materials
- Regular weeding
- Uprooting and burning infected crops
- Proper spacing

CROP DISEASES
Some crop diseases
- Cassava mosaic
- Leaf rot
- Tomato blight
- Leaf curling
- Groundnut Rosette
- Leaf spot
- Maize streak

Ways of controlling crop diseases
- By crop rotation
- Spraying chemicals

- Uprooting and burning of infected crops
- Planting healthy materials.
- Proper spacing
- Early planting

Crop rotation
It is the growing of different types of crops on the same piece of land seasonally.

Advantages of crop rotation
- Keeps the soil fertile
- Controls soil erosion
- Controls crop pests
- Controls crop diseases

N.B. 1) Legumes are alternated with non-leguminous plants.
Why? Because they make soil more fertile since legumes add nutrients to the soil.

Leguminous plants have root nodules which keep Nitrogen fixing bacteria.

2) Shallow rooters are alternated with deep rooters.
Why? This balances the use of nutrients from soil at different levels.

Uses of water in soil
- It makes the soil soft for roots to grow easily.
- It is used for seed germination.
- Plants use water to make food.
- It softens the ground for easy weeding.
- Cools the plants during transpiration.
- It dissolves nutrients in the soil for roots to absorb.

Harvesting
It is the collecting of ready (mature) crops from the garden
It is done during the dry season for easy drying of harvesting crops.

Some garden tools for harvesting

TOOL	**PURPOSE**

Sickle	A sickle is used for harvesting cereal crops.
Hoe	A hoe is used for harvesting root crops.
Panga	A panga is used for harvesting sugar cane, bananas.

Methods of harvesting crops
1. Hand picking (e.g. coffee, oranges, etc)
2. Cutting stems (e.g. sugar cane, bananas)
3. Uprooting (e.g. ground nuts, cassava)
4. Digging (e.g. potatoes)

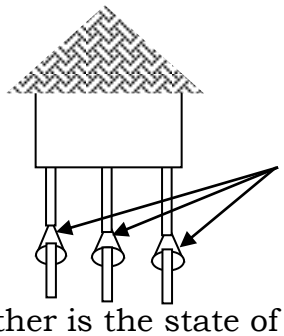
Storing of food
Food storage is the keeping of food safely for future use.

Reasons why farmers store food
1. To be eaten in dry season
2. For planting in next season
3. To be sold when market prices are better.

Places where food can be stored
1. In granaries
2. In silos
3. In refrigerators / freezers

Qualities of a good store
1. It should be well ventilated
2. The roof should be leak proof
3. It should have rat guards
4. It should be clean and dry.

A diagram showing a granary



N.B.
1. Rat guards prevent rats from entering the store.
2. Leak proof roof prevents damping and rotting of the seeds.

Exercise:
Name and give the use of the labeled parts.
Give two dangers of storing grains in a wet food store.

WEATHER CHANGES
1. Weather is the state of the atmosphere at a given place.
2. Elements of weather
   i. Sunshine
   ii. Temperature
   iii. Cloud cover
   iv. Rainfall

v. Wind movements
vi. Humidity

3. Types of weather
i. Cloudy weather
ii. Rainy weather
iii. Sunny weather
iv. Windy weather

4. Weather instruments
These are instruments used to measure different elements of weather.

WEATHER INSTRUMENT	**USE**
Rain gauge	Measures the amount of rainfall received in a given place.
Anemometer	Measures the speed of wind.
Wind vane	Shows the direction of wind.
Six's thermometer	Measures the maximum and minimum temperatures of the day.
Wind sock	Shows the direction of wind.
Barometer	Measures atmospheric air pressure.
Hygrometer	Measures the humidity in the atmosphere

The water cycle:

1. Sources of water

a. Natural sources of water
i. Rivers
ii. Swamps
iii. Lakes
iv. Rainfall

b. Artificial sources of water
i. Taps

ii. Tanks
iii. Bore holes
iv. Wells

2. Properties of water
i. It has no colour
ii. It has no taste
iii. It has no smell
iv. It takes the shape of the container

3. Water in air
This is called water vapour

Formation of water vapour
i. Through evaporation from water bodies
ii. Through transpiration

Importance of water vapour
i. It changes into clouds on condensation
ii. The clouds fall as rain

4. Rain
The drops that fall down from the clouds in the sky.

Rainfall
The water collected on the ground from the rain drops

5. **The water cycle**
This is the process by which rain is formed.

It involves
i. Evaporation
ii. Transpiration
iii. Condensation

Evaporation is the change of water from liquid to gas.

Transpiration is the loss of water from a plant to the atmosphere through leaves as vapour.

Condensation is the change of state from gas to liquid.

During the water cycle;

i. The sun heats the water bodies and vegetation
ii. Evaporation takes place from the water bodies and transpiration takes place in plants
iii. The water vapour rises up into the sky and condenses to form clouds
iv. The clouds become heavy and fall down as rain

A—Heat from the sun
B—Evaporation from water bodies
C—Transpiration from vegetation
D—Condensation forming clouds
E—Rain

Clouds
Clouds are formed when water vapour in the sky condenses.

Types of clouds
i. Cirrus—highest and lightest clouds
ii. Stratus
iii. Cumulus
iv. Nimbus—heaviest clouds

Effects of clouds on the environment
i. Clouds block direct sunlight
This reduces the brightness in our environment.

ii. Clouds lower the temperature in our environment by reducing heat from the sun.
iii. Clouds bring rain.

Effects of rain on the environment
i. Rain reduces temperature in the environment
ii. Rain reduces dust
iii. Rainfall softens soil

The weather chart
1. It is a chart that shows the daily weather changes in our environment.
2. A weather chart is produced through observation and recording.

The elements of weather in a weather chart include;
1. How much rainfalls
2. How much cloud is in the sky
3. How strong the wind is
4. How hot is the sunshine
5. How worm or cool is the air in our surroundings.

Examples of a weather chart

Element of weather	**Temperature**	**Cloud cover**	**Rainfall**	**Cloud cover**	**Wind movement**	**Sunshine**
DATE	TIME					

TOPICAL QUESTIONS

1. Briefly explain the term weather.

2. Mention four elements of weather.
   i) iii)
   ii) iv)

3. Identify four types of weather.
   i) iii)
   ii) iv)

4. Match the items in A with those in B.

A	**B**
Thermometer	Day's highest and lowest temperature
Barometer	Rainfall
Six's thermometer	Temperature

Rain gauge	Air pressure
Anemometer	Speed of wind

5. How do people manage the following changes in their environment?
   a) Strong wind
   b) High temperatures
   c) Very low temperatures
   d) Flooding

6. Name two examples of each water source below;
   a) Natural sources of water
      i)
      ii)
   b) Artificial sources of water
      i)
      ii)

7. Mention two properties of water
      i)
      ii)

8. Describe, in four sentences, how rain is formed.

9. How do the following affect temperature in the environment?
      a) clouds
      b) Rain

PERSONAL HYGIEN

1. Personal hygiene is the way we keep our bodies clean.
   It is the general cleanliness of the body.

2. Importance of personal hygiene.

   i. It controls the spread of germs.
   ii. It prevents bad body smell.
   iii. It prevents skin diseases
   iv. It prevents teeth diseases
   v. It prevents lice, mites and ticks.

3. Ways of keeping good personal hygiene.
   i. Bathing every day
   ii. Cutting finger and toe nails short
   iii. Brushing teeth every day
   iv. Washing hands after visiting the toilet or latrines.
   v. Washing hands after a physical task like digging, picking rubbish, etc.
   vi. Washing hands before eating food.
   vii. Washing clothes regularly
   viii. Washing beddings regularly
   ix. Combing hair daily.
   x. Ironing clothes and beddings.

4. Items used to keep the body clean

i. Soap
ii. Clean water
iii. Sponge
iv. Tooth brush
v. Comb
vi. Towel
vii) razor blade
viii) basin
ix) Sandals
x) Tooth paste

5. Dangers of poor personal hygiene.
   i. The body smells bad.
   ii. Jiggers, mites, ticks and lice can breed and affect the body.
   iii. The teeth may develop tooth decay.
   iv. Diarrhea diseases can spread easily.
   v. Accidental injuries from long finger nails to self or others.

6. Diseases brought by poor personal hygiene.

DISEASES	**CAUSE**
Tooth decay	Bacterial
Scabies	Itch mite
Dysentery	Bacteria Amoeba
Diarrhoea	Virus Bacteria
Ring worm	Fangus
Trachoma	Chlamydia

TOPICAL QUESTIONS

1. Briefly explain personal hygiene.
2. Name four items used in keeping good personal hygiene.
   i) iii)
   ii) iv)

3. Why is it important to keep good personal hygiene?
   i) iii)
   ii) iv)

4. State four ways of keeping personal hygiene.
   i)
   ii)
   iii)
   iv)

5. Name the diseases that affect the following parts of the body.
   a) eyes
   b) skin
   c) teeth

6. Suggest four ways of keeping good personal hygiene.
   i)
   ii)
   iii)
   iv)

7. Why are the following habits important to the individual.
   a) Cutting finger nails
   b) Combing hair
   c) Washing hands before eating
   d) Washing hands after using a toilet or latrine.