Science and Technology Grade 4 Notes

Living things are divided into two groups

- Living and non living things.
- Plants and animals are living things
- Non living things are stones,wood, buildings,roads, vehicles, mountains and many more others

1. **Plants**

Characteristics of plants as living things.

- They feed
- They grow
- They breath
- They remove waste
- They move they die
- They reproduce.

Handling plants

When you want to observe plants you should handle them with care,you should also wear protective gears to protect you from harmful plants

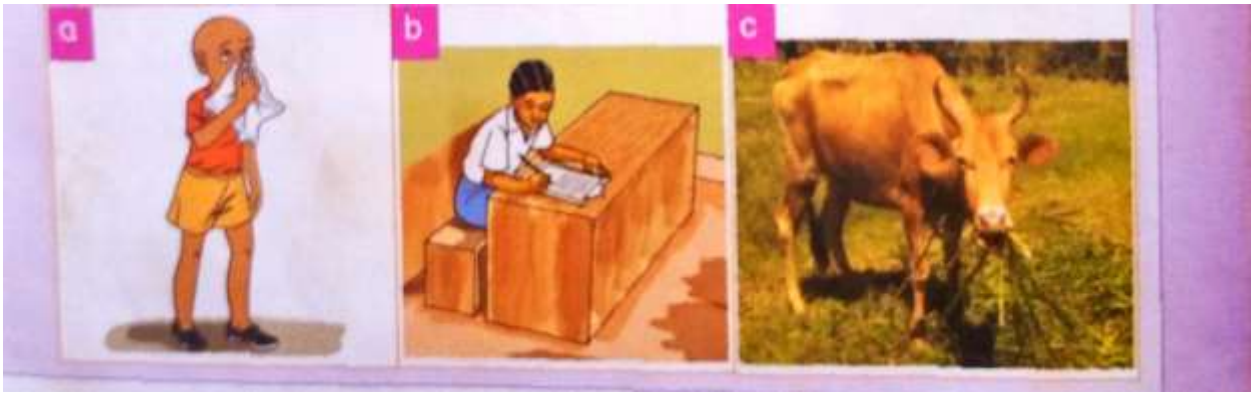
- Wear dust coat,to keep your clothes clean
- Wear goggles to protect your eyes
- Wear gloves to protect your hands
- Use forceps and tongsto turn over a plant leaf
- Use magnifying lens to see small holes on leaves.

Wash your hands aafter handling plants

Plants that grow in the locality are; maize.beans, sugarcane, vegetables,tea, potatoes and many others.

Revision exercise 1

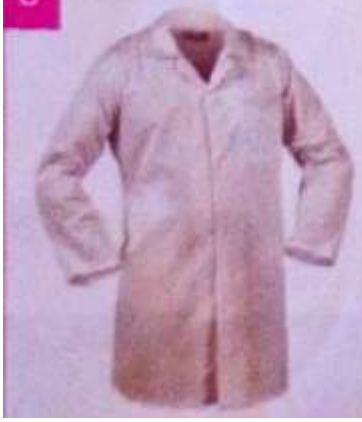
1. Identify and write living or non- living thing in the pictures below.



2.

2. **Match the item to the part of the body where it is worn.**

I

Picture of item	part of body
a 	hands
b 	body
c 	eyes

3. **Write characteristics of plants as living things**

4. **Draw and colour a plant in your area**

5. **All things around uscan be divided into_____ and_____**

6. **A maize plant and a cow are examples of _____**

7. **A stone and a wood are examples of ____**

2.Animals

Characteristics of animals as living things

- They feed
- They grow
- They breath
- They remove waste materials
- They move
- They die
- They reproduce

Vertebrates and invertbrates

A vertebrate is an animal with a backbone while an invertbrate is an animal without backbone.

Examples of vertebrates are, cow,sheep,dog,hen, crocodile

Examples of invertebrates are, slugs, butterflies,ants, cockroaches, millipedes,ticks,spiders,worms,crabs

Handling animals

Precautions to take when handling animals are;

- Use pair of forceps to pick and observe small animals.
- Wear gloves when holding a frog
- Wear overcoat to protect the body and clothes.
- Observe safety for animals
- Wash hands and change clothes after handling animals

Revision exercise 2

1.Complete the following sentences by filling in the correct word.

a)When animals give birth to young ones we say that they have_____

b) Most animals have_____eyes

c)When animals eat grass we say that they_____

d) Before a chick hatchesit was an_____

2. Name the following

a)A digital device that can take photographs

b)The last stage of an animal_____(death,growth)

A domestic animal found in many homes used for security

3. Write true or false

a) All animals are living things____

b)All animals eat the same food____

4. Write the seven characteristics of animals as living things.

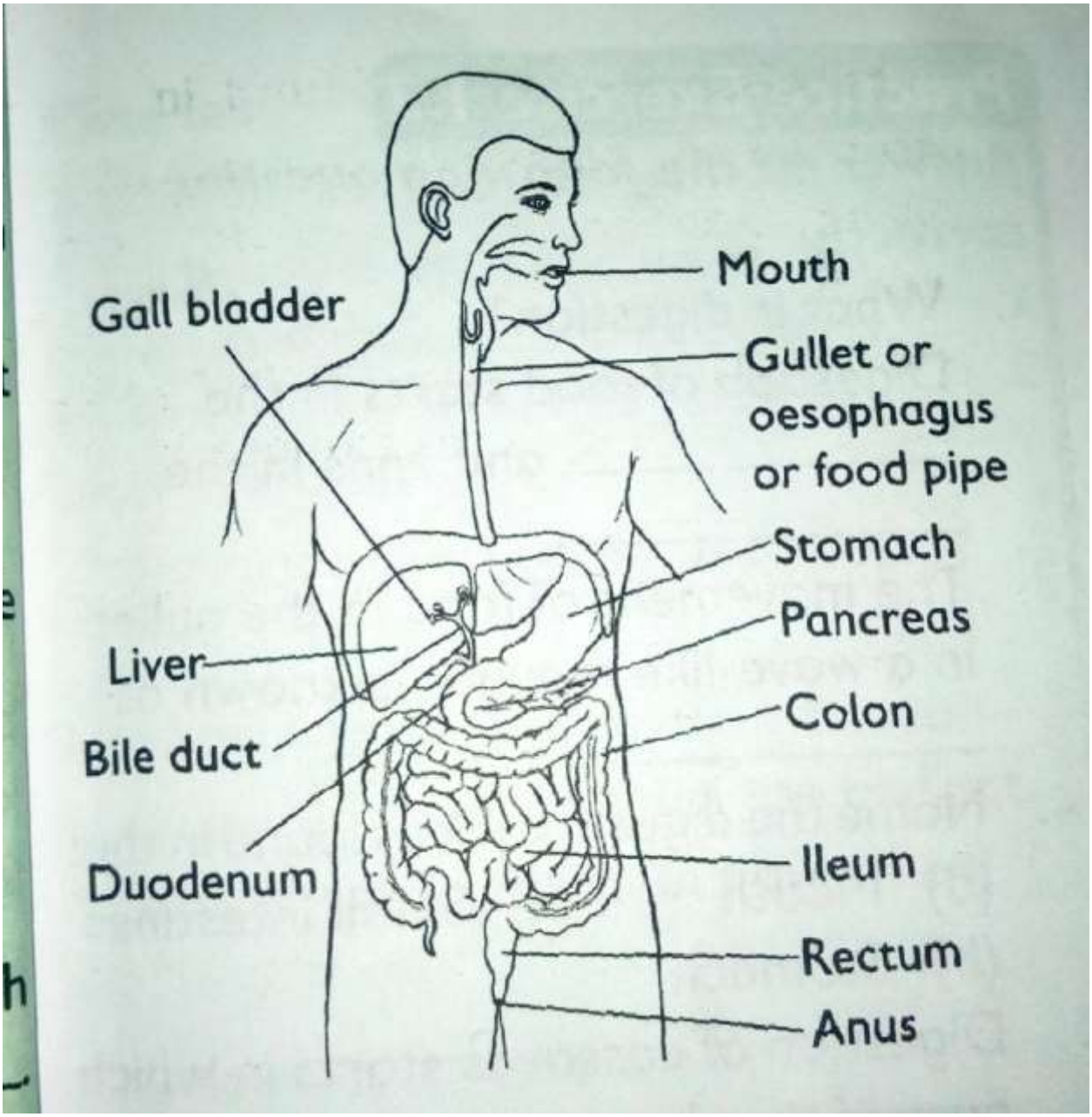
5. Which animal should not be in this group? Why?

Elephant, antelope,. Crocodile, giraffe,snail

6.Write two ways of keeping safe from dangerous animals.

3 Human body

Parts of the human digestive system



Functions of the different parts of the body

Mouth- is the first part of the digestive system where digestion begins.

Teeth- to grind food into small pieces

Saliva_ fluid that mixes food

Oesophagus- is a narrow tube where food passes as it moves to the stomach.

Stomach—it is a temporary store where food mixes with digestive juices.

Small intestines- is a long coiled tube of about seven metres, it absorbs digested food and digestion ends here.

Pancreas—is where pancreas juice is formed that mixes with food.

Liver--- produce bile juice which break down fats and absorbs digested food s

Large intestines__ undigested foods are passed here and water and mineral salts are absorbed here

Faeces_ unwanted food materials which is removed out of the body

Rectum--- it stores undigested materials from large intestines

Anus___ is the passage which allows faeces out of the body.

Taking care of the teeth

We take care of our teeth by;

- Brushing regularly
- Eating foods that makes our teeth strong like sugarcane,carrots and roasted maize.
- By avoiding sugary foods like sweets , biscuits,cakes and chocolates.
- By regularly visiting the dentist for check up

Types of teeth

The types of teeth that a human body has are;

Incissors are flat sharp front teeth used for biting food

Canines are pointed teeth next to the incisor used for tearing food

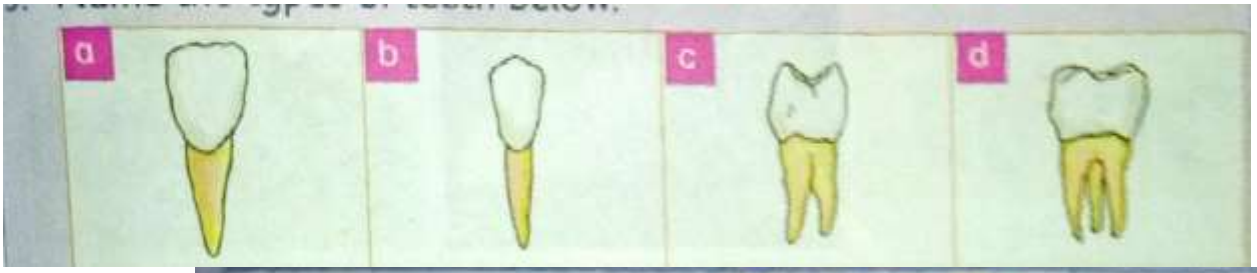
Premolar is a large flat teeth used for chewing and grinding.

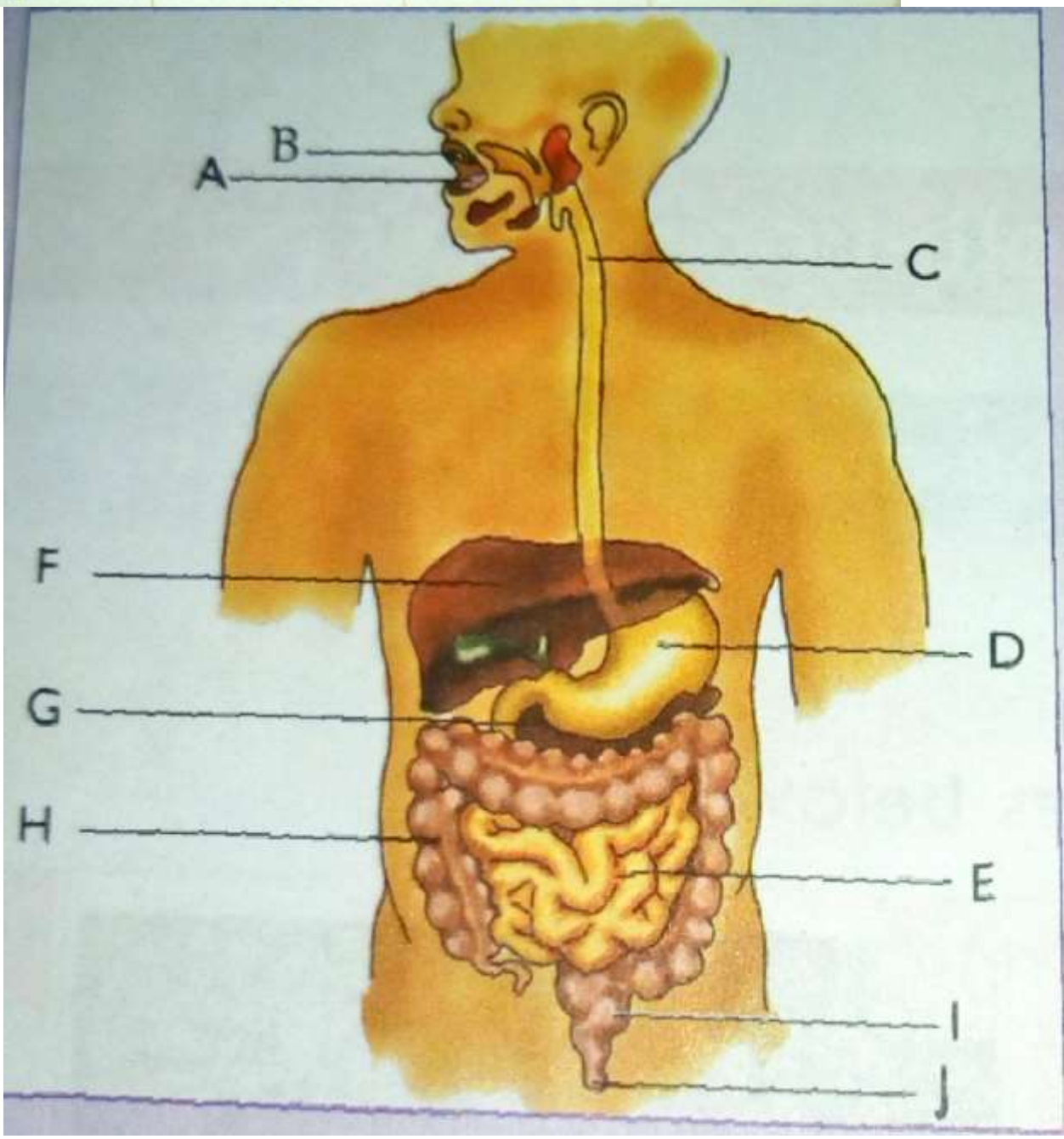
Molar is bigger than the premolar and it is found at the back of the mouth,it is used for chewing and grinding.

Revision exercise 3

1. Most digested food is absorbed in the_____

2. Name the following parts of the human digestive system.
3. Name the types of teeth below





4. The two types of teeth used for chewing food are_____ and____
5. I have____ teeth in my mouth
6. Choose the correct statement
    a) The small intestines are short and highly coiled
    b) The oesophagus is a thin- walled tube
    c) The salivain the mouth is just water.
7. Fill in the blank spaces
    a) The ___is a thin Long tube that connects the mouth and the stomach
    b) The small intestines are _____,_____,_____ to allow complete digestion and absorption of food
8. Write four sentences about good use of teeth

Air pollution.

Air pollution is making the air dirty.

Causes of air pollution

Burning charcoal,

vehicle fumes,

burning wastes like tyres

dead and rotten animals,

factory fumes and smoke,

Slaughter houses,

Smelling drainage,

Market wastes

Stone quarries that produce dust,

Busy earth roads.

Dirty toilets and latrines

Effects of air pollution on living things.

Air pollution causes;

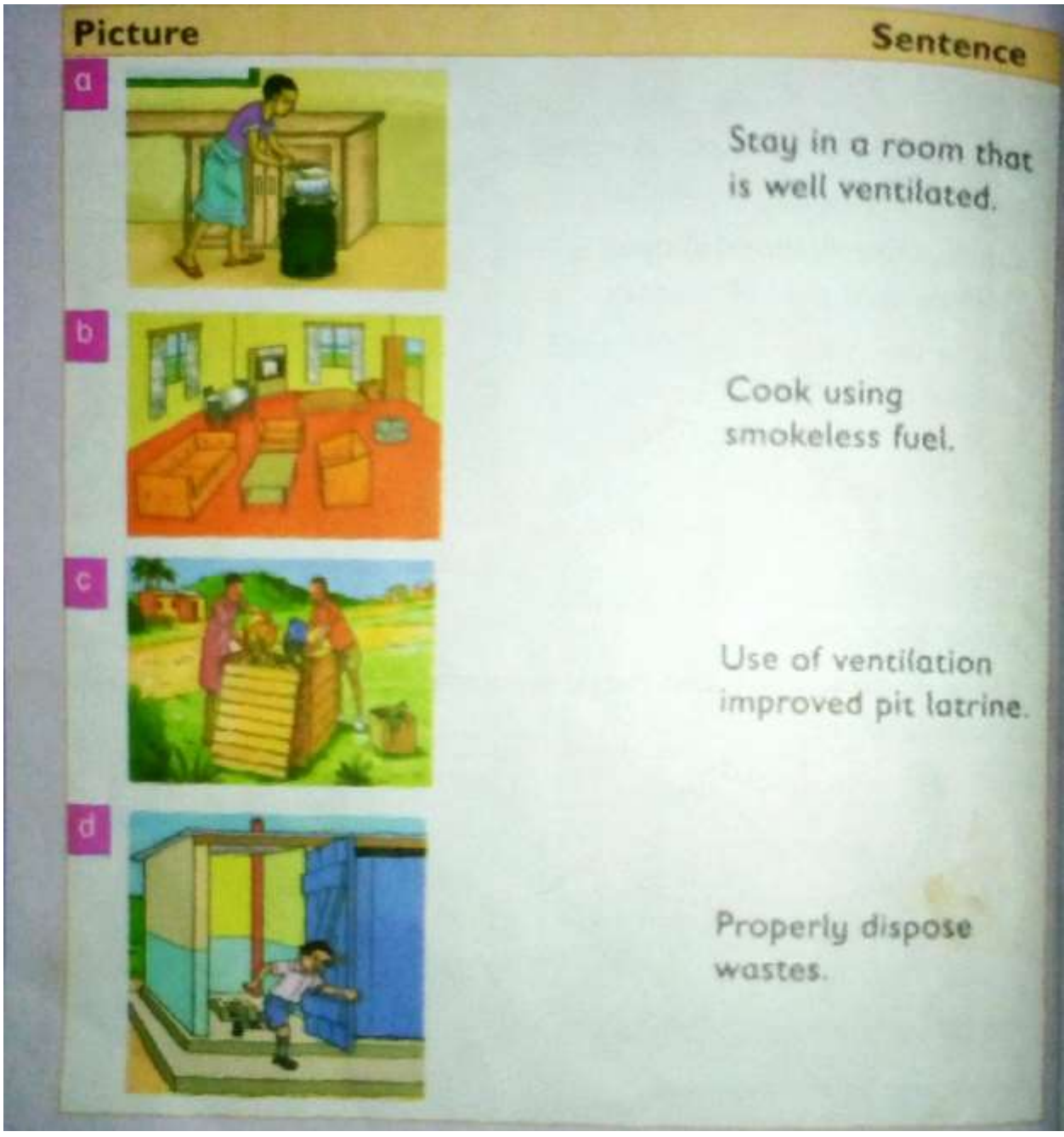
- Breathing problems
- Eye irrittation
- Poor growth of plants
- Poor visibility

Ways of reducing air pollution.

- Using ventilation improved pit latrines
- Sprinkling water on dusty grounds
- Properly disposing wastes
- Sprinkling Ash in pit latrines

Revision exercise 4

1. Write true or false in the sentences below.
    a) Smoke make us develop breathing problems_____
    b) Staying in a clean environment is healthy_____
    c) It is not bad to play near a smelling toilet
    d) Bad smell can cause stomach problems_____
    e) Air pollution affects growth of plants_____
2. Match the pictures with the correct sentence



Water pollution

Water pollution is making water dirty

Water pollutants in our environment.

Common water pollutants are;

Soil and wastes,these includes slaughter house wastes, domestic sewage, factory and industrial wastes,dead rotten plants and animals,among others.

Clean and polluted water

- Clean water is water that has no germs or water that is not open.
- Polluted water includes water in open pits and Ipools,ponds ,rivers,sewers and watering troughs among others.

Importance of clean water in the environment

- Clean water helps to reduce diseases such as cholera and typhoid which is brought about by dirty water.
- Clean water is safe for drinking.

Ways of reducing water pollution.

- Proper waste disposal can reduce water pollution.
- Using underground closed gutters to collect rain water helps to reduce water pollution

Revision exercise 5

1. Clean water helps animals to stay_____(healthy,sock)
2. _____polluted water does not make it safe for drinking (boiling,filtering)
3. I_____ plants with clean unpolluted water makes them grow well(washing, watering)
4. Write true or false
    a) Water can be polluted by litter
    b) Clean water is bad for use
    c) A water filter makes dirty water safe for drinking.
    d) Polluted water can make us sick.

Digital devices

A digital device is an equipment or tool that can process words,figures, sounds and images.

Examples of digital devices are; mobile phones,laptops,computers,radios, TV,cameras,and tablets.

Parts of a digital device

The parts of a digital device are:

Hardware--- the parts we see,touch and feel

Software---- programs that guide on what and when to do

Power button--- used to turn on or off a digital device

Monitor----displays what is going on

Processor----controls and processes programs

Keyboard---- used to type in to the computer

Mouse----moves on the screen to give instructions

Cables and wire connect the device to the hardware and power

Proper use of digital devices

- Ensure you charge regularly and give power to the device.
- Turn power off immediately after use.
- Use the digital devices for taking photographs,, recording videos and playing games.

Coding

Coding is a group of letters,words, symbols or patterns that are used to identify or group things.

Coded patterns

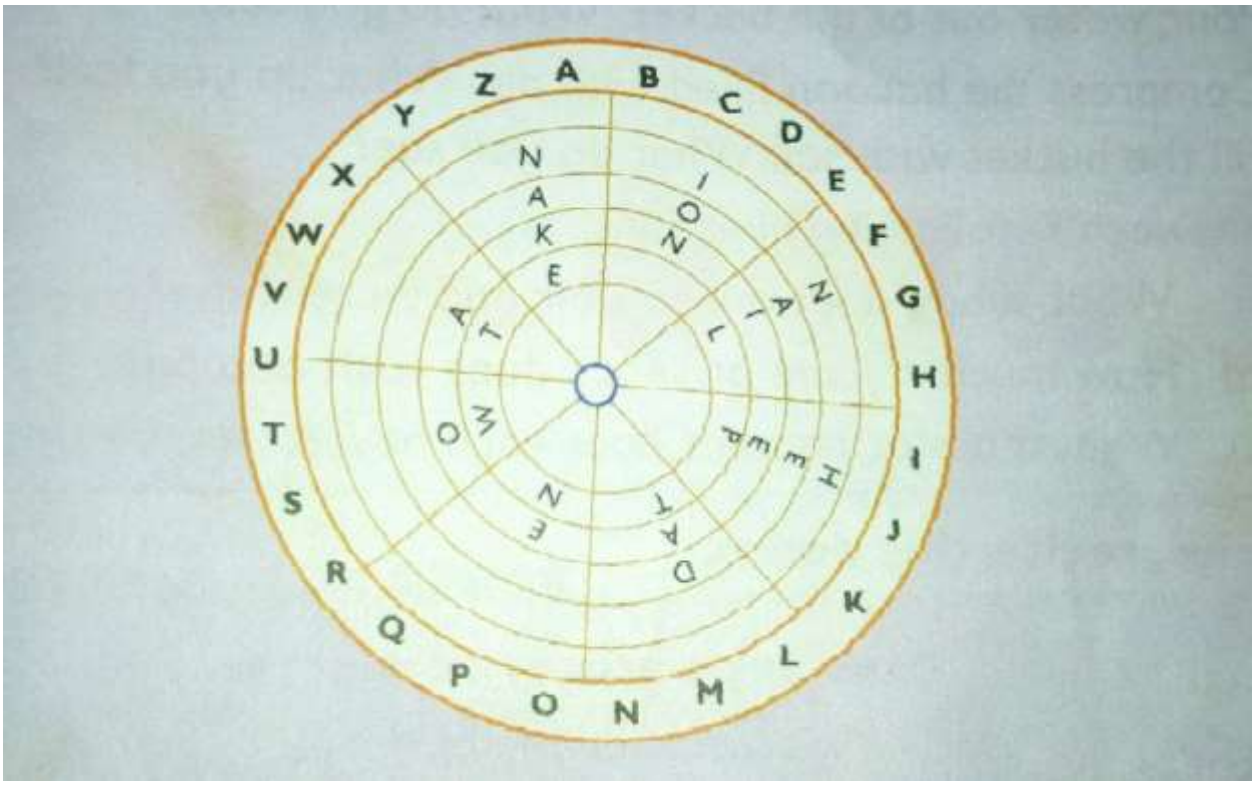
Common coded patterns in everyday life include traffic signs,icons on digital devices, arrangement of shapes in a football or tennis ball, arrangement of leaves, patterns of making neste,among others

Simple puzzle games

Simple puzzle games include sudokuin mathematics,word puzzles in English, joining date to make objects, assembling parts of an object to make a whole object and re- assembling dismantled parts to complete the whole.

Revision exercise 6

1. What is coding?
2. A) Make a word wheel as the one below



b)Turn the wheel to name some of the animals.

3. Find the value of A,B,C and D from the puzzle below.

B	A	10
A	C	12
B	D	22

States of matter

The three States of matter
The three States of matter are;

- Solids
- Liquids
- Gases

Characteristics of the three States of matter

Gases

- Things that appear empty have gas
- Gases have no fixed shape
- Gases have no fixed volume
- Gases occupy space and have weight

Liquids

- Liquids take the shape of the container they are put in.
- Liquids do not have a fixed shape
- Liquids flow
- Liquids have a fixed volume.

Solids.

- Solids cannot be compressed.
- Solids do not flow
- Solids have a fixed shape
- Solids have a fixed volume.

Revision exercise 7

1 In a _____shape does not change(solid, liquid,gas)
2 Shape of a ____ varies with that of the container (solid, liquid, gas)
3 Putting soil in a container is _____ (filling, emptying)
4 Pouring soil out from a container is _____ (filling, emptying)
5 One big bottle is filled by _____ small ones(one,many)
6 Many small containers fill _____big container (one,big)
7 Small balloons need _____ air to fill (little,a lot)
8 Large balloons need _____of air to fill in(little,a lot)
9 Different colors but same size balloons fill with_____ amount of air(equal, different)
10 Name the three states of matter and their characteristics
11 Write the safety precautions to take when working with different substances.

Properties of matter.

Properties of matter means different ways in which solids, liquids and gaseous behave.

Floating and sinking

Floating is when an object remains on the surface of water.

Sinking is when an object goes to the Bottom of the water surface.

Factors that affect floating and sinking include type of material and shape of the material.

Force

Force and it's effects

Force is a push or a pull that is applied on a body or object.

Effects of force on an object

- Force can cause change of direction of movement
- Force can change shape of an object
- Force can start and stop movement of an object.
- A force of push moves an object away
- A force of pull moves an object towards you.

Safety precautions when dealing with force

Protect your body when dealing with force by

- Wearing gloves to protect hands
- Wearing a headgear to protect the head
- Wearing leg guards to protect the legs

Sound Energy

Properties of sound

Sound travels in all directions

Sound reflection

Sound can be reflected. Reflected sound I called an echo

Sound producing instruments

Instruments that produce sound are;

- Shakers
- Guitar
- Whistles
- Drums

Making sound producing instruments from locally available materials.

You will need:

- Sticks
- Strings
- Spoon
- Bell
- Bottle tops
- Rubber bands
- Tins
- Bottle
- Small stones
- Boxes

Procedure

1. Identify a sound producing instrument you can make using locally available materials
2. Collect the materials and make your instruments
3. Test your instruments by hitting or plucking or blowing or shaking.
4. Write a song on sound.
5. Sing the song while playing your instrument
6. Bring four sound producing instruments to school.

Assessment.

1. Sound travels I _____directions(two,all)
2. We listen using our_____(ears, mouth)
3. Sound that reflects back is called an _____(echo, hello)
4. Name three places you can hear an echo
5. Draw and colour a sound producing instrument.

Light energy

Light travels in a straight line

Demonstrating that light travels in a straight line

You will need: table, piece of wood,glue,a pair of scissors, three cardboards, burning candle, ruler.

Procedure:

1. Cut out three square cardboards each should be 30 cm in length
2. Place the candle on the table.
3. Make a hole at the height of your candle light through the three cardboards.
4. Glue a piece of wood to each cardboard so that they are straight
5. Light the candle and place it on the opposite side.

6. Place cardboards on a straight line

7. Take photographs of your arranged activity.
8. Record your observations
9. Move one of the cardboards out of line.
10. Observe the candle and record your observations
11. Discuss your observations
12. Stick your photographs in your portfolio.

Observations

When cardboards are arranged in a straight line you will be able to see the little candle, when the cardboards are out of line you will not be able to see the little candle,this shows that light travels in a straight line.

Transmission of light through different materials

Demonstrating transmission of light through different materials.

You will need

Mirror, tissue paper, paper, candle flame.

Procedure:

1. Look at a burning candle through a white piece of paper.
2. Applying some oil fat on the white paper.
3. Look at the burning candle through the paper smeared with oil or fat.
4. Record your observations

   Observations

   A white piece of paper does not allow light to pass through.

   A paper smeared with oil allows some light to pass through.

Transparent, translucent and opaque materials.

Transparent materials
These materials allows light to pass through.
Clear glass and clear bottles are transparent

Translucent materials
Translucent materials allow some light to pass through.
Skylights, bathroom and ambulance windows are translucent.
Opaque materials
These materials do not allow light to pass through.
Walls, stones and wood are opaque materials.

Making a projector screen of still images.
Materials:
Wood glue, office pins or Staples. Four pieces of soft wood of the same thing size. White piece of clothing.

1. Lay out the four pieces of wood to make a frame.
2. Join the corners using wood glue.


Joining corners of the wooden frame using wood glue

3. Lay the white piece of clothing on a clean surface.
4. Place the frame on top of the cloth and centre it by pulling up the extra cloth material and over the edge.

5. Pin the cloth round the frame of wood. Keep the cloth tight and without wrinkles..

6. Place a hook on a wall and hang your projector screen.

7 Pin some photographs taken during your science lessons

Assessment exercise

1. _____ travels in a straight line
2. Describe how you will demo candle nstrate that light travels in a straight line.
3. _____ materials are the materials that allow all the light to pass through.
4. _____ materials are the materials that allow light to pass through
5. _____ materials are the materials that do not allow light to pass through.
6. Write four sentences on how transparent materials are used in your locality

Heat energy

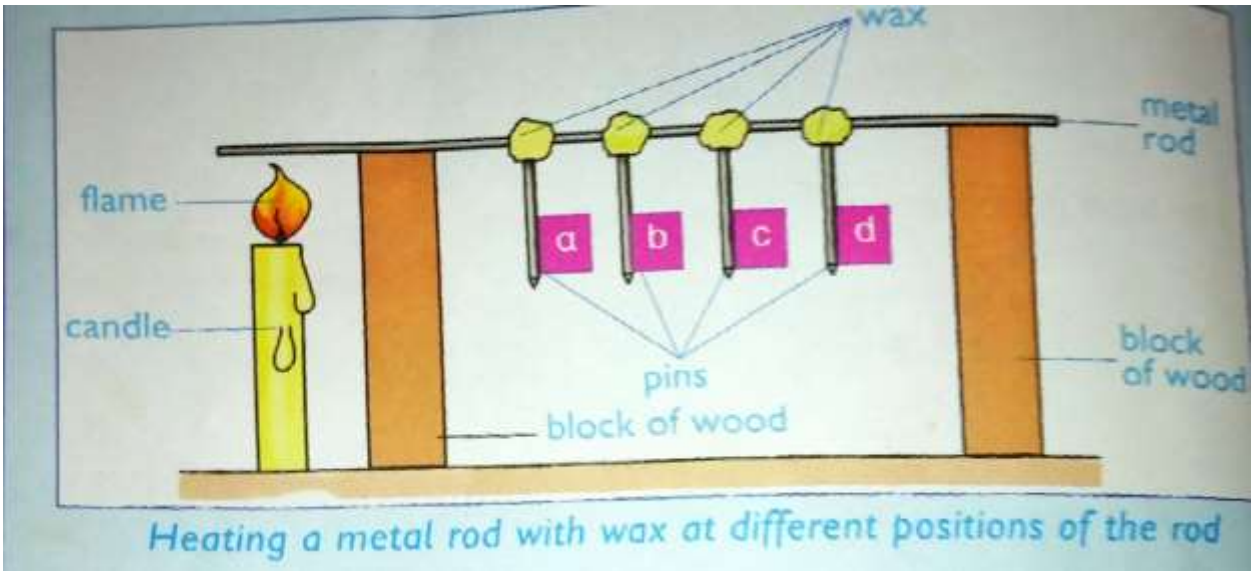
Conduction of heat

Demonstrating conduction of heat

Materials needed: a burning,wax,four pins,,two blocks of wood, metal rod.

Procedure:.

1 Arrange the materials provided as shown in the diagram below.



Heating a metal rod with wax at different positions of the rod

3. Heat the metal as shown above

Observation

- The wax will start melting then the pins will drop one after the other
- Pin (a) will drop first filled by (b) then (c) and lastly pin (d) will drop.
- The pins drop differently because of the movement of the heat.

Conduction is the transfer of heat through solids.

Poor and good conductors

Poor conductors are those materials that conduct heat the slowest

Good conductors are the materials that conducts heat fastest

Examples of materials that are good conductors are sufuria, metallic spoons, kettles, iron box

Examples of materials that are poor conductors are wood, plastic, cooking sticks,maize cob,rulers,piece of cloth,plastic cups,melamine,cooking pots.

Uses of poor and good conductors of heat.

- We use iron box to iron clothes because it is a good conductor

- We use sufuria to cook food at because it heats fast
- We use kettles to heat water fast

- Poor conductors are used to make sweaters, pullovers and jackets and also for making handles of cooking utensils such as kettle and sufurias.

Making oven gloves and fireless cooker from locally available materials.

Making gloves.

You will need:

An old tow, scissors, needle, thread, thimble,a piece of cloth.

Procedure

1. Place one palm on a piece of paper and draw loosely around it with a big circular like shape around the four fingers.
2. Cut the pattern out and transfer it on to an old towel. Cut out four shapes the same designs,two for the back and two for the front. Remember to leave about 1 inch when cutting for sewing space.
3. Transfer the same pattern to a piece of clothing. Cut out two of the exact same designs.
4. Place the piece of clothing between two pieces of towel cut outs, ensuring that they are of the right side. Pin them down and stitch diagonally to cover them together.
5. Repeat for the other side.
6. Stitch up the pats together with the insides out so that you may flip them right side out later.

Repeat the above steps for a pair of oven gloves

Project 11: making a Fairless cooker in class.

Materials needed:

Black cloth,a digital device, insulating materials like grass or tightly crushed newspaper or wood shavings or wool or dry banana leaves or saw dust.

Container with a lid like a cardboard box,a wooden box,a basket

Scissors, sewing needles and strong thread.

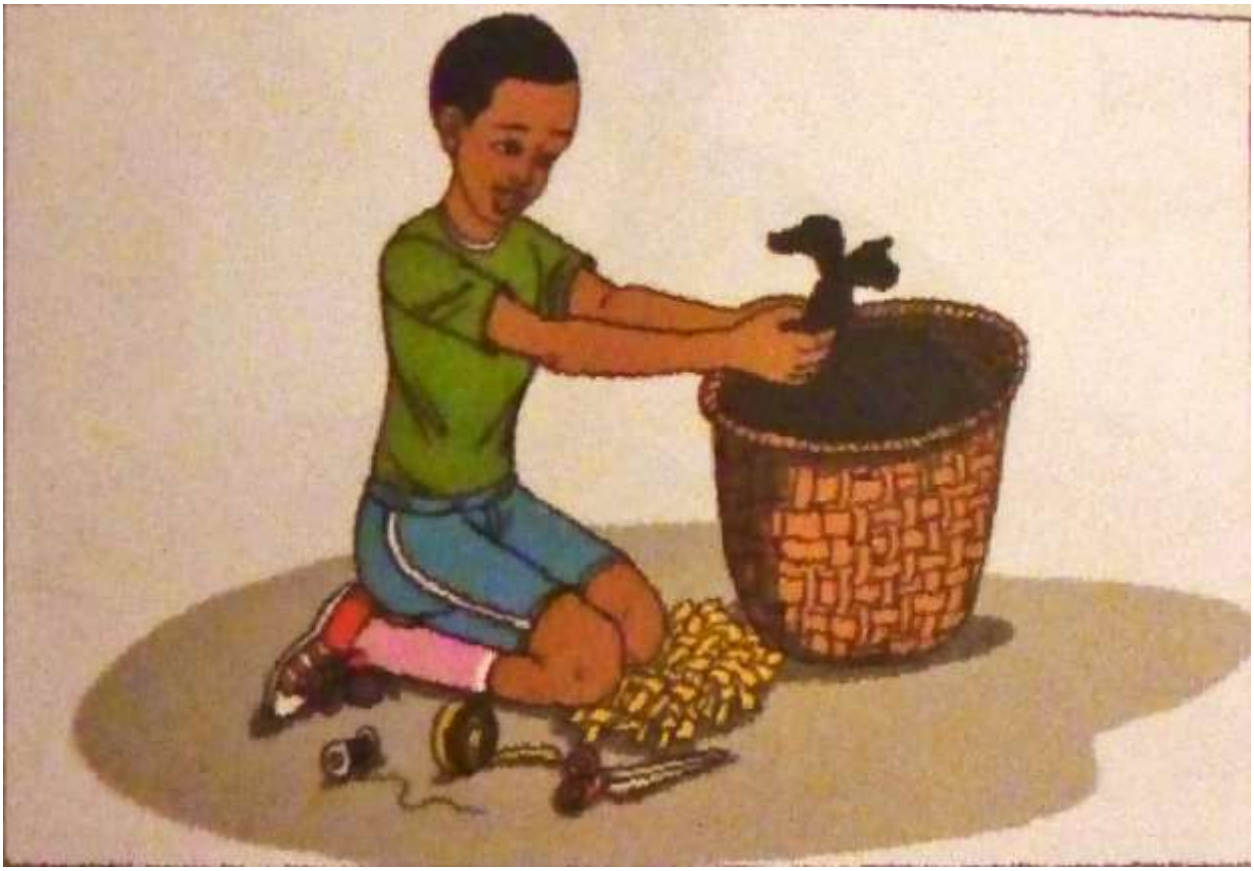
A flat stone with a rough base.

Procedure

1. Fill the basket a third full with the insulating materials

2. Place the largest sufuria available in the centre of a black cloth. Collect the corners of the cloth above the centre to make a bag.

3. Place the bag inside the basket,on top of the insulating material. Firmly pack more insulating material around the bag and up to the top of the basket.
4. Open out the bag and tuck the edges of the cloth down between the insulating material and the inside of the basket. Stitch the cloth to the top sides of the basket.
5. To insulate the lid, turn the lid upside down and fill it with an insulating material,then cover with a piece of cloth.
6. Stitch the edges of the cloth between the insulating material and the inside of the lid. Stitch the cloth all the way around, along the inside corner of the basket lid.



7. Stick your photographs in your portfolio
8. Place your fireless cooker in the science corner
9. Use your fireless cooker to keep your packed lunch warm

Assessment exercise 13

1. Name poor conductors of heat
2. Write the uses of good conductors of heat
3. Name the materials needed to investigate conduction of heat in solids
4. Name four good conductors of heat
5. Write the uses of good conductors of heat
6. State the use of fireless cooker in a kitchen.

Machines

Leavers

A lever is a simple machine that makes work easier.

Levers used in our community

Common levers include a beam balance, wheel barrow, hammer, scissors,see saw among others.

Parts of a lever

Parts of a lever are effort, fulcrum and load.

Levers that make work easier.

Examples of levers that make work easier in our community are spoons, wheel barrow,scales, weighing machines axes and many more.

Making a beam balance using the locally available materials.

You will need:

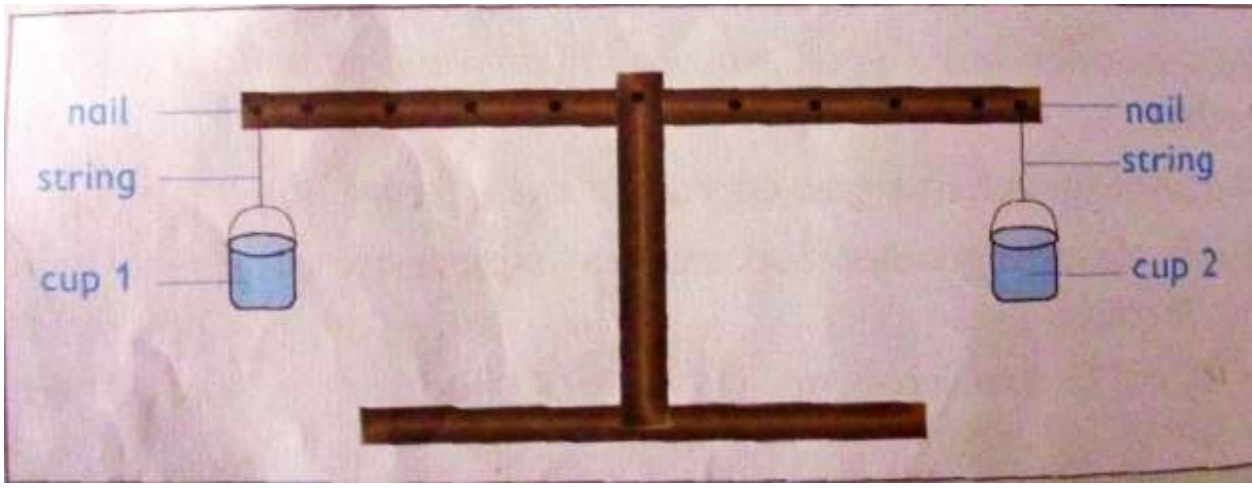
Ruler, hammer, bottle tops,wire or string, wooden stand, identical nails,two small plastic cups,a plunk of wood of 50 centimetres

Procedure

In groups

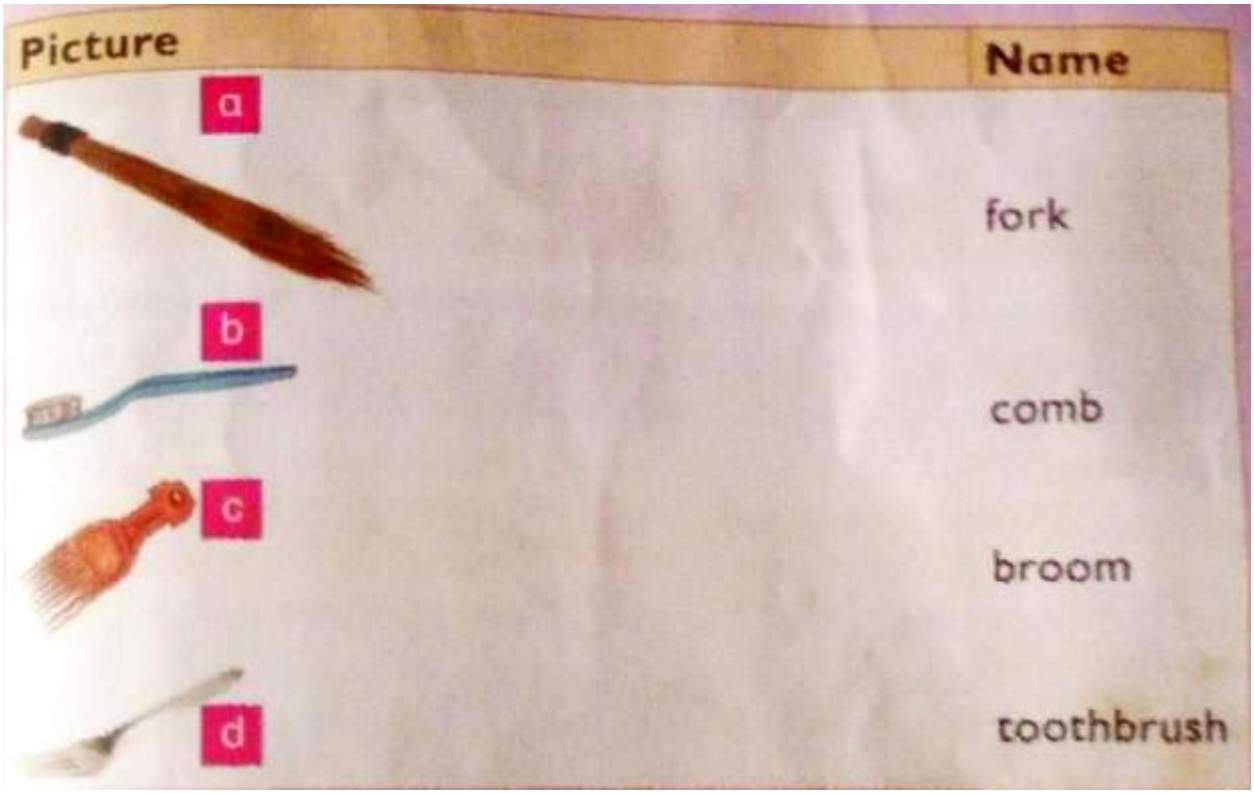
1. Search for the meaning of a beam balance from the dictionary or the internet.

2. Compare the meaning with the explanation below **A beam balance uses the idea of a lever to weigh and compare heaviness of things.**
3. Measure 25 centimeters to find the balancing point of the plank of wood
4. Make a hole through this point to form the pivot
5. Using a ruler make marks every one centimeters along the upper side of the plank of wood.
6. Hammer a nail on each of the marks leaving some nail where a string will hang
7. Hang two plastic cups at equal distance from the fulcrum using strings as shown below. Write your observations
8. Balance the cups using bottle tops. Write your observation.
9. Balance the cups at different positions and identify many bottles tops balance
10. Name an example of a beam balance in your locality. Draw and name parts of the beam balance



Assessment exercise 14

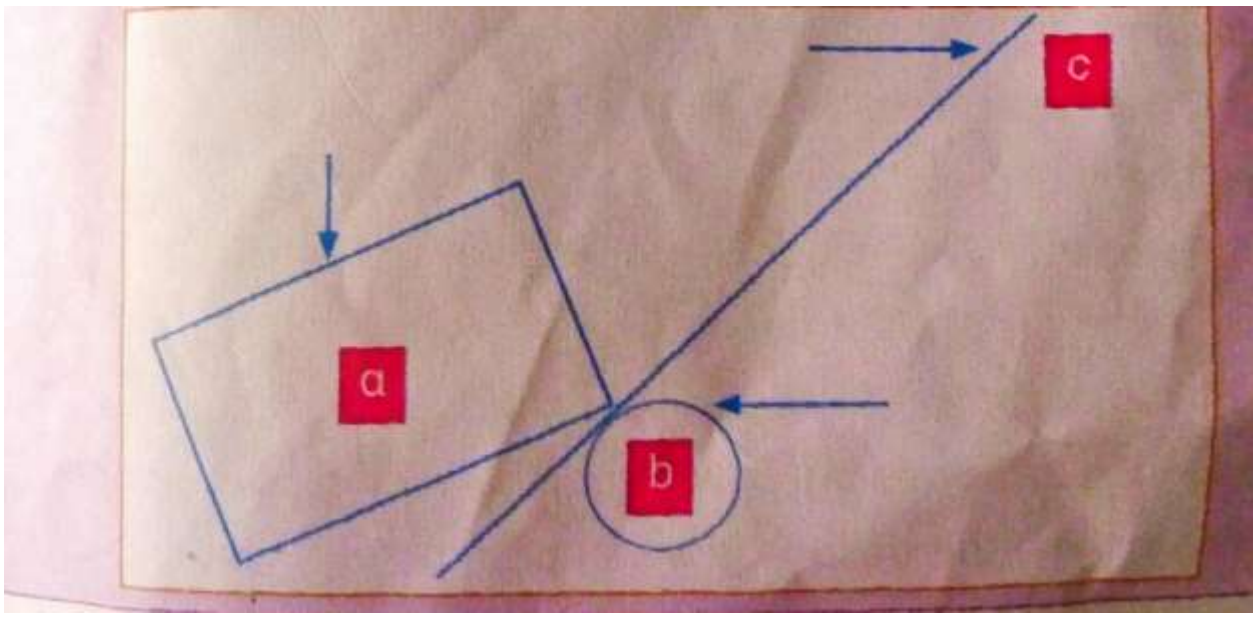
1. Match the pictures to the name



2. Write **true** or **false**
    a) Spoons and forks are levers
    b) A needle and a nail are levers
    c) A scissor is not a lever
    d) Simple tools that help us do work easier are called levers.

e) The part of the lever where you place your hand is the load
f) The part of the lever where the load is placed is the effort
g) Load and fulcrum are the same in any lever

4. Name the parts **a,b,**and **c** in the lever below

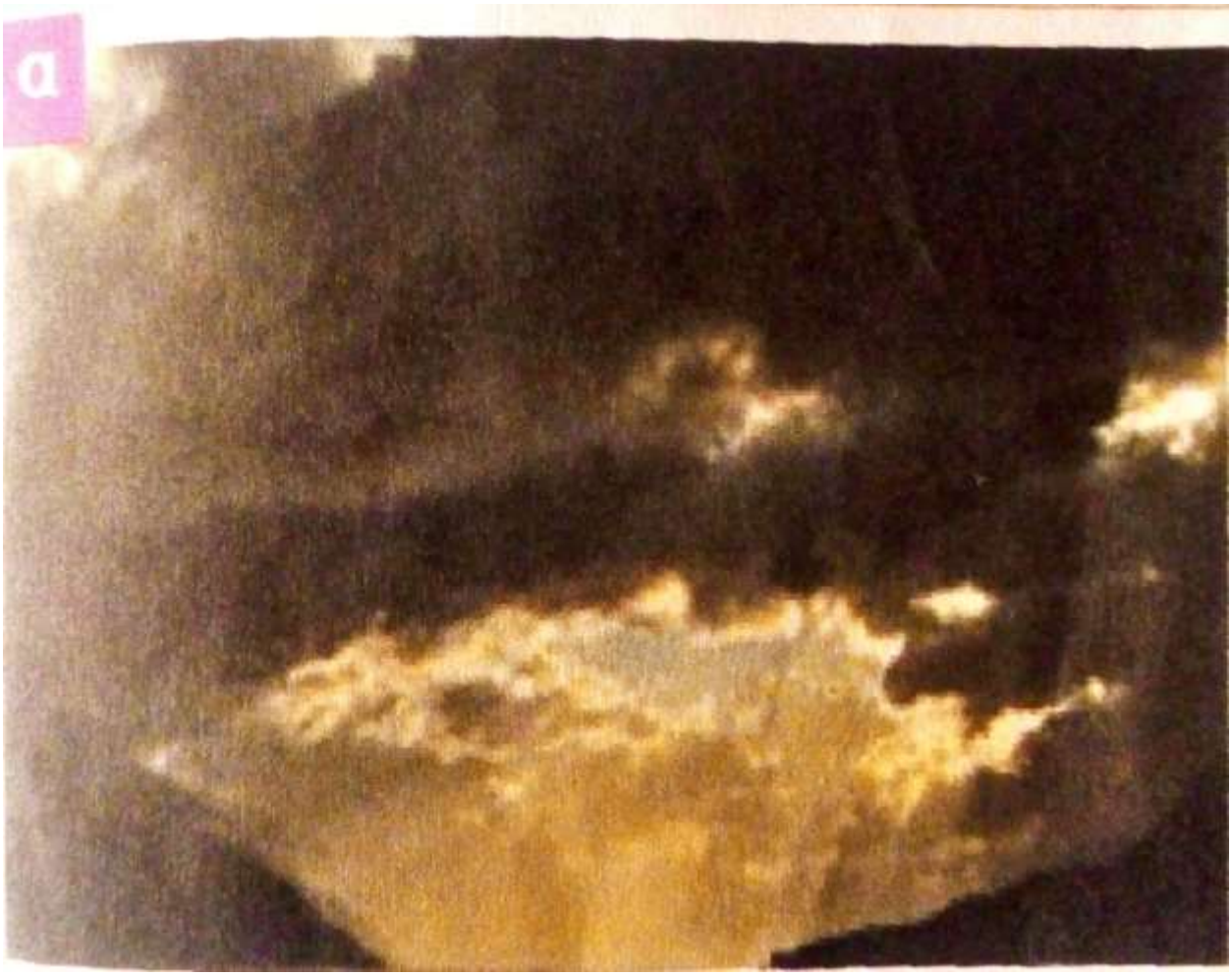


Weather and the sky
Weather conditions

Bodies in the sky during the day and night.
When you look at the sky during the day you will be able to see the sun , and when the sun is not there you will see the clouds.
At night we see the moon and stars in the sky.

Types of clouds in the sky during the day.
During the day we see different types of clouds in the sky.
Cloud are named in the latin language.
The different types of clouds are

a) **Nimbus clouds**



- They are dark grey in colour

- They cover the whole sky
- They are found low in the sky
- They look like mountains in the sky
- They are irregular in shape
- They bring heavy rainfall

b) Cirrus clouds

- They are thin with feathers like appearance
- They are found high in the sky
- They mostly appears during dry weather conditions

c) **Cumulus clouds**

They look like a bundle of cotton wool
They are found high in the sky
They are mostly seen in the sky during hot afternoon

d) **Stratus clouds**

- They appear in layers
- Some resemble animal features in the sky during hot afternoons.

Activities done during different weather conditions.

- Crops need rain to grow, we plant our crops during rainy seasons
- We require dry conditions so as to harvest crops

- Windy conditions make flying of kites and winnowing easier.
- We dry crops during the dry season
- We weed crops during rainy seasons

Importance of weather conditions in the locality.

- We plant our crops when it rains
- We wait for sunny conditions to harvest crops
- We play with kites on windy conditions
- Our clothes dry faster during windy and sunny conditions.

Making a weather clock

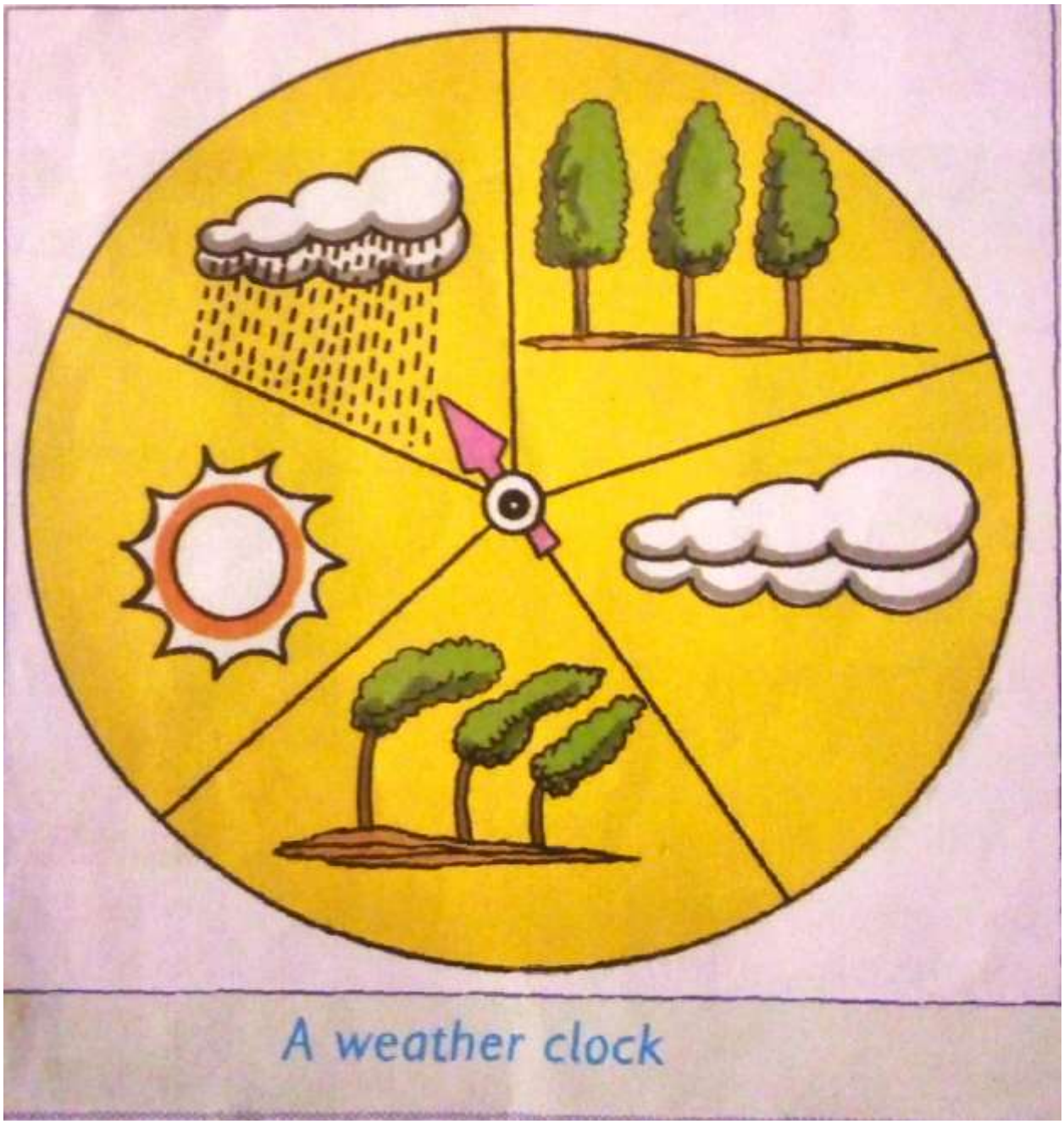
You will need:

A button, drinking straws or sticks, carton box or manila paper , scissors, needle and thread, crayons or coloured pencils or pictures of different weather conditions.

What to do

In paiirs

1. Draw a big circle on a manila paper
2. Cut out the circle using scissors.
3. Divide the circle into five sections.
4. Draw and colour the four different weather conditions on the quarters
5. Place the arrow at the centre of the circle
6. Stitch the arrow to the circle with a button over the arrow.
7. Display the clock and explain how it works.



Making a weather chart

You will need:
Scissors,coloured manilla papers, glue or porridge or wheat flour paste

What to do

In pairs

1 Draw weather symbols on a coloured manila paper.
2 Cut out the weather symbols to make weather cards.
3 On a different manila paper, write the days of the week and the time of the

day as shown above
4 Observe the weather in your locality for a week.
5 Stick the cut out weather cards according to the weather of that day as shown in the chart below
6 From your weather chart,
   a) Which days were rainy in the afternoon?
   b) How many days were windy in the evening?
   c) Which day was best for flying kites
   d) Wednesday was _____and _____

Assessment Exercise 15

1. List bodies observed in the sky during the day

2. Name the type of clouds described below
    a) Form a circle of white light around the moon or sun
    b) Dark grey in colour
    c) Have a flat bottom and are puffy white
3. Name the four types of clouds
4. List the activities done during the dry weather conditions in your locality
5. What are the importance of the different weather conditions in your locality?
6. What is a weather clock?
7. List the activities done during the wet weather conditions in your locality
8. Name the devices that are used to observe the sky.