SET III

Living Together in East Africa.

Major Resources of East Africa.

Meaning of resources/Examples.

A resource is a feature in the environment that man uses to satisfy their /his needs.

Types of natural resources.

Renewable resources.

Renewable resources are resources that can be replaced naturally once they are overexploited.

Non-renewable resources are resources that cannot be replace naturally once they are over-used or exhausted.

Examples of renewable resources.

- Plants
- Animals
- Water bodies
- Land
- Climate /rainfall/sunshine

Examples of non-renewable resources

- Minerals
- Fossils fuel i.e. coal, oil, natural, gas **Land**
- Land is the part of the earth that is not covered by water
- Land supports most resources in the environment.

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Importance of land

- Land provides space for building houses / settlement.
- Land is where crops are grown.
- Land provides space for burying the dead.
- Land provides space for grazing animals.
- Minerals are mined from land.

Problems facing land.

- Dumping of garbage and toxic materials on land.
- Over-cultivation
- Deforestation
- Land fragmentation
- Soil erosion

Possible solutions to some of the above problems.

- Garbage should be used for other purposes like generation of biogas.
- People should be encouraged to grow fodder crops for animals.
- People should be encouraged to use manure and fertilizer.
- Farmers should terrace their land to control soil erosion.
- Educate the people about the benefits of re-afforestation.

Note: There are things that people make to meet their needs and they are called human made resources.

Examples include;

- Electricity
- Mobile phones
- Vehicles
- Clothes
- Books
- Drugs
- Shoes
- Buildings
- Roads

Activity

1. What are natural resources?

   ……

2. Mention the two types of resources.

   (i) …… (ii) ……

3. State any two ways in which land is important to people.

   (i) …… (ii) ……

4. Give any two problems facing land in East Africa.

   (i) …… (ii) ……

5. State any two possible solutions to the above problems.

   (i) ……

   (ii) ……

6. State any two possible solutions to the above problems.

   (i) ……

   (ii) ……

7. Why is land called a natural resource?

   ……

8. Identify any two human made resources?

   (i) …… (ii) ……

Major Resources of East Africa.

Vegetation (Plants)

- Vegetation includes all plants that grow in an area.

Examples of plants.

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- Grass
- Flowers
- Trees (forests)
- Crops
- Swamps
- Shrubs

Forests

- A forest is a collection of trees growing together in an area. **Products obtained from forests include;**
- Timber
- Medicine e.g. quinine from mulberry trees.
- Tannin from wattle trees.
- Resin from pines for making varnish.
- Latex from rubber trees.
- Bark cloth from ficus trees
- Linen threads from flax trees.

Products obtained from latex.

- Balls
- Car tyres
- Erasers
- Gloves
- Elastic bands
- Tubes
- Shoe soles

<u>Importance of forests in E. Africa</u>.

- They help in the formation of rain.
- They attract tourists who bring in foreign exchange.
- They are habitats for wild animals.
- They purify air by absorbing carbondioxide and releasing oxygen.
- They are sources of timber.
- They are sources of herbal medicine.
- They conserve soil fertility.

- They are sources of wood fuel.
- They are sources of food e.g. fruits.
- They are used to maintain the natural beauty of the environment.
- They are used for scientific research.
- Mangrove forests provide water proof timber for making ships or boats. **Activity**

1. What is a forest?

   ……

   …

   ……..

2. .State any two products obtained from forests.

   (i) …… (ii) ……

3. How do forests help to modify the climate?

   ……

   …

   ……..

4. State any two ways in which forests are important to animals.

   (i) ……

   (ii) ……

5. In which one way do forests promote the health of people.

   ……

6. Give two ways in which man can help to conserve forests.

   (i) ……..

   (ii) ……

MAJOR RESOURCES IN East Africa.

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Types of Forests.

There are two major types of forests. These are :- Natural forests and planted forests.

Natural forest:- These are forests that grow on their own.

Examples of natural forests in Uganda.

- Mabira
- Budongo
- Bugoma
- Bwindi impenetrable forest
- Kibaale
- Kasyoha – Kitomi
- Marabigambo

Characteristics of natural forests.

- They have many tree species.
- They have hardwood timber
- They are evergreen.
- They are dense.

Tree species that grow in natural forests.

- Mahogany
- Green heart
- African Walnut
- Teak
- Ebony
- Rose wood

Note: Natural forests commonly produce hard wood timber.

Planted forests: These are forests which are grown by people.

Examples of planted forests.

- Lendu
- Itwara
- Mafuga
- Nabyeya
- Magamaga
- Bugamba

Tree species commonly found in planted forests.

- Pine
- Eucalyptus
- Cypress
- Spruce
- Fir

Problems facing forests.

- Deforestation
- Pests and disease
- Bush burning
- Drought

Ways of caring for forests.

- Creating forest reserves
- Encouraging people to protect forests.
- Educating people on the uses of trees to the environment.
- Planting more tree.
- Encouraging alternative sources of energy other than wood fuel.

Problems caused by forests to people.

- Vectors
- Wild animals.
- They hide bad people like rebels.
- They cause poor transport.

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- Trees break and kill people.

Bodies that conserve forests.

- National Forestry Authority (NFA)
- National Environment Management Authority (NEMA).

Ways in which NFA conserve forests.

- Providing tree seedlings.
- Arresting people who cut trees illegally.
- Educating people on the values of forests.

Activity:

1. What is meant by natural forests?
2. Give any two examples of natural forest in Uganda?
3. What is Bwindi impenetrable forest famous for?
4. Mention any two examples of natural forests.
5. Write NFA in full.
6. Give the meaning of the following terms.
   a) Afforestation
   b) Agro-forestry
   c) Deforestation
   d) Re-afforestation
7. How does lumbering affect forests?
8. Why does Karamoja have very few forest resources?
9. State two human activities that affect forest negatively.
10. Why do climbing animals mostly live in forest?

Living together in East Africa.

Major resources of East Africa.

Factors influencing the distribution of forests in East Africa.

Climate / rainfall.

(i) Nature of soils.

(ii) Human activities – some activities conserve forests while other activites destroy forests.

Ways in which people conserve forests.

- By planting trees.
- By protecting forests.
- By irrigating trees during drought.
- By reporting people who cut down trees.
- Aforestation - is the planting of trees in a new area.
- Re-afforestation is the growing of trees where they have been cut.
- Agro-forestry is the growing of trees alongside with other crops.

Ways in which people destroy forests.

- Deforestation
- Through road construction.
- Through bush burning
- Through settlement.
- Lumbering.

Deforestation – is the cutting down of trees on a large scale.

Lumbering is the felling of trees for timber.

Crops

- These are plants grown for food and income.

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- The growing of crops is called Arable farming.
- Cultivation is the growing of crops.
- Crops grown for selling are called cash crops.
- Cash crops are divided into two groups. These are traditional cash crop and nontraditional cash crops.

  These are crops which are originally grown for income.

Examples of traditional cash crops in East Africa.

- Coffee • Cloves • Cocoa
- Sisal • Tobacco • Rubber • Cotton • Tea • Pyrethrum
- **Note:** Coffee is the major export crop of Uganda.

Why people are encouraged to grow non-traditional cash crops.

- To increase family income.
- To increase food.
- To increase raw materials for industries.
- To promote food security.

Ways of increasing food security.

- Strong food in granaries.
- Irrigating /watering crops.
- Planting fast growing crops.
- Growing a variety of crops
- Growing drought resistant crops.

Activity:

1. Identify any one way in which people destroy forests.
2. State any four reasons why people destroy forests.
3. What are traditional cash crops?
4. Mention any two examples of non-traditional cash crop.
5. Why is coffee referred to as the main traditional cash crops?
6. How is crop growing important to people.

Non-traditional cash crops.

Examples of non-traditional cash crops and products from crops.

- Beans • Vanilla • Cassava
- Millet • Sweet potatoes • Irish potatoes
- Maize • Simsim
- Sorghum • Bananas

Products from crops.

Crops	**Product**	**Place where it is grown**
Cotton		
Sugar cane	Sugar	Kakira, Kinyara, Lugazi
Cloves	Spices	Zanzibar
Oil palm	Cooking oil	Kalangala
Pyrethrum	Insecticides	Kabale
Rubber	Shoes sole, tyres	Masindi
Cocoa	Sweets, beverages	Bundibugyo, Mukono
Sisal	Ropes, door-mats	Coastal areas
Tea	Tea leaves	Kyamuhunga, Kericho in Kenya

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Activity:

1. Why do farmers support Agro-based industries?
2. Name the major export crop of Uganda.
3. Why is the government of Uganda encouraging people to grow more food crops?
4. Mention any one product obtained from maize.
5. Which cash crop is grown in Kalangala district?
6. What is the difference between traditional and non-traditional cash crops?

Major economic resources of E. Africa.

Animals *There*

***are two types of animals*.**

- Domestic animals
- Wild animals **Domestic animals.**

These are animals which are kept at home.

Examples of domestic animals.

- Cows • Horse • Dogs
- Goats • Donkey • Cats
- Sheep • Camels
- Rabbit • Pigs

Uses of animals.

- They provide milk.
- They are a source of meat.
- They are sold for income.
- They are used to pay dowry.
- They are kept for protection e.g. dogs.
- They are kept for transport e.g. donkeys
- They give skins.
- Some people keep domestic animals for prestige.

Problems facing people while keeping domestic animals.

Shortage of land.

Parasites

Diseases

Shortage of water

Shortage of good quality pasture.

- Inadequate veterinary services.
- Theft.

Ranching.

- This is the rearing of animals for beef production.
- In East Africa, ranching is mainly done in Kenya.

Examples of ranch farms in Uganda.

- Kisozi ranch • Singo ranch
- Kabula ranch • Nshaara ranch in Nyabushozi.

Products obtained from a ranch farm.

- Beef
- Hides and skins
- Horn tips for making buttons and ornaments.
- Hooves for making glue.

Importance of ranches in East Africa.

- They are source of beef.
- They provide raw materials for industries.
- They provide jobs to people.
- They provide income.

Activity:

- How are domestic animals different from wild animals?

Apart from hunting, state any one way dogs are important to people.

Give any two reasons why people in East Africa rear animals in their homes.

What is ranching?

Name any two ranching schemes in Uganda.

Give any two ranching schemes in Uganda.

- Give any problem faced by ranch farmers in East Africa.
- Point out two values of ranching to the economy of a country.

Dairy Farming.

Dairy farming is the rearing of animals for milk production.

Examples of milk products include;

- Yoghurt • Ghee • Ice cream
- Cheese • Butter

Requirements to set up a dairy farm.

- Land • Source of water • Market
- Capital • Labour • Veterinary service

Examples of dairy cattle.

- Friesian cows
- Jersey cows

Examples of milk processing plants include;

- Jesa farm dairy • GBK
- Dairy corporation of Uganda. • Pearl Dairies
- Western highland creameries • Paramount Dairies

Advantages of dairy farming.

Provide raw materials for industries.

Creates employment opportunities to people.

Provides dairy products like ice cream Milk

and its products are source of income

Source of government revenue.

Disadvantages of dairy farming.

- Requires a lot of capital.
- Expensive to maintain animals.
- Requires a lot of skills.

Problems facing dairy farmers.

- Diseases
- Drought
- Bush burning
- Shortage of capital
- Shortage of market for some products.

Mixed Farming.

Solutions to problems facing dairy farmers.

- Spraying the animals.
- Vaccinating animals.
- Acquiring loans.
- Planting fodder crops.
- Digging dams.

- This is the rearing of animals and growing of crops on the same piece of land.

Advantages of mixed farming.

- The farmers get much income.
- Animal wastes are used as manure for the crops in the garden.
- Some crops can be used as animal feeds.
- The farmer makes much food.

Disadvantages of mixed farming.

- It requires a lot of labour.
- It is expensive to manage.
- It needs a large piece of land.

Activity:

!. What is dairy farming?

2. In which way is dairy farming different from mixed farming?

3. Mention any two products that can be obtained from a dairy farm.

4. How are veterinary doctors important to dairy farmers?

5. Why should a milk processing industry be opened in Mbarara?

6. Why is dairy farming difficult in Karamoja sub region?

Wild animals.

Wild animals are animals which live in the bush.

- Wild animals are of a great value to the economic development of a country.

Uses of wild animals.

- They are source of meat.
- They provide skins.
- They attract tourist.

Places which protect wild animals.

- Game parks
- Marine parks
- Sanctuaries
- Game reserves.
- Zoos

Game parks in East Africa.

- A game park is an area set aside to protect will animals.
- Game parks are under the Ministry of Tourism, Wildlife and Antiquiteis.
- Game parks are established to protect wild animals from extinction.
- Hunting and grazing of domestic animals in game parks is not allowed.

Poaching is the illegal hunting of wild animals in game parks.

Reasons why people carry out poaching.

- To get meat (food).
- To get ivory.
- To get rhino horn tips.
- To get hides and skins.
- To get income after selling the animals products.

Danger of poaching to the tourism industry.

- It leads to extinction of some animal species in game parks. OR: It reduces the number of animals in game parks.

Major parks in East Africa.

1. Tsavo National Game park. It is found in South Eastern Kenya and is famous for

lions.

2. Serengeti National Game park

   It is found in South Eastern Northern Tanzania. It is famous for wild beasts.

3. Lake Nakuru Game Park.

   It is found in Kenya. It is famous for flamingo birds.

4. Ruaha National Game Park.

- It is the largest in East Africa.
- It is famous for huge elephants.

5. Akagera National Park.

- It is found in Rwanda.
- It is named after R. Kagera.
- It has Lake Ihema.
- It is famous for lions and black rhinos.

6. Nyungwe Forest National Park.

- It is found in Rwanda.
- It is found at the border of Rwanda and Burundi.
- It conserves bamboo, grasslands, swamps and rain forests.
- It has Mount Bigugu.
- It has monkeys, chimpanzees and baboons.

7. Kibira National Park.

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- It is found in Burundi.
- It is famous for conservation of forest birds.

Activity:

1. State any one danger of wild animals to people.
2. What is a game parks?
3. Give the meaning of the term 'poaching'.
4. How is poaching dangerous to the tourism industry.
5. State any two reasons why people practice poaching in game parks.
6. Name the largest game park in East Africa.

Other Game parks in East Africa.

- Sibilo national park, Mt. Kenya N. park
- Meru National Park

Uganda

- Mt. Rwenzori National park
- Mt. Elgon National park
- Kibale National Park

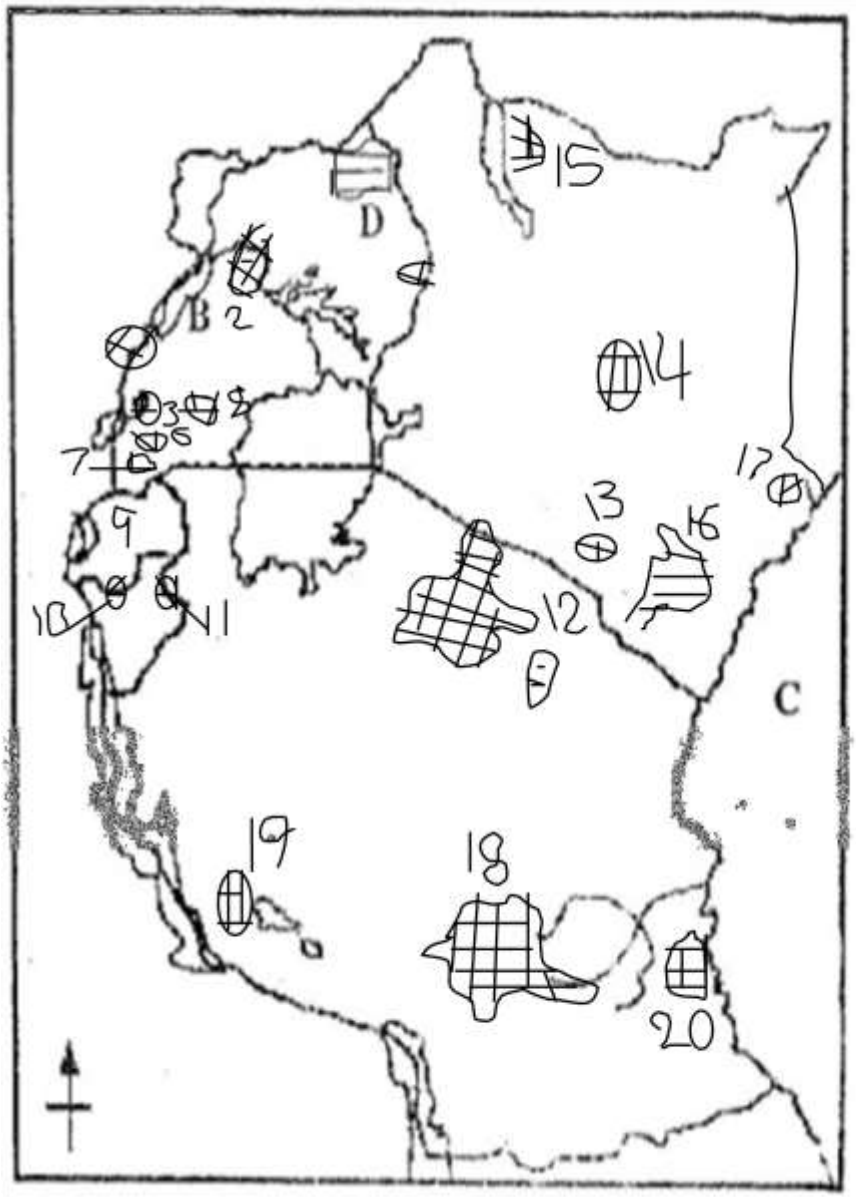
Rwanda

- Rusizi volcano national park **Burundi**
- Ruvubu volcano national park

- Semliki National Park **Tanzania**
- Tarangire National Park
- Katavi National Park
- Mikumi National Park
- Mahare Mountian National Park

A map of East Africa showing game parks.

Key



National Parks

1. Kidepo
2. Murchison falls N.P
3. Queen Elizabeth
4. Mt. Rwenzori NP
5. Mt. Elgon NP
6. Bwindi NP
7. Mgahinga NP
8. L. Mburo NP
9. Nyungwe NP
10. Kibira NP
11. Ruvubu NP
12. Serengeti NP
13. Amboseli NP
14. Aberdare NP
15. Sibiloi NP
16. Tasva NP
17. Lamu NP
18. Ruaha NP
19. Katavi NP
20. L. Nakuru NP.

ACTIVITY:

1. State any one danger of wild animals to people.
2. What is a game park?
3. Give the meaning of the term poaching.
4. How is poaching dangerous to the tourism industry?

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5. What is Kidepo Valley National game park famous for?
6. Name the largest game park in Uganda.
7. Which ministry is responsible for wild life conservation?
8. Why does the government protect wild animals in game parks?

Importance of game parks.

- They attract tourists who bring in foreign income to a country.
- They create employment opportunities to people eg game wardens, game rangers, etc.
- They help to protect the natural environment.
- They protect and preserve wildlife for future generations.
- They lead to development of infrastructure eg roads.
- They help to diversify the economy of a country.
- They promote education and research.

Problems faced by game parks (wildlife)

- Diseases
- Prolonged drought
- Wild bush fire
- Wars / insecurity.
- Encroachment.

Ways in which poaching is dangerous to game parks.

- Poaching reduces the number of animal species in game parks.
- Poaching leads to the extinction of some wild animals leads animals in game parks.

Possible solution for the above problems.

- Employing many game rangers.
- Setting and enforcing laws against poaching.
- Providing and improving veterinary services in game parks and game reserves.
- Discourage farming activities in game parks and game reserves.
- Firefighting equipment should be provided in game parks.
- The government should provide security.

Activity:

1. State any two economic importance of game parks.
2. Mention any two problems faced by game parks.
3. Name one game park in Kenya famous for lions.
4. How will the construction of valley dams help.
5. How does prolonged drought affect game parks?
6. Give any one effect of wild bush fires to animals in game parks.
7. State any one important of game parks to school children.

Tourism

Tourism is the act of travelling for pleasure and study purposes.

Examples of tourist attractions in East Africa.

- Mountains • Rivers • Historical sites
- Lakes • Climate
- Culture
- Rift valleys • Game parks

Importance of tourism industry.

- It creates employment opportunities to people.
- It creates market for local goods eg art and crafts.

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- It is a source of foreign exchange.
- It promotes development of infrastructure.
- It helps to preserve cultural sites.
- It promotes international co-operation.

Way tourism is referred to as an invisible trade?

- It doesn't involve physical exchange of goods but income is earned.

Examples of invisible exports of Uganda.

- Tourism
- Education
- Electricity
- Technology
- Labour

Problems facing tourism in East Africa.

- Poor transport network in some areas.
- Poor accommodation facilities.
- Lack of advertisement of tourist attractions on international media.
- Political instabilities.

Possible solutions to the above problems.

- By constructing modern roads, railways and airports.
- By providing and improving accommodation facilities.
- By maintaining political stability.
- The governments should advertise the tourist attractions on international media.

Activity:

1. Which ministry in Uganda is responsible for promoting the tourism industry?
2. Why do most tourists like visiting high mountains in East Africa?

3. Give the meaning of the term tourism.
4. State any two values of tourism towards economic development of Uganda.
5. Who is a tourist?
6. In which way does vegetation promote development of the tourism industry?

Living together in East Africa.

Major resources in East Africa.

Climate

Climate is the average weather condition recorded for a long period of time.

- Weather is the state of the atmosphere at a given place and time.

  Elements / aspects of climate.

  - Rainfall
  - Clouds
  - Temperature
  - Atmospheric pressure
  - Sunshine
  - humidity

Types of Weather.

- Cloudy
- Sunny
- Windy
- Rainy
- Humid
- Foggy

Examples of climatic zones.

- Equatorial climate
- Montane climate
- Tropical climate
- Semi-desert climate **Importance of rainfall.**
- It provides water for home use.
- It helps plants to grow.

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- It helps to cool temperature.

Dangers of rainfall •

Rainfall causes landslides.

- Rain fall leads to floods.

Uses of sunshine.

- It helps farmers to dry their harvests.
- It dries clothes.
- It provides solar energy.

Dangers of sunshine.

- Sunshine dries grass for animals.
- Sunshine dries water bodies.

Factors that affect climate.

- Deforestation.
- Bush burning
- Over grazing
- Encroachment on forests and swamps.

Ways of improving climate.

- Planting trees.
- Protecting forests and vegetation.

Activity

1. What does the term climate mean?
2. Write any two uses of rainfall to people.

3. How do animals depend on rainfall?
4. Outline four climatic zones in East Africa.
5. Give two aspects of climate that determines human activities.
6. How do nimbus clouds support the environment.
7. Give one way people improve climate in an area.

Living Together in East Africa.

The major Resources of East Africa.

Minerals of East Africa.

Minerals are valuable substances found in the earth crust. Minerals are found in underlying rocks in the earth's surface.

Mining is the extraction of minerals from the earth's surface.

Types of minerals.

- Metallic minerals • Non-metallic minerals.

Examples of metallic minerals.

- Copper • Gold • Tin
- Sliver • Iron

Examples of non-metallic

- Soda ash • Uranium
- Asbestos • Limestone

Products obtained from some of the minerals.

Minerals	Place where it is mined	Product

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Diamond	Mwadui in Shinyango	Jewellery
Copper	Kilembe (Kasese)	Cookers, electric cables, wires, coins, bracelets, gun bullets
Coal	Rukwa-Tanzani	Fuel
Crude oil	Lake Albert, L. Turkana	Petrol, oil paraffin, plastics, diesel
Phosphates	Tororo and Lake Magadi	Glasses, animal and human salt
Crypsum, limestone	Tororo, Hima	Cement, lime
Iron ore	Kabale	Making of fire proof iron sheets, insulators

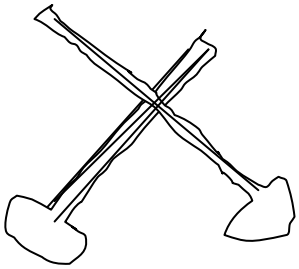
Methods of mining.

- Open cast mining
- Quarrying
- Deep shaft method
- Drilling method

Importance of quarrying.

- It provides building materials like sand and stones.
- It creates employment opportunities to people.
- It is a source of income.

A map symbol for a quarry.



Alluvial mining.

- Alluvial mining is the process of digging through mud and sand to get minerals.

- Sometimes hands are used to get minerals.
- This method is done on a small scale.
- Tools like hoes, shovel, basins and sieves are used.

Importance of mining to the economy of East African countries.

- It provides raw materials to some industries.
- It leads to urbanization.
- It provides government revenue by taxing mining companies.
- It creates employment opportunities.
- It leads to development of infrastructure.
- It earns foreign exchange through exporting minerals.

Activity

!. What is mining?

2. State one way limestone is important to people.

3. Why are phosphates valuable to farmers?

4. Draw a map symbol of a quarry.

5. Name any two examples of non-metallic minerals.

6. How is a quarry important builders?

7. Write any two products of limestone.

Problems faced by the mining industry in East Africa.

- Collapsing of mines which leads to death of people.
- Poor transport in area where some minerals are found.

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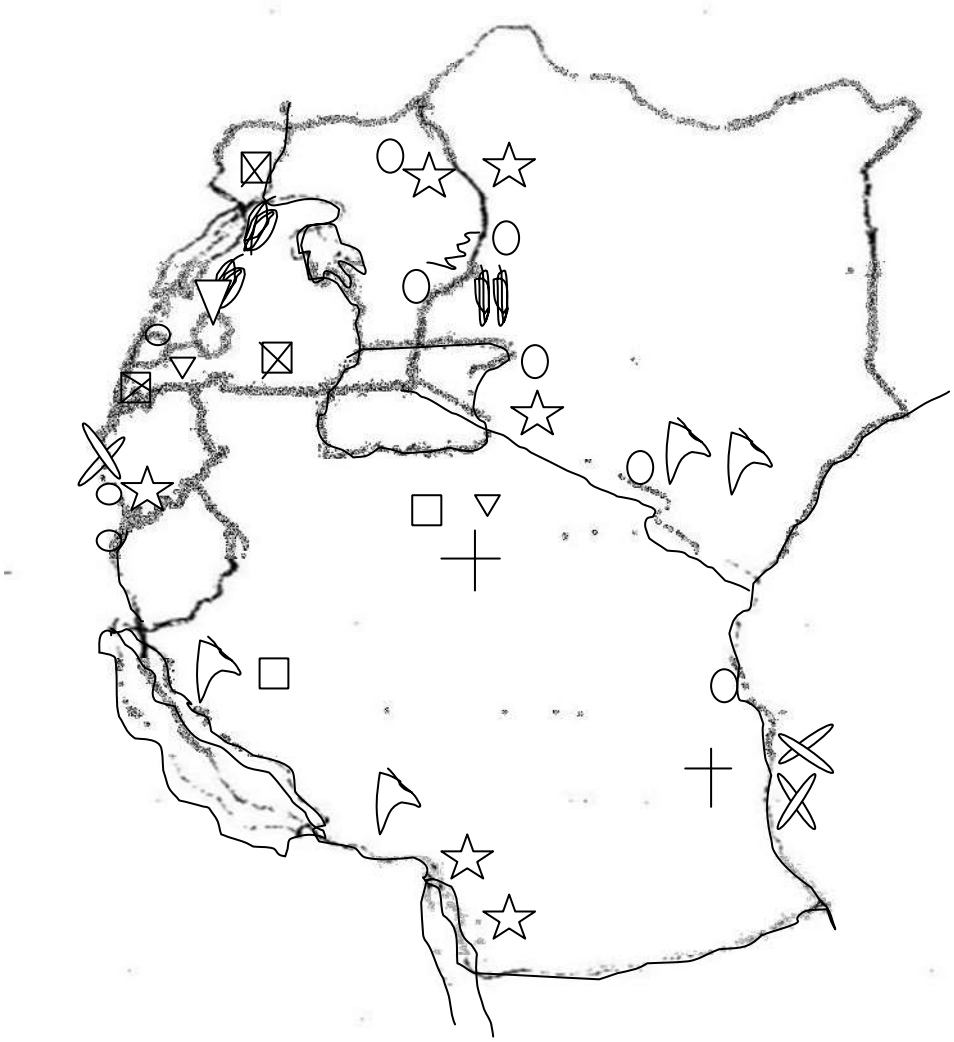
- Low technology.
- Shortage of skilled labour.
- Shortage of capital to invest in the mining sector.

<u>The map of East Africa showing location of minerals</u>.



<u>Key</u>

Gold

Diamond

limestone

gypsum

gas

mica

copper

tin

oil deposits

iron and steel

phosphates

Problems caused by mining.

- It leads to death of people when mines collapse.

- It causes landslides which lead to death and displacement of people.
- It leads to deforestation.

  In case the minerals are found in forested areas, people have to cut down forests.
- It leads to land degradation.
- Abandoned mines are hiding places for dangerous animals and rebels.

Solutions to the above problems.

- People should plant trees to replace the ones cut.
- The abandoned mines should be filled with soil.
- Mining should be done by export (people with special skills).
- It should be well constructed in order to prevent landslides.
- Miners should be provided with mining equipment e.g. headlamps.

Factors considered before mining a mineral.

- Quantity of the mineral.
- Market for the mineral.
- Cost of extracting the mineral.
- Availability of skilled labour.

Activity:

1.Which method of mining is used to mine crude oil?

2. Why has the extraction of crude oil around the shores of lake Albert delayed?
3. Name any two products obtained from crude oil.
4. How does mining affect soil in an area?

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5. IN which way were the people around the shores of lake Albert affected by the oil drilling project?
6. Give any two ways in which the government of East Africa can develop the mining industry.

Human resources (People).

These are people who provide labour to exploit other resources.

Types of labour.

- Skilled labour
- Unskilled labour

This is provided by trained people.

- **Examples of skilled labour** include;
  Engineers, teachers, doctors, plumbers, technicians, drivers etc Unskilled labour
- This is labour provided by untrained people. Examples include porters.

Importance of human resources.

- They invest money.
- They grow crops.
- They build houses.
- They treat the sick. • They teach people.

Problems facing people.

- Diseases
- Hunger
- Lack of money

- Unemployment
- Accidents

Ways of caring for people.

Treating of people.

- Giving guidance and counseling
- Giving people food.

Water resources.

- Drainage is the ground water system of an area. Drainage features in East Africa include;
- Lakes • Rivers
- Oceans • Springs
- Streams • Hot springs

Lakes

- A lake is a large area of water that is surrounded by land.

Types of lakes.

- Depression lakes
- Rift valley
- Lava dammed lakes
- Ox-bow lakes
- Human-made lakes
- Crater lakes

Examples of lakes in East Africa.

- Lake Tanganyika
- Lake Magadi
- Lake Malawi
- Lake Turkana

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Activity

1. Mention any two types of lakes in East Africa.
2. How was the formation of lake Tanganyika different from that of Lake Victoria?
3. How is Lake Tanganyika important to the people of Tanzania?
4. Name the deepest Lake in East Africa.
5. Name the lake famous for soda ash in Kenya.

Rift Valley lakes.

- These are lakes formed by the process of faulting.
- They are formed by the process of faulting.
- They are found in the rift valley. They are also called faulted lakes.

Characteristics of rift valley lakes.

- They have salty rocks underneath.
- They are deep.
- They are long and narrow.

Lakes found in the western rift valley.

- L. Albert
- L. Rukwa
- L. Tanganyika
- L. Edward

Lakes in the Eastern rift valley.

- Lake Manyara
- Lake Natron
- Lake Baringo
- Lake Eyasi
- Lake Naivasha
- Lake Bogoria

Crater lakes

- A crater is a depression that is found at the top of a mountain after volcanic eruption.
- A crater lake is a lake which is formed on tip of a dead volcanic.

- When the crater is later filled with water it is called crater lake. **Examples of crater lakes in Uganda.**
- Lake Katwe • L. Nyamunuka

  L. Nyakasura • L. Muhavura

Lava dammed lakes

- They are formed when lava flows and blocks the valley of the existing river.
- The blocked water forms a lake.
- Such lakes are called lava dammed (blocked) lakes. **Examples of lava dammed lakes include;**
- Lake Bunyonyi • Lake Bulela
- Lake Mutanda

Activity

1. Why is lake Nakuru economically important to the government of Kenya?
2. What is a crater lake?
3. State the difference between rift valley lakes and basin lakes.
4. What was the former name for Lake Turkana?
5. Give two examples of crater lakes in Uganda.
6. Which mineral is mined from Lake Magadi?

Human made lakes.

- Human made lakes are formed when man blocks or dams up a river.
- They are also formed as a result of digging a valley dam in a swamp.
- When a valley dam enlarges it becomes a lake.
- These lakes are also called reservoirs.

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Examples of human made lakes in East Africa.

- Kabaka's lake in Uganda.
- Kindaruma lake on River Tana in Kenya.
- Nyumba ya mungu on River Pangani in Tanzania.
- Lake Masinga is the largest human made in East Africa.

Ox-bow lakes

- These are lakes formed as a result of river meandering.
- They are commonly formed along the lower stage of the river.
- The bend (meander) of a river is separated from the main river.
- The section that is separated from the main river then becomes a lake.
- Such a lake is called an Ox-bow lake.

Importance of lakes.

- They attract tourists who bring in foreign exchange.
- They help in the formation of rain.
- They are used for water transport.
- They provide water for domestic use.
- They provide water for industrial use.
- They are used as fishing grounds. • They provide water for irrigation.
- The areas around lakes have fertile soils which favour crop growing.
- They are used as recreational grounds eg swimming.
- They are sources of building materials like sand.
- Some lakes provide minerals e.g. salt, crude oil.

Activity

1. What is a human made lake?
2. Give any two examples of people made lakes in East Africa.
3. How are Ox-bow lakes formed?
4. In which stage of the river are Ox-bow lakes commonly formed?
5. State any four ways in which lakes are of great value to man.
6. How do lakes help to modify the climate of an area?

Dangers of lakes to people who live near them.

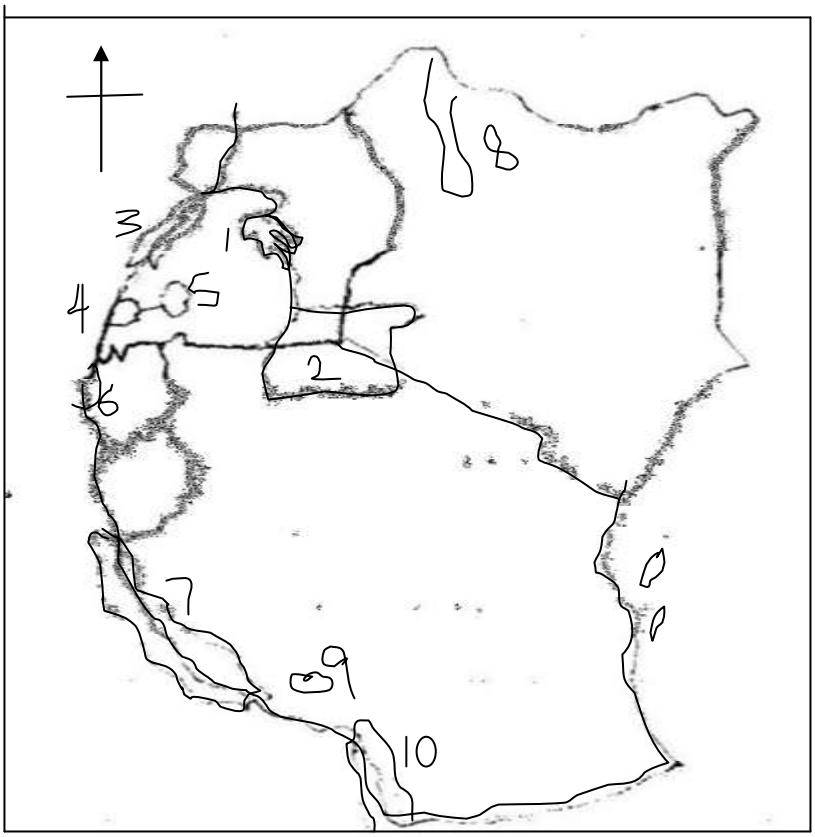
- They lead to death of people due to drowning.
- Flooding of lakes which leads to displacement of people and destruction of property.
- They encourage the breeding of disease vectors.
- They harbour dangerous wild animals which kill people.

Problems faced by lakes.

- Dumping of toxic waste materials.
- Over fishing
- Over use of water from lakes.
- Drought which reduces the water level.
- Presence of water hyacinth on some lakes .

Note: Silting is the deposition of sand or mud into water bodies.

<u>A map showing East Africa showing major lakes</u>.



Key

1. L. Kyoga
2. L. Victoria
3. L. Albert
4. L. George
5. L. Edward
6. L. Kivu
7. L. Tanganyika
8. L. Turkana
9. L. Rukwa
10. L. Malaci

Activity:

1. Name the largest fresh water lake in East Africa.
2. How do industries benefit from the lakes near them?
3. State any two problems facing lakes in East Africa.
4. Give any two reasons why it is not advisable to settle near water bodies.
5. What causes silting in lakes?

Major resources in East Africa.

Major rivers in East Africa.

There are two types of rivers in East Africa. These are:

i. Seasonal rivers ii.

Permanent rivers

Seasonal rivers are the rivers which flow during a wet season and dry up during a dry season eg.

- T. Turkwel, R. Laghbor, R. Lagh Bagal in Kenya, R. Agago and R. Mpanga, R. Dopeth, R. Narus in Uganda.

Permanent rivers

- Permanent rivers are the rivers which flow throughout the year.

Examples of permanent rivers in East Africa.

- R. Katonga, Nile, Kafu, Nkusi, Sezibwa in Uganda.
- R. Rifigi, Pangani, Ruvuma in Tanzania - R. Tana and Galana in Kenya.

Map showing main rivers in East Africa.

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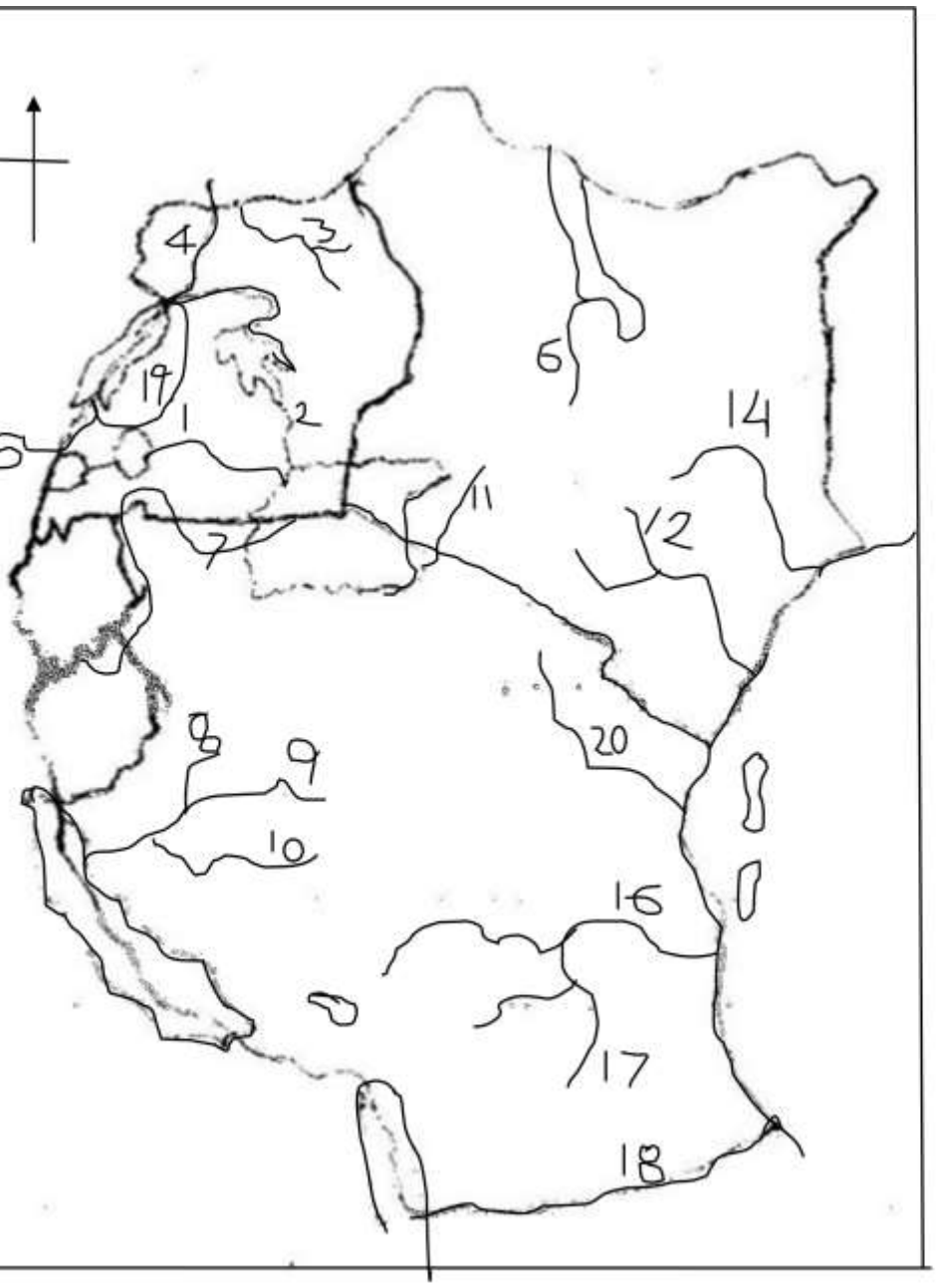

Key

Rivers

1. River Katonga
2. Victoria Nile
3. R. Achwa
4. Albert Nile
5. R. Semiliki
6. R. Turkana
7. R. Kagera
8. R. Malagarasi
9. R. Gombe
10. R. Ugalla
11. R. Mara
12. R. Athi
13. R. Galana
14. R. Tana
15. R. Luwegu
16. R. Rufiji
17. R. Njembe
18. R. Ruvuma
19. R. Kafu
20. R. Pangani

Features associated with rivers.

- The point where the river starts flowing is called the source.
- The point where the river ends is called the mouth.
- Some rivers end in deltas while other end in estuaries.

A delta

- This is the part of a river where it splits into several streams before entering the sea or lake.
- They are found in the old stage of the river.
- Deltas occur in the old stage of a river as it enters its mouth.

Importance of deltas.

- They have fertile soils for crop growing.
- They attract tourists.
- They are sources of minerals like oil.

Rivers that form deltas.

- R. Tanga
- R. Rufiji
- R. Semiliki

Activity

1. What is the meaning of permanent rivers?
2. Mention two types of rivers.
3. How is a delta different from an estuary?
4. Identify the importance of deltas.
5. What is a source of a river?
6. Mention the stage of the river in which deltas occur.
7. Identify two examples of rivers that form deltas.

Other terms connected to rivers.

- A river confluence is a point where two or more rivers meet.
- A meander is a curved bend of a river channel.

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- A tributary is a small river that joins the main river.
- A tributary is a small river that branches away from the main river.

Stages of a river.

- The youth upper stage.
- The middle or mature stage.
- The lower or old or senile stage.

The youth or upper stage.

It is found where the source of a river is found.

- The river flows very fast in this stage.
- One of the features found in this stage include gorge.

Characteristics of youth stage of a river.

- It forms water falls and rapids.
- It forms steep sided valleys or V-shaped valleys.
- The water is fast flowing.
- It flows over a steep slope.

The middle or mature.

- In this course, there is transportation of different materials. This is done in three ways.
    - Rolling down around the bed of the river itself. ○ Solution where mineral dissolve. ○ Suspension where rock particles are carried in suspension form.
    - The river begins to form meanders and flood plains.

The lower course of a river.

- This is the part of the river which consists of the mouth of the river.
- Here, whatever has been eroded is deposited.
- Ox-bow lakes are formed.
- The river may form a delta or estuary.
- The land is flat and water moves slowly.

Note: The river ends up in the sea, oceans, swamps or lakes.

Activity

1. In which way are deltas valuable to farmers?
2. Identify two economic activities that can be done in deltas.
3. What is the difference between a tributary and distributary?
4. Name the stage of a river that is associated with Ox-bow lakes.
5. What is a river confluence?
6. Name the main tributary of river Nile in Uganda.

Importance of rivers to people.

- They help to generate hydro-electric power.
- They attract tourists who bring foreign exchange.
- They are a source of water for domestic use.
- They are a source of water for industrial use.
- They are a source of water for irrigation.
- They help in the formation of rain.
- They are fishing grounds.
- They are used as recreation centres e.g. swimming.
- Some rivers are used for transport.

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Reasons why some rivers are not used for transport.

- They have rocks.
- They have sudds.
- They are shallow.

Dangers of rivers to people

- Rivers flood which leads to death of people and destruction of property.
- Storms on rivers may cause boats to capsize and kill people.
- Rivers have waterfalls which hinder water transport eg along the Victoria Nile.
- Rivers hide dangerous animals which kill people.
- They are breeding places for vectors e.g snails and mosquitoes.

Ways of caring for rivers.

- Planting trees along river banks.
- Using better fishing methods.
- Putting strict laws against dumping garbage in rivers.
- Protecting plants along rivers.

Swamps

- These are vegetated water logged areas.
- Swamps are also called wetlands.

Importance of swamps.

- They are a source of food for fish.
- They provide raw materials for craft industry eg papyrus, reeds, palm leaves and clay.
- They are a source of building materials like sand.
- They are a source of water for domestic use.

- They help in rain formation.
- They attract tourists who bring income.
- They are homes for wild animals.
- They filter water.
- They help to control floods.

Activity

1. State two ways of caring for rivers.
2. What is a wetland?
3. In which way do rivers promote farming?
4. Why are some river in Uganda not good for navigation?
5. How do swamps help to modify climate?
6. State one reason why the river valleys in the lower stage are suitable for crop growing.
7. Name the most swampy lake in East Africa.

Reasons why people drain swamps.

- To get land for settlement.
- To get land for crop growing.
- To construct roads.
- To get land for building industries.
- To make bricks.

Crops that grow in wetlands.

- Rice • Sugar canes • Egg plants
- Coco yams • Tomatoes • Cabbages **Problems faced by people living in wetlands.**
- Floods may lead to destruction of property.

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- Swamps are breeding places of disease vectors like mosquitoes.
- Swamps harbor dangerous animals which attack people.

Problems facing swamps.

- Swamp drainage
- Dumping of garbage
- Dumping of industrial wastes.
- Burning of swamps.
- Over grazing in swamps.

Solutions to problems facing swamps.

- Enforcing strict laws against encroachment
- Educating people on the dangers of draining swamps.
- Creating garbage dumping areas.

Note: The body in Uganda responsible for preserving swamps is called National Environmental Management Authority (NEMA).

Activity:

1. Give any two problems facing rivers?
2. Write NEMA in full.
3. Why is it not advisable for people to settle in swampy areas?
4. Name the type of fish that is commonly caught in swamps.
5. Mention any two problems facing swamps in Uganda.

Fishing industry in East Africa.

Fishing is the catching of fish from water bodies.

Examples of fishing grounds in East Africa.

- Lakes • Swamps
- Rivers • Oceans
- Ponds • Dams
- Streams

Fishing methods in East Africa.

- Traditional methods.
  - Fishing baskets and traps ○ Scoop nets ○ Hooks / angling
  - Bows, arrows and spears
- **Modern fishing methods** ○ Beach seine netting ○ Gillnets ○ Training ○ Drifting
  - Perse seine nets

Fish preservation

This is the process of protecting fish against bacteria. It is a way of keeping fish for a long period of time without going bad.

Traditional methods of fishing preservation.

- Smoking (commonest)
- Sun drying
- Salting
- Flour making

Modern methods of preserving fish.

- Freezing / refrigeration
- Tinning / canning
- Adding chemical e.g. sulphur dioxide

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Importance of fishing to the people of East Africa.

- Fish is a source of income to the people.
- It creates employment to people e.g. fishermen and fish mongers.
- It is a source of proteins and vitamins to people.
- Fish bones and other unwanted parts of fish are used to make fertilizers, animal feeds.
- The government gets income from taxing people who deal in fish.
- Fish is used for study purpose.
- Fish can be used o make some drugs eg cod-liver oil.
- Fishing is a source of foreign exchange.

Activity:

1. Why is fishing referred to as an economic activity
2. State any two traditional methods of catching fish.
3. Name the commonest type of fish caught in Uganda.
4. What are perishable goods?
5. Point out the four ways of preserving fish locally.
6. Give the commonest methods of preserving fish locally.
7. How do poultry farmers benefit from the fishing industry?

Problems facing the fishing industry in East Africa.

- Fluctuation of fish prices in the market. ○ Poor storage facilities. ○ Catching of young fish / indiscriminating fishing.
- Swamp drainage
- Poor transport routes between fishing areas and market centres.

- Strong winds on lakes cause capsizing of boats ○ Drought which leads to reduction of water levels in lakes and rivers. ○ Presence of water hyacinth which suffocates fish and breaks fishing nets.
- Pollution of water by dumping industrial wastes and chemicals.
- Silting of some lakes and rivers eg L. Kyoga. ○ Shortage of standard fishing equipment ○ Poor processing and preserving methods
- Cultural beliefs which discourage some people from eating fish.

Solutions to the above problems facing the fishing industry.

- By encouraging foreign investors. ○ By maintaining political stability ○ By establishing good storage facilities.
- Educating people about the dangers of poor fishing methods. ○ Enforcing laws against over-fishing. ○ By controlling the spread of water hyacinth.
- By protecting fishing grounds from water pollution. ○ By discouraging people from destroying wetlands. ○ By improving transport network in East Africa.
- By providing ready market for fish.

Some fishing processing firms in Uganda.

Tropical fish industries limited

Marine and Agro-Export Processing Limited Fresh water fish industries Limited.

Masese fish parkers limited.

Activity:

1. Outline four problems faced by the fishing industry.
2. Mention ways how the problems facing the fishing industry can be solved.
3. In which way has Masese fish parkers limited benefited the people who live around.

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Dangers of Water hyacinth to fishing industry.

- It has made water transport difficult. ○ It destroys fishing nets.
- It harbours disease vectors like snails and mosquitoes which affect fishermen.

Advantages of water hyacinth. ○ It is used in making animal feeds. ○ It provides craft materials. ○ It can be used as manure after removing it from water bodies.

- Its flowers can be used for decoration.

Ways of controlling water hyacinth.

- Using machines to remove it. ○ Using hands / manual method. ○ Using chemicals to spray it.
- Using beetles to eat it.

Activity:

1. How is fish poisoning dangerous to the fishing industry?
2. How dangerous are some industries to the nearby water sources? 3. State any two ways in which man can contaminate water sources.
4. Give any three dangers of water hyacinth to the fishing industry on lake Victoria.
5. What name is given to the floating vegetation on river Nile in Sudan?

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SET III

P.6 MATHEMATICS

ADDING FRACTIONS.

Examples:

1. Add: $^3/_6 + ¼$

$$^3/_6 + ¼ = \frac{6 + 3}{12} = \frac{9}{12}$$

$M_6 = \{6, 12, 18, \ldots\}$

$M_4 = \{4, 8, 12, \ldots\}$

L.C.M = 12

$\frac{3}{6} \times 12 = 3 \times 2$

$= 6$

$= \frac{1}{4} \times 12 = 1 \times 3$

$= 3$

2. Work out: $⅔ + ⅙ + ^2/_9$

$$⅔ + ⅙ + ^2/_9 = \frac{12 + 3 + 4}{18}$$

$$⅔ + ⅙ + ^2/_9 = \frac{12 + 3 + 4}{18}$$

$$= \frac{19}{18} = 1\frac{2}{18}$$

$M_3 = \{3, 6, 9, 12, 15, 18, \ldots\}$

$M_6 = \{6, 12, 18, \ldots\}$

$M_9 = \{9, 18, \ldots\}$

L.C.M = 18

$⅔ \times 18 = 2 \times 6$

$= 12$

$⅙ \times 18 = 3$

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$= 1\frac{1}{18}$ $\qquad$ $\frac{2}{9} \times 18 = 4$

19 $\qquad$ $= 18 \quad 19$

$$\begin{array}{r|l} & 1 \\ \hline 18 & -\underline{18} \\ & 1 \end{array}$$

$= 1\frac{1}{18}$

3. Daddy bought $2\frac{1}{5}$ kg of beans on Monday and $3\frac{1}{4}$ kg of beans on Tuesday. How many kg did he buy altogether?

$2\frac{1}{5} + 3\frac{1}{4}$

$= \frac{(5 \times 2) + 1}{5} + \frac{(4 \times 3) + 1}{4}$

$= \frac{10 + 1}{5} + \frac{12 + 1}{4}$

$= \frac{11}{5} + \frac{13}{4}$

$\frac{11}{5} + \frac{13}{4} = \frac{44 + 65}{20}$

$= \frac{109}{20}$

$\frac{109}{20} = 20 \overline{)109}$ $\quad$ 5, $\cancel{100}$, 9

$= 5\frac{9}{20}$

He bought $5\frac{9}{20}$ kg of beans.

$M_5 = \{5, 10, 15, 20, 25, \ldots\}$

$20 \; M_4 = \{4, 8, 12, 16, 20, \ldots\}$

$\frac{109}{20}$ $\qquad$ 4

$\frac{11}{5} \times \cancel{20} = 11 \times 4$ $\qquad$ 44

$\frac{11}{5} + \frac{13}{4} = \frac{44 + 65}{}$

$=$

$= 5\frac{9}{}$

$\{ \qquad \}$

20

$\frac{5}{5} = 44$ | 5 $\quad$ $\frac{+\ 65}{109}$

$\frac{13}{4} \times 20 = 13 \times 5$

$= 65$

$M_{20} = 20, 40, 60, 80, 100, 120$

1. Add: $\frac{2}{5} + \frac{1}{3}$
2. Grace paid ½ of her fees on Monday, ¼ of it on Tuesday and ⅓ of it on Wednesday. What fraction of her fees did she pay?
3. Add: $3\frac{2}{5} + 1\frac{1}{6}$
4. Find the sum of ¾ and ⅗.
5. Mummy bought 3¼ kg of sugar in the morning and 4¾ kg of sugar in the evening. How many kg did she buy altogether?

SUBTRACTING FRACTIONS:

Examples:

1. Subtract: $\frac{2}{3} - \frac{1}{5}$

$\frac{2}{3} - \frac{1}{5} = \frac{10 - 3}{15}$

$= \frac{7}{15}$

$M3 = \{3, 6, 9, 12, 15, \ldots\}$

$M5 = \{5, 10, 15, \ldots\}$

L.C.M = 15

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$$\frac{2}{\cancel{3}_{1}} \times \frac{\cancel{15}^{5}}{} = 2 \times 5$$

$$= 10$$

$$\frac{1}{5} \times \frac{\cancel{15}^{3}}{} = 1 \times 3$$

$$= 3$$

2. Daddy bought 6¼ kg of flour, he gave away 2½ kg to Aunt. How many kg did he remain with?

$6\frac{1}{4} - 2\frac{1}{2}$

$= \frac{(4 \times 6) + 1}{4} - \frac{(2 \times 2) + 1}{2}$

$= \frac{24 + 1}{4} - \frac{4 + 1}{2}$

$= \frac{25}{4} - \frac{5}{2}$

$= \frac{25}{4} - \frac{5}{2} = \frac{25 - 10}{4}$

$= \frac{15}{4}$

$= 3\frac{3}{4}$

He remained with 3¾kg

$M_4 = \{4, 8, 12, 16, \ldots\}$

$M_2 = \{2, 4, 6, 8, 10, \ldots\}$

L.C.M = 4

$\frac{25}{\cancel{4}_{1}} \times \frac{\cancel{4}^{1}}{} = 25 \times 1$

$= 25$

$\frac{5}{\cancel{2}} \times \frac{\cancel{4}^{2}}{} = 5 \times 2$

$= 10$

$\frac{15}{4} =$ d 3w

4 | 15

12

3n

$= 3\frac{3}{4}$

3. Subtract ⅔ from 3. L.C.M of 1 and 3 = 3 2

$3 - \frac{2}{3} = \frac{3}{1} - \frac{2}{3}$

$= \frac{9 - 2}{3}$

$\frac{7}{3}$

$= 2\frac{1}{3}$

$\frac{3}{1} \times 3 = 9$

$\frac{2}{3} \times \frac{3}{1} = 2 \times 1$

$= 2$

M3 = { 3, 6, 9, ... }

$\frac{7}{3}$ 3 | 7 − 6 = 1

$= 2\frac{1}{3} =$

Activity:

1. Subtract: ⅜ from ¾.
2. Aunt had 7¾ kg of peas, she gave away 5½ kg of peas to uncle. How many kg did she remain with?
3. Subtract: $^3/_7$ - ⅓ 4. Subtract: $5^5/_9$ - 1⅑.
5. Subtract: ⅖ from 1.
6. Takeaway: 6 - $^4/_6$

ADDING AND SUBTRACTING FRACTIONS.

Note: BODMAS is used to work out numbers with 2 or more operations.

Examples: **(BODMAS)**

1. Work out: ⅔ - ¾ + ⅓

⅔ + ⅓ - ¾ = $\frac{(8 + 4) - 9}{12}$

$= \frac{12 - 9}{12}$

$= \frac{3}{12}$

$= \frac{2}{3} \times \frac{4}{1} = \frac{8}{3}$

$= \frac{1}{3} \times \frac{4}{1} = 4$

$= \frac{3}{1} \times \frac{3}{4} =$

$\frac{9}{4}$

$M_3 = \{3, 6, 9, 12, 15, \ldots\}$

$M_4 = \{4, 8, 12, 16, \ldots\}$

L.C.M = 12

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2. Work out: ⅔ + ¾ - $^{5}/_{6}$ (BODMAS)

⅔ + ¾ - $^{5}/_{6}$ = $\frac{(8 + 9) - 10}{12}$

= $\frac{17 - 10}{12}$

= $\frac{7}{12}$

M_3 = 3{ 6, 9, 12, 15, … }

M_4 = { 4, 8, 12, 16, … }

M_6 = { 6, 12, 18, … }

L.C.M = 12

$\frac{2}{3}$ x 12 = 2 x 4

= 8

$\frac{3}{4}$ x 12 = 3 x 3

= 9

$\frac{5}{6}$ x 12 = 5 x 2

= 10

3. Joel had 3 ¼ litres of milk, he sold off 2¾ litres and later he was given 4⅖ litres of milk.

How much milk does he have now?

3¼ (-2¾ (+4⅖ (BODMAS)

3¼ + 4⅖ - 2¾

$\frac{(4 \times 3) + 1 + (5 \times 4) + 2 - (4 \times 2) + 3}{4}$

= $\frac{12 + 1}{4} + \frac{20 + 2}{5} - \frac{8 + 3}{4}$

M_4={4, 8, 12, 16, **20**, …

M_5={5, 10, 15, **20**, 25, …

5 | 20

4 | 20

L.C.M = 80

13 x 20 = 13 x 5

$4\frac{18}{4} \div 2 = \frac{9}{4}$

= 13 + 22 - 11
4 5 4

= 65 + 88 - 55
20

= 153 - 55
20

= 98
20

= $4\frac{18}{20}$

= $4\frac{9}{10}$

= 65
4

$\frac{22}{1} \times \frac{20}{1} = 22 \times 4$

= 88

$\frac{11}{1} \times \frac{20}{4} = 11 \times 5$

= 55

20 ÷ 2 = 10

= $4\frac{9}{10}$

He had $4\frac{9}{10}$ litres of milk.

Activity:

1.Work out: ¼ - ⅔ + ½

2. Work out: 5¾ - 7⅔ + $4\frac{1}{6}$

3. Patricia had 3¼ kgs of sugar, she gave 2½ kg to a friend and she was give more 4½ kg of sugar. How much sugar does she have now?

4. Subtract ⅕ from ⅓ and then add $\frac{3}{10}$. What is the result? 5. Work out: $\frac{3}{6}$ + ⅔ - $\frac{2}{9}$

MULTIPLYING A FRACTION BY A WHOLE NUMBER AND VICE VERSA. Guidelines

Note:- Give any whole numbers denominator 1

- Change mixed numbers to improper fractions.
- Cancel numerator with denominator where possible or use numerator product
  Denominator product

Examples:

1. Multiply: ¾ x 8

¾ x 8 = ¾ x 8/1 (8 over 2)

= 3 x 2 / 1 x 1

= 6/1

= 6

2. Work out: 12 x ⅔

12 x ⅔ = 12/1 (12 over 4) x ⅔

= 4 x 2 / 1 x 1

= 8/1

= 8

3. Workout: 2 x 3¼

2 x 3¼ = 2/1 x (4 x 3) + 1 / 4

= 2/1 x 12 + 1 / 4

= 2/1 x 13/4

= 2/1 x 13/4 (2 over 1, 4 over 4)

= 1 x 13 / 2

= 13/2

= 6½

13/2 = 2 d 6w, 13, −12, 1n

= 6½

4. Mary has 9 boxes each containing 2⅓ dozens of books. How many dozens of books does she have?

$9 \times 2\frac{1}{3}$

$= \frac{9}{1} \times \frac{(3 \times 2) + 1}{3}$

$= \frac{9}{1} \times \frac{6 + 1}{3}$

$= \frac{9}{1} \times \frac{7}{3}$

$= \frac{9}{1} \times \frac{3}{1}$

$= \frac{3 \times 7}{1 \times 1}$

$= \frac{21}{1}$

$= 21$

She has 21 dozens of books.

Activity:

1. Workout: $8 \times \frac{1}{4}$.
2. Workout: $6 \times \frac{2}{3}$
3. Multiply: $\frac{5}{8} \times 2$
4. Multiply: $4\frac{1}{5} \times 10$
5. Diana had 24 tins each containing $\frac{5}{8}$ litres of juice. How many litres of juice does she have altogether?
6. In a class 30 pupils, each pupil was given $1\frac{1}{2}$ dozens of books. How many dozens were given out?

MULTIPLYING A FRACTION BY A FRACTION.

Guidelines

- Use numerator product

Denominator product

OR Cancel numerator and denominators where possible.

Examples:

1. Simplify: $\frac{2}{3} \times \frac{7}{4}$

$$\frac{\cancel{2}^{1}}{\cancel{3}_{2}} \times \frac{7}{\cancel{4}} = \frac{1 \times 7}{2}$$

$$= \frac{7}{6}$$

$$= 1\frac{1}{6}$$

$$\frac{7}{6} = \begin{array}{r|l} & d \quad 1^{w} \\ 6 & 7 \\ 6 & \\ \hline & 1n \end{array}$$

$$3 \times 2 = 1\frac{1}{6}$$

2. Simplify: $\frac{2}{5} \times \frac{3}{8}$

$$\frac{\cancel{2}^{1}}{\cancel{5}} \times \frac{\cancel{3}}{\cancel{8}_{4}} = \frac{1}{5} \times \frac{3}{4}$$

$$= \frac{3}{20}$$

2 2

3 5 5 10

3. Simplify: $2\frac{1}{3} \times 1\frac{1}{5}$

$$2\frac{1}{3} \times 1\frac{1}{5} = \frac{(3 \times 2) + 1}{3} \times \frac{(5 \times 1) + 1}{5}$$

$$= \frac{6 + 1}{3} \times \frac{5 + 1}{5}$$

$$= \frac{7}{\cancel{}} \times \frac{\cancel{6}}{}$$

$$= \frac{7 \times 2}{1 \times 5}$$

$$= \frac{14}{5}$$

$$= 2\frac{4}{5}$$

$$\begin{array}{r|l} \underline{14} \quad 5 & 14 \\ & 4 \end{array}$$

$$= 2\frac{4}{5}$$

ACTIVITY:

1. Simplify: $\frac{3}{8} \times \frac{4}{6}$
2. Simplify: $\frac{1}{2} \times \frac{1}{3} \times \frac{2}{3}$

3. Simplify: $2\frac{1}{2} \times 3\frac{1}{3}$
4. Simplify: $\frac{3}{5} \times \frac{2}{4}$
5. Simplify: $\frac{5}{9} \times \frac{6}{10}$
6. Work out: $3\frac{1}{2} \times \frac{4}{5} \times \frac{2}{6}$

FINDING RECIPROCALS.

Reciprocals:- are two numbers whose product is 1.

Examples:

1. What is the reciprocal of $\frac{3}{8}$?

the reciprocal be r

$\frac{3}{8} \times r = 1$

$\frac{3}{8}r = 1$

$\cancel{\times}\ \frac{3r}{8} = 1 \times 8$

$3r = 8$

$\frac{3r}{3} = \frac{8}{3}$

$r = \frac{8}{3}$ or $2\frac{2}{3}$

$\frac{8}{3} = 2\frac{2}{3}$

2 Let

3 8

6

2n 8

2. Find the reciprocal of $3\frac{1}{4}$.

Let the reciprocal be k.

$3\frac{1}{4} \times K = 1$

$\frac{(4 \times 3)}{4} + 1 \times K = 1$

$\frac{12 + 1}{4} \times K = 1$

$\frac{13}{4} \times K = 1$

$\frac{13k}{4} = 1$

$\cancel{4} \times \frac{13k}{\cancel{4}} = 1 \times 4$

$\frac{\cancel{13}k}{\cancel{13}} = \frac{4}{13}$

$K = \frac{4}{13}$

3. What is the reciprocal of 8?

Let the reciprocal be n.

8 x n = 1

8n = 1

$\frac{8n}{8} = \frac{1}{8}$

n = $^1/_8$

4. What is the reciprocal of 0.3?
   Let the reciprocal be q.

0.3 x q = 1

$\frac{3}{10} \times q = 1$

$\frac{3q}{10} = 1$

$\frac{10}{10} \times \frac{3q}{10} = 1 \times 10$

3q = 10

$\frac{3q}{3} = \frac{10}{3}$

$q = \frac{10}{3}$ or $3\frac{1}{3}$

d x 3n

$\frac{10}{3} = 3\overline{)10}$

- 9

1n

$= 3\frac{1}{3}$

Activity:

1. What is the reciprocal of $^{11}/_3$?
2. Find the reciprocal of $2\frac{2}{5}$.
3. What is the reciprocal of 0.5?
4. What is the reciprocal of 12?
5. Solve the following:-
   (a) 5 x y = 1
   (b) $^7/_6$ x m = 1
6. Find the reciprocal of 2.5.
7. Multiply 27 by the reciprocal of 9.

NB: For more practice, Mk Pri. MTC's Bk.6 Pg. 52.

DIVIDING A WHOLE NUMBER BY A FRACTION AND VICE VERSA USING THE RECIPROCAL.

Reciprocal means upside down.

Guidelines:

- Find the reciprocal of the divisor.
- Multiply it by the dividend (first fraction).
- Use numerator product OR Cancel numerator and denominator where possible. - Denominator product **Examples:**

1. Divide 4 by $\frac{2}{5}$.

$4\left(\div \frac{2}{5}\right) = 4 \times \frac{5}{2}$

$= \frac{2}{4} \times \frac{5}{2_1}$

$= 2 \times 5$

$= 10$

2. Work out: $21 \div \frac{3}{5}$

$21\left(\div \frac{3}{5}\right) = 21 \times \frac{5}{3}$

$= \frac{7}{21} \times \frac{5}{3_1}$

$= 7 \times 5$

Divide $\frac{5}{9}$ by 15.

$\frac{5}{9} \div 15 = \frac{5}{9} \div \frac{15}{1}$

$= \frac{5}{9}\left(\div \frac{15}{1}\right)$

$= \frac{5}{9} \times \frac{1}{15_3}$

$= \frac{1 \times 1}{9 \times 3}$

$= \frac{1}{27}$

4. Workout: $10 \div 1\frac{2}{3}$

$\frac{10}{1} \div \frac{(3 \times 1) + 2}{3}$

$\frac{10}{1} \div \frac{5}{3} = \frac{10}{1}\left(\div \frac{5}{3}\right)$

$= \frac{10}{1} \times \frac{3}{5_1}$

$= \frac{2}{1} \times \frac{3}{1}$

$= \frac{6}{1}$

$= 6$

$= 35$

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3.

Activity:

Use the reciprocal of the divisor to divide the following:-

1. Workshop: 6 ÷ ½.
2. Simplify: 15 ÷ ⅕.
3. Workout: 8 ÷ ⅔.
4. Divide: $1\frac{3}{7}$ ÷ 2
5. Divide $\frac{4}{9}$ by 8.
6. How many packets of ¾ kg can be obtained from 15 kg?
7. Divide: $\frac{2}{7}$ ÷ 5

DIVIDING A FRACTION BY A FRACTION USING RECIPROCAL.

N.B: Follow the guidelines in the first lesson of division.

1. Workout: ⅞ ÷ ½

⅞ (÷ ½) = ⅞ x $\frac{2}{1}$

= $\frac{7}{8}$ x $\frac{2}{1}$

4 x 1

$\frac{7 \times 1}{4}$

$= \frac{7}{4}$

$\frac{7}{4}$ = d4 | 7

- 4

3n

$= 1\frac{3}{4}$

4

= 1¾

2 Simplify 4½ ÷ 1⅓

4½ ÷ 1⅓

$\left(\frac{2 \times 4) + 1}{2} \div \frac{(3 \times 1) + 1}{3}\right.$

$\frac{8 + 1}{3} \div \frac{3 + 1}{1}$

$\frac{9}{2}$ (÷ 4/3)

$= \frac{9}{2} \times \frac{3}{4}$

$= \frac{9 \times 3}{2 \times 4}$

$= \frac{27}{8}$

$= 3\frac{3}{8}$

$\frac{27}{8} = 8\overline{)27}$

3

- 24

3

= 3⅜ 2

Activity:

1. Simplify: ⅔ ÷ $^{5}/_{12}$.
2. Workout: 3½ ÷ 1¼.
3. Simplify: 1⅓ ÷ $^{4}/_{9}$.
4. Workout: $^{5}/_{2}$ ÷ 1¼.
5. Simplify: $^{5}/_{8}$ ÷ ¾.
6. Grace cut a 2½ metres of cloth into pieces of $1^{4}/_{5}$ metres to make bags.

   How many pieces did she get?
7. How many packets of 1⅕ kg of salt can be obtained from 4⅘ kg of salt.

SIMPLIFYING FRACTIONS WITH MIXED OPERATIONS.

Note: We use **BODMAS** to simplify numbers with more than 2 operations.

B - Brackets (1st)

O - of (2nd)

D - Division (3rd)

M - Multiplication (4th)

A - Addition (5th)

S - subtraction (6th)

Examples:

BODMAS

1. Simplify ¾ of $^{16}/_{9}$ - $^{5}/_{9}$ + ⅓

(^{1}¾ x ^{4}$^{16}/_{9}$) - $^{5}/_{9}$ + ⅓
$_{1}$ $_{3}$

$^{4}/_{3}$ (- $^{5}/_{9}$ (+ ⅓

= $^{4}/_{3}$ + ⅓ - $^{5}/_{9}$

= $\frac{12 + 3 - 5}{9}$

= $\frac{15 - 5}{9}$

= $\frac{10}{9}$

= $1^{1}/_{9}$

M3 = {3, 6, 9, 12, …}

M9 = { 9, 18

L.C.M = 9

^{3}
$^{4}/_{3}$ x 9 = 4 x 3
$_{1}$

= 12

^{3}
⅓ x $^{\cancel{9}}$ = 1 x 3
$_{1}$ = 3

^{1}
$^{5}/_{9}$ x $^{\cancel{9}}$ = 5 x 1
$_{1}$

= 5

---

2. Simplify: ⅔ - ¾ of $^{3}/_{9}$ x ⅔

⅔ - (¾ of $^{3}/_{9}$) x ⅔ BODMAS

^{1}
⅔ - ($^{\cancel{3}}$¾ x ^{3}$^{3}/_{9}$) x ⅔
$_{3}$

⅔ - $^{1}/_{6}$ = $\frac{4 - 1}{6}$

= $^{3}/_{6}$

M3 = {3, **6**, 9, ..

M6 = { **6**, 12, …

L.C. M = 6

$\frac{2}{3} - \left(\frac{\cancel{3}^{1}}{\cancel{12}_{6}} \times \frac{1}{\cancel{2}_{1}}\right)$

$\frac{2}{3} - \frac{1}{6}$

$\frac{\cancel{2}^{1}}{\cancel{3}_{1}} \times \frac{\cancel{6}^{2}}{\cancel{1}} = 2 \times 2$

$= 4$

$\frac{\cancel{1}}{\cancel{6}_{1}} \times \frac{\cancel{6}}{\cancel{1}} = 1 \times 1$

$= 1$

3. Simplify: $\frac{1}{3} \times \frac{1}{2} \div \frac{1}{4} \times \frac{1}{5}$

$\frac{1}{3} \times \left(\frac{1}{2} \left(\div \left(\frac{1}{4}\right)\right)\right) \times \frac{1}{5}$

BODMAS

$\frac{1}{3} \times \frac{\cancel{1}}{\cancel{2}_{1}} \times \frac{\cancel{4}^{2}}{1} \times \frac{1}{5}$

$= \frac{1 \times 2 \times 1}{3 \times 1 \times 5}$

$\frac{1}{3} \times \frac{2}{1} \times \frac{1}{5}$

$= \frac{2}{15}$

Activity:

1. Simplify: $\frac{1}{3} \times \frac{1}{4} + \frac{1}{2}$.
2. Simplify: $\frac{3}{5} + \frac{1}{3} \div \frac{4}{6}$.
3. Simplify: $\frac{1}{3} \times \frac{1}{2} + \frac{1}{4} - \frac{1}{5}$.
4. Simplify: $\left(\frac{2}{5} \times \frac{1}{7}\right) \div \left(\frac{1}{4} - \frac{1}{5}\right)$
5. Simplify: $\frac{5}{6} \div \left(\frac{3}{4} \text{ of } 3\right)$
6. Simplify: $\frac{2}{3}$ of $\frac{3}{4} - \frac{1}{3} + \frac{1}{2}$.
7. Simplify: $\frac{1}{2} - \frac{2}{5}$ of $\frac{5}{6} + \frac{1}{4}$

THEME:- NUMERACY

TOPIC:- OPERATIONS ON DECIMALS ADDING

DECIMALS UP TO 3 DECIMAL PLACES.

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Guidelines:

- Balance the decimal places.
- Arrange figures vertically according to their place values.
- Start adding from right to the left beginning with the fractions towards the wholes. **Examples:**

1. Add: 26.13 to 5.43

$$\begin{array}{r} {\scriptstyle 1} \\ 26.13 \\ +\ \ 05.43 \\ \hline 31.56 \\ \hline \end{array}$$

2. Add: 4.8 + 1.31

$$\begin{array}{r} 4.8 \\ +\ 1.31 \\ \hline = \quad 6.11 \end{array}$$

4.80 = 4.80 + 1.31

$$\begin{array}{r} 6.11 \\ \hline \end{array}$$

3. A rope is 5.4 metres long. Another rope is 3.52 metres long. What is the total length of the rope?

One rope is 5.4 m = 5.4 + 3.52

Another rope is 3.52 m = 5.40 + 3.52

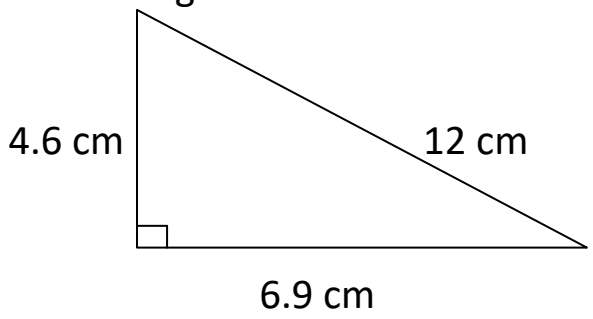
$$\begin{array}{r} 5.40\ \text{m} \\ 3.52\ \text{m} \\ 8.92\ \text{m} \\ \hline \end{array}$$

The length of the two ropes is 8.92 m.

Activity:

1. Add: 6.8 + 9.1
2. Find the sum of 7.46 and 8.632.

3. Add: 18 + 93.01 + 4.3
4. Dad bought 4.25 kg of sugar. Mummy bought 3.5 kg of sugar. How many kg of sugar did they buy altogether?
5. Find the total distance around the figure below.



6. A tank contains 269.58 litres of water. If it rained and added on 164.32 litres. How much water is in the tank now?

OPERATIONS ON DECIMALS.

SUBTRACTION OF DECIMALS UP TO 3 DECIMAL PLACES.

Guidelines:

- Balance the decimal places.
- Arrange figures vertically according to the place values.
- Start subtracting from the right to the left beginning with fractions towards the wholes.
- Regroup where needed.

Examples:

1. Subtract: 9.32 - 6.804

= 9.320 - 6.804

8 13 10
~~9.~~ ~~3~~ ~~2~~ 0
4. 6. 8 0 4
2. 5 1 6

2. Subtract 3.43 from 5.

= 5 - 3.43

= 5.00 - 3.43

4910

- 3.43

1.57

3. A sack of irish potatoes weighs 92.3 kg. If 50.25 kg were sold, how many kg were left?

kg 92.30 kg

Weight sold 50.25 kg

= 92.30 kg - 50.25 kg

= 42.05 kg ∴ 42.05 kg were left.

210 Weight of sack 92.3

- 50.25 kg

42.05 kg

Activity:

1. Subtract: 6.5 - 4.3
2. Subtract: 3.702 from 5.6.
3. Find the difference of 17.29 and 11.34.
4. Aunt has 13.45 metres of cloth. She cuts off 5.98 metres to make a dress. How many metres is she left with?
5. Dad fuelled his car with 20.25 litres and consumed 11.51 litres. How many litres remained?
6. A soap factory produced 425.75 boxes of soap, 112.5 boxes were donated to market vendors. How many boxes remained?

ADDING AND SUBTRACTING DECIMALS UP TO 3 DECIMAL PLACES.

Guidelines:

- **Give operation signs to owners.**
- **Follow BODMAS order / Re-arrange.**

Examples:

1. Work out 7.35 - 9.24 + 15.1

   = 7.35(-9.24(+15.1

   = (7.35 + 15.1) - 9.24

   (7.35 + 15.10) - 9.24

1	**112**
07.35	~~22~~.45
+ 15.10	- 09.24
22.45	13.21

2. Work out 1.3 - 0.8 + 2.7

   1.3 - 0.8 (+2.7 = 1.3 + 2.7 - 0.8

1	310
1.3	~~4.0~~
+ 2.7	- 0. 8
~~4.0~~	3.2

3. Our netball team scored 6.3 points in the first round, lost 2.7 points in the second round and gained 4.5 points in the third round. What was the total score?

   6.3 - 2.7 + 4.5

   6.3(-2.7(+4.5 = (6.3 + 4.5) - 2.7

   ~~The total score of the team was 8.1 points.~~

6.3	10.8
+ 4.5	– 2.7
10.8	8.1

Activity:

1. Workout: 8.6 + 3.2 - 1.9.
2. Work out: 0.8 - 1.53 + 5.31.
3. Workout: 17.6 - 50.9 + 34.4.
4. Workout: 5.05 + 0.01 - 3.
5. Daddy had 12.5 dozens of books, he gave 3.25 dozens to the children and later bought 6 more dozens. How many dozens did he remain with?

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6. Gorolla scored 6.5 points in round one, 2.7 points in round two and lost 8.2 points in round three. What was his score?

MULTIPLYING DECIMALS BY 10, 100 AND 1000.

Guidelines

Express decimals as common fractions.

Examples:

1. Workout 0.6 x 10

   0.6 x 10

   $\frac{6}{10} \times \frac{10^{1}}{1} = 6 \times 1 = 6$

2. Work out 0.04 x 1000

   0.04 x 1000

   $\frac{4}{100} \times \frac{1000}{1} = 4 \times 10 = 40$

3. Work out 3.2 x 100

   3.2 x 100

   $\frac{32}{10} \times \frac{100}{1} = 32 \times 10 = 320$

4. Workout 0.243 x 100

   0.243 x 100

   $\frac{243}{1000} \times \frac{100}{1} = \frac{243 \times 1}{10}$

   $= \frac{243}{10}$

   $= 24.3$

Activity

1. Work out the following.
   a. 0.9 x 10
   b. 0.9 x 100
   c. 0.9 x 1000
   d. 0.85 x 1000
   e. 2.56 x 1000
   f. 0.23 x 100
   g. 4.39 x 10
   h. 2.53 x 1000

MULTIPLYING DECIMALS BY A WHOLE NUMBER.

Guidelines:

- **Express decimals as common fractions and multiply .** -
Change back the answer to a decimal.

Examples

1. Workout 2.5 x 3 1

$3.5 \times 3 = \frac{25}{10} \times 3$

$= \frac{75}{10}$

$= 7.5$

$\begin{array}{r} 25 \\ \times\ 3 \\ \hline 75 \end{array}$

$\frac{75}{10} = 7.5$

2. Work out 0.24 x 4

$0.24 \times 4 = \frac{24}{100} \times 4$

$= \frac{96}{100}$

$= 0.96$

$\begin{array}{r} 1 \\ 24 \\ \times\ 4 \\ \hline 96 \end{array}$

$\frac{96}{100} = 0.96$

3. The weight of an empty tin is 0.45 kg. What is the weight of 12 such tins?

$0.45 \times 12 = \frac{45}{100} \times 12$

$= \frac{540}{100}$

$= \frac{54}{10}$

$= \frac{5.4}{10}$

$= 5.4$

ALTERNATIVE

Guidelines

a) Count decimal places.

- Multiply decimals as whole numbers.

- Place the decimal point in the answer depending on the number of decimal places.

Examples

1. Workout 2.5 x 3

2.5 x 3 (1 decimal place)

```
    1
    2.5
x     3
    7.5  ( 1 decimal place)
```

2. Work out 0.24 x 4

0.24 x 4 (2 decimal places)

```
      1
    0.24
X      4
    0.96
```

3. The weight of an empty tin is 0.45 kg. What is the weight of 12 such tins?

```
     1
    0451   2 dec places)
X     12
     090
    0450
```

05 4 0

Activity

Workout the following by expressing decimals first as common fractions.

1. 0.9 x 12
2. 0.13 x 9
3. 1.38 x 5
4. A tailor used 2.15 metres to make a dress. How many metres are needed to make 9 such dresses?

Work out the following by counting number of decimal places.

5. 2.37 x 3
6. 11.43 x 4
7. 15.4 x 3
8. A family consumes 25.5 litres of milk every day. How many litres of milk will it consume in 4 days?

MULTIPLYING A DECIMAL BY A DECIMAL.

Guidelines

- Express decimals as common fractions and multiply.
- Change back the answer to a decimal. **Examples**

1.Simply: 0.8 x 0.2

0.8 x 0.2

$\frac{8}{10} \times \frac{2}{10} = \frac{8}{10} \times \frac{2}{10}$

$= \frac{16}{100}$

$= 0.16$

$\frac{16}{100} = \frac{16}{}$

$= 0.16$

-

2.Dad bought 12.5 packs of tinned beef. How many kg did he buy if each pack weighs 0.5 kg.

(12.5 x 0.5) kg

$\frac{125}{10} \times \frac{5}{10} = \frac{125 \times 5}{10 \quad 10}$

$= \frac{625}{100}$

$= 6.25$

$\times \quad 5$

He bought 6.25 kg

$\frac{6.25}{100} = 6.25$

$= 6.25$

12

125

625

- Count the decimal places.
- Multiply decimals as whole numbers.
- Place the decimal points in the answer depending on the number of decimal places.

1.Simplify: 0.8 x 0.2

0.8 x 0.2 (2 decimal places)

```
      1
     0.8
X    0.2
     16
+   000
   0.16
```

2.Dad bought 12.5 packets of tinned beef. How many kg did he buy if each pack weighs 0.5 kg?

(12.5 x 0.5) kg (2 decimal places)

```
     12
     125
X    0.5
     625
```

0000
06.25

Dad bought 6.25 kg of meat.

Activity

1. **Workout the following by expressing decimals first as Common fractions.** a. 0.5 x 1.2
   b. 0.8 x 0.25
   c. 20.5 x 13.6

   Work out the following by counting number of decimal places. d. 0.08 x 0.6
   e. 18.7 x 3.2
   f. 46.1 x 13.2

DIVIDING A WHOLE NUMBER BY A DECIMAL.

Guidelines

- Express the decimal as a common fraction.
- Find the reciprocal of the division.
- Multiply it by the whole number.
- Either multiply $\frac{n \times n}{d \times d}$ of cancel numerator and denominator vertically or diagonally.

Examples

1. Divide 4 by 0.5

   $4 \div 0.5$

   $4 \left(\div \frac{5}{10}\right)$

   $4 \times \frac{10}{5}$

   $= 4 \times \frac{2}{\cancel{10}}{\cancel{5}}$

   $= 4 \times 2$

   $= 8$

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2. A container contains 20 litres. How many 0.25 litre bottles can be got from it?

   = 20 x $\frac{100}{}$

   = 20 ($\div \frac{25}{100}$)

   = 20 x $\frac{100}{25}$

   4 = 20 ÷ 0.25

   $\frac{25}{1}$

   = 20 x 4

   = 80

   There are 80 bottles of 0.25 litres

3. Divide 21 by 0.03

   = 21 ÷ 0.03

   = 21 ($\div \frac{3}{100}$)

   100 = 21 x $\frac{100}{3}$

   $\frac{7}{}$

   = $\frac{21}{}$ x $\frac{100}{3}$

   = 7 x

   = 700

Activity:

1. Work out: 48 ÷ 1.2
2. Work out: 6 ÷ 0.02
3. Work out: 100 ÷ 2.5
4. A jerrycan contains 10 litres. How many bottles of 0.5 litres can be obtained from it?
5. A piece of cloth 20 m long is cut into small pieces of 0.4 m. How many pieces will be got?
6. How many packets of 0.75 kg can be obtained from 15 kg?

DIVIDING DECIMALS BY A WHOLE NUMBER.

Guidelines

- Make the whole number a fraction.
- Express the decimal fraction as a common fraction.
- Find the reciprocal of the divisor.
- Multiply it by the dividend.

- Either multiply n x n or cancel numerator and denominator vertically or diagonally. d x d

Examples

1. Divide 0.6 by 2.

   = 0.6 ÷ 2

   = $^{6}/_{10}$ (÷ $^{2}/_{1}$)

   = $^{6}/_{10}$ x ½

   0.3

   = $^{3}\cancel{6}/_{10}$ x $\cancel{1/2}$ 1

   = $\frac{3 \times 1}{10 \times 1}$

   = $\frac{3}{10}$

2. Divide 0.28 by 7.

   = 0.28 ÷ 7

   = $^{28}/_{100}$ (÷ $^{7}/_{1}$)

   = $^{4}\cancel{28}/_{100}$ x $\cancel{1/7}$ 1

   = $\frac{4 \times 1}{100 \times 1}$

   = $^{4}/_{100}$

   = 0.04

3. A piece of rope is 7.2 m long. It was cut into 6 equal pieces. What will be the length of each piece?

   = 7.2 ÷ 6

   = $^{72}/_{10}$ (÷ $^{6}/_{1}$)

   = $\frac{\overset{12}{\cancel{72}}}{10} \times \frac{1}{\cancel{6}}$

   = $\frac{12 \times 1}{10 \times 1}$

   = $\frac{12}{10}$

   = 1.2

Activity

1. Work out the following:
   a. 0.4 ÷ 4
   b. 0.06 ÷ 12
   c. 0.009 ÷ 3
   d. 0.002 ÷ 10

1 The length of each piece is 1.2 m.

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2. Dad has 3.6 acres of land. If he divides it amongst his 6 children, what will each child get?
3. Make 5 packets of salt from 25.15 kg of salt. What will be the weight of each packet?

DIVIDING A DECIMAL BY A DECIMAL.

Guideline:

- **Express decimals as common fractions.**
- **Find the reciprocal of the divisor.**
- **Multiply it by the dividend and follow through.**

Examples:

1. Workout $2.4 \div 0.4$

$2.4 \div 0.4 = {}^{24}/_{10} \left(\div {}^{4}/_{10}\right)$

$= \frac{24}{10} \times \frac{10}{4}$

$= {}^{24}/_{10} \times {}^{10}/_{4}$ (6, 1, 1, 1)

$= \frac{6 \times 1}{1 \times 1}$

$= {}^{6}/_{1}$

$= 6$

2. Divide 5.2 by 0.02.

$5.2 \div 0.02 = {}^{52}/_{10} \left(\div {}^{2}/_{100}\right)$

$= {}^{52}/_{10} \times {}^{100}/_{2}$ (26, 1)

$= \frac{52}{10} \times \frac{100}{2}$

$= 26 \times 10$

$= 260$

$26 \times$

$2 \overline{)52}$

-4

12

-12

00

3. Daddy bought 12.5 litres of paraffin, he packed it into bottles of 0.25 litres. How many bottles did he get?

$12.5 \div 0.25 = 125 \left(\div \frac{25}{100}\right)$

$= 125 \times \frac{100}{25}$

10 5

$= \frac{\cancel{125}}{\cancel{10}} \times \frac{\cancel{100}}{\cancel{25}}$

1

$= 5 \times 10$

$= 50$

25
50
75
100
125

He got 50 bottles of 0.25 litres.

Activity

1. Work out the following;
   a) 0.8 ÷ 0.2
   b) 0.036 ÷ 0.4
   c) 3.3 ÷ 0.03
   d) 0.81 ÷ 0.09
2. Aunt has 7.2 acres of land. She divided it into plots of 0.6 acres. How many plots did she get?
3. A shopkeeper bought 6.25 kg of sugar and packed it into packs of 0.25 kg. How many packs did he get?

OPERATIONS ON DECIMALS

MULTIPLYING AND DIVIDING DECIMALS.

Guidelines

- Express decimals as common fractions.
- Create brackets for multiplication and division parts.
- Find the reciprocal of the divisor.
- Multiply it by the multiplication part and follow through.

Examples

1. Simply: $\frac{0.12 \times 0.6}{0.4}$

$= (\frac{12}{100} \times \frac{6}{10}) (\div \frac{4}{10})$

$\frac{12}{100} \times \frac{6}{10} \times \frac{10}{4}$

$= \frac{12}{100} \times \frac{6}{10} \times \frac{10}{4}$

$= \frac{3 \times 6 \times 1}{100 \times 1 \times 1}$

$= \frac{18}{100}$

$= 0.18$

2. Simplify: $\frac{0.14 \times 0.9}{0.03 \times 0.7}$

$= (\frac{14}{100} \times \frac{9}{10}) \div (\frac{3}{100} \times \frac{7}{10})$

$= \frac{14}{100} \times \frac{9}{10} \times \frac{100}{3} \times \frac{10}{7}$

$= \frac{\cancel{14}^{1}}{\cancel{100}_{1}} \times \frac{\cancel{9}^{1}}{\cancel{10}_{1}} \times \frac{\cancel{100}^{1}}{\cancel{3}_{1}} \times \frac{\cancel{10}^{1}}{\cancel{7}_{1}}$

$= \frac{2 \times 3 \times 1 \times 1}{1 \times 1 \times 1 \times 1}$

$= \frac{6}{1}$

$= 6$

3. Simplify: $\frac{2.1 \times 2.4}{0.03}$

$= (\frac{21}{10} \times \frac{24}{10}) (\div \frac{3}{100})$

$= \frac{21}{10} \times \frac{24}{10} \times \frac{100}{3}$

$= \frac{21}{\cancel{10}_{1}} \times \frac{\cancel{24}^{8}}{\cancel{10}_{1}} \times \frac{\cancel{100}}{3}$

$= \frac{2.1 \times 8 \times 1}{1 \times 1 \times 1}$

$= \frac{168}{1}$

$= 168$

Activity

1. Simplify: $\frac{0.7 \times 0.6}{0.3}$

2. Simplify: $\frac{0.09 \times 0.4}{0.06}$

3. Simplify: $\frac{0.72 \times 0.48}{0.012}$

4. Simplify: $\frac{20 \times 0.4}{0.05}$

5. Simplify: $\frac{0.24 \times 0.6}{0.12}$

6. Simplify: $\frac{0.25 \times 3.6}{0.5 \times 0.9}$

SIMPLIFYING DECIMALS WITH MIXED OPERATIONS.

Note: We use BODMAS to simplify numbers with more than 2 operations.

B - Brackets (1st)

O - of (2nd)

D - Division (3rd)

M - Multiplication (4th)

A - Addition (5th)

S - Subtraction (6th)

Examples

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1. Simplify: 0.7 + 0.6 x 0.4 - 0.5

   = 0.7 +(0.6 x 0.4) - 0.5

   = (0.7 + 0.24) - 0.5

   = 0.70 + 0.24 - 0.50

   $^{6}/_{10}$ x $^{4}/_{10}$ = $^{24}/_{100}$

   = 0.24

   0.70 + 0.24 = 0.94

   0.94 − 0.50 = 0.44

2. Simplify: 4.5 x 0.3 + 3.5 - 4.1

   = (4.5 x 0.3) + 3.5 - 4.1

   = (1.35 + 3.5) - 4.1

   = (1.35 + 3.50) - 4.10

   $^{45}/_{10}$ x $^{3}/_{10}$ = $^{135}/_{100}$

   = 1.35

   1.35 + 3.50 = 4.85

   4.85 - 4.10 = 0.75

3. David got 9.2 litres of milk from his cow and gave 3.7 to his mother. He later got 2.3 litres more. How much milk did he have?

   9.2 (-3-7(+ 2.3 = (9.2 + 2.3) - 3.7

   = 9.2 + 2.3 = 11.5

   10 15 − 11.5 = 7.8

   He had 7.8 litres

Activity

1. Workout: 23.9 - 33.2 + 54.4
2. Work out 4.8 x 0.3 ÷ 0.2 + 3.6

3. Workout: (5.4 + 1.8) ÷ 0.3 x 0.2.
4. Work out: 3.6 x 1.6 ÷ 0.3 - 2.1
5. Daddy bought 25.5 kg of meat, he gave 8.25 kg to Aunt and 4.5 kg to uncle. How many kg did he remain with?
6. A tailor bought 3 rolls of fabric each 2.25 m long. He cut the rolls into pieces of 2.5 m each. How many pieces did he get?

SET III

MATTER AND ENERGY
SOUND AND ENERGY
SOUND

Sound: This is a form of energy produced by the vibration of objects.

Vibration

Vibration: This is the movement of an object to and fro or up and down. **Kinds of sound**

(i) Music (ii) Noise

Music: This is organized sound with regular intervals.

Noise: This is disorganized sound with irregular intervals.

Sources of sound (places or things where sound is produced) (i) Natural sources of sound.

(ii) Artificial sources of sound.

Natural sources of sound.

These are sources that exist naturally.

Examples of natural sources of sound.

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- Rainfall
- Wind
- Waterfalls
- Earthquakes
- Erupting volcano
- Grasshoppers and crickets
- Thunder
- Birds
- Bees and mosquitoes
- All mammals

How do the following living things makes sound?

a) **Mammals:** Through vibration of their vocal cords

b) **Birds:** Through vibration of their rings of cartilage in the trachea (wind pipe).

c) **Mosquitoes and bees:** Through rapid flapping or motion of their wings which cause the air around to vibrate.

d) **Grasshoppers and crickets:** Through rubbing their hind legs against their vibrating wings to produce sound.

Artificial sources of sound.

These are sources of sound that are people made.

Examples of artificial sources of sound.

- Musical instruments
- Radios
- Generators
- Bells
- Aeroplanes
- Gongs
- Clocks
- Whistles
- Guns
- Cars etc

Types of sound:
- Loud sound
- Soft sound
- High sound
- Low sound

Activity:

1. Give the meaning of the following terms;
   a) Sound
   b) Vibration
   c) energy
2. Give the difference between music and noise.
3. How is a mosquito able to produce sound as it flies?
4. In which way does a person produce sound?
5. Mention two examples of artificial sources of sound.

MUSICAL INSTRUMENTS

Groups or types of musical instruments.

a) Percussion instrument
b) String musical instruments
c) Wind musical instruments.

Percussion musical instruments

These are musical instruments that produce sound by vibration of their surfaces when stuck (hit), beaten or played.

Examples of percussion musical instruments.

- Drums - Shakers
- Xylophones - Bells
- Rattles - Thumb piano

Xylophone drum

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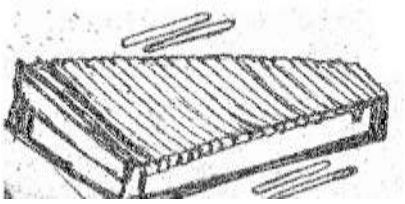
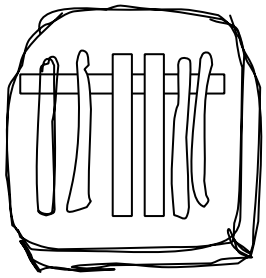


Thumb piano



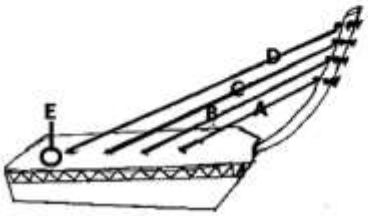
String musical instruments.

These are musical instruments which produce sound by the vibration of their strings when plucked.

Examples of string musical instruments.

- Guitar - Tube fiddles (endingidi)
- Bow harp (adungu) - Bowlyre (Enttongoli)
- Violin

Bow harp



bowlyre

violin

Tube fiddle

guitar

Wind musical instruments.

These are musical instruments that produce sound by vibration of air blown in them.

Examples of wind musical instruments.

(I) Flute

(II) Trumpet

(III) Horn

(IV) Organ

(V) Bugle

(VI) Saxophone

(VII) Horn

(VIII) Pan pipes

(IX) Recorders

(X) Whistles

Draw diagrams of the above instruments.

Activity

1. How does each of the following produce sound?
   a) Guitar
   b) Drum
   c) Piano
   d) Organ
   e) whistle
2. Name one percussion musical instrument made using animal skin.
3. Why is a flute grouped under wind instruments?
4. Give one reason why a drum is grouped together with a brass drum.

PRODUCTION AND TRANSMISSION OF SOUND

How sound is produced?

Through vibration of an object. When an object vibrates.

Note: When a substance is struck, particles vibrate on the position that is hit. Each particle passes vibrations to the next particle until sound is heard at a distance.

The vibration of particles forms waves. Sound waves travel through matter (solid, liquid or gas) and carry energy from the source to other points.

How does sound travel?

Sound travels by means of sound waves.

Why does sound not travel through a vacuum?

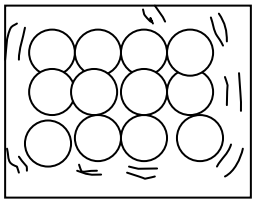
This is because a vacuum does not contain matter; therefore there are not particles on which sound can move.

A vacuum is space without matter.

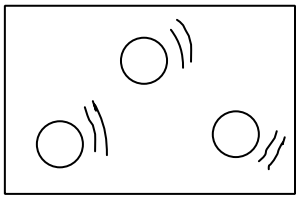
Transmission of sound in solids, liquids and gases.

Speed at which sound travels in substances is affected by how close particles of a substance are to each other.

Particles in solids are very close to each other, hence sound can easily be carried by vibration from one particle to another.



In gases, particles are far apart hence sound does not travel very well from particles to particle, hence sound travels slowest in gases.



Sound travels fast in gases, faster in liquids and fastest in solids.

The speed of sound in normal air or gas is 330 m/ sec. The speed of sound in liquids is 1484 m/sec. The speed of sound in solids is 1600 m /sec.

Therefore, sound travels fastest through solids, faster through liquids and fast or slower through air or gases.

Activity

1. How does sound travel from one place to another?
2. In which state of matter does sound travel?

   (a) Fastest? Give a reason for your answer.

   (b) Faster?

   (c) Fast or slowest? Give a reason for your answer.

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PITCH, VOLUME AND FREQUENCY OF SOUND.

Factors that affect the speed of sound.

a) Temperature c) Altitude

b) Wind d) Heat

Wind: Wind carries sound further if it is blowing in the same direction; but if it is blowing against the sound it obstructs the sound waves.

Temperature: During the night when the temperature is low, the waves travel very near the ground level. This is why we hear very clearly and easily at night than during the day.

Altitude: Sound waves move easily along a lower altitude than climbing or going up a hill or mountain. This is why someone at the lower end on a hill can hear properly someone at a higher level but the one on a higher level cannot easily hear sound properly from someone at a level lower than him.

Heat: The heat of the day makes the sound waves rise high making if difficult to hear.

Pitch of sound

Pitch is the highness of lowness of sound. It is the sharpness or mildness of sound.

What determines the pitch of sound? (Factors determining the pitch of sound).

1. Size of a vibrating object.
2. Tension of the string (in the vibrating object).
3. Length of a vibrating object.
4. Frequency
5. Nature of the vibrating material

6. Thickness or thinness of the vibrating material.

Size of a vibrating object.

A small object produces a high sound while a big one produces low sound. Smaller objects produce faster vibrations than bigger ones. The faster the vibrations, the higher the sound. The slower the vibrations the lower the sound.

Tension in the vibrating object.

Tension refers to tightness or looseness of an object. A tight object produces a higher pitch while a loose one produces a lower pitch.

Length of a vibrating object.

Long strings produce low sound while short strings produce high sound.

Nature of the vibrating material

The type of material used determines the pitch of sound e.g wood, plastic or metallic objects produce different pitches if they are of the same size and length.

Frequency: When the frequency is high, the pitch of sound produced is high.

Volume of sound

This refers to the loudness or softness of sound.

Frequency is the number of times an object vibrates per second.

a) High frequency produces high pitched sound.
b) Low frequency produces low pitched sound.

Waves of a high pitched sound, faster vibrations, high frequency.

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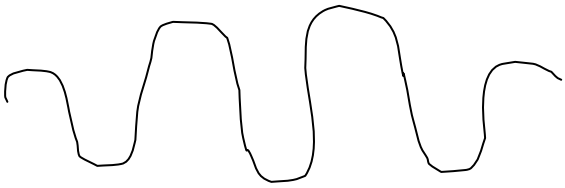
Waves *of a low pitched sound, slower vibrations, low frequency.*

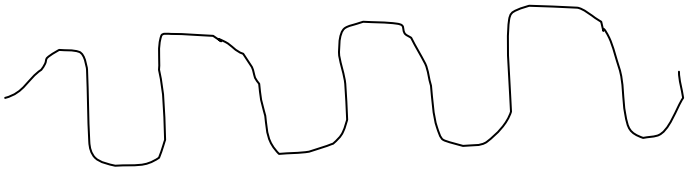


What factor does volume of sound depend on?

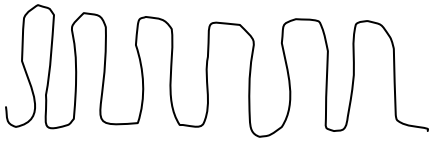
The volume of sound depends on its amplitude.

Amplitude: This is the width of vibrations or sound waves. The greater the amplitude, the louder the sound, the smaller the amplitude, the softer the sound.

Soft sound, small amplitude.



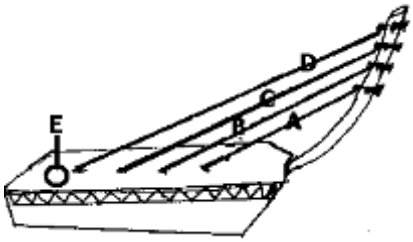
Loud sound greater amplitude.



PITCH OF SOUND.

Practical activity (a).

Below is a bow harp (adungu).



Pluck strings A, B, C and D one at a time.

1. (a)Which of the strings above produces sound of highest pitch?

(b) Give a reason why the string you stated in (a) above produces high pitched sound.

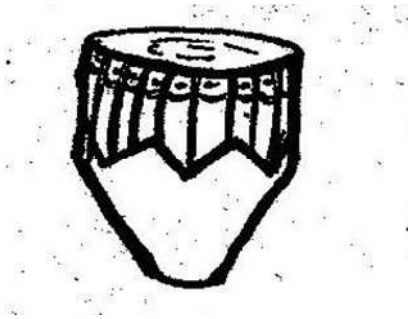
2. (a) Which string produces the lowest pitched sound?

(b) Give a reason to support your answer.

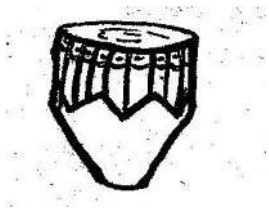
Practical activity (b).

Drum A is bigger. It also has a wider surface. Drum B is smaller. It also has a smaller surface.

A



B

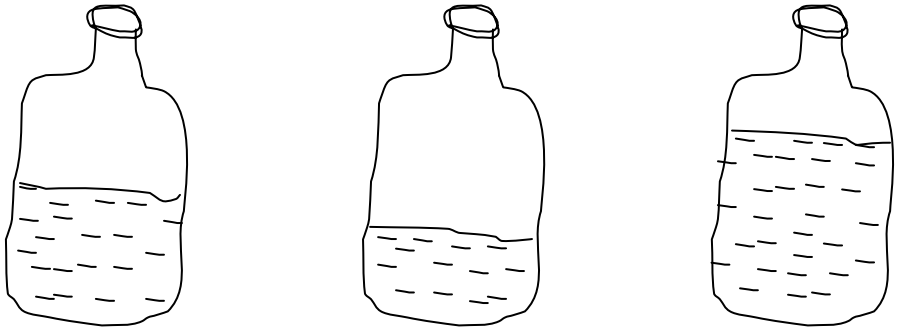


a) Which of the drums produces a lower pitch of sound? Give a reason for your answer.
b) Why do the two drums produce different sounds?
c) Which drum will produce sound of a higher pitch of sound? Give a reason for your answer.
d) Why are drums put under sunshine before playing?

Practical activity (c)

An experiment to show pitch of sound.

A B C



1. Get three bottles of the same size.
2. Pour water into them at different levels as shown in the diagram below.
3. Blow air into each bottle, one at a time. Compare the pitch of bottle A, B and C and fill in the table.

Bottle	**Pitch produced (high or low)**	**Reason**
C		
B		
A		

Question: Explain how you can make a test tube produce a high pitch?

ECHOES

An echo is a reflected sound. Echoes are formed when the sound waves hit a barrier of an obstacle.

Places where echoes can be heard.

(i) Empty rooms

(ii) Thick forests

(iii) Radio and TV studios

(iv) Valleys

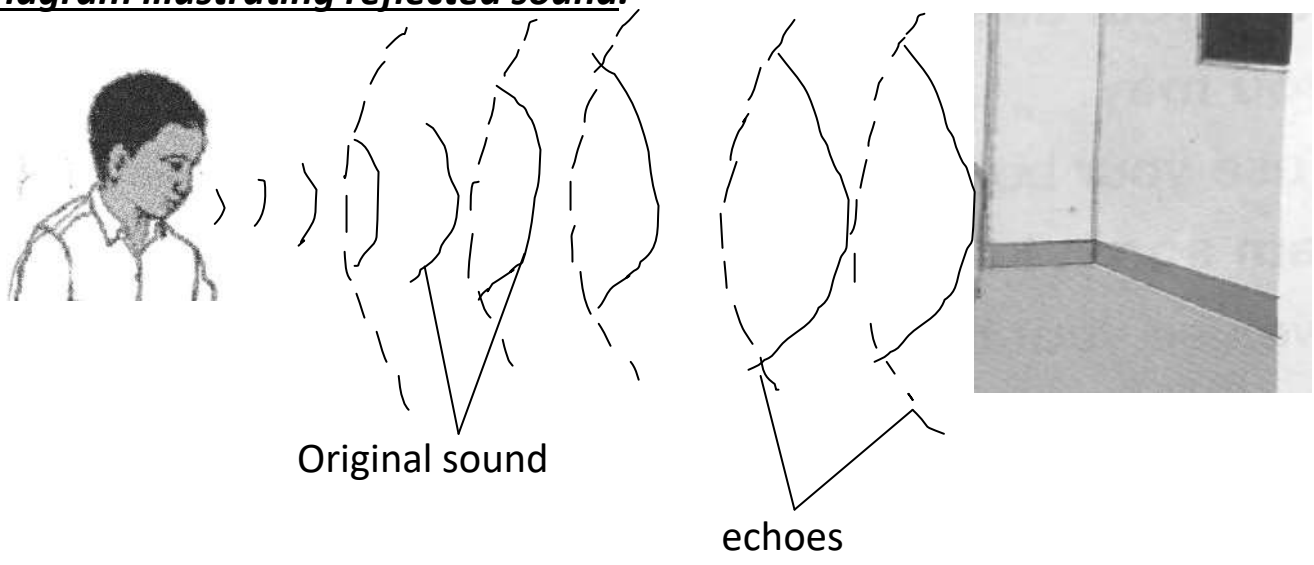
(v) Caves

(vi) Theatre

(vii) Cinema

(viii) Music recording studios

Diagram illustrating reflected sound.



What kind of surfaces produce the best echoes?

- Smooth hard surfaces
- Soft surfaces absorb sound.

How are echoes reduced in radio TV studios, theatres and cinema halls?

By covering the walls with soft porous materials to absorb sound e.g. soft boards, thick and heavy curtains.

Examples of soft porous materials which can be used to reduce echoes in buildings.

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(i) Soft wood (ii) Soft boards
(iii) Rubber sheets
(iv) Woolen carpets (v) Cloth curtains.

How do soft porous materials help to reduce echoes in building?

Soft porous materials absorb sound waves and prevent reflection of sound.

Why are words in an echo not heard clearly?

The echo has a lower frequency than the original sound.

Advantages of echoes.

(i) Echoes are used by bats to find their prey and dodge obstacles in the dark.

(ii) Whales and dolphins use echoes to get their prey and also know if there is an obstacle infront.

(iii) Blind people use echolocation to avoid obstacles on their way by the help of an echo stick.

(iv) Sailors or sea men use echoes (echo sounding) to measure the depth of the sea (water bodies).

(v) Pilots use echoes from hills and mountains to avoid accidents.

Note: The instruments used by sailors to measure sea depth is known as sonar or farthometer. It sends sound to the bottom of the water body, measures the time the sound takes to come back and then calculates the depth.

Disadvantages of echoes in nature.

(i) Echoes make hearing difficult, especially in the empty halls.

(ii) They cause irritating sounds and noise to the ears.

Activity:

1. Sailors need sound in order to travel safely.

(a) What form of sound do they need?

(b) What is the purpose of that sound.

(c) How do sailors use that sound?

2. Nakalule entered an empty hall. She shouted loudly and heard many other similar shouts after her own.

(a) What term refers to the other similar sounds?

(b) How are such sounds produced?

(c) Name two ways how such sounds can be controlled.

(d) Give two advantages of such sounds in everyday life.

3. Why are the walls of the theatres and studios covered with soft porous materials?

CALCULATIONS ON SPEED, TIME AND DISTANCE INVOLVING SOUND.

Speed of sound.

The speed of sound in air is taken as 330 metres per second (330m/sec).

To calculate distance travelled by sound, we use:

Distance travelled = Speed of sound x time taken

This means in 2 seconds, sound travels a distance given by

Distance travelled = speed of sound x time taken

= 330m x 2

= 660m

Distance travelled by an echo. The distance travelled by an echo is twice that from where the source of the sound is. This is because an echo is produced when sound waves have been reflected off a surface.

2 x distance btn. source of sound and receiver = speed of sound taken to hear an echo x Time

Example:

A gun is fired. If a man heard a gunshot after 3 seconds, how far was he from the firing point?

Distance = Speed x Time taken

= 330m x 3

= 330m x 3

= 990m

Example 2

A man was chopping wood using an axe. If it took 3 seconds fro him to hear the echo, how far was he from the reflecting surface?

2 x Distance = speed x Time taken

$2 \times \text{Distance} = \frac{330\text{m}}{\text{sec}} \times 3\ \text{sec}$

$2 \times \text{Distance} = \frac{330\text{m} \times 3}{2}$

$\text{Distance} = \frac{990\text{m}}{2}$

= 495 m

Example 3

A tree is seen falling a distance away. Then sound is heard after 4 seconds. How far is the tree from us?

2 x Distance = Speed x Time taken

$\cancel{2} \times \text{Distance} = \frac{330\text{m}}{\text{sec}} \times 4\ \cancel{\text{sec}}$

$\text{Distance} = \frac{330\text{m} \times 4}{2}$

Distance = 660 m

$$\text{Distance} = \frac{660}{2}$$

Activity

1. Kate shouted and heard the bounced sound after two seconds. How far was Kate from the object that bounced the sound?
2. Amooti was standing across a valley. If she heard the echo from the valley after 5 seconds, how far was she from the valley?

CALCULATIONS ON SPEED, TIME AND DISTANCE INVOLVING SOUND.

Example: I

A bomb went off at 900 m away. How long will it take to hear the sound?

Let time taken be y seconds.

Distance = speed x Time taken

900m = $\frac{330\text{m}}{\text{Sec}}$ x y

$$\frac{900\text{m}}{330\text{m}} \times \text{sec} = \frac{330\text{m}}{330\text{m}} \times y$$

$$\frac{300\text{sec}}{110} = y$$

$$\frac{30}{11} = y$$

$$Y = 2\tfrac{8}{11} \text{ seconds}$$

Example II

Kato was standing 990m away from Wasswa who called him by clapping. How long did it take him to hear the clapping?

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$= 990\text{ m} \div \frac{330\text{m}}{\text{Sec}}$$

$$= \frac{\cancel{990}\text{m}}{3} \times \frac{\text{sec}}{330\text{m}}$$

Time = 3 sec

Example III

Akot is standing across the valley which is 660m away from the cliff. If she shouts, how long does it take her to hear the echo?

$$\text{Time} = \frac{2 \times \text{Distance}}{\text{Speed}}$$

$$= (2 \times 660\text{m}) \div \frac{330\text{m}}{\text{Sec}}$$

$$= 1320\text{ m} \div \frac{330\text{ m}}{\text{Sec}}$$

$$= \frac{\cancel{1320}\text{m}}{4} \times \frac{\text{sec}}{\cancel{330}\text{m}}$$
$$1$$

Time = 4 sec

Activity

1. Okello was standing 165m away from his father who called him by clapping. How long did it take him to hear the clapping?

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$= 990\text{m} \div \frac{330\text{m}}{\text{Sec}}$$

$$= \frac{990\text{m}}{3} \times \frac{\text{sec}}{330\text{m}}$$

Time = 3 sec

Example III

Akot is standing across the valley which is 660m away from the cliff. If she shouts, how long does it take her to hear the echo?

$$2 \times \text{Distance} = \text{speed} \times \text{Time}$$

$$\text{Time} = \frac{2 \times \text{Distance}}{\text{Speed}}$$

$$= (2 \times 660\text{m}) \div \frac{330\text{m}}{\text{Sec}}$$

$$\frac{1320\text{m}}{4} \times \frac{\text{sec}}{330\text{m}}$$

$$\text{Time} = 4 \text{ sec}$$

Activity

1. Okello was standing 165m away from his father who called him by clapping. How long did it take him to hear the clapping?
2. Ssekitto was chopping wood with an axe. He was 495m away from the reflecting surface. How long will it take him to hear the echo?

$$\text{Time} = 2 \times \frac{\text{Distance}}{\text{Speed}}$$

$$\text{Time} = 2 \times \frac{\text{Distance}}{\text{Speed}}$$

$$\text{Time} = (2 \times 495\text{m}) \div \frac{330\text{m}}{\text{Sec}}$$

$$= 990\text{m} \div \frac{330\text{m}}{\text{Sec}}$$

$$= \frac{\cancel{990}^{3}\text{m}}{1} \times \frac{\text{sec}}{\cancel{330}\text{m}}$$

$$\text{Time} = 3\ \text{sec}$$

STORING AND REPRODUCING STORED SOUND

Storing and reproducing stored sound.

Sound energy can be stored and later reproduced for future use and reference.

Methods of storing sound.

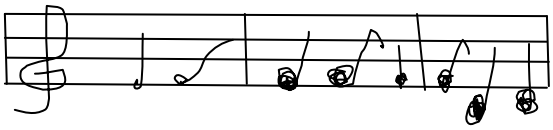
(i) By writing (Notation method).

(ii) By recording method.

Sound energy can be stored by notation. Notation means writing sound in form of symbols or syllables instead of words.

Types of notation

a) Staff notation (symbols used)



b) Sol-fa notation (syllables used) s/m:d:s/m:d:s/m:-:-/d:-:-/r:r:r/r:-:r/m:-:-/-:-:s How is sound stored by writing (notation) reproduced?

(i) By singing or reading solfa.

(ii) By playing musical instruments.

Recording:

To store sound by recording, a machine is used to transform the sound waves into an electrical form.

Devices used to store sound by recording.

- Magnetic tapes
- Compact discs (CDs)
- Digitals video Discs (DVDs)
- Cassette tapes
- Video tapes
- Vinyl records
- Floppy discs
- Flash discs
- Film strips
- Mobile phones / cell phones
- Memory cards
- Computer diskettes
- Mp3 / MP4 discs

How is sound stored by recording reproduced? By playing back the devices which store sound / re-playing.

Devices used to reproduce stored sound.

(i) Radio cassettes (vi) Video decks

(ii) DVD players (vii) Video disc players

(iii) CD players (viii) Grammo phones

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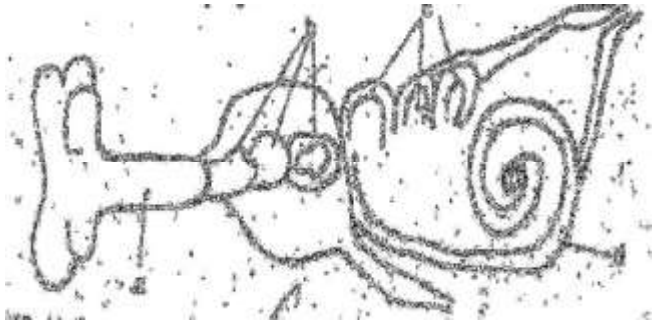
(iv) Cell phones (ix) Film projectors
(v) Computers (x) Record players

Activity

1. (a) Write two ways of storing sound.
   (b) State any four devices on which sound can be stored for future references.
2. State how stored sound in solfa notation can be reproduced.
3. Mention four devices that can reproduce stored sound.
4. Name one device used to reproduce sound stored by solfa notation.
5. Give two importance of sound energy in the environment.

THE MAMMALIAN EAR

Structure of the mammalian ear.



The ear is made of three regions.

1. Outer ear
2. Middle ear
3. Inner ear

<u>The outer ear</u>:

It consists of the following parts: Pinna and Auditory canal.

Part	**Function**
Pinna	It collects sound waves
Auditory canal	It directs sound waves to the ear drum

<u>The middle ear</u>:

It consists of the following parts; ear drum, ossicles, malleus (Hammer), incus (Anvil), Stapes (stirrup).

Part	Function
Ear drum	It vibrates as it receives sound waves and
	transmits them to the ossicles. The ear drum is made of thin memberance which is sensitive to sound waves.
Ossicles	These are three small bones found in the middle ear. **H** - Hammer **A** - Anvil **S** - Stirrup **M** - Malleus **I** - Incus **S** - Stapes The ossicles transmits and amplify vibrations produced by the ear drum across the middle ear to the inner ear.
Eustachian tube	It balances air pressure between the ear and the atmospheric pressure. -Balances the pressure on both sides of the ear drum.

The inner ear

This is a fluid – filled area consisting of the cochlea and semi-circular canals, auditory nerves.

Part	Function
Cochlea	It receives sound vibrations from the ossicles and converts them into nerve impulses (sound signals).
Semi circular canal	For body balance and posture

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Auditory nerves	They send nerve impulses to the brain for interpretation.

HEARING PROCESS

How are we able to hear?

(i) The pinna collects sound waves and directs them to the auditory canal as they strike the ear drum. The pinna is folded to increase its surface area for collecting sound waves.

(ii) The ear drum vibrates and the sound vibrations shake the malleus, incus and stapes.

(iii) The ossicles (malleus, incus and stapes) vibrate and pass the vibrations to the cochlea in the inner ear.

(iv) The fluid in the cochlea vibrates and turns sound vibrations into nerve signals (impulses).

(v) The auditory nerves pick up the nerve signals from the cochlea and send them to the brain.

(vi) The brain interprets the nerve impulses and sends the message back to the ear and then we are able to hear an identify different sound. **Activity**

1. What are the two main functions of the ear?
2. How is the eardrum adapted to its function?
3. What general name is given to the three bones found in the ear.
4. What part of the ear balances the air pressure between the ear and atmospheric pressure?
5. State the difference between semi-circular canal and Eustachian tube in terms of function?
6. Name the part of the ear where the sound vibrations are converted into nerve impulses.

DISEASES AND DISORDERS OF THE EAR.

Common diseases of the ear (Ear infection).

1. **Otalgia** (Ear ache): It is caused by bacteria. It affects the middle hidden part of the ear connected to the Eustachian tube.

Signs and symptoms of otalgia.

- Cold or stuffy or blocked nose in children.
- Fever
- Pus discharge from the ear
- Child often cries while rubbing the ear.

Control and treatment measures for otalgia.

(i) Treating infected people with antibiotics.
(ii) Infected children should not blow their nose hard.

2. **Otitis**

It is caused by bacteria, fungus or mechanical dangers.

(a) Otitis externa -- Bacterial infection of the outer ear.

Signs and symptoms of otitis externa.

(i) Inflammation (swelling) of the outer ear.
(ii) Wounds appear on the pinna.
(iii) Pus is seen on the wounds.

(b) **Otitis media**

Signs and symptoms of otitis media.

(i) Inflammation of the middle ear.
(ii) Severe pain in the middle ear.
(iii) Pus discharge from the semi-circular canals.
(iv) Child cries and keeps on pulling the ear.

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(c) **Otitis interna**

Signs and symptoms of otitis interna.

(i) Pain in the inner ear.
(ii) A thick sticky and smelling pus drains from the ear.
(iii) Red and painful pinna.

How can otitis be controlled?
Take the infected person to a health worker for treatment.

Ear defects / disorders of the ear.

a. Permanent deafness

This is a condition when one cannot hear completely and cannot be corrected.
Permanent deafness may be inherited from parents which causes a child to be born when it is deaf.
N.B: Permanent deafness can also be caused by rapture of the ear drum.

3. **Partial deafness**

   Partial deafness is a condition in which a person is unable to hear properly. This usually results from having too much wax in the auditory canal.

   Correction of partial deafness

   - Remove the ear wax using ear buds.
   - Remove the wax using a syringe filled with warm water. This is called ear syringing.

4. **Sensory deafness**

   This is a condition where the affected person cannot tell the difference between sounds i.e. the person hears but cannot understand.

   Causes of sensory deafness

   (i) Old age
   (ii) Diseases or injury of the auditory nerves.
   (iii) Serious fracture of the skull.

How to control sensory deafness.

(i) Having a balanced diet enables one keep healthy even at old age.
(ii) Treat any ear infection as soon as the symptoms are noticed.
(iii) Avoid travelling in vehicles which are under bad mechanical conditions.

WAYS OF CARING FOR OUR EARS.

COMPARISON OF HEARING ORGANS IN OTHER ANIMALS.

Ways of caring for our ears.

(i) Use soft material to clean the ear. Sharp objects can break the ear drum.
(ii) Wash the ears everyday with soap and clean water.
(iii) Avoid listening to very loud sounds.
(iv) Avoid boxing each other on the ears.
(v) Remove excess wax from the external ear to prevent temporary deafness.
(vi) Treat infections of the ear.
(vii) Have regular checkups (health examination).
(viii) Don't allow children to push foreign objects like seeds into the ears.

Importance of wax found in the ear.

a) It traps dust and some foreign bodies in the ear.
b) It cleans the ear canal.
c) It protects the ear against infections.
Wax contains chemicals that kill germs.

Note: Too much wax can lead to partial deafness.

Comparing hearing organs of different animals.

a) *Hearing in fish:*
Fish use lateral line to detect and pick up sound vibrations in water.

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b) *Hearing in snakes:*
Snakes do not have actual ears, but they have inner ear systems such as cochlea in mammals. In snakes, the cochlea is connected to jaw bones and enables it to sense ground vibrations.

c) *Hearing in birds:*
Birds have ears covered by soft feathers called auriculars which protect ears and are used to direct sound into their ears.

d) *Hearing in insects:*
Some insects like mosquitoes collect sound vibrations using their antennae (feelers). Others like butter flies, moth and caterpillars use small hairs called setae found on their body surfaces to pick sound vibrations.
Adult butterflies also detect sound vibrations through veins on their wings.

e) *Hearing in amphibians:*
All amphibians have ears. The hearing organ for amphibians is called amphibian papilla.

Activity:

1. State one importance of wax in the ear.
2. State one danger of too much was accumulating in the ear.
3. State two ways in which we can care for our ears.
4. Why do people who work in noisy places put on ear plugs?
5. Why is it dangerous to remove wax from the ear using sharp objects?

For the questions given, use the correct form of the word in brackets to complete the sentence.

1. The ministry of …… is recruiting able young men to the UPDF. (defend)
2. Some of Peter's …… live in America. (relate)
3. The day is ……today. (cloud)
4. The quadruplets have just ……the dining table. (lay)
5. My cousin ……last Saturday. (marry)
6. Nalule has …… the best dress for the party. (choose)
7. Our grandfather is the …….. of all our relatives. (old)
8. Hannah is the …….. girl in our uncle's family. (disciplined)
9. Some of our chairs are …… . (metal)
10. They have …… to the tailor. (speak)
11. The tailor …… Sewed the wedding gown. (skill)
12. People praise God because he is very …… to them. (mercy)
13. That hall was not …….. for the conference. (suit)
14. Kambeja's dress is …… than mine. (brown)
15. That old cat's fur is full of …….. . (louse)
16. Revising notes is …….. than watching cartoons. (good)
17. We should not speak …….. in public. (arrogant)
18. September is the …….. month of the year. (nine)
19. I …… for a vacancy in senior one at Gayaza High School last year. (seek)
20. One should always respect …….. in public. (self)

The table below shows people who had their marriages in different forms. Study it carefully and in full sentences answer questions that follow.

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NAME	DATE OF MARRIAGE	TYPE OF MARRIAGE	RELIGION	WITNESS
ONEKA	30/4/2020	CIVIL	CATHOLIC	RDC-KLA
AKELLO	15/6/2020	CUSTOMARY	PROTESTANT	
BATTE	20/5/2020	HOLY MATRIMONY	CATHOLIC	BISHOP TAKA

Questions:

1. How many people got married?

   ……

2. When did Oneka marry?

   ……

3. Who witnessed Akello's marriage?

   ……

4. What type of marriage did Batte take?

   ……

5. How many people were catholic?

   ……

6. What is holy matrimony?

   ……

7. Why is marriage important?

   ……

8. Where did Oneka's marriage take place?

   ……

9. What religion is Batte?

   ……

10. On which date was Akello's marriage?

    ……

Re-arrange these sentences below to form a good story.

1. A chairperson, a secretary, timekeeper and the main speakers.
2. The class monitor asks them to choose only one motion by raising up hands.
3. After all about the motion, pupils choose.
4. Before pupils hold a debate,
5. While the timekeeper allocates time to the speakers.
6. The class monitor organizes them to choose a motion.
7. The chairperson is the one who presides over the debate.
8. A motion is the topic to be discussed.
9. The motion which is carried is again written on the chalkboard.
10. Pupils suggest different motions.

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The sentences below are in wrong order. Re-arrange them to make a good story.

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1. The furniture he makes include; chairs, benches, desks, tables and beds.
2. James is a very famous carpenter in our sub-county.
3. They are made out of different types of wood.
4. When this wood is got from there, it is brought to the workshop.
5. He makes a lot of very beautiful furniture.
6. At the workshop, the wood is cut into different sizes of planks using a saw.
7. The wood is either Mvule, mahogany or ennongo obtained from forests.
8. The planks are then planned, shaped and later joined into frames using nails.
9. Finally, he puts the finished furniture on display.
10. After all that, the item made is polished and left to dry.

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Read the advertisement below and answer the questions in full sentences.

Vocational Courses

The office of the Chairperson L.C 1 Kibwa Village, informs all those whose daughters and sons completed Primary Seven and Senior four that they have Opened up a centre at Kira to teach and train students in vocational courses.

Each course is nine months for the award of a certificate.

Course	Fees
Carpentry	220,000/= per term.
Tailoring	200,000/= per term.
Baking	150,000/= per term.
Animal keeping	100,000/= per term.
Catering	250,000/= per term.

The new term will begin on 5th August, 2020. Register your children now.

Batenga Julie

Secretary Kibua village

6th July 2020

Questions:

1. What is the advertisement about?

   ……

2. Which people qualify for the course?

   ……

3. How long is each course?

   ……

4. Which is the most expensive course?

   ……..

5. Where has the centre been opened?

   ……

6. How much will a student taking baking pay per term?

   ……

7. When was the advertisement written?

   ……..

8. Who wrote the advertisement?

   ……

9. When will the new term begin?

   ……..

10. How many courses are offered at this centre?

    ……

Read the advertisement below and answer the questions about it in full sentences.

GREAT LAKES HOTEL

VACANCIES

One waitress and one chef

Applications are invited from suitably qualified Ugandans for the post of a Waitress and a chef at Great Lakes Hotel. Applicants should be between 18 - 25 yrs old.

Qualifications: At least a certificate in catering

Salary : Very attractive and includes free medical care and free Accommodation.

Handwritten applications with copies of certificates should be addressed to:

The Manager,
Great Lakes Hotels,
P. O. Box 723,
Kasangati.

To reach him not later than 30th Sept. 2020.

Questions:

1. Which hotel has put this job advertisement?

   ……

2. How many vacancies are available at this hotel?

   ……

3. What type of applications are needed?

   ……

4. Will a Congolese woman with a certificate in catering be given a job at this hotel? Give your reason. ……

   ……

5. How old should the applicants be?

   ……

6. What qualification is required for the advertised jobs?

   ……

7. Where is this hotel located?

   ……..

8. To whom should all the applications be addressed?

   ……..

9. Which posts are being advertised?

   ……..

10. What is the closing date for receiving applications?

    ……

Read the invitation card below carefully and answer in full sentences the questions that follow.

INTRODUCTION CEREMONY.

The family of Mr. and Mrs. Olum of Bunga with pleasure invite the company of

Mr. and Mrs.

Abdul Mukasa to the introduction ceremony of their daughter.

Aol Precious

The ceremony will take place on 6/10/2020 at their home in Bunga at

00 noon.

Your presence will grace the occasion.

Musoke Paul	RSVP	Jim Herald
0776430120		078195341

Questions:

1. What is the invitation about?

……

2. Where will the ceremony take place?

……

3. How is Aoal related to Mr. Olumu?

……

4. How many people are invited to this function?

……

5. Which two people should be contacted for further information?

……

6. Write the meaning of RSVP?

……

7. When will the function take place?

……

8. Where is Mrs. Olum's residence?

……

9. At what time will the function take place?

……

10. Write in full

Mr. …….

The notice below was displayed on the notice board of St. Patrick Primary Njala.

Examinations Examinations

All P. 7 candidates should be ready for these examinations papers to be written on Monday, 5th October, 2020.

Time : 9: 00 am - 11: 30 am 2: 00 pm - 4: 15 pm

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Subjects : SCIENCE ENGLISH

Venue : School Main Hall

NB: The first ten candidates will sit at the new desks.

Academic Board.

Questions:

1. What is the notice about?

   ……

2. How many subjects did the candidates sit that day?

   ……

3. When did the candidates sit the examinations?

   ……

4. On which day of the week were the examinations done?

   ……

5. How long will the science paper take?

   ……

6. Give another word to mean: Venue.

   ……..

7. Write in full.

   (i) st. …….

   (ii) NB ……..

8. Why do you think Matte will come early that day?

   ……

9. How many subjects are shown on the notice?

   ……..

10. Where was the notice displayed?

    ……..

Read the poem below and in full sentences answer the questions that follow.

THE VILLAGE WOMAN.

Look at the woman
Tired, hungry baby,
Climbing to her back And
she herself so tired.
She drags her legs.
The firewood bundled on her head weighs
heavily
But still she drags on.

Her skin once smooth and lovely,
Is now muddied and dark,
Her clothes dusty and torn
Her feet dirty and cracked
When she reaches home
Fetches water from the well
Lights fire, prepares the food.
There's more work in the field
Till the sun sets
Dear God! When will she rest?

Ezra.

Questions

1. What is the poem about?

   ……

2. Who is at the woman's back?

……..

3. Where does the woman live?

……

4. What is the woman carrying on her head?

……..

5. What is the current condition of the woman's skin?

……..

6. Where does the woman draw water from?

……

7. Why does the woman go back to the field?

……..

8. For how long does the woman work?

……

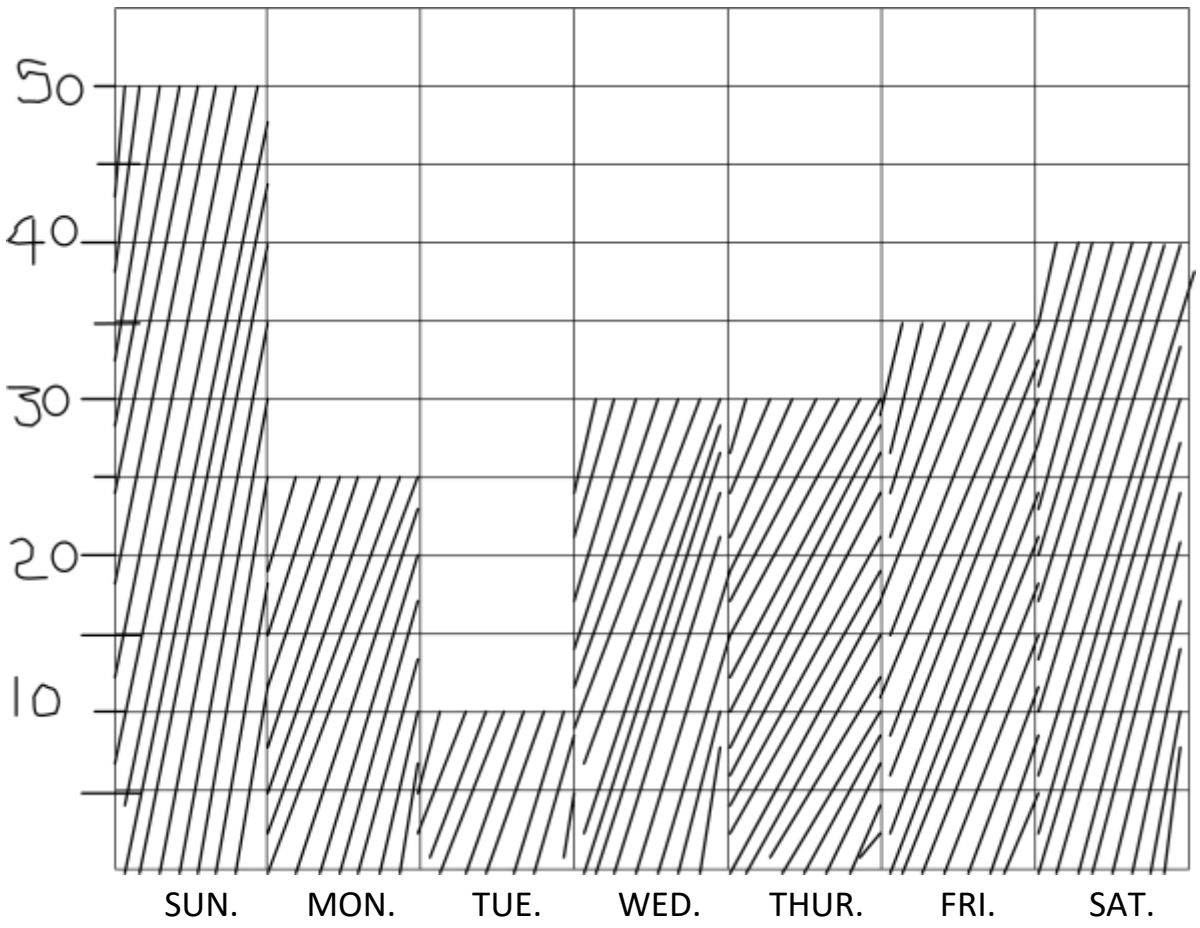
9. What is the writer complaining about?

……

10. Give another word to mean, "fetches".

……

The graph below shows how Joash Restaurant served its customers in the first week of July 2020. Study it and answer the questions.



Days of the week.

Questions:

1. What does the graph show?

   ……

2. On which day of the week did the restaurant serve the least number of customers?

   ……

3. How many customers did the restaurant serve on Thursday?

   ……

4. Why do you think many customers flocked the restaurant?

   ……

5. When did this restaurant take a record of the customers served?

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……

6. For which restaurant was the information recorded?

   ……..

7. How many customers were recorded in the week?

   ……..

8. How many more customers were served on Wednesday than Tuesday?

   ……

9. What was the total number of customers served on Sunday and Monday?

   ……

10. Write Sat. in full.

    ……..