

P.5 SCIENCE CLASS WORK WEEK THREE.

CROP GROWING

ROOT CROPS

Root crops are crops that store their food in the swollen underground roots.

Examples of root crops

- Cassava
- Sweet potatoes
- Carrots
- Yams

STEM TUBERS

Are crops which store their food in swollen underground stems.

Examples of stem tubers

- Coco yams
- Irish potatoes

Which food values do we get from eating mostly root crops.

We get carbohydrates.

How are the following crops propagated?

Crop	Propagation
Cassava	By planting stem cuttings
Sweet potatoes	By planting vines / stem cuttings
Carrots	By planting carrot seeds
Yams	By planting the roots

DEMONSTRATION ON HOW TO GROW DIFFERENT CROPS.

CARING FOR ROOT CROPS

1. By weeding the root crops (removing unwanted crops from the garden)

Importance of weeding

- To reduce competition for sunlight, water and mineral salts between weeds and crops.
- To prevent easy spread of pests and diseases from the weeds to crops
- Improve the crop yields

2. Pruning the crops (cutting off excess or poorly growing plants)

Importance of pruning

- To reduce over weight on the plants
- To prevent competition for sunlight carbon dioxide and oxygen
- Pruned materials can be used as mulches in the garden

Garden tools used for pruning crops

- Pruning saw
- Secateurs

3. Thinning (removal of excess or poorly growing seedlings / crops in a nursery bed /garden)

Importance of thinning

- Creates space for the crops to grow well.

- Improves on the yields.
- There is less competition for nutrients from the soil
- Reduces hiding places for the crop pests
- The crops are easily sprayed with pesticides.

How is thinning done in the garden

- By uprooting unwanted crops manually
- Watering the crops (providing water for the plants to prevent withering wilting /drying up)
- The garden tool used for carrying water and watering the crops is called the watering can.

NB: We can also use an over head sprinkler or dig channels to allow the flow of water to the crops in the garden.

4. Plant training /staking.

To grow in a desirable direction using strings and sticks

Examples of crops that can be trained /staked

- Tomatoes
- Passion fruits
- Vanilla

ACTIVITY

1. What are root crops?
2. give three examples of root crops.
3. what are stem tubers?
4. why is a sugar cane not grouped under stem tubers?
5. how are the following crops propagated
 - a) cassava
 - b) sweet potatoes
 - c) bananas

ROOT CROP PESTS AND DISEASES

Pests:

Pests are living organisms that destroy crops e.g. birds, worms, insects, rodents etc

Diseases:

Diseases are illness /sickness in living organisms i.e. plants and animals.

A TABLE SHOWING THE PESTS AND DISEASE THAT AFFECT VARIOUS ROOT CROPS

No	Root crops	Pests	Diseases
1.	Cassava	Whitefly, monkeys, cassava scale, green cassava mites, caterpillars, wild pigs, rodents e.g. moles	Cassava mosaic, leaf spot, bacterial blight
2.	Sweet potatoes	Eel worms, caterpillars, sweet potatoes, weevils, wild pigs, monkeys, rodents	Potatoes blight, bacterial wilt sweet potato mosaics
3.	Carrots	Aphids, moles, eel worms, cut worms, root knot, nematodes	Bacterial wilt, leaf spot, a leaf rust
4.	Yams	Termites, Locusts, Mole, Yam beetles	Leaf spot and leaf rust (fungi)

CHARACTERISTICS OF ROOT CROP PESTS

- Pests which damage the shoot system (leaves and stem /braches) have strong mouth parts to cut and chew the leaves.
- Pests which destroy the tubers have sharp claws which help them to dig the soil
- They have sharp incisors which bite or cut the roots /tubers.
- Other pests that damage root crops have fingers which they use to uproot the root a crop e.g. apes and monkeys.

Examples

- Locusts
- Caterpillars
- Army worms
- Sweet potatoes weevils
- Variegated grasshoppers

HOW TO CONTROL CROP PESTS

- By spraying the crops with pesticides.

Dangers of pests to crop farmers

- Pests damage farmer's crops
- Reduce on the crop yields
- Cause decaying root crops
- Wastes money to control

Uses of pests to farmers

- Some pests are a source of food to man e.g. grasshoppers and locusts.
- Some are eaten by farmer's poultry e.g. caterpillars

ACTIVITY

1. What is thinning?
2. Of what importance is thinning to a crop farmer?
3. Identify any one garden tool for pruning crops.
4. What are pests?
5. Give one way of controlling pests.

FOUR MAJOR CONTROL METHODS OF PESTS

1. Mechanical control method

E.g.

- physical guarding (Fencing the garden)
- Silting traps /scares
- Staying scary crows

The above methods can control pests like wild pigs, moles, birds, rodents etc

2. Biological pest control

This is where a predator is used to control the pests e.g. you can tame a cat to kill rats.

3. Cultural methods

- By practicing crop rotation
- The available pests of a particular crop
- Early planting and harvesting
- Practicing resident species /varieties
- Through proper control of weeds
- By planting disease free cuttings /vines

- Chemical control method; is a method where a farmer sprays pesticides /insecticides to kill the pests

HARVESTING AND STORAGE OF ROOT CROPS

Harvesting

Harvesting is the removal of mature and ready crops from the garden.

Storage

Storage is the keeping of harvested crops safely for future use

Sweet potatoes

- Mature within the first six months after planting.
- However, first growing varieties mature within three months
- Potato tubers do not mature at the same time, but keep growing as you harvest the ready /mature tubers.
- Ready sweet potatoes make cracks in the soil
- Farmers spot the cracks and harvest the ready tubers using sharp sticks or sharp pointed metal rods.
- Sweet potatoes tubes can as well be harvested at once using hoes mostly for scale.
- Harvested tubers can be peeled, cooked and eaten immediately
- The surplus can be sold in market or sliced into tiny pieces, dried and stored in cool /dry places.

Cassava

- Some varieties take 6 months to mature others take up to 1 year.
- During harvesting the whole plant is dug out using a hoe and tubers removed
- While preparing cassava for eating, you peel using a knife, wash, cook and eat.
- Surplus cassava can be sold off in markets or slices and dried before storage or dried slices can be pounded to make cassava bread or pan cakes, local beer (kwete), local glue.

Methods of storing root crops

- Temporary storage e.g. burying the tubes under wet soil
- Long time storage (after drying the slices) e.g. storing in granaries /sacks /slices (modern stores) silos

ACTIVITY

1. What is harvesting?
2. Why is dry season important to crop farmers?
3. Suggest one biological method of controlling crop pests.
4. Mention one method of harvesting crops.
5. Name the modern method of storing harvested crops.

KEEPING AND USING FARM RECORD

Farm records

These are details or information concerning all activities that take place on a farm.

Example of farm records used on root crops

- Farm inventory e.g. farm equipment size of lands.
- Cash record e.g. money spend or received when carrying out the project
- Non-cash records – unpaid for labour may be family members
- Records of production e.g. number of acres planted /map of the farm

Importance of keeping farm records

- To know the progress of the farm
- Proper records can be used to get loans in the bank
- To plan for the farm for future use
- To know whether the farmer is making profits or losses.

SPECIMEN OF FARM RECORDS SHEET

<i>Date</i>	<i>Crop planted</i>	<i>Date of weed control</i>	<i>Date of manuring</i>	<i>Date of harvest</i>	<i>Date of sale</i>
2/2/2005	cassava	3/3/2005	3/4/2005	7/7/2005	13/5/2005

SCIENCE CLUBS /SOCIETIES IN THE SCHOOL

The science club

Involve learners in science related activities

Examples of Science related societies.

- Wildlife clubs
- Red cross clubs
- Young farmers clubs
- Science contest
- Science exhibition
- Science quizzes
- Science projects
- Science paper presentation etc

Importance of science activities to learners

- Develop a positive attitude in learners towards science.
- Expose learners to the kind of work that can lead to their career
- Shape learners for their future career in the science field i.e. doctors, engineers, surgeons, dentists, electricians, and agriculturalist.

Wildlife club

Enables learners to learn more about uncultivated plants and wild animals that exist in the natural environment.

Roles of the wild life club

- Protecting the environment.
- Conserving the environment.
- Teaching or sensitizing others to protect or conserve the environment.

Activities done by the wildlife clubs in school

- Maintaining a free nursery in the school
- Tree labeling
- Establishing wood / tree projects
- Monitoring wildlife abusers e.g. poachers
- Bird watching
- Preventing water, air and soil pollution
- Setting up a botanical garden
- Construction of an aquarium

Aims of the science oriented clubs in school

- To promote /boost children's interests in the science subject
- To enable children to know how scientists work.
- To equip learners with knowledge and skills for their future career.
- To promote learning of science in the school.

The young farmers clubs

The young farmers clubs include young boys and girls in and out of school who are interested in farming.

Roles of the young farmers clubs

- To keep animals and grow crops.
- To teach other farmers better farming methods.

Qn: When are the activities of young farmer's clubs done?

- After school time

Qn: Under which department / ministry in Uganda are the young farmers clubs

- Department of agriculture

Role of the department of agriculture in young farmers clubs

- i. To unite all the young farmers' clubs in the country.
- ii. To set up competitions in school where prizes are given to winners.
- iii. Train and send technical people to teach and answer questions of the young farmers.
- iv. To teach young farmers better farming methods.
- v. To start money making and savings projects for self support.

Topical questions

1. How can root crops be cared by crop farmers
2. Give any two examples of stem tubers
3. State the importance of farm records on a crop farm
4. Identify the main role of the wildlife club in a school like greenhill
5. Which is the best season for crop growing
6. How are the following crops propagated
 - Sweet potatoes
 - Cassava
 - Carrots
7. Which food value is mostly obtained from root crops
8. Give the difference between a pest and a parasite.

BACTERIA AND FUNGI

Bacteria means a microscopic single celled organism that are present almost every where.

Places where bacteria are mostly found

- Animal bodies
- Contaminated water
- Soil
- Nodules of legumes
- Latrines
- Rubbish pits
- Air
- Contaminated food

How do bacteria reproduce

- 1) By cell division (binary fission)
- 2) By spore formation

Diagram

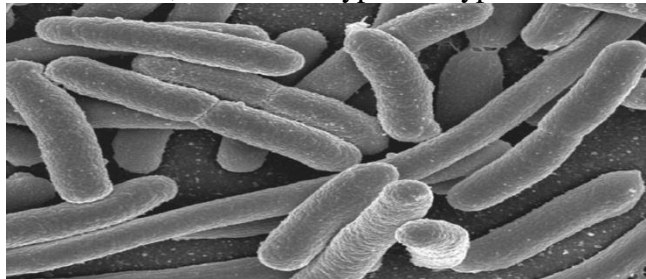


Types of bacteria

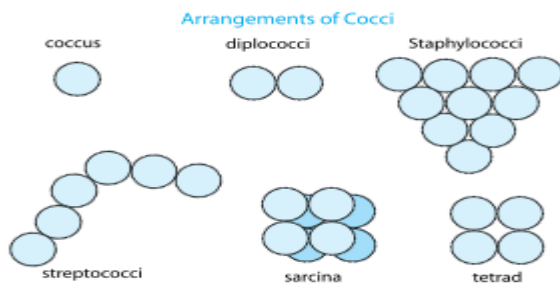
- i. Rod shaped bacteria (bacilli)
- ii. Spherical shaped bacteria (cocci)
- iii. Spiral shaped bacteria

1. Rod shaped bacteria (bacilli)

e.g bacillus anthracis for anthrax, salmonella typhi for typhoid



2. Spherical shaped bacteria (cocci) e.g staphylococci for boils, streptococcus for sore throat, diplococci



3. spirochaete for syphilis



4. Coma shaped bacteria (vibrios)



ACTIVITY

1. What are bacteria?
2. How do bacteria reproduce?
3. Identify one place where bacteria can be found.
4. In which way is reproduction in bacteria similar to that in fungi?
5. which type of bacteria course the following disease
 - a) Gonorrhoea?
 - b) Syphilis?
 - c) Cholera?

Importance of useful bacteria

1. Nitrogen fixing bacteria fix nitrogen back into the soil to improve soil fertility
2. Bacteria break or digest fibre food/ roughage / cellulose in the caeca of birds
3. Bacteria help in decomposition / rotting of dead plants and animals
4. Bacteria help to reduce on the amount of faeces in pit latrines as well as sewage tanks
5. Bacteria help in fermentation of beer, ghee, yoghurt and cheese.
6. Bacteria help in making humus (manure) in compost pits)
7. Bacteria help to reduce on the amount of garbage as they rot.

Dangers of harmful bacteria

1. Harmful bacteria cause diseases to both animals and plants.
2. Bacteria cause poor yields to crops
 2. Bacteria cause food poisoning
 3. contaminates food and makes it poisonous to human health
 4. Some cause diseases.

How to control dangers caused by harmful bacteria

- i. by preserving food(keeping food free from bacteria)
- ii. by observing proper food hygiene i.e. ensuring that food is kept in a clean environment and clean containers
- iii. by using antiseptics(drugs that kill germs on cuts and wounds)e.g. detol, saloon, hydrogen peroxide tincture of iodine etc
- iv. by sing disinfectants to kill bacteria in places like bacteria and reduce the bad smell e.g. harpic, jeyz , etc
- v. by using antibiotic (drugs used to kill bacteria in our bodies) inform of injections, tablets, capsules, syrups e.g. penicillin from penicillium) that was discovered by Alexander Fleming, etc
- vi. through sterilization of medical instruments e/g springs
- vii. through pasteurization (involves) heating the food stuffs to a high temperature and sealing it before suddenly cooling it)

it was discovered by Dr. Louis Pasteur to preserve milk. He also discovered the vaccines against anthrax and rabies.

FUNGI

Fungi are simple organisms that obtain their food from decaying plants and animal matter.

Fungi are saprophytes because they feed saprophytic ally (obtain soluble food from dead organic matter)

Examples of fungi

- Mushrooms
- Moulds
- Yeasts
- Puffball
- Toad stools (poisonous fungi)

Characteristics of fungi

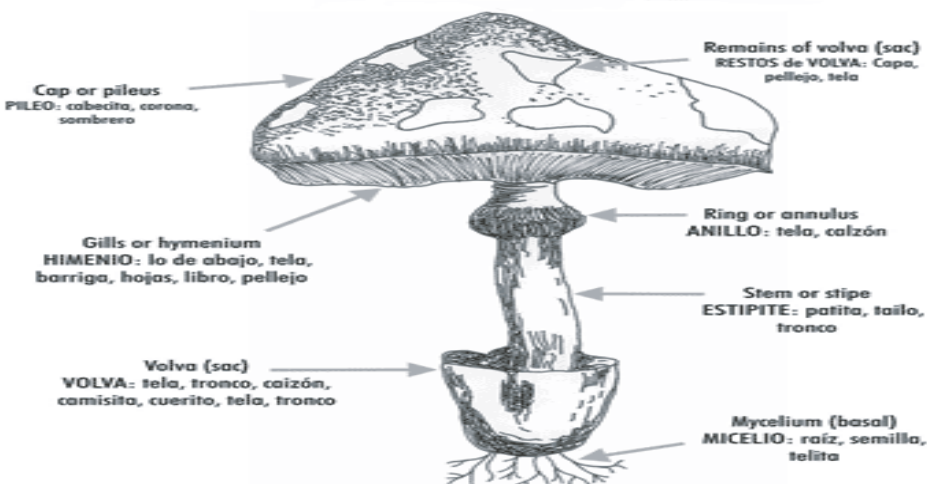
- Fungi exist in both as single celled (unicellular) or multicellular organisms.
- Fungi lack chlorophyll (they can make their own food)
- Fungi feed saprophytic ally or parasitically
- They have nuclei in their cells

Importance of fungi

- Some fungi like yeast are used to bake bread and cakes
- Some fungi like mushrooms are a source of food to man
- Some fungi like moulds (*penicillium rotatum*) are used to make medicine penicillium
- Yeast is used to brew local beer or ferment fruit juices to make wine
- Fungi help in decomposition of rubbish in rubbish pits to make humus
- Yeast is used to flavors cheese
- Yeast is a source of vitamin B that prevents beriberi

Mushrooms

Scientific and popular names for the parts of a mushroom



IMPORTANCE OF MUSHROOMS.

- They are eaten as food.
- Some mushrooms are sold to get money.

- Mushrooms are used for study purpose.

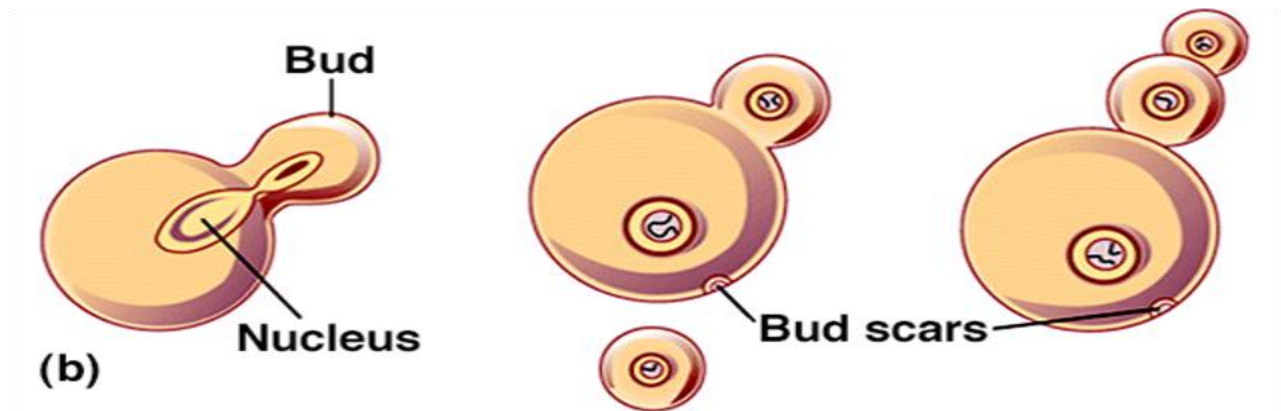
Activity

1. What are fungi?
2. How do fungi reproduce?
3. Give examples of fungi.
4. Draw a mushroom and name the cap, gills and stipe.

How do fungi reproduce?

Most fungi reproduce by means of **spores** unlike Yeast which reproduces by **budding**

Diagram



Danger of harmful fungi

- Harmful fungi cause food poisoning
- Harmful fungi cause a number of diseases to both plants and animals

Examples of fungal diseases in animals

- Ring worms (cause round patches on the skin)
- Athletes foot (attacks the skin between the toes)
- Thrush caused by candida
- Finger nail deformation

Examples of fungal diseases in plants

- Panama e.g. banana
- Cigarand rot
- Blast wilt
- Coffee berry disease (rust) coffee plant
- Root rot in tea plants.

How to control the dangers caused by harmful fungi

- Boiling milk and water before drinking.
- Reheating and warming cold food before eating it.
- Salting the food.
- Pickling – putting vinegar in edible vegetables and other foods.
- Avoid eating uncovered food.
- Spray plants with fungicides.

- Get early treatment for any fungal infection /disease.
- Sterilize all surgical instruments to kill all the germs.
 - Irradiation in canned foods.
- Avoid eating or catching poisonous fungi.
- Proper management of house refuse and rubbish
- Proper use of the latrine.
- Avoid sharing towels, socks, under wears etc.
- Use medicated soap to bathe e.g. detol , protex, etc.
- Use disinfectants in cleaning toilets e.g. jeyz.

Similarities between bacteria and fungi

- Both feed saprophytic ally
- Both cause fermentation
- Both can cause rotting /decomposition
- Some of them cause diseases while others are useful to man
- Some are single celled while others are multicellular

Differences between bacteria and fungi

- Bacteria reproduce by means of cell division (binary fission) while fungi reproduce by means of budding and spores.
- All bacteria are very tiny microscope while some fungi like mushrooms are big
- Bacteria reproduce much faster than fungi
- Some bacteria make their own food by combing some simple chemical substance while fungi cannot make their own food

Topical questions

1. How are bacteria different from fungi?

2. Where are bacteria found in our environment?

3. Name any one poisonous fungi

4. Give the three types of bacteria

5. Which bacteria do the following?

a) Add nitrogen back into the soil

b) Make food go bad

c) Cause typhoid

d) Cause cholera

6 Identify any two immunisable disease caused by bacteria

7 How do the following reproduce?

a) Yeast

b) Bacteria

8 Give the importance of fungi to people

9 How are bacteria useful to people?

10 In the space below, draw a mushroom and label all the parts

Mixture

A mixture is when two or more different substance are mixed together e.g. when we mix sand and cement we get concrete blocks

Dissolving substance/ solutes.

These are substances that dissolve when put in water/ any liquid after stirring. So, solutes are soluble in water or the liquid

Examples of solutes.

- Sugar
- Salt
- milk powder

Insoluble substances.

Substances which don't completely dissolve in any liquid or water.

e.g. sand, maize flour, stones etc

A suspension: is a substance where the solute does not completely dissolve in the solvent.

Solvent.

Is a substance in which a solute dissolves.

Examples.

- water
- petrol
- methylated spirit

Nb: Water is universal solvent because it dissolves almost all solutes.

solution.

Is a uniform mixture of a solute and solvent.

saturated solution is a solution which dissolves more solutes after heating it.

Super saturated solution is a solution which cannot dissolve any more solute even after heating it.

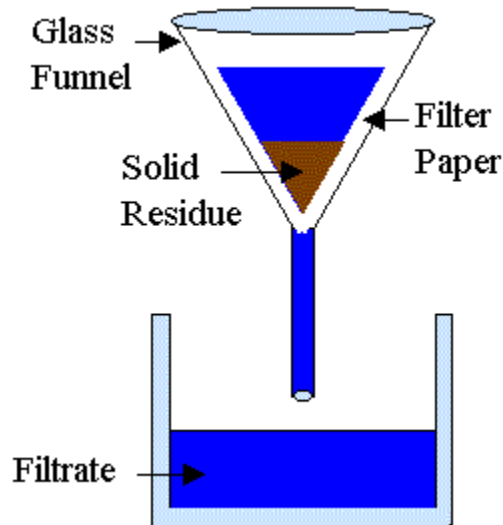
SEPARATION OF MIXTURES.

a. Filtration.

It is a process of separating solid particles from a liquid using a filter.

The solid particles that remain in the filter are called **residues**.

The liquid that passes through is called **a filtrate**.



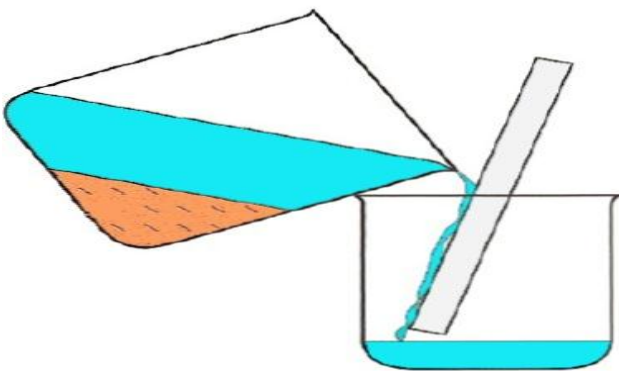
How filtration method can be applied in our homes.

- b. When separating passion, orange, etc fruit juice from the seeds.
- c. When separating clear water from muddy water.

LESSON 5

2. Decantation.

It is when solids particles are allowed to settle at the bottom of a liquid then a liquid is carefully poured off to separate it from the solid particles.



The solid particles that remain in the one container is called a **residue**.

The liquid that is collected in another container is called a **decantee**.

How decantation method can be applied in our homes.

1. When separating passion, orange, etc fruit juice from the seeds.
- d. When separating clear water from muddy water.

Qn: Why is it important for one to first shake a syrup before taking it?

For the medicine to mix with the liquid that has settled at the top.

1. Distillation.

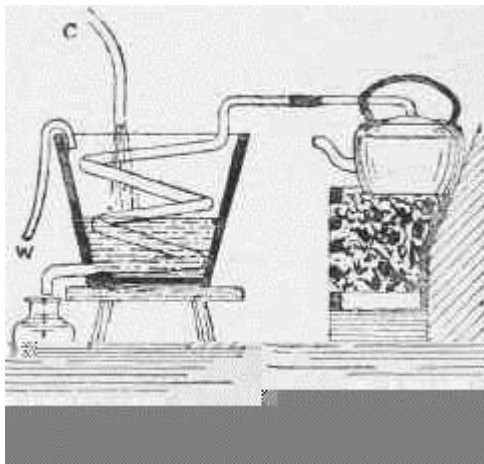
It is the making of dirty water pure by evaporation and condensation.

Nb: Distilled water is not good for drinking because it lacks mineral salts.

The substance that remains in the container is called **a residue**.

The substance that is collected in the second container is called **a distillate**.

Distilled water is used to mix drugs in hospitals.



Experiment on how to separate mixtures.

SEPARATION OF MIXTURES OF SOLIDS.

1. Floatation.

It is a method of separation of mixtures where one sinks and the other floats.

2. Using magnets to separate metallic objects from non metallic objects.
3. Hand picking / sorting.