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ANSWER BOOKLET

AGRICULTURE

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Strand 1 : Conservation of Resources

Controlling Soil Pollution

Activity 1- Page 1

1. Observe causes of soil pollution.

2.a) Use of chemical fertilizers and pesticides.

b) Improper disposal of plastic materials and containers.

3. a) Use organic manure instead of chemical fertilizers.

b) Proper disposal and recycling of plastic materials

Activity 2 -Page 1

(a) **Reusing plastic materials:** Reduces the amount of plastic waste that ends up in the soil hence minimizing pollution.

(b) **Organic farming:** Involves using natural manure and compost instead of chemical fertilizers to help maintain soil fertility and prevents contamination.

(c) **Proper waste management:** Ensures that waste is collected, separated, and disposed off correctly to prevent dumping of harmful materials into the soil.

Assessment Work- Page 5

1. Soil pollution is the contamination of soil by harmful substances such as chemicals, waste, or pollutants that reduce its fertility and affect living organisms.
2. • Proper disposal and recycling of waste.
   • Use of organic fertilizers instead of chemical fertilizers.
3. • Dumping household garbage and plastics on the ground.
   • Pouring used oil, detergents or chemicals into the soil.
4. Yes,soil pollution can affect the food we eat because plants absorb harmful chemicals from polluted soil, which can make the food unsafe for humans.
5. • Remove and properly dispose off the pollutants.
   • Add organic manure to improve soil fertility.
   • Plant cover crops to restore soil health.
6. • Animals may eat contaminated plants or grass and get sick.
   • Humans may consume polluted crops leading to diseases such as cancer or stomach problems.

Constructing Water Retention Structures

Activity 1- Page 5

1. The picture shows surface runoff where water is flowing over a farm after heavy rain, leaving waterlogged soil.
2. • It causes loss of topsoil and nutrients.
   • Leads to waterlogging that affects plant growth.
   • May carry fertilizers and pesticides into nearby water sources.
3. • By directing it into storage tanks, ponds, or trenches for later irrigation use.
   • By constructing terraces or contour bunds to help retain water for plants.

Activity 2 - Page 6

1. a) Water retention ditches:These are shallow trenches dug across slopes to trap and hold rainwater.They reduce soil erosion and allow water to slowly infiltrate the soil, improving soil moisture for plants.

b) Water retention pits:These are small, deep holes dug in the ground to collect and store rainwater run-off. The stored water seeps slowly into the soil, recharging groundwater and providing moisture for nearby crops.

c) Earth basins: These are shallow, circular or rectangular depressions built around plants or in fields to collect and hold surface run-off.The water retained in the basin infiltrates slowly, keeping the soil moist and reducing water loss through run-off.

2. a)They trap and hold rainwater, preventing it from washing away fertile topsoil.

(b) The stored water infiltrates the soil, maintaining moisture for longer periods.

(c) They reduce the need for frequent watering, saving time and water.

Practice Assessment - Page 12

1. Bananas, sweet potatoes, napier grass, sugarcane, arrowroots.

2.(a) These structures help capture and store surface run-off (rainwater that flows over the ground) so it can soak into the soil instead of being wasted.

(b) These are small, deep holes or basins dug in a field. They are designed to collect and hold a lot of rainwater. The water stays in the pit and slowly soaks deep into the ground, storing it for the crops to use later, especially during dry periods.

3. (a) Water retention ditch
   (b) It lets the water deep into the ground slowly to keep the plants hydrated.

4. It helps to ensure there is enough water for crops during dry seasons.

5.(a) Identify an appropriate site for constructing an earth basin.

(b) Clear the area where the basin will be constructed.

(c) Mark the shape: Choose a suitable size and mark the circle or square on the ground.

(d) Dig and remove soil from the marked area to create a shallow, depression where water can collect.

(e) Use the soil you dug out to build a low, raised wall around the edge of the depression to stop water from running out.

6. Jembe , Shovel or Spade, Wheelbarrow Measuring Tape or Rope

Conserving Food Nutrients

Activity 1- Page 13

1.(a) Wash vegetables before cutting to minimize loss of nutrients.

(b) Peel vegetables thinly because most of the nutrients are found under the skin.

(c) Cut vegetables into large pieces to retain nutrients.

(d) Avoid cooking vegetables for a long time using high temperatures to retain nutrients.

(e) Cover vegetables while cooking to avoid loss of nutrients through evaporation.

Activity 3 - Page 13

1. a) Cutting cabbage
   b) Washing tomatoes
   c) Cooking spinach

Practice Assessment - Page 19

1. You should cook vegetables for a short time to prevent the loss of heat-sensitive vitamins.
2. Use the least amount of water possible and use the water (broth) in which the vegetables were cooked in a soup
3. The small cutting exposes more of the vegetable's cells to air which can destroy some vitamins before cooking.
   A better alternative is to cut vegetables into larger pieces just before you start cooking.
4. • Steaming: The vegetables are cooked by steam not directly in water so the nutrients don't leach out.
   • Stir-Frying: This method uses a short cooking time and little oil, and constant stirring ensures the vegetables cook quickly and evenly.
5. • Reducing the amount of water used in cooking.
   • Reducing the cooking time
   • Reducing the surface area of the food that is exposed.
6. Yes, Conserving vitamins and minerals in vegetables is important because these are essential nutrients that our body need to stay strong and healthy.
7. (a) True (b) False
   (c) True (d) True (e) False
8. Wash vegetables quickly under running water instead of soaking them.
   Peel thinly as nutrients are concentrated near the surface.
   Cut them into large pieces just before you start cooking.
   Cook quickly and use little water.
   Serve immediately.
9. Conserve nutrients while preparing and cooking vegetables.

Growing Trees

Activity 1 - Page 20

1. Picture A shows a landscape with trees and grass, while picture B shows a barren, dry landscape with no trees.
2. Picture A is more attractive and beautiful because the presence of trees and grass makes the environment look green, lively and healthy.
3. Picture A likely experiences more rainfall and fresh air.
4. Picture B is where soil erosion can easily take place. The absence of trees means there are no roots to hold the soil together, making it exposed to erosion by wind and water.
5. They prevent soil erosion, produce oxygen, provide habitats for wildlife, help regulate the climate and contribute to the water cycle.

Activity 2 - Page 20

i) - Trees provide shade to animals and human beings.
- Trees prevent soil erosion.
- Trees provide food to both humans and animals.
- Trees provide support for climbing plants.
- Trees shed leaves on the ground, they decompose and form organic matter which adds nutrients to the soil.

Practice Assessment - Page 24

1. Spade, watering can, tree seedlings, organic manure
2. (a)Seeds Seedlings Cuttings
   (b) Mulching-involves covering the soil around seedlings with materials such as dry grass or leaves to retain moisture.
   Weeding- the removal of unwanted plants to reduce competition for nutrients and water.
   Watering-Watering is done regularly to supply enough moisture to trees
3. a) Regulating climate by storing carbon and releasing oxygen.
   b. Preventing soil erosion by holding soil together.
   c. Trees help water soak into the ground reducing the run off.
4. a) Beautifying nature.
   b) Cooling the environment.
   c) Retaining water in the soil
   d) Releasing oxygen.

Soil Conservation Measures

Activity 1 - Page 25

1.- It prevents soil erosion.
- It protects the topsoil, which has nutrients needed for plant growth.
- It maintains soil fertility for better crop production.
- It reduces pollution and degradation of the land.
- It supports sustainable farming for future generations.
- It prevents loss of soil organisms that help in decomposition and soil health.

2.- Terracing - Contour farming
- Planting cover crops - Mulching
- Agroforestry - Crop rotation
- Strip cropping - Grassed waterways
- Stone lines / trash lines
- Soil bunds
- Minimum tillage

Activity 2 - Page 25

(a) Strip cropping- Growing crops in alternating strips (e.g., maize and beans) to reduce soil erosion by slowing down wind and water movement.

(b) Stone lines- Lines of stones arranged along the contour to slow runoff water and trap soil being carried away.

(c) Soil bunds- Raised soil embankments built along the contour to hold water, reduce runoff, and prevent erosion.

(d) Grassed waterways- Channels or pathways planted with grass to safely guide excess water through a farm without eroding the soil.

(e) Trash lines- Lines made of crop residues (trash) placed along the contour to trap soil and slow runoff.

2. Write brief notes. (Learners simply summarise the points above.)

Check your progress Page 31-32

1. Soil conservation is the practice of protecting and managing soil to prevent erosion, maintain fertility, and ensure sustainable agricultural production.
2.- Soil conservation is important because it:
   - Prevents soil erosion.
   - Protects the topsoil, which contains nutrients needed by plants.
   - Improves and maintains soil fertility.
   - Supports good crop production.
   - Prevents land degradation and pollution.
   - Ensures sustainable farming for future generations.
3. From left to right
- Terracing- Steps or terraces cut on slopes to reduce erosion.
- Soil bunds - are small embankments made of soil built along contour lines.
- Strip cropping- Planting crops in alternating strips to reduce soil erosion.

4. (a) Grassed waterways- Grass is planted in natural water channels or drainage paths. The grass slows down moving water and prevents it from eroding the soil. It safely directs water through the farm.

(b) Soil bunds- These are raised embankments of soil built across slopes along the contour. They slow down runoff water, reduce soil movement, and help water soak into the ground. This reduces erosion and conserves moisture.

(c) Strip cropping- Crops are planted in alternating strips (e.g., maize strip, beans strip). The strips slow down wind and water, reducing erosion. Some strips (like legumes or grass strips) protect soil better than others.

(d) Trash lines- are made by placing crop residues (such as maize stalks, grass, or other plant remains) along the contour of a slope. They slow down the speed of runoff water, trap soil particles being washed away, reduce soil erosion and improve soil moisture retention.

(e) Stone lines- Stone lines are rows of stones arranged along the contour across a slope. They slow down water movement, trap eroded soil, reduce soil erosion and help water seep into the soil

5. Draw and colour a farm model

6. - It helps learners and farmers understand soil conservation methods better. A model shows how the methods work in a simple, visual way.
- It helps farmers apply these methods correctly on actual farms. The model demonstrates the right layout and positioning.
- It helps in training and teaching soil conservation practices.
- It helps in planning before applying the real structures on the farm.

Water Harvesting and Storage

Activity 1- Page 32

1. - Roof catchment systems *(collecting rainwater from roofs into tanks)*
   - Surface runoff collection
   - Dams
   - Water pans
   - Ponds
   - Shallow wells
   - Trenches
2. - Water tanks
   - Dams
   - Water pans
   - Ponds
   - Underground tanks
   - Drums
   - Reservoirs
3. Share suggestions
   (Group discussion - no written answer needed.)

Activity 2 - Page 32-33

1a). Shallow water pans- These are shallow excavated depressions used to collect and store rainwater. They hold water for irrigation, livestock, and sometimes domestic use. They are easy and cheap to construct.

Water ponds- Deeper and bigger than water pans. They store more water and

last longer. Useful for irrigation, fish farming, and livestock watering. Suitable water containers- These include plastic tanks, drums, jerrycans, clay pots, and metal tanks. Used to store harvested rainwater, especially from roofs. Good for domestic use, such as washing, cleaning, and cooking (when treated).

2. - Roof water Harvesting. Rainwater is collected from the roof of a building. The roof has gutters that direct water into a storage container or tank. This method is very common in homes and schools.
   - Water Pond. Rainwater or run-off water collects in a pond dug in the ground. It's an open water storage point surrounded by soil.
3. Water Pan. This is a large shallow excavation used to trap and store surface run-off water. It holds more water than a pond and is used mainly for farming and livestock.

Assessment Work- Page 40

1. Gutters are installed along the eaves of a roof to collect rainwater runoff, which is then channelled through downpipes into a storage tank.
2. Advantages:
   - Can store large volumes of water.
   - Uses local materials and labour for construction.
   - Can be used for multiple purposes (irrigation, livestock).

   Disadvantages:
   - Requires a large area of land.
   - Water loss through evaporation and seepage can be high.
   - Prone to contamination from surface runoff and animals.
3. Roof catchment method using gutters and a tank.

   Reason: This method is ideal for areas with limited ground space as it utilizes existing roof surfaces and vertical space for the tank.

4. - Provides a readily available water source during dry periods.
   - Reduces reliance on main water supply or boreholes.
   - Helps in flood control and reduces soil erosion.
   - Rainwater is typically free of chemicals found in treated water.
6. a) Shallow pans, b) Use of tanks, c) Water pond
7. To prevent water from seeping into the ground.
8. Kagongo village water pan issue

(a) - Water seepage into the ground due to the absence of a pond liner.
   - High rate of evaporation due to exposure to the sun and wind.

(b) The solution is to install an impermeable pond liner (e.g., made of polythene or clay) to prevent seepage, and potentially cover the water surface to reduce evaporation.

Conserving Animal Feed: Hay

Activity 1 - Page 41

1. a) Stacked hay - Hay that has been cut, dried, and piled in a stack for storage and later use as animal feed.

b) Standing forage - Green crops or pasture that remain unharvested in the field and are grazed directly by livestock.

b) Baled haymaking - The process of cutting, drying, and compressing hay into compact bales for easier storage, handling, and feeding.

Activity 2 page 41

1. Observe the illustrations
2. a) Standing forage, b) Baled haymaking
   c) Stacked hay
3. The learner to provide appropriate answer
4. a) Napier grass,
   b) Grass,
   c) Maize stalks

Assessment Work - Page 48

1. Forage is any edible parts of plants that can provide feed for grazing animals, or that can be harvested for feeding.
2. Napier grass, Maize stover, Lucerne, Rhodes grass, Sorghum, Clover
3. - Ensures a continuous supply of animal feed during periods when fresh forage is scarce.
- Maintains animal health and productivity by providing essential nutrients during dry seasons.
- Provides a strategic reserve to mitigate the impact of prolonged drought and prevent livestock losses.
4. Stacked hay refers to forage that has been cut, dried, and then gathered into large piles or stacks for storage. Standing forage refers to forage crops that are left to dry and cure while still in the field, before being harvested or baled.
5. Storing baled hay in a well-ventilated dry place prevents the growth of mould and fungi, which require moisture to thrive.

6. a) The method shown above is hay making (specifically, baled hay).

b) An example of a forage crop conserved through this method is grass (e.g., Rhodes grass) or lucerne

(c) -Cutting the forage at the appropriate stage of maturity.
- Wilting/Drying the cut forage in the field to reduce its moisture content (below 20%).
- Raking the dried forage into windrows for easier collection.
- Baling the forage into compact bales using a baler machine.
- Storing the bales in a dry, well-ventilated place, often on pallets to avoid ground moisture.

d) The item used to compress the forage in a rectangular shape is a baler (specifically, a rectangular or square baler).

8.- High moisture content of the forage when it was baled or stored.
- Improper storage conditions, such as a damp storage area or exposure to rain/ moisture.

9. - Ensuring the forage is adequately dry (moisture content below 20%) before baling and storage.
- Storing the bales in a dry, well-ventilated shed or barn, off the ground *(e.g., on wooden pallets)*.

10. The effect of moulds growing on the conserved forage is spoilage and reduction in nutritional value. Mouldy hay can also be toxic to livestock, potentially causing health problems.

11. -Hay making (as described in question 6).
- Silage making (conserving forage in an airtight condition to ferment).
- Fodder banking (establishing specific areas of high-yielding forage crops for use during dry seasons).
- Standing hay/Deferred grazing (setting aside specific paddocks to be grazed later in the dry season).

Conserving Leftover Foods

Activity 1 - Page 49

1.a) Leftover food refers to food that remains uneaten after a meal or a serving.

b) - Refrigeration - Freezing
- Proper sealing - Heating

c) Importance of conserving leftover foods
- Reduces food waste
- Saves money
- Saves time
- Reducing food waste conserves resources (water, energy, land) used in food production and disposal.

Activity 2 - Page 49

1. Observe the pictures
2. - The fruit and salad would typically be eaten cold or chilled.
- The pasta and the sandwich/roll could be reheated (e.g. in a microwave or oven) before eating.
3. - Prevents the spread of harmful bacteria.
- Reduces the risk of food poisoning.
- Keeps the food safe to eat.
- Protects the health of family members.
- Maintains the food's quality and taste.
- Prevents contamination from dirt and germs.
- Promotes overall cleanliness in the kitchen.

Assessment Work - Page 57

1. Leftover food refers to food that has not been consumed during a meal and is saved for later consumption.
2. - Reduces food wastage, which is beneficial for the environment and personal finances.
- Saves time and effort in preparing future meals.
- Saves money by maximizing the use of purchased food items.

3. a) The ingredients would typically be the existing leftover githeri, onions, tomatoes, cooking oil, salt, spices, and water

b) Step 1: Heat a small amount of cooking oil in a pan or pot.
Step 2: Sauté any desired additional ingredients like chopped onions and tomatoes until soft.
Step 3: Add the leftover githeri to the pan and mix well with the sautéed ingredients.
Step 4: Add a little water or stock if needed, cover, and let it simmer over low heat until heated through.
Step 5: Season with salt and spices to taste before serving.

4. - Reheating
   - Preparing another recipe
5. - Washing hands thoroughly before handling food.
   - Ensuring all utensils and surfaces are clean.
   - Using clean, food-grade containers for storage and preparation.
   - Ensuring the food is heated to a safe temperature to kill any potential bacteria.
6. To enhance the flavour, texture, and nutritional value of the leftover food, making it more appealing and palatable for consumption.
7. - The best thing for Ogutu to do was to dispose of the leftover potatoes immediately.
   - A bad smell indicates spoilage and potential bacterial growth and consuming them could lead to food poisoning.

Integrated Farming

Activity 1 - Page 58

1. (a) Crop Production- It is the practice of planting crops for various uses, such as food, feed, or fiber.

(b) Livestock rearing - The process of breeding and raising domestic animals, such as cattle, sheep, and goats, for products like meat, milk, and wool.

(c) Fish farming- The practice of rearing fish in ponds as a source of food and income generation to the household.

(d) Agroforestry- It is the growing of trees on land where crops are grown and animals are kept.

(e) Poultry rearing- The raising of domesticated birds such as chickens, ducks, turkeys, and geese for meat or eggs.

(f) Beekeeping- It is the keeping of bees, taking care and obtaining honey from them.

(g) Horticulture- It is the growing of perishable plants such as vegetables and fruits for sale.

Assessment Work - Page 65

1. Integrated farming is a method of farming that combines different agricultural components, such as crops, livestock, and fish farming such that they benefit from each other.
2. -Waste products from one component (e.g., livestock manure) are used as inputs for another (e.g., fertilizer for crops or fish pond).
- The system promotes the recycling of nutrients and water, reducing the need for external inputs like synthetic fertilizers.
- Farmers can generate revenue from multiple products e,g crops, livestock products.
- Reduced reliance on chemical inputs and efficient waste management minimize environmental pollution and promote a balanced ecosystem on the farm.

3.a)Integrated farming

b)- Livestock manure can be used to fertilize the fish pond (promoting growth of algae/

plankton for fish feed) and the crops.
- Crop residue/waste can be used as feed or bedding for the livestock.
- Nutrient-rich water from the pond can be used to irrigate and fertilize the crops. Crops povide food for the farmer and potentially feed for the livestock.

(c) Yes, this method is supported because it is a sustainable and efficient way of farming.

4.a) - Rearing livestock helps conserve resources by providing manure, that reduces the need for expensive and polluting chemical fertilizers for crops and the fish pond.
- Yes, the fish pond benefits from the livestock as the manure can be added to the pond to encourage the growth of phytoplankton and zooplankton, which serve as natural food for the fish.

(b) -Yes, trees absorb carbon dioxide and release oxygen, which improves air quality and mitigates climate change.
- They prevent soil erosion by holding soil with their roots, conserve water, and provide habitats for wildlife.

(c) -Food supply: Access to a variety of food products like crops, fish, poultry, and possibly honey.
- Income generation: Sale of surplus farm products provides a source of revenue.
- Waste products from one component (e.g., animal manure) are used as inputs for another.
- Practices like planting trees improve the local environment, and using biogas can provide clean energy for cooking and lighting.

5. A model would illustrate the cyclical flow of resources:
- Crops provide food for the household and potentially feed for poultry and bees.
- Poultry provides meat, eggs, and manure.
- Manure from poultry is used as fertilizer for crops or added to the fish pond to boost plankton growth.
- Fish farming provides food and water that can be used for irrigation.
- Bee keeping provides honey and aids in crop pollination.
- Trees provide shade, windbreaks, and improve soil and air quality, supporting the entire system.

6. - Biogas can be used for cooking and lighting, replacing firewood or other fossil fuels.
- It efficiently manages organic waste (manure, crop residue) by converting it into useful products.
- The residue from the biogas unit is a nutrient-rich organic fertilizer for crops and fish ponds.

7. -Crops, particularly fodder crops or crop residues (like stalks and leaves), serve as a primary food source for livestock.
- Crop residues can be used as bedding for poultry or other animals.
- Trees and certain crops can provide shade and shelter for livestock.

8. It minimizes waste by cycling resources (e.g., manure to fertilizer), preventing accumulation and environmental contamination.

9. - It is expensive to establish
- Diseases can easily be transmitted from one component to another.

STRAND 2 : Production Processes

Crop Establishment

Activity 1- Page 67

Fine tilth-It is a type of tilth that involves breaking down lumpy soil to achieve fine soil.

Medium tilth-It is a type of tilth which is slightly coarse. It is neither too fine nor too rough.

Coarse tilth-It is a type of tilth where the planting site is rough and has big lumps.

Activity 2 - Page 68

1. Small seeds-Fine tilth
   Vegetative cutting-Coarse tilth
   Banana suckers- Coarse tilth
   Sweet potato cutting-Coarse tilth
2. Fine tilth is good for small sized seeds

which need a smooth surface.
Medium tilth is good for medium sized seeds.
Coarse tilth is good for large planting materials.

3.Tubers, suckers, cutting, seeds.

Activity 3 - Page 69

1. Observe the illustration.
2. a. Digging
   b. Weeding.
3. a. Select a suitable site.
   b. Clear the vegetation.
   c. Dig the site to attain the tilth required.
   d. Mix the soil with organic matter.
4. Slasher, jembe, rake

Practice Assessment - Page 72

1. Fine tilth
2. a. Tubers, suckers and cuttings
   b. Medium sized seeds such as beans and maize
   c. Miller, carrot seeds
3. Different planting materials require different tilths.
4. The size and type of the planting material determines the appropriate tilth
5. Weeding,Pest and Disease Control, Watering: Thinning, Earthing Up.
6. Tilth → Planting Materials
   a. Fine tilth → Small seeds
   b. Medium tilth → Medium-sized seeds
   c. Coarse tilth → Large planting materials
7. Rake

Selected Crop Management Practices

Activity 1 - Page 73

1.a. Gapping is the practice of planting seeds to replace seeds which failed to germinate.

b. Thinning is the removal of excess seedlings in a seedbed.

c. Weeding is the removal of unwanted plants.

d. Earthing up is the heading of soil around the base of the crop.

Activity 2 Page 73 - 74

1. a) Gapping
   b) Thinning
   c) Weeding
   d) Earthing up

2. a) Gapping is the practice of replacing seedlings that failed to germinate or died after planting. Farmers fill the empty spaces with new healthy seedlings.

b) Thinning is the removal of excess seedlings where many seeds germinated too close to each other. Only the strongest seedlings are left to grow.

c) Weeding is the removal of unwanted plants (weeds) from the crop field. It can be done by hand, hoe, mulching, or using herbicides.

d) Earthing up is the practice of heaping soil around the base of growing crops. It is commonly done for crops like potatoes, maize, and beans.

2.a) Gapping

Gapping ensures a uniform plant population in the field, leads to even growth and higher yields, and reduces competition between mature plants and late-germinating weeds.

b) Thinning

Thinning reduces overcrowding among plants, allows each plant enough space, sunlight, water, and nutrients and promotes stronger and healthier crops.

c) Weeding

Weeding reduces competition for nutrients, water, and sunlight, and prevents weeds from hosting pests and diseases.

d) Earthing Up

Earthing up supports the crop and prevents lodging (falling over), helps retain moisture around the roots, stops weeds from growing around the base of the plant, and encourages the development of additional roots and tubers (e.g., potatoes).

Practice Assessment - Page 78

1.Uprooting, Digging out, Mulching

2.a)A blade jembe

b) Using a jembe, father then soil around the crops carefully to avoid damaging or exposing the roots.

3. Gapping

4 a) Thinning prevent seedlings from water and nutrients competition.

b) Gapping ensures maximum yields.

c) Weeding ensures plants get enough nutrients they need to grow healthy.

d) Earthing up helps to control weeding growth and control soil moisture.

5. Thinning is the removal of crops that are crowded at one place while gapping is replanting crops where termination failed.

6. Maize, sweet potatoes

7. Weeds, water and nutrients, pests.

Preparing Animal Products

Activity 1 - Page 79

1.a)Eggs are graded according to low quality, medium quality and high quality.

b) Animal products are prepared for different purposes such as consumption, selling and storing.

c) Size, weight, colour, shape, cleanliness, texture and shell quality.

Activity 2- Page 81

1. a) Honey combs are harvested from the bee hives and honey is processed through crushing and straining method.

b) Honey is processed through crushing and straining method and packed in clean containers made of Class, plastic or aluminium.

Practice Assessment - Page 84

1. Crushing and straining method

2.Weight, size, cleanliness, texture

3. a) -Clean the eggs

- Sort and trade eggs accordingly
- Pack eggs in different trays according to their grades.

b) -Sorting and grading eggs encourages farmers to produce high quality eggs thus high profit.

- It helps farmers to identify consumer's preference.
- Sorting eggs helps in grading them for different purposes.

4. Crushing is breaking the honey combs into small pieces.

Straining honey is putting the small pieces of honey combs in a strained to separate honey from wax and other solids.

5. No, it destroys the purity of the honey.

6. By placing the eggs in the trays according to their size with broadens of the egg facing upwards.

Cooking Food

Activity 1- Page 84

Grilling-This is a method of cooking where food is cooked over direct heat such as flames or hot coals.

Roasting-This is a dry method of cooking that uses indirect heat from all sides.

Steaming-This is a method of cooking using steam from boiling water.

Practice Assessment - Page 91

a. Grilling-This is a method of cooking where food is cooked over direct heat such as flames or hot coals.

b. Roasting-This is a dry method of cooking that uses indirect heat from all sides.

c. Steaming-This is a method of cooking using steam from boiling water.

2. Grilling: Meat (steaks, sausages, kebabs), fish, vegetables,onions and slices of bread.
Roasting: Large cuts of meat (beef, chicken, lamb), vegetables,potatoes, carrots, sweet potatoes and nuts.
Steaming:Vegetables (broccoli, carrots, green beans), fish fillets, dumplings, and rice.

3. a.Wear appropriate clothing.
b. Use oven mitts/dry cloths.
c. Keep handles turned inwards

4. Roasting is a method of cooking that uses indirect dry heat while grilling is a method of cooking that involves exposing the surface of food to direct heat.

5.- Get a large, non-flammable metal container that is wide and shallow.

- Make a few small holes near the bottom of the container to allow air to flow, which helps the charcoal burn well.
- Place charcoal inside the container and light it to create hot coals.
- Place a clean, strong metal wire rack on top of the container, raised a little above the coals. This is where he will place the meat.

6. Different methods of cooking produces different textures of food.

Kitchen and Backyard Gardening

Activity 1 - Page 92-93

1. a, b and c follow the guidelines

2a) Vegetables: sukuma wiki (kale), spinach, cabbages, onions, tomatoes, carrots, lettuce.

- Herbs: coriander (dhania), mint, rosemary, basil
- Spices: ginger, garlic, chillies
- Fruits: strawberries, passion fruits, bananas, pawpaw

(b) - Increasing household food supply

- Saving money because families produce their own vegetables
- Improving nutrition by providing fresh vegetables and herbs
- Providing income when surplus produce is sold
- Making good use of small spaces around the home
- Encouraging sustainable farming practices

(c) Note down your findings in your exercise books.

3. (a) - Leafy vegetables (e.g., kale, spinach)
(b)- Sacks

Assessment Work - Page 99

(a) Kitchen gardening -This is the growing of small, easily accessible crops such as vegetables, herbs and spices in a garden close to the kitchen.

(b) Backyard gardening - This is the practice of growing crops at the back or around the home, usually using available space to produce food for household use.

2. - Sukuma wiki (kale)
- Spinach
- Tomatoes
- Onions
- Carrots
- Herbs like coriander (dhania)
- Cabbage
- Green pepper
- Lettuce
- Ginger or garlic (spices)

3. - Efficient use of small spaces (e.g., containers, sacks, pots)
- Conservation of water through targeted watering
- Use of recycled materials such as tyres, tins, sacks
- Vertical and raised-bed gardening for higher production
- Reduced cost of production
- Easy management and harvesting

4. (a) - Pots/containers
- Old tyres used as planting containers
- Sacks or grow bags

(b)- Clean the containers and ensure there are drainage holes.

- Fill the containers with good soil mixed with compost or manure.
- Level the top and moisten the soil.
- Plant seeds or seedlings at the correct spacing.
- Water lightly and place the container where it receives enough sunlight.

5.(a) Watering- Ensures plants receive enough moisture for growth, prevents wilting, and helps nutrients dissolve and move in the soil.

(b) Thinning- Reduces overcrowding, ensures each plant gets enough light, space,

nutrients and air, and allows stronger seedlings to grow better.

(c) Pest and disease control- Prevents crop damage, improves yield, and keeps the plants healthy throughout the growing period.

(d) Gapping- Replacing missing or weak seedlings ensures uniform plant population and improves total crop yield.

6. - Container gardening (pots, cans, basins, buckets, tins)
   - Sack gardening
   - Vertical gardening (stacking containers upward)
   - Using old tyres
   - Raised beds
   - Hanging/ Suspended gardens

7. Causes
   - Poor soil fertility
   - Insufficient water
   - Too much water / waterlogging
   - Pests and diseases
   - Shade / lack of enough sunlight
   - Overcrowding of plants
   - Poor seed quality

Solutions:

- Add manure or compost
- Water regularly and correctly
- Improve drainage
- Control pests and diseases
- Ensure the garden receives enough sunlight
- Thin or gap plants
- Use certified good-quality seeds

8. - Compost improves soil structure and fertility naturally
   - It is safe for the environment and does not pollute the soil
   - It is cheaper and can be made at home
   - It increases water retention in the soil
   - It is safe for family consumption because it avoids harmful chemical residues
   - Helps beneficial soil organisms like earthworms thrive

Poultry Rearing in a Fold

Activity 1- Page 100

Poultry- Poultry refers to domesticated birds kept by humans for meat, eggs, or feathers. Examples include: chickens, ducks, turkeys, geese, and guinea fowls.

Poultry Fold- A poultry fold is a structure or enclosure where poultry are kept and protected. It provides shelter, feeding space, and protection from predators and harsh weather.

2. Common systems of rearing poultry used in Kenya.

a) Free-Range System- Birds are allowed to move around freely in an open compound or field. They look for food by scratching the ground and insects. Farmers only provide little food supplements in the morning and evening. Common in rural areas.

b) Deep Litter System- Birds are kept inside a poultry house. The floor is covered with litter materials like wood shavings or dry grass. Feeders and drinkers are placed inside. Suitable for keeping many birds at once.

c) Battery Cage System. Birds (especially layers) are kept in cages. Each cage has a feeder, drinker, and egg-collection area. Eggs roll out automatically for collection. Common in commercial layer farms.

d) Semi-Intensive System- Birds stay partly in a poultry house and partly in a fenced run. Combines advantages of free-range and deep litter.

3. Share suggestion
(Group discussion, no written answer needed.)

Activity 2 - Page 100

1. Searching for photos and watching videos clips on poultry fold.
2. Examples showing a poultry farm, chicken in folds
3. Locally Available Materials
   - Timber/wood - Nails
   - Wire mesh - Iron sheets
   - Hinges - Wooden poles

4. 1. Roof- Protects birds from rain, sun, wind, and predators.
   - Keeps the poultry fold dry and warm.
2. Door- Allows the farmer to enter the fold for feeding, cleaning, and inspection. Keeps birds securely inside the house.
3. Wire Mesh- Allows good ventilation inside the poultry fold. Keeps predators (dogs, cats, wild birds) out. Helps light enter the fold.
4. Frame- The wooden or metal structure that supports the entire poultry house. Holds the roof, wire mesh and walls firmly in place. Makes the fold strong and stable.
5. Floor- Provides a clean, dry and comfortable surface for birds. Reduces disease by preventing dampness. Often covered with litter (wood shavings) to absorb moisture.
6. Rear (Rear-End) Section or Rear Opening
   - Sometimes used for cleaning or egg collection in portable folds. Allows easy removal of droppings and old litter. Helps with cleaning the poultry fold. Can also be an access point for collecting eggs in some designs.
7. Feeding Area- Space where feeders are placed for birds to eat comfortably. Ensures all birds can access feed. Helps reduce competition and feed wastage.
8. Run- A fenced outdoor area where birds can move freely. Allows natural behaviours such as scratching, dust bathing, and exercising. Provides fresh air and sunlight.
9. Metal Handles- Make it easy to lift or move portable poultry folds from one place to another.
   Help in relocating birds to fresh ground (in free-range or portable arc systems).
10. Hinges- Attached to doors or movable parts of the fold. Allow smooth opening and closing. Provide security and easy access for the farmer.

Assessment Work - Page 104-105

1. A poultry fold is a portable structure used to house and shelter poultry, such as chickens, ducks, or turkeys, within an enclosed outdoor area.

2.- Wood / timber. - Wire mesh.
- Iron sheets.
- Nails, screws, hinges.
- Flooring materials.
- Handles or wheels.

3. Learners to identify the parts labelled.

4 a)- Feeding the birds with the correct amount of feed.
- Providing clean drinking water every day.
- Cleaning the poultry fold and removing wet or dirty litter.
- Collecting eggs from the nesting area.

b) - It helps keep birds healthy and productive.
- It prevents diseases, parasite infestation, and dirty conditions.
- It ensures the birds grow well and produce more meat or eggs.
- It keeps the poultry fold clean and safe for the birds.

c) - Birds are protected from predators such as dogs, cats, and birds of prey.
- It is easy to manage feeding, watering, and cleaning.
- Birds are protected from harsh weather conditions like rain and strong sun.
- It is easy to collect eggs.
- It reduces disease spread.
- It prevents prevents birds from scattering.

5.a) - Mongoose - Dogs
- Cats - Hawks / Eagles

b) - Use strong wire mesh around the poultry fold.
- Close the door properly at night.
- Repair holes or weak parts of the fold immediately.
- Raise the fold slightly above ground to keep snakes out.

- Use proper roofing and locks to prevent predators from entering.

6.- Clean the poultry fold thoroughly and remove all litter.

- Disinfect the fold using approved chemicals or disinfectants.
- Dust or spray birds with recommended anti-mite/lice pesticides.
- To prevent future infestation:
- Regularly clean the fold and change litter often.
- Avoid overcrowding of birds.
- Provide good ventilation and sunlight.
- Quarantine new birds before mixing them with others.

7. - Step 1: Calculate the area of the fold.

Area = length × width

= 2 m × 1.5 m

=3m²

Step 2: Calculate the total space required by 20 birds.

Each bird needs 0.2 m².

Total space = 20 × 0.2

= 4 m²

Step 3: Compare available space to required space.

Available space = 3m²

Required space = 4 m²

Conclusion: No, the fold is small, because 3m² is less than the 4 m² required.

8. A suitable design would involve a raised structure to allow for easy cleaning and protection from ground predators. The materials should be durable and easily accessible, such as wood and wire mesh. It should have good ventilation and a secure door. The design would benefit learners by providing a practical, hands-on learning experience in agriculture, teaching responsibility, and offering a sustainable source of income or food for the school.

Crop Pest and Disease Control

Activity 1 - Page 106

a) A crop pest is any animal or organism that damages crops by feeding on them or destroying their parts.

(b).- Aphids - Caterpillars

- Cutworms - Whiteflies

- . Beetles - Grasshoppers

(c) Share your work with classmates

Activity 2- Page 106 - 107

1. a) Tomato b) Cabbage

c) Carrot d) Kale / Sukumawiki

(b) (a) Tomato- The fruit has holes and dark spots. Shows rotting or decaying areas. Likely caused by fruit borers.

(b) Cabbage - Leaves appear curled, distorted, or wrinkled. May show yellow patches. This is a sign of attack by aphids.

(c) Carrot- The root has tunnels, scars, and brown damaged patches.

(d) Sukumawiki - Leaves have holes, chewed edges and irregular damage. Caused by caterpillars or cutworms.

c) Pest attacks on vegetable crops cause various damages that affect the health and yield of the plants.

- Tomato. Holes on the tomato fruit cause internal damage, which eventually leads to the tomato rotting.
- Cabbage. Damaged leaves affect the development of the head and the overall leaf health of the cabbage plant.
- Carrot. Root damage occurs, leading to the rotting of some part of the carrot.
- Kales. Chewed leaves result in the stunted growth of the kale plant.

(d) Share your work with your classmates.

Activity 3 - Page 107- 108

(a) - Cutworm - Aphids - Caterpillar

b)- Cutworms damage vegetable crops by cutting seedlings at the soil line and boring into roots and tubers.

- Aphids suck plant sap, leading to distorted, yellowed leaves, sticky "honeydew," black sooty mold, and the transmission of harmful plant viruses.
- Caterpillars chew leaves, stems, and fruits, causing holes, defoliation, and boring damage to plant structures.

(c) Crop pests are organisms that attack and damage crops. Vegetable crop pests include cutworms, aphids, and caterpillars.

Cutworms damage crops, particularly seedlings, by cutting the young plants off at or below the ground level, which often kills the plant.

Aphids feed by sucking the sap from plant leaves. This feeding causes the leaves to curl, yellow, and the plant's growth to be stunted.

Caterpillars cause significant economic damage by biting and chewing leaves, flowers, fruits, and young shoots, causing holes in leaves.

(d) Share your work with classmates.

Activity 4 - Page 108

1. Use a digital device to watch video clips or animations on the crop pests that damage vegetables; the cutworms, caterpillars and aphids.

2.. Beans, cabbage, and potatoes. Are vegetable crops attacked by cutworms, aphids and caterpillars.

- Potatoes, tomatoes, peppers, cabbage, peas and beans. Are attacked by cutworms.
- Cabbage, broccoli, kales, beans, lettuce, potatoes, spinach, and tomatoes are attacked by aphids.
- Maize, cotton are attacked by caterpillars.

3. Share your findings with classmates.

Assessment Questions - Page 111

1a) A crop pest: Any living organism, such as an insect, rodent or bird, that causes physical damage to crops either directly by feeding on them or indirectly by introducing pathogens.

b) A crop disease: Any abnormal condition or deviation from a healthy state in a plant, resulting from a physiological disturbance caused by pathogenic agents like fungi, bacteria, or viruses.

2a) A caterpillar

b) Caterpillars feed on crop leaves, making holes or eating them completely. This weakens the plant, slows its growth, and can reduce yields or kill young plants.

c) - Cultural methods
- Physical methods
- Biological methods
- Chemical methods

3.a) - Yellowing and browning of leaves or pods
- Presence of dark or brown spots on the pods
- Wilted or curled leaves

b) - Black, brown, or rotten patches on the fruit
- Soft, sunken, and decaying areas
- Mold or fungal growth on the surface
- Fruit shriveling or falling prematurely

c). - Leaves turning brown or black
- Rotting of cabbage head
- Wilting and drying of outer leaves
- Presence of soft rot or watery decay

b). - Cultural control methods
- Planting disease-resistant crop varieties.
- Practicing crop rotation with different plant families to break disease cycles.
- Ensuring proper plant spacing to improve air circulation and reduce moisture build-up.
- Removing and destroying (e.g., by burning) infected plant parts or entire plants to prevent spread.
- Chemical controls. Applying appropriate fungicides, bactericides, or nematicides

when necessary, following all safety instructions.

4. a)Handpicking

- Always wear gardening gloves (leather gloves offer good protection) to prevent cuts, skin irritants, or bites.
- Wash hands carefully with soap and water after the activity.

b) Removing the affected parts

- Wear gloves to prevent contact with pathogens or potential skin irritants.
- Clean and disinfect tools used for pruning or cutting after use to prevent spreading the disease to healthy plants.

c) Uprooting heavily affected vegetable crops

- Wear gloves and a mask, especially when handling soil or potting mix, to avoid inhaling

5. a) Protecting Yields - Pests and diseases directly damage plants, reducing the overall quantity yield of vegetables produced.

b) Maintaining quality and market value - Damage makes vegetables unattractive or unmarketable, leading to significant economic loss for farmers.

c) Preventing Spread- Timely control prevents the spread of pathogens and pests to healthy plants, other fields, or even across regions and countries.

d) Ensuring Food Safety and Health- Proper management reduces the need for harmful chemical pesticides, safeguarding the health and safety of farmers and consumers by minimizing exposure to toxic residues.

e) Reducing Production Costs- Effective, preventative control methods can be more cost-effective than managing a full-blown infestation, saving resources in the long run.

Preparation of Animal Products

Activity 1 - Page 112

a) - It improves cleanliness and safety. Processing removes dirt, germs, parasites and unwanted parts, making the food safe for people to eat.

- It reduces spoilage. Fish and poultry spoil quickly. Processing using salting, smoking, sun drying, helps them last longer.
- It improves taste and appearance. Proper dressing and processing makes the food more appealing, tastier and ready to cook.
- It reduces waste. Only the useful, edible parts are kept, which helps reduce wastage.
- Makes storage and transport easier. Cleaned and processed products are easier to store and move without going bad.
- It increases market value for the products. Well-processed fish or poultry fetch better prices, helping farmers earn more.
- It prevents food-borne diseases. Proper handling prevents illnesses caused by contaminated or poorly handled meat.

(b) Short notes on findings

(c) Present your findings to your classmates.

Digital Activity - Page 113

1. Activities carried out when processing fish;
   - Scaling
   - Gutting
   - Cleaning
   - Salting
   - Frying
2. Watch video clips
3. Discuss your findings

Activity 2 - Page 113-114

Picture A - Scaling
Picture B - Gutting
Picture C - Cleaning
Picture D - Salting
Picture E - Deep Frying

(b) Why is it important to carry out each of the activities above?

- Scaling. It removes hard, inedible scales. It improves the appearance and texture of the fish.

- Gutting. It removes internal organs that spoil quickly. It pevents rotting and bad smell. It makes the fish safe and hygienic for consumption.
- Cleaning. It removes blood, slime, dirt, and bacteria. Ensures good hygiene and improves quality.
- Salting. It helps to remove excess water. Prepares fish for cooking, seasoning, or storage.
  It also reduces quick spoilage.
- Deep Frying. It kills harmful bacteria. It also makes the fish safe to eat. It improves taste and texture.

(c) Share your work with your classmates.

Activity 3 Page 116

Picture A - Beheading. The person is cutting off the head of the poultry using a knife.
This is the first step in dressing poultry.

Picture B - Defeathering. The person is removing the feathers from the bird after slaughter. The bird has been scalded so the feathers come off easily.

Picture C - Removing the Offal. The person is cutting open the abdomen and removing the internal organs. This step removes inedible organs and prepares the chicken for cleaning or cooking.

Picture D - Cleaning. The poultry carcass is being washed under running water.
This removes blood, dirt, and any remaining internal debris.

2. Defeathering - Feathers are plucked from the skin after scalding to ensure the bird is clean and ready for further processing.
3. Removing the offal - The abdomen is opened and internal organs are taken out to prevent contamination and spoilage.
4. Cleaning - The dressed poultry is thoroughly washed to remove dirt, blood, and bacteria, making it safe for cooking or storage.

Assessment Questions - Page 118

1. - To ensure the meat is clean and safe for human consumption.
   - To improve the appearance, quality and taste of the meat.
   - To prevent spoilage by removing parts that rot quickly (e.g., internal organs).
2. (a) Beheading - This is the removal of the poultry's head using a sharp knife to begin the dressing process.
   (b) Defeathering - After scalding the bird in hot water, the feathers are plucked off to leave the skin clean.
   (c) Removing the offal - The abdomen is opened and the internal organs (guts) are removed. This prevents contamination and speeds up cooling.
   (d) Cleaning - The carcass is washed thoroughly under clean running water to remove blood, dirt and any remaining internal debris.
3. - Use a sharp knife carefully to avoid cuts.
   - Keep the working area, tools, and hands clean to maintain hygiene.
   - Dispose of waste (scales, guts, feathers) properly to avoid attracting flies and causing pollution.
4. (a) Washing the fish
   (b) Scaling the fish
   (c) Gutting the fish
   Correct order: Scaling, Gutting, Cleaning.
5. - Internal organs spoil quickly and can cause bad smell.
   - They may contain harmful bacteria that contaminate the meat.
   - Removing them keeps the carcass fresh, clean and safe for consumption.
6. **Similarities**
   - Both involve removing internal organs.
   - Both require cleaning to ensure cleanliness and hygiene.

   Differences
   - Fish processing involves scaling, while poultry dressing involves defeathering.
   - Poultry dressing includes beheading, while fish does not always require beheading.

7. I would use salting, smoking or sun-drying because these methods do not require electricity.
   They help to remove moisture from the meat and prevent bacteria from growing, which helps the meat last longer.
8. **In humans.**
   - Poorly processed meat can contain bacteria, leading to food poisoning.
   - Contaminated meat may cause diseases such as diarrhoea and cholera.

   On the environment:
   - Improper disposal of scales, guts, feathers, and blood attracts flies and pests.
   - Waste can pollute water sources and cause bad smells in the surroundings.

Preserving Animal Products: Meat and Milk

Activity 1- Page 119

1. - Preserving meat prevents spoilage and keeps it safe for longer.
   - It reduces food wastage at home.
   - It saves money since meat can be stored and used over time.
   - It improves food safety by preventing bacterial growth.
   - It maintains the taste, smell, and flavour of the meat.
   - It ensures continuous supply of meat during times of scarcity.
   - It allows value addition such as making sausages or smoked meat.

Activity 2 - Page 120

(a) - The milk was not cooled in a clay pot.
   - The milk was left in a warm place.
   - The milk was not boiled or preserved soon after milking.

(b) - Boiling
   - Cooling
   - Fermenting milk (to make mala or sour milk)

(c) - Boiling- Milk is heated to kill germs and slow spoilage.
   - Cooling - Milk is stored in a cool place to reduce bacterial growth.
   - Fermenting - Milk is allowed to turn sour forming fermented milk that lasts longer.

Activity 3 - Page 120

1. Picture (a) Boiling milk - The milk is being heated in a sufuria.
   Picture (b) Fermenting milk - The milk is fermented in a gourd.

2.- Boiling - Kills germs and bacteria that cause milk to spoil. Makes milk safe for drinking and increases shelf life.
   - Home cooling. Storing in a clay pot covered with a wet cloth (cooling). Keeps the milk cool through evaporation. Slows down the growth of bacteria. It also helps milk stay fresh for longer.

The importance of preserving meat

Activity 1 -Page 123

1. It prevents food wastage by allowing the meat to be consumed over several days without getting spoiled.
2. It maintains the taste, flavour and smell of the meat by preventing it from rotting.
3. It maintains the nutritional value of the meat by stopping microorganisms like bacteria from destroying important nutrients such as proteins.
4. It keeps meat safe for longer, especially because fresh meat spoils quickly if not preserved.
5. It helps families save money, since preserved meat can be stored and used later instead of being thrown away.
6. It improves food security at home by ensuring that meat remains available for use even when it is not freshly obtained.

Activity 2 - Page 123

1. - It prevents spoilage.
   - It helps maintain flavour and quality.
   - It saves food from being thrown away.
   - It maintains nutritional value.
   - It ensures that microorganisms do not destroy the meat.

Methods of Preserving Meat

Activity 3 - Page 124

1. a) Smoking b) Sun-drying
   c) Salting
2. a) Smoking - Smoke dries the meat and acts as a preservative. Smoke chemicals kill bacteria and add flavour.

b) Sun- drying - Removes moisture from meat. Stops bacterial growth and allows long storage.

c) Salting. Salt draws out moisture from meat. It prevents bacteria from growing.

Activity 4 - Page 125

a) They had too much meat left after the family gathering and did not have a refrigerator or freezer to store it, so the meat was at risk of spoiling.

(b) - Salting the meat - rubbing it with salt and drying it under the sun.
- Smoking the meat - hanging it above the kitchen fireplace.
- Sun Drying the meat - drying meat in the sun.

Assessment Questions - Page 128

1. - It prevents food spoilage.
   - It reduces wastage.
   - It maintains food quality and taste.
   - It improves food safety.
   - It ensures a continuous supply of food.
2. - Boiling - kills germs to prevent spoilage.
   - Cooling - slows bacterial growth.
   - Fermenting - turns milk into yoghurt/ mala, making it last longer.
3. a) Smoking - Smoke dries the meat and acts as a preservative. Smoke chemicals kill bacteria and add flavour.

   b) Sun- drying - Removes moisture from meat. Stops bacterial growth and allows long storage.

   c) Salting. Salt draws out moisture from meat. It prevents bacteria from growing.
4. a) - It is safe for eating and free from harmful bacteria.
   - It maintains its flavour, smell, and nutritional value.
   - It does not cause sickness.

b) - To prevent contamination.
   - To avoid food poisoning.
   - To maintain the safety and quality of the preserved food.
5. - Fermenting (making mala/yoghurt)
   - Cooling in a refrigerator (if available).

Cooking: Preparing a Balanced Meal

Activity 1- Page 129

1. A balanced diet is a meal that contains all the essential food nutrients in the correct proportions, including carbohydrates, proteins, fats, vitamins, minerals and water.
2. A balanced meal contains foods from these food groups:
   Carbohydrates - rice, ugali, bread, potatoes
   Proteins - meat, beans, eggs, fish
   Fats and oils - cooking oil, avocado, nuts
   Vitamins - fruits and vegetables
   Water and Minerals
3. - Nutritional needs of the family
   - Age of family members; infants, teenagers, old people
   - Health status of individuals in the family.
   - Occupation of individuals; athletee
   - Availability of food; season.
   - Cost of the ingredients
   - Cooking method.

Activity 2 - Page 129-130

a.- Picture a shows a sick person in bed.
- Picture b shows a well-set full meal on a table.
- Picture c shows outdoors with banana trees and someone eating.
- Picture of an elderly man.

b) Factor in picture a is Health condition of an individual. Sick people need soft, easily digestible, nutritious food.
Factor in picture b - Variety of food groups .A balanced meal must include all nutrients.

Factor in c - Availability of food. Available foods can influence meal preparation.
Factor in d - Age of the person. Elderly people need softer, easily digestible, low-fat meals.

c) 1. Health Condition of an Individual. Sick people require soft, easily digestible, and nutritious foods. Meals should support recovery and be gentle on the digestive system.

2. Variety of Food Groups. A balanced meal should include foods from all food groups to supply all essential nutrients. Ensures the body gets proteins, carbohydrates, vitamins, minerals and fats.

3. Availability of Food. Meal planning depends on what foods are locally available or affordable. Seasonal foods often influence what is prepared.

4. Age of the Person. Elderly individuals need softer, easily digestible and low-fat foods. Children may require more energy-giving and body-building foods.

Preparing a Balanced Meal for Healthy Living Page 131

Activity 1 - Page 131

a) Bread, maize, wheat, Sorghum
b) Vitamins
c) Proteins

Activity 4 Page 133

a) Buffet Style
b) Blue- plate style
c) Family service

a) Buffet Style - Food is arranged on a long table (buffet table). Guests serve themselves or are served by attendants at the buffet. People move along the table and choose the foods they want. Common in parties, hotels, and large gatherings.

Advantages:

- Guests choose what they prefer.
- Serves many people quickly.

b) Blue-Plate Style - Food is served on a plate in the kitchen and then taken to the table. Each plate contains all parts of the meal (main dish + accompaniments). The person serving controls the portion sizes.

Advantages:

- Reduces food wastage.
- Makes serving faster and tidy.

c) Family Service - The food is placed in serving dishes on the dining table. Family members serve themselves or pass dishes around. Encourages interaction during meals.

Advantages:

- Suitable for family meals.
- Promotes sharing and good table manners.

Assessment Questions - Page 135 - 136

1. A balanced diet is a diet that contains all the essential nutrients in the right amounts for healthy body functioning.

2. - Carbohydrates - Proteins
   - Fats and Oils - Vitamins
   - Minerals - Water

3. (a) - It helps the body to recover faster and fight diseases.
   - It provides all essential nutrients needed for good health and energy.

   (b)- Eating too much junk or fatty foods
   - Skipping meals
   - Overeating
   - Eating too much sugar.
   - Eating late at night.

4. - Nutritional needs of the family
   - Age and health of family members
   - Availability of food
   - Cost and budget
   - Cooking time and method
   - Family preferences

5. ***Ingredients:***
- Maize flour
- Water
- Green leafy vegetables (e.g., sukuma wiki)
- Beef
- Salt
- Cooking oil
- Onion & tomato

Procedure:

a) To cook ugali:
1. Boil water.
2. Add flour gradually while stirring.
3. Cook and turn until firm.

b) To cook vegetables:
1. Heat oil and fry onions.
2. Add tomatoes.
3. Add chopped vegetables and cook until soft.
4. Add salt and serve.

c) To cook beef:
1. Boil beef until tender.
2. Add oil, onions, and tomatoes.
3. Fry until well cooked.

Serving style:

The best serving style is plated service because each family member receives a well-balanced portion.

6. (a) Blue - plate service
(b) Buffet service
(c) Family service

(b) Buffet service is used in different

(c) Blue-plate service

- This is a style where food is served on individual plates in the kitchen and then taken to each person.

Organic Gardening

Activity 1 - Page 137

1. a) Organic manure- It is a natural fertilizer we receive from animal snd plant waste that provides essential nutrients to the plants with causing harm to the plants.

(b) Organic pesticides- It is pesticides we receive from natural sources, such as plants, animals, bacteria, and certain minerals.

(c) Mechanical weed control- It is the use of physical methods to control weeds, such as tilling, uprooting and mulching.

(d) Organic foliar feed- A method of feeding plants by applying liquid fertilizer directly to their leaves, where nutrients are absorbed via their stomata.

Assessment Work- Page 145

1. It is a method of farming where crops are grown and taken care without using artificial fertilisers or agricultural chemicals.
2. Use of organic manure, mechanical weed control, organic pesticides, organic foliar feed
3. Step 1: Prepare the soil
Clear the area of weeds and debris, then enrich the soil by digging in compost or other organic matter.

Step 2: Sow the seeds
Sow spinach seeds directly into the prepared soil, following recommended spacing and depth guidelines.

Step 3: Water and maintain
Water regularly to keep the soil consistently moist. Weed by hand to prevent competition for nutrients and water.

Step 4: Manage pests
Monitor for pests and use organic control methods if necessary, such as neem oil or companion planting.

4. - Fruit and vegetable scraps: Provide nitrogen for microbial growth.
- Grass clippings: Offer a good source of nitrogen ("greens").
- Dry leaves: Provide carbon ("browns") to balance the nitrogen.
- Coffee grounds: Add nitrogen and improve soil structure.

5. - It improves soil structure and fertility, increasing crop production.
- Unlike pesticides, manure does not harm beneficial insects in the soil.

6. - Assess soil quality: To understand existing nutrient levels and structure.
- Add organic matter: To improve water retention and fertility in dry soil.
- Establish an irrigation system: To ensure a reliable water source for the vegetables.

7. Foliar feed is a liquid applied directly to leaves for quick nutrient absorption, while compost is a solid soil amendment that improves long-term soil health.
- Preparation: Foliar feed is usually a diluted liquid extract; compost is made by decomposing organic matter over time.
- Use: Foliar feed is sprayed on leaves; compost is mixed into or top-dressed onto the soil.
- Benefits: Foliar feed provides rapid nutrient boost; compost offers slow-release nutrients and improves soil structure.

8. - Collect local materials such as garlic, chili peppers, and possibly some neem leaves, She can prepare an organic pesticide by blending local materials like garlic and chili peppers with water, straining the mixture, and then spraying the liquid onto the affected vegetables.

Storage of Crop Produce

Activity 1 - Page 145

1. i) Store room- A secure room where harvested crop produce is kept safely before use or sale.

ii) Storage bags used to hold and protect dry crop produce such as grains and beans during storage.

ii) Storage container- A sealed or covered container used to store and protect crop produce from pests, moisture, and contamination.

Activity 2- Page 146

1. Granary
2. Cleaning: All dirt, dust, old grain, and debris are removed to prevent contamination and pest infestation.
2. Dusting: The walls, floor, and roof are dusted to remove hidden dust, cobwebs, and insect eggs.
3. Repairing: Broken parts of the granary such as walls, doors, or the floor are fixed to ensure the structure is strong and secure.
4. Sealing cracks: All openings and cracks are sealed to prevent insects, moisture, and pests from entering.
5. Controlling rodents: Rodent traps or safe rodent repellents are used, and the area around the granary is cleared to keep rats and mice away.

Assessment Work - Page 155

1. Storage container, Storage bags, Store room
2. High moisture content in the maize seeds or the storage environment.
3. Refer to the answers provided on Activity 2 on page 146
4. To prevent spoilage by mould and pests, and to maintain quality.
5. Checking moisture content is important to ensure the grains are at a safe level for long-term storage to prevent spoilage.

Methods:

- Using an electronic device that provides a numerical reading of the moisture percentage.
- Biting a grain to check for hardness, or shaking grains in a container to listen for a rattling sound (dry grains rattle loudly).

6.- Prevent quantitative losses: Rodents consume significant amounts of stored grains, leading to direct loss of produce.

- Prevent qualitative losses: They contaminate the produce with urine, faeces, and hair, making it unfit for human or animal consumption.
- Prevent structural damage: Rodents can gnaw on the storage structure itself, creating entry points for other pests and potentially causing collapse.

7. Allows circulation of air, which helps to remove excess moisture and heat generated by the stored produce. This prevents mould from developing.

8. a) Granary

b) -The raised platform makes it difficult for rodents and crawling insects to access the stored produce.

- It allows air circulation underneath, which helps keep the floor dry and improves overall ventilation, preventing moisture build-up.

Cooking: Using Flour Mixtures

Activity 1 -Page 156

1. a) A batter is a mixture of flour and liquid that is thin and pourable. It can easily flow or be scooped. Examples include pancake batter and cake batter.

b) A dough is a mixture of flour and liquid that is thick, soft, and can be kneaded. It does not pour. Examples include bread dough and chapati dough.

Activity 2 - Page 156

1. a) i) Mandazi
ii) Chapati,
iii) Pan cakes,
iv) Bread

b) - Mandazi- dough
- Chapati - dough
- Pan cakes- batter
- Bread - dough

c) Eggs, milk, margarine, water, sugar, wheat flour

Assessment Work - Page 164

1. A flour mixture is a combination of flour and a liquid, along with other ingredients, used to create various food products.
Common ingredients used in a pancake batter include:
   - Flour
   - Liquid (e.g., milk or water)
   - Eggs
   - Raising agent (e.g., baking powder)

2. - Not enough oil/fat was added. Correction: Add sufficient oil or fat to the dough next time to make it soft and tender.
- Cold water was used to knead the dough. Correction: Use warm water to help relax the gluten and make the dough softer.
- The dough was not rested before cooking. Correction: Allow the dough to rest for at least 15-20 minutes before rolling and cooking to allow the gluten to relax.

3. Baking powder and yeast are both raising agents, but they differ in action and application:
Baking powder: A chemical raising agent that acts quickly when mixed with liquid and heated.
Yeast: A raising agent that ferments sugars, producing gas over a longer period.

4. Thin batter: Has a pouring consistency and is typically used for products like pancakes.
Thick batter: Has a dropping consistency and is typically used for products like muffins or some types of cakes.

5. Using cold water and not resting the dough before cooking chapati may result in a hard, tough and less flexible final product. Cold water can make the gluten tighter, and without resting time, the gluten does not relax, making it difficult to roll and resulting in a dense texture.

6. Preparation: Stiff dough requires kneading to develop gluten, while thin batter is simply mixed until combined.
Texture: Stiff dough is firm and holds its shape (e.g., chapati dough), while thin batter is liquid and pourable (e.g., pancake batter).

Food products: Stiff dough makes products like chapati or bread, while thin batter makes products like pancakes or crepes.

7. The right response was that accurate measurement of ingredients is important to ensure the correct consistency, texture, flavor, and appearance of the final product.

Strand 3: Hygiene Practices

Hygiene in Rearing Animals

Activity 1- Page 165

1a) Cleaning feeders and waterers should be done daily to protect animal feeds and water from contamination.

b) Cleaning animal houses keep the animals healthy and comfortable.

c) Cleaning the animals should be done daily to control eternal parasites.

Practice Assessment - Page 169

1. a) Cleaning an animal

b) - To maintain clean environment.
- Clean animals are free from pests and diseases.
- Reduced chances of contamination animal feeds and water.

c) A soft brush, Clean water, an acaricide, protective clothing.

2. a) Feeders are containers used to provide feeds to animals.
   b) Waterers are containers used to give animals water.
   c) Structures are home for animals.
3. Brooms,clean water and soap, a brush.
4. To clean the rabbit.
5. a) False b) True
   c) True d) True

Laundry: Loose Coloured Items

Activity 1 - Page 170

1. The first picture, the T shirt has maintained it's colour while the second one it has lost its colour.
2. Precautions were not adhered to during laundry.
3. It loses colour when put in water.

Activity 2 - Page 171

1. a) Sorting separates loose coloured items from white and fast coloured items to avoid staining.

b) Loose coloured items should be washed quickly using kneading and squeezing method to prevent loss of colour.

c) Loose coloured items should be dried under a shade to prevent them from fading.

d) Loose coloured items should be ironed on the wrong side with a warm iron to prevent fading.

3. a)- Sorting
- Washing by kneading and squeezing
- Drying
- Finishing

b) - Warm and cold water.
- Mild soap and detergent
- Table salt or vinegar
- A loose coloured item

Practice Assessment - Page 175

1. - Collect the require Equipment and materials.
- Sort the items according to factors such as colour and amount of dirt.
- Wash the item quickly in warm siapy water using kneading and squeezing method.
- Rinse in clean warm water, then in cold water and add salt or vinegar to fit the colour.
- Dry the items under the shade to prevent fading.

2.a) - Avoiding too much soap.
- Adding salt to the final running cold water to fit the colour.
- Using mild soap to prevent loss of colour.

b) To prevent loss of colour.

c) To fix the colour.

3.a) Sorting is separating loose coloured items from white and fast coloured items.

b) Washing by kneading and squeezing involves repeatedly applying gentle pressure on the garments with hands.

c) Drying involves putting the washed garment outside in fresh air.

d) Finishing refers to ironing and folding of the garments for storage.

4. A loose coloured item, basin, mild soap, salt and vinegar, iron box.
5. a) To prevent formation of sheen.
   b) To prevent fading.
6. a) Vinegar, lemon, mild soap, salt, baking soda.

b) Vinegar-to brighten the colour.
Salt-to fix the colour.
Mild soap-to prevent loss of colour.

7. Tick appropriately.

Cleaning the Kitchen

Activity 1- Page 177-178

(i)- Sweeping the floors to remove loose dust, crumbs, and debris.

- Using a mop with warm soapy water to clean sticky spots and stains on the kitchen floor.
- Dusting/wiping surfaces like shelves, tables, and window sills with a soft cloth to remove fine particles.

(ii) 1. Sweeping the floors

- Sweeping involves using a broom to remove loose dirt, dust, crumbs, and other small debris from the kitchen floor.
- It is usually the first step in cleaning because it clears away particles that can make mopping difficult.
- Sweeping helps prevent pests such as ants, cockroaches, and rats that are attracted to food crumbs.
- It keeps the kitchen tidy and reduces accidents caused by slipping on food particles.

2. Mopping with warm soapy water

- Mopping uses a wet mop and a bucket of warm water mixed with detergent.
- Warm soapy water helps to dissolve grease, remove stains, and clean sticky spots that sweeping cannot remove.
- It sanitises the kitchen floor by removing germs and bacteria.
- Mopping also leaves the floor cleaner, fresher, and safer by reducing slippery areas.
- It should be done after sweeping for best results.

3. Dusting or wiping surfaces

- Dusting/wiping involves using a soft cloth (dry or damp) to clean shelves, tables, window sills, counters, and other surfaces.
- It removes fine particles like dust, flour, food splashes, and grease.
- Wiping prevents contamination of food and keeps the kitchen hygienic.
- It also helps maintain the appearance of the kitchen by making surfaces smooth and shiny.
- Regular wiping prevents build-up of dirt which can attract pests or cause stains.

(iii) Share your work with your classmates.

Activity 2 - Page 179

a) Routine cleaning refers to the regular daily cleaning activities done to keep the kitchen neat, safe, and hygienic. These are simple tasks carried out every day before, during, or after food preparation. The main routine cleaning practices include;

1. Sweeping

- Removing loose dirt, dust, and food particles from the floor using a broom.
- Helps maintain cleanliness and prevents pests like ants and cockroaches.

2. Wiping Surfaces

- Using a clean cloth with soapy water to wipe tables, counters, shelves, stoves, and window sills.
- Removes spills, stains, and fine dust that may contaminate food.

3. Mopping

- Cleaning the floor with a mop dipped in warm soapy water.
- Removes sticky dirt, stains, and germs that sweeping cannot remove.
- Leaves the kitchen fresh and hygienic.

4. Washing Utensils and Equipment

- Cleaning pots, pans, knives, plates, and cooking tools immediately after use.
- Prevents smells, germs growth, and overcrowding of dirty utensils.

5. Emptying Dustbins
- Removing kitchen waste in the bin and washing the bin afterwards.
- Prevents bad odour and reduces the chances of attracting pests.

6. Drying and Arranging
- Allowing surfaces and utensils to air-dry or wiping them dry.
- Returning items to their correct storage areas for easy access.

Importance of Routine Kitchen Cleaning
- Prevents contamination of food.
- Controls disease-causing germs.
- Prevents pest infestation.
- Creates a safe working environment.
- Maintains good hygiene and kitchen appearance.
- Reduces accidents such as slipping on spills.

Activity 3 - Page 179
(i) Using digital device

(ii)

1. Sweeping the Kitchen Floor

Procedure:
- Remove movable items from the floor area.
- Use a broom to sweep dirt from corners toward the centre.
- Collect the dirt using a dustpan.
- Dispose of the dirt in the dustbin. Shake or clean the broom after use.

2. Wiping Kitchen Surfaces

Procedure:
- Dust off loose dirt from surfaces.
- Dip a clean cloth in warm soapy water.
- Wring out excess water.
- Wipe tables, counters, shelves, window sills, and stoves.
- Rinse the cloth and wipe again with clean water.
- Dry surfaces using a clean dry cloth or allow them to air-dry.

3. Mopping the Floor

Procedure:
- Sweep the floor first to remove loose dirt.
- Mix warm water and detergent in a bucket.
- Dip the mop in the solution and wring out extra water.
- Mop the floor starting from the farthest corner toward the door.
- Rinse the mop in clean water and mop again to remove soap.
- Leave the floor to air-dry.

4. Washing Utensils

Procedure:
- Scrape off leftover food from utensils.
- Soak greasy utensils in warm soapy water.
- Wash using a sponge or scouring pad.
- Rinse in clean water.
- Place on a rack to dry or wipe with a clean cloth.
- Store them in their correct places.

5. Emptying Dustbins

Procedure:
- Tie or remove the garbage bag from the bin.
- Dispose of waste in the main garbage collection area.
- Wash the dustbin using water and detergent.
- Rinse with clean water.
- Leave it to dry in the sun.
- Insert a fresh garbage bag.
- Drying and arranging Items

Procedure:
- Ensure all washed utensils are dry.
- Wipe wet areas such as the sink or counters.
- Arrange utensils, pans, and cups in their proper racks or shelves.
- Return cleaned equipment to their storage positions.
- Ensure the kitchen is tidy before leaving.

(iii) Share your work with your classmates.

Activity 4 - Page 184
a) Daily cleaning involves:
- Sweeping the kitchen floor.
- Wiping counters, tables, and shelves.
- Washing utensils and equipment.
- Mopping the floor with soapy water.
- Emptying and cleaning dustbins.
- Leaving the kitchen dry and tidy.

(b) Daily Cleaning Procedure in a chart

1. Collect cleaning materials. Broom, mop, bucket, detergent, cleaning cloths, scrubbing brush.
2. Remove items. Take out utensils, equipment, and food items from working areas.
3. Sweep the floor. Remove dust, food particles, and dirt.
4. Wipe surfaces. Clean tables, shelves, counters, and stoves using a damp cloth and detergent.
5. Wash and rinse utensils/equipment. Use soap and clean water. Rinse and place them on the rack to dry.
6. Mop the floor. Use soapy water, then rinse with clean water.
7. Empty and clean dustbins. Dispose of waste properly and wash the bin.
8. Dry the kitchen. Leave surfaces and floors dry to prevent accidents and growth of germs.
9. Return cleaned items. Put utensils, equipment, and materials back in their proper places.

(c) Share your experience with your classmates.

Assessment Questions - Page 184

1. Cleaning a kitchen is the process of removing dirt, food remains, grease and germs from all kitchen surfaces, equipment and utensils to keep the kitchen safe and hygienic.

2.- To prevent food contamination.
- To stop the spread of germs and diseases
- To keep pests such as flies, rats, and cockroaches away.
- To maintain a neat and pleasant environment.
- To prolong the life of kitchen equipment and surfaces.
- To promote safety and prevent accidents like slipping.

3. - Sweeping - Mopping
   - Scrubbing - Wiping
   - Dusting - Washing
   - Rinsing

4. (i) Sweeping - Removing loose dirt, dust, and food particles from the floor.
   (ii) Mopping -Using water and detergent to clean and remove stains from floors.
   (iii) Wiping - Cleaning counters, tables, shelves, and appliances using a cloth and soapy water.

5. Materials required:
   - Water
   - Detergent/soap
   - Disinfectant
   - Scrubbing brush
   - Mops
   - Buckets
   - Cleaning cloths
   - Broom and dustpan
   - Gloves

Procedure:

- Remove all movable equipment and utensils from the kitchen.
- Sweep the floor to remove loose dirt.
- Dust and wipe shelves, counters, and walls.
- Scrub surfaces (floors, sinks, counters) using detergent and a brush.
- Rinse with clean water.
- Disinfect all surfaces to kill germs.
- Dry using a clean cloth or allow to air-dry.
- Clean and return all equipment and utensils to their proper places.

6. - It prevents contamination of food.
- It reduces the risk of food-borne diseases.
- It keeps away pests such as rodents and insects.
- It promotes a safe working environment.
- It keeps the kitchen attractive and organised.
- It prevents bad smells.
- It helps maintain hygiene and good health.
- It preserves kitchen equipment and surfaces.

Cleaning Waste Disposal Facilities

Activity 1- Page 185

1. a) - It helps prevent bad smells.
- It reduces the spread of germs and diseases.
- It keeps the environment clean and safe.
- It prevents pests like rats and flies from breeding.
- It improves the appearance and hygiene of the area.

b) Dust bin, Sink, Open drains

2. a) Refer to answers provided in question 1a above

b) 1. Sink: A sink is used to dispose of liquid waste such as dirty water after washing utensils or hands. The waste water flows through the drain pipe

2. Dust bin: A dust bin is used to collect solid waste such as paper, food remains, and plastic. Waste is thrown into the bin to keep the environment clean.
3. Open drains: Open drains are used to carry wastewater away from homes and buildings. They help direct dirty water to a safe disposal point.

Assessment Work- Page 193

1. The steps would involve contacting the relevant authorities, such as the local council or environmental health department, to report the issue and request professional assistance for emptying or repairing the pit.
2. Two safety measures are wearing appropriate personal protective equipment (PPE) and ensuring adequate ventilation.
3. Wearing appropriate PPE, assessing the blockage safely, using a suitable tool like a drain snake or plunger to clear the obstruction, and then thoroughly cleaning and disinfecting the area.
4. Bleach (sodium hypochlorite solution) and detergents.
5. Gloves, Safety googles, Overall, Apron, Face shiel, Gumboots
6. It can lead to the spread of diseases like cholera, environmental pollution of soil and water sources, and the spread of pests such as flies and rodents.

Disinfecting Clothing and Household Articles

Activity 1 - Page 194

1. a) Sun drying: Clothes are washed and then spread out in direct sunlight. The heat and UV rays from the sun help kill germs.

b) Salting: Salt is sprinkled or dissolved in water and used to soak the clothes. The salt helps kill germs and prevents the growth of bacteria and fungi on the fabric.

c) Boiling: The clothes are placed in hot water and heated until the water boils for a few minutes. The high temperature destroys harmful microorganisms. (Used carefully to avoid fading.)

d) Ironing: After washing and drying, the clothes are ironed with a hot iron. The heat from the iron kills remaining germs on the fabric.

e) Use of disinfectant: Clothes are washed in water mixed with a safe fabric-friendly disinfectant. The disinfectant kills germs during rinsing or soaking.

Activity 2- Page 195

1. a) Refer to the answers provided in activity one number 1 above.

Assessment Work - Page 200

1. The steps involved washing the handkerchiefs thoroughly with soap and water, rinsing them, and then applying a disinfection method like boiling or using a chemical disinfectant.
2. Boiling method or chemical disinfection
3. The process involves washing the socks, placing them in boiling water for a about five minutes and then drying them.
4. Maina would likely use boiling or a strong

chemical for the cotton shirt and a gentler chemical disinfectant for the wool sweater.

- Cotton shirt: Cotton is durable and can withstand high temperatures. Boiling the shirt is an effective disinfection method that will not damage the fabric.
- Wool sweater: Wool is a delicate fabric that shrinks and gets damaged by high heat (boiling) and strong chemicals like bleach. A specific, mild chemical disinfectant suitable for wool would be used to avoid damage.

5. Kitchen counters, sink areas
6. Precautions include wearing protective gear, ensuring ventilation, and following instructions.

Strand 4: Production Techniques

Knitting Skills

Activity 1- Page 201

1.a) A knit stitch is formed by pulling yarn from back to front through a loop forming a v shape.

b) A purl stitch is formed by pulling yarn from front to back through a loop forming little bumps shape.

Activity 2 - Page 202

1. The first is casting on stitches while the second one is casting off stitches.
2. Knitting needles and yarn.
3. Gloves, sweater, table mats among others.

Practice Assessment - Page 208

1.a) Knitting tool box is used to hold and store different knitting materials safely.

b) Working yarn is the strand of yarn that is actively used to make stitches when knitting.

c) Knit stitch is formed by pulling yarn from back to front through a loop.

d) Purl stitch is formed by pulling yarn from front to back through a loop.

e) Casting on is the first step in knitting that provides the foundation for the article being knitted.

f) Casting off is the process of securing the stitches at the end of the article to prevent unraveling.

2. Knitting needles, yarn, a pair of scissors, tape measure, safety pins.
3. Do not bite or year the yarn with your hands.

- Keep knitting needles in a knitting materials tool box away from children.
- Work in a well lit room.

4. c) Knit stitch is formed by pulling yarn from back to front through a loop while a Purl stitch is formed by pulling yarn from front to back through a loop.
5. By cutting and smoothening sharpened sticks.
6. By knitting two stitches together.
7. Table mats, por holders.

Constructing Framed Suspended Garden

Activity 1- Page 208

Framed suspended gardens are constructed on framed structures of any shape and can also be constructed using locally available materials.

Activity 2 - Page 209

1. Vegetables, herbs and spices.
2. Answer accordingly
3. Carrots, kale, spinach, tomatoes, coriander among others
4. Framed suspended garden are constructed on framed structures made of any shape, then they are suspended or hanged.
5. Make a framed work by cutting the wooden planks into appropriate pieces joining them using nails to make the framed structure. Then fix your containers on the framed work.
6. Share your findings with your classmates.

Practice Assessment - Page 213

1. Peas, tomatoes, spinach, pepper, lettuces and many others.
2. a) Mulching should be done to conserve moisture.
   b) Watering should be done early in the morning or late in the evening
   c) Gapping should be done to acquire correct spacing.
3. Design a frame.
4. Woods, containers, plastics, wires, strings, ropes.
5. a) Wooden planks are used to make frames.
   b) Wires are used ti make loops for hanging the containers.
   c) Rope is used to hand the suspended gardens.
   d) Pole is used to make the frames.
6. Answer appropriately.
7. Design a poster.

Adding Value to Crop Produce

Activity 1 - Page 214

1.- Vegetables can be dried to increase their shelf life.
- Potatoes can be cut into smaller pieces and then deep fried to make crisps.
- Simsim seeds can be mixed with sugar to make simsim balls.
- Grains can be dried and grounded to make pumpkin flour.

Activity 2 (page 214)

1. - Sweet potatoes - Maize
   - Beans - Potatoes
   - Cassavas - Pumpkin
2. Sweet potatoes can be cut into small pieces and deep fried to make fried.
- Maize can be dried and milled into flour.
- Beans can be dried to get nutrients and milled into flour.
- Potatoes can be cut into small pieces, deep fried to make chips.
- Cassavas can be cut into small pieces, deep fried to make crisps.
- Pumpkin can be dried and grounded to make pumpkin flour.

3.- Groundnuts can be dried and roasted to make butter.
- Fruits can be processed to make fruit juice.
- Vegetables can be sun dried and packed for storage.

Practice Assessment - Page 219

1. A. a) Simsim balls b) Maize flour
   c) Cassava crisps d) Dried vegetables.
   B. a) Simsim seeds b) Maize grains
   c) Cassava d) Vegetables
   C. a) Drying b) Drying
   c) Deep frying d) Drying
2. Crop produce can be added value by changing it into a new, more useful, or more attractive form. This is done through processing methods like drying, grinding, cooking, frying, packaging, or mixing with other ingredients.
3. a) Earns more money as it increase the monetary value of crop produce.
- Enhances good taste of crop produce.
- Reduced post harvest losses.
4. They could make sweet potato crisps or chips.
5. List crop produce available in your locality.
6. (a) Sweet potatoes: Make crisps, flour, or sweet potato scones.
   (b) Cassava: Make cassava crisps or cassava flour.
   (c) Groundnuts: Roast them and make groundnut butter or make groundnut oil.
7. You wash and peel the potatoes, slice them into thin pieces and then fry them in hot oil until they are crispy. This changes the raw potato into potato crisps that is ready to eat and sells for more money.
8. Potatoes
9. The raw sim sim seeds are first cleaned and roasted to bring out their flavour, then roasted seeds are ground/milled using a machine or mortar until the natural oil in the seeds is released and turns the powder into a smooth, fine butter.

Making Homemade Soap

Activity 1- Page 220

1. Liquid soap, powder soap, bar soap, paste soap.
2. - Washing dishes
   - Cleaning domestic animals and their shelters.
   - Bathing.
   - Cleaning surfacessuch as walls and floors.
3. Name the soap you use at home
4. Discuss with classmates.

Activity 2 - Page 222

- Mix ashes and water to make the strong chemical needed to break down fat.
- Animal Fats/Plant Oils are the main ingredient that becomes the soap.
- Salt is added to improve the texture and tickets the mixture.

Practice Assessment - Page 225

1. - Cleaning dishes
   - Bathing
   - Laundry work
   - General cleaning at home.
2. - It is cost effective.
   - It lasts long.
3. An apron and gloves.

4.- Make lye by mixing wood ashwith water in a bucket.
- Melt the animal fat, cool it then add the lye.
- Heat the mixture continue stirring until it forms a trace.
- Add salt to harden the soap, colourants and fragrances for good smell.
- Pour the thick mixture into moulds and cut into bars.
- Grind some pieces into fine powder.

5.a) powder soap
- Make lye by mixing wood ashwith water in a bucket.
- Melt the animal fat, cool it then add the lye.
- Heat the mixture continue stirring until it forms a trace.
- Add salt to harden the soap, colourants and fragrances for good smell.
- Pour the thick mixture into moulds and cut into bars.
- Grind some pieces into fine powder.

b) Liquid soap
- Mix wood ash with water in a bucket to form lye.
- Melt the plant oil, add lye and stir using an immersion stick.
- Continue stirring until it thickens. Add salt.
- Stir until the mixture form a smooth gel like constitency.
- Add hot hot water to dilute the mixture for a liquid soap.

c) Cake soap.
- Make lye by mixing wood ashwith water in a bucket.
- Melt the animal fat, cool it then add the lye.
- Heat the mixture continue stirring until it forms a trace.
- Add salt to harden the soap, colourants and fragrances for good smell.
- Pour the thick mixture into moulds and let the soap to cool and harden.
- Remove the soap from moulds and cut into bars.

d) Paste soap
- Make a lye by mixing wood ash with water.
- Heat the animal fat and strain the melted fat to remove impurities.
- Add lye to the cooled fat and stir constantly.
- Heat the mixture and stir until it thickens.
- Allow the soap paste to cool slightly.
- Put the soap paste into air tight containers for storage.

Sewing Skills: Construction Household Items

Identifying the types of seams used in making clothes

Activity 1- Page 226

1. Look at your peer's school uniform.
2. The stitching where two pieces of fabric are joined is called a seam.
   Examples you may see on a school uniform include the;

- Side seams - Shoulder seams
- Armhole seams - Skirt or trouser seams

2. Most school uniforms have one or two lines of stitches.
   One line = plain seam
3. - Join parts of the garment together
- Make the uniform strong and long-lasting
- Help the uniform fit properly
- Improve appearance and neatness
- Prevent fabric edges from fraying

Activity 2 - Page 226

1. Seam (a) is a plain seam
   Seam (b) is an open seam
2. A Plain Seam - It is the most common and basic type of seam used to join two pieces of fabric together.

- Created by placing two fabric pieces right sides together.
- Stitched along the seam line.
- The seam allowances lie on one side after stitching.
- Strong and suitable for most garments and household items.
  It is used to make;
  - Dresses - Skirts
  - Shirts - Pillowcases
  - General sewing work

2. Open Seam- An open seam is a seam where the seam allowances are pressed open after stitching.

- Similar to a plain seam but the seam allowances are separated and pressed flat in opposite directions.
- Reduces bulk and makes the garment lie smoothly.
- Gives a neat finish on the inside of the garment.
  It is used to make;
- Skirts and trousersllmooth, flat appearance
- Garments made of medium-weight fabrics

3. Share your answers with classmates.

Assessment Work - Page 235

1. a. Knitting needles b. Pins (on a pinwheel)
   c. Tailor's chalk d. Thimble
   e. Scissors

b) - Handle scissors carefully to avoid cuts.
- Do not put pins or needles in the mouth.
- Store pins in a pin cushion after use.
- Use a thimble to protect your fingers when sewing.
- Keep sharp tools away from children.
- Pass scissors with handles first.

2. - It joins two pieces of fabric together.
- It strengthens the garment or item.
- It prevents raw edges from fraying.
- It helps the item fit properly.
- It improves the appearance and neatness of the item.

3. (i) Plain seam
   (ii) Open seam

4. (i) Plain seam

- Place two fabrics right sides together.
- Stitch along the seam line.
- Open the two fabric pieces and press the seam allowances open.

(ii) Open seam with tape

- Make a normal plain seam.
- Open and press the seam allowances.
- Place a tape/strip of fabric over the raw edges.
- Stitch along both sides of the tape to neaten the seam.

5. - Pillowcase - Cushion cover
   - Lap bag - Work bag
   - Tablecloth - Apron
   - Kitchen towel

6.

Household Item	Seam used
Pillowcase	Plain seam
Cushion cover	Plain seam
Lap bag	Open seam
Work bag	Open seam
Tablecloth	Plain seam
Apron	Plain seam

7. - Should be strong.
   - Be secure
   - Be straight and even.
   - Have neat and smooth stitching.
   - Have proper finishing to prevent fraying
   - Be suitable for the type of fabric.

Constructing Innovative Animal Waterer

Activity 1- Page 236

1. - Buckets or basins
   - Plastic troughs
   - Metal troughs
   - Clay pots
   - Old tyres converted into waterers
   - Automatic (float-valve) waterers
   - Raised pipe waterers for cows/goats
   - Hanging drinkers (for poultry)
   - Jerrycans turned into water dispensers
   - Drip waterers for poultry

2. - Buckets/basins are filled manually with clean water and the animals drink directly.
   - Troughs are long containers filled with water for cattle, goats or sheep.
   - Clay pots ; store cool water. The animals drink from the opening.
   - Tyre waterers; old tyre cut and filled with water; used for ducks or goats.
   - Automatic waterers; connected to a tank. Water refills automatically.
   - Raised pipe waterers; water flows through a pipe and animals drink at openings.
   - Hanging poultry drinkers. They are suspended to prevent contamination and are refilled manually.

Activity 3 - Page 236- 237

(a) A rabbit drinking from a plastic container.
(b) Hen drinking from a plastic pipe pipe
(c) Dog drinking from a metallic bowl
(d) Duck drinking from a tyre waterer.

2. (a) Rabbit drinking from a plastic container
- A plastic container is filled with clean water and placed inside the rabbit's hutch.
- The container is usually shallow or narrow to prevent the rabbit from stepping inside and spilling the water.
- The rabbit drinks by lowering its mouth to the container.
- The container must be cleaned and refilled daily to keep the water fresh and prevent diseases.

(b) Hen drinking from a plastic pipe.
- A plastic pipe waterer is usually fixed horizontally and has small holes or nipples along its length.
- Clean water flows through the pipe.
- The hen taps or pecks the nipple or edge of the hole, and water drips out for it to drink.
- This method reduces water wastage and keeps the water clean.
- It is commonly used in poultry houses with many birds.

(c) Dog drinking from a metallic bowl
- A metallic bowl is placed on the ground or a raised stand and filled with clean water.
- The dog laps up the water using its tongue.
- Metal bowls are preferred because they are strong, durable, and easy to clean.
- The bowl must be refilled often, especially in hot weather, to prevent dehydration.

(d) Duck drinking from a tyre waterer
- A tyre waterer is made by cutting and cleaning an old tyre and filling the inner space with water.
- The water forms a shallow pool where ducks can drink and splash.

- Ducks dip their beaks into the tyre waterer to drink, and sometimes clean their nostrils and bills.
- The tyre is heavy and stable, so it does not tip over easily.
- It must be cleaned regularly because ducks tend to muddy the water faster.

Activity 1 - Page 238-239

(a) A chicken drinking from an upside- down plastic bottle waterer made from an empty plastic bottle (e.g., soda bottle)

(b) Chicken drinking from a shallow basin made of plastic.

(c) Bottle waterer

- The plastic bottle is filled with clean water and hung upside down.
- When the bottle cap/nozzle has a small hole, water flows into a small dish or the bottle cap area.
- As the chicken drinks the water, more water flows down automatically due to air pressure.
- This ensures a steady supply of clean water and reduces spillage or contamination.

Basin waterer with stones

- Water is poured into the shallow basin.
- Stones are placed inside to reduce water movement and prevent chicks from stepping into or dirtying the water.
- Chickens drink from the spaces between the stones.
- The design keeps water clean, minimizes wastage, and makes the waterer stable and safe.

Assessment Questions - Page 240

1. An animal waterer is a device or equipment designed to provide clean drinking water to animals.
2. - Plastic containers or buckets
   - Troughs
   - Basins
   - Plastic bottles used as automatic waterers
   - Metal or plastic bowls
   - Drums cut into halves
3. - Waterers often get contaminated with dirt, droppings, or leftover feed.
   - Animals may spill the water, leading to wastage.
   - Some waterers are made from weak materials and can break easily.
   - Water flow can be blocked by dirt or particles.
   - In the dry season the waterers may run out quickly; in cold weather they may freeze.
   - Larger animals may prevent weaker ones from reaching the waterers.
4. a) A traditional animal waterer - picture c
   c) An innovative animal waterer- picture b
   d)Which picture shows an innovative animal waterer?
5. Picture (b)- an electric automatic dog waterer.
   - It requires electricity to function, so it cannot work during power cuts.
   - It may be expensive to buy and maintain.
   - The water pump can get blocked if water is dirty.
   - Animals might damage the electric parts or cables.
6. - They reduce water wastage by controlling the flow of water.
- They keep water cleaner and more hygienic.
- They store more water and provide a constant supply.
- They prevent animals from stepping in or spilling the water.
- They are durable and harder for animals to overturn.
7. Draw a simple sketch of one common animal waterer in your community.

ICT Support Services

Activity 1- Page 241

(a) Support services accessed through ICT include;

1. Weather forecast services - Farmers get information about rainfall, sunshine, wind, storms, and temperature changes.
2. Veterinary services - Farmers receive advice from veterinary officers through SMS, calls, websites, or mobile apps.
3. Input supply services - Farmers access information on seeds, fertilizers, tools, chemicals and animal feeds online.
4. Market information services - Farmers check market prices for crops and animals through ICT.
5. Financial services - Farmers use mobile money and online banking for payments and loans.
6. Training and extension services - Farmers attend online training and learn new farming techniques using ICT.

(b) Discuss your findings in your group.

(c) Write brief notes about your findings.

- ICT helps farmers get quick and reliable weather updates to plan their farming activities.
- Farmers can access veterinary advice on disease control, treatment, and animal care.
- ICT enables farmers to order farm inputs such as seeds, fertilizers, and equipment online.
- Farmers use ICT to access market prices, helping them sell their produce at better prices.
- ICT provides access to training materials and farming demonstrations on videos, radio, and agricultural websites.

(d) Share your findings with other groups.

Assessment Questions- Page 242

1. Support services are helpful services provided to farmers, businesses, or households to make work easier, faster, and more effective.

2. - Mobile phone - Computer / laptops
   - Tablet

3. (a)Catering services

- Calling or texting catering service providers.
- Use of social media platforms where caterers advertise their menu.
- Viewing menus, prices and bookings on websites.

(b) Marketing information

- By checking prices of goods online
- SMS price alerts
- Radio and TV business programs
- Using mobile apps to view updated market prices

(c) Weather forecaast services

- Watching TV weather news
- Listening to weather updates on radio
- Using weather apps on a mobile phone
- Receiving SMS weather alerts

4. Discuss the importance of ICT in support services.

- Provides quick access to important information.
- Helps farmers plan better using weather and market information.
- Reduces the cost of traveling to access services physically.
- Enables fast communication with experts (veterinary, extension officers).
- Helps farmers buy and order inputs online.

5. - Do not share your personal passwords with anyone.
- Keep your devices updated and protected.
- Avoid giving unnecessary personal information online.
- Ensure important data is backed up and not copied by others.
- Always log out after using shared devices.
- Keep records of services for future use.
- Avoid opening suspicious links or websites.

Grafting in Plants

Activity 2 - Page 244

1.a) The pictures shows development of grafted plants

Assessment Questions - Page 252

1. It is a method of plant propagation where the stem (scion) is joined to root system (rootstock) of another plant so as they grow as a single plant.
2. Repair, Aesthetic, Rejuvenation, Improvement purposes
3. Watering, Protecting the graft union, Removal of the graft tape after a successful union.
4. The extra buds can use up water and nutrients meant for the scion.

5. a) Scion- It is the upper part of a grafted plant. Its function is to produce the desired fruits, flowers, or leaves.

b) Rootstock- It is the lower part of a grafted plant. Its function is to provide strong roots and support, and to resist diseases and harsh soil conditions.

6. a) G- Scion, M- Rootstock

b)- Joining the parts- Place the scion onto the rootstock so that their cut surfaces and cambium layers match closely.

- Tying the graft- Tie the joint firmly using grafting tape or a soft material to hold the parts together.
- Sealing the joint- Apply grafting wax or a sealant to prevent drying and infection.

Homemade Sundryer

Activity 1- Page 253

1. c) -Wooden sticks or timber
   - Nails or screws
   - Wire mesh or netting
   - Clear polythene sheet
   - Dark cloth or paint (optional, for heat absorption)

Assessment Work - Page 257

1. Kindly to the answers provided on Activity 1 page 253 above.

2. - It helps preserve vegetables for a longer time.
   - It prevents vegetables from rotting.
   - It saves money by reducing food waste.
   - It keeps vegetables safe from insects and dirt.
3. Spinach, Kales, Cabbage, Onions, Tomatoes
4. - It preserves the nutrients in the vegetables.
   - It dries vegetables faster than leaving them in the open air.
   - It keeps vegetables clean and free from dust and insects.
   - It is an inexpensive and easy method of drying vegetables.

5. a) Homemade Sundryer

b) Vegetables are placed inside the sun dryer, which lets sunlight and air pass through while keeping out dust and insects. The heat from the sun removes moisture from the vegetables, preventing the growth of bacteria and fungi. This drying process helps the vegetables stay fresh and safe for a longer time.

MODEL PAST PAPERS ANSWERS

MODEL PAPER ONE ANSWERS : GRADE 7

SECTION A

1.	B	11.	B
2.	C	12.	A
3.	D	13.	C
4.	A	14.	D
5.	B	15.	A
6.	D	16.	C
7.	A	17.	B
8.	C	18.	C
9.	D	19.	C
10.	B	20.	A

SECTION B

21. a) i) The seeds or seedlings should be disease-free.
ii) The seeds or seedlings should be of a high-yielding variety.
iii) The seeds or seedlings should be well-adapted to the local climate and soil conditions.

b) i) Healthy seedlings establish quickly and grow vigorously, leading to better yields.
ii) They reduce the risk of spreading pests and diseases in the garden.
iii) They ensure production of quality vegetables that are safe and nutritious for consumption.

22. i) "Keep the soil clean, keep our food safe!"
ii) "Say no to dumping waste - protect our soil, protect our future!"

23. a) Shallow water pan

b) i) The water pan collects and stores excess surface runoff, reducing the speed and amount of water flowing over the land, which prevents soil erosion.
ii) The stored water in the water pan can be used for irrigation, reducing the need for uncontrolled water flow that could wash away soil.

24. a) i) Seeds
ii) Seedlings

b) i) Hoe / Jembe
ii) Watering can

c) i) Watering the young trees regularly to promote healthy growth.
ii) Mulching around the trees to conserve soil moisture and prevent weeds.

25. a) i) Animal fat / vegetable oil
ii) Wood ash (as a source of lye)

b) i) Collect animal fat/vegetable oil and wood ash.
ii) Prepare lye solution by mixing water with wood ash and filtering it.
iii) Heat the fat/oil until melted.
iv) Slowly add the lye solution to the heated fat/oil while stirring continuously.
v) Pour the mixture into molds and leave to harden before cutting into bars.

26. i) Wash hands thoroughly before handling food.
ii) Keep raw and cooked food separate to prevent contamination.
iii) Ensure the grill is placed in a safe, ventilated place away from flammable materials.
iv) Use clean utensils and cook food thoroughly before serving.

27. i) Wash the cabbage thoroughly and cut it into suitable pieces.
ii) Boil water in a large pot.
iii) Place the cabbage pieces in boiling water for a few minutes (about 2 - 3 minutes).
iv) Quickly transfer the blanched cabbage into cold/ice water to stop the cooking process, then drain and pack for freezing.

MODEL PAPER TWO ANSWERS : GRADE 7

SECTION A

1.	C	11.	B
2.	B	12.	A
3.	D	13.	C
4.	A	14.	D
5.	B	15.	B
6.	D	16.	A
7.	C	17.	D
8.	A	18.	B
9.	C	19.	C
10.	D	20.	A

SECTION B

21. Digging them out, slashing, mulching, uprooting

22. i) Filtering/sieving to remove impurities such as wax, pollen and dead bees.
ii) Heating/pasteurizing to kill harmful microorganisms and delay crystallization.
iii) Packaging in clean, airtight containers for storage and sale.

23. a) List four materials you will need to set up the framed garden. (4 Marks)
i) Timber/wooden planks or poles
ii) Nails or binding wire
iii) Soil/manure mixture
iv) Watering can or buckets
b) i) Helps in conserving soil and water within the frame.
ii) Makes weeding, watering, and general crop management easier.
c) i) Spinach
ii) Kales (Sukuma wiki)
iii) Onions

24. i) Provides water for irrigation during dry periods.
ii) Reduces soil erosion by controlling excess water flow.
iii) Increases groundwater recharge and improves soil moisture.
iv) Ensures a sustainable supply of water for crops and livestock.

25. a) Use of agricultural chemicals
b) Apply organic manure

26. i) Knitting needles
ii) Yarn/wool
iii) Scissors

27. a) Peeling the vegetables thinly - To reduce wastage of edible parts and retain more nutrients.
b) Cutting the vegetables before cooking - To allow even and faster cooking.
c) Covering the vegetables while cooking - To prevent loss of nutrients and save cooking fuel/energy.
d) Reducing the cooking time - To preserve heat-sensitive vitamins and improve texture and taste.

28. i) Reduce - Cook vegetables for a shorter time to minimize nutrient loss.
ii) Recycle - Use the water used in cooking (e.g., in soups or stews) to recover lost nutrients.
iii) Replace - Replace the lost nutrients by eating a variety of foods rich in vitamins and minerals.

MODEL PAPER THREE ANSWERS : GRADE 7

SECTION A

1.	A	11.	D
2.	D	12.	C
3.	C	13.	A
4.	B	14.	C
5.	A	15.	B
6.	C	16.	D
7.	D	17.	B
8.	A	18.	B
9.	A	19.	D
10.	C	20.	A

SECTION B

21.i) Weeding- removing unwanted plants that compete with crops for nutrients, light and water.
ii) Watering - supplying adequate moisture to crops for healthy growth.
iii) Mulching - covering the soil around crops to conserve moisture and control weeds.
iv) Fertilizer/manure application - adding nutrients to the soil to boost crop growth.

22. a) -To remove dirt and droppings, ensuring they are clean and hygienic for consumption.
- To prevent contamination and damage that may reduce egg quality.

b) i) Egg trays (cardboard or plastic).
ii) Clean, dry baskets or crates lined with soft material.

c) i) For consumption - wash, dry, and store in a clean, cool place.

ii) For hatching - select clean, unwashed eggs of medium size and store them properly before incubation.

23. a) Hoe / Jembe

b) Gently heap soil around the base of the sweet potato plants using a hoe, covering the exposed roots and creating ridges to support tuber formation.

24. i) Gapping - replacing dead or missing plants in a field to maintain uniform plant population.

ii) Mulching - covering the soil surface around crops with dry grass, leaves, or other materials to conserve moisture and control weeds.

iii) Thinning - removing excess seedlings to reduce overcrowding and allow remaining plants to grow well.

25. a) i) Smooth sticks/bamboo pieces.
ii) Polished wires/metal rods.

b) i) Cut the sticks or metal rods to the desired length.

ii) Sharpen one end smoothly to form a pointed tip.

iii) Smoothen/polish the entire surface using sandpaper to remove roughness.

iv) Fix knobs/stoppers at the blunt ends to prevent stitches from slipping off.

26. To protect the eyes from harmful chemical splashes and irritation.

27.i) Preserves most vitamins and minerals in food.

ii) Enhances natural flavor and color of food.

iii) Uses less fat, making the food healthier.

28. i) Provides variety in taste, texture and appearance of meals.

ii) Ensures a balanced diet by combining nutrients retained in different methods.

29. i) "Cook vegetables for a short time - save the vitamins!"

ii) "Use less water when cooking to keep nutrients strong."

iii) "Don't throw away cooking water -reuse it in soups and stews!"

MODEL PAPER ONE ANSWERS : GRADE 8

SECTION A

1.	A	11.	C
2.	D	12.	C
3.	C	13.	B
4.	B	14.	D
5.	D	15.	A
6.	A	16.	C
7.	D	17.	C
8.	B	18.	D
9.	A	19.	B
10.	B	20.	A

SECTION B

21. - A kitchen garden provides a steady supply of fresh vegetables, fruits, and herbs for family meals.

- It improves household nutrition by supplying essential vitamins and minerals that prevent malnutrition.

'A kitchen garden reduces food costs since families spend less money buying vegetables and fruits.

- It can also serve as a source of income when surplus produce is sold, enabling families to buy other nutritious foods.

22. a) i) Grassed waterways,
ii) Stonelines

b) - Soil bunds

Soil bunds are embankments made across the slope of the land. They slow down the movement of water, reduce soil erosion, and allow rainwater to soak into the ground, which improves soil fertility and moisture retention.

- Trash lines

Trash lines are made by placing crop residues such as maize stalks or dry grass along the contour of the land. They reduce the speed of running water, trap soil particles being carried away, and gradually decompose to add organic matter that enriches the soil.

23. a) i) Scaling - Remove scales from the skin using a knife or scaling tool.

ii) Gutting - Cut open the belly and remove the internal organs.

iii) Washing - Thoroughly wash the fish in clean water to remove blood and dirt.

iv) Salting - Apply salt directly to the flesh of the fish.

v) Frying - Dip the fish in hot cooking oil until it turns golden brown.

(b) i) Beheading - Slaughter the bird by cutting the neck veins and allow blood to drain completely.

ii) Defeathering - Dip the bird in hot water to loosen feathers, then pluck them.

iii) Removal of offal - Cut open the abdomen and remove internal organs carefully.

iv) Cleaning - Wash the carcass thoroughly in clean water and place it in cold storage to keep it fresh.

24. i) It helps to improve the quality and safety of the meat for consumption.

ii) It makes the products more attractive and marketable to consumers.

iii) It increases the shelf life of fish and poultry by preventing spoilage.

iv) It adds value, which helps farmers earn more income.

25. a) i) French seam (left image)

ii) Open/plain seam (right image)

b) i) French seam - It is made by sewing the wrong sides of fabric together first, trimming the allowance, then turning and stitching again on the right sides to enclose raw edges. It gives a neat and durable finish.

ii) Open/plain seam - The two pieces of fabric are placed right sides together and stitched, then the seam allowance is pressed open on both sides. It is commonly used in dressmaking.

c) i) Seams join two or more pieces of fabric together securely.

ii) Seams strengthen the garment and prevent fraying of raw edges, while also giving it a neat appearance.

MODEL PAPER TWO ANSWERS : GRADE 8

SECTION A

1.	D	11.	B
2.	B	12.	B
3.	C	13.	C
4.	A	14.	A
5.	D	15.	D
6.	B	16.	D
7.	A	17.	A
8.	C	18.	B
9.	A	19.	D
10.	C	20.	C

SECTION B

21. a) Cutworms

b) - Handpicking
- Applying ash
- Applying pesticides chemical

22. a) A farm model is a small-scale representation of a farm showing different farming enterprises, structures and practices for learning purposes.

b) i) Sticks or twigs ii) Stones

iii) Clay or soil iv) Grass or leaves

v) Cardboard or polythene

23. i) Gutting is the process of removing the internal organs of a fish after it has been cut open along the belly. This is done to make the fish clean and safe for cooking.

ii) Scaling is the process of removing the outer scales from the skin of a fish using a scaler or knife. This is done to improve the texture, appearance, and taste of the fish when cooked.

24. a) Water pond, Shallow water pan, Water tank

b) i) Installing tanks on a raised platform or tower to allow water flow by gravity.

ii) Installing tanks on the ground surface or on a concrete base.

c) i) Regularly removing silt and debris from the water pan.

ii) Repairing cracks or leaks on the water pan walls and base.

iii) Fencing around the water pan to prevent contamination by animals.

iv) Planting grass or trees around the water pan to control soil erosion.

24. a) a- Mopping, b- Sweeping, c- Vacuuming

b) i) Sweep or vacuum the tiled floor to remove dust and loose dirt.

ii) Mop the floor using clean water mixed with mild detergent.

iii) Rinse with clean water and dry the floor to prevent slipperiness.

c) i) To prevent the breeding of disease-causing germs and pests.

ii) To maintain hygiene and ensure safe food preparation.

26. a) i) Availability and cost of different food items.

ii) Nutritional needs of the family members.

iii) Variety in meals to avoid monotony and ensure balanced diet.

MODEL PAPER THREE ANSWERS : GRADE 8

SECTION A

1.	D	11.	D
2.	A	12.	A
3.	C	13.	C
4.	B	14.	D
5.	D	15.	A
6.	B	16.	C
7.	A	17.	B
8.	B	18.	A
9.	C	19.	D
10.	C	20.	B

SECTION B

21. a) A poultry fold

b) i) Providing poultry with adequate feed and clean drinking water.

ii) Cleaning and disinfecting the poultry fold regularly to prevent diseases.

iii) Vaccinating and deworming the poultry to maintain good health.

22. a) Removal of offals

b) Beheading, Defeathering, Cleaning, Frying

23.a) i) Smartphone

ii) Laptop

iii) Tablet

iv) Desktop computer

b) i) Avoid overexposure to screens by taking regular breaks.

ii) Ensure correct sitting posture to prevent back and eye strain.

iii) Keep ICT devices away from water and food to avoid damage.

iv) Use strong passwords and antivirus software to protect data.

24. a) A balanced diet is a meal that contains all the essential nutrients (carbohydrates, proteins, vitamins, minerals, fats, and water) in the right proportions for proper body functioning.

b) i) The age and health status of family members.

ii) The availability and cost of different food items.

iii) The nutritional needs and food preferences of the family.

c) i) The number of guests and their food preferences.

ii) The type of occasion and the budget available.

25. a) Smoking

b) i) It helps to extend the shelf life of meat by slowing down spoilage.

ii) It prevents the growth of harmful microorganisms that cause meat to rot.

iii) It adds a unique flavour and aroma to the meat, making it more enjoyable.

c) Sun drying, Salting, Refrigeration

26. a) i) Leaving dirty utensils unwashed.

ii) Allowing food waste to remain uncovered.

iii) Keeping the floor wet and littered with food particles.

b) i) Washing utensils immediately after use.

ii) Covering and properly disposing of food waste.

iii) Sweeping and mopping the kitchen floor regularly to keep it clean and dry.

MODEL PAPER ONE ANSWERS : GRADE 9

SECTION A

1.	B	16.	D
2.	B	17.	B
3.	D	18.	C
4.	C	19.	A
5.	A	20.	C
6.	D	21.	B
7.	C	22.	B
8.	A	23.	C
9.	B	24.	A
10.	D	25.	C
11.	C	26.	A
12.	A	27.	B
13.	C	28.	A
14.	D	29.	D
15.	C	30.	D

SECTION B

31. a) a- Standing forage,
b- Stacked straws, c- Baled hay
b) To prevent nutrient loss and spoilage caused by rain and direct sunlight.
c) Grass

32. a)- Timber / wooden poles
- Nails
- Wire mesh / chicken wire
- Iron sheets / roofing materials
- Hinges (for fixing the door)
- Locks or latches (to secure the fold)

b) i) Cleaning the poultry fold regularly
ii) Providing adequate feed and water
iii) Collecting eggs daily
iv) Controlling pests and diseases

c) i) Protects poultry from predators
ii) Prevents theft of poultry
iii) Helps in controlling spread of diseases
iv) Provides shelter against harsh weather conditions

33. a) i) Maize stalks ii) Grass
iii) Small sticks/twigs iv) Stones/pebbles
v) Soil

b) i) Slows down the speed of running water, reducing soil erosion
ii) Allows water to infiltrate into the soil, improving soil fertility and moisture retention.

34.a) Structures or containers designed for collection, storage, and safe removal of waste materials.

b) i) To prevent foul smell
ii) To reduce the spread of diseases
iii) To discourage pests like flies and rats
iv) To maintain hygiene and cleanliness
v) To enhance proper recycling and waste management

35.a) Ensures produce is dry enough to prevent mold growth and rotting

b) Allows circulation of fresh air, preventing accumulation of moisture and growth of fungi.

36.a) i) Wheat flour ii) Water
iii) Salt iv) Cooking oil/fat
v) Optional - sugar or milk

b) Dough mixture

c) i) Ensures correct proportions of ingredients
ii) Gives consistent results in quality
iii) Saves time during preparation
iv) Helps in cost control by preventing wastage

37.a) i) Refrigerating or freezing the food
ii) Storing in clean, airtight containers

b) i) Prevents wastage of food
ii) Saves money by reducing cost of buying extra food
iii) Ensures food safety and prevents food poisoning
iv) Maintains nutritional value of the food
v) Helps in proper meal planning at home

38. a) i) Steaming
ii) Stir-frying

b) i) Promotes good health
ii) Prevents deficiency diseases
iii) Improves body immunity
iv) Provides energy and growth nutrients

c) i) Exposure to sunlight destroys vitamins such as Vitamin C
ii) Washing vegetables too early causes nutrient leaching
iii) Keeping vegetables in poorly ventilated areas accelerates spoilage and loss of nutrients

MODEL PAPER TWO ANSWERS : GRADE 9

SECTION A

1.	B	16.	A
2.	A	17.	C
3.	C	18.	D
4.	D	19.	C
5.	C	20.	A
6.	B	21.	B
7.	A	22.	A
8.	C	23.	D
9.	B	24.	D
10.	D	25.	A
11.	A	26.	B
12.	C	27.	D
13.	D	28.	C
14.	C	29.	A
15.	B	30.	B

SECTION B

31. a) Integrated farming

b) Fish farming, Poultry rearing, Livestock rearing, Crop growing, Tree planting

c) i) Manure from livestock and poultry is used to fertilize crops and fish ponds, improving soil and water fertility.

ii) Crop residues and by-products provide feed for livestock, poultry, and fish.

iii) Trees provide shade and windbreaks for crops, livestock, and fish ponds, while also supplying fodder and firewood.

iv) Fish pond water rich in nutrients can be used to irrigate crops, boosting yields.

32.a) i) The water container may easily tip over and spill.

ii) The water may get dirty quickly when animals step into it.

iii) Limited capacity may not provide enough water for all animals.

iv) Frequent refilling may be required, increasing workload.

b i) Plastic bottles

ii) Old buckets

iii) Used cooking oil containers

iv) Old sufurias (pans)

v) Tin cans

33. a) i) Trees provide shade, creating a cool and comfortable environment.

ii) They reduce soil erosion by holding the soil with their roots.

iii) Trees improve air quality by absorbing carbon dioxide and releasing oxygen.

iv) They act as windbreaks, protecting crops and buildings.

v) Trees provide fruits, fuel wood, and timber for use.

b) i) Digging an appropriate hole and mixing topsoil with manure.

ii) Placing the seedling upright in the hole and covering the roots with soil.

iii) Watering the seedling and placing mulch around the base to conserve moisture

34. a) i) To kill disease-causing germs and parasites.

ii) To prevent the spread of infections within the household.

iii) To maintain cleanliness and freshness of clothes and items.

iv) To prolong the lifespan of household articles by preventing contamination.

b) i) Bleach - Used to soak or wipe surfaces and whiten clothes.

ii) Dettol - Added to water when washing clothes or mopping floors to kill germs.

iii) Jik - Used for disinfecting toilets, bathrooms, and soaking clothes.

iv) Soap and hot water - Used for washing utensils, clothes and surfaces to remove dirt and germs.

v) Vinegar - Used for cleaning surfaces like kitchen counters and utensils.

35. i) Age - Young children and the elderly require soft, easily digestible and nutrient-rich foods, while adolescents need more energy-giving foods.

ii) Health status - Sick people may need special diets such as low-fat, high-vitamin, or easily digestible foods.

iii) Gender - Males generally require more energy due to higher physical activity, while females may need more iron-rich foods to compensate for blood loss during menstruation.

36. a) Rooftop water harvesting
b) i) The capacity of the storage structure to meet the garden's water needs.
ii) The location, ensuring it is near the garden and on a firm foundation.
iii) The materials to be used for durability and cost-effectiveness.
iv) The source of water (rainwater, borehole, or piped water) for filling the structure.
c) i) The water can be used for irrigating crops, especially during dry seasons.
ii) The water can be used for watering livestock and poultry.
iii) The water can be used for mixing farm chemicals
37. a) Vegetables sun dryer
b) i) Vegetables are cleaned, sliced into thin pieces and spread evenly on clean trays or mats. They are then placed under direct sunlight until most of the moisture is removed.
ii) Sun-drying reduces the water content in vegetables, which prevents the growth of microorganisms and enzymes that cause spoilage, thereby extending shelf life.
c) i) The place should have adequate exposure to direct sunlight for faster drying.
ii) The location should be clean and free from dust or contaminants to maintain hygiene.
iii) The area should be protected from pests and animals, such asbirds and insects.
38. a) Flour provides structure and bulk to many food products such as bread, cakes and pastries.
b) i) The type and amount of flour used *(e.g., hard wheat flour produces tougher products while soft wheat flour gives tender products).*
ii) The amount of liquid and mixing method (too much mixing develops excess gluten, making products tough).
c) Improper mixing can lead to uneven distribution of ingredients, resulting in lumps, poor texture, and undesirable appearance. It can also make the product too tough or too dry.
39. i) Reducing the amount of cooking time - Minimizes nutrient loss, especially of heat-sensitive vitamins such as Vitamin C and B-complex.
ii) Washing before cutting - Prevents water-soluble vitamins and minerals from leaching out during washing, thus preserving nutrients

MODEL PAPER THREE ANSWERS : GRADE 9

SECTION A

1.	B	16.	C
2.	D	17.	D
3.	D	18.	C
4.	C	19.	A
5.	A	20.	B
6.	C	21.	A
7.	B	22.	D
8.	D	23.	C
9.	A	24.	D
10.	C	25.	B
11.	B	26.	A
12.	A	27.	D
13.	D	28.	B
14.	C	29.	A
15.	B	30.	B

SECTION B

31. a) Grafting in plants
b) i) To promote environmental conservation by reducing soil erosion.
ii) To improve air quality through absorption of carbon dioxide and release of oxygen.
iii) To provide shade, windbreaks, and beautification of the environment.
iv) To supply timber, firewood and other useful products in the future.
c) i) Regular watering to keep the soil moist, especially during dry periods.
ii) Mulching around the base to conserve soil moisture and suppress weeds.
iii) Weeding to reduce competition for nutrients and water.
iv) Protecting the plant from damage by animals or pests, e.g., fencing or spraying.

32. a) Framed suspended garden
b) - Used plastic bottles
- Buckets or tins
- Wooden boxes

c) i) Saves space since vegetables are grown vertically.

ii) Helps in conserving water by reducing wastage.

iii) Protects vegetables from pests and soil-borne diseases.

iv) Provides fresh vegetables close to homesteads, improving nutrition.

33. i) Type of fabric to be joined.
ii) Purpose or use of the garment.
iii) Desired appearance or finish of the seam.

34. a) Granary

b) If the granary is not well maintained, it can allow entry of pests, moisture, and diseases which cause spoilage, rotting, or destruction of stored crops.

c) Dusting, Controlling rodents, Cleaning, Repairing leakages, Sealing cracks

35.a) It is the practice of growing crops without using synthetic chemicals such as fertilizers, pesticides, or herbicides, but instead relying on natural methods to improve soil fertility and control pests.

b) i) Provides safe and healthy food free from harmful chemical residues.

ii) Improves soil fertility and structure through the use of compost and manure.

iii) Reduces environmental pollution caused by chemical fertilizers and pesticides.

iv) Promotes sustainable farming practices for future generations.

36. a) Boiling - Articles are immersed in water and heated to boiling point for 10 -15 minutes to kill germs.

b) Use of disinfectants -Articles are soaked or rinsed in recommended disinfectant solutions for a specific period to destroy harmful microorganisms.

37. a) i) Sugar - Adds sweetness and improves flavor.

ii) Eggs - Provide structure, richness and help bind ingredients.

iii) Fat (e.g., margarine, butter, oil) - Improves texture, tenderness and flavor.

iv) Milk/water - Provides moisture and helps in forming the dough or batter.

b) The role of raising agents is to introduce air or gas into flour mixtures, making the final product light and porous. Example: Baking powder or yeast.

c) Over mixing makes the product tough due to over development of gluten.
Under mixing causes uneven texture and poor rise in the product.

38. a) i) Risk of food poisoning due to bacterial growth.

ii) Loss of nutritional value and unpleasant taste.

b) Labeling and dating leftover foods helps in identifying contents and ensuring they are consumed before spoilage.

c) i) Heat thoroughly to steaming point before serving.

ii) Use a stove, oven, or microwave to reheat evenly.

d) i) Reduces food wastage at household and community level.

ii) Saves money by maximizing food resources.

iii) Ensures availability of food during shortages.

iv) Reduces environmental pollution from food waste disposal.

39. a) Roasting - Cooking food in an oven or over open heat using dry hot air, usually with some fat/oil.
Grilling- Cooking food directly over or under strong radiant heat.

b) i) Keep flammable items away from the heat source.

ii) Use long-handled tools to avoid burns.

iii) Ensure food is properly cooked before eating.

c) i) Conserves most nutrients in food since it uses minimal water.

ii) Produces food that is light, tender, and easy to digest.