

STANDARD 4 AGRICULTURE AND SCIENCE & TECHNOLOGY SUMMARY NOTES

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UNIT 1: SCIENTIFIC INVESTIGATION

Scientific investigation

-A scientific investigation is a process in which one designs and carries out an experiment to obtain information.

Steps to follow when conducting a scientific investigation

a) Identifying a problem

-This is the first step in planning and conducting a scientific investigation.

-No scientific investigation can be conducted if one does not know the problem to be solved.

-The problem to be investigated may be stated in the form of a question.

Examples of problems to be investigated

i) What can happen if paraffin is mixed with water? ii) Why

do some materials float while others sink? b) **Making a prediction**

-The purpose of conducting a scientific investigation is to find out the solution to the problem.

-Sometimes it is useful to have an idea about the expected solution to the solution. This is done by making a prediction.

-A prediction is a reasonable guess of what is expected to happen based on existing facts. For example, predicting yield in a maize garden with the following plant spacing of 25cm and 50cm respectively. c) **Planning the investigation**

-When planning an investigation, one should consider the factors that would affect the results of the investigation. This is done by keeping all the factors the same except the one being investigated. For example, 'How does the plant spacing of maize affect yield. Plot A-25cm, Plot B-50cm apart.

-In this investigation, you would have the same maize variety and size of the garden, one seed per planting station and seed planted on the same day. All factors must be kept constant, but the factor to be investigated, the plant spacing, must be varied.

-The factors to be considered in an experiment are called variables. A variable is anything that can be changed or manipulated e.g. spacing of maize.

d) **Carrying out the investigation**

-When the investigation has been planned, it can then be carried out. There is need to record the observation as it is being carried out.

-Sometimes the observations are recorded in a table as shown below

PLOT	PLANT SPACING(cm)	YIELD OF MAIZE(kg)
A	25	20
B	50	10

-The recorded observations as in the table are called results of the investigation.

-The results are used to make conclusions from the investigation.

e) **Interpreting the results**

-Once the results have been obtained, one has to make meaning of them. This involves explaining what the results means. For example, the highest yield was from Plot B while lowest yield was from Plot A. f) **Making conclusions**

-Involves making a summary of what one has found out from the investigation based on the results.

-This is the step when the answer to the investigation is given. For example, spacing of 25 cm apart produces the highest yield therefore planting one seed of maize per planting station requires a spacing of 25 cm in order to obtain high yields.

UNIT 2: COMMON DISEASES

Examples of common diseases

-Scabies

-Malaria

- AIDS
- Cholera
- Dysentery a)

Scabies

Causes

- Is caused by a mite which burrows into the skin to deposit its eggs.

Transmission

- Skin to skin contact
- Bathing in stagnant water e.g. water in a container or swimming pool in which an infected person has bathed.
- Sharing bath towels, face towels, sponges, clothes, shoes, socks and beddings.

Signs and symptoms of scabies

- Rashes between fingers, toes, buttocks and on elbows.
- Itching and pain in the affected areas.
- Discolouration of the affected areas.

Prevention of scabies

- Avoid skin to skin contact with an infected person.
- Avoid bathing from the same water source with an infected person.
- Avoid sharing bath towels, face towels, sponges, clothes and beddings with an infected person.
- General cleanliness of the body, for example, bathing is using clean water and soap.

b) Malaria

Causes of malaria

- It is caused by protozoan parasite called Plasmodium.

Transmission

- The organisms that cause malaria are passed from one person to another through mosquito bites. When a mosquito with plasmodia bites a person, it leaves the plasmodia into the body. The person may become sick with malaria after two weeks from the time of infection.

Signs and symptoms

- Headache

- Feeling cold
- Shivering -Sweating
- Fever
- Loss of appetite
- General body weakness
- Vomiting
- Diarrhoea
- Pain in the body, especially the joints.

Prevention

- Draining stagnant water in the environment where mosquitoes breed.
- Cutting grass short to destroy the places where mosquitoes hide.
- Spraying insecticides to kill mosquitoes.
- Sleeping under mosquito nets.
- Applying oil on stagnant water to suffocate any mosquito larvae and pupae.
- Using appropriate mesh on windows.
- Using mosquito repellents.
- Taking anti-malarial drugs.

c) **AIDS**

Cause of AIDS

- AIDS is an abbreviation which stands for Acquired Immune Deficiency Syndrome.
- It is caused by a virus called Human Immunodeficiency Virus {HIV}.

Transmission

- Sexual intercourse {main mode}.
- Mother to child during pregnancy, delivery or breast-feeding.
- Blood to blood that is, transfusion of infected blood, sharing skin cutting instruments or using needles that are not sterilized.

Signs and symptoms

- Skin rash

- Night sweat
- General body weakness
- Shingles
- Chronic cough {usually more than a month}.
- Swellings around the neck and in the arm pit.
- Sores in the mouth
- Loss of body weight over a period of time.
- Diarrhoea lasting for over a month.
- Persistent fever.
- Loss of memory.

Prevention

- Abstinence from sex
- Being faithful to one sexual partner.
- Condom use for safe sex.
- Avoid sharing skin cutting objects e.g. needles, razor blades and toothbrushes.
- Avoid getting pregnant if one is HIV positive.
- Avoid contact with other people's blood unless protected. d) [Diarrhoeal](#)

[diseases](#)

Causes of diarrhoeal diseases

- Caused by germs such as bacteria and amoeba which are found in areas of poor sanitation e.g. where people do not use toilets.

Transmission

- Houseflies
- Drinking contaminated water.
- Eating food without washing hands.
- Eating unwashed raw vegetables and fruits.

Signs and symptoms of diarrhoeal diseases -Passing out

- watery stools.
- Ulceration and bleeding with pain.

- Vomiting
- Dehydration

Prevention

- Cover food to avoid houseflies landing on it.
- Boiling drinking water or treating it with chemicals.
- Washing hands before eating food.
- Washing raw vegetables and fruits before eating.
- Washing hands after visiting a toilet. e)

Tuberculosis (TB)

Causes of TB

- TB is an infectious disease caused by bacteria.

Transmission

- Breathing infected air during close contact.
- Drinking unboiled milk from infected animal.
- Eating meat from TB infected animal.

Signs and symptoms

- Loss of weight
- General body weakness
- Poor appetite
- Fever
- Night sweat
- Common cough with a progressive increase in production of mucus.
- Coughing up blood.

Prevention

- Sleeping in a well-ventilated room.
- Drinking boiled milk.
- Avoid eating uninspected meat.

UNIT 3: FOOD CROPS AND OTHER EDIBLE PLANTS**Food crops**

- a) **Cereals** such as maize, sorghum, millet, rice and wheat.
- b) **Legumes** such as beans, groundnuts, Bambara nuts or ground beans {nzama}, soya beans, pigeon peas {nandolo}, cow peas {khobwe/nseula}, sweet peas {nsawawa}, chick peas {tchana}, grams {soloko/mphodza}, sesame {chitowe}, kabaifa, kamumpanda and kalongonda.
- c) **Vegetables** such as cabbage, tomatoes, onions, garlic, rape, mustard, carrot, okra {therere}, katate, denje, bonongwe, mushroom {bowa}, eggplant {mabilinganya}, lettuce, cucumber, pumpkins, water melons, green/sweet pepper, chigwada, fwifwi, kamganje, mnkhwani, mwamunaligone, chisoso, luni, khwanya, mtambe, moringa {cham'mwamba/msangowa}, limanda, kholowa and chikande/chinaka.
- d) **Roots** and tubers such as sweet potatoes, Irish potatoes, cassava and yams.
- e) **Fruits** such as citrus {oranges, tangerines, lime, lemons, grapefruits}, bananas, apples, pineapples, avocado pears, mangoes, paw paws, guavas, peaches, masuku, masau, malambe, bwemba, mpsipsa, katope, matowo, nkhuu, , maye/mateme, mpoza, mphinjinji and maula.
- f) **Oil seed** such as sunflower, sesame {chitowe}, soya beans and groundnuts.
- g) **Tree nut** such as coconut, cashew nut and macadamia.

Places where food crops are grown

FOOD CROP	SOME CROPS WHERE GROWN
Maize	All districts
Rice	Zomba, Nkhotakota, Phalombe, Mangochi, Karonga, NkhataBay, Salima, Chikwawa, Nsanje and Chikwawa.
Sorghum	Nsanje, Chikwawa, Phalombe plain, Chitipa and other low rainfall areas.
Millet finger & bulrush	Chikwawa, Nsanje, Chitipa, Karonga and Mzimba.
Wheat	Neno, Dedza, Mchinji, Mwanza, Ntchisi, Rumphi and Chitipa.
Beans	All districts
Groundnuts	All districts
Soya beans	Lilongwe, Dedza, Kasungu, Mchinji, Mzimba, Dowa, Zomba, Chiradzulu, Machinga, Mangochi and Ntchisi.

Pigeon peas	Most districts in Malawi.
Cow peas	Bwanje Valley, Phalombe plain, Lakeshore and Shire valley
Cassava	Nkhotakota, NkhataBay, Rumphi, Karonga, Lilongwe, Mzimba, Kasungu, Chitipa, Dedza, Dowa, Machinga, Mulanje and Zomba.
Sweet potatoes	All districts.
Citrus fruits	Mwanza, Neno, Ntchisi, Ntcheu, NkhataBay and Thyolo.
Irish potatoes	Neno, Dedza, Ntchisi, Rumphi, Chitipa {Misuku Hills}, Ntcheu and Mchinji.
Masuku	Lilongwe, Mzimba, Machinga, Rumphi, Mchinji, Dedza and Ntcheu.
Vegetables	All districts.
Bananas, mangoes, paw paws and guavas	All districts
Malambe and bwemba	Chikwawa, Nsanje, Salima, Nkhotakota, Karonga, Mangochi, Balaka and Machinga.
Avocado pears	Mulanje, Thyolo, Zomba, NkhataBay, Chitipa and Karonga.
Pineapples	Mulanje, Thyolo, NkhataBay, Rumphi {Phoka} and Karonga {Songwe}.
Sugarcane	All districts

Classifying food crops

-Food crops can be classified according to their edible parts such as leaves, roots/bulbs/tubers, fruits, stems, flowers, grains, nuts and seeds.

Table showing some edible parts of food crops

EDIBLE PARTS	FOOD CROPS
Leaves	Cabbage, rape, lettuce, cassava, mustard, kamganje, beans, sweet potatoes, amaranthus, black jack, cowpeas, luni, fwifwi and therere.
Root/bulb/tuber	Potatoes, carrots, onions, garlic, ginger, turnips, cassava, yams and cocoa yams.

Fruits	Tomatoes, egg plants/brinjals, oranges, cucumbers, tangerines, lemons, avocado pears, paw paws, masau, bwemba, malambe, mapoza, mangoes, masuku, bananas/plantains, pineapples, guava, peaches, apples, plums, grapes, okra, pepper, pumpkins and water melons.
Flowers	Cauliflower, pumpkins, hibiscus and broccoli.
Nuts and oil seeds	Sunflower, sesame, groundnuts, cashew nut, coconut, macadamia nuts, pumpkin seeds and bambara nuts.
Cereals	Maize, millet, rice, wheat and sorghum.
Legumes	Beans, peas, soya, groundnuts and sesame
Stems	Sugarcane, misale and mitsinde.

UNIT 4: TYPES OF FOOD**Sources of food**

-Plants

-Animals

>Some plants are cultivated while others are wild.

>Some animals are tamed while others are wild.

Food items from plants

CULTIVATED PLANTS	WILD PLANTS
Maize, guava, beans, paw paws, sorghum, groundnuts, millet, rice, cassava and sweet potatoes.	Nthudza, ntonongoli, mpsimpsa, mateme/maye, masau, luni, bonongwe, chisoso, zipwete, denje and zikande.

Food items from animals

-Meat

-Milk

-Eggs

-Honey

UNIT 5: IMPORTANCE OF PRODUCING A VARIETY OF CROPS AND LIVESTOCK

Importance of producing a variety of crops and livestock

a) **Food security**

-If one crop fails because of various factors including unfavourable growing conditions, farmers can depend on other crop for food and sale. For example, if a maize crop fails, people can depend on cassava or sweet potatoes.

-If there are floods or dry spell, people can have alternatives of income and food. b) **Income all year round**

-Different varieties of crops are harvested and sold at different times throughout the year.

c) **Improved nutrition**

-People will eat a variety of foods which will make all food groups. This will help people to have a diversified diet thereby improving their health. d) **Raw materials**

-A variety of crop and animal products are produced some of which can be used as raw materials in industries. e) **Source of manure**

-Different animal droppings and crop residues can be applied in the garden to improve soil fertility.

UNIT 6: LIVESTOCK IN THE COMMUNITY

Livestock in the communities

-Livestock are domestic animals that provide valuable products.

Common livestock reared in most communities

-Chickens

-Goats

-Cattle

-Pigeons

-Ducks

-Guinea fowls

-Pigs

-Sheep

-Rabbits

-Fish

-Bees

Importance of livestock in the community

a) Food

-People obtain eggs, milk and meat for food. These provide the body with nutrients for growth and repair of worn out tissues.

b) Income

-Live animals and animal products such as eggs, milk, meat, skins (hides) and droppings can be sold for money.

c) Power

-Cattle and donkeys are used to pull ploughs, ridgers and cart.

Uses of livestock products

LIVESTOCK PRODUCTS	USE
Eggs	Food, selling and baking.
Milk	Food, selling, baking, making yoghurt, ice cream, butter, cheese and sour milk.
Meat	Food, selling and making sausages.
Droppings	Manure and selling
Skins	Making mats, making drums, furniture and costumes for traditional dances, making shoes and handbags.
Bee wax	Making candles and polish
Feathers	Decorating hats and stuffing pillows.

UNIT 7: INDIGENOUS TECHNOLOGIES IN THE COMMUNITY

Technology

-Technology is the use of scientific knowledge to solve everyday challenges.

-Indigenous technologies are technologies which are locally developed (made).

Examples of indigenous technologies in the communities

-Winnower (lichero)

- Sieve (kape/sefa)
- Grinding stone (mphelo)
- Wooden spoon (chipande)
- Fish trap (mono)

Uses of indigenous technologies

TECHNOLOGY	USE
Winnower	For separating light substances from heavy ones.
Sieve (kape)	For separating big granules from small ones.
Grinding stone	For grinding grains into flour.
Cooking stick (mthiko)	For mixing and stirring food.
Bow and arrow (mpaliro ndi uta)	For hunting and security.
Canoe (bwato)	For transportation, fishing and recreation.
Wooden spoon (chipande)	For serving food.

How the indigenous technologies work

TECHNOLOGY	HOW IT WORKS
Winnower	By means of blowing air, bran (which is lighter than grains is separated from grains).
Sieve	By means of shaking, small particles pass through the holes of the sieve and leave big particles in the sieve.
Grinding stone	The grains are placed between two stones. The daughter stone (mwana mphelo) is moved to and fro thereby crashing the grains into flour.
Cooking stick	By means of stirring, a consistent distribution of solvent in flour is achieved, hence a smooth mixture.
Fish trap	Fish enters through a narrow opening and once trapped, the fish cannot move out.

UNIT 8: MODERN TECHNOLOGIES**Modern technologies**

- These are new technologies developed to solve challenges.
- These technologies are usually more advanced and efficient than indigenous technologies.

Examples of modern technologies

- Maize mill
- Telephone
- Wheelbarrow
- Bicycle
- Radio
- Television
- Agro-forestry

Uses of modern technologies

TECHNOLOGY	USE
Electric sewing machine	For making and mending clothes.
Wheelbarrow	For carrying loads.
Electric hair cutter	For cutting hair.
Computer	For processing information, record keeping and communication.
Telephone Cell phone Fax machine	For communication.
Fertilizer	For improving soil fertility.
Radio	For entertainment, communication and education.
Maize mill	For grinding grain into flour.
Refrigerator	For preserving perishable foods.
Solar panel	For production of electricity and heating water.
Hybridisation	For producing better varieties of crops and animals.
Television	For entertainment, information and education.

Tractor	For pulling ridgers, planters, ploughs, harrows and for transportation.
Treadle pump	For drawing water from shallow wells.
Borehole (mjigo)	For drawing water from underground.
Maize Sheller	For shelling maize grains from the cob.
Irrigation	For supplying water to crops.

How modern technologies work

MODERN TECHNOLOGY	HOW IT WORKS
Wheel barrow	By pushing the wheel barrow containing the load.
Bicycle	By pushing the paddles.
Solar panel	The light from the sun is converted to electricity by the solar panel. The light from the sun is absorbed by the panel and converted into heat energy which is used for heating.
Radio	Radio waves from a radio station travel through the air to the radio.
Treadle pump	By pushing the paddles (treadles) to draw water from shallow well.

UNIT 9: STRENGTHS AND CHALLENGES OF TECHNOLOGIES**Indigenous technologies**

STRENGTHS	WEAKNESSES
-Cheap to acquire. -Safe to use. -Locally available. -Easy to use. -Low cost on repair and maintenance. -Easy to recycle. -Does not require specialised training to repair or maintain.	-Produces poor work or product -Usually slow. -Fails to handle large volume of work. -Discriminates against gender and age. -Usually not durable. -Crude -Time consuming.
Environmental friendly	-Tiresome.

Modern technologies

STRENGTHS	WEAKNESSES
-Produces quality work or products. -Less time taken to do the work. -Can handle large volumes of work. -Highly reduces the number of people that could have done the work.	-Expensive to buy. -Not environmental friendly. -High costs of maintenance and repair. -Needs specialised training to repair or maintain them. -Demands high levels of safety when using. -Creates unemployment.

UNIT 10: ECONOMIC ACTIVITIES USING AGRICULTURE, SCIENCE AND TECHNOLOGY IN OUR COMMUNITY**Economic activities**

-Economic activities are the occupations whose aim is to generate income to improve the lives of people and their communities.

Types of activities to make money for economic activities

-Cultivating cash crops such as cotton, tobacco, groundnuts, beans, soya beans, paprika, rice, sugarcane, mushrooms and Irish potatoes.

-Growing vegetables such as tomatoes, cabbages, carrots, onions, mustard (mpiru) and rape.

-Processing crops and vegetables such as making juice and jam from fruits and vegetables, making soap from cotton seed oil, extracting oil from groundnuts and sunflower seeds, milling rice and maize.

-Tinsmithing: Making pails, buckets, drinking and feeding troughs for livestock.

-Rearing animals such as chickens, guinea fowl, turkeys, goats, sheep, cattle and fish.

Handcrafting: Weaving, sewing, dyeing, basket and mat making, shoe repairing, embroidery and toy making,

-Baking: Making bread, scones and cakes.

-Running a maize mill.

-Buying and selling commodities in communities. These commodities include agricultural products (sugarcane, potatoes, beans, vegetables, fruits) and nonagricultural products (metal works and pottery).

-Providing services such as hair dressing, brick laying, selling vaccines to farmers and repairing watches, bicycles, cell phones and TVs.

-Running a garage and/or welding shop.

The importance of economic activities

ECONOMIC ACTIVITY	IMPORTANCE
Growing crops and rearing animals.	-Provides animal power. -Promotes self-reliance. -Improves people's nutrition. -Promotes unity, -Improves people's income. -Improves social interaction. -Provides chances to learn new skills in farming. -An opportunity for physical exercise.
Growing vegetables	-Provides income. -Improves people's nutrition.
Processing agricultural products	-Add value to the products for better sales. -Preserves the products. -Reduces bulkiness.
Baking	-Provides cash. -Food for family.
Running a maize mill	-Provides a wide social interaction. -Renders services to a cross-section of the community. -Saves time to do other work. -Provides cash.
Handcrafting	-Provides cash.
Running a garage	-Source of employment.
	-Services to the community. -Saves time to do other work. -Provides skills to others.
Buying and selling commodities	-Sources of food. -Sources of income.
Service providing	-Provides skills to others. -Source of income.
Tin smithing	--Provides skills to others. -Source of income.

UNIT 11: BUYING AND SELLING IN THE COMMUNITY

Buying and selling

-Buying is a process of choosing a product, bargaining and agreeing on the price and method of payments, paying then collecting the product.

-Selling is a process that involves deciding the price for the product, deciding the mode or type of payment and then the collection of the product by the buyer. **Commodities that can be bought and sold in the community**

-Crops such as maize, millet, sorghum, sugarcane, vegetables, fruits, potatoes, cassava and groundnuts and their products.

-Livestock products such as meat, eggs, manure, milk and skins.

-Processed commodities such as flitters (mandazi, zitumbuwa, zikondamoyo and mikate), thobwa, fried or smoked fish, roasted or boiled groundnuts, roasted potatoes and cassava chips.

-Other commodities such as fuel wood, charcoal, timber, medicines, thatching grass, bamboos, clothing, beds, medicines, tins, mbaula, door frames, chairs and window frames.

UNIT 12: MARKET PLACES

Market

Market refers to a place where people buy and sell various items.

Importance of a market

-It helps people to sell their commodities.

-Helps people to buy their needs.

-Assist people to meet and interact socially.

-Enables people to share information.

Activities that take place at the market

-Displaying

-Storing

-Advertising

-Grading

-Costing

- Sharing information
- Selling
- Buying
- Packaging
- Pricing
- Bargaining

Types of markets based on physical set up

a) Flea markets

Characteristics

- Controlled area that is governed by self-imposed code of conduct.
- Places where goods and services are sold or rented.
- Market activities can be held either indoors for example warehouse, hall or outdoors like in the field or under a tree.
Can be held daily, weekly, monthly, semi-annually and annually.
- Goods sold include produce from farms, groceries, snacks, new and second hand clothes, hardware items and services such as shoe repairing.
- Goods are sold or bought at a bargaining price.
- Vendors range from individual/family who may want to sell few surplus goods/produce or scouts who move from one place to another to buy items for sale.

b) Auction

Characteristics

- Market in which buyers enter with competitive goods and sellers enter with competitive offers at the same time.
- The price at which an item is traded represents the highest that a buyer is willing to pay and the lowest price a seller is willing to sell.
- Matching bids and offers are then paired together and the orders are executed. For example, cattle markets, tobacco auction floors.

c) Shop Description

- A shop is a building or part of building where goods and services are sold.
- A shop is a modern indoor version of traditional market place.

Challenges faced by market places -Poor

sanitation.

- Poor storage of products.
- Displaying items close to main and busy roads.
- Frequent fire out breaks.
- Lack of safe water supply.

Ways of addressing challenges faced at market places

- Providing dust bins, rubbish pits, latrines/toilets.
- Providing a safe water supply.
- Proper use of facilities e.g. latrines, taps.
- Observing safety measures.
- Re-using packaging material.
- Providing storage facilities.
- Displaying items at appropriate places.

UNIT 13: MANAGING CHANGE IN THE COMMUNITY

Changes that take place in the community -Day and

night.

- Weather and seasonal changes.
- Availability of food.
- Population size.

>These affect our lives in different ways such as choice of clothes to wear, type of activities that we can perform and adequacy of food.

a) Weather changes

-Weather is the condition of the day. These conditions can either be cloudy, sunny, rainy, clear and windy.

b) Seasonal changes

- A season is the average condition of weather over a period of time.
- These conditions can be hot, wet, cold and dry.

c) **Availability of food**

-Availability of food changes due to changes in season.

It can be abundant in one season and scarce in another season. For example, mangoes and pumpkins are abundant in wet season while scarce in dry season. d) **Population size**

-The number of people in a community changes as a result of birth rate or death rate. It can increase or decrease. **Causes of changes in the community**

a) **Weather and seasonal change**

-Weather and seasonal changes can be caused by changes in temperature (coldness or hotness), rainfall, atmospheric pressure, cloud cover and human activities that can lead to the destruction of the environment.

b) **Availability of food**

-Availability of food can change due to changes in weather, seasons and soil type.

-Favourable conditions such as adequate rainfall and fertile soil results into abundant yield.

-Unfavourable conditions such as drought and floods result into low yields. c) **Population size**

-The population size can change as well by either increasing or decreasing.

-An increase in population may be caused by high birth rate and immigration due to wars, famine or economic factors.

-High death rates and emigration can cause a decrease in population size.

-The deaths can result from diseases, wars, famine, and natural disasters like earthquakes.

Management of changes in the community a) **Food availability**

I} **Food abundance**

-Proper storage e.g. in bags and nkhekwe.

Processing the food e.g. mfutso, makaka and juices.

Selling the surplus.

-Application of pesticides e.g. actelic and neem.

II} **Food scarcity**

-Preservation of food.

-Irrigation.

-Crop diversification.

- Planting drought resistant varieties.
- Buying food when it is in abundance.
- Avoid wastage.

b) Population size

I} Increase

- Proper family planning.
- Creating economic activities in rural areas.

II} Decrease

- Disease control.
- Good nutrition.
- Environmental management.
- Good relationships among communities and countries.
- Avoid conflicts such as civil wars.

c) Weather and seasonal changes -Avoid

- cutting trees carelessly.
- Plant trees.
- Proper disposal of waste materials from homes and industries.

UNIT 14: MANAGING WEATHER AND SEASONAL CHANGES

Challenges of weather and seasonal changes -Discomfort due to

excessive cold or heat.

- Restriction to limited activities.
- Drought.
- Soil erosion.
- Floods -Strong

winds

a) Discomfort due to excessive cold or heat

- As the weather and seasons are changing, there are also changes in daily temperatures.

- Low temperatures result in cold conditions while high temperatures result in hot conditions.
- These conditions can be unbearable for human beings.

b) Restriction to human activities

- In some weather conditions people are limited in the activities they can do. For example, a school football or netball match can be cancelled if it is raining.
- Absenteeism in schools can be high during rainy days.
- In some cases, where learners are required to cross streams, the streams are too dangerous to cross because of the fast running rain water.
- At school, learning cannot take place where lessons are conducted in the open space.

c) Drought

- Drought is a condition which comes as a result of prolonged dry conditions during rainy season.
- This results into low yields.
- Drought is characterised by shortage in food supply.

d) Soil erosion

- Soil erosion is the washing away of top fertile soil by wind or running water

Challenges

- Deterioration of soil fertility which leads to low yields.
- Formation of gullies.

Solutions to the challenges associated with weather and seasonal changes a) **Use of warning facilities**

- People can wear clothing to protect themselves from cold weather.
- With warm clothing, people feel comfortable and can carry on with their activities.
- In some cases, rooms may be warmed up using heaters to make them more comfortable to people.

b) Use of cooling facilities

- During excessive heat, people can make themselves comfortable through wearing of light clothing, using fans or air conditioners to cool rooms and planting trees to provide a cool shed when it is very hot.

c) Use of water proof materials

-People may be restricted to indoor activities when it is raining to avoid getting wet. However, they can still do outdoor activities e.g. going to school by using waterproof materials such as umbrellas and raincoats.

d) Planting trees

-Soil erosion can be reduced by planting trees on bare land.

-When land is covered with trees, water moves slowly and more water gets absorbed into the soil. This reduces the rate of soil erosion as a result are minimised and soil fertility is maintained.

-Trees can also act as wind breakers by reducing the speed of wind.

Limitations of the solutions to the challenges associated with weather and seasonal changes

a) Use of warming facilities

-Some facilities like electric heaters use electricity. As such, they can only be used where there is electricity. On the other hand, the charcoal heater encourages cutting down of trees and also produces carbon monoxide.

b) Use of water proof utensils

-Umbrella only protects a person from moderate rains.

-The umbrella can also get damaged during stormy rains.

-There are also alternatives to ensure that a person is protected even in stormy rains.

-A raincoat may be used to avoid getting wet. It can cover the whole body therefore a person is protected even in stormy rains.

c) Use of cooling facilities

Fan

-A fan helps to cool the environment.

-There are two types of fans namely electric and manual.

-The electric fan can only work where there is electricity. -The hand fan is limited since one can get tired of fanning oneself.

d) Use of irrigation equipment

i) Watering can

-It carries little amount of water as such it can only be used to water a smaller garden.

-A more effective solution is the use of a treadle pump which pumps water through pipes to where it is needed.

ii) **Treadle pump**

-Relatively larger areas can be irrigated but requires a lot of human energy. e) **Planting trees**

-Trees take time to grow to a size they can act as wind break and reduce the movement of water on the soil. Therefore, the best way is to avoid cutting trees carelessly.

GLOSSARY

Dehydration: Loss of water from the body.

Parasite: An organism living in or on another organism (the host) and derives its food from it.

Protozoa: A one-celled organism.

Cereal: Grain crops.

Edible: That can be eaten.

Legume: Pod bearing crops.

Food security: Availability and accessibility of food all year round.

Minced meat: Ground meat.

Survey: Examine carefully.

Fax machine: A device that sends and receives printed documents.

Solar panel: A block of cells that produces electricity when exposed to sunlight.

Indigenous: Belonging to a particular place rather than coming from somewhere else.

Technology: Application of scientific knowledge to solve practical challenges.

Economic activity: Any activity that can generate income.

Physical graph: A method of presenting information in terms of numbers of things or objects.

Commodities: Items that can be sold or bought.

Consumer: A person who buys and uses the items.

Set up: Appearance of structure.

Trader: A person who sells items.

REFERENCE

Standard 4 Agriculture and Science & Technology Teacher's Guide

GLORY BE TO GOD!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!