SCIENCE BECE SYLLABUS

ASPECT OF THE SYLLABUS	SUB-STRANDS	
Physics	Energy	
	Electricity and electronics	
	Conversion and conversation of energy	
	Force and motion	
	Solar system	
Chemistry	Materials	
	Science and technology	
Biology	Living cells	
	Earth science	
	Life cycle of organisms	
	Human body systems	
	Ecosystem	
	Waste management	
	Human health	
	Climate change and green economy	
Agriculture	Crop production	
	Animal production	
	Farming systems	
	Agricultural science tools	
	Understanding environment	

ASPECT	Strands/topic	DETAILS	PRACTICAL
	Compounds	Binary compounds	
		Examples	
		Chemical formula	
		Elements, ions, molecules	
	Acids and bases	Definitions	Acid base indicators
		• Sources of water	pH scale
		• Properties	test for acids
		• Test	neutralization reaction
		 Acids-bases indicators 	application
		Neutralization reaction	
	Bonding	Definition	
		• Types : description	
		Formation	
Chemistry		• Examples	
5	Mixtures	• definition	Separation of mixtures
		• types	Solutes, solvents
		• examples	solutions types and
		• solutes and solvents	applications
		• properties	
		 suspension and colloid 	
		• separation of mixtures	
	Matter 2	Atoms	Electronic configuration
		Sub-particles	Atomic number mass
		Electrical charges	number , etc
		Atomic number and mass number	
		Electronic configuration	
	M 44 - 1.	Formation of ions	A man a second s
	Matter 1	Solids, inquid and gases	of solids liquids and
		Properties	gases
		Importance	guses
		importance	
BIOLOGY	Living cells	Plants and animal cell	
	E E	Organelle	Diagram of; plant cell,
		Parts of organelle and function	animal cell, eukaryotic
		Eukaryotic cells and prokaryotic	cell, prokaryotic cell,
		cells	specialized cells and
		Importance of Eukaryotic cells	function of parts
		and prokaryotic cells	
		Specialized cells	
		Examples and functions	
	Earth science	Water cycle	Diagram of ; water cycle ,
		Explanation	carbon cycle
		Carbon cycle process	
		Importance	
	Life cycle of	Life cycle of grasshopper	Diagram of:
	organisms	Stages and features	
	0	Why incomplete	

2025 BECE DETAILED PREDICTED TOPICS

	The human body systems	Harmful effects Reduction Mosquito(same as above) Housefly(the same as the above) Dentition-parts Types Function Diseases How to clean teeth Nutrition -definition Function of food	Grasshopper, life cycle of grasshopper, mosquito, housefly Diagram of; Digestive system Types and part of teeth Test for food substances Heart Respiratory system
		Nutrients Function Digestion Parts of digestive system How food digest Circulatory system Respiratory system	
	Ecosystems	Definitions Components Habitat Relationship The sun Terms Food web and food chain	Diagram of ; Types of habitat
	Human health	Waste management; scientific methods of waste management Importance of waste management Types of waste Communicable and Non- communicable diseases; examples, symptoms, effects, prevention Fungal diseases; examples, symptoms, effects, prevention Bacterial diseases; examples, symptoms, effects, prevention Viral diseases; examples, symptoms, effects, prevention Science and technology,	
		importance, effects, Science and industry; industrial products and scientific methods Types of industries	
	Climate change	Green gas effect, sustainable energy use, Signs for climate change, Factors, control, green economy, measures to control,	
PHYSICS	Energy	Forms of energy, explanations and calculations	Propagation of light

	Proper use of energy Factors affecting potential and kinetic energy Heat transfer Light; properties, colours, Renewable and non-renewable energy source examples How to produce energy Heat and temperature differences Electrical energy consumed calculations Properties of images How images are formed Formation of shadow, eclipse Reflection, refraction, dispersion of light	Reflection, refraction, dispersion of light Transfer of heat experiment Vacuum flask
Electricity and electronics	Forms of generating electricity Thermal and nuclear electricity Electrical and Electronic components and functions Brightness of LED Stages of electricity transmission Discharging and charging of a capacitor Calculations in electrical circuit Forward and reverse bias	Electronics and electrical circuit diagram
Conversion and conversation of energy	Law of conservation of energy Energy conversion examples Conservation of energy, importance, Differences between conversion and conservation of energy	Energy generation
Force and motion	Definition of inertia Balanced and unbalanced forces and motion Newton's first laws of motion and application Magnet -types, properties, uses, ways of making magnets, Newton second law and magnet Pressure-concepts, applications, relationship between pressure and forces Newton's third law of motion- application, momentum Simple machine-types, examples, levers-types, complex machines	Experiment of; Making magnets, Newton's 1, 2, 1,3 law of motion Experiment on pressure Diagram of simple machines

		Input, output, efficiency of s	
		machine, calculations,	
		improvement, why efficiency is	
	0.1	less than I	
	Solar	Solar system	
	system	Planets, starst, inner and outer,	
		galaxy, milky way galaxy,	
AGRIC	Crop	Plants nutrient-types, difference,	Types of seeds beds,
	production	sources, application,	experiment forb growing
		Seeds beds-types, seeds	crops, parts of plants,
		Cultural practices	germination
		Part of plants	Experiment on how plants
			absorbs water and
			nutrients
	Animal	Types of domestic animals,	Diagrams of farm animals
	production	breeds, characteristics,	
		differences, similarities,	
		Ruminants-examples	
		Non-ruminates-examples	
		Differences between ruminants	
		and non-ruminants	
		Types of animal feed	
	Farming	Types of farming systems	Crop rotation table
	systems	Advantages and disadvantages	Manure preparation
	systems	Cron rotation principles	manare preparation
		Manure: types how to prepare	
		Wandle. types, now to prepare	
	Soil	Soil-importance, components,	Experiment for
		physical properties, soil profile,	Components, water
			retaining capacity, soil
			profile, microorganism,
			structure
	Farm tools	Farm tools and uses, care	Diagram of farm tools
			and uses

5. Study the diagram and answer the questions on it



- a. What is does the diagram represent
- b. Name the parts A to D

c. State the function of the parts A to D



- a) Identify A, B, and C and describe the shape
- b) Name the parts labeled I and II in A.
- c) State the functions of A,B and C in relation to diet or food
- d) Mention two diseases that affect the tooth

ANSWER

- a) A—pre-molar, molar; flattened with projections on their surface
 B—incisor ; chisel shape
 - C—canine ; conical or pointed
- b) I-crown II- roots
- c) pre-molar are used for tearing and grinding of food

incisor are used for cutting food

canines are used for tearing flesh

d)Gum disease and tooth decay

Study the diagram below carefully

a) Identify the parts labeled I,II,III,IV and V

b) State briefly the structural adaptation each of III, IV and V

ANSWER

- a) I jaw bone or gum
 - II—molar III—premolar
 - IV—canine
 - V—incisor
- b) III—the crown has a large surface are for grinding and crushing food Iv--- the crown is pointed and it is used for stabbing and tearing of flesh V----the crown is chisel-shaped and it is used for cutting, tearing and holding of hold.

L

1. Study the diagrams below and answer the questions that follow



- a) Identify K and L
- b) Name the parts labeled I to IV in K
- c) Name parts labeled I to IV in L
- d) State the function of I and III in K
- e) State the function of parts labeled V and VI in L
- f) State two difference between K and L
- g) State two similarities between K and L

ANSWERS

- a) K is animal cell L is plant cell
- b) I---cell membrane
 - II---mitochondrion

III—nucleus

- IV ---cytoplasm
- c) I----nucleus
 - II---cellulose cell wall
 - III---mitochondrion
 - IV—chloroplast
 - V---cytoplasm
 - VI--- vacuole
- d) Cell membrane protects the internal structure of the cell Nucleus controls the life activities of the cell
- e) Cytoplasm gets rid of waste materials through the cell membrane Vacuole stores food substances such as sugar for the cell
- f) Differences

Plant cell	Animal cell
Has cellulose cell wall	Has no cellulose cell wall
Has chloroplasts	Has no chloroplasts

g) Similarities

Plant cell	Animal cell
Has nucleus	Has nucleus
Has cytoplasm	Has cytoplasm

2. The figure below represents the beginning of an experiment to demonstrate osmosis in a living cell using yam tissue.



- a) Draw and label a diagram to illustrate what would be observe if the set -up is allowed to stand for 24 hours
- b) What does the yam represent?
- c) Explain the principle involve in the experiment

- d) How would you set-up a control of the experiment above?
- e) Give one example the osmotic process in each of the following living things
 - i) flowering plants
 - ii) humans

- a)
- b) A semi-permeable membrane
- c) Water moves across the living yam by osmosis into the strong sugar solution that has a high osmotic potential until equilibrium is reached when the concentration of the diluted sugar solution and water are the same
- d) A trough is filled with distilled water and a living yam cup is placed in it. The yam is then filled with the distilled water used in filling the through. Since the concentration on both sides of the yam are the same, there will be no movement of water molecules
- e) I) absorption of water into the root hair

ii)water absorption in the proximal convoluted tubule of a nephron

3. The set-up below shows air being breathed out through the mouth into testtube containing lime water.



- a) Why does the lime water turn milky?
- b) Identify the milky substance produced
- c) Write a balanced chemical equation for the reaction
- d) Name two other substances present in breathed-out air
- e) What is the aim of the experiment?

- a) Because of presence of carbon dioxide in the expired air
- b) Calcium carbonate or $CaCO_3$
- c) $Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$
- d) Nitrogen, water vapour or water, rare gases,
- 4. A student performed test on food substances A, B and C and made the following observations.

Food substance	Test	observation
A	Few drops of iodine	The iodine solution in
	solution was added to	turns blue-black
	A	
В	A drop of B was	A translucent patch
	applied to a white	was seen on the paper
	sheet of paper	
С	Benedict's solution	Benedict's solution
	was added to C and	turns from blue to
	the mixture boiled	brich-red

- a) Identify food substances A, B and C
- b) Give the products of digestion of A,B,and C
- c) In which parts of the alimentary canal does the digestion of each of food substances A, B, and C start?
- d) In which part of the alimentary canal is food substance C absorbed after digestion?

ANSWERS

- a) A—starch
 - B—fat and oil
 - C—glucose or reducing sugar
- b) starch ---glucose or fructose

fat and oil----fatty acids or glycerol

glucose ---remains glucose

c) Starch --mouth

Oil ----small intestine or duodenum Glucose –pass through the system

- d) Glucose is absorbed in the small intestine.
- 5. In an experiment, yam pap is put into two test tubes A and B containing iodine solution. The test tubes are warmed slightly to a temperature of 37°C and saliva is put into test tube B



- State the colour of the content of test tube A
- State the colour changes of the contents in test tube B after about 3 minutes.
- Fehling's solution is added to the contents of test tube B after the3 minutes and it turns brick- red. What food substance is present? Give two functions of saliva in eating.
- Why was it necessary to warm the contents of the test tubes to about 37°C?
- Give two aims of the experiment.

11. The diagram below represents a system of a living organism. Study it and answer the questions below.



a. Name the parts A to D

- b. State the main function of C
- c. What does the diagram represents
- d. List the two gas involved in the processes
- 14. The diagram represents a biological phenomenon.



- I. What does the diagram represents
- II. Name the parts A to E
- III. State the function of parts A to E

15. The diagram represents parts of a leaf. Study it and answer the questions on it.



- I. Name the parts A to F
- II. State the functions of the parts A to F
- III. What is the main function of the diagram
- IV. How does the diagram prepare its food

- V. What group of organisms does the diagram belongs to
- VI. What role does the diagram play in the carbon cycle

16. The diagram represents a biological cell of an organism



- I. What is the name of the diagram
- II. Name the parts A to D
- III. State the functions of parts A to D
- IV. How does the diagram becomes active

17. The diagram represents part of a system. Study it and answer the questions on it.



- I. What does the diagram represent?
- II. Name the parts I to IV
- III. State two adaptive features of the diagram

IV. State the function of the diagram

1. use the diagram below to answer the questions that follow



- a) what would the observer see from the position shown?
- b) What happens when cardboard B is shifted?
- c) Explain the observation made (b) above
- d) What would be observed when the cardboard B is brought back to its original position?

- e) What does the experiment demonstrate?
- f) Mention two devices that devices that works on property of light demonstrated
- g) Mention two natural occurrences that could be explained by the property of light demonstrated

- a) The observer will see light or rays through the three holes
- b) Light can no longer be seen through the holes
- c) Light travels in straight line and because cardboard B is shifted out of the straight line, the light is not seen again
- d) The observer will again see light through the three holes
- e) The experiment demonstrates that light travels in straight line
- f) Pinhole camera, torch light and periscope
- g) Formation of shadows and eclipse

b. The set-up below represents an electronic circuit with some components. Study it carefully and answer the questions below.



- i. Name the parts labeled S1, L1, b, c, and e
- ii. What is the name given to T(b, c, e) in the diagram
- iii. Explain what will happen to L1 and L2 if S1 and S2 are closed
- iv. What will happen to L1 and L2 if S1 is open and S2 is close
 - 2. The figure below shows the inside of 13A main plug



- a) Which of parts labeled is the earth wire?
- b) What colour is used to represent the earth wire?
- c) Which of the part labeled is the neutral wire?
- d) What colour is used to represent the neutral wire?
- e) Which of the part labeled is live wire?
- f) What colour is used to represent the live wire?
- g) State the role of part labeled I
- h) Identify parts II, III, IV, VI and VII

- a) I represent earth wire
- b) Green or yellow
- c) VIII represents neutral wire
- d) Blue
- e) V represents live wire
- f) Brown
- g) The earth wire prevents an electrical shock
- h) II-earth pin
 - III---fuse
 - IV---live pin
 - VI--- cable grip
 - VII---neutral pin
- 3. In a experiment, a pupil took two empty milo tins and made holes in their sides as shown in the diagram above. The pupil then filled the milo tins with water



- a) Draw and label the diagrams to show what the pupil will observe in setup A and set-up B
- b) Explain the observations in set set-up A and set-up B
- c) What is the aim of set-up A?
- d) What is the aim of set-up B?

a) Labeled diagrams



b) Set-up A---the pressure of the water coming out of the lower hole is higher than the one at the top.

Set-up B—the pressure of water coming out of holes are the same because they are at the same level

AIM

- c) Set-up—to show that pressure increases with depth in a liquid
- d) Set-up—to show that pressure at the same point or level in a liquid is the same.

In an experiment, an iron bar is magnetized by dragging a magnet over the surface of from A to end B several times as shown in the diagram below.



- a. Mention the method of magnetization
- b. Give the polarity of the ends A and B of the bar after magnetization
- c. Give other two methods of magnetization

The diagram below is an illustration of a thermos flask. Study and use it to answer the questions



- a. Name the parts I to v
- b. How does the device minimze heat loss or gain through
 - 1. Conduction
 - 2. Covection
 - 3. Radiation
- c. State one use of the thermos flask





Figure 1

figure 2

- a. What does figure 1 and 2 represent
- b. Name parts labelled X and Y
- c. What is the role of Y
- d. Mention the material that can be used to make Y
- e. State two uses of the device in the diagram

PREDICTED QUESTIONS CHEMISTRY PRACTICAL

1. the diagram below shows the structure of an atom. Study the diagram carfully and use it to answer the questions that follow.



i) identify the parts labelled I, II, III and IV

ii)how many electrons are in the atom?

iii)state the atomic number of the atom

iv)state two differences between protons and electrons

ANSWER

I)electron

II)shell

III)neutron

IV)nucleus

ii)number of electrons= 3

iii)the atomic number = 3

iv)proton has positive charge

proton has a mass of 1a.m.u

electron has a negative charge

electron has a negligible mass number

2. In an experiment to investigate the reactivity of zinc, a piece of the metal was droped into a test tube coantaining dilute hydrochloric acid. The experimental set-up is illustrated below.



- a) Write a balanced chemical equation for the reaction that occurred in the experiment
- b) Name the gas involved
- c) List two metals which cannot react in a similar way as zinc
- d) List two metals which cannot react in similar way as the zinc
- e) Name two glass apparatus which could have been used instead of the test tube

ANSWER

- a) $Zn + 2HCl \rightarrow Zn + Cl_2 + H_2$
- b) Hydrogen gas
- c) Magnesium, sodium, lithium and iron
- d) Gold, platinum and silver
- e) Beaker, round bottled flask, conical flask

3. The set-up below was used by a student to separate a solid-solid mixture. Use it to answer the questions that follow.



- a) Name the parts I, II and III
- b) What is the method of separation used by the student
- c) Mention two substances that can sublime
- d) Mention one mixture that can be separated by the method above
- e) State three factors that affect the rate at which a solute disolves in a solvent.

ANSWER

a. I inverted funnel

Il iodine crystal

III evaporating dish

- b. Sublimation
- c. Iodine crystal, naphthalene
- d. I a mixture of sand and iodine crystal II a mixture of sand and naphthalene
- e. Particle size, temperature and stirring
- 4. The diagram below shows the set -up of how a mixture was separated in the laboratory. Use it to answer the questions that follow.



- a. Name parts I to VII
- b. What method of separation is used in the set-up?
- c. State the function of part III
- d. Which of the liquid in the mixture is separated first and why?
- e. State two applications of the above method of separation

- a. I thermometer
 - II water outlet
 - III water jacket
 - IV water
 - V water inlet
 - VI liquid distillate
 - VII distillation flask
- b. Distillation
- c. It cools the vapour and condenses it to liquid
- d. Alcohol, because it has a lower boiling point than water
- e. It used in water purificationIt is used in separating the components of crude oil

5. The diagram below shows the set-up of an experiment in which a student added some quantity of hydroxide solution of the same concentration.



- a. Name the parts labeled I to VI
- b. Mention one instrument that could be used to transfer the sodium hydroxide solution into II
- c. What is the name of the reaction that occurred between dilute hydrochloric acid and sodium hydroxide solution?
- d. What is the name of the compound that would be left in an evaporating dish if the liquid mixture III is heated

a. I burette

II conical flask III sodium hydroxide solution IV retort stand

- b. Measuring cylinder, pipette
- c. Neutralization reaction
- d. Sodium chloride(NaCl)

c) The graduated diagram below represent a pH scale. Answer the questions on it.



- i. Read and record each of the PH values; P1, P2,P3 and P4
- ii. What does pH; P1 and P2 indicate. Give two examples of such liquids
- iii. What does pH; P3 and P4 indicate. Give two examples of such liquids
- iv. Sate the observations red litmus and blue litmus paper are dipped in turns into each of the liquid

PRACTICAL PREDICTED QUESTIONS



- a. Identify each of the tools
- b. State one use each the tools
- c. Name the parts labeled I,II and III
- d. State three ways of maintaining tool E

e. State three precautions that must be taken when using tool B

ANSWER

a. A watering can

- B knapsack sprayer
- C hand fork
- D wheel barrow
- E hoe
- F hand trowel
- G garden shears
- H sickle
- b. Uses

Tools	uses
A	For watering crops
В	For spraying chemicals on crops
С	For stirring the soil
D	For transporting farm tools and
	produce
E	For weeding
F	For transplanting
G	For trimming hedges
Н	For harvesting rice

c. I handle

ll tank

III blade

- d. 1. Wash soil particles from food
 - 2.metal parts should be oiled
 - 3. blades should be sharpened when blunted

- e. 1 wear protective clothing
 - 2.do not spray in windy environment
 - 3.wear eye glasses and respirators



- a. Name each of the equipment labeled A, B,C, and E
- b. State one use of each of the tool above

- a. A garden peg
 - B tape measure
 - C cross-staff
 - D garden line
 - E ranging pole

b. Uses

tool	uses	
A	Marking planting distances	
В	Measuring distances	
С	Constructing right angles at	
	corners of plot	
D	Marking out plots	
E	Sighting survey stations	

The diagram below is an illustration of a fruit. Study it carefully and answer the questions that follow.



- a. Identify the fruit
- b. Name each of the parts I and II
- c. Mention the term used for removing each of the parts labeled I and II
- d. Give two uses each of the parts I and II
- e. Name one insect pest and rodent pest that infest the fruit
- f. State two ways of controlling the pest

(17) The table below shows the arrangement of four crops cultivated in a farming system adopted by a school over a four-year period.Study the table carefully and answer the questions that follow

Plot	Year 2	Year 2	Year 3	Year 4
year				
Plot 1	Maize	Cassava	Groundnut	Cabbage
Plot 2	I	Groundnut	Cabbage	II
Plot 3	III	Cabbage	IV	Cassava
Plot 4	Cabbage	Maize	V	Groundnut

- (i) What type of farming is illustrated in the table?
- (ii) Name each of the crops labeled I, II, III, IV and V
- (iii) List two diseases that attack the crop labeled II
- (iv) State two reasons for including groundnut in the farming system illustrated

Study them carefully and use them to answer the questions that follow:



- (i) Identify each of the tools labeled A, B, C, D and E.
- (ii) Mention one use of each of the tools labeled A, B, C, D and E.