MINISTRY OF EDUCATION

REPUBLIC OF GHANA

NATIONAL COUNCIL FOR CURRICULUM AND ASSESSMENT

PREPARATORY MATERIALS FOR COMMON CORE PROGRAMME ASSESSMENT

SCIENCE

Preamble for the Preparatory Test Items Developed Based on The Common Core Programme (Science Curriculum) for the Junior High School.

This preparatory test has been developed to assess your understanding of key science concepts covered in the Common Core Programme Curriculum. The test focuses on the following five strands:

Diversity of Matter: This strand explores the properties and composition of matter, including states of matter, elements, mixtures, and compounds.

Cycles: This strand focuses on natural cycles including the water cycle, rock cycle, and the carbon cycle. It explores how these cycles interact and sustain life on Earth.

Systems: This strand investigates how different parts of a system interact to create a whole. It covers topics like the human body, ecosystems, and technological systems.

Forces and Energy: This strand explores the different types of forces, including gravity, electricity, and magnetism, and their relationship to energy transfer and conversion.

Humans and the Environment: This strand examines the interactions between humans and the environment, including areas like resource conservation, pollution, and sustainable practices.

The test items within each strand are aligned with the content standards and performance indicators outlined in the Common Core Programme Curriculum. They assess your knowledge (understanding of key concepts), application (ability to use scientific knowledge in different contexts), and reasoning (critical thinking and problem-solving skills).

The test includes a variety of question types, ranging from multiple-choice to short answer and diagrams.

By taking this test, you will have the opportunity to gauge your science knowledge and identify areas where you may need to focus your studies in preparation for future assessments.

Below is the test specification table which provides a detailed breakdown of the test content by strands and sub-strands.

SCIENCE SPECIFICATION TABLE COVERING -JHS 1,2 & 3 (50 ITEMS)

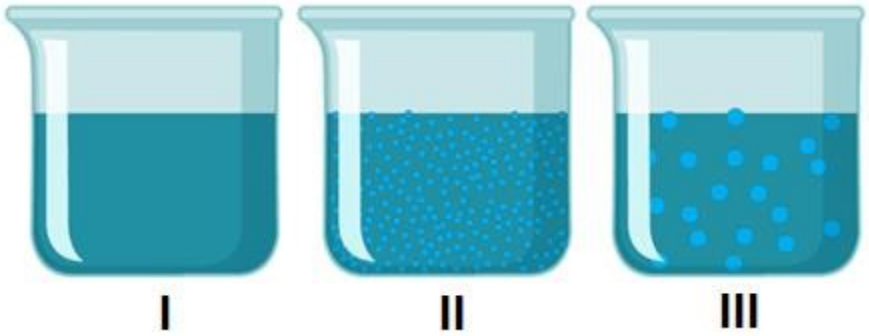
		No. of Indicators			Assessment Areas			
					Level 1	Level 2	Level 3	
Strand	Sub-Strand	B7	B8	B9	Know & Unders.	Application	Reasoning	Total No. of Items
1: DIVERSITY OF MATTER	Materials	1		1	x		x	2
	Living Cells	1	1	1	x	x	x	3
2: CYCLES	Earth Science	1	1	1	x	x	x	3
	Life Cycle Of Organisms	1	1	1		x	x	2
	Crop Production	1	1	1	X	X	x	3
	Animal Production	1	1	1	X	X	X	3
3: SYSTEMS	The Human Body System	1	1	1	x	X	X	3
	The Solar System		1	1		X	X	2
	Ecosystem		1	1	x	x		2
	FARMING SYSTEMS		1	1		X	X	2
4: FORCES AND ENERGY	Energy	1	1	1	x	X x	X	4
	Electricity And Electronics	1	1	1	x	X	X	3

	Agricultural Tools		1	1		X	X	2
	Conversion & Conservation	1	1	1	x	X	X	3
	Forces & Motion	1	1	1	x	X	X	3
5: HUMANS AND THE ENVIRONMENT	Waste Management	1		1	x	X		2
	Human Health	1	1		x	X		2
	Science And Industry		1	1		X	x	2
	Climate Change And Green Economy		1	1	x		X	2
	Understanding The Environment	1		1		X	X	2
	Total				**14(28%)**	**19(38)**	**17(34%)**	**50**

SUMMARY TABLE OF THE SCIENCE CCP CURRICULUM			
Level	**Total Number of Indicators Count**	**Total Number of Indicators used**	**Percentage Number of Indicators used**
B7	52	14	27%
B8	50	17	34%
B9	58	19	33%

Answer all the following questions

1. Which of the following illustrations best describe a colloid?



A. III only
B. II only
C. I only
D. II and III

2. The unique behaviours and properties exhibited by particles that arise from the interactions between the dispersed particles and the surrounding medium is known as A. colloidal effect.
B. emulsion effect.
C. suspension effect. D. Tyndall effect.

3. During science class, a student of Ampekrom JHS discovers that an atom consists of neutrons, electrons, and protons. He then drew the structure of the atom as shown below in Diagram X.

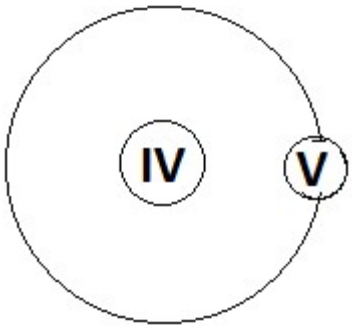


Diagram X

Which of the following best describes the location of particles in the part labelled IV?

A. Protons and electrons are located in IV.

B. Protons and neutrons are located in IV.

C. Neutrons and electrons are located in IV. D. Protons and neutrons are located in IV.

4. JHS three students were asked to classify the organisms in Diagram W as prokaryotes and eukaryotes.

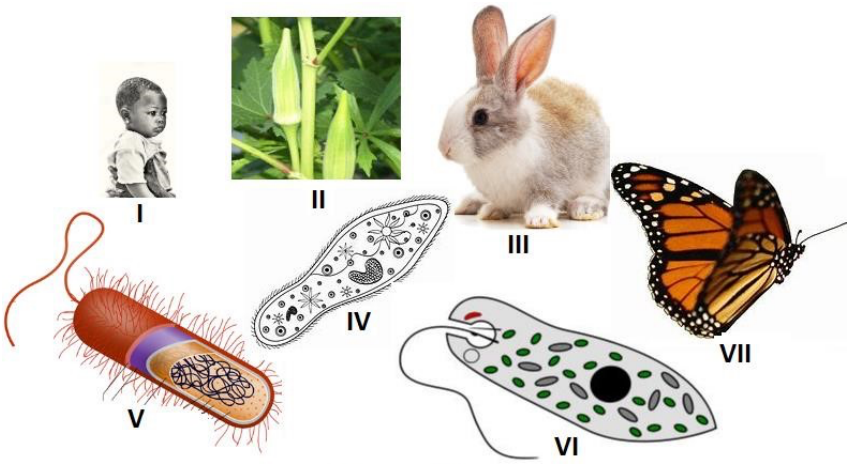


Diagram W

Which of the following is correct about their classification?

A. I, II, V, and VI are prokaryotes

B. I, II, III, and IV are prokaryotes

C. I, II, IV, and VII are eukaryotes

D. I, II, IV, and V are eukaryotes

5. A mixture in which one substance is uniformly dispersed in another substance is known as

A. suspension

B. Colloid

C. Solusion

D. Solution

6. An example of a homogeneous mixture is

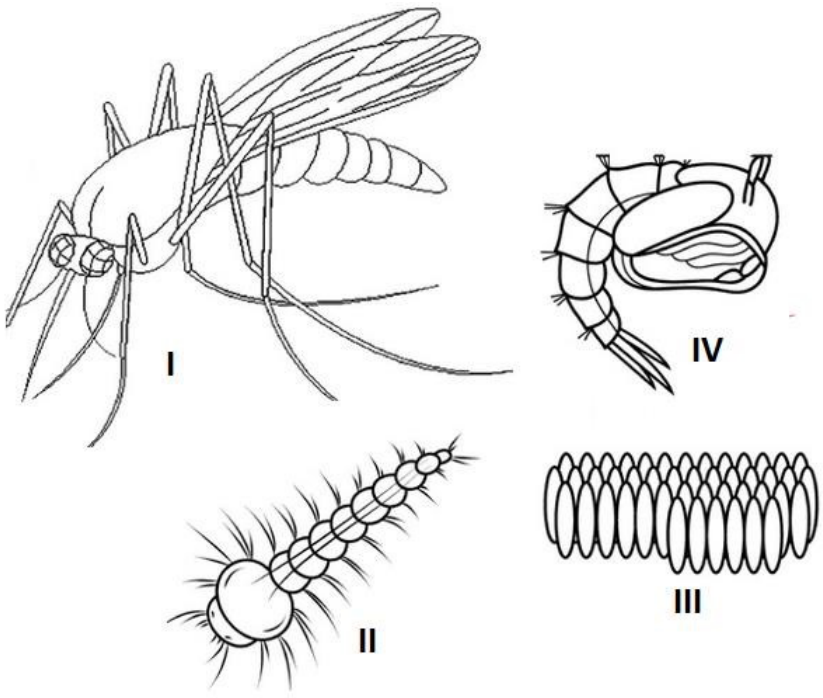
A. sand and water.

B. oil and vinegar.

C. salt and pepper.

D. sugar and water.

7. The illustrations in Diagram **D** below show the stages of development of an organism.



Re-arrange the stages labeled I, II, III, and IV to show the correct stages of the life cycle of the organism.

A. I, II, III and IV
B. II, III, and IV
C. III, IV, II, and I
D. IV, III, II, and I

8. You have been given the following pictures that relate to energy sources used in everyday life. Which of the picture(s) highlights more on the non-renewable energy sources?

W

X

Y

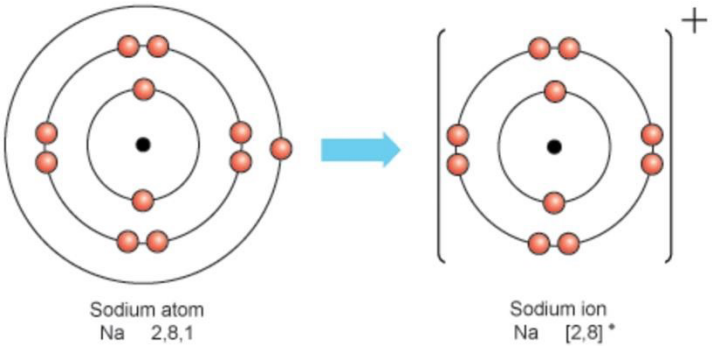
Z

A. **W** and **Z**
B. **W** and **X**
C. **Z** only
D. **Y** only

9. The impacts of climate change are widespread and affecting the environment and social aspects of life; rising temperatures, changing weather patterns. These continue to have dropping effects on ecosystem function and services. The following measures can help reduce the effects of climate except

A. improving energy efficiency in buildings
B. improving greenhouse gas emission
C. improving sustainable agriculture practices
D. transitioning to renewable energy sources.

10. Sodium (Na) loses one electron to form a Sodium ion (Na+). What is the difference in charge between a Sodium atom and a Sodium ion?



A.+1
B. -1
C. 0
D. 1

11. The human teeth play a vital role in the process of mastication and contribute to the overall oral health of humans. The diagram below shows the types of teeth in humans.

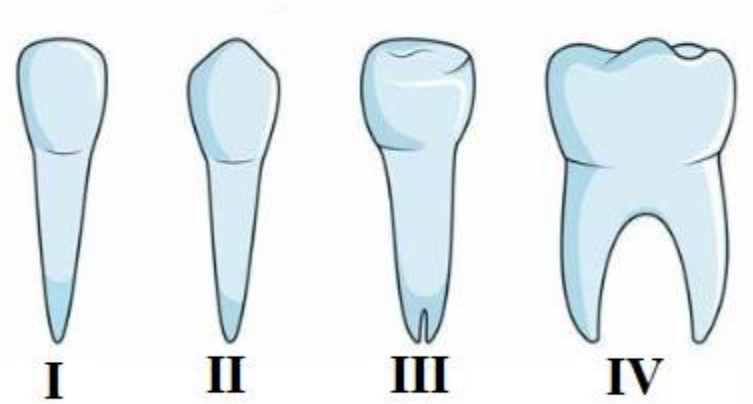


Diagram G

Which of the following best describe the function of the tooth labelled I?

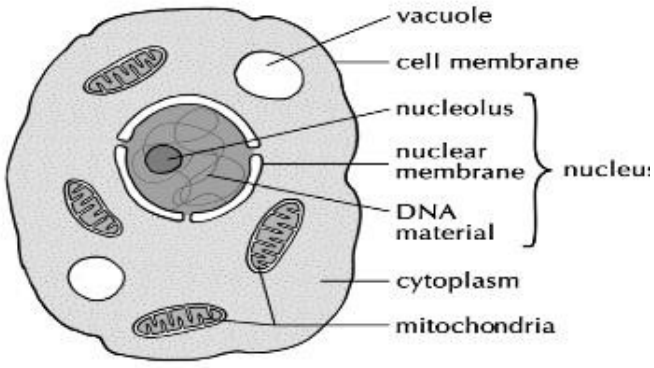
A. Tearing and grasping.
B. Grinding, and chewing.
C. Cutting and biting.
D. Crushing and grinding.

12. Akosua wanted to see whether a solid substance is an acid or a base. In what order should she arrange the following steps?

I. Test with blue litmus paper.
II. Dissolve the substance in water
III. Look at any changes in colour of the litmus paper
IV. Grind some of the substance to make a powder

A. I, IV, II, III
B. II, I, III, IV
C. III, II, I, IV
D. IV, II, I, III

Use the drawing of a typical plant cell below to answer question 13



13. The plant cell survives with the release of energy through
    A. Cell membrane
    B. Cytoplasm
    C. DNA material
    D. Mitochondria

14. A P-N junction diode allows current to flow in one direction only. In a circuit, how would a diode be positioned to allow current to flow through an LED?
    A. the positive side of the diode will be connected to the positive side of the LED.
    B. With the negative side of the diode connected to the positive side of the LED.
    C. The direction of the diode doesn't matter for LED operation.
    D. Diodes cannot be used in circuits with LEDs.

15. How does energy conservation differ from energy conversion in terms of energy use?

    A. Energy conservation aims to generate new energy, while energy conversion helps maintain existing energy levels.
    B. Energy conservation involves transforming energy from one form to another, while energy conversion aims to reduce energy consumption.
    C. Energy conversion focuses on improving energy sources, while energy conservation aims to minimize energy wastage.
    D. Energy conversion is about saving energy in a physical system, whereas energy conservation involves behavioral changes to reduce energy use.

16. Which material is commonly used in making simple agricultural tools like hoes and shovels?

    A. Aluminum
    B. Plastic
    C. Steel
    D. Wood

17. Which of the following chemical compounds is commonly used in the production of fertilizers.

A. H_2CO_3
B. Na_2O_2
C. NH_4Cl
D. NH_4NO_3

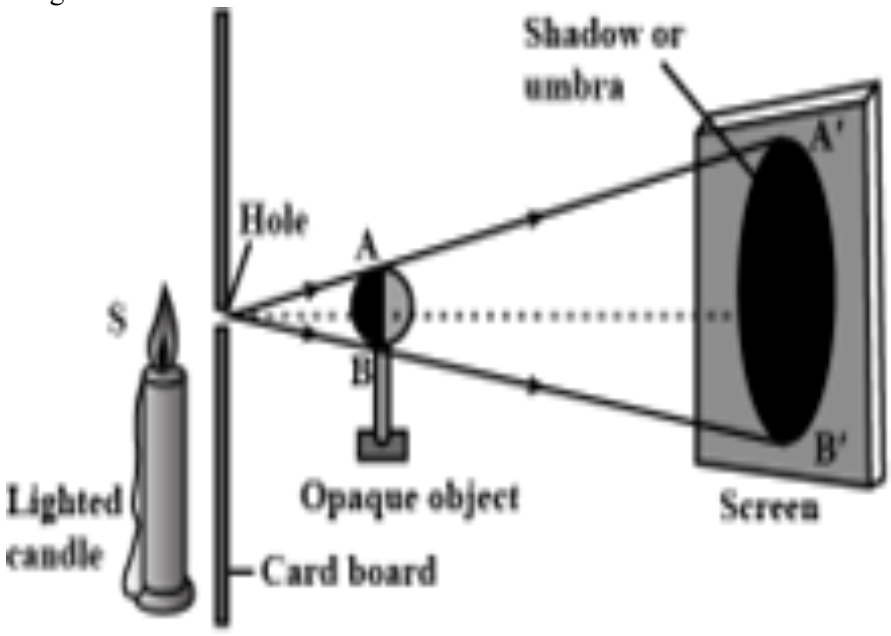
18. Most birds sit on their eggs until they hatch. Which of these is the most important reason why birds sit on their eggs?

A. to keep the eggs inside the nest
B. to keep the eggs warm
C. to protect the eggs from the wind
D. to protect the eggs from the rain.

19. Why is the life cycle of a grasshopper described as incomplete metamorphosis compared to the housefly and mosquito?

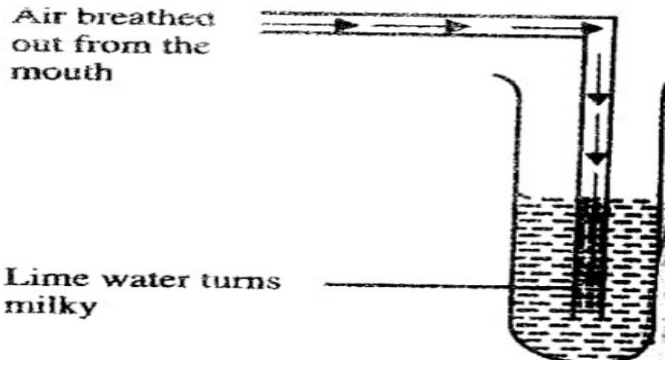
A. Grasshoppers do not undergo distinct stages of development.
B. Grasshoppers have fewer molting stages.
C. Grasshoppers have simpler larval forms.
D. Grasshoppers lack a pupal stage in their life cycle.

20. How do umbra and penumbra differ in the situation of shadow formation as shown in the diagram?



A. Umbra consists of the faintest shadow, penumbra is the most defined shadow.
B. Umbra forms closer to the light source, penumbra is further away from the object.
C. Umbra is the darkest part of the shadow, while penumbra is the partial shadow.
D. Umbra represents direct sunlight, while penumbra is indirect sunlight.

21. Asibi breathed air through a delivery tube into a test tube containing lime water as shown in the diagram below. The lime water turns milky. Identify the milky substance in the test tube.



A. Calcium carbonate
B. Calcium chloride
C. Calcium hydroxide
D. Calcium nitrate

22. Atoms can gain or lose electrons to become ions. The following statements about cations and anions are correct except

A. Cations have more protons, anions have fewer protons.
B. Cations are positive ions, while anions are negative ions.
C. Metals form cations, whilst non-metals form anions
D. There is no difference between them, they are the same.

23. Which of the following statements accurately compares ruminant, monogastric, and poultry feed characteristics?

A. Monogastrics have complex stomachs with multiple compartments for fermentation, unlike ruminants and poultry.
B. Poultry feed typically contains high levels of cellulose to support efficient nutrient absorption, differing from ruminants and monogastrics.
C. Ruminants require high-fiber feed for proper digestion, while monogastrics rely on grain-based diets for energy.

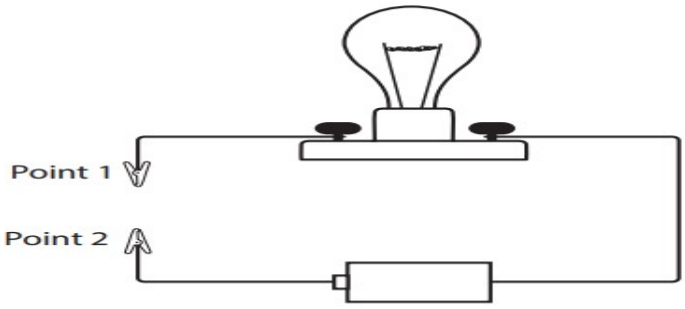
D. Ruminants, monogastrics, and poultry all have similar digestive systems and nutrient requirements.

24. Four different thermometers were used to measure the temperature of water in four different beakers. Which thermometer reading shows the hottest water?

25. A hammer was used to drive a nail unto the wood as seen in the diagram. How is the hammer and the nail related in term of pressure, area, and force from the diagram.

A. application of area over a small force
B. application of force over a small area, high pressure at the point of contact.
C. high pressure does not allow the nail to penetrate the wood
D. no high pressure at the point of contact.

26. The following picture shows a lightbulb connected to a battery in an electrical circuit. Which of the following objects connected to Points 1 and 2 will allow the bulb to glow?



A. iron nail
B. plastic spoon
C. rubber band
D. wooden stick

27. The word equation that represents the reaction between NaOH and HCl is
A. Sodium hydroxide + hydrochloric acid → ammonia
B. Sodium hydroxide + hydrochloric acid → hydrogen and water
C. Sodium hydroxide + hydrochloric acid → salt and water
D. Sodium hydroxide + hydrochloric acid → water and gas

28. Plants grow best in soils that are rich in …
A. grains of sand
B. lumps of clay
C. layers of gravel
D. decaying plants and animals

29. The food producer within the plant cell uses energy from the sun and converts carbon dioxide and water into sugars. This sub-cellular structure is called
A. chloroplast
B. mitochondria
C. nucleus
D. vacuole

30. Water vapour from lakes, rivers and oceans rises into the atmosphere due to the sun heating the earth's surface. As the water vapour cools, it condenses into tiny droplets, forming clouds. When these droplets combine and grow heavy enough they fall back to the earth's surface as rain. What is the technical name for the last process of the water cycle the describes?
A. condensation
B. evaporation
C. precipitation
D. Transpiration

31. Which of the options below shows the stages of the house fly life cycle after hatching:
A. adult, larva, egg, pupa

B. egg, adult, pupa, larva
C. larva, pupa, adult, egg
D. pupa, egg, larva, adult

The table below shows an incomplete arrangement of food substances, their sources, functions and defeciency. Complete the table by selecting the appropriate option for each food substance. **Use this table to answer questions 32, 33 and 34.**

Food substance	Source	Function	Defeciency
Protein	fish	formation of nails	marasmus
Calcium (Ca)	…….	…….	……..
Iron (Fe)	……	……..	……..
Ascorbic acid	……..	……	……

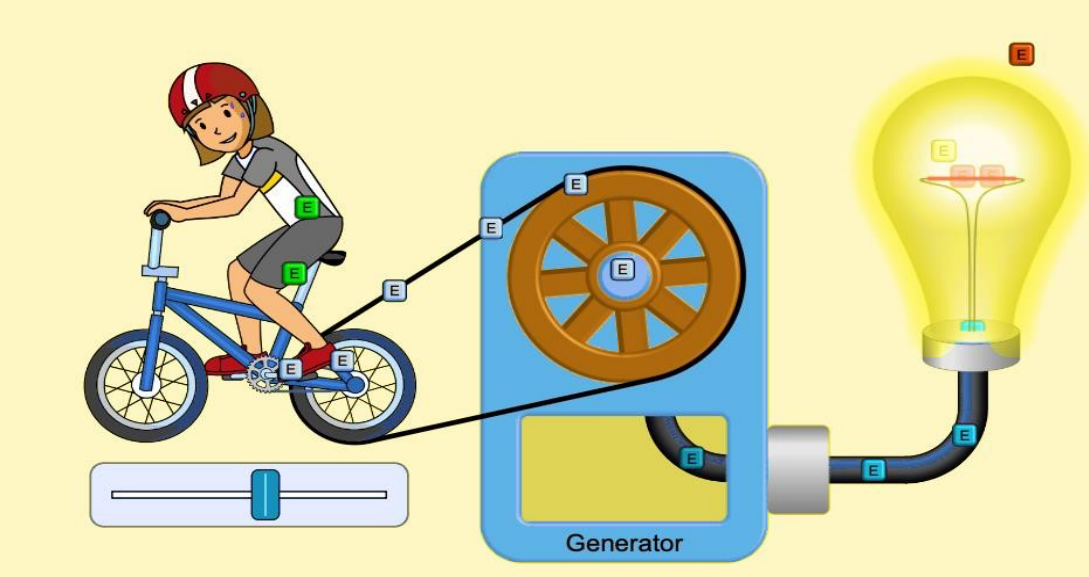
32. A. Calcium: snail, protein synthesis, dry skin formation
B. Calcium: seafood, thyroid gland function, mouth sores
C. Calcium: sea salt, cell membrane functioning, eczema
D. Calcium: cheese, skeleton framework formation, rickets

33. A. Iron: crab, protein synthesis, dry skin and hair
B. Iron: glycogen, repair of body tissues, stroke
C. Iron: lean meat, building haemoglobin, anaemia
D. Iron: vegetables, cell membrane function, yellow hair

34. A. Ascorbic acid: animals, provides energy, mouth sores
B. Ascorbic acid: cellulose, protects vital organs, hair loss
C. Ascorbic acid: fresh fruits, resistance to infection, scurvy
D. Ascorbic acid: groundnuts, blood formation, diabetes

The diagrams below for questions 35 and 36 shows how energy (E) can be transformed. Study the activities taking place in each of the diagrams below and select from the given options, the energy changes that take place.

35.



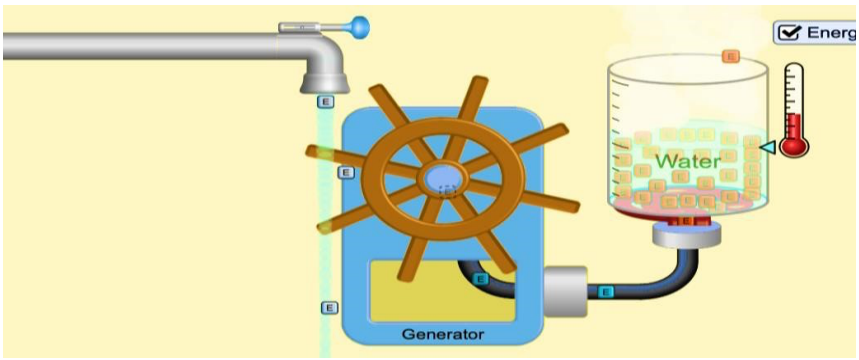
A. $chemical\ energy \rightarrow kinetic\ energy \rightarrow mechanical\ energy \rightarrow electrical\ energy \rightarrow light\ energy + heat\ energy$

B. $Chemical\ energy \rightarrow kinetic\ energy \rightarrow sound\ energy \rightarrow electrical\ energy \rightarrow light\ energy + heat\ energy$

C. $potential\ energy \rightarrow chemical\ energy \rightarrow kinetic\ energy \rightarrow mechanical\ energy \rightarrow light\ energy + heat\ energy$

D. $potential\ energy \rightarrow kinetic\ energy \rightarrow electrical\ energy \rightarrow light\ energy + heat\ energy + sound\ energy$

36.



A. $kinetic\ energy \rightarrow mechanical\ energy \rightarrow electrical\ energy \rightarrow heat\ energy$

B. $potential\ energy \rightarrow kinetic\ energy \rightarrow electrical\ energy \rightarrow heat\ energy$

C. $sound\ energy \rightarrow mechanical\ energy \rightarrow electrical\ energy \rightarrow heat\ energy$

D. $chemical\ energy \rightarrow mechanical\ energy \rightarrow electrical\ energy \rightarrow heat\ energy$

37. What happens to the particles of a solid when it is heated to its melting point?
A. They break free from their fixed positions.
B. They disperse in the air as individual particles.
C. They stop moving altogether.
D. They vibrate faster but remain in fixed positions.

38. Consider the structure of ice and water. How do the particles in these two states of matter differ in terms of arrangement and movement?
A. Ice particles are more tightly packed and vibrate less than water particles.
B. Ice particles are loosely arranged and move freely compared to water particles.
C. Ice particles have more kinetic energy than water particles.
D. There is no difference in the arrangement and movement of particles between ice and water.

39. What property of liquids allows them to take the shape of their container but maintain a constant volume?
A. strong forces of attraction between particles
B. ability of particles to move past each other
C. random motion of particles at high speeds
D. fixed positions of particles within the liquid

40. How does the arrangement of particles differ in solids, liquids, and gases?
A. Solids have the most organized particles, followed by liquids and gases.
B. Gases have the most organized particles, followed by liquids and solids.
C. Liquids have the most organized particles, followed by solids and gases.
D. The level of organization is the same in all three states of matter.

41. Which of the following best describes the characteristic behavior of particles in a solid state of matter?

A. The particles are far apart and have no fixed shape.
B. The particles are tightly packed and vibrate in fixed positions.
C. The particles have the most freedom of movement.
D. The particles move freely past each other.

42. Which activity involves the conversion of mechanical energy into sound energy?

A. Charging a smartphone
B. Playing a musical instrument.
C. Riding a roller coaster

D. Turning the pages of a book

43. What form of energy is primarily used when a car is in motion?

A. Chemical energy
B. Gravitational energy
C. Nuclear energy
D. D. Solar energy

44. Which of the following best represents the transformation of light energy into electrical energy?

A. Burning wood in a fireplace.
B. Lighting a candle.
C. Running on a treadmill.
D. Using a solar panel to power a calculator.

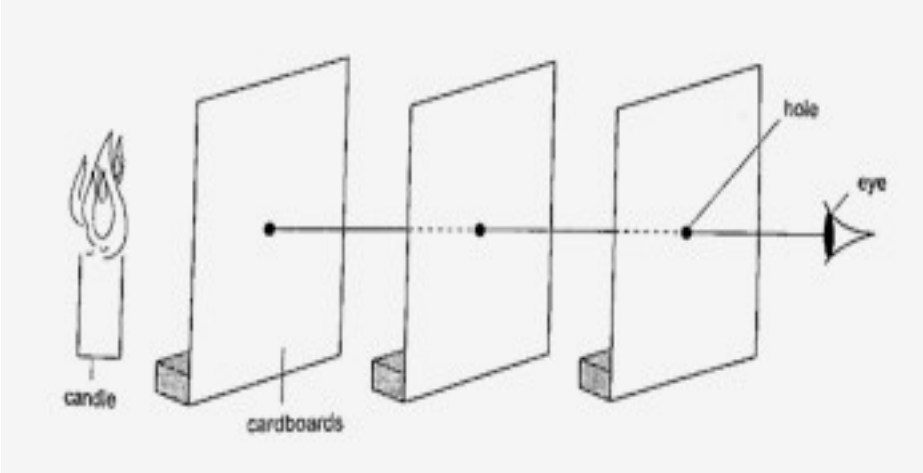
45. How does heat transfer occur primarily in a metal object?

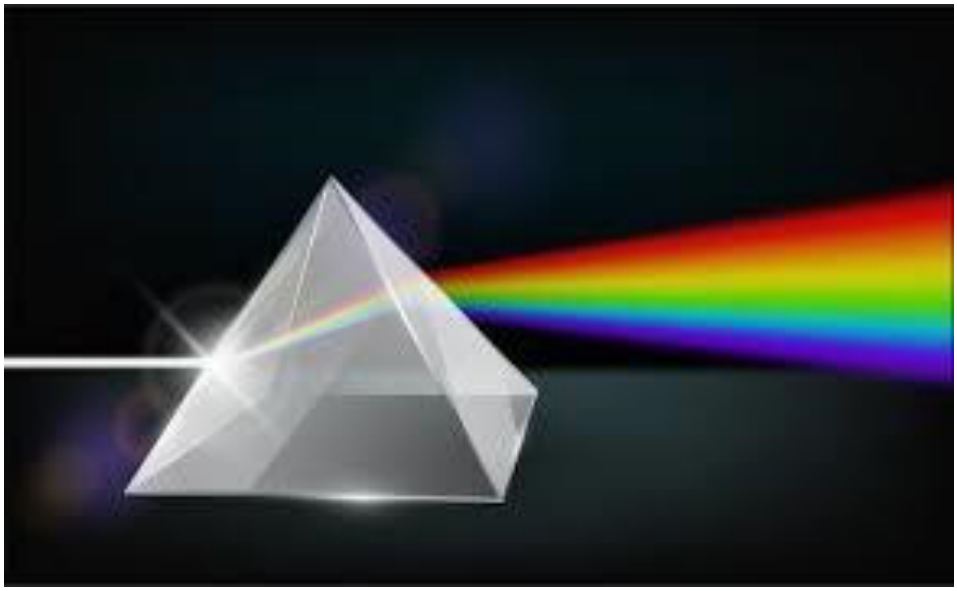
A.Conduction
B.Convection
C.Radiation
D. Absorption

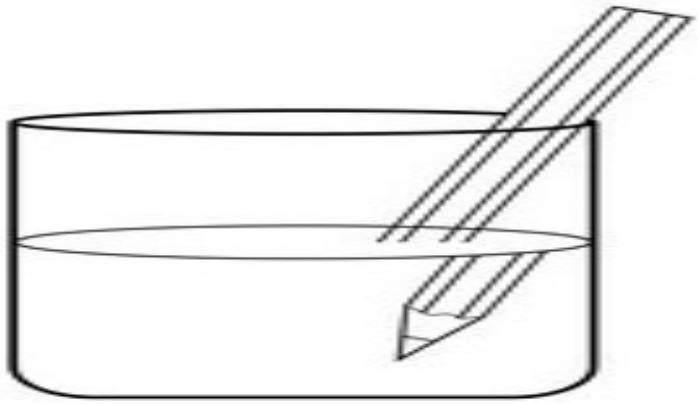
46. Which medium primarily transfers heat through the movement of its particles?

A. Gas
B. Liquid
C. Metal
D. Plastic

At the annual science fair hosted by a STEM club of a Junior High School, learners set up a variety of interesting experiments to showcase scientific concepts as shown below. Use the experiments to answer questions 47 – 50.







47. Which experiment best demonstrates that light travels in a straight line?

A. Measuring the angle of incidence and angle of reflection.
B. Observing the shadows cast by different objects.
C. Passing light through cardboards.
D. Using a pinhole camera to create an image.

48. How does refraction of light take place?

A. By reflecting light off a screen.
B. By refracting light through a prism.
C. By diffracting light through a narrow aperture.
D. By scattering light in multiple directions.

49. When measuring the angle of incidence and angle of reflection, what principle of light behaviour is being demonstrated?

A.Dispersion
B.Refrction
C. Reflection
D. Diffraction

50. What principle of light represents the bending of pencil in a beaker containing water.

A.Dispersion
B.Refraction
C.Reflection
D. Diffraction