



# FSP SCIENCE CONTEST 2021

## QUESTION BOOKLET GRADE 7 & 8

**VIBRANT YOUNGSTERS**

**TIME ALLOWED: 90 Minutes**

**MAXIMUM MARKS: 90**



**FAMOUS STUDENTS PLATFORM**

# INSTRUCTIONS

- 1) DON'T START ATTEMPTING THE PAPER UNTIL INSTRUCTED BY THE INVIGILATOR.
- 2) INSTRUCTIONS FROM THE EXAMINATION INVIGILATOR MUST BE CARRIED OUT PROMPTLY.
- 3) CAREFULLY RECHECK YOUR NAME, FATHER NAME, SCHOOL NAME, ADDRESS ETC AT THE BUBBLE SHEET / ANSWER SHEET.
- 4) RECORD ALL ANSWERS ON THE BUBBLE SHEET ONLY. SELECT BEST ANSWER FROM THE FOUR GIVEN OPTIONS AND MARK ONLY ONE OPTION IN EACH QUESTION.
- 5) USE BLUE / BLACK INK TO FILL UP THE CIRCLES FOR YOUR ANSWERS ON THE BUBBLE SHEET. USE OF LEAD PENCIL IS NOT ALLOWED.
- 6) USE OF ANY HELPING MATERIAL INCLUDING CELL PHONES AND ELECTRONIC DEVICES IS STRICTLY PROHIBITED.
- 7) EVERY CORRECT ANSWER EARNS THREE POINTS. THERE WOULD BE NEGATIVE MARKING. ONE POINT WOULD BE DEDUCTED FOR EVERY INCORRECT ANSWER.
- 8) CANDIDATES MAY NOT LEAVE THE EXAMINATION ROOM UNESCORTED FOR ANY REASON, AND THIS INCLUDES USING THE WASHROOM.
- 9) NO MATERIALS OR ELECTRONIC DEVICES SHALL BE BROUGHT IN TO THE ROOM.
- 10) THERE ARE FIVE CATEGORIES OF THE CONTEST AS UNDER:
  - A) VIBRANT YOUNGSTERS (GRADE 1 & 2)
  - B) VIBRANT YOUNGSTERS (GRADE 3 & 4)
  - C) VIBRANT YOUNGSTERS (GRADE 5 & 6)
  - D) VIBRANT YOUNGSTERS (GRADE 7 & 8)
  - E) VIBRANT YOUNGSTERS (GRADE 9 & 10 / 0-LEVELS)
- 11) ONLY REGISTERED STUDENTS CAN PARTICIPATE IN THE CONTEST.
- 12) NO CANDIDATE SHALL TAKE OUT OF THE HALL ANY ANSWER BOOK(S) OR PART OF AN ANSWER BOOK, WHETHER USED OR UNUSED, OR OTHER SUPPLIED MATERIAL.
- 13) IF A PARTICIPANT DOES NOT UNDERSTAND A WORD OR PHRASE ON THE EXAM PAPER, NEITHER EXAMINER NOR INVIGILATOR IS PERMITTED TO ANSWER.
- 14) FOR INFORMATION ABOUT UPCOMING CONTESTS OR PROVIDING VALUABLE FEEDBACK, PLEASE VISIT [WWW.FSPCOMPETITIONS.ORG](http://WWW.FSPCOMPETITIONS.ORG)
- 15) ANY ACADEMIC MISCONDUCT OR MALPRACTICE MUST BE REPORTED TO FSP VIBRANT YOUNGSTERS AT [INFO@FSPCOMPETITIONS.ORG](mailto:INFO@FSPCOMPETITIONS.ORG)



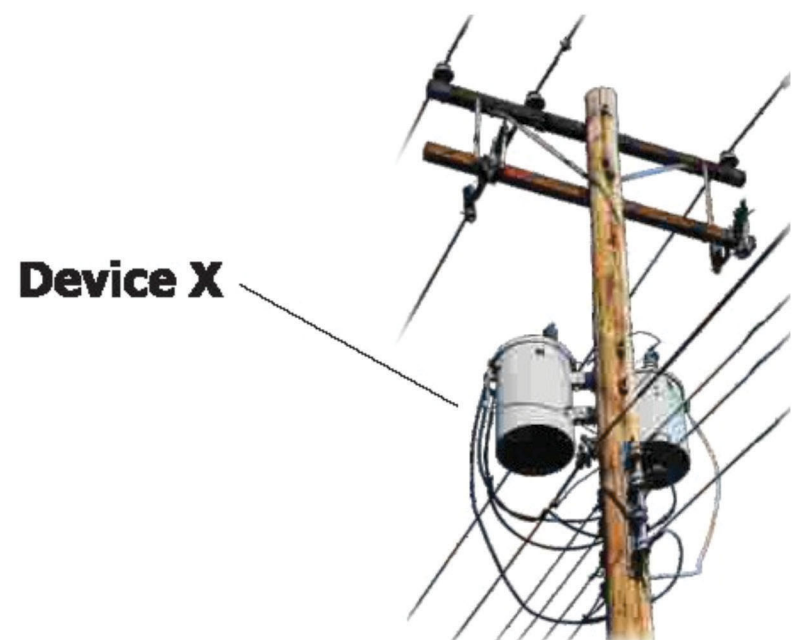
Q.1) Cellular respiration converts the energy stored in sugars to high-energy molecules called ATP:

Which cell structure carries out cellular respiration?

- Ⓐ Nucleus
  - Ⓑ Chloroplast
  - Ⓒ Mitochondrion
  - Ⓓ Endoplasmic reticulum
- 

Q.2) The following image shows Device X, found in a power grid system

What is the role of this device within the electrical grid system?



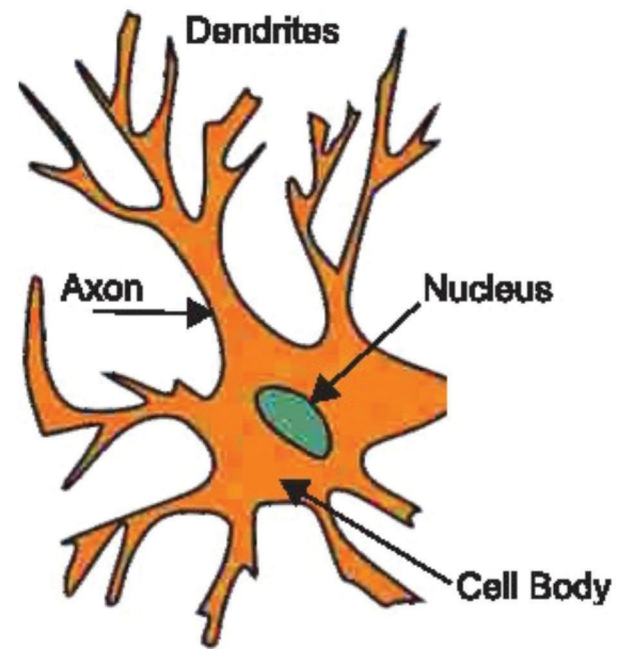
- Ⓐ It is a generator that produces the current needed Inside the home.
  - Ⓑ It is a distributor that diverts power from the distribution line to the home.
  - Ⓒ It is a transformer that reduces the voltage between the power line and the home.
  - Ⓓ It is a regulator that limits the amount of electric power in the wire to the home.
- 

Q.3) Chris viewed the following cell through a microscope lens.

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Which type of cell is Chris observing?

- A Nerve cell
- B Bone cell
- C Blood cell
- D Muscle cell



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Q.4) Which situation is explained by Newton's first law of motion?

- A A basketball bounces upward when it is dropped on the floor.
- B You can lift more mass with the same force using a longer lever.
- C Even though you stop pedaling your bicycle, you keep moving forward.
- D More fuel is required to accelerate a large truck than is required to accelerate a small car.

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Q.5) Certain virus causes people to catch colds and other infections more easily. Which body system does the virus affect?

- A Circulatory
- B Digestive
- C Immune
- D Nervous

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Q.6) A sewer system operator would like to use electromagnetic radiation to destroy bacteria and other organisms in filtered wastewater before it is released into the environment.

Which type of electromagnetic radiation is capable of treating the wastewater?

- A Ultraviolet
- B Infrared
- C Visible
- D Radio



Q.7) Which of these is a renewable energy resource that does not produce carbon dioxide?

- A Coal                       B Wind                       C Biomass                       D Fossil fuel
- 

Q.8) Which list of characteristics describes organisms classified as animals?

- A Unicellular, prokaryotic, autotrophic  
 B Multicellular, eukaryotic, heterotrophic  
 C Unicellular, eukaryotic, heterotrophic  
 D Multicellular, eukaryotic, autotrophic
- 

Q.9) The list includes six situations.

- A book sliding across a table at a constant speed
- A ball sitting on a shelf
- A can rolling down a ramp
- A swing moving back and forth
- A car traveling at a constant speed of 15 m/s
- A bird landing on a branch

Which objects in the list experience an unbalanced force?

- A The book, the ball, and the car  
 B The ball, the car, and the bird  
 C The can, the swing, and the bird  
 D The book, the ball, the can, and the swing
- 

Q.10) A clerk at a hardware store performed the activities in the list.

**(Next Page)**

**Activities:**

1. Pushed a 300 N box for 5 m across a floor using 110 N of force.
2. Lifted a 490 N box of tools from the floor to a shelf 1.5 m high.
3. Held a 50 N clay pot for 4 minutes for a customer while the customer did more shopping.

Which statement best describes the amount of work performed for the three activities?

- A Activity 3 required more work than Activity 1, but Activity 3 did not require more work than Activity 2.
  - B Activity 1 required the same amount of work as Activity 3.
  - C Activity 2 required the most work.
  - D Activity 1 was the only activity that required work.
- 

Q.11) Black walnut trees produce a nontoxic chemical that becomes highly toxic when it is exposed to air or soil. How does this chemical help black walnut trees compete with plants growing nearby?

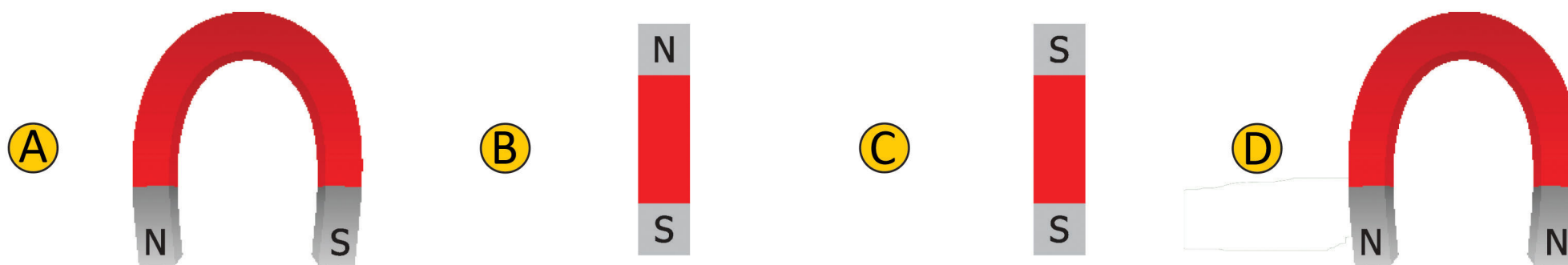
- A By attracting herbivores to the other plants
  - B By suppressing the growth of the other plants
  - C By increasing the photosynthesis rates in the other plants
  - D By limiting the amount of water available to the other plants
- 

Q.12) Clouds are formed when millions of drops of water become suspended in the air. Which of the following is a step in the process of cloud formation?

- A Expansion of cold air
  - B Formation of Carbon dioxide
  - C Condensation of vapor
  - D Fossil fuel
-

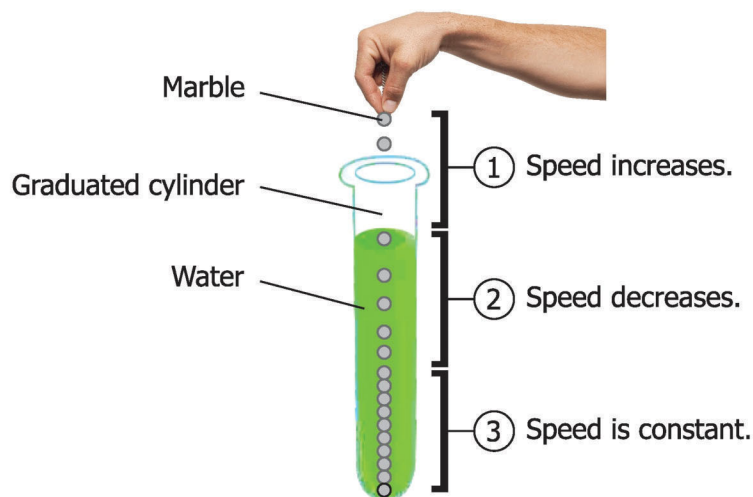


Q.13) Which magnet below would provide the best example for the magnetic poles and magnetic fields of Earth?



Q.14) A student used a video camera to record another student dropping a marble through water in a graduated cylinder. The students watched the video in slow motion and made the observations shown below.

Marble Drop Experiment



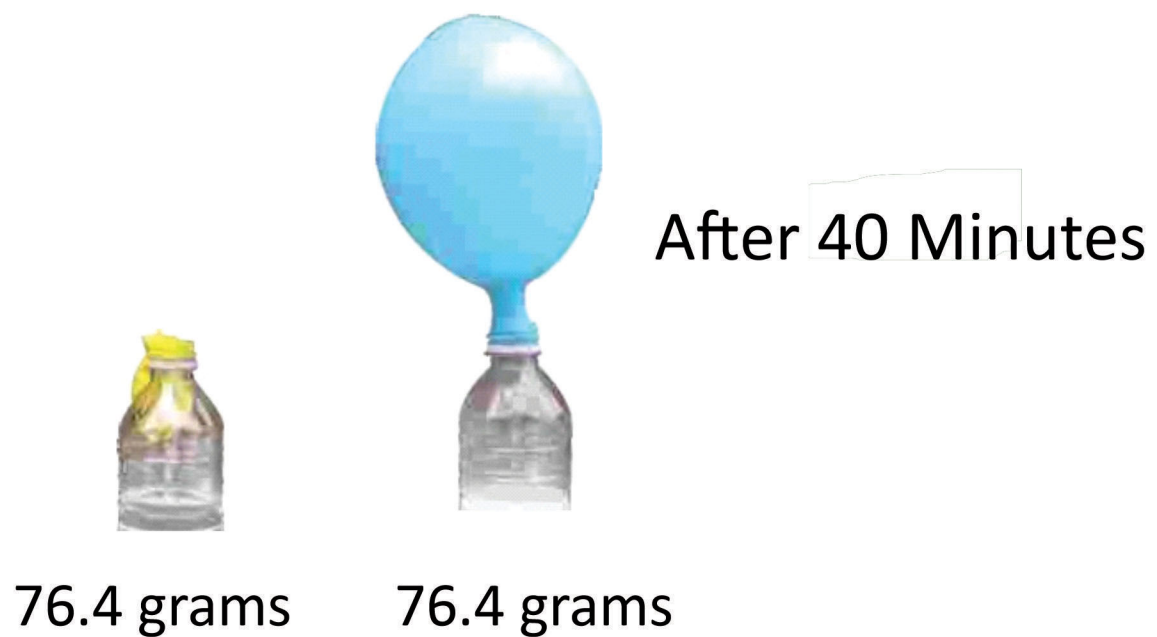
During which part or parts of the marble's fall did the marble experience unbalanced forces?

- Ⓐ Part 1 only
- Ⓑ Parts 1 and 2 only
- Ⓒ Part 3 only
- Ⓓ Parts 2 and 3 only

Q.15) Which combination of substances is a compound?

- Ⓐ salt and water stirred in a glass
- Ⓑ food coloring in frosting
- Ⓒ peanut butter and jelly sandwich
- Ⓓ sulfur dioxide and water forming acid rain

Q.16) A student adds 5 grams of baking soda to 50 grams of vinegar in a container and quickly attaches a balloon to the top of the bottle. The student's investigation is shown below.



What occurred in this investigation?

- A** The reaction produces heat, which causes the plastic of the balloon to soften and change shape.
- B** The reaction in the container produces gas, which causes the balloon to inflate.
- C** The outside air pressure pushes on the container and forces air inside the balloon.
- D** The air molecules from the container move into the balloon and form a solid substance.

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Q.17) A nuclear power plant has recently been built to generate electricity for a town located near several small lakes. Which is not a benefit of this nuclear power plant being built?

- A** The cost of the electricity will decrease
  - B** The loss of habitat for local wildlife.
  - C** The heating of homes will be easier.
  - D** The nuclear power plant will provide jobs.
-



Q.18) Different types of water pollution and their effects are described in the table below..

Descriptions of Water Pollution

Type	Effect
Raw Sewage	Illnesses such as typhoid and hepatitis can spread to humans
Phosphate and Nitrate	Increases algae, then decaying algae uses up oxygen in water
Poison	Stored in the bodies of fish and builds up in organisms that eat fish
Oil	Becomes stuck on bird feathers
Thermal (heat)	Causes water to be less able to contain oxygen; causes bacteria to grow

Based on the table, which of the followings results from both phosphate and nitrate pollution and thermal (heat) pollution in water?

- Ⓐ Diseases are carried through the water.
  - Ⓑ Materials contaminate the bodies of birds.
  - Ⓒ Growth of algae rapidly increases.
  - Ⓓ Levels of oxygen in the water decrease.
- 

Q.19) A company is designing a dam with a floodgate to keep houses safe during the rainy season. The company is reviewing several possible designs that have worked in the past and is trying to develop a plan for implementing one design. Which is the next step in this process?

- Ⓐ pick several dams to use in a consumer survey.
  - Ⓑ test each dam model during a different flood season.
  - Ⓒ analyze the dam designs and pick one based on local needs.
  - Ⓓ redesign the past dams based on what the company feels will work best.
-

Q.20) The picture shows an exchange of gases between plants and animals.



What gas is most likely represented by the arrow labeled X?

- A carbon dioxide
  - B hydrogen
  - C nitrogen
  - D oxygen
- 

Q.21) Medical researchers are developing a wireless blood pressure monitoring system for use in hospitals. This system allows nurses to measure a patient's blood pressure without awakening the patient. Which is the intended benefit of this technology?

- A Patients will not be disturbed.
  - B Patients will have to take fewer medications.
  - C Patients can experience pain relief.
  - D Patients can avoid having surgery.
- 

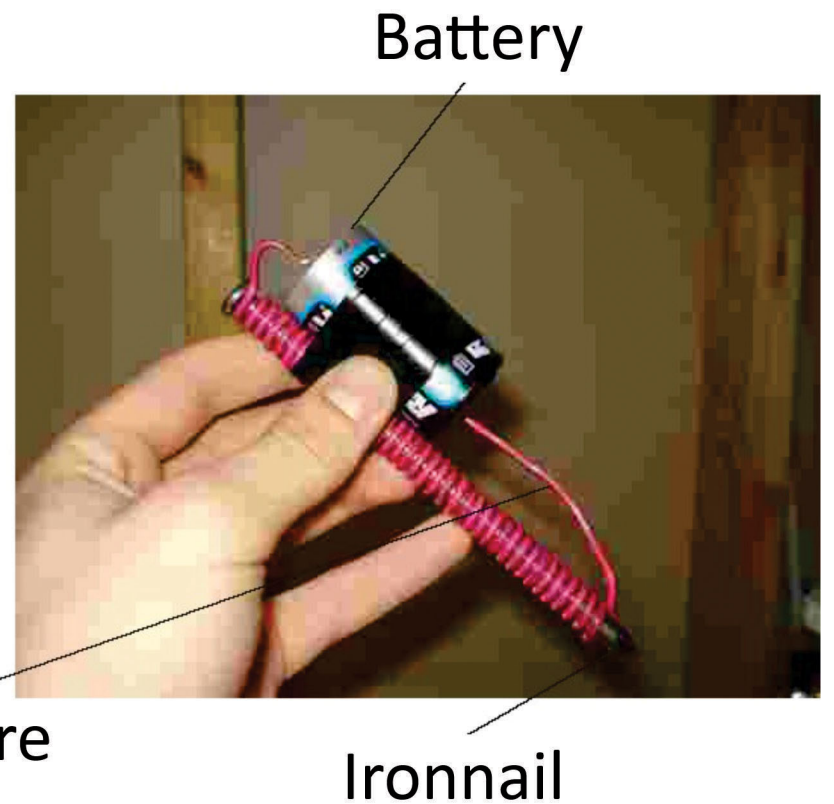
Q.22) The parts of an electromagnet are shown below.

(Next Page)



The strength of the magnet will be increased by

- Ⓐ using more nails.
- Ⓑ adding a switch.
- Ⓒ making more loops with the wire.
- Ⓓ placing the battery closer to the nail.



Q.23) Some researchers are developing a new fertilizer designed to improve the growth of plants in hot, dry climates. The fertilizer was applied to one hundred desert plants in a greenhouse. The average daytime temperature in the greenhouse was 90°F, and the humidity levels were low. Which is best for the researchers to do next?

- Ⓐ compare plants that received fertilizer to similar plants that received none
- Ⓑ begin selling the fertilizer to gardeners living in hot, dry climates
- Ⓒ change the conditions in the greenhouse and retest the fertilizer
- Ⓓ test the fertilizer on plants that are adapted to cooler climates

Q.24) Four changes are shown below. Which of these represents a chemical change?

- Ⓐ A match is lit, creating a yellow-orange flame.
- Ⓑ A small piece of ice melts, changing from a solid to a liquid.
- Ⓒ ball of clay sinks in water, and floats when reshaped.
- Ⓓ A pot of water is heated to boiling, and evaporation occurs.

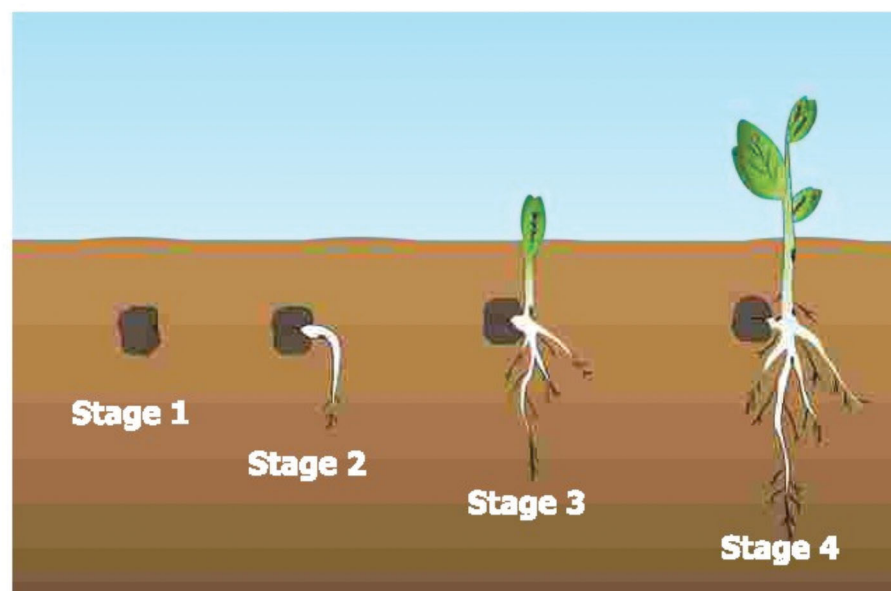
Q.25) The procedure below is designed to test how water temperature affects the rate at which sugar dissolves.

- Measure 150 milliliters of water into each beaker.
- Heat water to three different temperatures.
- Put 5 grams of sugar into each of the beakers at the same time.
- Stir and record the time it takes for the sugar to completely dissolve.

Which additional step will most improve the investigation?

- A** Use 200 milliliters of water in each beaker.
- B** Record the Initial and final temperatures of the water.
- C** Stir at different rates for each beaker.
- D** Record the times when sugar is half dissolved.

Q.26) The diagram below shows the stages of development of a plant.



At which stage has germination begun?

- A** 1
- B** 2
- C** 3
- D** 4

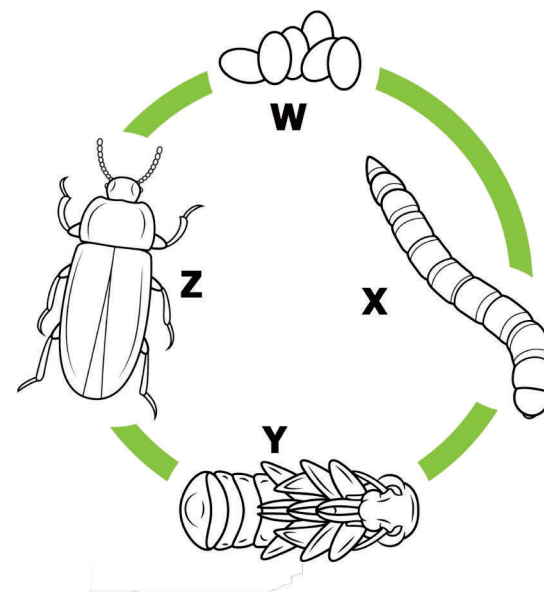
Q.27) The diagram below shows the life cycle of a mealworm. The stages in its life cycle are labeled W, X, Y, and z.

(Next Page)



Which stage is shown at Y?

- A adult
- B egg
- C larva
- D pupa



Q.28) Which statement best describes wood and coal in terms of renewability and formation time?

- A Wood is nonrenewable and forms in a few years, unlike coal, which is renewable and takes millions of years to form.
- B Wood is renewable and forms in a few years, unlike coal, which is nonrenewable and takes millions of years to form.
- C Wood is nonrenewable and takes millions of years to form, unlike coal, which is renewable and forms in a few years.
- D Wood is renewable and takes millions of years to form, unlike coal, which is nonrenewable forms in a few years.

Q.29) A student observes that a gas is formed when chemical Y is added to chemical Z in the lab. The student's observation of a new product being formed is the common outcome of all.

- A physical changes.
- B chemical changes
- C mass changes
- D phase changes

Q.30) Which of the following is a way that people directly affect the environment?

- A playing soccer
- B dumping trash
- C attending a concert
- D going to school



# ANSWER SHEET

## INSTRUCTIONS:

- This is a generic answer sheet to be used by participants of all grades. Students of Grade 1-2 will fill in circles of first 20 questions. Grade 3-4 will fill in circles of 25 questions & Grade 5-10 will fill in circles of 30 questions.
- Please recheck your Name, Father Name, Garde & School written below, the same would appear at your certificate.
- Use of lead pencil is not allowed.
- Use only Black / Blue ink to fill in the circles.

Choose only ONE of the FOUR proposed answers (A,B,C or D) & fill in the circles with your answer.

Example of correctly filled table of answers.

Ⓐ Ⓑ ● Ⓓ Correct Filling Answer "C"

Ⓐ Ⓑ ✕ Ⓓ wrong filling

Ⓐ Ⓑ ■ Ⓓ wrong filling

Ⓐ Ⓑ ✓ Ⓓ wrong filling

Ⓐ Ⓑ ● Ⓒ Ⓓ wrong filling

Q. No.	Answer				Q. No.	Answer			
1	Ⓐ	Ⓑ	●	Ⓓ	16	Ⓐ	●	Ⓒ	Ⓓ
2	Ⓐ	Ⓑ	●	Ⓓ	17	Ⓐ	●	Ⓒ	Ⓓ
3	●	Ⓑ	Ⓒ	Ⓓ	18	Ⓐ	Ⓑ	Ⓒ	●
4	Ⓐ	Ⓑ	●	Ⓓ	19	Ⓐ	Ⓑ	●	Ⓓ
5	Ⓐ	Ⓑ	●	Ⓓ	20	Ⓐ	Ⓑ	Ⓒ	●
6	●	Ⓑ	Ⓒ	Ⓓ	21	●	Ⓑ	Ⓒ	Ⓓ
7	Ⓐ	●	Ⓒ	Ⓓ	22	Ⓐ	Ⓑ	●	Ⓓ
8	Ⓐ	●	Ⓒ	Ⓓ	23	●	Ⓑ	Ⓒ	Ⓓ
9	Ⓐ	Ⓑ	●	Ⓓ	24	●	Ⓑ	Ⓒ	Ⓓ
10	Ⓐ	Ⓑ	●	Ⓓ	25	Ⓐ	●	Ⓒ	Ⓓ
11	Ⓐ	●	Ⓒ	Ⓓ	26	Ⓐ	●	Ⓒ	Ⓓ
12	Ⓐ	Ⓑ	●	Ⓓ	27	Ⓐ	Ⓑ	Ⓒ	●
13	Ⓐ	Ⓑ	●	Ⓓ	28	Ⓐ	●	Ⓒ	Ⓓ
14	Ⓐ	●	Ⓒ	Ⓓ	29	Ⓐ	●	Ⓒ	Ⓓ
15	Ⓐ	Ⓑ	Ⓒ	●	30	Ⓐ	●	Ⓒ	Ⓓ





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