



Preparation for the National Grade Six Assessment

Guide #2 | Science Free Response

Who are you?

If you are in grade 5 or 6 and will be taking the next National Grade Six Assessment, then this packet is for you. This packet has past exam questions which have been solved with explanations to help you learn how to solve similar questions. Completing this packet will increase your chances of passing the exam with the highest possible score.

Who are we?

This packet was created by the Caribbean Education Project, a team of students and teachers from universities in the United States and the Caribbean. Our goal is to help you with your preparations for the next exam and to help you better understand each topic. We want you to achieve your best score on the exam. If you are not clear on concepts after reading the material, ask your parent or guardian for help. If they cannot help, ask another family member or a friend. If no one can help you, then ask your parents to send us a message on Facebook or WhatsApp or e-mail us.

- To reach us through Facebook, go on Facebook and search for “Shawn Shivdat.” Then send me a message using Facebook Messenger.
- To reach us by WhatsApp, save this number “Shawn Shivdat, +1 404-406-9638” and message me on WhatsApp.
- To reach us by e-mail, send a message to this e-mail address: info@caribed.org.

Keep in contact

If you are using this packet to prepare, we would like to hear from you. Please keep in touch with us so we can help you with any questions you may have. We can also provide updates when future materials are posted. Send us your name and contact information through WhatsApp, Facebook Messenger, or e-mail (listed above), or send a picture of this sheet filled out through WhatsApp, Facebook Messenger, or e-mail.

Name: _____

Parent’s phone number: _____

Parent’s e-mail address: _____

**PLEASE SHARE THIS GUIDE WITH OTHERS WHO MAY BENEFIT
FROM USING IT.**



How to use this guide:

1. The following pages have a total of 6 past exam questions. Try to answer these questions in the prescribed 55 minutes. If you are not able to answer a question, skip it and go on to the next question. When you are done answering all the questions, you can return to the ones you are having trouble with during your remaining time.
2. It is okay if you were not able to answer all the questions correctly on your first try. Keep practicing the questions, and you will get better. Soon, you will be able to answer all the questions in the 55 minutes. (**TIP:** Practice makes you perfect, so keep practicing.)
3. Answers to all the questions are on the pages immediately after the practice test. When you finish answering the questions, compare your answers to the answers on these pages.
4. Mark the questions which you got wrong.
5. Read our guide to solving each question. Even for questions you got correct, read the explanations we provided because you will likely learn something from them. Our explanations provide valuable information which can provide you with additional skills to solve other problems.
6. Always read the instructions for each question carefully before attempting to answer. Also, read the question itself carefully and pay attention to what the question is asking you to do before attempting to answer it.
7. We provide the answers to all the questions in the practice exams to help you. Do not look at the answers before you attempt the questions. If you look at the answers before, you will not learn a lot from this packet. So, do we have a deal? Okay, I heard you say yes.



**MINISTRY OF EDUCATION
NATIONAL GRADE SIX ASSESSMENT
PRACTICE TEST
SCIENCE
PAPER 2
2017**

Reading Time: 10 minutes

Writing Time: 45 minutes

READ THESE INSTRUCTIONS CAREFULLY BEFORE YOU ATTEMPT TO ANSWER THE QUESTIONS.

1. Write your candidate number clearly on each page.
2. This paper contains **six** questions. You are required to answer **question 1** and **three others**. Each question is worth 5 marks.

Note: You must answer **only four** questions.

Be sure to answer **fully** the **four** questions.

3. Write the answer for each question in the space provided in this booklet.
4. Answers **must** be written in complete sentences.
5. Ensure that your handwriting is clear.
6. If you have to erase, do so cleanly.
7. Look over your work when you have finished.
8. **Do not** take away **any** part of this booklet.

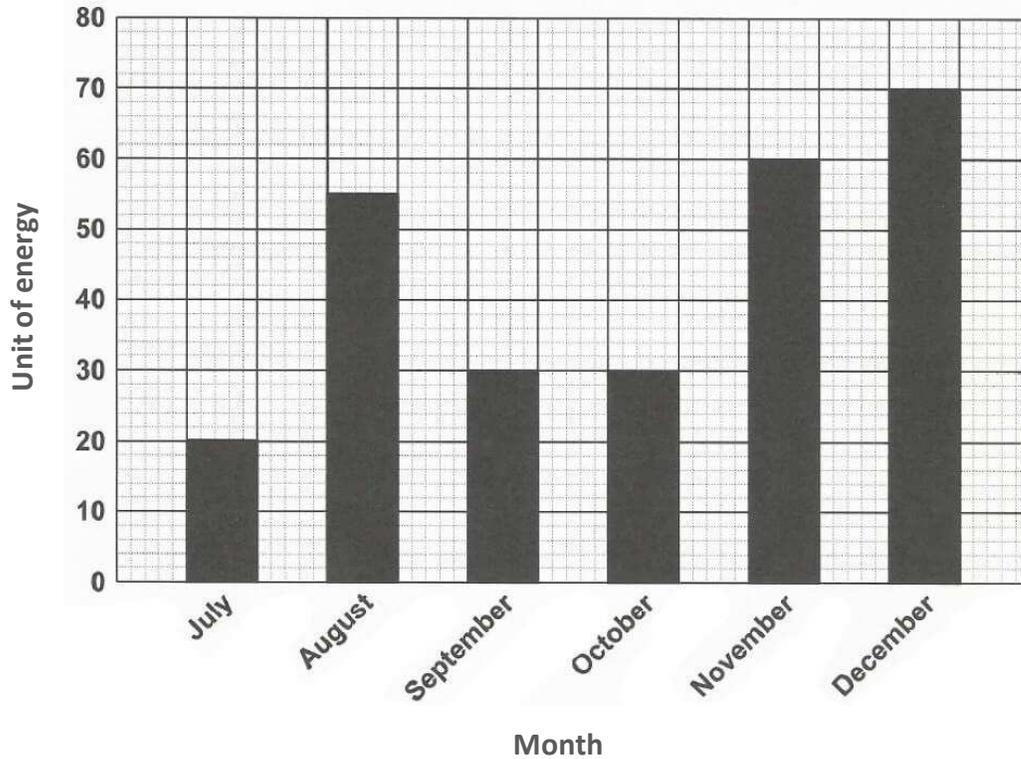
DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.



Candidate number: _____

Instruction: You must answer Question 1.

1. Study the graph below, which shows the number of units of energy used by a household over a six-month period, and answer the questions that follow.



- (a) How many units of energy were consumed in November?

(1 mark)

GO ON TO THE NEXT PAGE



Candidate number: _____

(b) In which month was energy saving **most** likely practised?

(1 mark)

(c) In which **two** months was energy consumption the same?

_____ and

(1 mark)

(d) To what form of energy does a blender convert electrical energy in order to crush food?

(1 mark)

(e) Electricity in most of our homes is produced from fossil fuel. Why is it important to conserve electricity?

(1 mark)

Total 5 marks

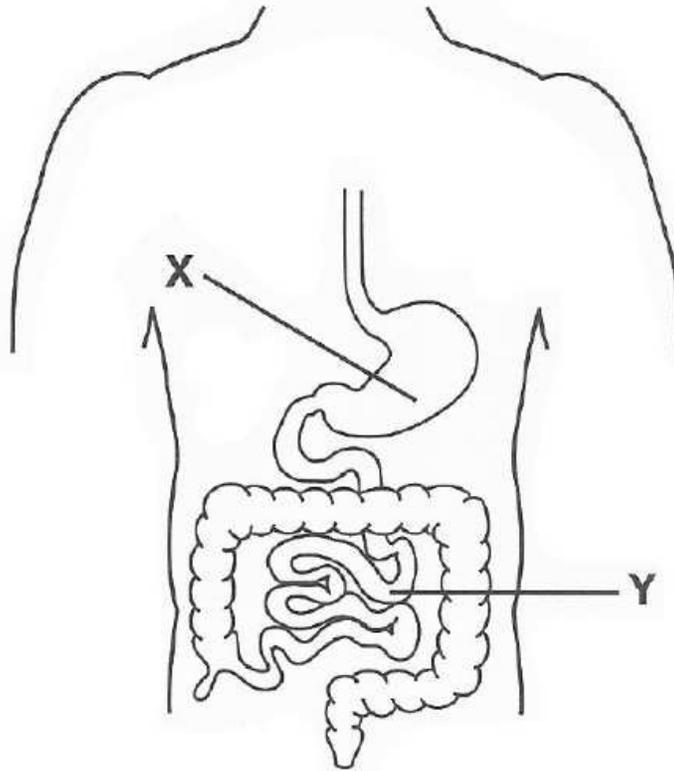
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Candidate number: _____

Instruction: Answer any three questions from Questions 2 to 6.

2. The diagram below represents part of a system in the human body. Study the diagram and answer the questions that follow.



- (a) Name the part labelled **X**.

(1 mark)

GO ON TO THE NEXT PAGE



Candidate number: _____

(b) What process takes place in the parts labelled **X** and **Y**?

Part **X** _____

Part **Y** _____

(2 marks)

(c) Suggest **two** practices that will ensure that the body receives adequate nutrition.

(i) _____

(1 mark)

(ii) _____

(1 mark)

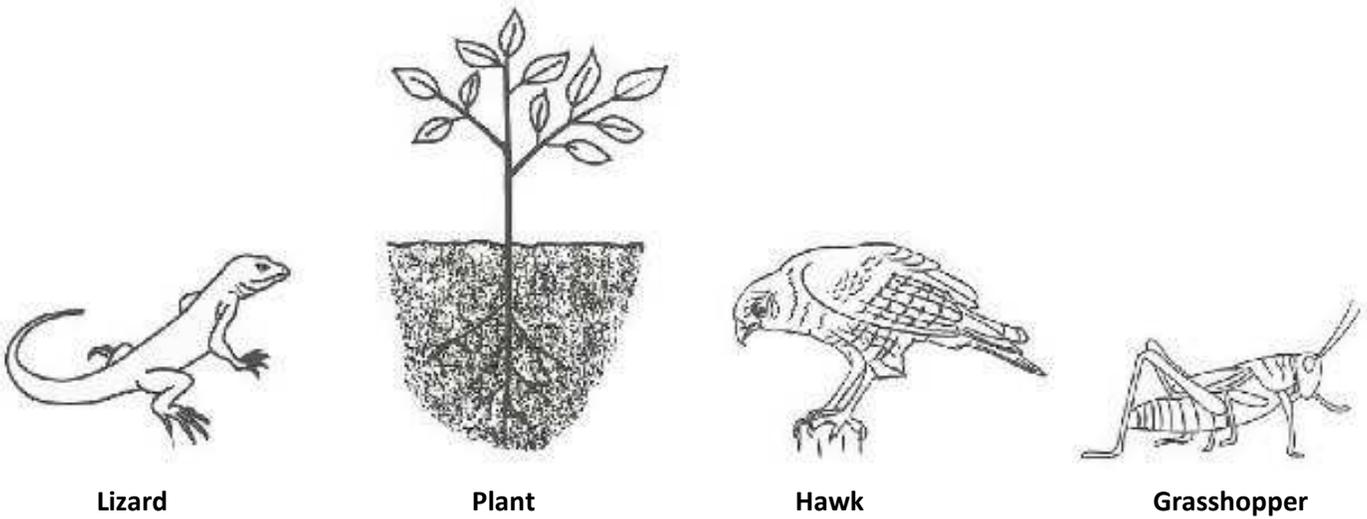
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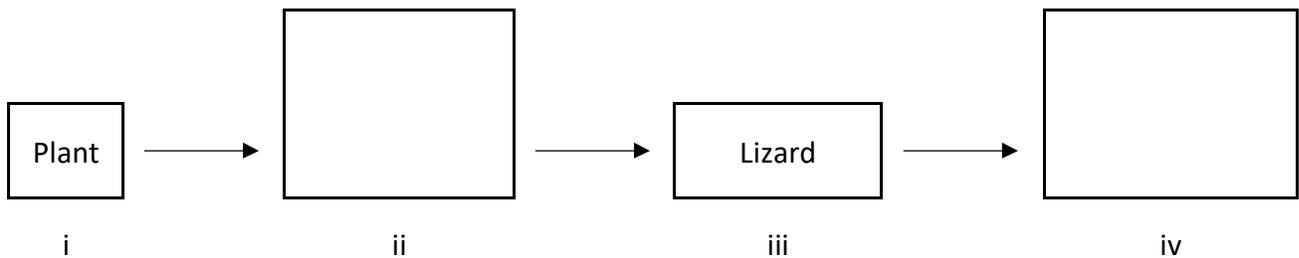
3. Study the drawings below and answer the questions that follow.



(a) Which of the organisms is a producer?

(1 mark)

(b) Complete the food chain below, using the organisms above.



(2 marks)

GO ON TO THE NEXT PAGE



Candidate number: _____

(c) What do the arrows in the food chain represent?

(1 mark)

(d) If the lizard is removed from the food chain, what will happen to the organism placed in the box marked **(iv)**?

(1 mark)

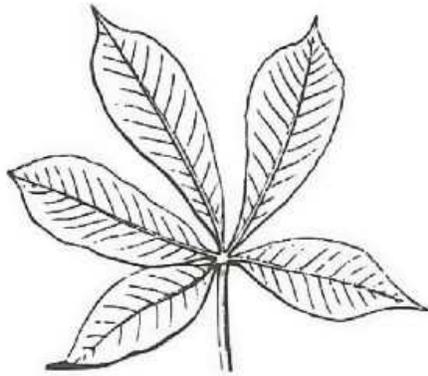
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Candidate number: _____

4. Study the diagrams of the three leaves shown below and answer the questions that follow.



**Compound
leaf**



A



**Parallel
veined
leaf**

(a) State the type of leaf at **A**.

(1 mark)

(b) Which type of leaf would be found on the following plants:

(i) Mango? _____

(1 mark)

(ii) Rice? _____

(1 mark)

GO ON TO THE NEXT PAGE



Candidate number: _____

(c) State **two** characteristics of the root of a plant with parallel veined leaves.

(i) _____

(1 mark)

(ii) _____

(1 mark)

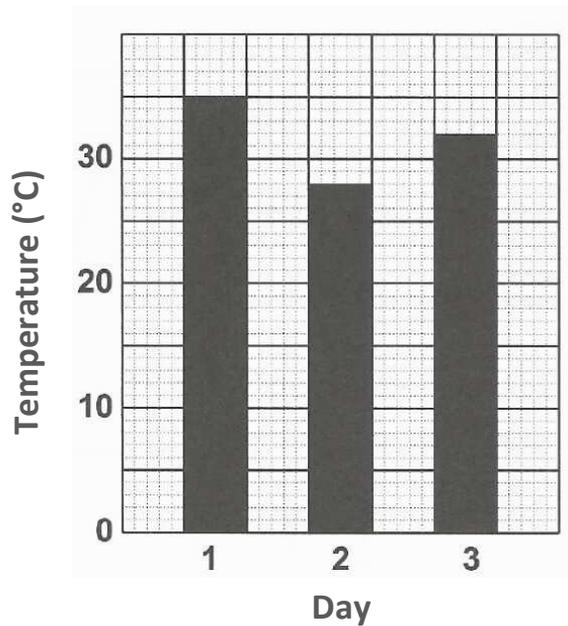
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Candidate number: _____

5. The graph below shows the temperature recorded for three days during a week. Study the graph and answer the questions that follow.



- (a) Name the instrument used for measuring temperature.

(1 mark)

- (b) By how much did the temperature on Day 3 increase when compared with Day 2? **Show your work.**

(2 marks)

GO ON TO THE NEXT PAGE



Candidate number: _____

(c) The average temperature of the environment increased rapidly over a prolonged period of time. What are **two** effects of this increased temperature on the environment?

(i) _____

(1 mark)

(ii) _____

(1 mark)

Total 5 marks

GO ON TO THE NEXT PAGE



Candidate number: _____

6. (a) What is a satellite?

(1 mark)

(b) Name a **natural** satellite.

(1 mark)

(c) State **one** use of artificial satellites.

(1 mark)

GO ON TO THE NEXT PAGE



Candidate number: _____

(d) State **two** effects that a damaged artificial satellite can have on our daily lives.

(i) _____

(1 mark)

(ii) _____

(1 mark)

Total 5 marks

END OF TEST

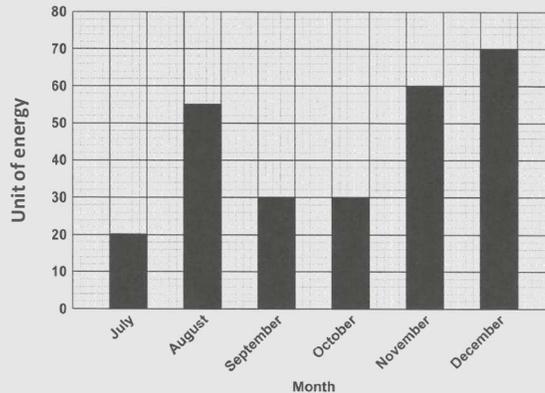
IF YOU FINISH BEFORE TIME IS UP, CHECK YOUR WORK ON THIS ASSESSMENT



ANSWER EXPLANATIONS

QUESTION 1 ANSWER EXPLANATION

1. Study the graph below, which shows the number of units of energy used by a household over a six-month period, and answer the questions that follow.



- (a) How many units of energy were consumed in November? (1 mark)
(b) In which month was energy saving **most** likely practised? (1 mark)
(c) In which **two** months was energy consumption the same? (1 mark)
(d) To what form of energy does a blender convert electrical energy in order to crush food? (1 mark)
(e) Electricity in most of our homes is produced from fossil fuel. Why is it important to conserve electricity? (1 mark)

Answer for part (a):

- (a) 60 units of energy were consumed in November.

Answer Explanation

Each bar in the graph indicates a month as labelled by the horizontal axis. Identify the bar that is above the label “November” and follow it up to the top of the shaded bar. Trace a line that lines up with the top of the November bar to the vertical axis on the left of the graph. November lines up with 60 units of energy.

Answer for part (b):

- (b) July was the month energy saving was most likely practised.

Answer Explanation

Energy saving means that consumption of energy is reduced. Of all the bars on the graph, the one with the lowest units of energy is the bar labeled “July”. For this reason, July is the month where energy saving was most likely practised.

Answer for part (c):

- (c) Energy consumption was the same in the months of September and October.

Answer Explanation

Same energy consumption means that the units of energy used are equal. The bars with equal heights are September and October.

Answer for part (d):

- (d) The blender converts electrical energy into kinetic energy to crush food.

Answer Explanation

In order to crush food, a blender must spin its blades. The type of energy where objects are in motion is called kinetic energy.

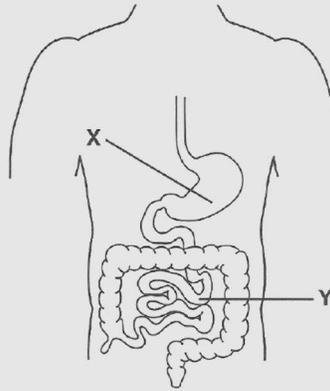
Example Answer for part (e):

- (e) Fossil fuels are generally classified as non-renewable resources of energy because they take millions of years to form and our known viable reserves are being depleted much faster than new ones are generated. It is important to conserve this form of energy because it is not unlimited; we can run out of this form of energy.



QUESTION 2 ANSWER EXPLANATION

2. The diagram below represents part of a system in the human body. Study the diagram and answer the questions that follow.



- (a) Name the part labelled X. (1 mark)
- (b) What process takes place in the parts labelled X and Y? (2 marks)
- (c) Suggest **two** practices that will ensure that the body receives adequate nutrition. (2 marks)

Answer for part (a):

(a) The part labelled X is the stomach.

Answer Explanation

X is pointing to the part of the digestive system that is connected to the oesophagus, which is the stomach.

Example Answer for part (b):

(b) Part X is the stomach and this is where digestion takes place. Part Y is the small intestine, and this is where digestion and absorption of food takes place.

Answer Explanation

Digestion actually begins in the mouth. Food is chewed and mixed with saliva (a digestive juice) which moistens food so it moves more easily through your oesophagus and into your stomach. The stomach then secretes acids and enzymes that further digest the food.

After leaving the stomach, the food moves into the small intestine where the main function is to absorb nutrients and minerals from the food.

Example Answers for part (c):

(c) One practice to ensure the body receives adequate nutrition is to drink water regularly since the body needs water in all its cells, organs, and tissues. Another practice is to eat more vegetables, fruits, and/or protein. Another practice is to not overeat foods high in refined sugars and to limit salt intake. Another practice is to limit the amounts of trans-fatty acids.

Answer Explanation

Drinking water regularly is important because your body uses water in all its cells, organs, and tissues to help regulate its temperature and maintain other bodily functions. Because your body loses water through breathing, sweating, and digestion, it's important to rehydrate by drinking fluids and eating foods that contain water.

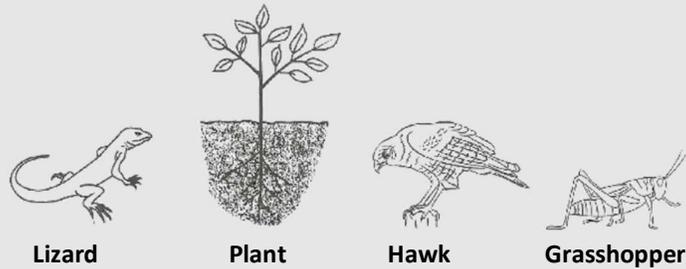
It's also important to eat more vegetables, fruits, and/or protein. Eating vegetables every day is important for health. They provide essential vitamins, minerals, and other nutrients, such as antioxidants and fiber. Research consistently shows that people who eat the most vegetables have the lowest risk of many diseases, including cancer and heart disease.

You can also answer: choose whole grain carbs, healthy fats, limit foods high in saturated fat, and avoid foods with trans fat.

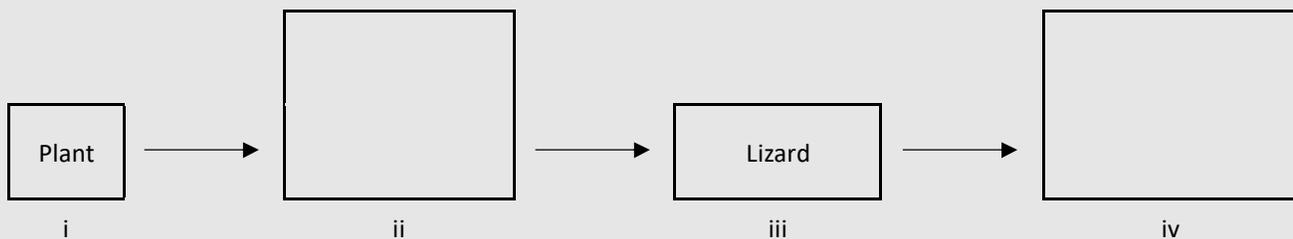


QUESTION 3 ANSWER EXPLANATION

3. Study the drawings below and answer the questions that follow.



- (a) Which of the organisms is a producer? (1 mark)
(b) Complete the food chain below, using the organisms above.



- (c) What do the arrows in the food chain represent? (2 marks)
(d) If the lizard is removed from the food chain, what will happen to the organism placed in the box marked (iv)? (1 mark)

Answer for part (a):

(a) The plant is a producer.

Answer Explanation

Producers are organisms who make their own food. Plants are producers. Plants self-feed through the process of photosynthesis. Also, producers are the first energy source for primary consumers and start off the living food chain. Looking at the diagram on the next part of the question, the plant is in box (i) so it is the producer.

Answers for part (b):

(b) The grasshopper goes in box (ii) and the hawk goes in box (iv).

Answer Explanation

Using the process of elimination, (ii) has to be either the hawk or the grasshopper. Considering the size of these two different organisms, it is probably more likely that a hawk could eat a lizard than for a grasshopper to eat a lizard. Thus, the grasshopper must be (ii) since it will eat the plant, but the grasshopper will then be eaten by the lizard. The hawk will then eat the lizard, so the hawk goes in box (iv).

Example Answer for part (c):

(c) The arrows in the food chain represent the flow of energy.

Answer Explanation

Energy is transferred when one organism is eaten by another organism. A food chain is an easy way to diagram the flow of energy in a community.

Example Answers for part (d):

The organism placed in the box marked (iv) will likely die off.

Answer Explanation

The hawk is the organism in box (iv) and it consumes lizards. Therefore, if the lizard is removed from the food chain, the hawk will lose a source of food. Without a source of food, the hawk will not survive and will die off.



QUESTION 4 ANSWER EXPLANATION

4. Study the diagrams of the three leaves shown below and answer the questions that follow.



**Compound
leaf**



A



**Parallel
veined
leaf**

- (a) State the type of leaf at **A**. (1 mark)
- (b) Which type of leaf would be found on the following plants:
- (i) Mango? (1 mark)
- (ii) Rice? (1 mark)
- (c) State **two** characteristics of the root of a plant with parallel veined leaves. (1 mark)
- (1 mark)

Answer for part (a):

(a) Leaf **A** is a net-veined (or reticulated) leaf.

Answer Explanation

There are two types of plants: monocots and dicots. One distinction between the two is that monocots have parallel-veined leaves while dicots have "net-veined" leaves, which means they have the familiar leaves with center vein and branching veins running from it. The type of leaf shown in picture **A** is a net-veined, also called a reticulated leaf.

Answer for part (b)(i):

(b) Mango has a net-veined leaf.

Answer Explanation

The mango plant is a dicotyledon (the seed is divided into two cotyledons), and all dicotyledons have net-veined venation and therefore, **net-veined leaves**.

Answer for part (b)(ii):

(b) Rice has a parallel veined leaf.

Answer Explanation

Rice is a singular cotyledon (monocot) like grasses, grain, and maize/corn. All these plants feature leaves with parallel veins.

Example Answers for part (c):

(c) The roots of animals with parallel veined leaves are fibrous and have vascular bundles arranged in a ring.

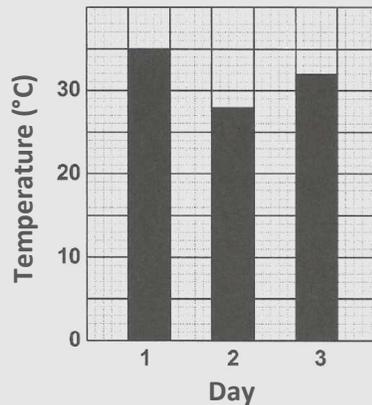
Answer Explanation

Plants with parallel veined leaves are monocots. Monocots tend to have **fibrous roots** that web off in many directions. These fibrous roots occupy the upper level of the soil in comparison to dicot root structures that dig deeper and create thicker systems. Monocot roots also have their **vascular bundles arranged in a ring**. Dicot roots have their xylem in the center of the root and phloem outside the xylem.



QUESTION 5 ANSWER EXPLANATION

5. The graph below shows the temperature recorded for three days during a week. Study the graph and answer the questions that follow.



- (a) Name the instrument used for measuring temperature. (1 mark)
- (b) By how much did the temperature on Day 3 increase when compared with Day 2? **Show your work.** (2 marks)
- (c) The average temperature of the environment increased rapidly over a prolonged period of time. What are **two** effects of this increased temperature on the environment? (1 mark)

Answer for part (a):

(a) A thermometer measures temperature.

Answer Explanation

One of the most common devices for measuring temperature is the glass thermometer. This consists of a glass tube filled with mercury or some other liquid, which acts as the working fluid. The root “therm-” also means heat in Greek (this can be helpful to remind you that a thermometer measures heat).

Answer for part (b):

(b) The temperature increased by 4°C.

Answer Explanation

To find out how much the temperature increased, we need to subtract the temperature of day 2 from the temperature of day 3. This will tell us the change in temperature. The vertical axis is labelled as temperature in degrees Celsius and we can see that each vertical line indicates a 1 degree change in temperature because there are 10 lines between 20 and 30. Lining up the bars of day 2 and day 3 with the vertical axis, we see that day 2 had a temperature of 28 degrees Celsius and day 3 was 32 degrees Celsius. The work we need to show is the equation below:

$$32 \text{ degrees Celsius} - 28 \text{ degrees Celsius} = \text{increase of 4 degrees Celsius.}$$

Example Answer for part (c):

(c) One effect of increased temperature on the environment is the increased magnitude of many types of natural disasters, like storms, heat waves, floods, and droughts. Increased temperatures can also lead to warmer, wetter climates that increase the prevalence of food-borne and water-borne disease.

Answer Explanation

Increasing temperatures over a prolonged period of time can worsen the magnitude of many types of disasters, including storms, heat waves, floods, and droughts. A warmer climate creates an atmosphere that can collect, retain, and drop more water; thus, this can result in wet areas become wetter and dry areas drier. The increasing number of droughts, intense storms, and floods poses public health and safety risks. One health risk brought on by drought conditions include decreased access to clean drinking water, a leading cause of death and serious disease worldwide. On the other hand, heavier rains cause streams, rivers, and lakes to overflow, damaging life and property, contaminates drinking water, creates hazardous-material spills, and promotes mold infestation and unhealthy air. A warmer, wetter climate can also lead to an increase in food-borne and waterborne illnesses and disease-carrying insects such as mosquitoes, fleas, and ticks.



QUESTION 6 ANSWER EXPLANATION

- | | |
|---|----------|
| (a) What is a satellite? | (1 mark) |
| (b) Name a natural satellite. | (1 mark) |
| (c) State one use of artificial satellites. | (1 mark) |
| (d) State two effects that a damaged artificial satellite can have on our daily lives. | (1 mark) |

Example Answer for part (a):

- (a) A satellite is an object in space that orbits or circles around a bigger object. A satellite is a moon, planet or machine that orbits a planet or star.

Example Answers for part (b):

- (b) The Earth and the Moon are examples of natural satellites

Answer Explanation

A **natural satellite** in astronomy is a smaller celestial body which moves around a larger body. The smaller body is held in orbit by gravitation. Earth is a natural satellite because it orbits the Sun. Likewise, the Moon is a natural satellite because it orbits Earth.

Earth and the **Moon** are examples of natural satellites.

Example Answers for part (c):

- (c) Uses of artificial satellites include weather forecasting, studying the universe, communication signals, navigation at sea, and military purposes.

Answer Explanation

Thousands of artificial, or man-made, satellites orbit Earth. Some take pictures of the planet that help meteorologists predict weather and track hurricanes. Some take pictures of other planets, the Sun, black holes, dark matter or faraway galaxies. These pictures help scientists better understand the solar system and universe. Still other satellites are used mainly for communications, such as **beaming TV signals** and **phone calls** around the world. A group of more than 20 satellites make up the Global Positioning System, or **GPS**. If you have a GPS receiver, these satellites can help figure out your exact location both on land and at sea. Artificial satellites are also used by the military.

Example Answers for part (d):

- (d) A damaged artificial satellite can create:
- loss or poor internet and radio signals
 - loss at sea
 - poor or no weather alerts
 - countries potentially being in danger of battling each other.

