

THE UNIVERSITY OF THE STATE OF NEW YORK

# GRADE 8

## INTERMEDIATE-LEVEL SCIENCE TEST

### WRITTEN TEST v202

Student Name \_\_\_\_\_

School Name \_\_\_\_\_

The possession or use of any communications device is strictly prohibited when taking this examination. If you have or use any communications device, no matter how briefly, your examination will be invalidated and no score will be calculated for you.

Print your name and the name of your school on the lines above.

The questions on this test measure your knowledge and understanding of science. The test has two parts. Both parts are contained in this test booklet.

**Part I** consists of 45 multiple-choice questions. Record your answers to these questions on the separate answer sheet. Use only a No. 2 pencil on your answer sheet.

**Part II** consists of 40 open-ended questions. Write your answers to these questions in the spaces provided in this test booklet.

You may use a calculator to answer the questions on the test if needed.

You will have two hours to answer the questions on this test.

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

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THE STATE EDUCATION DEPARTMENT  
ALBANY, NEW YORK 12234

Part I

- 1 In addition to cytoplasm, most human body cells also have

  - chloroplasts and a cell wall
  - chloroplasts and a cell membrane
  - genetic material and a cell wall
  - genetic material and a cell membrane

2 When a plant dies, the materials in the plant

  - are lost forever
  - usually become fossils
  - are recycled by decomposers
  - react with carbon dioxide

3 Which sequence represents increasing levels of organization in the human body?

  - organ → organ system → cell → tissue
  - organ → cell → organ system → tissue
  - cell → tissue → organ → organ system
  - cell → organ → tissue → organ system

4 The breaking down of food in the human digestive system is both chemical and

  - geothermal
  - mechanical
  - electrical
  - potential

5 Which substance is produced during cellular respiration?

  - oxygen
  - sugar
  - carbon dioxide
  - vitamins

6 Which human organ system removes liquid and gaseous waste from the body?

  - endocrine
  - excretory
  - nervous
  - muscular

7 Chemicals that regulate and control human body functions are known as

  - fats
  - hormones
  - carbohydrates
  - elements

8 The sequence below represents the organization of the genetic information in the nucleus of a cell. One term in the sequence is represented by **X**.

$$\text{DNA} \rightarrow \text{X} \rightarrow \text{chromosome}$$

The **X** in the sequence most likely represents a

  - gene
  - mutation
  - clone
  - protein

9 The sum of all chemical reactions in an organism is called

  - metabolism
  - exercise
  - adaptation
  - respiration

10 Which process takes place within chloroplasts?

  - metamorphosis
  - photosynthesis
  - sexual reproduction
  - cellular division

11 The energy required for organisms to respond to the environment comes from

  - vitamins
  - minerals
  - water
  - food

**Note that question 12 has only three choices.**

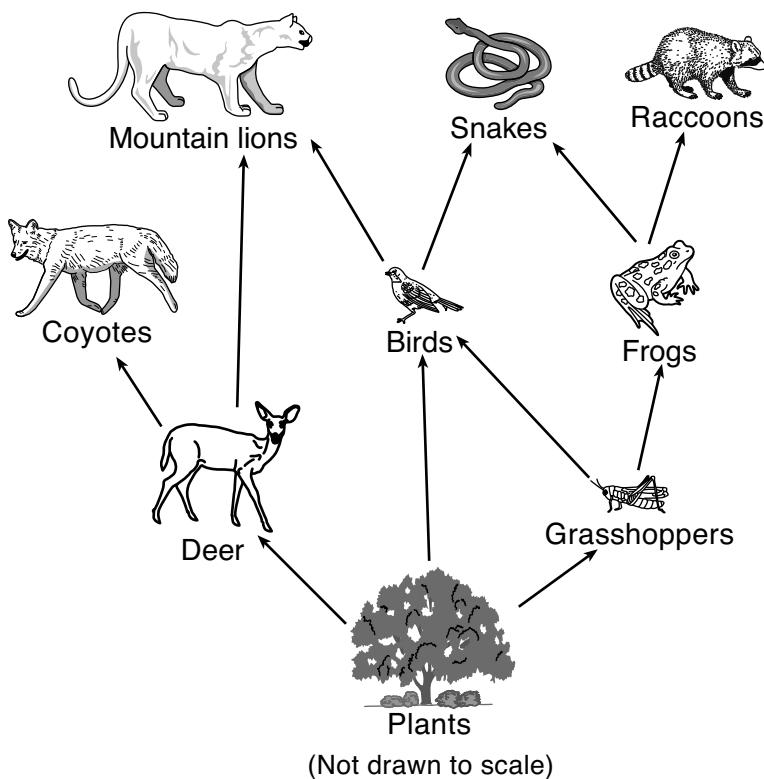
12 A most likely cause for a person's loss of body weight might be taking in

  - fewer Calories per day than required
  - more Calories per day than required
  - the same number of Calories per day as required

13 Organisms are classified as producers if they are able to

  - remove oxygen from the air
  - remove microbes from the soil
  - make their own food
  - make carbon dioxide

Base your answers to questions 14 through 17 on the diagram below and on your knowledge of science. The diagram represents a food web.



14 According to this food web, which organism is an omnivore?

- |          |             |
|----------|-------------|
| (1) deer | (3) coyote  |
| (2) bird | (4) raccoon |

15 Which food chain best represents the transfer of energy from plants to mountain lions in this food web?

- (1) plants → deer → birds → mountain lions
- (2) plants → deer → coyotes → mountain lions
- (3) plants → grasshoppers → frogs → mountain lions
- (4) plants → grasshoppers → birds → mountain lions

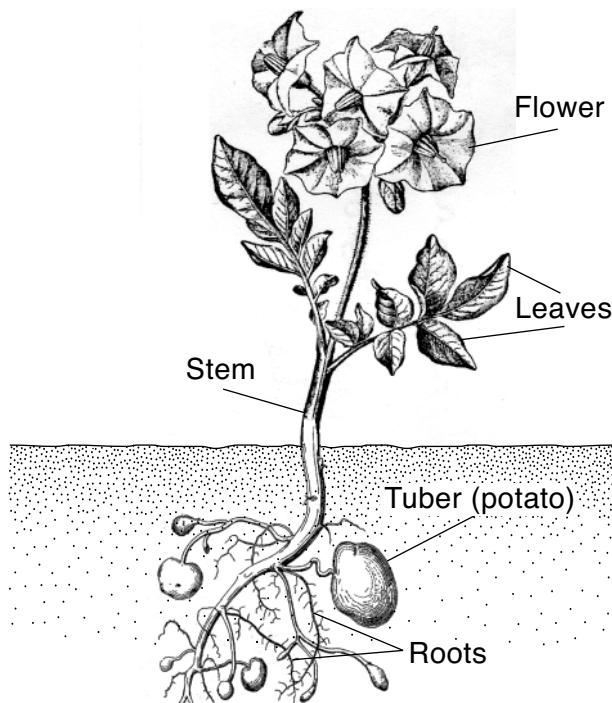
16 The deer, snakes, and frogs represented in the food web are all types of

- |               |                |
|---------------|----------------|
| (1) consumers | (3) herbivores |
| (2) prey      | (4) predators  |

17 Based on the diagram, which interaction demonstrates competition between organisms?

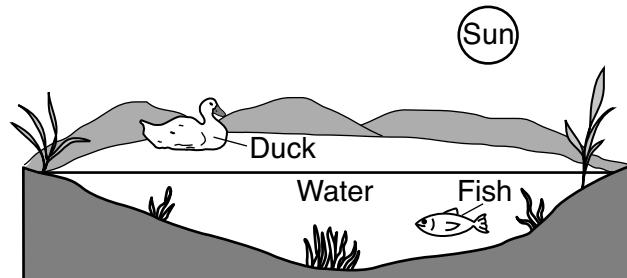
- (1) plants and birds compete for the grasshoppers
- (2) coyotes and mountain lions compete for the deer
- (3) snakes and frogs compete for the raccoons
- (4) frogs and grasshoppers compete for the plants

Base your answers to questions 18 and 19 on the diagram below and on your knowledge of science. The diagram represents a potato plant. Several plant structures are labeled.






20 The diagram below represents a pond area.



(Not drawn to scale)

The original source of energy for this pond area is the

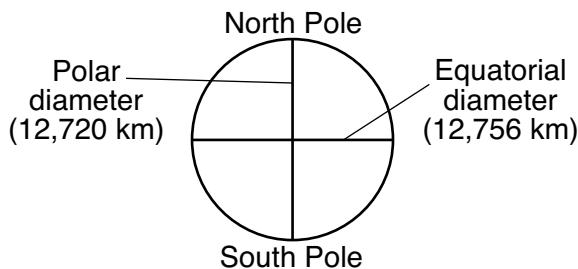


Base your answers to questions 21 and 22 on the data table below and on your knowledge of science. The data table shows the years when Halley's Comet was closest to the Sun, making it visible to observers on Earth.

## **Years When Halley's Comet Was Observed**

1759
1835
1910
1986

- 24 The diagram below represents Earth's polar and equatorial diameters, measured in kilometers (km).



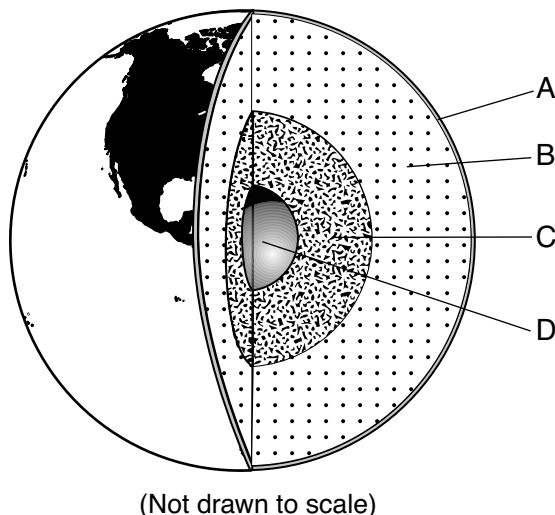
The shape of Earth is best described as

- (1) perfectly spherical because the equatorial diameter is the same as the polar diameter
  - (2) perfectly spherical because the equatorial diameter is slightly larger than the polar diameter
  - (3) nearly spherical because the equatorial diameter is the same as the polar diameter
  - (4) nearly spherical because the equatorial diameter is slightly larger than the polar diameter

- 25 Snowflakes are seen melting as they fall through the air. This melting occurs because the snowflakes

- (1) lose heat and the surrounding air loses heat
  - (2) lose heat and the surrounding air gains heat
  - (3) gain heat and the surrounding air gains heat
  - (4) gain heat and the surrounding air loses heat

- 26 The diagram below represents Earth's layers, labeled A through D.



Which letter represents the outer core?



- 27 The freezing point of a substance is the temperature at which the substance changes from

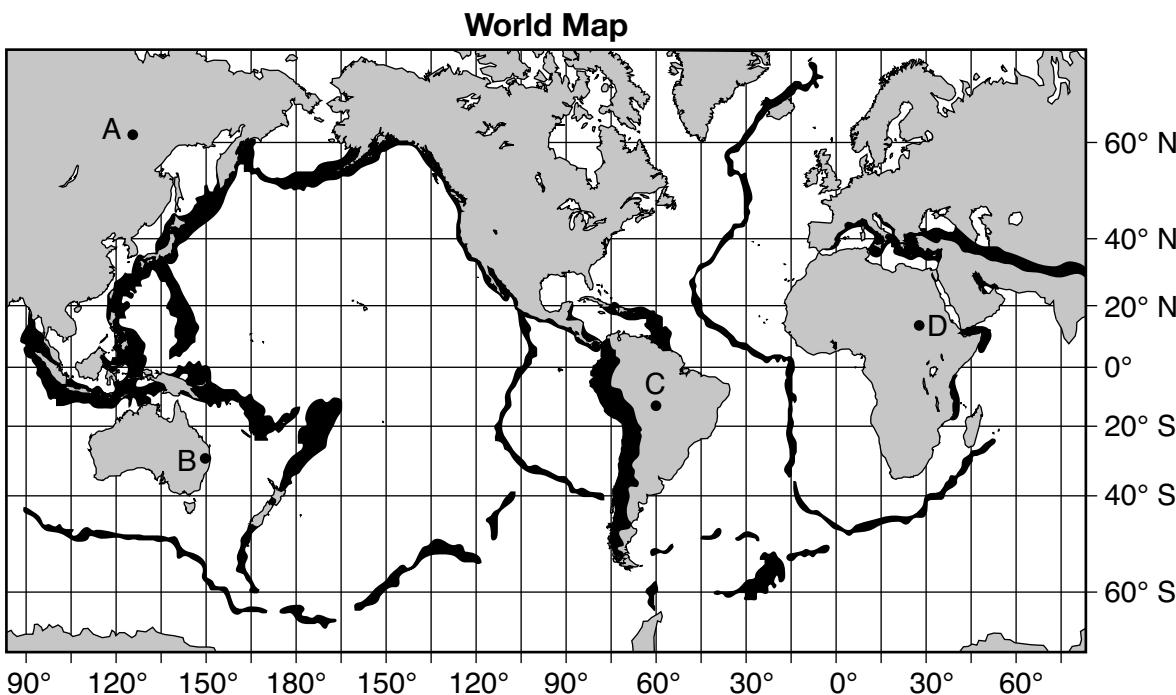
- (1) gas to liquid                  (3) liquid to gas  
(2) gas to solid                  (4) liquid to solid

- 28 Which item is too small to be seen with a compound microscope?

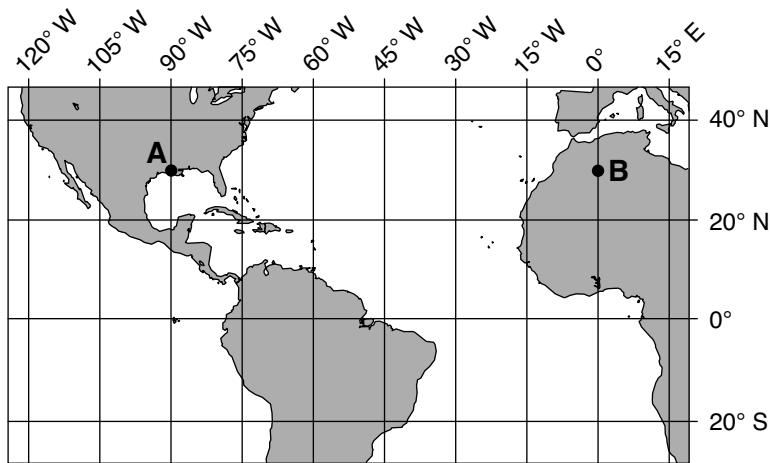
- (1) an atom of iron      (3) an onion cell  
(2) a grain of salt      (4) a human hair

- 29 Which property can be used to help identify many minerals?

Base your answers to questions 30 through 32 on the world map below and on your knowledge of science. The darkly shaded areas of the map represent regions with a high potential for earthquakes to occur. Letters A through D represent locations on Earth.



Base your answers to questions 33 and 34 on the map below, which shows a portion of Earth. Points A and B represent locations on Earth's surface. Some latitude and longitude lines are shown.






**Note that question 34 has only three choices.**

- 34 If the time at point A is 2:00 p.m., then the time at point B is

  - (1) before 2:00 p.m.
  - (2) 2:00 p.m.
  - (3) after 2:00 p.m.

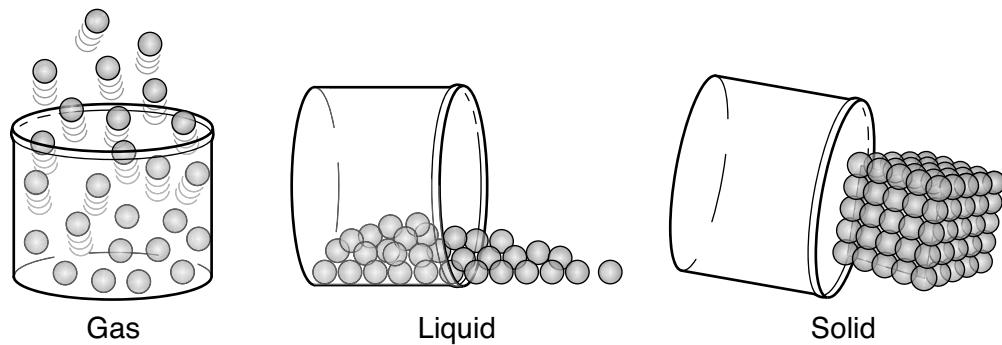
- 35 Under which set of conditions would the greatest additional amount of sugar dissolve in 100 grams of water?

  - (1) low water temperature and a small amount of sugar already dissolved in the water
  - (2) low water temperature and a large amount of sugar already dissolved in the water
  - (3) high water temperature and a small amount of sugar already dissolved in the water
  - (4) high water temperature and a large amount of sugar already dissolved in the water

36 The basic difference between infrared light, visible light, and ultraviolet light is their

  - (1) wavelength
  - (2) temperature
  - (3) electric charge
  - (4) traveling speed

Base your answers to questions 37 and 38 on the diagram below and on your knowledge of science. The diagram represents equal masses of the same substance in three phases.



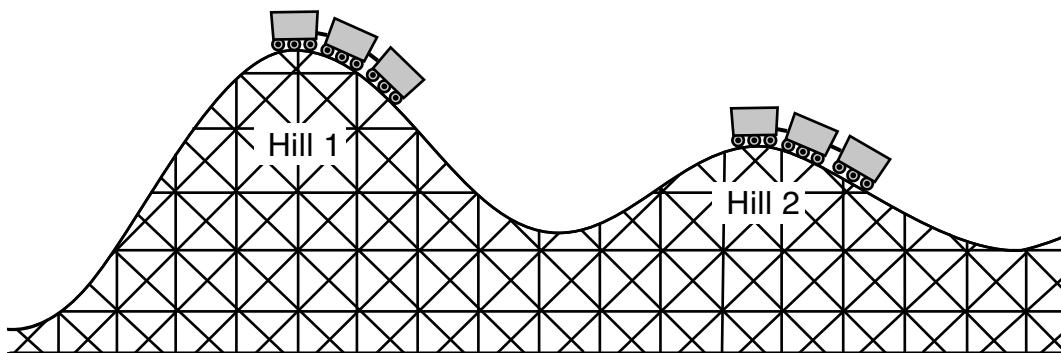
37 Compared to the shapes and volumes of the gas and liquid, the solid

- (1) has a definite shape and a definite volume
- (2) has a definite shape and no definite volume
- (3) takes the shape of its container and has a definite volume
- (4) takes the shape of its container and has no definite volume

38 A comparison of the three phases shows that in the sample of the liquid, the atoms have a

- (1) greater force of attraction than the solid and the gas
  - (2) greater force of attraction than the gas, only
  - (3) weaker force of attraction than the gas, only
  - (4) weaker force of attraction than the solid and the gas
-

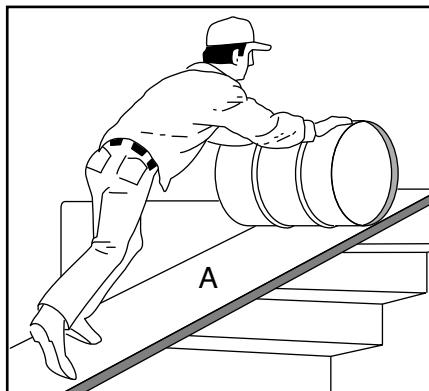
39 The diagram below represents a roller coaster at two positions on the roller coaster track.



Compared to the potential energy of the roller coaster at the top of hill 1, the potential energy of the roller coaster at the top of hill 2 is

- (1) less because the roller coaster is at a lower elevation
- (2) less because the roller coaster is on a more gentle slope
- (3) greater because the roller coaster is at a lower elevation
- (4) greater because the roller coaster is on a more gentle slope

40 The diagram below represents a simple machine, labeled A, that is being used to move a barrel up the stairs.



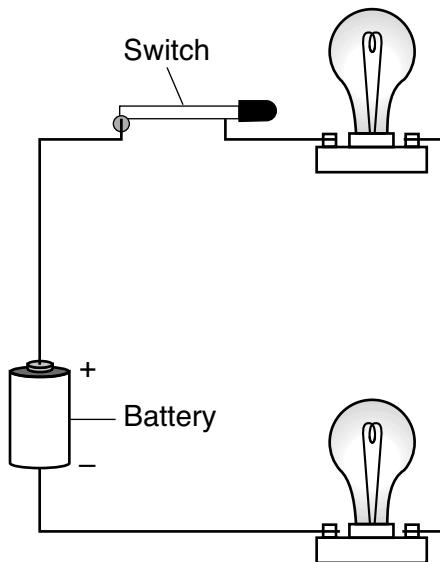
Which simple machine is represented by letter A in the diagram?

- (1) lever
- (2) pulley
- (3) wheel and axle
- (4) inclined plane

41 Which force causes a satellite to remain in orbit?

- (1) magnetism
- (2) gravity
- (3) electricity
- (4) friction

Base your answers to questions 42 and 43 on the diagram below and on your knowledge of science. The diagram represents a closed electrical circuit with a switch and two lightbulbs.



42 In this circuit, one function of the switch is to

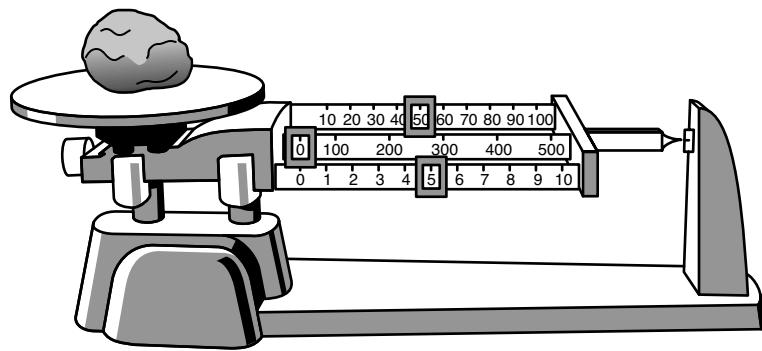
- (1) store electrical energy
- (2) produce solar energy
- (3) transform electrical energy into light energy
- (4) complete the circuit so light is produced

43 Which form of energy is stored in the battery?

- (1) nuclear
- (2) light
- (3) chemical
- (4) mechanical

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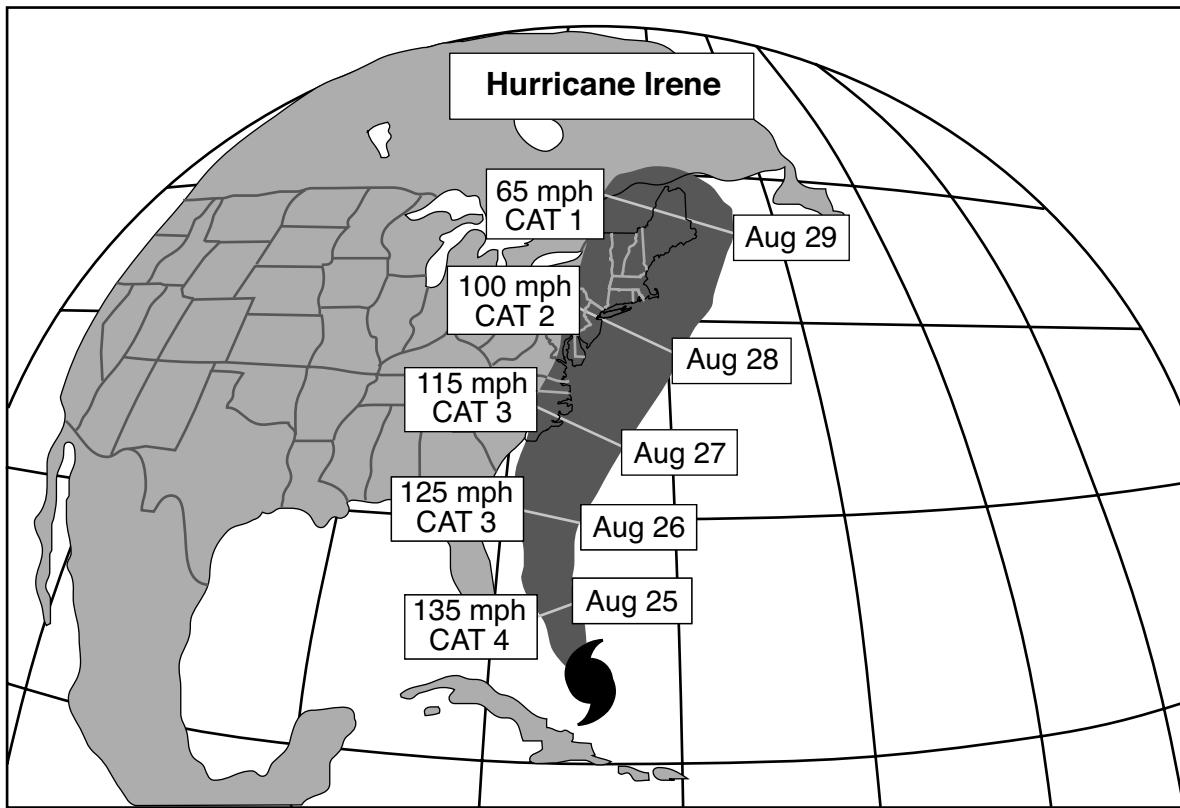
44 The diagram below represents a triple-beam balance with a rock on it.



A student finds the mass of the rock to be 55.0 grams. The student is making

- (1) an inference
- (2) a hypothesis
- (3) an explanation
- (4) a measurement

- 45 The weather map below shows the location of Hurricane Irene [ ] on August 24, 2011, and its predicted path of travel over the next five days. The predictions for the maximum wind speed in miles per hour (mph) and category (CAT) classification of the hurricane for each date are shown. The greater the category, the stronger the hurricane.



What was predicted to happen to this hurricane between August 25 and August 29?

- (1) The wind speed would decrease and the hurricane would become weaker.
  - (2) The wind speed would decrease and the hurricane would become stronger.
  - (3) The wind speed would increase and the hurricane would become weaker.
  - (4) The wind speed would increase and the hurricane would become stronger.
-

## Part II

*Directions (46–85): Record your answers in the spaces provided below each question.*

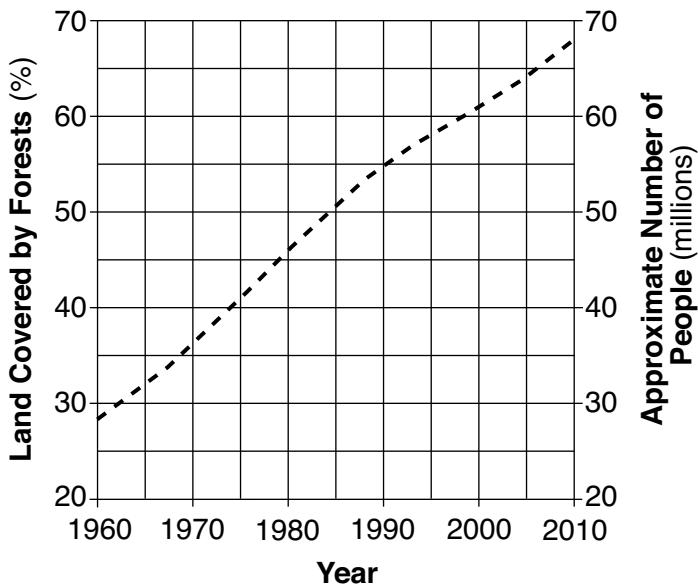
Base your answers to questions 46 through 48 on the data table below and on your knowledge of science. The data table shows the percentage of land covered by forests in Thailand, an area in Asia, and the approximate number of people in Thailand, from 1960 to 2010.

**Facts About Thailand**

Year	Land Covered by Forests (%)	Approximate Number of People (in millions)
1960	53	28
1970	45	36
1980	34	46
1990	28	55
2000	26	61
2010	24	68

- 46 On the graph below, use an **X** to plot the data for the land covered by forests for the years shown. Connect the **X**s with a line. The data for the approximate number of people in the area for the years shown have already been plotted on the graph. [1]

**Approximate Number of People and the Land Covered by Forests in Thailand, 1960–2010**



- 47 Based on the data, state the general relationship between the approximate number of people and the percentage of land covered by forests in Thailand. [1]

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- 48 Describe *one* benefit forested areas have on the environment. [1]

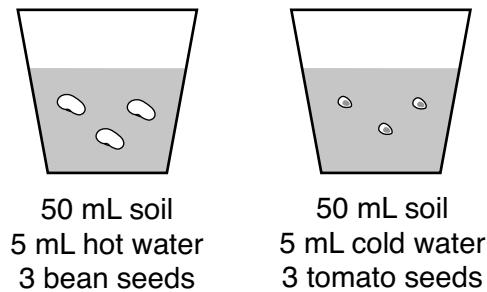
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Base your answers to questions 49 and 50 on the information below and on your knowledge of science.

A group of students did an experiment to measure the effect of water temperature on seed-germination time. The students planted the same number of two types of seeds in separate containers. Each container was made of clear plastic and had 50 milliliters (mL) of soil. For one week, bean seeds were watered once a day with 5 mL of hot ( $30^{\circ}$  Celsius ( $^{\circ}\text{C}$ )) water. Tomato seeds were watered once a day with 5 mL of cold ( $10^{\circ}\text{C}$ ) water. The time it took each type of seed to germinate was observed and recorded. The experimental setup is represented in the diagram below.



- 49 Identify *two* factors that were kept constant in this experiment. [1]

(1) \_\_\_\_\_

(2) \_\_\_\_\_

- 50 Explain why using different seed types along with different water temperatures is an improper experimental design. [1]

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Base your answers to questions 51 and 52 on the information below and on your knowledge of science.

### Fossils

Fossils are the remains of plants or animals, or indications of their presence, preserved in rocks. Scientists use fossils to study past environmental conditions and climates. Most fossils are the remains or traces of organisms that lived in the past, but no longer exist.

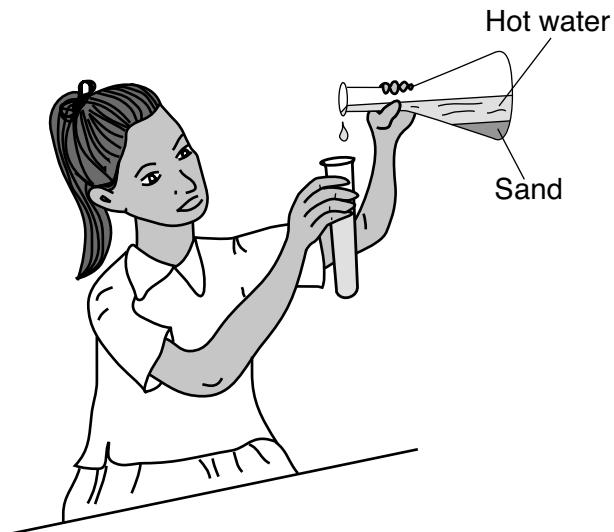
- 51 Rock layers that have *not* been overturned are exposed in a cliff. The rock layers contain many fossils. In which rock layer do the fossils most closely resemble existing species? [1]
- 

- 52 Scientists found saltwater fish fossils in rock layers in Montana, an inland state in the western United States. Describe what this might indicate about past environmental conditions in Montana. [1]
- 
- 
- 

- 53 Changes in populations of species, communities, and ecosystems that occur over long periods of time may be the result of evolution, ecological succession, or interference by humans. Complete the chart below by circling the most likely cause for each change described in the left-hand column. [1]

Description of Change	Cause		
A high mountain pond has fewer trout than it had fifty years ago, due to acid rain.	Evolution	Ecological Succession	Interference by Humans
The modern horse is much larger than its ancestors that lived thirty-million years ago.	Evolution	Ecological Succession	Interference by Humans
A forest now stands where there was once just a grassy field.	Evolution	Ecological Succession	Interference by Humans

Base your answers to questions 54 and 55 on the diagram below and on your knowledge of science. The diagram represents a student separating a mixture of sand and hot water in a flask.



54 Describe *two* safety procedures that the student in the diagram should be following in order to separate this mixture. [1]

(1) \_\_\_\_\_

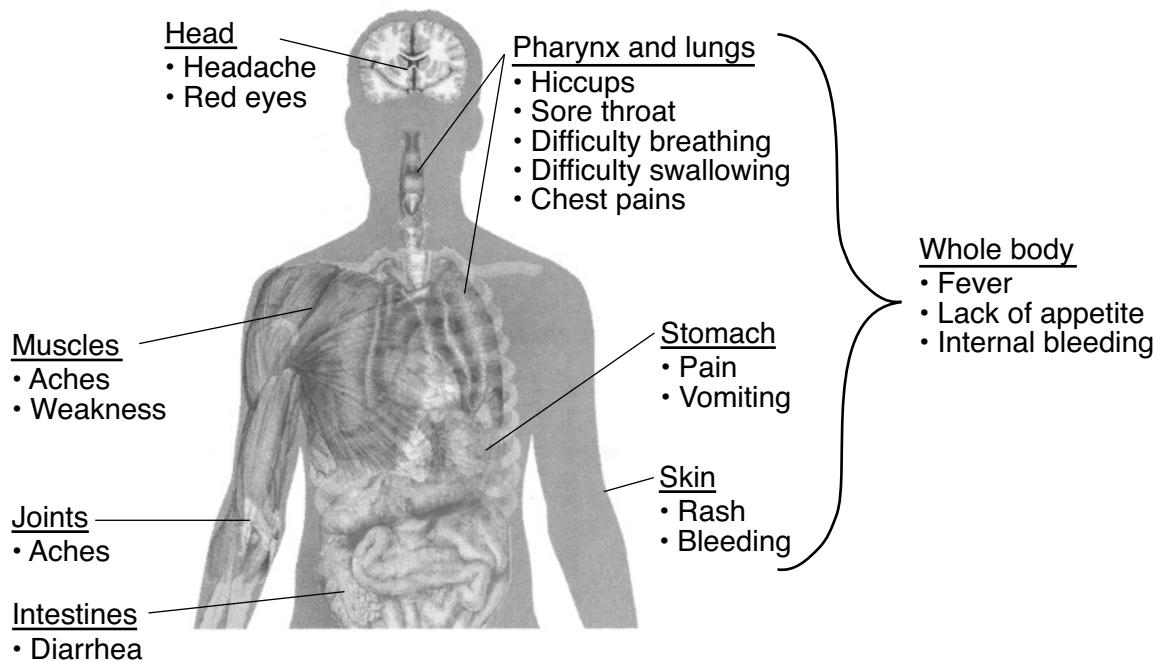
(2) \_\_\_\_\_

55 Besides pouring off the hot water as shown in the diagram, describe *one* other way the student can separate the sand and water mixture. [1]

\_\_\_\_\_

Base your answers to questions 56 and 57 on the diagram and information below, and on your knowledge of science. The diagram represents parts of the human body and the symptoms of Ebola. Ebola is an infectious disease that affects humans.

### Symptoms of Ebola



56 Identify the organ shown in the diagram and the human body system affected when Ebola causes vomiting. [1]

Organ: \_\_\_\_\_

Body system: \_\_\_\_\_

57 Describe *one* way the human body protects itself from an infectious disease. [1]

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Base your answers to questions 58 and 59 on the diagrams below and on your knowledge of science. The diagrams represent a food label for mayonnaise and a food label for ketchup. The nutritional information for both is based on a one tablespoon (Tbsp) serving size.

### Mayonnaise Label

<b>Nutrition Facts</b>	
Serving Size 1 Tbsp (14g) Servings Per Container 60	
<b>Amount Per Serving</b>	
<b>Calories</b> 45 Calories from Fat 40	
	% Daily Value*
<b>Total Fat</b> 4.5g	7%
Saturated Fat 0.5g	3%
<b>Trans Fat</b> 0g	
<b>Cholesterol</b> less than 5mg	0%
<b>Sodium</b> 120mg	5%
<b>Total Carbohydrate</b> less than 1g	0%
<b>Protein</b> 0g	
Vitamin A 0%	• Vitamin C 0%
Vitamin E 6%	• Vitamin K 20%
Calcium 0%	• Iron 0%

\* Percent Daily Values are based on a 2,000 calorie diet.

### Ketchup Label

<b>Nutrition Facts</b>	
Serving Size 1 Tbsp (17g) Servings Per Container 192	
<b>Amount Per Serving</b>	
<b>Calories</b> 20 Calories from Fat 0	
	% Daily Value*
<b>Total Fat</b> 0g	0%
Saturated Fat 0g	0%
<b>Trans Fat</b> 0g	
<b>Cholesterol</b> 0mg	0%
<b>Sodium</b> 220mg	9%
<b>Total Carbohydrate</b> 5g	2%
Dietary Fiber 0g	0%
Sugars 3g	
<b>Protein</b> 0g	
Vitamin A 4%	• Vitamin C 0%
Vitamin E 0%	• Vitamin K 0%
Calcium 0%	• Iron 0%

\* Percent Daily Values are based on a 2,000 calorie diet.

- 58 Describe how the labels indicate that one tablespoon of mayonnaise contains more energy than one tablespoon of ketchup. [1]

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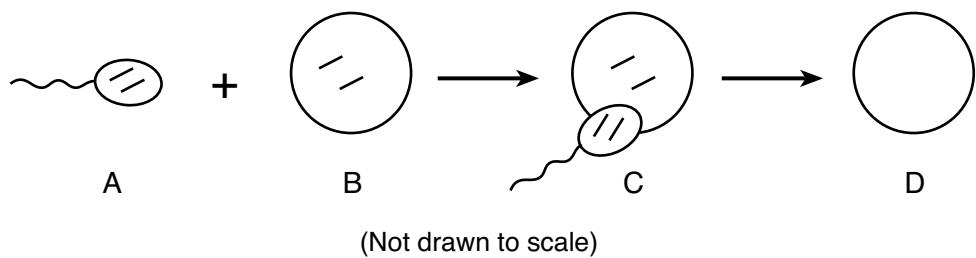
- 59 Calculate the total number of milligrams (mg) of sodium that would be found in three servings of ketchup. [1]

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mg

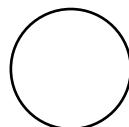
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Base your answers to questions 60 and 61 on the diagram below and on your knowledge of science. The diagram represents a partial model of reproduction. The lines in the cells of A, B, and C represent chromosomes. The chromosomes in cell D have *not* been indicated.



- 60 Identify the cell at A. [1]
- 

- 61 Complete the diagram below by drawing the number of chromosomes (lines) that would be found in cell D. [1]

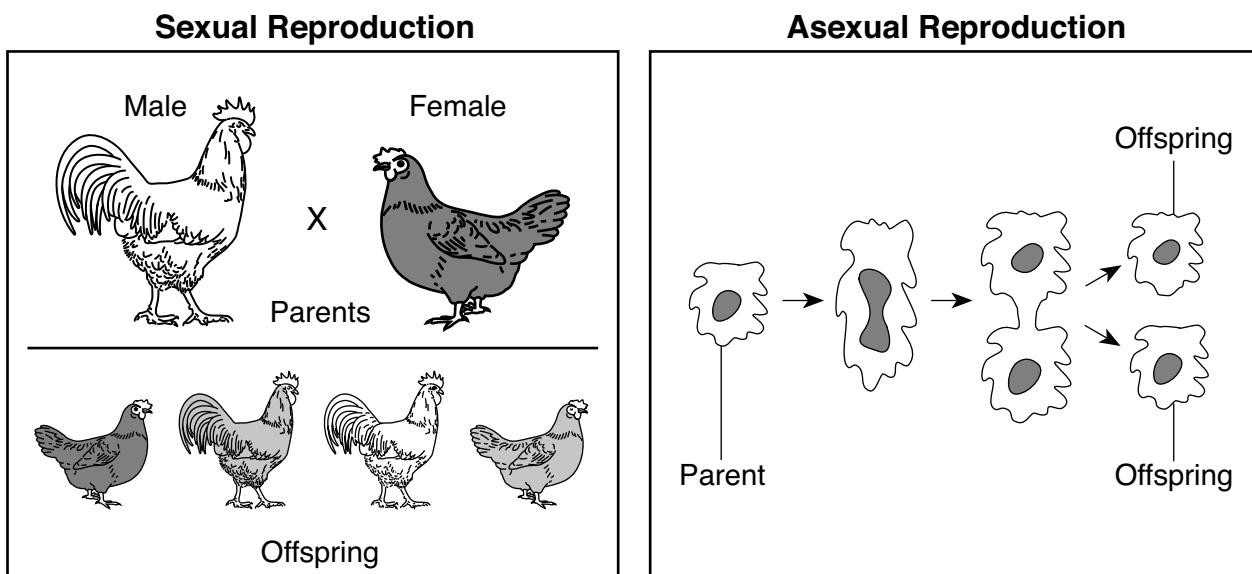


D

(Not drawn to scale)

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62 The diagrams below represent sexual reproduction and asexual reproduction.



(Not drawn to scale)

Using evidence shown in the diagram, identify *two* ways asexual reproduction is different from sexual reproduction. [1]

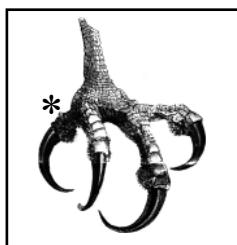
Asexual difference 1: \_\_\_\_\_

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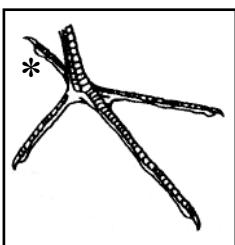
Asexual difference 2: \_\_\_\_\_

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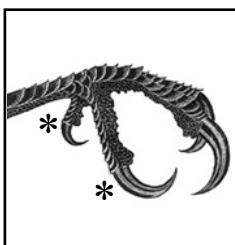
Base your answers to questions 63 and 64 on the diagrams and identification key for birds below, and on your knowledge of science. The diagrams represent the feet of five different birds, labeled V, W, X, Y, and Z. The identification key provides information about how to identify the bird based on its foot structure. Hind toes are indicated by an \*.



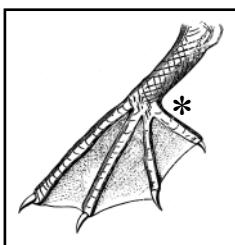
V



W



X



Y



Z

Source: Exploring Life Science Laboratory Manual, Prentice Hall, 1995, p. 209–210.

#### Identification Key

- |    |  |
|----|--|
| 1a | If the toes are straight and lie flat, go to 2.                |
| 1b | If the toes are curled and appear to grasp, go to 3.           |
| 2a | If there is webbing between the toes, it is a pelican.         |
| 2b | If there is no webbing, go to 4.                               |
| 3a | If there are 3 front toes and 1 hind toe, it is an osprey.     |
| 3b | If there are 2 front toes and 2 hind toes, it is a woodpecker. |
| 4a | If there are 3 front toes and no hind toes, it is a rhea.      |
| 4b | If there are 3 front toes and 1 hind toe, it is a heron.       |

63 Identify the bird represented by the foot labeled W. [1]

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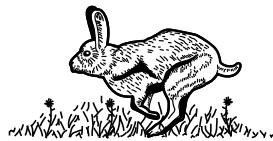
64 Explain how the webbing between the toes of bird Y could help a coastal bird survive. [1]

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Base your answers to questions 65 and 66 on the diagram below and on your knowledge of science. The diagram represents a rabbit running in its natural environment.



- 65 Locomotion is necessary for many activities of the rabbit's daily life. Other than escaping danger, describe another way that locomotion is helpful to the rabbit. [1]

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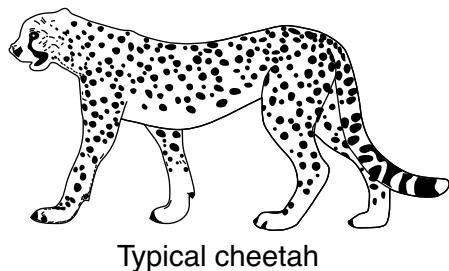
- 66 As the rabbit's environment changes from fall to winter, describe *one* way that the rabbit's body may change in order to survive the winter. [1]

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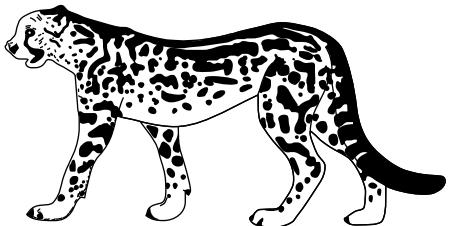
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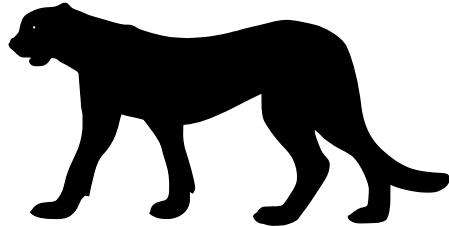
Base your answers to questions 67 and 68 on the diagram below and on your knowledge of science. The diagram represents a typical cheetah and three coat-color variations found in nature.



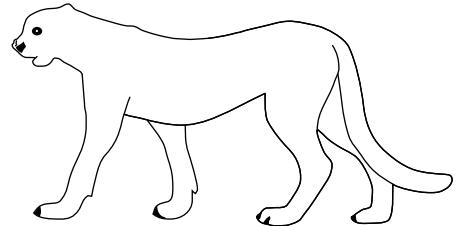
Typical cheetah



King cheetah



Melanistic (black) cheetah



Albino (white) cheetah

- 67 Identify *one* cause for the three coat-color variations in cheetahs. [1]

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- 68 Cheetahs normally hunt their prey on the open grasslands of Africa during the day. Explain why the king cheetah and melanistic cheetah would have a better chance of catching prey at sunrise or sunset. [1]

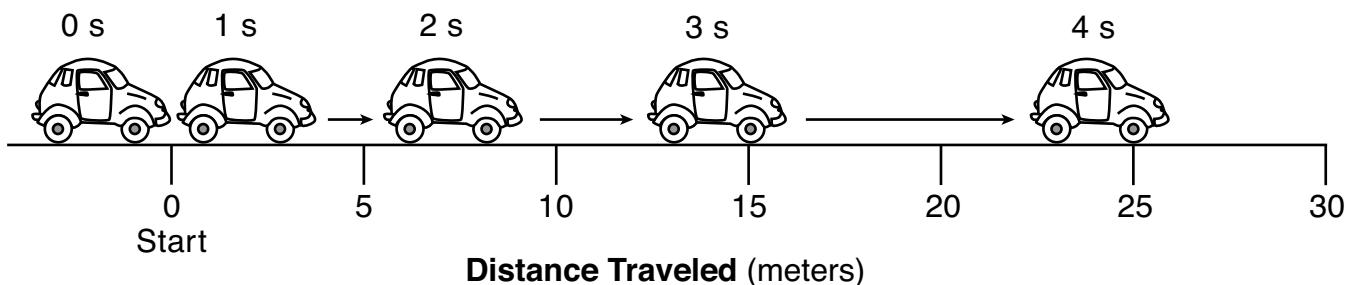
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Base your answers to questions 69 and 70 on the diagram below and on your knowledge of science. The diagram represents a car accelerating from a stopped position (start). Positions of the car for each second (s) of movement are shown. Distance traveled was measured from the front of the car.



- 69 Determine the number of meters (m) the car traveled in the first 2 seconds. [1]

\_\_\_\_\_ m

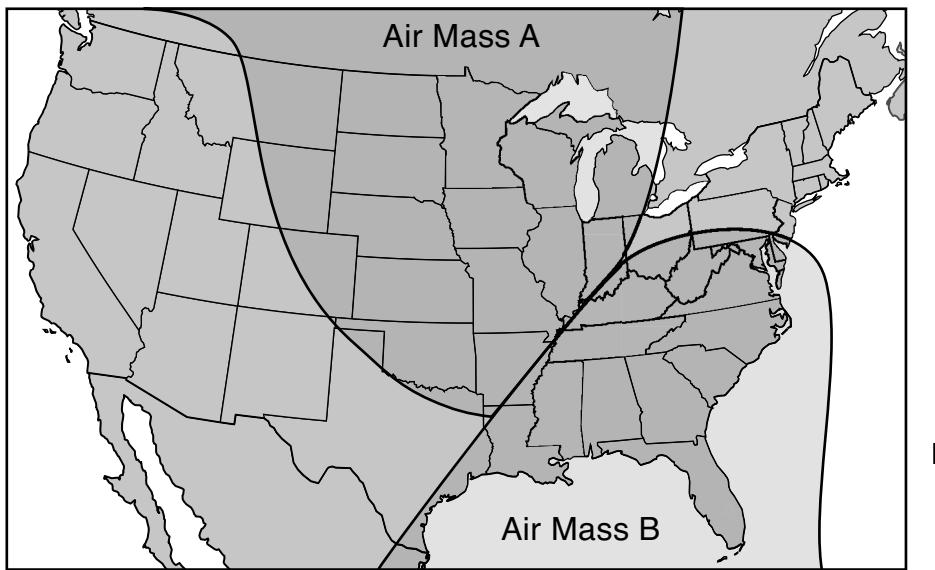
- 70 Describe *one* piece of evidence from the diagram which indicates that the car was accelerating. [1]

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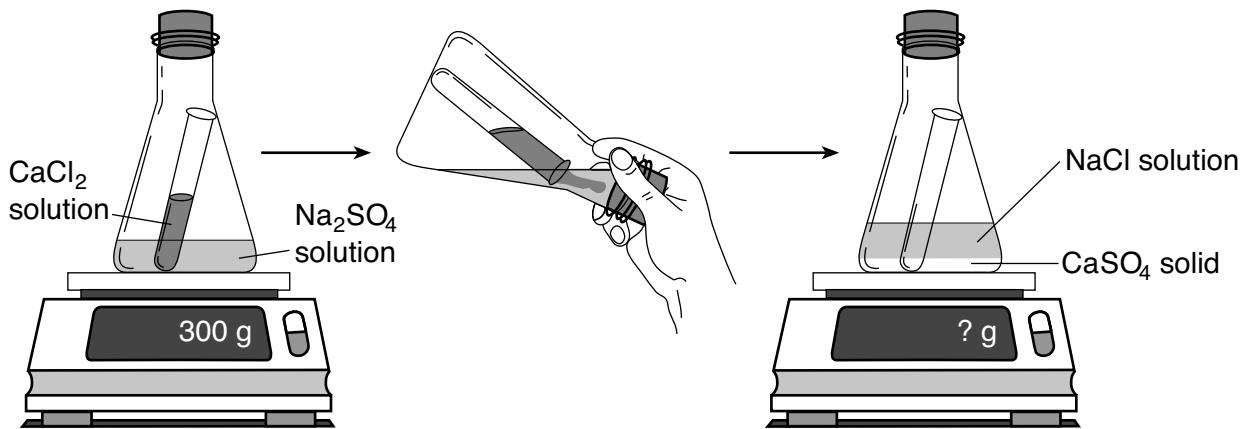
Base your answers to questions 71 and 72 on the map below and on your knowledge of science. The map shows air masses A and B over North America.



- 71 On the map above, place an **X** where a front is located relative to the two air masses shown. [1]

- 72 On the same map above, draw an arrow in air mass B to show the most likely direction that air mass B will move over the next few days. [1]

Base your answers to questions 73 and 74 on the diagram below and on your knowledge of science. The diagram represents a test tube containing a calcium chloride ( $\text{CaCl}_2$ ) solution placed in a flask containing a sodium sulfate ( $\text{Na}_2\text{SO}_4$ ) solution. The sealed flask is sitting on a digital balance, which reads 300 grams (g). The calcium chloride is combined with the sodium sulfate by tilting the flask, and placed back on the balance. The flask now contains solid, white calcium sulfate ( $\text{CaSO}_4$ ) at the bottom of the sodium chloride (NaCl) solution.



- 73 Describe *one* piece of evidence represented in the diagram which shows that a chemical change occurred in the flask. [1]

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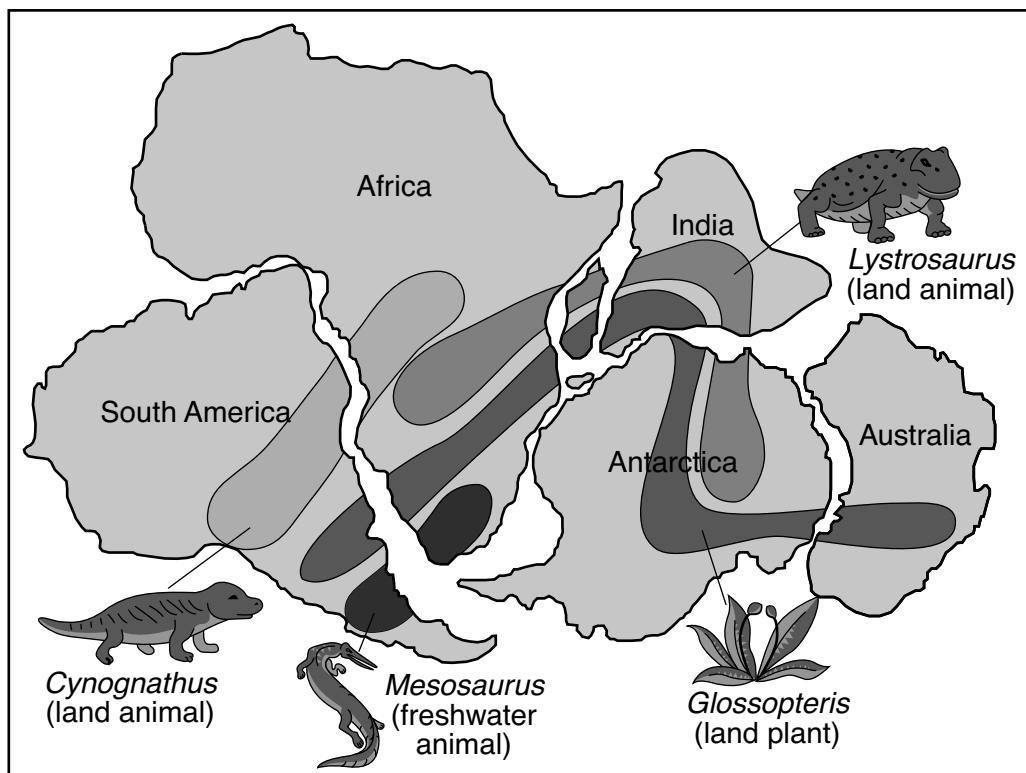
- 74 Indicate the amount of mass that would be displayed on the balance after the solutions have been combined. [1]

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g

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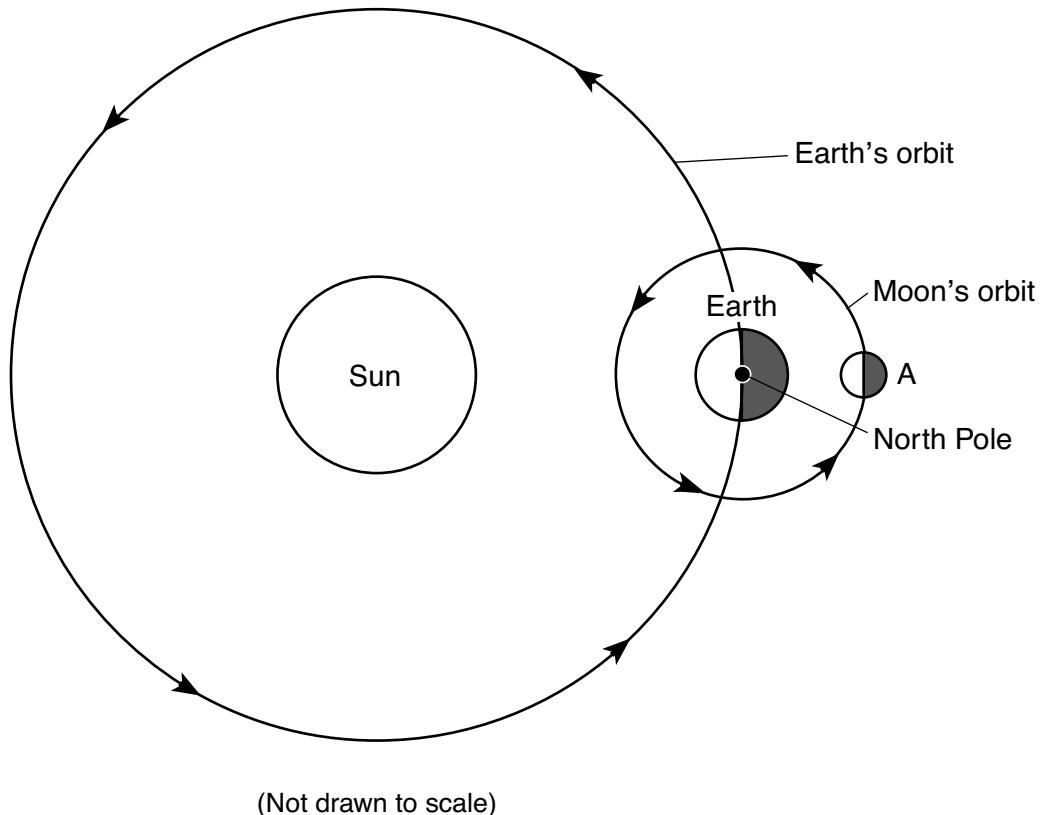
Base your answers to questions 75 and 76 on the map below and on your knowledge of science. The map shows the inferred positions of five landmasses millions of years ago. The locations of where four organisms lived during this time period based on fossil evidence are indicated on the map.



- 75 Identify the name of the organism that lived on all five labeled landmasses. [1]
- 

- 76 Describe evidence from the map, other than the fossil record, that suggests that continents were once together as one landmass millions of years ago. [1]
- 
- 
-

Base your answers to questions 77 and 78 on the diagram below and on your knowledge of science. The diagram represents Earth's orbit around the Sun, and the Moon at position A in its orbit around Earth.



- 77 The diagram below represents different phases of the Moon as viewed from Earth. *On the diagram*, circle the phase of the Moon that would be seen from Earth when the Moon is at position A. [1]

Moon Phases



- 78 Identify the general compass direction in which both the Moon and the Sun appear to rise, due to Earth's rotation, as viewed by an observer on Earth. [1]

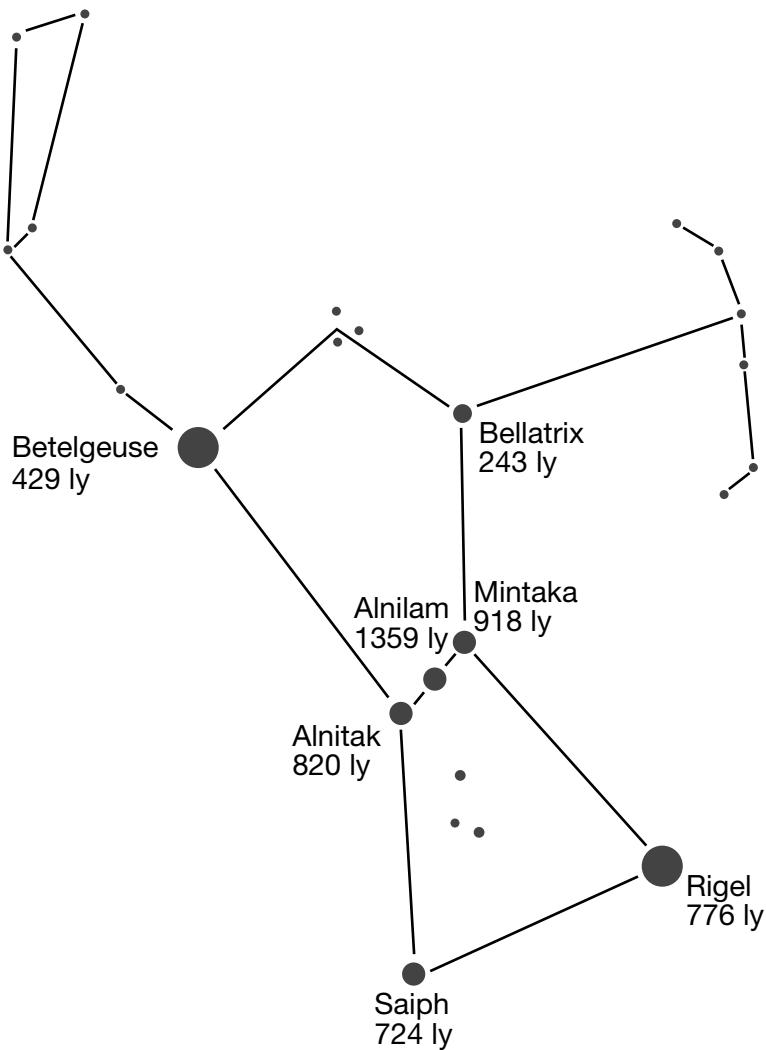
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Base your answers to questions 79 and 80 on the information and diagram below, and on your knowledge of science. The diagram represents an apparent pattern of stars seen in the night sky known as the constellation Orion. The names of some stars and their distances from Earth, in light-years (ly), are indicated.

A light-year is the distance light travels in one year, which is approximately  $9.5 \times 10^{12}$  kilometers (km). The distance between Earth and its closest star, our Sun, is approximately  $1.5 \times 10^8$  kilometers (km).

### Constellation Orion



- 79 *Betelgeuse* and *Rigel* are at least seventy-five times larger than the Sun. Explain why these two stars seen in the constellation Orion look like small points of light in the night sky. [1]

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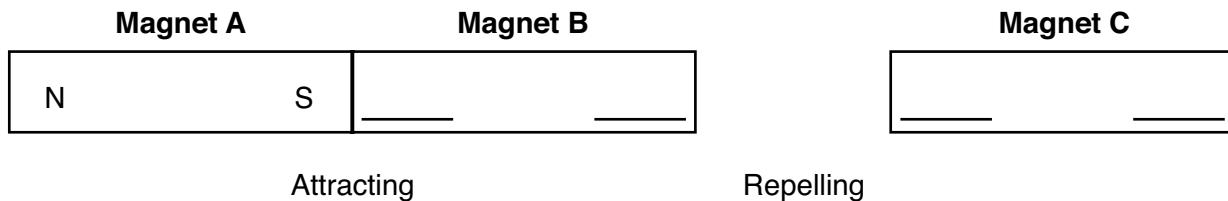
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- 80 Identify the labeled star in the constellation Orion that is closest to Earth. [1]

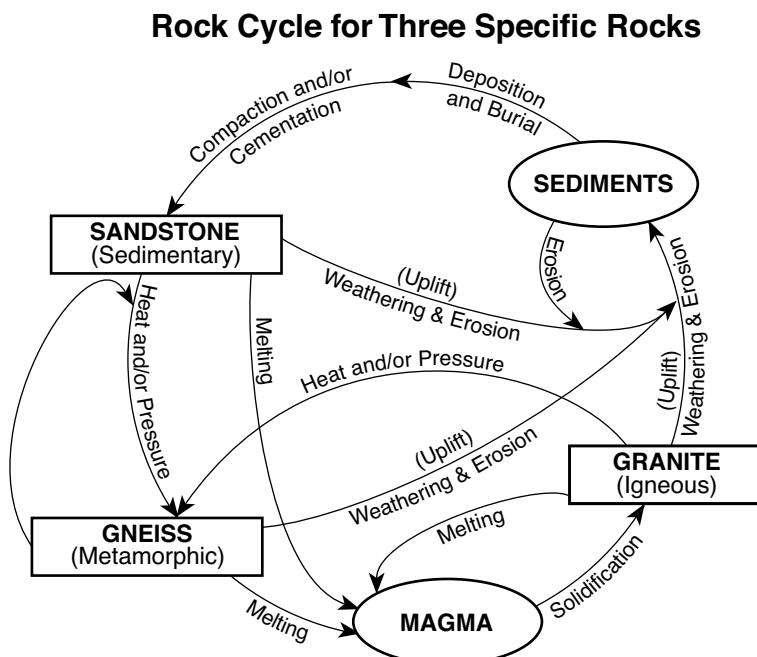
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- 81 The diagram below shows three bar magnets. Magnets A and B are attracting each other. Magnets B and C are repelling each other. The north pole (N) and south pole (S) are labeled on magnet A. Identify the positions of the north and south poles on magnets B and C by placing the letter N (north) or S (south) on each blank line. [1]



Base your answers to questions 82 and 83 on the diagram below and on your knowledge of science. The diagram shows the rock cycle and examples of three types of rock: gneiss, granite, and sandstone. Under the right conditions, each of these rocks can change into either of the other two rocks.



- 82 Identify *two* conditions that will change granite into gneiss. [1]

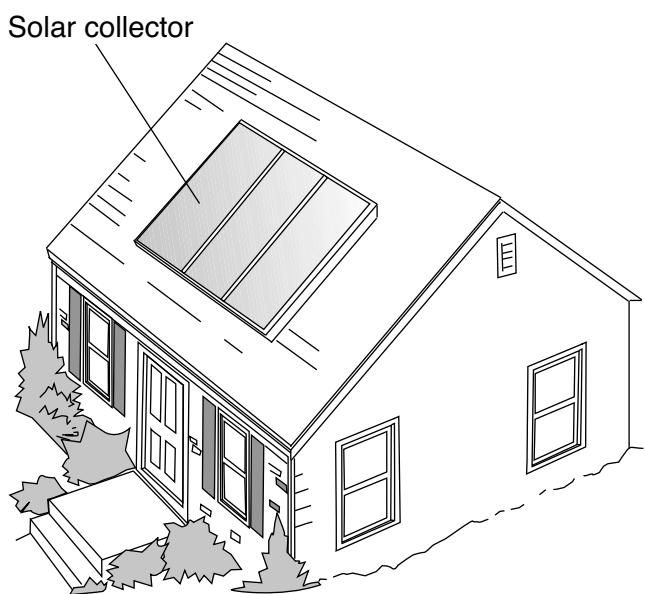
\_\_\_\_\_ and \_\_\_\_\_

- 83 Identify the rock labeled in the diagram that would most likely contain fossils. [1]

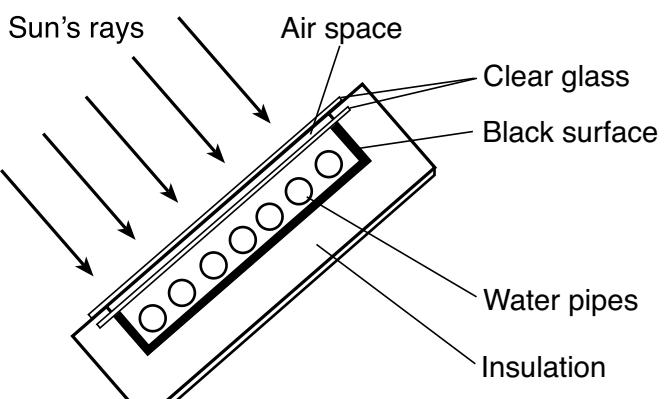
\_\_\_\_\_

Base your answers to questions 84 and 85 on the diagrams below and on your knowledge of science. Diagram 1 represents a solar collector on the south side of a house in New York State. Diagram 2 is a side view showing the parts of a solar collector. The purpose of this solar collector is to absorb radiation from the Sun to heat the water used in the house.

**Diagram 1**  
**House in New York State**



**Diagram 2**  
**Parts of a Solar Collector**



- 84 Why is the inner surface of the solar collector black instead of white? [1]

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- 85 Describe *one* benefit to the environment of using solar radiation instead of fossil fuels to heat the water used in the house. [1]

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**Grade 8 Intermediate-Level Science Test****v202 Written Test****Answer Key: Part I (Multiple-Choice Questions)**

**Note:** All schools (public, nonpublic, and charter) administering the **Grade 8 Intermediate-Level Science Test** in the 2020–2021 school year are required to make arrangements to obtain answer sheets and associated scanning services from a Regional Information Center (RIC) or a large-city scanning center. These centers will scan and score the answer sheets according to the following criteria:

1. One credit will be awarded for each correct response.
2. Credit will not be allowed if two or more answers have been marked for the same question.
3. The raw score for Part I will be determined by counting the number of correct responses.

For information only, correct responses are listed in the chart below.

Test	Date	Question Number	Correct Response	Question Type	Credit	Weight
Grade 8 ILS	v202	1	4	MC	1	1
Grade 8 ILS	v202	2	3	MC	1	1
Grade 8 ILS	v202	3	3	MC	1	1
Grade 8 ILS	v202	4	2	MC	1	1
Grade 8 ILS	v202	5	3	MC	1	1
Grade 8 ILS	v202	6	2	MC	1	1
Grade 8 ILS	v202	7	2	MC	1	1
Grade 8 ILS	v202	8	1	MC	1	1
Grade 8 ILS	v202	9	1	MC	1	1
Grade 8 ILS	v202	10	2	MC	1	1
Grade 8 ILS	v202	11	4	MC	1	1
Grade 8 ILS	v202	12	1	MC	1	1
Grade 8 ILS	v202	13	3	MC	1	1
Grade 8 ILS	v202	14	2	MC	1	1
Grade 8 ILS	v202	15	4	MC	1	1
Grade 8 ILS	v202	16	1	MC	1	1
Grade 8 ILS	v202	17	2	MC	1	1
Grade 8 ILS	v202	18	1	MC	1	1
Grade 8 ILS	v202	19	4	MC	1	1
Grade 8 ILS	v202	20	2	MC	1	1
Grade 8 ILS	v202	21	3	MC	1	1
Grade 8 ILS	v202	22	4	MC	1	1
Grade 8 ILS	v202	23	3	MC	1	1
Grade 8 ILS	v202	24	4	MC	1	1
Grade 8 ILS	v202	25	4	MC	1	1
Grade 8 ILS	v202	26	3	MC	1	1
Grade 8 ILS	v202	27	4	MC	1	1
Grade 8 ILS	v202	28	1	MC	1	1
Grade 8 ILS	v202	29	2	MC	1	1
Grade 8 ILS	v202	30	2	MC	1	1
Grade 8 ILS	v202	31	3	MC	1	1
Grade 8 ILS	v202	32	2	MC	1	1
Grade 8 ILS	v202	33	1	MC	1	1
Grade 8 ILS	v202	34	3	MC	1	1

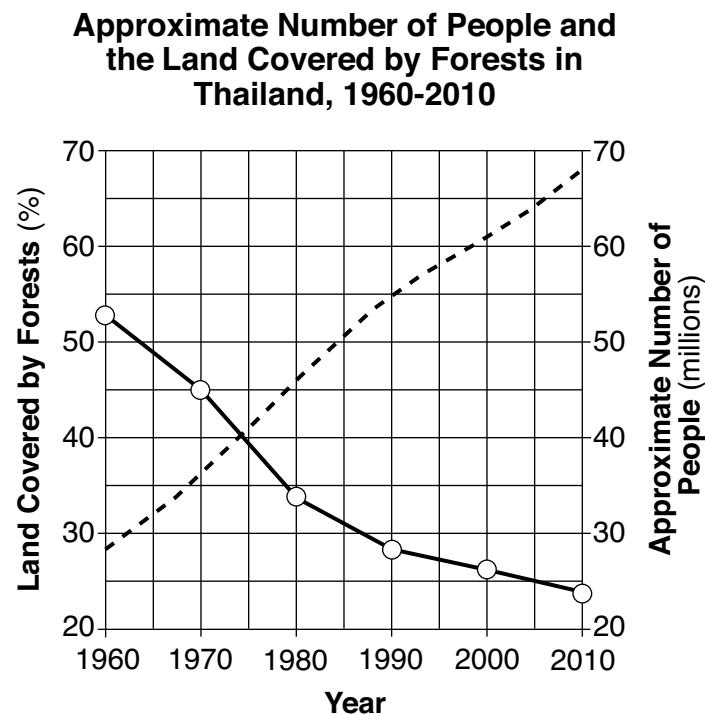
Grade 8 ILS	v202	<b>35</b>	<b>3</b>	MC	1	1
Grade 8 ILS	v202	<b>36</b>	<b>1</b>	MC	1	1
Grade 8 ILS	v202	<b>37</b>	<b>1</b>	MC	1	1
Grade 8 ILS	v202	<b>38</b>	<b>2</b>	MC	1	1
Grade 8 ILS	v202	<b>39</b>	<b>1</b>	MC	1	1
Grade 8 ILS	v202	<b>40</b>	<b>4</b>	MC	1	1
Grade 8 ILS	v202	<b>41</b>	<b>2</b>	MC	1	1
Grade 8 ILS	v202	<b>42</b>	<b>4</b>	MC	1	1
Grade 8 ILS	v202	<b>43</b>	<b>3</b>	MC	1	1
Grade 8 ILS	v202	<b>44</b>	<b>4</b>	MC	1	1
Grade 8 ILS	v202	<b>45</b>	<b>1</b>	MC	1	1

**Key**

MC = Multiple-choice question

- 46** [1] Allow 1 credit if the centers of *all six Xs* are plotted within or touch the circles shown on the graph below and are correctly connected with a line that passes within or touches the circles.

**Example of a 1-credit response:**



**Note:** Allow credit if the student uses a symbol other than an **X** to plot the points.

It is recommended that an overlay of the same scale as the student test booklet be used to ensure reliability in rating.

- 47** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- As the number of people increased, the amount of forest area decreased.
- The more people in Thailand, the fewer forests there are.
- As population goes up, forests go down.
- It's an indirect/inverse relationship.
- negative correlation

- 48** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- habitats for animals
- food for animals
- removal of  $\text{CO}_2$  from the atmosphere
- provide  $\text{O}_2$  to the environment
- biodiversity
- prevent erosion/flood control
- water purification

**49** [1] Allow 1 credit for *two* acceptable responses. Acceptable responses include, but are not limited to:

- same number of seeds
- amount of soil/50 mL of soil
- amount of water/5 mL of water
- clarity of container
- water once a day
- size of container
- shape of container
- material from which the container is made

**Note:** Do *not* allow credit for “water” alone because it doesn’t specify whether the amount of water or the temperature of the water was kept constant.

**50** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- You can’t compare the results because there are two independent (manipulated) variables.
- You can only change one variable at a time.
- The students changed two variables.
- They should have used all bean or all tomato seeds if different water temperatures were used.

**51** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- top layer/uppermost layer
- highest rock layer
- the rock layer closest to the surface
- youngest layer

**Note:** Do *not* allow credit for “first layer” or “outer layer” because these could refer to top or bottom.

**52** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The area was once covered with water.
- Montana was once under the ocean.

**53** [1] Allow 1 credit for *all three* correct answers circled, as shown below.

Description of Change	Cause
A high mountain pond has fewer trout than it had fifty years ago, due to acid rain.	Ecological Succession Evolution <i>Interference by Humans</i>
The modern horse is much larger than its ancestors that lived thirty-million years ago.	Ecological Succession Evolution <i>Interference by Humans</i>
A forest now stands where there was once just a grassy field.	Ecological Succession Evolution <i>Interference by Humans</i>

**54** [1] Allow 1 credit for *two* correct responses. Acceptable responses include, but are not limited to:

- The student should be wearing goggles.
- Gloves should be worn.
- An apron should be worn.
- A test tube clamp/rack should be used.
- Pour below eye level.
- Have adult supervision/a teacher present.

**55** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Boil the water away.
- Use the process of filtration with filter paper.
- Allow the water to evaporate.
- Pour it through a sieve/strainer.

**56** [1] Allow 1 credit for *both* stomach as the organ *and* digestive as the human body system.

**57** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- produces specialized cells/white blood cells
- makes chemicals that identify and destroy infectious diseases
- develops antibodies
- A fever/high temperature may kill off microbes.
- getting rid of the disease in various ways/vomiting/coughing/diarrhea
- Skin prevents disease organisms from entering the body.
- immune system

**Note:** Do *not* allow credit for artificial interventions taken by a person (e.g., vaccines/antibiotics/vitamins) because these examples are not natural human body responses.

**58** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

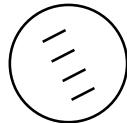
- Mayonnaise contains more Calories per serving than ketchup.
- greater number of Calories
- One tablespoon of mayonnaise has 45 Calories and one tablespoon of ketchup has 20 Calories.

**59** [1] Allow 1 credit for 660 mg.

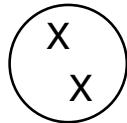
**60** [1] Allow 1 credit for sperm *or* male sex cell *or* male gamete.

**61** [1] Allow 1 credit for drawing four chromosomes (lines) in circle D.

**Examples of 1-credit responses are shown below.**



D



D

**Note:** Allow credit if the number 4 is used instead of four lines.

**62** [1] Allow 1 credit for *two different* acceptable responses. Acceptable responses include, but are not limited to:

- There is only one parent.
- no genetic variation/Offspring are genetically identical to the parent./Parent passes on identical DNA to offspring.
- One parent divides into two offspring.
- The original parent no longer exists after reproduction.

**Note:** Do *not* allow credit for two similar responses, for example: “asexual has one parent” and “sexual has two parents.”

**63** [1] Allow 1 credit for heron.

**64** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Webbing helps the bird swim.
- Webbed feet help it move faster in the water.
- The webbing provides a wider surface area to keep the bird from sinking in the mud/sand.

**65** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Moving around helps the rabbit find food/water.
- Locomotion helps the rabbit find a mate.
- Moving will help the rabbit dig a burrow.

**66** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The fur color may become lighter.
- The rabbit may grow thicker fur.
- The rabbit may put on a thicker layer of fat.
- Their metabolism may change.

**Note:** Do *not* allow credit for hibernation because no species of rabbit is known to hibernate.

**67** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Mutations can cause changes in the fur patterns.
- Sexual reproduction allows for variations in the genes of organisms.
- mutation
- They have different genes.
- sexual reproduction

**68** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- It would be harder to see the cheetahs at these times because they are darker.
- They would be better camouflaged.
- They would blend in better with their environment.

**69** [1] Allow 1 credit for any value from 8.0 to 9.0 m.

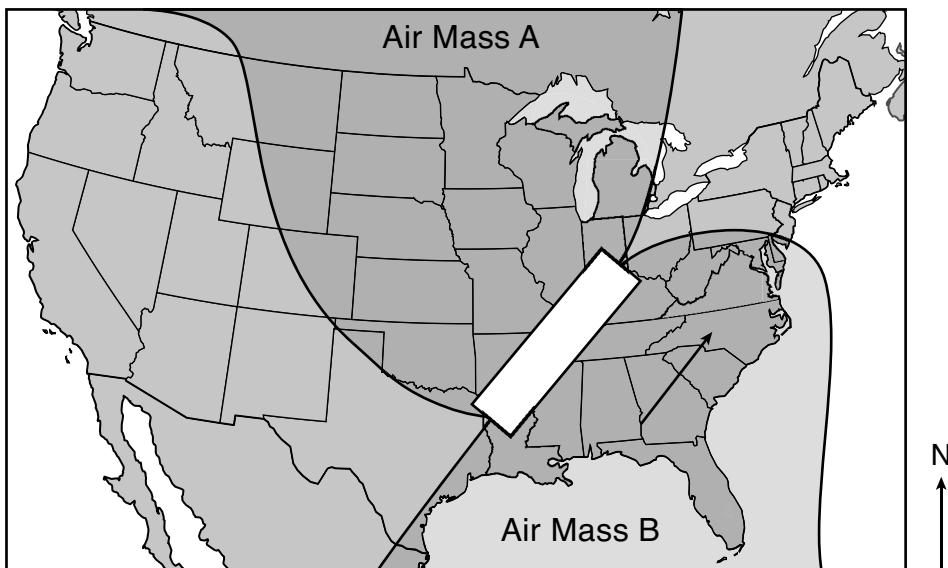
**70** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The car traveled a greater distance each second.
- The diagram shows the car positions getting farther apart.
- The arrows are getting longer.

**Note:** Do *not* allow credit if the student simply writes “arrows” because they only indicate motion/direction.

- 71** [1] Allow 1 credit if the center of the **X** is drawn within the boxed area.

**Example of a 1-credit response:**



**Note:** It is recommended that an overlay of the same scale as the student test booklet be used to ensure reliability in rating.

- 72** [1] Allow 1 credit for an arrow drawn inside air mass *B*, pointing in any direction from north to east.

**An example of a 1-credit response is shown on the map above.**

**Note:** Allow credit if a correctly drawn arrow extends outside of air mass *B*.

- 73** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- A precipitate/white solid formed.
- A new substance was created.
- New chemicals were formed after the originals were combined together.
- A white, insoluble substance formed.

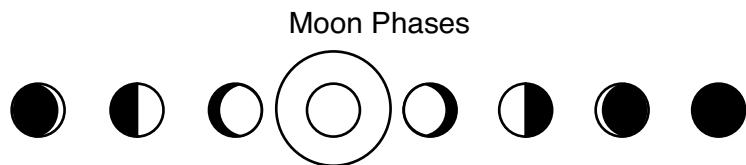
- 74** [1] Allow 1 credit for 300 g.

- 75** [1] Allow 1 credit for *Glossopteris* or land plant.

- 76** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The continents seem to fit together like pieces of a puzzle.
  - The coastlines of South America and Africa fit together.

- 77** [1] Allow 1 credit for circling the Full Moon phase, as shown below.



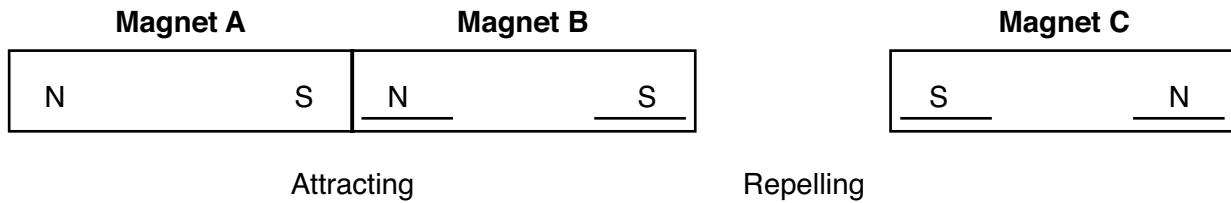
- 78** [1] Allow 1 credit for east/E or northeast/NE or southeast/SE.

- 79** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The stars are light-years away from Earth.
  - There is a large distance between Earth and the stars in the constellation Orion.
  - Distances between the Sun and other stars are vast.
  - The stars are very far away.

- 80** [1] Allow 1 credit for *Bellatrix*.

- 81** [1] Allow 1 credit if *all four* student-labeled poles are correct, as shown below.



**82** [1] Allow 1 credit for heat *and* pressure.

**83** [1] Allow 1 credit for sandstone *or* sedimentary rock.

**84** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- A black surface will absorb more wavelengths of light.
- A white surface reflects more wavelengths of light.

**Note:** Do *not* allow credit for the following responses:

Black absorbs more heat. (The black surface absorbs *light/energy*, not heat. The light is converted to heat.)

Black attracts more sunlight. (The black surface *receives* the same amount of sunlight as the white surface.)

**85** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- less pollution
- Solar energy is renewable.
- conserves fossil fuels
- reduces the need for mining fossil fuels
- Less carbon dioxide is produced.
- reduces global warming