

THE UNIVERSITY OF THE STATE OF NEW YORK

GRADE 8

INTERMEDIATE-LEVEL SCIENCE TEST

WRITTEN TEST

JUNE 4, 2018

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.

Copyright 2018

THE UNIVERSITY OF THE STATE OF NEW YORK
THE STATE EDUCATION DEPARTMENT
ALBANY, NEW YORK 12234

Part I

DIRECTIONS

There are 45 questions on Part I of the test. Each question is followed by three or four choices, numbered 1 through 4. Read each question carefully. Decide which choice is the best answer. On the separate answer sheet, mark your answer in the row of circles for each question by filling in the circle that has the same number as the answer you have chosen.

Read the sample question below.

Sample Question

Earth gets most of its light from

- (1) the stars
- (2) the Sun
- (3) the Moon
- (4) other planets

The correct answer is **the Sun**, which is choice number **2**. On your answer sheet, look at the box showing the row of answer circles for the sample question. Since choice number **2** is the correct answer for the sample question, the circle with the number **2** has been filled in.

Answer all of the questions in Part I in the same way. Mark only one answer for each question. If you want to change an answer, be sure to erase your first mark completely. Then mark the answer you want.

You will not need scrap paper. You may use the pages of this test booklet to work out your answers to the questions.

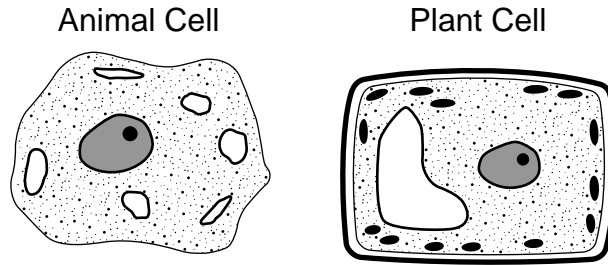
You may use a calculator if needed.

When you are told to start working, turn the page and begin with question 1. Work carefully and answer all of the questions in Part I.

When you have finished Part I, go right on to Part II. Answer all of the questions in Part II.

Part I

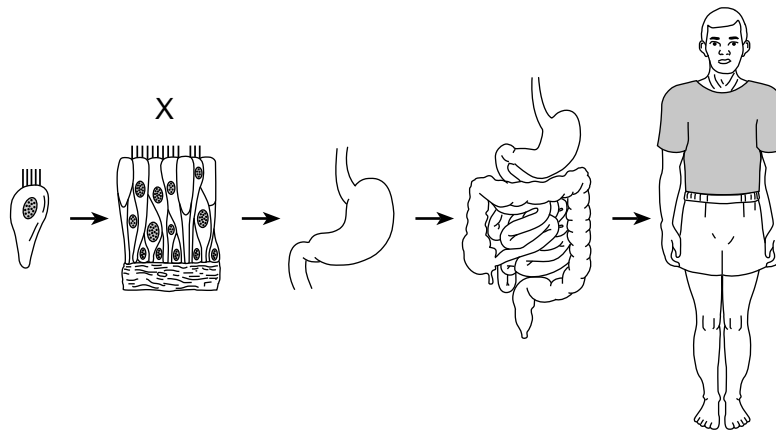
1 The diagrams below represent two types of cells, an animal cell and a plant cell.



Which type of cell uses energy to carry out life processes?

- (1) plant cell, only
- (2) animal cell, only
- (3) both a plant cell and an animal cell
- (4) neither a plant cell nor an animal cell

2 A diagram representing the levels of organization within an organism is shown below.

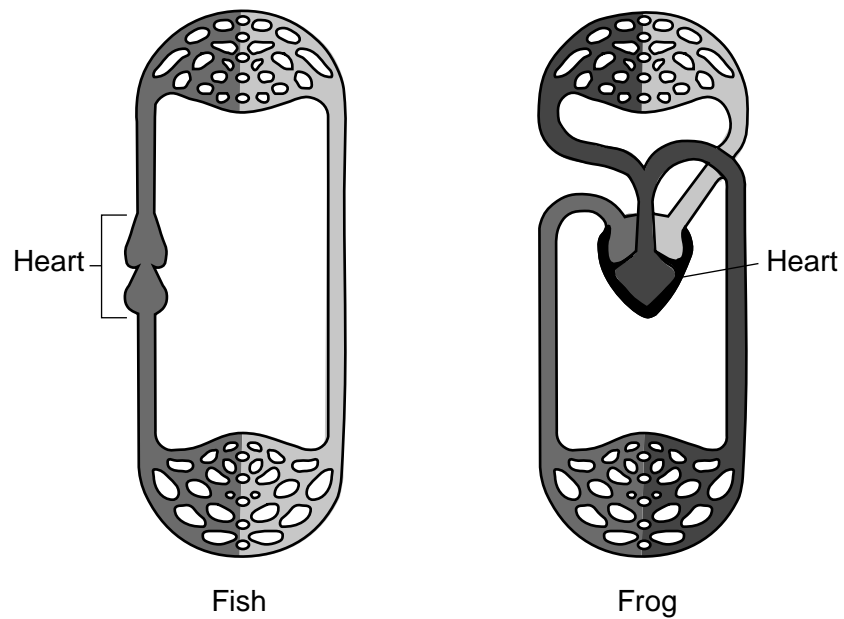


(Not drawn to scale)

Which level of organization is identified by X?

- (1) cell
- (2) tissue
- (3) organ
- (4) organ system

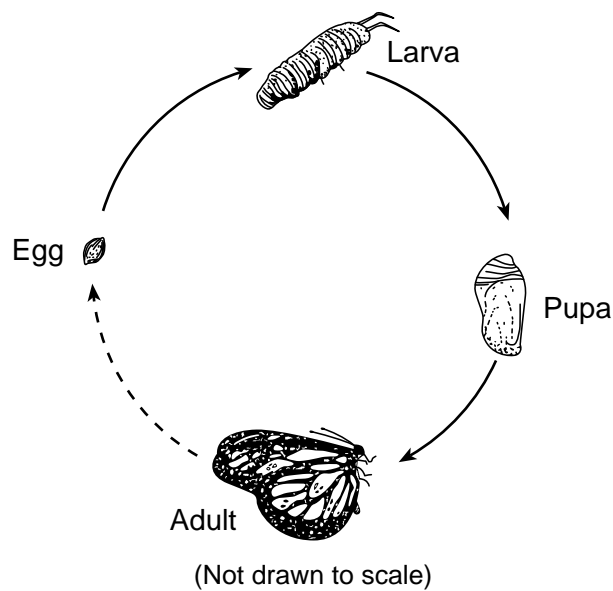
3 The diagrams below show models of the circulatory systems of a fish and frog.



A student compared these diagrams. The student found that each of these organisms had a heart to pump blood. Which statement is supported by the student's findings?

- (1) Some organisms are composed of one cell, while others are multicellular.
- (2) Many multicellular animals have similar organs and specialized systems.
- (3) The circulatory system in most organisms removes solid wastes from their bodies.
- (4) All animals have identical circulatory systems.

4 The diagram below represents the life cycle of a butterfly.



This life cycle represents the process of

- (1) separation from parent
- (2) asexual reproduction
- (3) metamorphosis
- (4) extinction

5 Water and carbon dioxide are waste products released as a direct result of

- (1) asexual reproduction
- (2) mechanical digestion
- (3) natural selection
- (4) cellular respiration

6 The primary function of a plant's roots is to

- (1) absorb water
- (2) perform photosynthesis
- (3) produce seeds
- (4) exchange gases

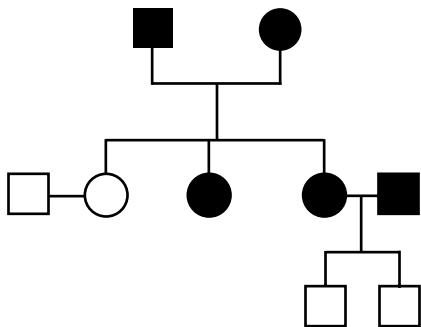
7 Genes are a part of a

- (1) cell wall
- (2) chromosome
- (3) hormone
- (4) vitamin

8 Compared to the amount of genetic information contained in a normal human body cell, the amount contained in a normal human sperm cell is

- (1) the same
- (2) twice as much
- (3) one-half as much
- (4) one-fourth as much

9 The diagram below represents a pedigree chart.



Which type of information is organized by this chart?

- (1) energy flow in an ecosystem
- (2) population growth for pea plants
- (3) the number of chromosomes in an organism
- (4) the passing of a trait from one generation to another

10 A change in an animal's DNA, leading to a variation in a species, is called

- (1) a mutation
- (2) an infection
- (3) selective breeding
- (4) sexual reproduction

11 Which set of terms describes natural fertilization and development in humans before birth?

- (1) external fertilization, external development
- (2) external fertilization, internal development
- (3) internal fertilization, external development
- (4) internal fertilization, internal development

12 A plant growing toward a light source is an example of an organism

- (1) attracting a mate
- (2) destroying infectious germs
- (3) responding to external stimuli
- (4) obtaining moisture from the air

13 A cactus plant, a snake, and a hawk can be members of the same

- (1) community
- (2) kingdom
- (3) population
- (4) species

14 Which substance in green plants needs to absorb sunlight during photosynthesis?

- (1) chlorophyll
- (2) cytoplasm
- (3) oxygen
- (4) water

15 In 1865, a pond was surrounded by open fields. Today, the same area is swampy and surrounded by a forest. Which process is responsible for this change?

- (1) metamorphosis
- (2) conservation
- (3) ecological succession
- (4) crustal plate movement

Base your answers to questions 16 and 17 on the food label below and on your knowledge of science. The food label lists nutritional facts about a serving of cereal alone and cereal with a $\frac{1}{2}$ cup of fat-free milk.

Nutrition Facts		
Serving Size	51 Biscuits (55g/1.9 oz.)	
Servings Per Container	About 8	
Amount Per Serving	Cereal	Cereal with 1/2 Cup Fat-free Milk
Calories	190	230
Calories from Fat	10	10
% Daily Value		
Total Fat 1g	2%	2%
Saturated Fat 0g	0%	0%
<i>Trans</i> Fat 0g		
Polyunsaturated Fat 0.5g		
Monounsaturated Fat 0g		
Cholesterol 0mg	0%	0%
Sodium 0mg	0%	3%
Potassium 200mg	6%	11%
Total Carbohydrate 46g	15%	17%
Dietary Fiber 6g	23%	23%
Sugars 12g		
Other Carbohydrate 28g		
Protein 5g		
Vitamin A	0%	4%
Vitamin C	0%	0%
Calcium	0%	15%
Iron	90%	90%
Thiamin	25%	30%
Riboflavin	25%	35%
Niacin	25%	25%
Vitamin B ₆	25%	25%
Folic Acid	25%	25%
Vitamin B ₁₂	25%	35%
Phosphorus	15%	25%
Magnesium	10%	15%
Zinc	10%	15%

16 How much total energy is contained in a single serving of this cereal with a $\frac{1}{2}$ cup of fat-free milk?

- (1) 10 Calories
- (2) 40 Calories
- (3) 190 Calories
- (4) 230 Calories

17 One nutrient that is obtained only when milk is added to the cereal is

- (1) niacin
- (2) cholesterol
- (3) sodium
- (4) phosphorus

18 The fur on an arctic polar bear appears white all year. The color of the fur is an example of

- (1) an adaptation helping an organism to survive
- (2) an organism exchanging materials with its environment
- (3) an organism responding to internal stimuli
- (4) metabolism regulating an organism's activities

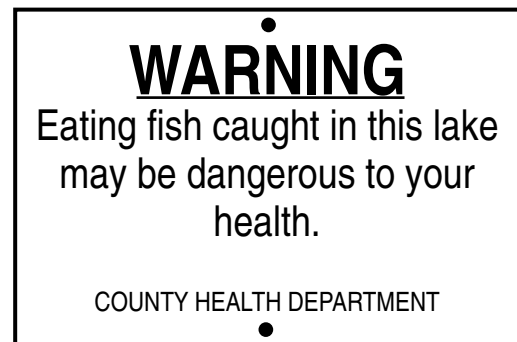
19 Urban growth and uncontrolled waste disposal by humans most likely results in

- (1) conservation of fossil fuels
- (2) environmental degradation
- (3) improved soil composition
- (4) a balanced ecosystem

20 Cell division occurs as part of which process?

- (1) Energy in food is released.
- (2) A cut on a person's finger heals.
- (3) A disinfectant destroys microbes.
- (4) The body eliminates wastes.

21 The sign below was posted near a lake.



Which environmental problem is most likely indicated by the sign?

- (1) toxic waste
- (2) global warming
- (3) ozone depletion
- (4) species extinction

22 Which human activity would help reduce the amount of carbon dioxide in the atmosphere?

- (1) decrease the burning of fossil fuels
- (2) decrease the number of recycling programs
- (3) increase the human population
- (4) increase the number of cars being driven

23 The data table below shows data for four planets in our solar system.

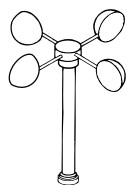
Data Table

Planet	Distance from Sun (millions of km)	Period of Revolution (in Earth time)	Period of Rotation (in Earth time)
Mercury	57.9	88 days	59 days
Venus	108.2	225 days	243 days
Earth	149.6	365 days	24 hours
Mars	227.9	687 days	25 hours

For which planet is the length of the planet's day longer than the planet's year?

- (1) Mercury (2) Venus (3) Earth (4) Mars

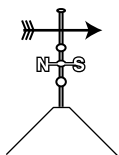
24 Which weather instrument is used to measure wind speed?



Anemometer
(1)



Barometer
(2)



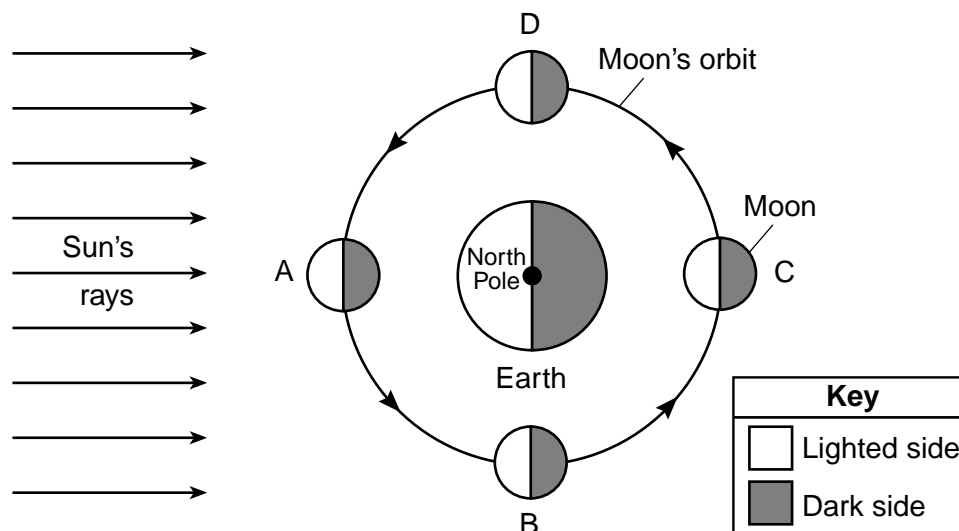
Weather vane
(3)



Rain gauge
(4)

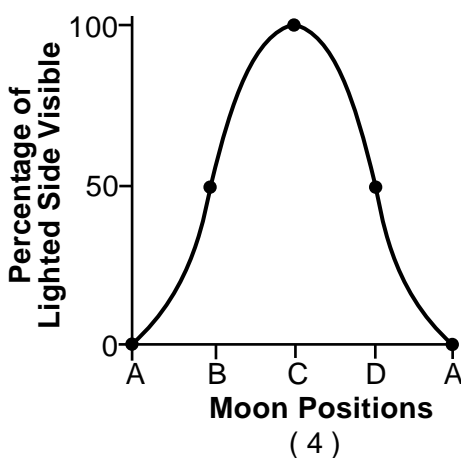
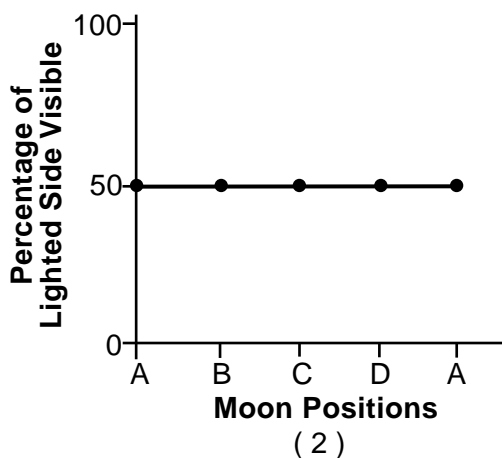
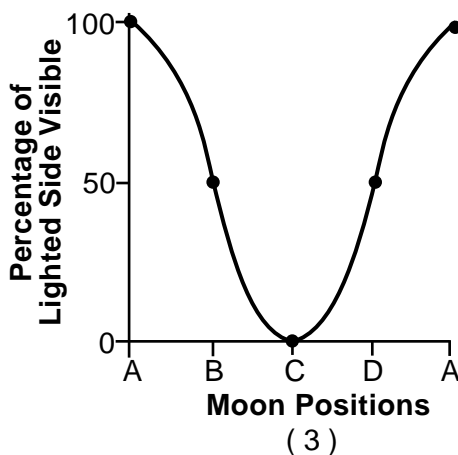
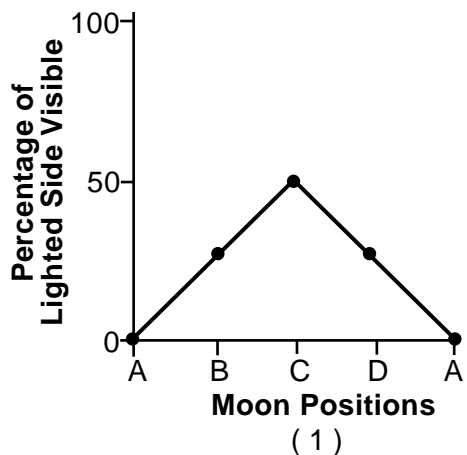
(Not drawn to scale)

Base your answers to questions 25 and 26 on the diagram below and on your knowledge of science. The diagram represents the Moon at positions A, B, C, and D, in its orbit around Earth.



(Not drawn to scale)

25 Which graph best represents the percentage of the lighted side of the Moon that can be seen by an observer in the northern hemisphere when the Moon is at the positions shown?



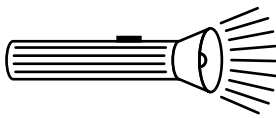
26 Approximately how long does it take for an observer on Earth to view a complete cycle of Moon phases?

- (1) 12 hours
- (2) 24 hours
- (3) 1 month
- (4) 1 year

- 27 The motions of comets and asteroids in our solar system are predictable because they are
- (1) smaller than planets
 - (2) nearly spherical in shape
 - (3) in orbit around the Sun
 - (4) controlled by Earth's gravity

- 28 Which two gases, when released into the atmosphere, are believed to contribute most to global warming?
- (1) nitrogen and oxygen
 - (2) nitrogen and carbon dioxide
 - (3) methane and oxygen
 - (4) methane and carbon dioxide

- 29 The diagram below represents a flashlight that has been turned on.



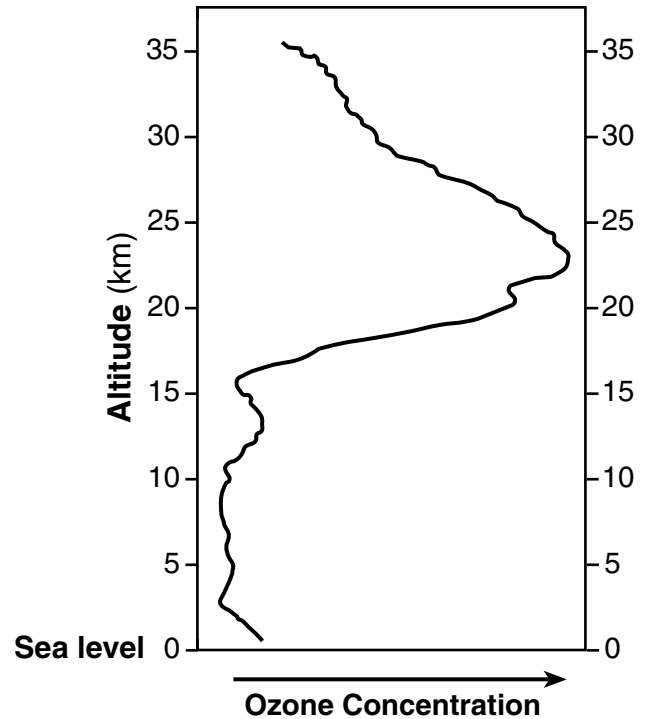
Which form of energy is being converted to electrical energy by the batteries in the flashlight?

- (1) chemical
- (2) nuclear
- (3) solar
- (4) sound

- 30 Which set of Earth components is arranged in order from solid to liquid to gas?
- (1) hydrosphere, atmosphere, lithosphere
 - (2) hydrosphere, lithosphere, atmosphere
 - (3) lithosphere, atmosphere, hydrosphere
 - (4) lithosphere, hydrosphere, atmosphere

- 31 The graph below shows the change in ozone concentration with altitude in Earth's atmosphere. The data table below shows the average height range above sea level, in kilometers (km), for the different layers of Earth's atmosphere.

Ozone Concentration vs. Altitude in Earth's Atmosphere



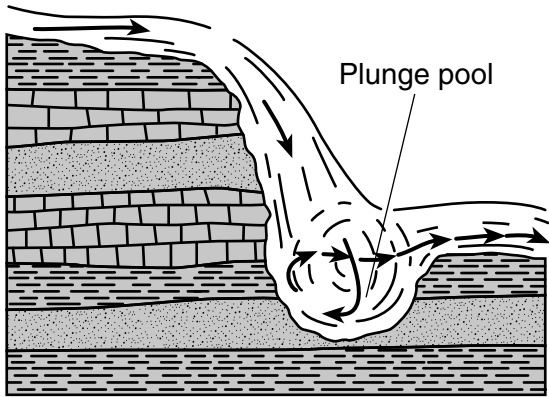
Data Table

Layer of Earth's Atmosphere	Range in Altitude Above Sea Level (km)
middle stratosphere	21 to 35
lower stratosphere	8 to 20
upper troposphere	4 to 7
lower troposphere	0 to 3

Which layer of Earth's atmosphere contains the highest concentration of ozone?

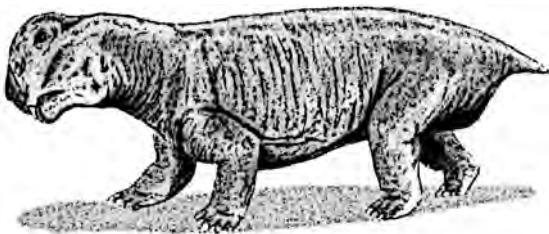
- (1) middle stratosphere
- (2) lower stratosphere
- (3) upper troposphere
- (4) lower troposphere

- 32 The cross section below represents a plunge pool that formed at the bottom of a waterfall.



The plunge pool at the bottom of the waterfall was formed mainly by

- (1) deposition (2) evaporation (3) precipitation (4) erosion
- 33 What is the main source of energy for the water cycle?
- (1) the Moon (2) the Sun (3) winds (4) oceans
- 34 The diagram below represents a *Lystrosaurus*. *Lystrosaurus* was an herbivore that lived on land about 250 million years ago. Fossils of this dinosaur have been discovered on the widely separated continents of Africa and South America.



Which statement best explains why *Lystrosaurus* fossils are found on these two continents?

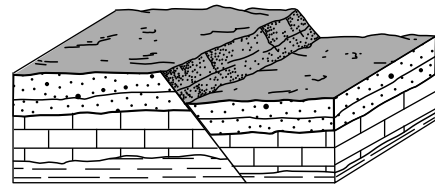
- (1) This dinosaur could fly to distant locations.
 (2) Both continents were once joined together.
 (3) Predators transported the remains of this dinosaur between continents.
 (4) Glaciers transported the fossils to the two continents.

- 35 A student correctly determined the density of two rocks. If the volumes of the two rocks are equal, the rock with the greater density has a
- (1) rounder shape (2) smoother surface (3) greater mass (4) smaller size

- 36 Which terms best describe the properties of a gas?
- (1) definite volume and a definite shape
 (2) definite volume and no definite shape
 (3) no definite volume and a definite shape
 (4) no definite volume and no definite shape

- 37 Low-pressure systems generally move across the United States from
- (1) north to south (2) east to west (3) west to east (4) south to north

- 38 The block diagram below represents a displaced rock structure.



Which process was responsible for the displacement of the horizontal rock layers?

- (1) folding (2) faulting (3) tilting (4) weathering
- 39 Which event is an example of a physical change?
- (1) iron rusting (2) fireworks exploding (3) eggs cooking (4) ice melting

Note that question 40 has only three choices.

40 The diagram below represents a portion of the Periodic Table of the Elements.

Portion of the Periodic Table of the Elements

KEY

1	H	approximate atomic mass
H		symbol
Hydrogen		name
1		atomic number

Groups

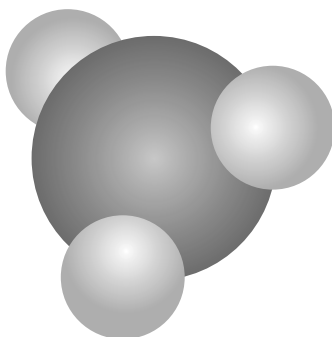
	13	14	15	16	17	18	
11	12	13	14	15	16	17	18
64	65	70	73	75	79	80	84
29	30	31	32	33	34	35	36
108	112	115	119	122	128	127	131
47	48	49	50	51	52	53	54

Based on its position in the Periodic Table, at room temperature, cadmium is most likely a

- (1) noble gas
- (2) nonmetal
- (3) metal

41 The model below represents a molecule of ammonia gas.

Model of a Molecule of Ammonia Gas

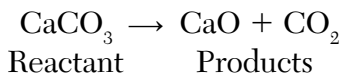


Key	
Nitrogen atom	
Hydrogen atom	

Ammonia gas would be classified as

- (1) a compound
- (2) a mixture
- (3) an element
- (4) an atom

42 When calcium carbonate (CaCO_3) is heated, it decomposes to form calcium oxide (CaO) and carbon dioxide (CO_2). The equation below shows this reaction.



In this reaction, the mass of CaCO_3

- (1) is less than the mass of CaO plus the mass of CO_2
- (2) is greater than the mass of CaO plus the mass of CO_2
- (3) equals the mass of CaO plus the mass of CO_2
- (4) equals the mass of CaO minus the mass of CO_2

43 The chart below shows the wind-chill temperatures caused by wind speeds at different surface air temperatures.

		Surface Air Temperature (°F)																	
		40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Wind Speed (mph)	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98	

What is the wind-chill temperature when the surface air temperature is 10°F and the wind speed is 20 mph?

- (1) -41°F
- (2) -9°F
- (3) 9°F
- (4) 4°F

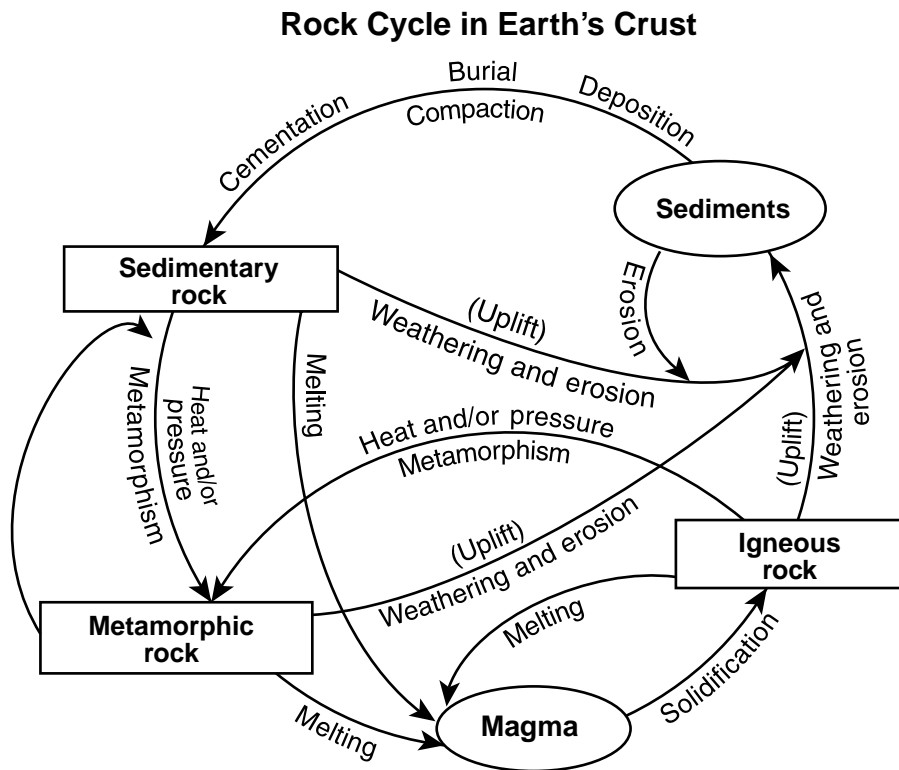
44 The diagram below represents a person using a wheelbarrow to move a heavy load of soil.



Which two simple machines are parts of the wheelbarrow?

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

45 The diagram below represents the rock cycle.



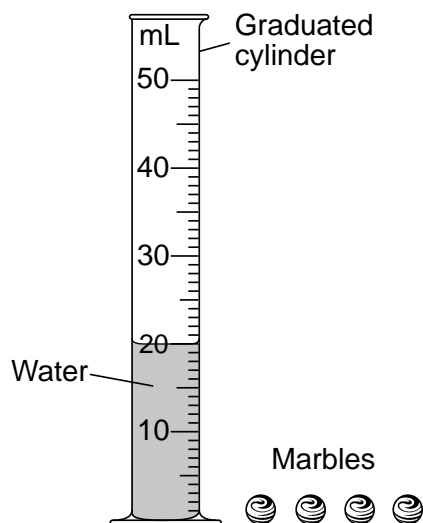
According to this diagram, metamorphic rock is formed by

- (1) melting and solidification
- (2) burial and compaction
- (3) weathering and erosion
- (4) heat and/or pressure

Part II

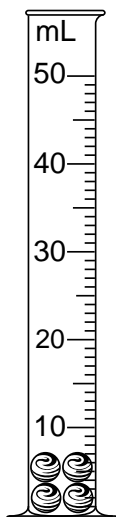
Directions (46–85): Record your answers in the spaces provided below each question.

- 46 The diagram below represents a graduated cylinder containing 20 mL of water. Four identical marbles are next to the cylinder.

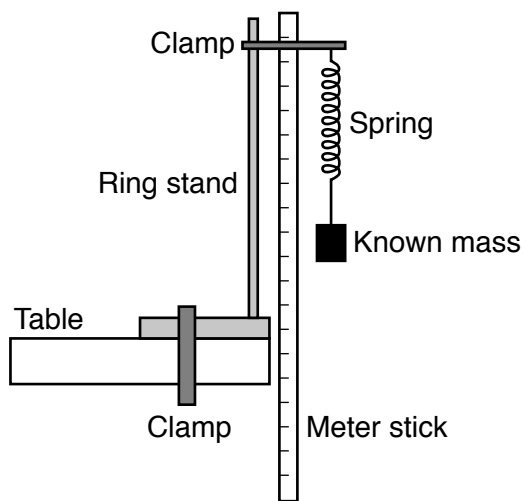


After two of the marbles are added to the cylinder, the water level reads 24 mL.

Shade in the graduated cylinder below to show what the water level would be after the *other* two marbles are added. [1]



Base your answers to questions 47 through 50 on the diagram and data table below and on your knowledge of science. The diagram shows a laboratory set-up used to investigate the relationship between the force on the spring and the length it will stretch. Increasing masses were attached to the spring. The length the spring stretched for each mass was measured using a meter stick. The data table shows the results of the investigation.

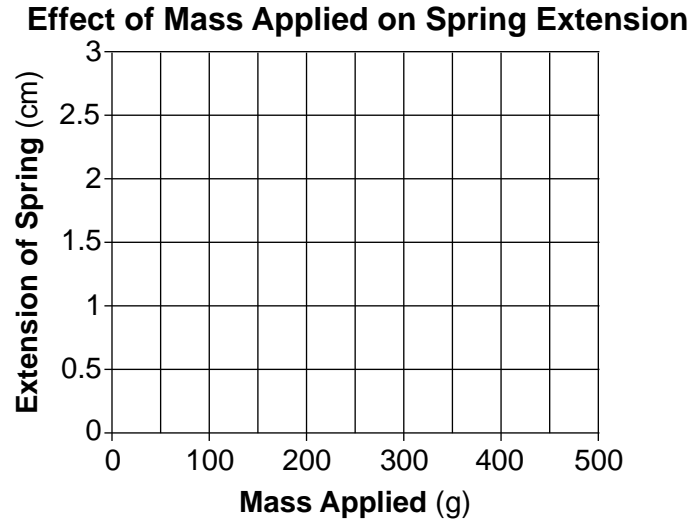


(Not drawn to scale)

Data Table

Mass (g)	Extension of Spring (cm)
0	0
100	0.5
200	0.6
300	0.8
400	1.5
500	2.5

- 47 On the graph below, use an **X** to plot the extension of the spring for each mass shown in the data table. Connect the centers of the **Xs** with a line. [1]



- 48 Describe the general relationship between the mass applied and the extension on the spring. [1]

- 49 Based on the data, estimate the extension of the spring when a 250-gram mass is applied. [1]

_____ **cm**

- 50 Identify the force acting on the mass that causes the spring to extend. [1]

Base your answers to questions 51 and 52 on the data table below and on your knowledge of science. The data table shows the numbers of two samples of bacteria, A and B, growing in a laboratory over a five-hour period.

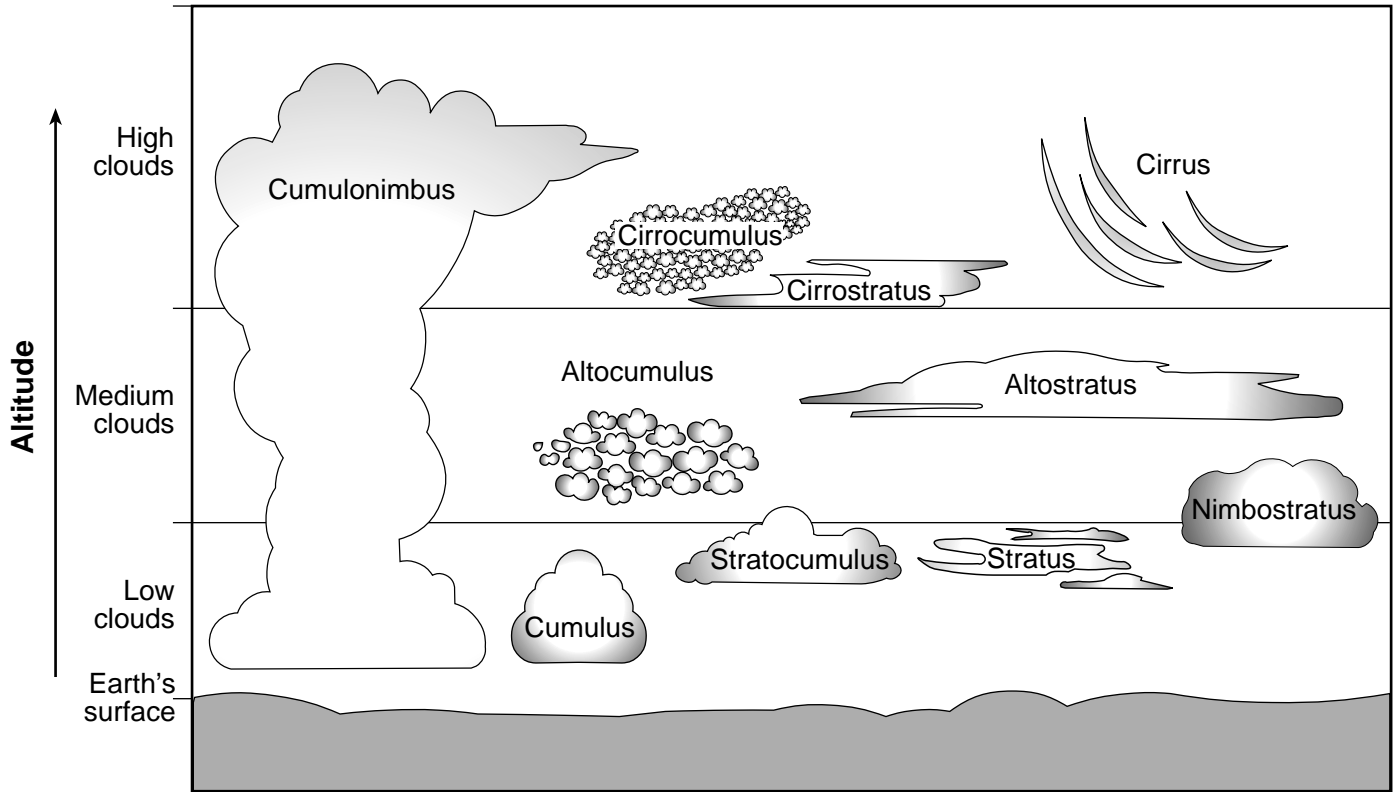
Data Table

Time (hours)	Number of Bacteria A in Sample	Number of Bacteria B in Sample
0	1	1
0.5	2	1
1.0	4	2
1.5	8	2
2.0	16	4
2.5	32	4
3.0	64	8
3.5	128	8
4.0	256	16
4.5	512	16
5.0	1024	32

51 Based on the pattern in the data table, predict the number of bacteria B at 6 hours. [1]

52 Describe how the reproductive rates for bacteria A and bacteria B differ. [1]

Base your answers to questions 53 through 55 on the diagram below and on your knowledge of science. The diagram represents ten types of clouds and where they are found in Earth's atmosphere.

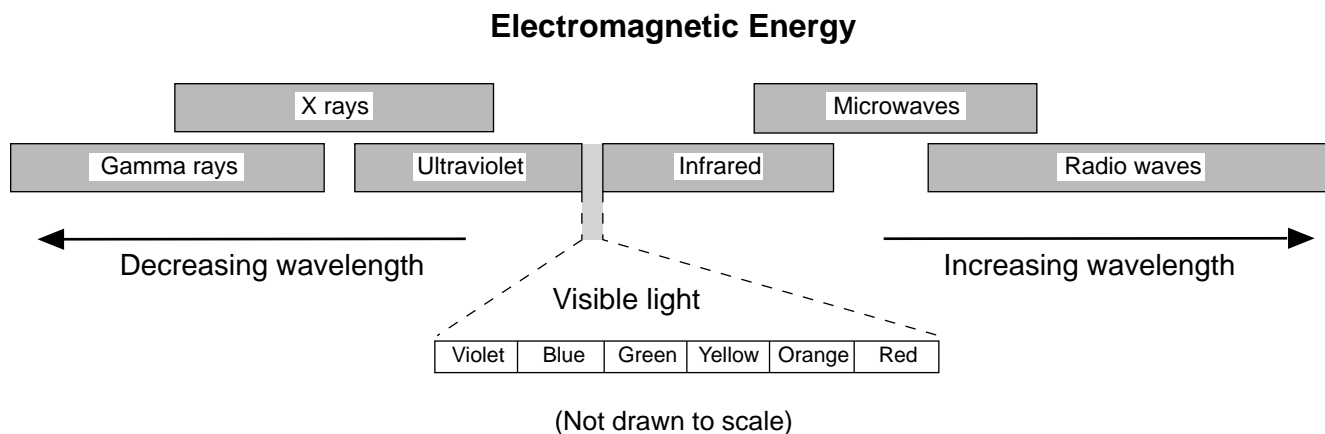


53 Identify *one* factor represented in the diagram that is used to classify the ten types of clouds. [1]

54 Identify the water cycle process that forms clouds when moist air cools as it rises. [1]

55 Explain why less sunlight reaches Earth's surface when cumulonimbus clouds are over a location than when cirrus clouds are over the same location. [1]

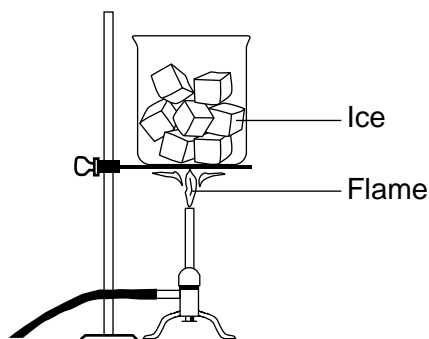
56 The diagram below represents the electromagnetic spectrum.



List the following three types of electromagnetic energy in order from shortest wavelength to longest wavelength: infrared, x rays, red visible light. [1]

Shortest _____
↓
Longest _____

57 The diagram below shows a beaker of ice placed over an open flame.



Describe what happens to the molecules in the ice as the temperature of the ice increases. [1]

Base your answers to questions 58 and 59 on the passage below and on your knowledge of science.

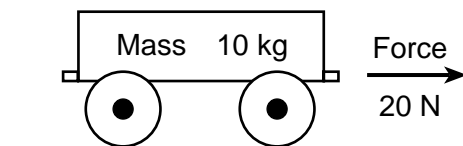
Ultraviolet Radiation

The Sun's radiation comes to Earth as many different wavelengths of electromagnetic energy. One form of energy is ultraviolet radiation. A person's overexposure to the Sun's ultraviolet radiation (UV rays) is the biggest risk factor for skin cancer. Some ultraviolet radiation is absorbed by the ozone layer, which is located in Earth's atmosphere. This ozone layer provides a natural protection for living organisms.

58 State *one* reason why all of the ultraviolet radiation coming toward Earth does *not* reach Earth's surface. [1]

59 Describe *one* action a person can take to avoid overexposure to UV radiation. [1]

Base your answers to questions 60 and 61 on the diagram below and on your knowledge of science. The diagram represents a cart with a mass of 10 kilograms (kg) being pulled to the right with a force of 20 newtons (N).



60 Using the equation below, calculate the acceleration of the cart in meters per second squared (m/s^2). [1]

$$\text{Force} = \text{Mass} \times \text{Acceleration}$$

_____ m/s^2

61 Identify the force between the wheels of the cart and the ground surface that opposes forward motion of the cart. [1]

Base your answers to questions 62 and 63 on the information and data table below and on your knowledge of science.

Four students participated in an experiment to determine the effect of exercise on heart rate. Four students measured their heart rates while at rest. After exercising for 10 minutes, they measured their heart rates again. Data for these students are shown in the table below. Heart rate is measured in beats per minute (bpm).

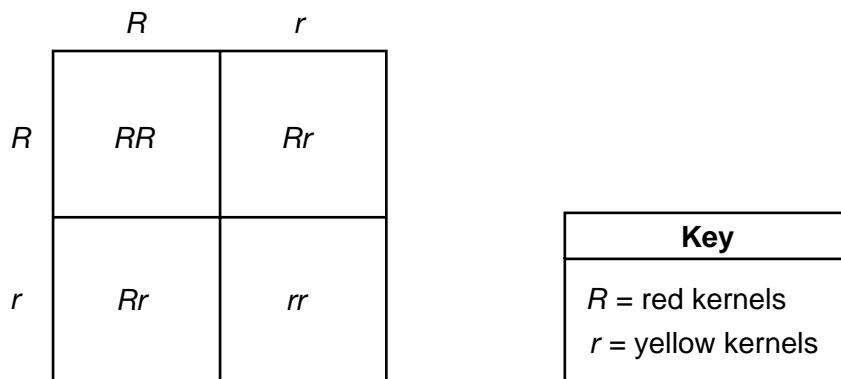
The Effect of Exercise on Heart Rate

Student	Heart Rate (bpm)	
	At Rest	After Exercising for 10 Minutes
1	60	90
2	86	122
3	72	112
4	75	115

62 Based on the data table, describe the effect of exercising for 10 minutes on the heart rates of the four students. [1]

63 Describe *one* way to determine a person's heart rate. [1]

Base your answers to questions 64 and 65 on the Punnett square below and on your knowledge of science. In corn plants, the trait for red kernels (*R*) is dominant to yellow kernels (*r*). The Punnett square represents a cross between two corn plants, both of which have a gene for red kernels and a gene for yellow kernels (*Rr* x *Rr*).



64 The diagram below represents an ear of corn with both red and yellow kernels.

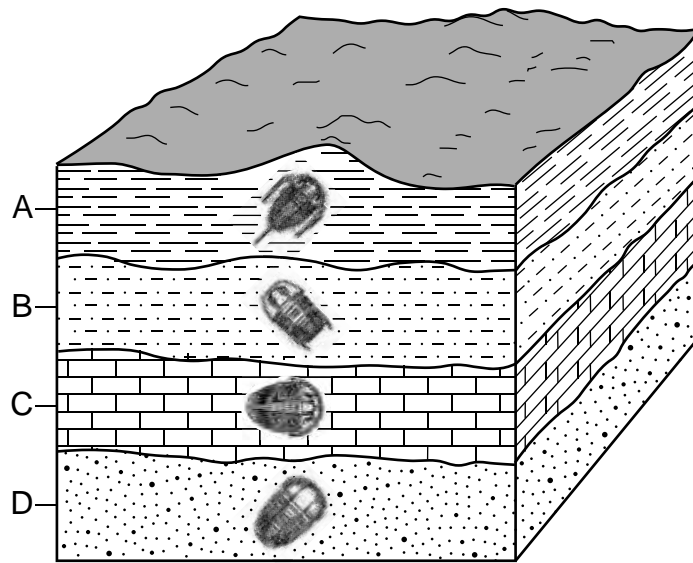


Explain why the number of red and yellow kernels on this ear of corn represents the results of the cross that is observed in the Punnett square. [1]

65 Identify the two genes of each parent that would always produce an ear of corn which has all yellow kernels. [1]

_____ × _____
 (parent 1) (parent 2)

Base your answers to questions 66 through 68 on the cross section below and on your knowledge of science. The cross section represents several rock layers that have not been overturned. Each layer contains trilobite fossils.



(Not drawn to scale)

66 Explain why the trilobite fossils found in rock layer A are considered to be younger than the trilobite fossils in rock layer D. [1]

67 Circle the class (type) of rock below that most likely includes rock layers A, B, C, and D, and give evidence to support your choice. [1]

Circle one: igneous metamorphic sedimentary

Evidence: _____

68 Explain how studying fossils supports the theory of evolution. [1]

Base your answers to questions 69 through 71 on the information below and on your knowledge of science. The list below describes some characteristics of the Canada lynx, an animal that is a member of the cat family.

Canada Lynx

- Found in the colder climates of Canada and Alaska
- Thick, dense fur
- Preys on small animals, such as the snowshoe hare
- Large spaces between teeth so that bite enters prey as deeply as possible
- Wide feet to walk better over snow and ice

69 Explain why the Canada lynx is classified as a carnivore. [1]

70 Choose *one* characteristic from the list that helps the Canada lynx carry out the life process of locomotion. [1]

71 Explain why the population of the Canada lynx in one area may decrease if the population of snowshoe hares decreased in that same area. [1]

Base your answers to questions 72 and 73 on the information below and on your knowledge of science.

Keeping Goldfish

Goldfish are one of the most common fish kept in a home aquarium. One thing these fish need is an appropriately sized environment. Goldfish produce a hormone, known as somatostatin, that can limit their growth and can keep them from outgrowing their tank. Somatostatin allows the fish to grow to an appropriate size so that the concentration of wastes produced by the fish do not reach harmful levels in the aquarium.

72 Identify the body system in the fish that is most likely producing the hormone somatostatin. [1]

_____ system

73 Explain how limiting growth is advantageous for the goldfish's survival in a home aquarium. [1]

74 The diagrams below represent human body cells that have divided normally and human body cells that have divided *abnormally*.

Human body cells that have divided normally



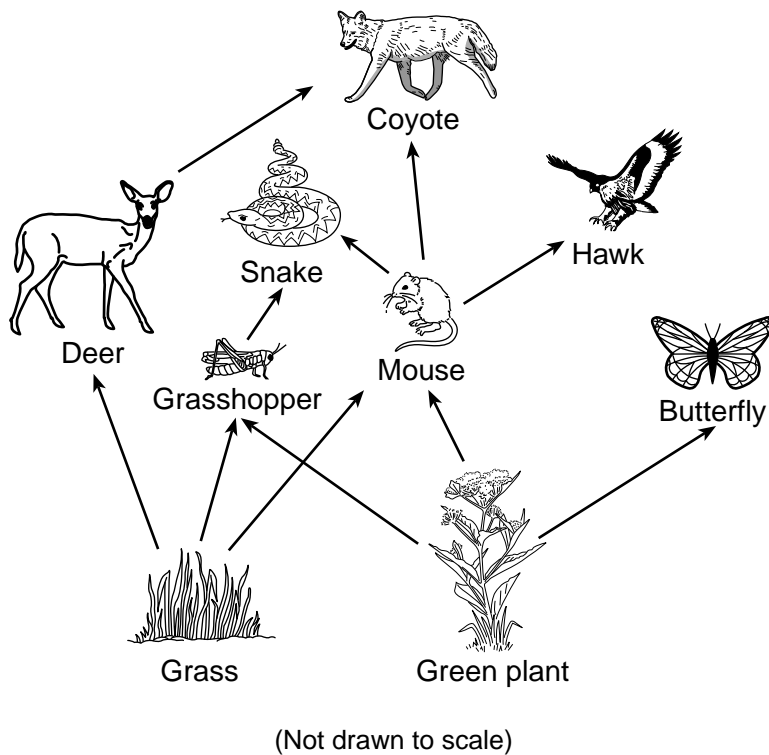
Human body cells that have divided abnormally



(Not drawn to scale)

What disease results from abnormal cell division? [1]

Base your answers to questions 75 and 76 on the partial food web below and on your knowledge of science.

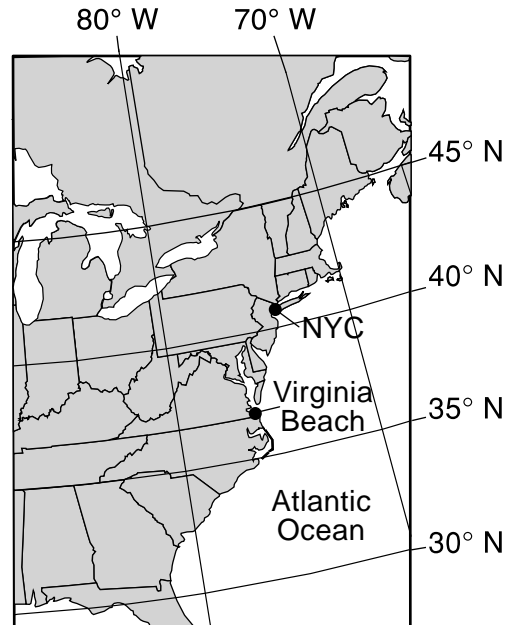
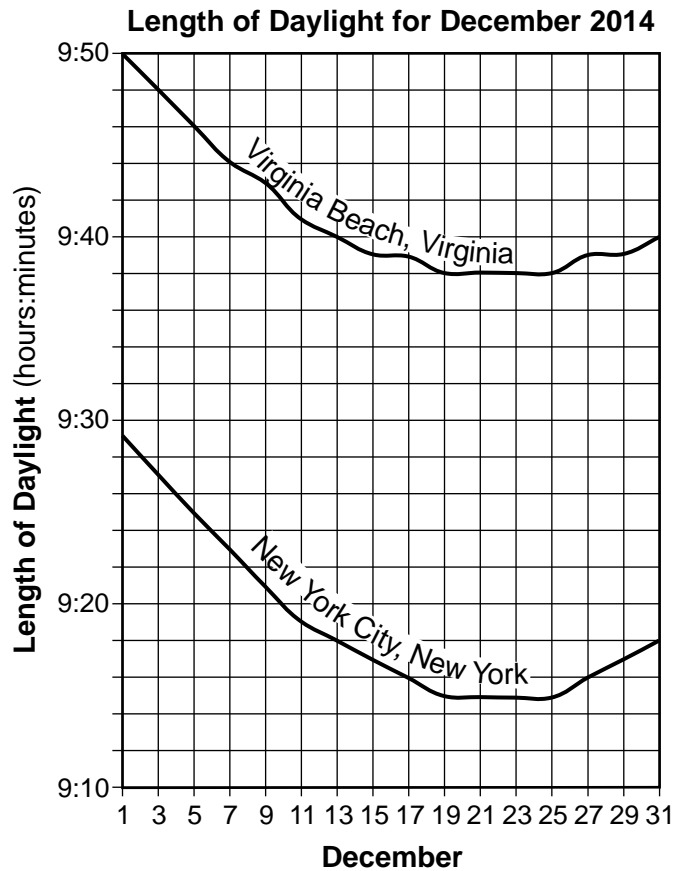


75 Identify *two* organisms in the food web that compete for food. [1]

_____ and _____

76 Fungi and bacteria are not shown in this food web but play a role in this ecosystem. Describe the role of fungi and bacteria in this food web. [1]

Base your answers to questions 77 and 78 on the graph and map below and on your knowledge of science. The graph shows the length of daylight for two cities, New York City (NYC), New York and Virginia Beach, Virginia, during the month of December 2014. The map shows the locations of New York City and Virginia Beach in the United States.



77 Determine the number of hours and minutes of daylight for Virginia Beach and New York City on December 13. [1]

Virginia Beach: _____

New York City: _____

78 Describe the general relationship between the latitude of a location in the United States and the length of daylight in December for that location. [1]

Base your answers to questions 79 through 81 on the passage below and on your knowledge of science. The passage describes some of the properties of earthquake waves.

Earthquake Waves

An earthquake occurs when pieces of Earth's crust move, producing waves of energy called seismic waves. Two types of seismic waves that travel through Earth's interior are called *P*-waves and *S*-waves. *P*-waves can travel through solids and liquids, but *S*-waves can only travel through solids.

79 Identify *one* Earth layer in which earthquakes may occur. [1]

80 Explain how the properties of *P*-waves and *S*-waves have been used to determine that Earth's outer core is liquid. [1]

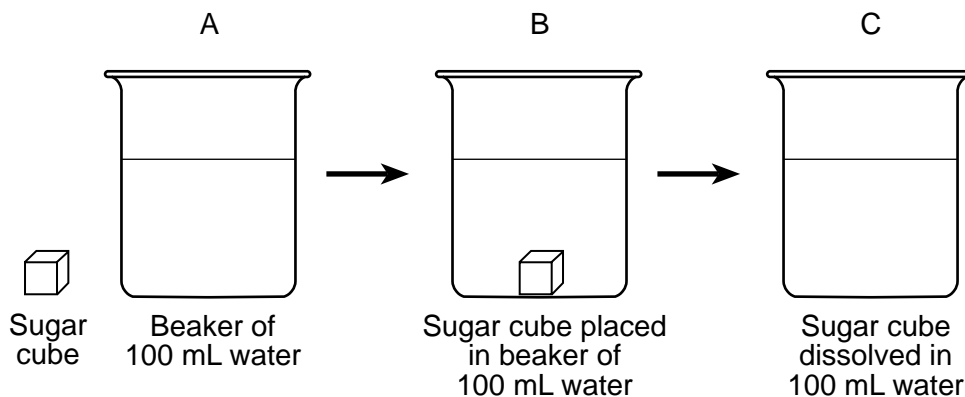
81 Other than moving to a new area, describe *two* actions people should take in order to prepare for the possibility of strong earthquakes. [1]

(1) _____

(2) _____

Base your answers to questions 82 and 83 on the information below and on your knowledge of science.

A sugar cube was placed into a beaker containing 100 mL of water at room temperature and completely dissolved into the water. This process is represented by the series of diagrams labeled A, B, and C below.



82 Describe *one* way to make the sugar cube dissolve faster in the 100 mL of water. [1]

83 Describe *one* way that the dissolved sugar at C could be separated from the water. [1]

Base your answers to questions 84 and 85 on the passage and data table below and on your knowledge of science.

A group of students were experimenting with building electromagnets in science class. To do this, the students wrapped a piece of insulated copper wire around an iron nail and then connected the two ends of the wire to a battery, making the nail magnetic. The number of wraps of the wire around the nail affected the number of metal paperclips that the electromagnet could pick up at one time. The results of the students' experiment are shown in the data table below.

Electromagnet Strength

Number of Wire Wraps	Number of Paperclips Picked Up
10	4
15	7
20	9
25	13

84 Predict how many paperclips the electromagnet would have picked up if the students had wrapped the wire around the nail only five times. [1]

_____ **paperclips**

85 When the wires were disconnected from the battery, all of the paper clips fell off the nail. Explain why the battery is needed to pick up the paperclips. [1]

GRADE 8 INTERMEDIATE-LEVEL SCIENCE

For Teacher Use Only Part II Credits

Question	Maximum Credit	Credit Allowed
46	1	
47	1	
48	1	
49	1	
50	1	
51	1	
52	1	
53	1	
54	1	
55	1	
56	1	
57	1	
58	1	
59	1	
60	1	
61	1	
62	1	
63	1	
64	1	
65	1	
66	1	
67	1	
68	1	
69	1	
70	1	
71	1	
72	1	
73	1	
74	1	
75	1	
76	1	
77	1	
78	1	
79	1	
80	1	
81	1	
82	1	
83	1	
84	1	
85	1	
Total	40	