

THE UNIVERSITY OF THE STATE OF NEW YORK

GRADE 4

ELEMENTARY-LEVEL SCIENCE TEST

WRITTEN TEST

JUNE 6, 2016

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 test has two parts. Parts I and II are in this test booklet.

Part I contains 30 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 14 open-ended questions. Write your answers to Part II in this test booklet.

You will have as much time as you need to answer the questions.

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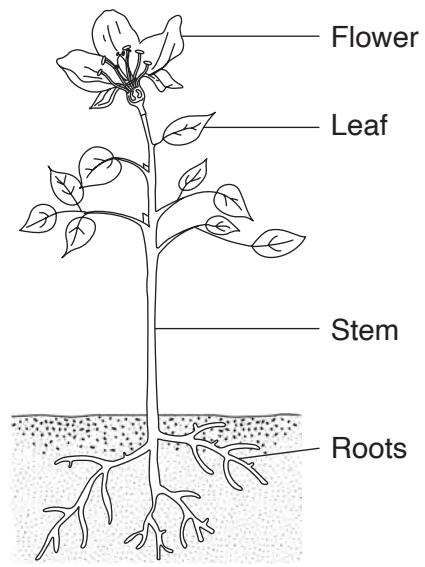
Part I

- 1 Which list contains only *nonliving* things?
 - A coins, snakes, birds
 - B water, rocks, sunlight
 - C rubber ball, plants, house
 - D soil, fish, air

- 2 An example of a learned behavior is
 - A driving a car
 - B having blue eyes
 - C shivering in the cold
 - D breathing air

- 3 Some birds build nests in the spring. This nest building is a seasonal adaptation that occurs to help the birds
 - A fly south
 - B find food
 - C protect their young
 - D survive the winter

4 The diagram below shows four plant structures.



Which plant structure takes in the water and nutrients used by the plant to grow?

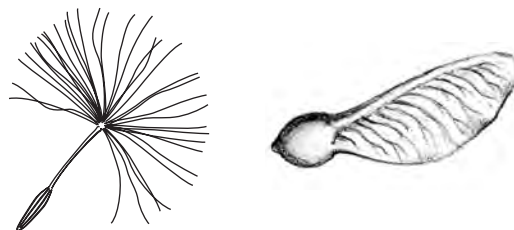
- A flower
- B leaf
- C stem
- D roots

- 5 The diagram below shows a model used to help people make healthful food choices.



Which good health habit is encouraged by this model?

- A exercising regularly
 - B eating a balanced diet
 - C avoiding harmful substances
 - D washing hands
- 6 The diagram below shows seeds from two different plants.



Each seed is attached to a structure that helps the seed to

- A obtain water
- B produce food
- C disperse (spread)
- D capture sunlight

- 7 The diagram below shows a bird. The 🎵 symbol represents the bird making sounds (chirping).



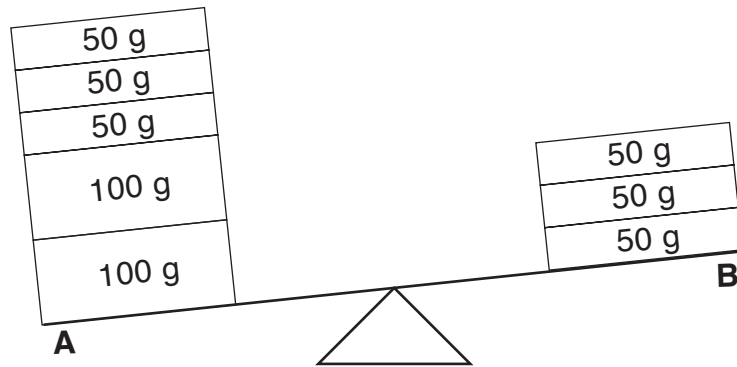
Which animal behavior is demonstrated by the bird chirping?

- A taking in nutrients
 - B eliminating waste
 - C reproducing
 - D communicating
- 8 What is a decomposer?
- A a living thing that breaks down dead organisms
 - B a living thing that makes its own food
 - C an animal that eats live plants
 - D an animal that hunts other animals
- 9 The fur of an arctic fox turns from brown to white as winter approaches. This is an example of
- A camouflage
 - B hibernation
 - C migration
 - D movement

Note that question 10 has only three choices.

- 10** Some birds live in a forest. If many of the trees in the forest are cut down, the shelter for the birds will
- A decrease
 - B increase
 - C remain the same
- 11** The human body gets the energy it needs for growth and repair directly from
- A soil
 - B food
 - C sunlight
 - D water
- 12** One example of matter is
- A sound
 - B light
 - C heat
 - D water
- 13** Which human activity often has a ***harmful*** effect on the environment?
- A recycling paper and plastic
 - B riding a bicycle to school
 - C helping seeds to germinate
 - D throwing garbage into a stream
- 14** The number of daylight hours in New York State changes with the
- A season of the year
 - B Moon's changing appearance
 - C direction of the wind
 - D arrival of a severe storm

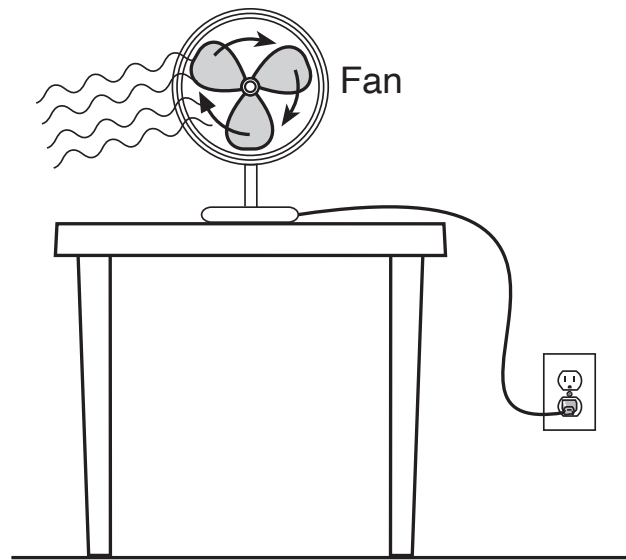
- 15** The diagram below shows a balance. Side *A* has five blocks and side *B* has three blocks. The mass of each block is shown in grams (g).



A student could balance sides *A* and *B* by

- A moving 200 g from side *A* to side *B*
 - B moving 200 g from side *B* to side *A*
 - C moving 100 g from side *A* to side *B*
 - D moving 100 g from side *B* to side *A*
- 16** Which process occurs when rocks and soil slide down a mountain?
- A erosion
 - B migration
 - C recycling
 - D maintenance

- 17** The diagram below shows a fan that uses energy to move the air in a room.



Which form of energy causes the blades of the fan to turn?

- A chemical
 - B electrical
 - C heat
 - D light
- 18** Which metric unit is used to describe an object's length?
- A gram (g)
 - B milliliter (mL)
 - C centimeter (cm)
 - D degree Celsius ($^{\circ}\text{C}$)
- 19** Which property of an object can be described as smooth?
- A color
 - B odor
 - C size
 - D texture

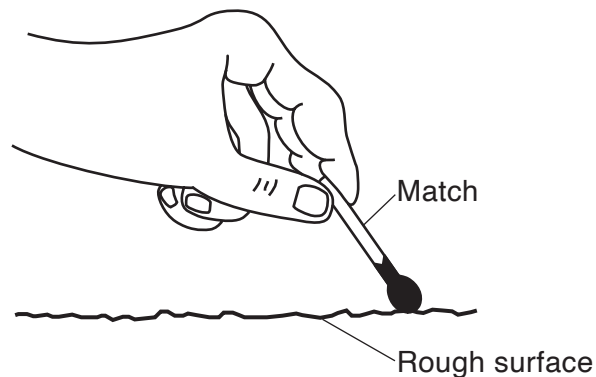
20 One property of liquids is that they have a definite

- A flexibility
- B temperature
- C volume
- D shape

21 Which color shirt will reflect the most light on a hot, sunny day?

- A black
- B blue
- C red
- D white

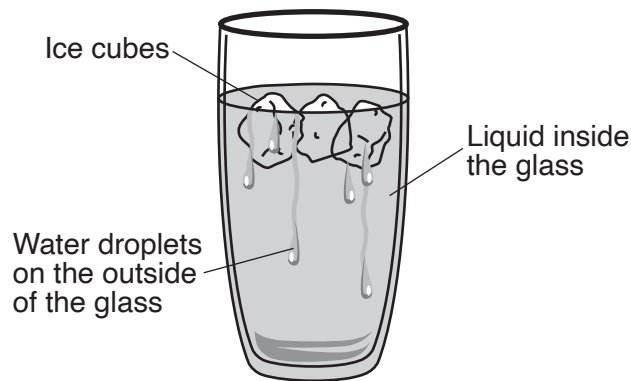
22 The diagram below shows a person lighting a match by rubbing it on a rough surface.



Which form of energy is being used to light the match?

- A solar
- B sound
- C electrical
- D mechanical

- 23** The diagram below shows a glass of liquid with ice that has been placed in a sunny window. Water droplets have formed on the outside of the glass.



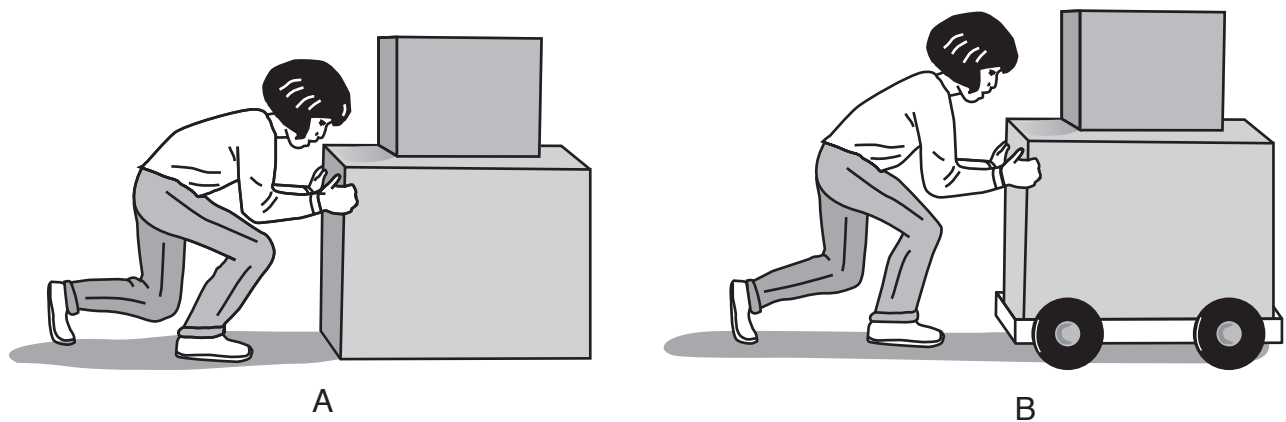
Which process caused the water droplets to form on the outside of the glass?

- A condensation
 - B evaporation
 - C precipitation
 - D runoff
- 24** A student tosses a ball into the air. Which force causes the ball to fall back to the ground?
- A gravity
 - B magnetism
 - C mechanical
 - D friction
- 25** When a boy stands in a field in the sunlight, he usually is able to see his
- A weight
 - B temperature
 - C reflection
 - D shadow

26 Which object will most likely be attracted to a magnet?

- A wooden block
- B plastic cup
- C metal nail
- D glass bead

27 The diagrams *A* and *B* below show a student moving the same boxes in two different ways. In diagram *B*, the student is using wheels, which are part of a simple machine.



It will be easier for the student to use wheels to push the boxes in diagram *B* because there is

- A less mass
- B less friction
- C more gravity
- D more erosion

- 28** The data table below shows air temperatures, in degrees Fahrenheit (°F), recorded at noon for five days.

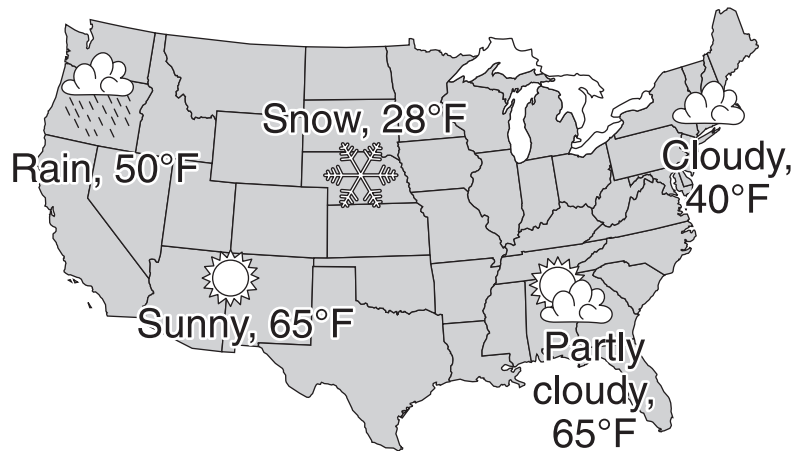
Air Temperatures at Noon

Day	Air Temperature (°F)
Monday	72
Tuesday	75
Wednesday	68
Thursday	70
Friday	70

How much ***lower*** was the temperature at noon on Wednesday than at noon on Monday?

- A 2°F
 - B 4°F
 - C 6°F
 - D 8°F
- 29** On a field trip, a student holds a frog and reports that it has slippery skin. This is an example of
- A a measurement
 - B a prediction
 - C an explanation
 - D an observation

- 30** The map below shows some weather conditions at five different locations on a single day in the United States.



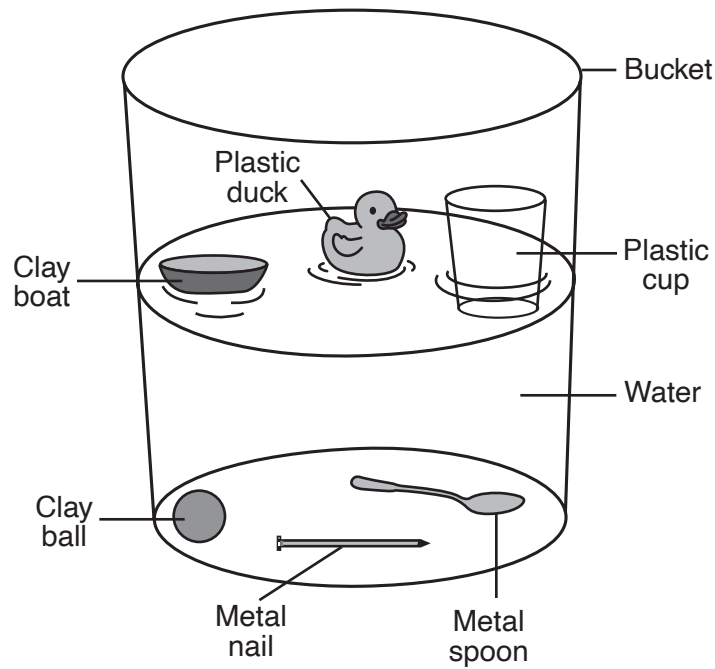
What is the temperature at the location on the map where liquid precipitation is occurring?

- A 28°F
- B 40°F
- C 50°F
- D 65°F

Part II

Directions (31–44): Record your answers in the space provided below each question.

- 31** A group of students did a sink-or-float experiment with six different objects in a bucket of water. The diagram below shows the results.



Use the diagram to complete the chart below. Place an **X** in the correct column for each object to indicate if it sank or floated in water. [1]

Object	Sank	Floated
clay boat		
clay ball		
plastic duck		
plastic cup		
metal spoon		
metal nail		

- 32** The data table below shows the times of sunrise for several days in August 2012.

Data Table

Day	Time of Sunrise
Day 1	6:00 a.m.
Day 4	6:03 a.m.
Day 7	6:06 a.m.
Day 10	6:09 a.m.
Day 13	6:12 a.m.
Day 16	?

Based on the pattern shown in the data table, predict the sunrise time for Day 16. [1]

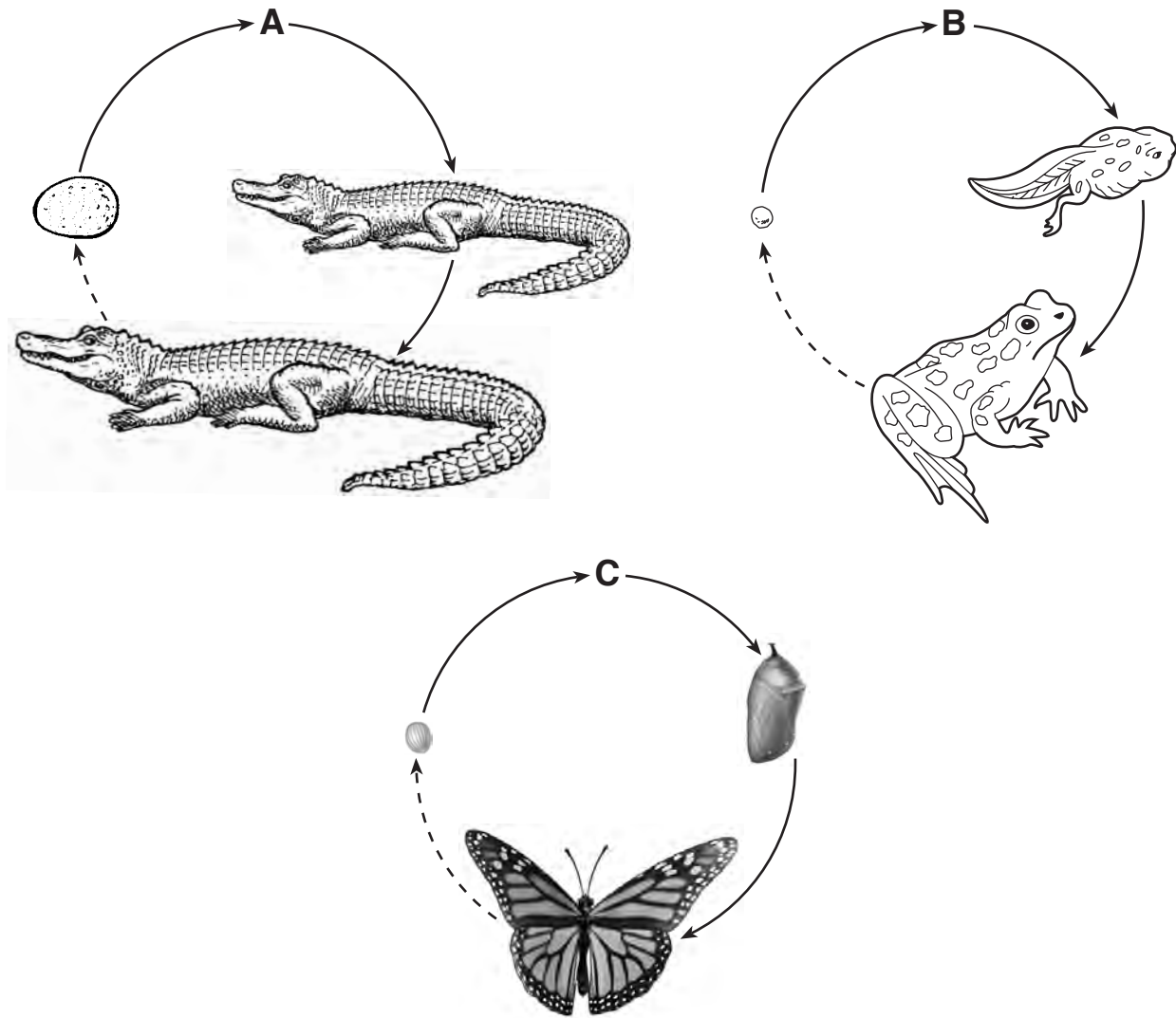
_____ **a.m.**

- 33** Humans use different body structures to sense their environment. The chart below lists five observations that a student made about a piece of fruit, using the five senses. Complete the chart by identifying the body structure used to make **each** observation. The body structure used to observe touch is shown. [1]

Observations of Fruit Made Using the Five Senses

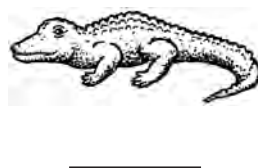
Observation of Fruit	Sense	Body Structure Used to Make this Observation
smooth surface	touch	skin
fruity	smell	
red color	sight	
makes a sound when dropped	hearing	
sweet	taste	

- 34** Three life cycles are shown in the diagrams below. In each life cycle, one stage is labeled A, B, or C.



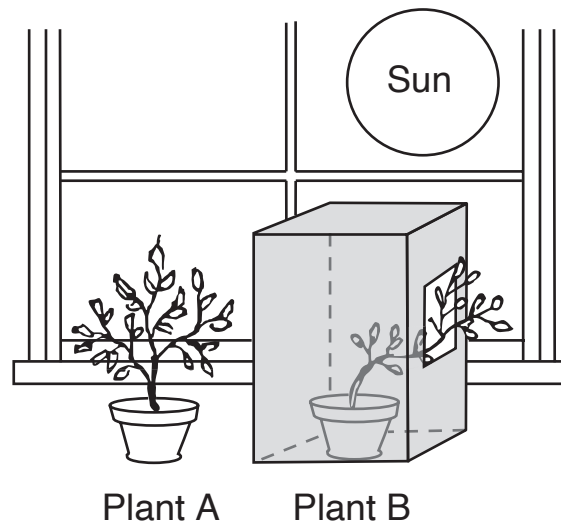
(Not drawn to scale)

Each diagram below shows a stage from one of these three life cycles. Underneath each diagram, place the letter from the diagram above that shows in which life cycle it belongs. [1]



Base your answers to questions 35 and 36 on the experiment and diagram below and on your knowledge of science.

A student placed two plants, *A* and *B*, near a sunny window to study plant growth. Plants *A* and *B* were the same type of plant and received the same amount of water. Plant *B* was covered with a box that had a hole cut into its side. The results after several weeks are shown in the diagram.



35 Explain why plant *B* grew out of the hole in the box. [1]

36 Explain why the student included plant *A* in the experiment. [1]

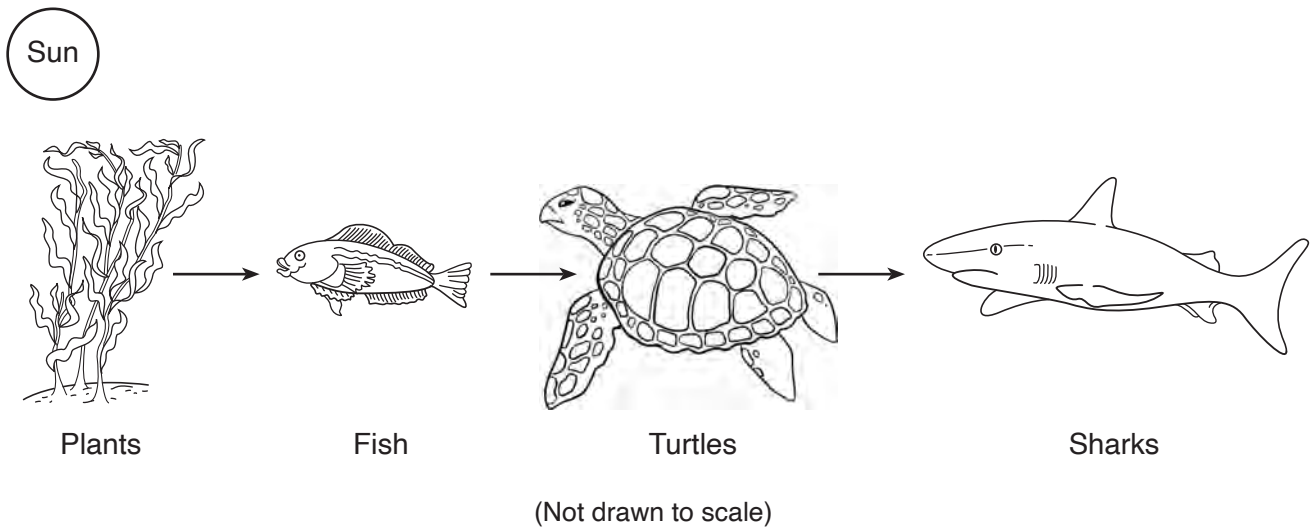
37 Describe **one** change that will happen to an oak tree in New York State as the season changes from fall to winter. [1]

38 The chart below describes two different motions of Earth. Identify these two Earth motions by writing each word in the box below in the blank space next to its description. [1]

rotation
revolution

Description of Earth Motion	Name of Earth Motion
Earth moves in a path around the Sun, causing one year.	
Earth spins around once every 24 hours, causing day and night.	

Base your answers to questions 39 through 41 on the diagram below and on your knowledge of science. The diagram shows an ocean food chain.



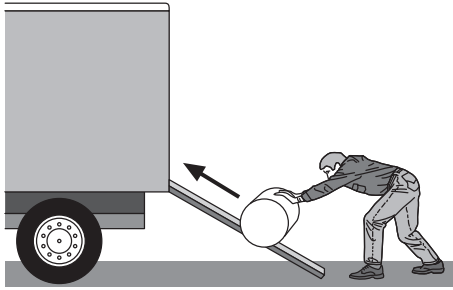
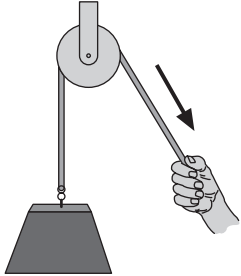
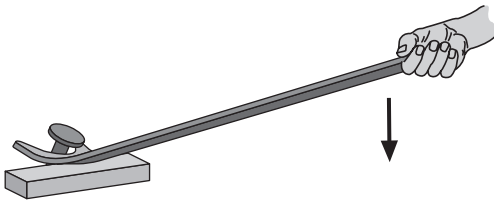
39 What is the main source of energy for this food chain? [1]

40 Which organism in this food chain is a producer? [1]

41 Identify the organism in this food chain that is both a predator and prey. [1]

- 42** The diagrams below show three different simple machines. Use the three terms in the box to complete the chart by identifying **each** simple machine shown. [1]

lever
inclined plane
pulley

Diagram	Simple Machine
	
	
	

- 43** The diagram below shows a flashlight. A flashlight uses energy stored in batteries to produce electricity to light the bulb.

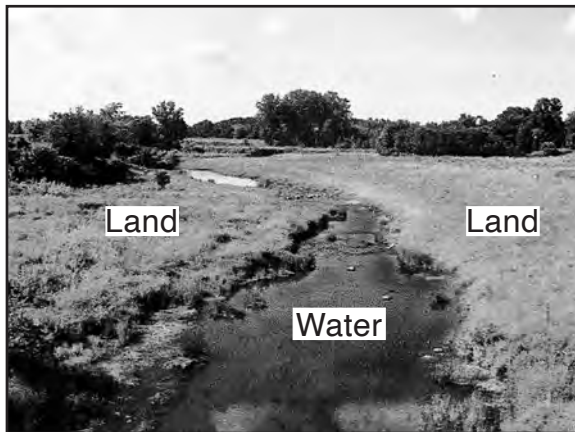


When a student turned on the flashlight, light was ***not*** produced. Give ***two different*** reasons why the flashlight might be broken and ***not*** produce any light. [2]

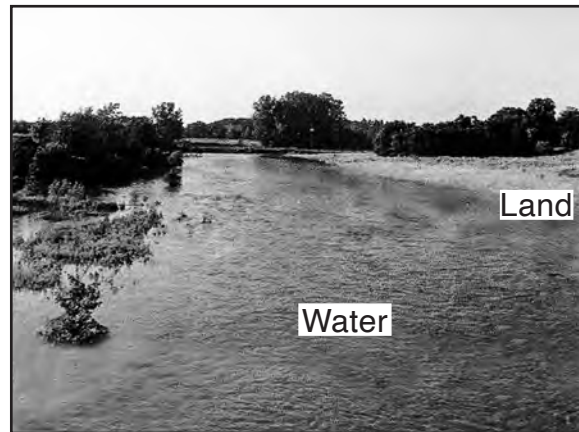
Reason 1: _____

Reason 2: _____

- 44 The pictures below show an area before and after an extreme natural event.



Before



After

Identify **one** extreme natural event that could have caused the area to look like it does in the *After* picture. [1]

GRADE 4

ELEMENTARY-LEVEL SCIENCE TEST

JUNE 2016 WRITTEN TEST FOR TEACHERS ONLY

SCORING KEY AND RATING GUIDE

Note: All schools (public, nonpublic, and charter) administering the Grade 4 Elementary-Level Science Test 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.

Question Number	Correct Response	Question Number	Correct Response	Question Number	Correct Response
1	B	11	B	21	D
2	A	12	D	22	D
3	C	13	D	23	A
4	D	14	A	24	A
5	B	15	C	25	D
6	C	16	A	26	C
7	D	17	B	27	B
8	A	18	C	28	B
9	A	19	D	29	D
10	A	20	C	30	C

- 31 [1] Allow 1 credit for *all six* **X**s placed in the correct columns as shown in the chart below.

Object	Sank	Floated
clay boat		X
clay ball	X	
plastic duck		X
plastic cup		X
metal spoon	X	
metal nail	X	

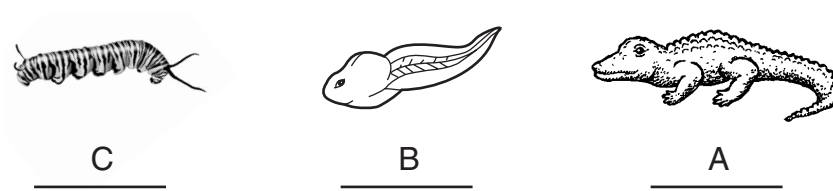
Note: Allow credit if a symbol other than an **X** is used.

- 32 [1] Allow 1 credit for 6:15 a.m.

- 33 [1] Allow 1 credit for a correct body structure in *all four* unshaded rows. Acceptable responses include, but are not limited to:

Observation of Fruit	Sense	Body Structure Used to Make this Observation
smooth surface	touch	skin
fruity	smell	nose
red color	sight	eye(s)
makes a sound when dropped	hearing	ear(s)
sweet	taste	— tongue — mouth — tastebud(s) — nose

34 [1] Allow 1 credit for *all three* letters placed correctly, as shown below.



Note: Allow credit if the student names butterfly, frog, alligator/crocodile, instead of *C*, *B*, *A*.

35 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Plants grow toward the light.
- It was growing out to get to the sunlight.
- It grew toward the sunlight.
- It needed light./needs light for making food
- to get sunlight
- phototropism response

36 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- to see what happened without a box
- to see how it would be different from *B*
- Plant *A* was a control.
- to compare *B* to *A*

37 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The tree will lose its leaves.
- The tree will become bare.
- The leaves will change color.
- The leaves will fall.
- The leaves will die.
- Acorns will fall off the tree.

Note: Do *not* allow credit for “the tree will die” since this is not a seasonal change.

38 [1] Allow 1 credit for the *two* words placed as shown in the chart below.

Description of Earth Motion	Name of Earth Motion
Earth moves in a path around the Sun, causing one year.	revolution
Earth spins around once every 24 hours, causing day and night.	rotation

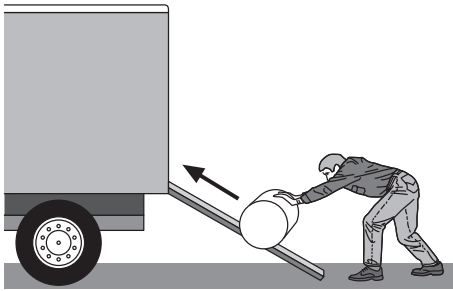
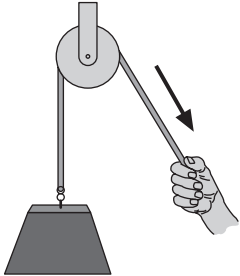
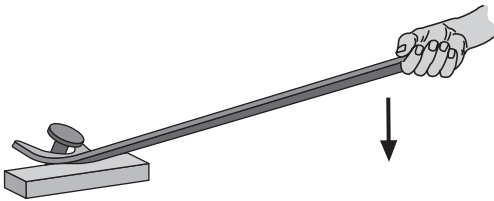
39 [1] Allow 1 credit for the Sun *or* sunlight.

40 [1] Allow 1 credit for plant(s).

Note: Allow credit if the student identifies “seaweed” *or* “algae,” even though these two organisms are not classified as true plants.

41 [1] Allow 1 credit for turtle(s).

42 [1] Allow 1 credit for *three* acceptable responses, as shown in the chart below.

Diagram	Simple Machine
	inclined plane
	pulley
	lever

43 [2] Allow a maximum of 2 credits, 1 credit for each acceptable response. Acceptable responses include, but are not limited to:

- The battery is dead./needs new batteries
- batteries missing
- batteries put in wrong
- The lightbulb is dead./has a broken filament/bulb is broken
- circuit is open
- The switch is broken.
- A wire is broken.
- circuit is broken

Note: Acceptable responses must include two *different* reasons.

44 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- flood
- hurricane
- heavy rain
- sudden melting of snow upstream
- thunderstorm/storm
- earthquake destroyed a nearby dam