

THE UNIVERSITY OF THE STATE OF NEW YORK

# GRADE 4

## ELEMENTARY-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 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 15 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.

**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

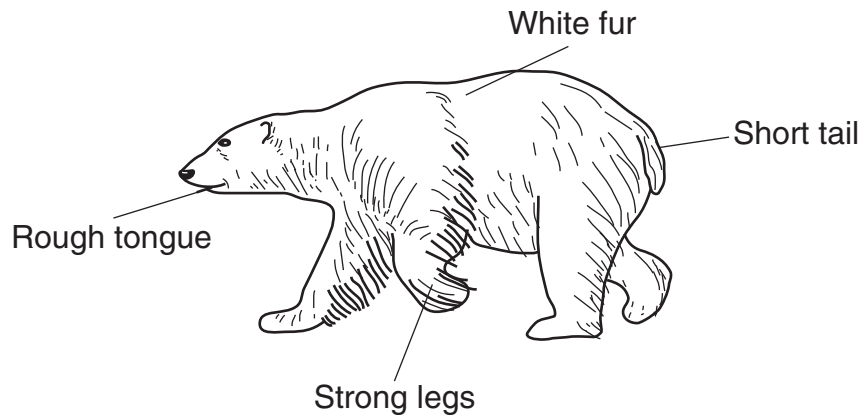
1 Which life process is common to all living things?

- A reproduction
- B germination
- C hunting for food
- D pollinating flowers

2 A skunk's odor is unpleasant to other animals. A monarch butterfly's coloration warns birds of its bitter taste. These adaptations help these animals to

- A find water
- B find prey
- C seek shelter
- D avoid predators

3 The diagram below shows a polar bear that lives in a cold, snowy environment. Four of the polar bear's body structures have been labeled.



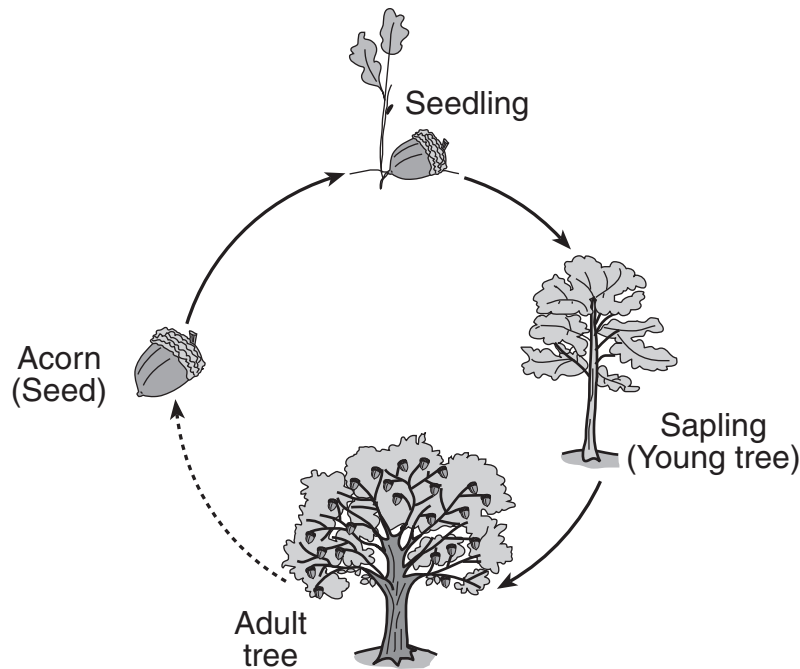
Which body structure provides camouflage for the polar bear in its environment?

- A rough tongue
- B strong legs
- C short tail
- D white fur

4 When the food supply in an area ***decreases***, many of the deer living there will

- A move to a new habitat
- B change their color
- C hibernate
- D reproduce

5 The diagram below shows the growth and development of an oak tree.



(Not drawn to scale)

This diagram shows a

- A life span
- B life cycle
- C food chain
- D food supply

- 6 The main purpose of a plant's flower is to
- A soak up water
  - B produce seeds
  - C provide shelter
  - D support the plant
- 7 Humans have hair and nails that are always growing. What provides the energy needed for this growth to occur?
- A wind
  - B food
  - C water
  - D soil
- 8 A prairie dog whistles loudly when it senses danger. When it whistles, all of the prairie dogs nearby run and hide in their burrows. Which sense helps the other prairie dogs receive this warning?
- A hearing
  - B sight
  - C smell
  - D taste
- 9 The diagram below shows an eagle that has captured a rabbit for food



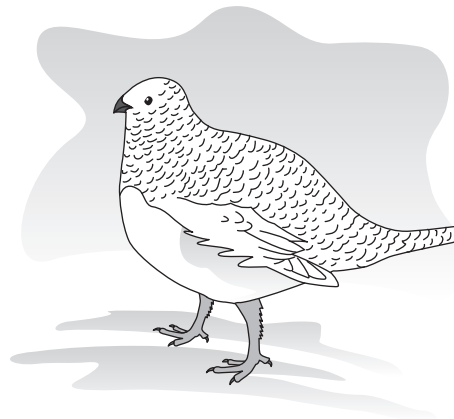
This rabbit is an example of a

- A decomposer
- B predator
- C prey
- D producer

10 The diagram below shows the same arctic bird in summer and winter.



Arctic bird in summer



Arctic bird in winter

Which observation of the bird in winter provides the best evidence that the bird is storing fat?

- A It has fewer feathers.
- B It changes color.
- C It is bigger.
- D It has a longer neck.

**Note that question 11 has only three choices.**

11 Frogs eat crickets. If the population of crickets in an area *decreases*, the number of frogs in the area will most likely

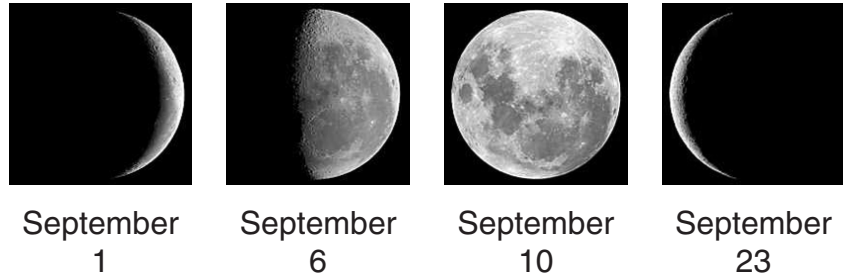
- A decrease
- B increase
- C remain the same

12 What provides the source of energy for the water cycle?

- A rain
- B soil
- C the Sun
- D the Moon

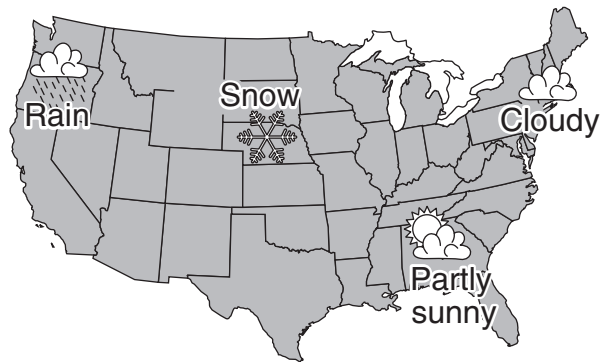
- 13 Which human activity has a helpful effect on the environment?
- A littering
  - B polluting
  - C recycling
  - D smoking
- 14 Many organisms live in the forest. The taller trees in the forest are often cut down for wood. How can this change in the environment be **helpful** to plants?
- A Water erodes the soil.
  - B Animals have more food.
  - C Humans build new houses.
  - D More sunlight reaches the ground.
- 15 How long does it take Earth to revolve around the Sun?
- A one year
  - B one month
  - C one week
  - D one day

- 16** The diagram below shows the appearance of an object in the sky that was observed from Earth during the month of September.



The object being observed was most likely

- A the Sun
  - B the Moon
  - C a star
  - D a planet
- 17** The map below shows some weather conditions occurring at different locations in the United States on a certain day.



Which two conditions shown on the map are forms of precipitation?

- A cloudy and partly sunny
- B snow and partly sunny
- C snow and rain
- D cloudy and rain

- 18 A student crumpled up a flat sheet of paper into a round ball. Which property of the paper changed?
- A hardness
  - B color
  - C mass
  - D shape
- 19 Which property of a mirror makes it possible for a student to see her image in it?
- A volume
  - B magnetism
  - C reflectiveness
  - D conductivity
- 20 Which type of energy needs to be **removed** from liquid water to change the liquid water to solid water?
- A light
  - B heat
  - C sound
  - D chemical
- 21 Which example of matter has **no** definite shape and **no** definite volume?
- A air
  - B clay
  - C rock
  - D milk
- 22 Which form of energy is produced when a person claps his hands?
- A chemical
  - B electrical
  - C light
  - D sound



**23** The photograph below shows a waterfall.



Which two processes are occurring when rock particles are carried over the cliff by the waterfall and then settle in another area?

- A evaporation and condensation
- B deposition and evaporation
- C condensation and erosion
- D erosion and deposition

**24** Which unit should be used when a student uses a metric ruler to measure the length of a desk?

- A degree Celsius ( $^{\circ}\text{C}$ )
- B gram (g)
- C milliliter (mL)
- D centimeter (cm)

**25** A student rubs her hands together. Her hands will feel warmer due to heat produced by

- A erosion
- B friction
- C gravity
- D sunlight

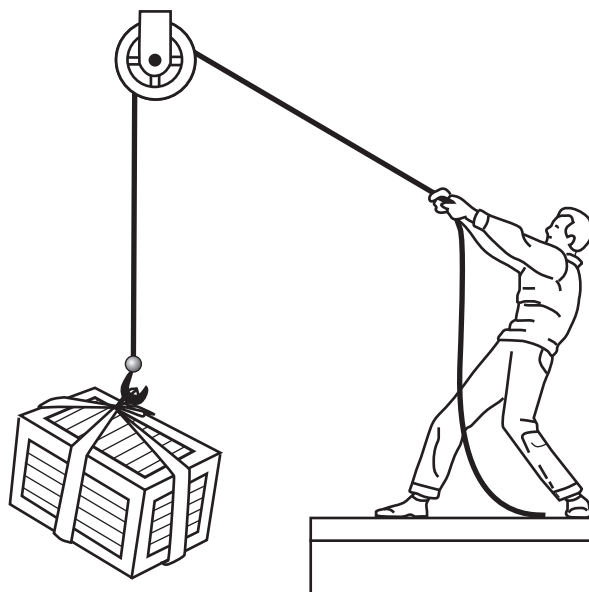
**26** Which action allows electrical energy to change to another form of energy?

- A sleeping in a cold room
- B turning on a light in a dark room
- C cooking food on an open campfire
- D playing a violin in a music group

**27** Which force pulls objects toward the center of Earth?

- A gravity
- B friction
- C magnetism
- D electricity

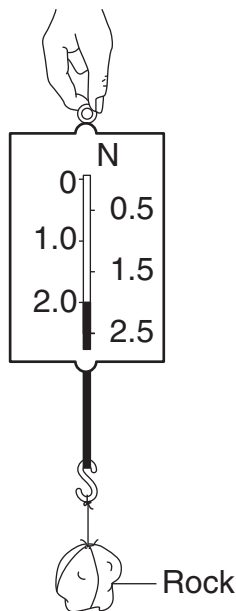
**28** The diagram below shows a person using a simple machine to lift a box.



The box is being lifted with the help of

- A an inclined plane
- B a magnet
- C a pulley
- D a lever

**29** The diagram below shows a spring scale.



(Not drawn to scale)

The spring scale is being used to measure the rock's

- A temperature
- B weight
- C length
- D volume

**30** Which statement about frogs is an example of an opinion?

- A Frogs lay eggs.
- B Frogs live in all 50 states.
- C Frogs are very unusual animals.
- D There are over 4,000 kinds of frogs.

\*\*\*\*\*

## Part II

*Directions* (31–45): Record your answers in the space provided below each question.

- 31** The chart below shows a page from a student’s science journal. The student observed the properties of the same cup of ice cream at three different times on one day. Mass was measured in grams (g) and temperature was measured in degrees Celsius (°C).

**Observations of Ice Cream**

Time	Observations
5:30 p.m.	— temperature is 0°C — texture is hard — mass of cup and ice cream is 125 g
5:45 p.m.	— texture is soft — temperature is 2°C — mass of cup and ice cream is 125 g
6:15 p.m.	— mass of the cup and ice cream is 125 g — texture is very soft — temperature is 5°C

The student organized some of these observations into the data table below. Complete the data table by filling in the information that belongs in the blank boxes. [1]

**Data Table**

Property of the Ice Cream	Observations of Ice Cream at Different Times		
	5:30 p.m.	5:45 p.m.	6:15 p.m.
temperature of the ice cream	0°C		5°C
texture of the ice cream		soft	very soft
mass of the cup and ice cream	125 g	125 g	

Base your answers to questions 32 and 33 on the data table below and on your knowledge of science. The data table shows the times of sunrise and sunset in Albany, New York, for four days in a row. The time of sunset for day 5, the next day, is ***not*** shown.

**Sunrise and Sunset Times for  
Five Days in Albany, New York**

Day	Sunrise	Sunset
1	5:48 a.m.	8:15 p.m.
2	5:49 a.m.	8:14 p.m.
3	5:50 a.m.	8:13 p.m.
4	5:51 a.m.	8:12 p.m.
5	5:52 a.m.	

**32** How much earlier was sunrise on day 1 than on day 4? [1]

\_\_\_\_\_ **minutes**

**33** Based on the pattern in the data table, predict the time of sunset on day 5. [1]

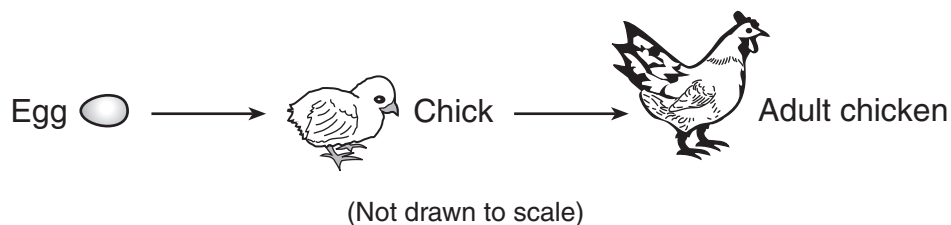
\_\_\_\_\_ **p.m.**

\*\*\*\*\*

- 34** People inherit many traits from their parents. Some characteristics are **not** inherited and are acquired later on. In the chart below, place an **X** in the column to identify whether the observation of a person is an inherited trait or an acquired characteristic. The **X** for the first row is shown. [1]

Observation of Person	Inherited Trait	Acquired Characteristic
having brown eyes	X	
having a scar		
having large ears		
having a tattoo		

- 35** The diagram below shows three stages in the life of a chicken. [1]

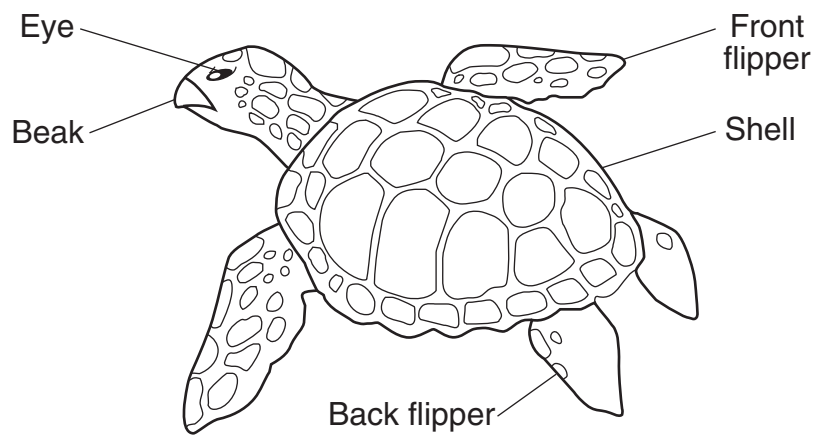


Describe **one** way that the chick's body changes as it develops into an adult. [1]

---

---

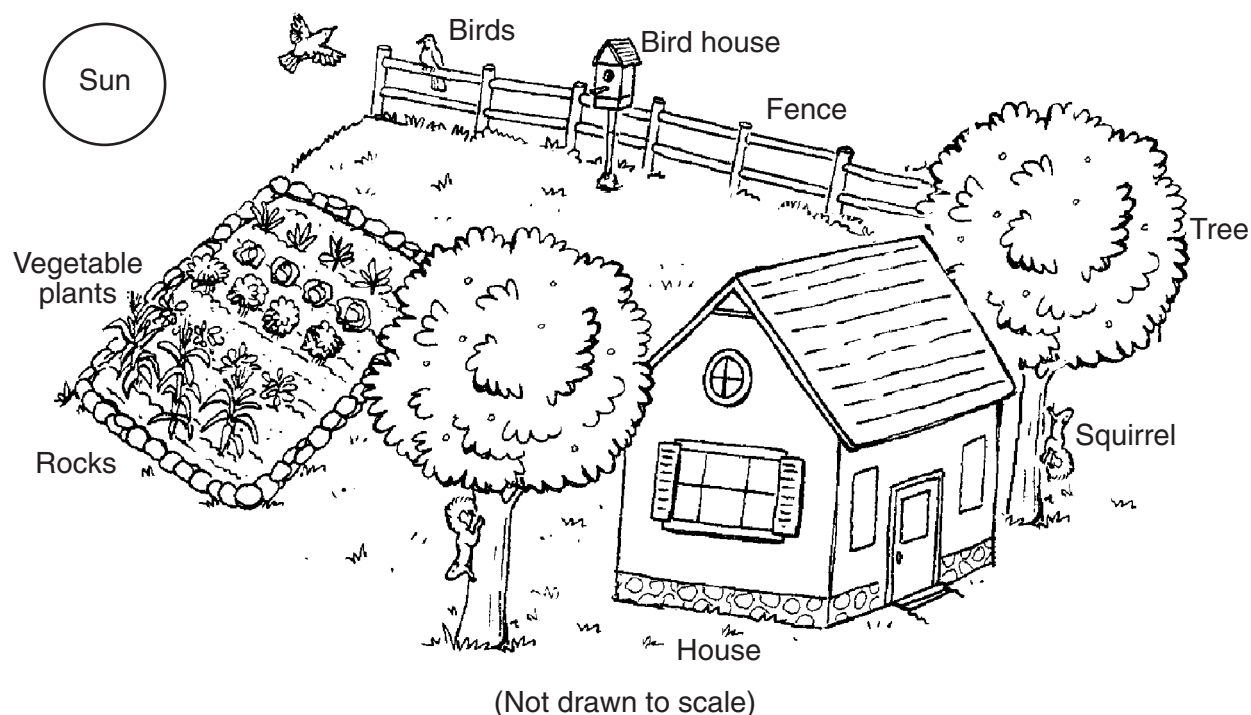
- 36** Animals have different body structures and adaptations that help them grow and survive. The diagram below shows a sea turtle with five body structures labeled.



The chart below lists the functions of these body structures. Complete the chart by placing each labeled body structure next to the function it performs. The body structure that is used to dig a hole for eggs is shown. [1]

Function	Body Structure
to dig a hole for eggs	back flipper(s)
to see predators	
to eat and drink	
to swim in water	

Base your answers to questions 37 and 38 on the diagram below and on your knowledge of science. The diagram shows some living and nonliving things.



**37** Identify **one** thing labeled in the diagram that uses energy from the Sun to make food. [1]

---

**38** Identify **one nonliving** thing labeled in the diagram that was created by humans. [1]

---

\*\*\*\*\*



**39** Identify **two** activities that promote good health in humans. [1]

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

\_\_\_\_\_

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

\_\_\_\_\_

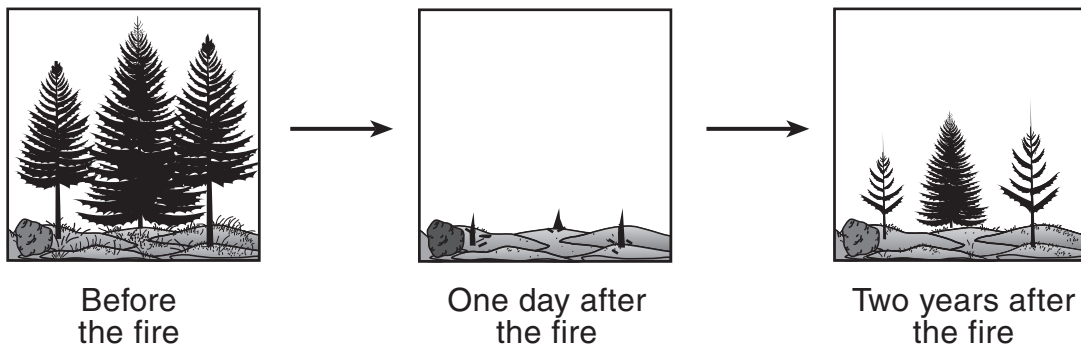
**40** A student observes that a rock has the following characteristics:

black  
no odor  
round  
smooth

The chart below lists three senses that people can use to make observations of objects. Complete the chart by identifying **one** characteristic of the rock that was observed by using each sense listed. [1]

Sense	Characteristic Observed by Using This Sense
sight	
smell	
touch	

- 41 The diagram below shows a forest area before a fire, one day after the fire, and two years after the fire.

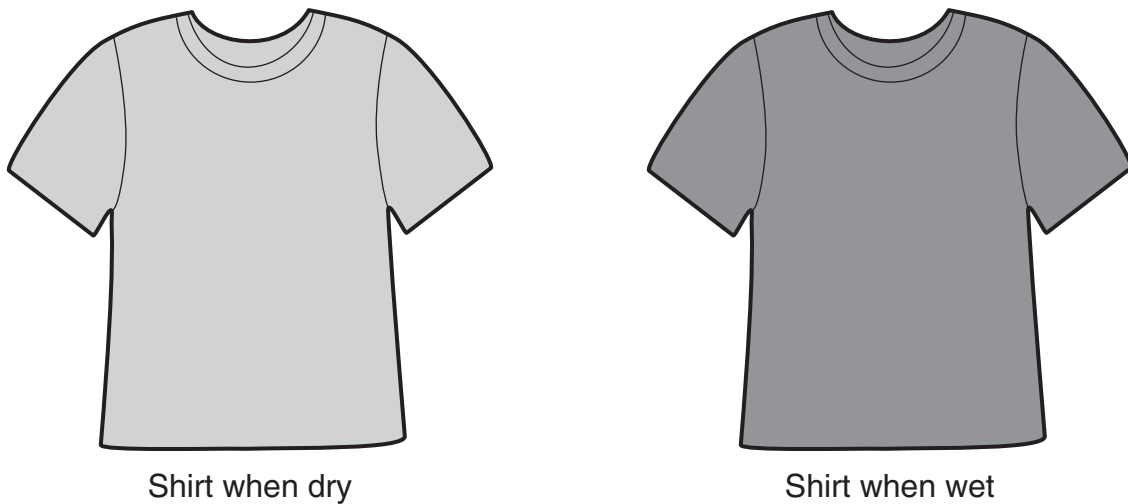


Describe **one** way in which animals that remained in the area after the fire may have been **negatively** affected by the fire. [1]

---

---

- 42 The diagram below shows the same shirt when it is dry and when it is wet.

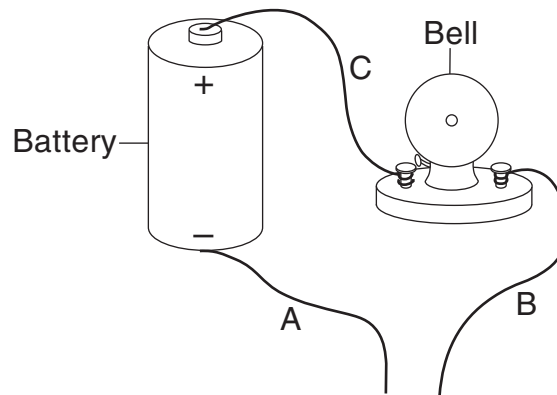


Describe how the appearance of the shirt changed when it became wet. [1]

---

---

- 43 The diagram below shows part of an electrical circuit that includes a battery, a bell, and three wires labeled *A*, *B*, and *C*.



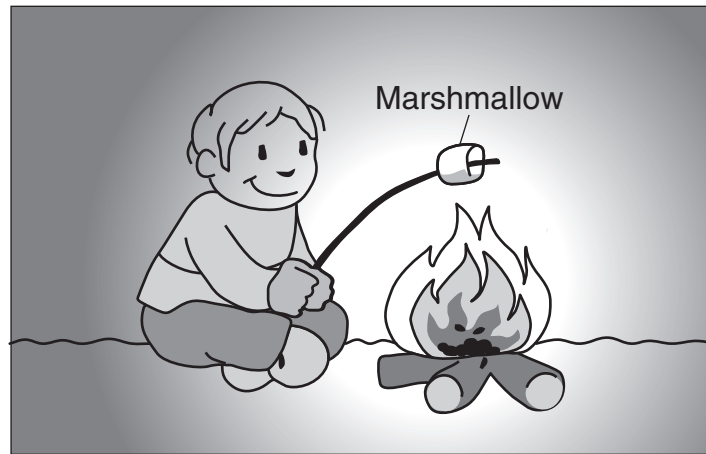
The bell does ***not*** make a sound. Explain what needs to be done to the circuit so that the bell will make a sound. [1]

---

---

---

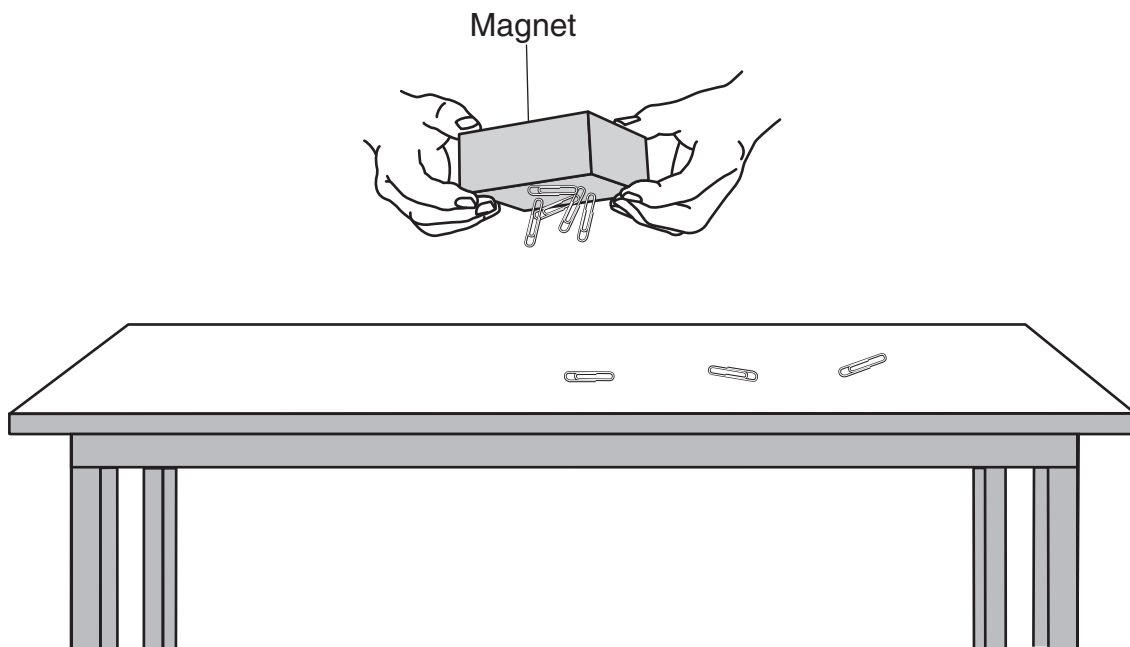
- 44 The diagram below shows a student sitting near a campfire, roasting a marshmallow on a cool evening.



Different types of energy are produced by the campfire. Complete the chart below by describing **one** way that each type of energy produced by the campfire is **helpful** to the student. [1]

Type of Energy Produced by the Campfire	How This Energy is Helpful to the Student
heat	
light	

45 The diagram below shows a magnet picking up paper clips from a table.



Give **one** reason why the magnet was able to pick up only **some** of the paper clips on the table. [1]

---

---

---

\*\*\*\*\*

# GRADE 4

## ELEMENTARY-LEVEL SCIENCE TEST

### JUNE 2018 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	A	11	A	21	A
2	D	12	C	22	D
3	D	13	C	23	D
4	A	14	D	24	D
5	B	15	A	25	B
6	B	16	B	26	B
7	B	17	C	27	A
8	A	18	D	28	C
9	C	19	C	29	B
10	C	20	B	30	C

- 31 [1] Allow 1 credit for an acceptable response in *all three* unshaded boxes, as shown below.

**Data Table**

Property of the Ice Cream	Observations of Ice Cream at Different Times		
	5:30 p.m.	5:45 p.m.	6:15 p.m.
temperature of the ice cream	0°C	2°C	5°C
texture of the ice cream	hard	soft	very soft
mass of the cup and ice cream	125 g	125 g	125 g

**Note:** Do *not* allow credit if data are entered without units.

- 32 [1] Allow 1 credit for 3 minutes.

- 33 [1] Allow 1 credit for 8:11 p.m.

**Note:** Allow credit if the student places the correct time in the data table for day 5 sunset if no response is written on the line.

- 34 [1] Allow 1 credit if *only three* **Xs** are placed correctly in the unshaded rows, as shown in the chart below.

Observation of Person	Inherited Trait	Acquired Characteristic
having brown eyes	X	
having a scar		X
having large ears	X	
having a tattoo		X

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

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

- Its body gets bigger.
- Feathers change color/size/shape/form.
- gets more feathers
- It grows.
- It gets taller.
- It is able to lay eggs/reproduce.

**Note:** Do *not* allow credit for “size” and “feathers” alone, as there is no qualifier to show a change.

**36** [1] Allow 1 credit for an acceptable response in *all three* unshaded rows, as shown below.

Function	Body Structure
to dig a hole for eggs	back flippers
to see predators	— eye(s)
to eat and drink	— beak
to swim in water	— flipper(s) — front/back flippers

**Note:** Do *not* allow credit for structures not labeled on the diagram; e.g. feet, mouth.

**37** [1] Allow 1 credit for tree *or* vegetable plants/vegetables/plants.

**38** [1] Allow 1 credit for birdhouse *or* fence *or* house.



**39** [1] Allow 1 credit for *two* acceptable responses. Acceptable responses include, but are not limited to:

- Eat a healthy diet.
- Eat a lot of fruits and vegetables.
- Get some exercise every day.
- Get a good night's sleep.
- Drink a lot of water.
- Brush your teeth.
- Wash your hands often.
- Ride a bike *or* go running.
- Don't use drugs or alcohol.
- Go to the doctor/get health checkups.

**Note:** Allow credit if *two* forms of exercise or eating *two* food groups are listed.

**40** [1] Allow 1 credit for an acceptable response in *all three* rows. Acceptable responses include, but are not limited to:

Sense	Characteristic Observed by Using This Sense
sight	<ul style="list-style-type: none"><li>— black</li><li>— round</li><li>— smooth</li></ul>
smell	<ul style="list-style-type: none"><li>— no odor</li></ul>
touch	<ul style="list-style-type: none"><li>— smooth</li><li>— round</li></ul>

**41** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Their shelter may have been destroyed.
- fewer animals to eat
- loss of habitat
- loss of food
- may have to find a new home
- may be badly burned or injured
- Smoke in the air is unhealthy.

**Note:** Do *not* allow credit for “the animals will die,” unless a reason is given for the cause of the death, such as those above. The question refers to the effect on remaining animals.

**42** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- It looks darker.
- The color changes.

**43** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Add a closed switch between *A* and *B*.
- Connect wires *A* and *B*.
- Place a conductor between *A* and *B*.
- Wires *A* and *B* should be connected with metal/metal objects.
- The loose wires need to be connected.
- Place a battery between *A* and *B*. (must specify location)
- Complete/close the circuit.

**Note:** Consider any student drawings within the diagram that support the student's required written response.

**44** [1] Allow 1 credit for an acceptable response in *both* rows of the table. Acceptable responses include, but are not limited to:

Type of Energy Produced by the Campfire	How This Energy is Helpful to the Student
heat	<ul style="list-style-type: none"><li>— keeps the student warm</li><li>— helps cook food</li><li>— use it to roast the marshmallow(s)</li></ul>
light	<ul style="list-style-type: none"><li>— to see the area around the fire</li><li>— to see to put marshmallows on sticks</li><li>— to keep animals away</li></ul>

**45** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The other paper clips are not metal.
- The other paper clips are plastic.
- The magnet is too far away to pick all of them up.
- The magnet isn't strong enough.
- Some paper clips are farther away.
- The magnet could only pick up some because its magnetic field was not strong enough.
- The magnet can only pick up some because maybe some are copper. (Copper and some other metals are not magnetic.)
- The magnet can only pick up some because magnets only pick up steel, iron, and nickel.
- because some are metal and the rest are not