

Grade 6 Science Online Practice Test - 1999

(Adapted from the 1999 Grade 6 Science Achievement Test)

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Description

- There are 50 multiple-choice questions on this test.

This test is designed to be completed in 60 minutes; however, you may have an additional 30 minutes to complete the test, if you need it.

Instructions

- Read each question carefully. Each question has four possible answers from which you are to choose the **correct** or **best** answer.
- Calculators may be used but are not necessary.

Multiple Choice

- Decide which of the choices **best** completes the statement or answers the question.
- Locate the circle next to the letter that corresponds to your choice and click on it with your mouse's left button. The circle will fill in. In order to change your answer, click on a different circle. Try the example below.

Example

This examination is for the subject of

- A. mathematics
- B. science
- C. language arts
- D. social studies

- Try to answer all the questions. If you cannot answer a question, go on to the next one. Click on the "Score Test!" button on the last page to get your score.

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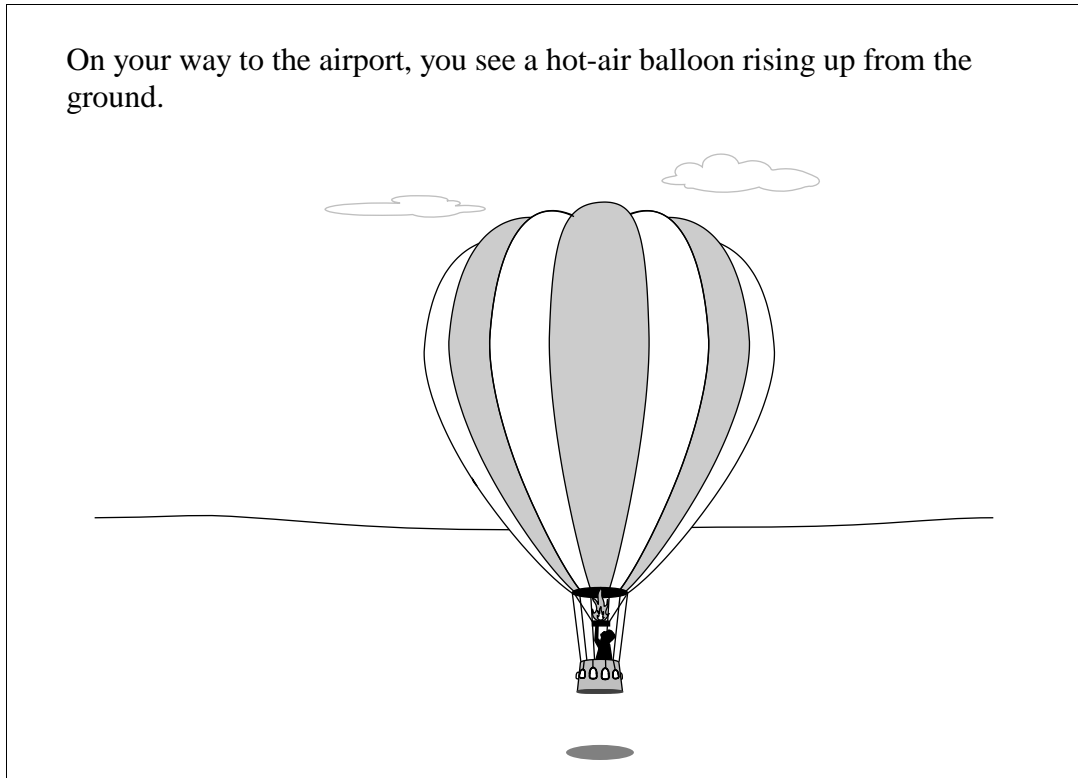
FLYING INTO AN ENVIRONMENTAL CAMP

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As a member of an environment club in southern Alberta, you have been chosen to accompany a pilot working for the Alberta Environmental Protection Agency. She is flying supplies into an environmental camp in the mountains. You are very excited about this because you will have the chance to earn several badges as part of your club activities.

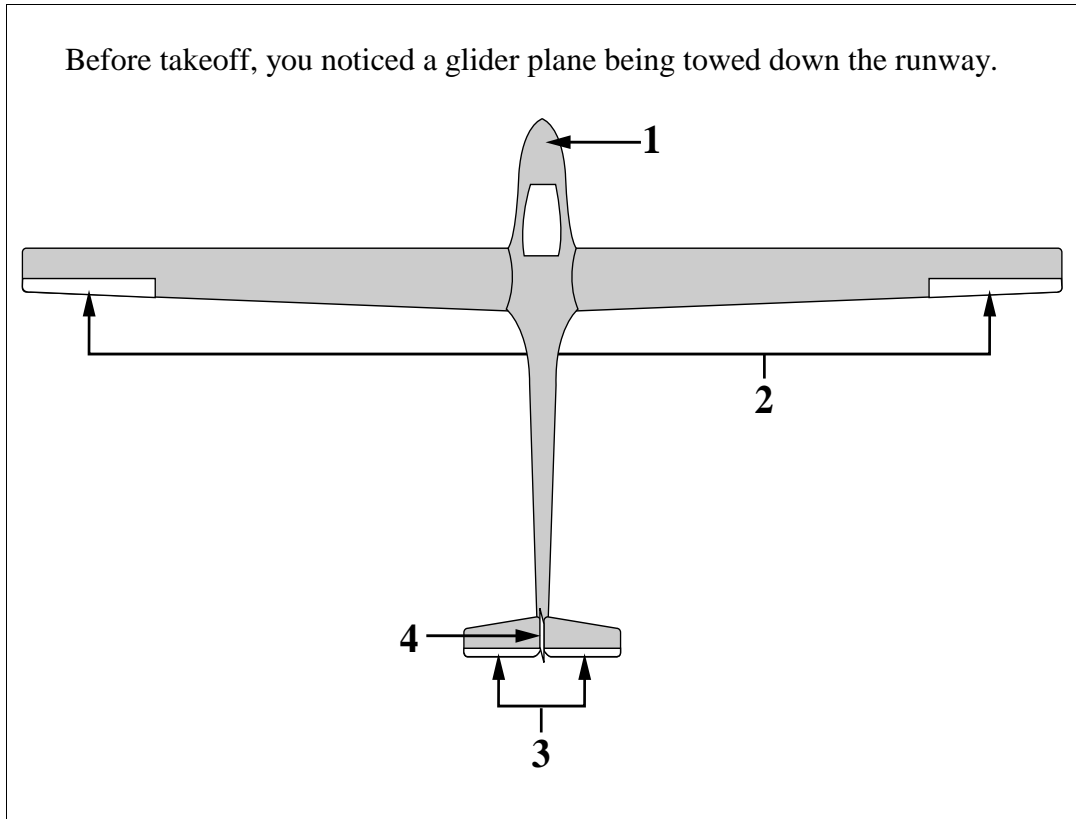
Use the following information to answer question 1.

On your way to the airport, you see a hot-air balloon rising up from the ground.



1. Hot-air balloons rise because the
 - A. air outside the balloon is lighter than the air inside the balloon
 - B. air inside the balloon takes up space and can be compressed
 - C. lift on the balloon is greater than the force of gravity
 - D. air inside the balloon is more dense than the air outside the balloon

Use the following information to answer question 2.



2. In order for the glider to be lifted off the ground, the position of one of its parts must be changed. This part is labelled
- A. 1
 - B. 2
 - C. 3
 - D. 4
-
3. After takeoff, the pilot steadily increases the airplane's speed and altitude. For this increase to occur,
- A. thrust must equal drag and lift must equal gravity
 - B. thrust must be greater than drag and lift must be greater than gravity
 - C. thrust must equal drag and lift must be greater than gravity
 - D. thrust must be greater than drag and lift must equal gravity

4. The pilot explains that the airplane is like a bird in that both are streamlined in order to reduce
- A. lift
 - B. weight
 - C. drag
 - D. thrust

Use the following information to answer question 5.

The pilot states that many of the designs used in the construction of airplanes are similar to features of birds. As you think about what the pilot told you, you consider some features of birds of flight.

Features of Birds

- I** Streamlined design
- II** Tail feathers
- III** Long claws
- IV** Legs that fold up

5. The features of birds listed above that are similar to features in airplane designs are
- A. I, II, and III
 - B. I, II, and IV
 - C. I, III, and IV
 - D. II, III, and IV
-
6. The pilot explains how the airflow around a wing produces the force that holds the airplane up. The airflow is fastest
- A. behind the wing
 - B. in front of the wing
 - C. over top of the wing
 - D. underneath the wing

As the airplane approaches the landing field near the camp, you see smoke from a forest fire in the distance.

7. Once you arrive at the camp, you meet an environmental biologist who explains that forest fires are not completely bad for the environment. One way that forest fires help the environment is that they
- A. allow for the new growth of plants needed by some animals
 - B. produce a gas that reduces the greenhouse effect
 - C. make some plant species extinct, thereby allowing new ones to develop
 - D. force animals to move to other areas
8. After a forest fire, the types of animals that live in a regrowing forest are different from the types of animals that lived in the original forest. This change in the animal population **most likely** occurs because
- A. similar types of vegetation grow in the area at different times
 - B. different types of vegetation grow in the area at different times
 - C. only one type of tree grows in the area immediately after the fire
 - D. only one type of grass grows in the area long after the fire

Use the following information to answer question 9.

You make a chart that shows how the length of the shadow of a small tree can change over a period of a few hours on a sunny day.

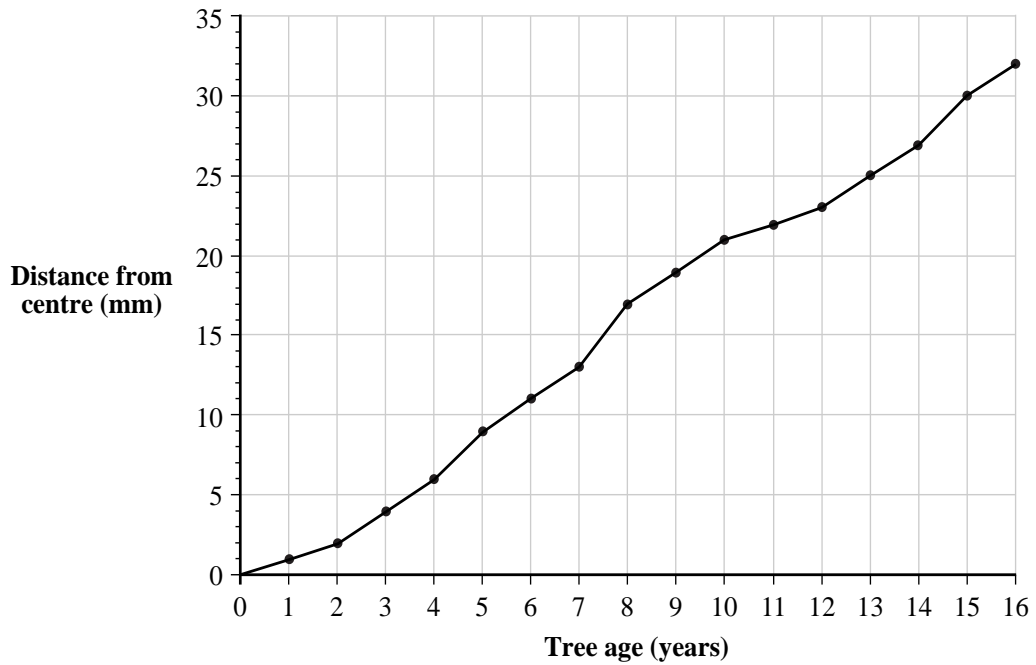
Shadow Length During the Day

Time of day	Length of shadow (mm)
11:00 A.M.	177
11:20 A.M.	164
11:40 A.M.	154
12:00 noon	146
12:20 P.M.	141
12:40 P.M.	138
1:00 P.M.	137
1:20 P.M.	138
1:40 P.M.	140
2:00 P.M.	145
2:20 P.M.	152
2:40 P.M.	161

9. You infer from the chart that the Sun is at the highest point in the sky at
- A. 11:00 A.M.
 - B. 12:00 noon
 - C. 1:00 P.M.
 - D. 2:40 P.M.

Use the following information to answer question 10.

The biologist shows you a graph she made after looking at the growth rings of a large tree stump.



10. This graph shows that the tree grew most slowly between years

- A. 8 and 9
- B. 10 and 11
- C. 12 and 13
- D. 14 and 15

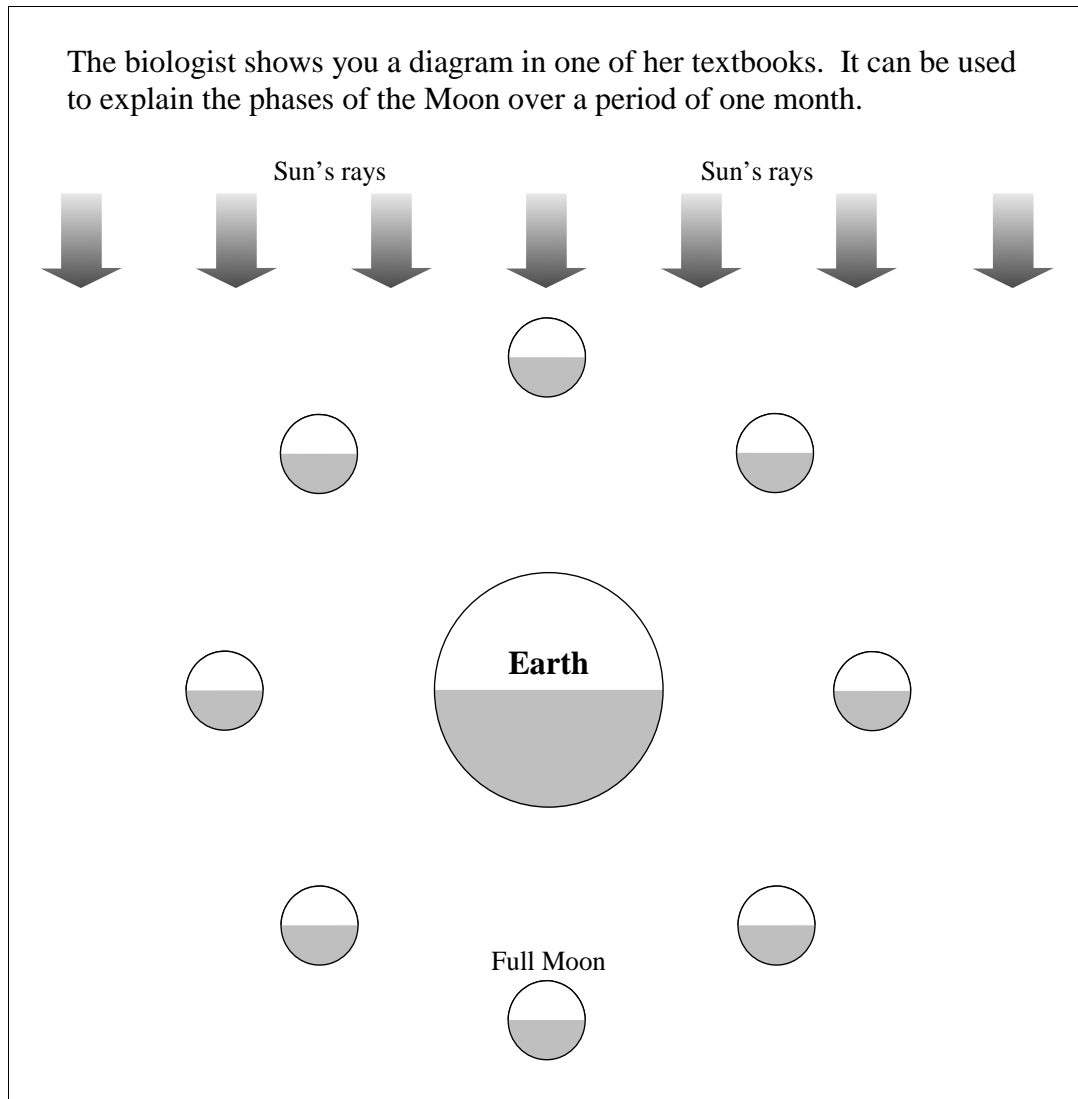
Use the following information to answer question 11.

You see a pile of logs. The end of one of them is illustrated below.



11. Based on the illustration above, the tree **most likely**
- A. was cut from a mature forest
 - B. was a Douglas fir
 - C. lived through a drought
 - D. grew close to another tree
-
12. While looking up at the night sky, you see a bright, full moon. The biologist explains that the Moon does not light up the sky as much as the Sun does because the Moon
- A. is much farther away from Earth than from the Sun
 - B. only reflects some of the light produced by the Sun
 - C. is smaller than Earth
 - D. only reflects light from Earth

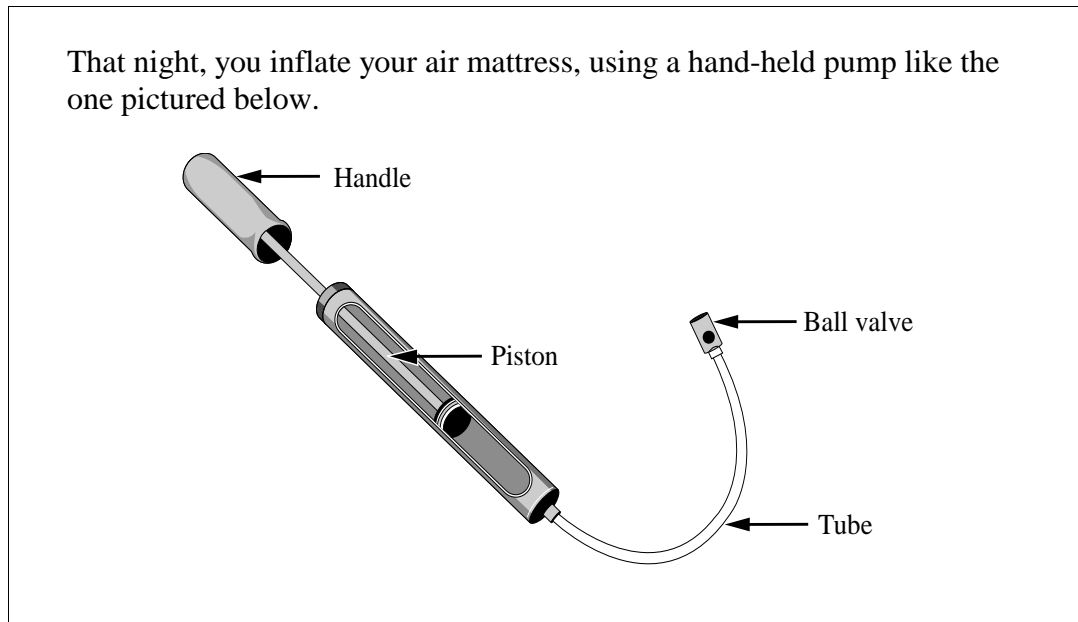
Use the following information to answer question 13.



13. She explains that beginning at the new moon phase, as the Moon revolves around Earth, the portion of the Moon that we see
- A. increases then decreases
 - B. decreases then increases
 - C. remains the same
 - D. disappears

Use the following information to answer question 14.

That night, you inflate your air mattress, using a hand-held pump like the one pictured below.



14. You know that the pump is designed to
- A. pump air only into bicycle tires
 - B. compress air and then allow it to flow out through the valve
 - C. heat air and then allow it to expand to fill the mattress
 - D. reduce the volume of air in the mattress so that air will fill the mattress

In the morning, you collect some leaves as part of a project to earn an environmental badge. The biologist gives you the chart below so that you can identify the leaves.

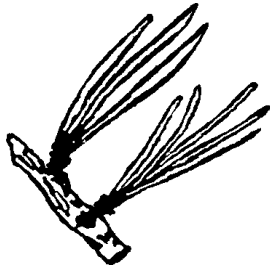
Use the following information to answer questions 15 to 19.

Tree Identification Chart		
Tree	Leaf Description	Tree Description
Balsam poplar	—egg-shaped with a sharp point	—long, narrow shape with large, thick, short branches
Red willow	—pointed tips —attached in alternating pattern —long and skinny	—smooth, slim twigs —straight, unbranched trunk —can be found near water
Red alder	—6 to 12 cm long with pointed tips —serrated edges	—can be shrub-like —grows on stream banks and marshes —produces catkins (cone-like structures)
Trembling aspen	—stem of leaf is longer than leaf —nearly circular with abrupt, short, sharp tip	—long trunk and short, roundish crown
White spruce	—single needle joins twig —needles are four-sided and have tiny, brown stem	—cones found only at the top
Lodgepole pine	—two needles per bunch —spiralled or twisted	—small, hard cones —tall, straight tree —older trees in groups normally have no living branches near the bottom

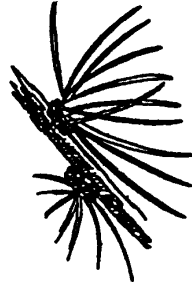
15. The deciduous trees listed in the chart are
- A. trembling aspen, balsam poplar, red willow, and red alder
 - B. balsam poplar, white spruce, red alder, and lodgepole pine
 - C. white spruce and lodgepole pine
 - D. white spruce and balsam poplar

16. According to the chart, which of the following leaf diagrams is a lodgepole pine?

A.



B.



C.



D.



17. The biologist shows you some pictures of trees. After reading the chart, you realize that a trembling aspen is shown in

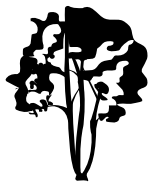
A.



B.



C.

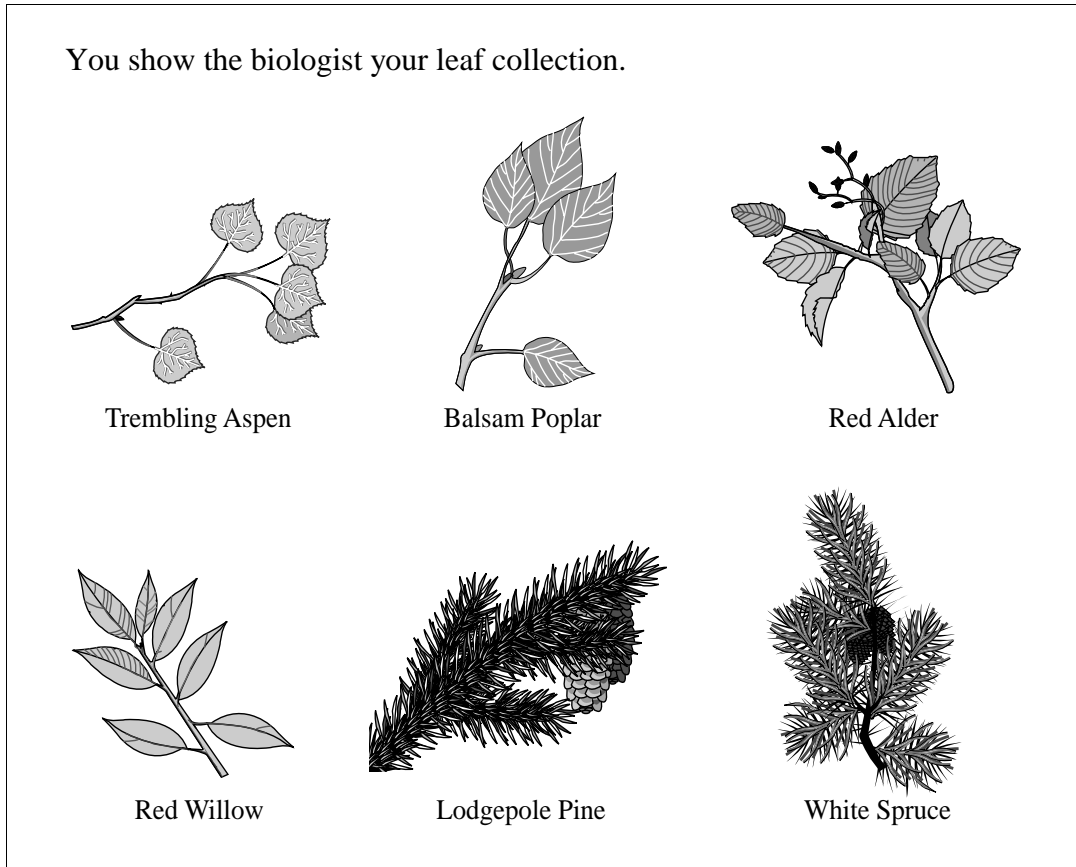


D.



18. Near a river, the biologist shows you many trees with long, slender leaves that have been nibbled by deer. You use the chart to identify the trees as
- A. red willows
 - B. balsam poplars
 - C. red alders
 - D. trembling aspens

Use the following additional information to answer question 19.



19. The biologist says that you have labelled two leaves incorrectly. She identifies the leaves that have been **incorrectly** labelled as the
- A. white spruce and lodgepole pine
 - B. red alder and balsam poplar
 - C. red willow and red alder
 - D. trembling aspen and balsam poplar

20. You and the biologist discuss how leaves produce food for trees by the process of
- A. transpiration
 - B. respiration
 - C. digestion
 - D. photosynthesis
21. During the flight home, the pilot explains that in areas where land has been clear-cut the water quality of nearby rivers can change because
- A. insect numbers decrease
 - B. solar heat increases
 - C. nutrients decrease
 - D. soil erosion increases



The next 13 questions are about science demonstrations, projects, and displays that you saw when you visited a school science fair in Alberta.

Use the following information to answer question 22.

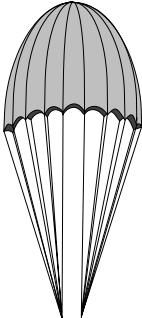
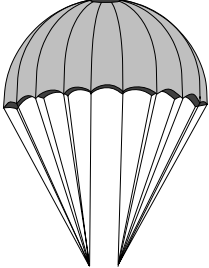
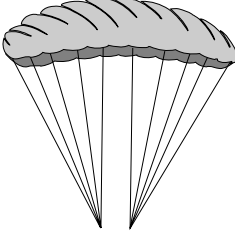
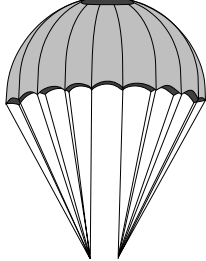
To demonstrate Bernoulli's Principle, Kerry blew over the top of a strip of paper.



22. This demonstration is designed to show that fast moving air
- A. creates a low pressure area
 - B. creates a high pressure area
 - C. forces a curved strip of paper to curve more
 - D. forces a curved strip of paper to curve less

Use the following information to answer question 23.

Shauna displays this chart about different types of parachutes.

Shape	Name	Drop Speed (metres per second)	Hole diameter (centimetres)
	Swallow	100 m/s	none
	Hawk	40 m/s	20 cm
	Eagle	50 m/s	none
	Falcon	45 m/s	40 cm

23. The best parachute for a slow, controlled descent is the

- A. swallow
- B. hawk
- C. eagle
- D. falcon

Use the following information to answer question 24.

Natalie's display is a record of the time that the Sun has risen and set for the past four days.

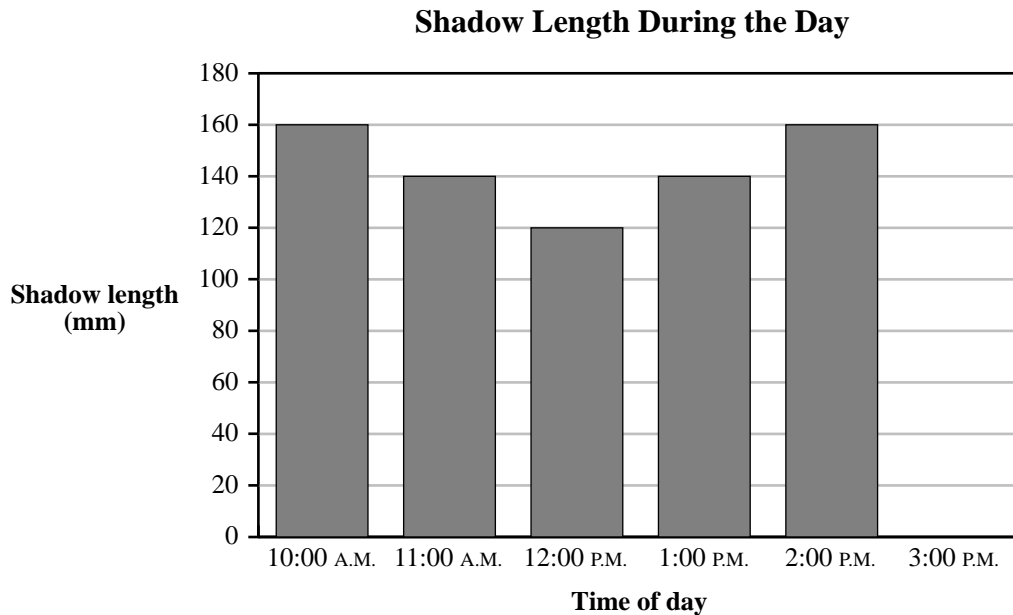
Times for Sunrise and Sunset

	Day 1	Day 2	Day 3	Day 4
Time of sunrise	5:29 A.M.	5:26 A.M.	5:23 A.M.	5:20 A.M.
Time of sunset	10:17 P.M.	10:20 P.M.	10:23 P.M.	10:26 P.M.

24. From Natalie's display, other students can infer that she recorded these times during the month of
- A. March
 - B. June
 - C. August
 - D. September

Use the following information to answer question 25.

Natalie also has a graph that she constructed to show how the length of a shadow changes throughout a sunny day.



25. Natalie predicted that the length of the shadow at 3:00 P.M. would be

- A. 140 mm
 - B. 160 mm
 - C. 170 mm
 - D. 180 mm
-

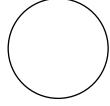

26. Sean demonstrated a device to show how humans breathe. He knew that for his device to show how a human breathes, it would have to

- A. use nitrogen and give off oxygen
- B. use carbon dioxide and give off oxygen
- C. use oxygen and give off nitrogen
- D. use oxygen and give off carbon dioxide

Use the following information to answer questions 27 and 28.

Jean-Paul's display has a chart with information about each planet in our solar system.

Our Solar System

Planet	Relative size	Maximum distance from Sun (millions)	Diameter	Average surface temperature	Day length (Earth units)	Year length (Earth units)	Number of moons
Mercury	◦	69.7 km	4 880 km	350°C day, -170°C night	58.0 days	88 days	0
Venus	○	109.0 km	12 100 km	480°C	243.0 days	225 days	0
Earth	○	152.1 km	12 756 km	22°C	1.0 day	365 days	1
Mars	◦	249.1 km	6 787 km	-23°C	1.0 day	687 days	2
Jupiter		815.7 km	142 800 km	-150°C	10.0 h	12 years	16
Saturn		1 507.0 km	120 000 km	-180°C	10.0 h	30 years	17
Uranus	○	3 004.0 km	51 800 km	-210°C	16.0 h	84 years	5
Neptune	○	4 537.0 km	49 500 km	-220°C	18.0 h	165 years	2
Pluto	◦	7 375.0 km	3 000 km	-230°C	6.4 days	248 years	1

27. According to Jean-Paul's chart, the planet that has the same number of natural satellites as Earth is
- A. Venus
 - B. Mars
 - C. Neptune
 - D. Pluto
28. While making his display, Jean-Paul realized that the planet that rotates most slowly on its axis is
- A. Venus
 - B. Mars
 - C. Neptune
 - D. Pluto

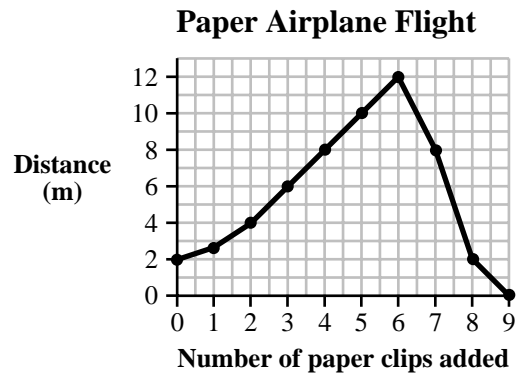
Use the following information to answer questions 29 and 30.

Peter's project showed how different-sized craters can be made by dropping rocks of different sizes from the same height into a pan containing 10 cm of flour.

- 29.** The manipulated or independent variable in this project is the
- A.** size of the rocks
 - B.** height from which the rocks are dropped
 - C.** amount of flour used
 - D.** size of the crater created in the flour
- 30.** Two variables that are kept constant in this investigation are the
- A.** size of the pan and the size of the craters created
 - B.** height from which the rocks are dropped and the size of the rocks
 - C.** depth of flour in the pan and the height from which the rocks are dropped
 - D.** amount of flour used and the size of the rocks

Use the following information to answer question 31.

In Allison's project, she experiments to see if adding mass to a paper airplane will affect how far it flies. A graph of her results is shown below.



31. An inference that can be made from Allison's graph is that
- A. an airplane requires at least one paper clip to fly
 - B. an airplane that flies 8 m has only 4 paper clips
 - C. an increase in mass affects the distance an airplane flies
 - D. after 5 paper clips are added, an airplane will fly 12 m

32. One display showed a working model of a hot-air balloon. The model rose slightly above the display table and then hovered at the same position. When the top flap of the balloon was opened, the balloon
- A. continued to rise because the amount of air inside the balloon remained the same
 - B. stayed at the same position because cold air inside the balloon was less dense than the air outside the balloon
 - C. descended because hot air was released from the balloon
 - D. descended because cold air pushed the balloon down

Use the following information to answer question 33.

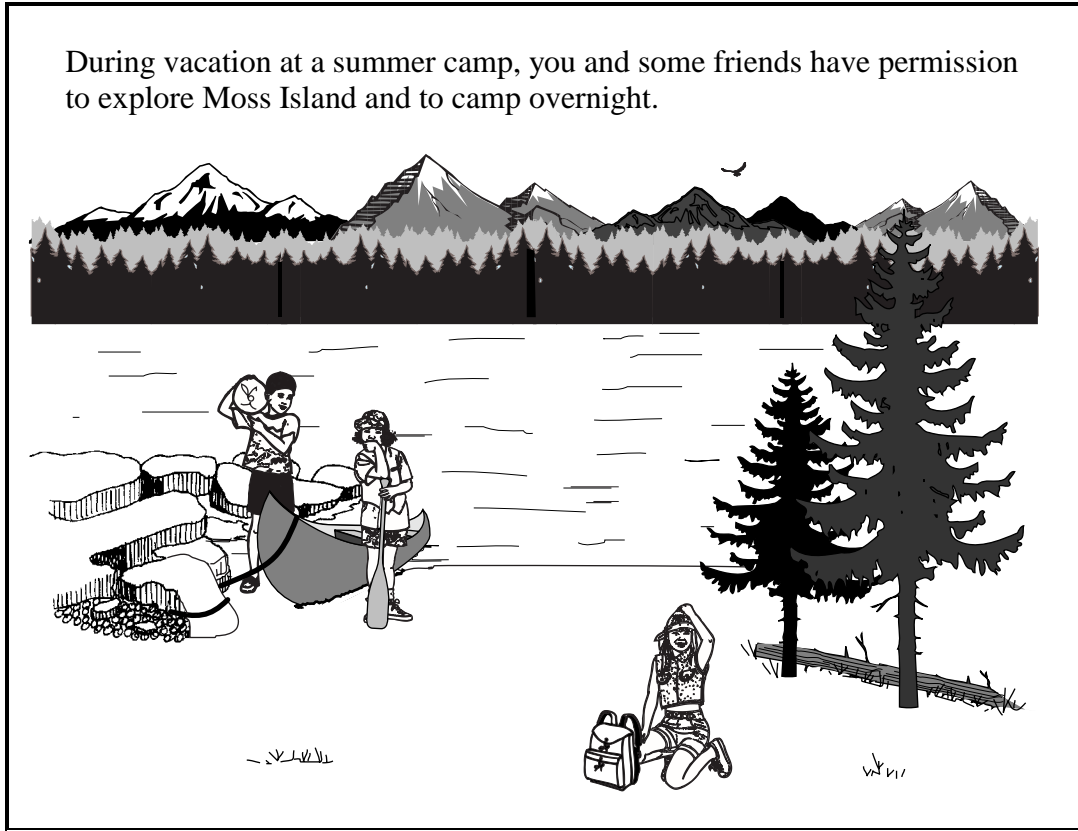
Henri investigated how the length of a shadow cast by a sundial changes throughout the day.

Time of Day	Length of the Sundial's Shadow
09:00	80 cm
10:00	70 cm
11:00	50 cm
12:00	40 cm
13:00	50 cm
14:00	?
15:00	?

33. Henri predicted that the length of the shadow cast by the sundial at 15:00 would be
- A. 50 cm
 - B. 60 cm
 - C. 70 cm
 - D. 80 cm
-
34. Henri explained that the length of a shadow changes throughout the day because of the
- A. movement of the Sun
 - B. rotation of Earth on its axis
 - C. revolution of Earth around the Sun
 - D. tilt of Earth on its axis

MYSTERY ON MOSS ISLAND

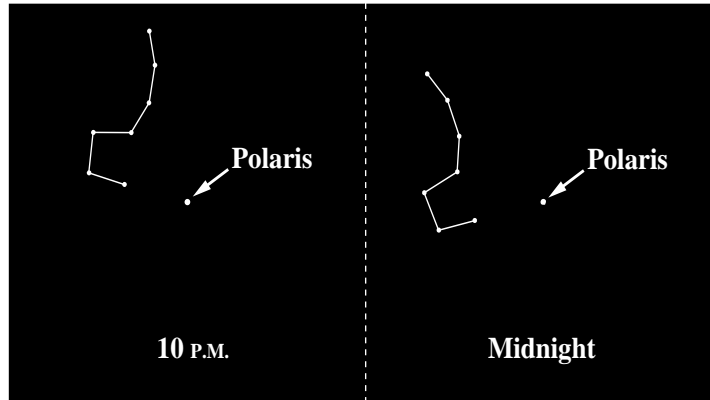
During vacation at a summer camp, you and some friends have permission to explore Moss Island and to camp overnight.



35. At your campsite on the beach, one of your friends sees a decaying tree. As the tree decays, it will
- A. add nutrients to the soil
 - B. add oxygen to the soil
 - C. removing nitrogen from the air
 - D. remove water from the air
36. That night, around the campfire, one of your friends asks which gas is used up by the fire and which gas is released by the fire. You explain that
- A. nitrogen is used up and oxygen is released
 - B. oxygen is used up and nitrogen is released
 - C. carbon dioxide is used up and oxygen is released
 - D. oxygen is used up and carbon dioxide is released

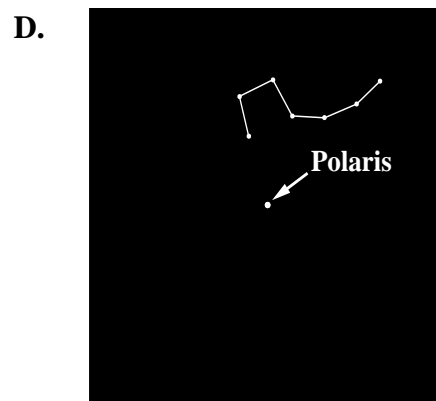
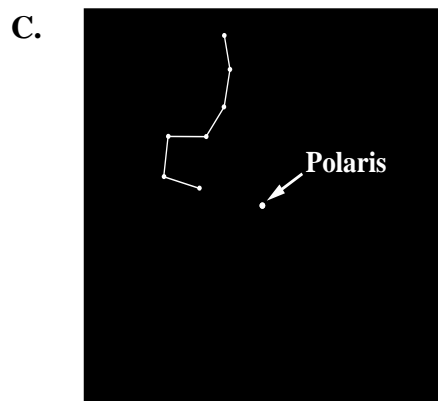
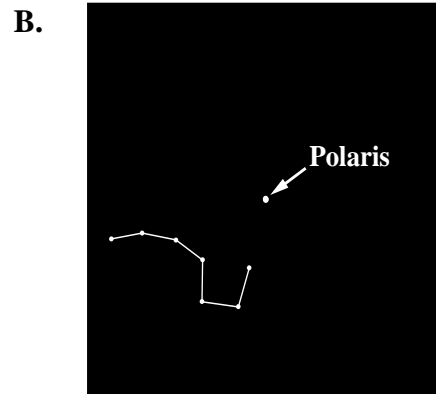
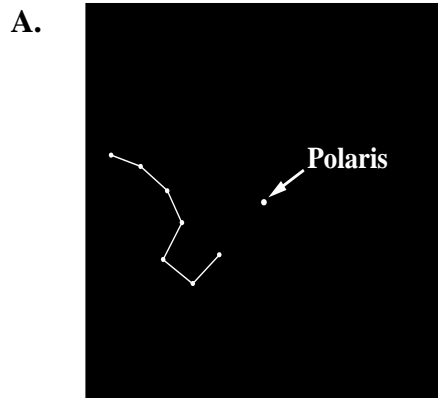
Use the following information to answer questions 37 and 38.

At 10:00 P.M., you notice the constellation of the Big Dipper and the star Polaris. When you wake up at midnight, you notice that the Big Dipper appears to have moved.



37. The reason that the Big Dipper appears to have moved is that
- A. the stars randomly change their positions
 - B. the Moon's gravity causes the stars to change their positions
 - C. Earth tilts closer to the Sun as it rotates during the night
 - D. Earth rotates on its axis as it revolves around the Sun

38. At 2 A.M., the position of the Big Dipper would be



39. The next morning, you observe the Sun rising in the

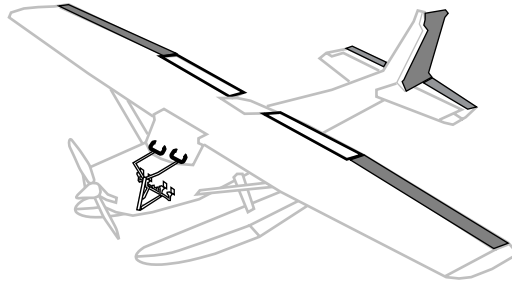
- A. north
- B. east
- C. south
- D. west

40. Days are longer during the summer than they are during the winter because

- A. the Sun is closer to Earth
- B. the Sun travels more slowly across the sky
- C. Earth's axis is tilted more toward the Sun
- D. Earth is rotating on its axis at a slower speed

Use the following information to answer question 41.

While hiking on the island, you and your friends hear an airplane. When you look up, you see an RCMP floatplane. All of you wave to the floatplane. The pilot makes the floatplane roll from side to side to let you know that he sees you.



41. In order to roll the airplane from side to side, the pilot would move the
- A. rudder from side to side
 - B. elevators from side to side
 - C. ailerons up and down
 - D. flaps up and down

The floatplane turns and appears to land on the water near your campsite. You and your friends quickly return to the campsite.

Use the following information to answer question 42.

The floatplane comes to shore near your campsite and you see that the pilot is an RCMP officer. The officer tells you that he is returning to the island to complete an investigation related to a poaching crime. Since the poachers have been caught already, the officer lets you and your friends hike to the poachers' campsite with him. When you arrive at the campsite, this is what you see.



42. The RCMP officer tells you that when he first came to the crime scene the deer carcass and the fire were still warm. The officer used this evidence to determine the
- A. motive for the crime
 - B. time of the crime
 - C. suspects
 - D. witness

Use the following information to answer questions 43 and 44.

The RCMP officer opens a notebook and shows you a chart that has information about four people who were found in the area and were suspected of poaching. The last column on the chart shows evidence from the campsite.

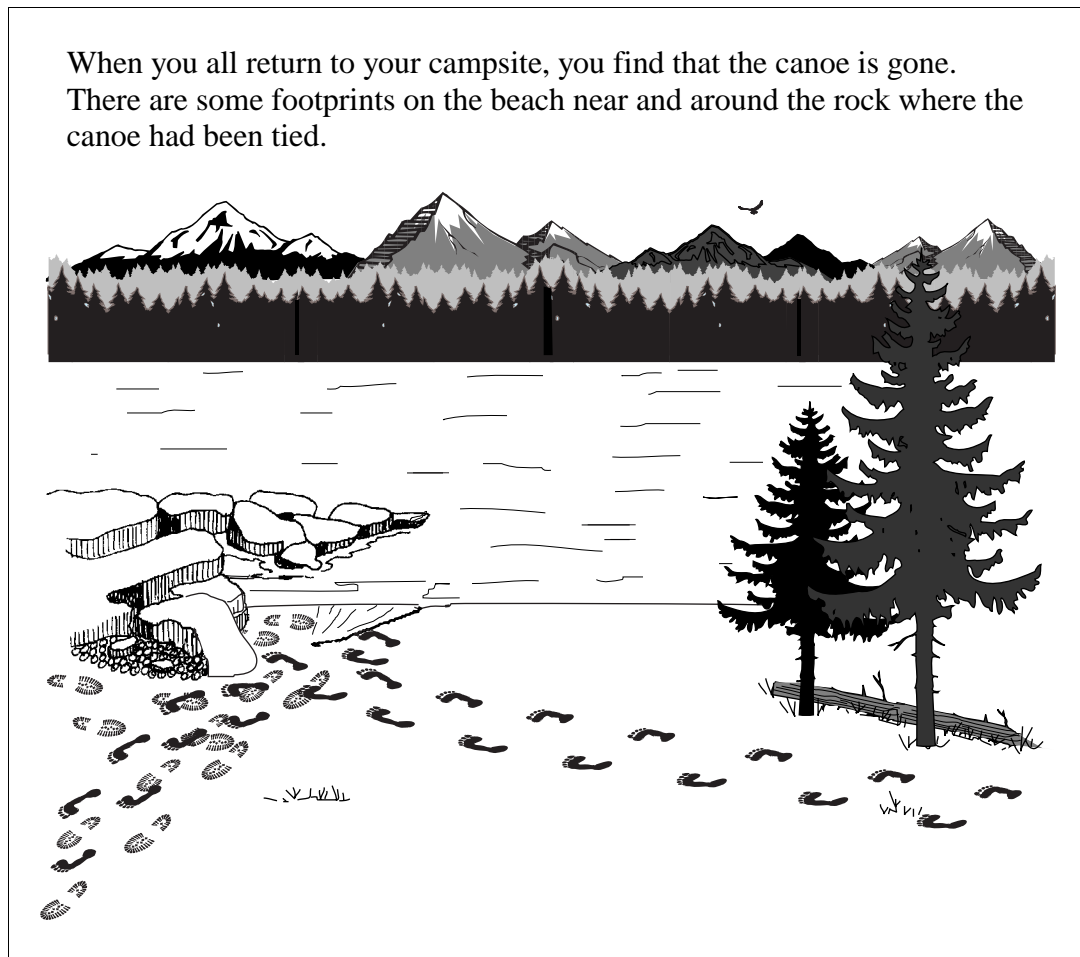
Chart Analysis

Type of Evidence	Suspect 1	Suspect 2	Suspect 3	Suspect 4	Evidence at campsite
fingerprint	loops	loops	arches	whorls	<i>loops</i>
shoe print	size 10 w	size 10 n	size 9 w	size 10 w	<i>size 10 w</i>
ink	black ink pen	red ink pen	black ink pen	blue ink pen	<i>black ink on envelope</i>
cloth	white cotton shirt	white nylon shirt	white polyester shirt	white cotton shirt	<i>white cotton on bush</i>

43. Which of the suspects **could** have left the shoe prints at the campsite?
- A. Suspect 1 or suspect 2
 - B. Suspect 1 or suspect 4
 - C. Suspect 2 or suspect 3
 - D. Suspect 3 or suspect 4
44. Based on the information in this chart, which of the suspects was **most likely** at the campsite?
- A. Suspect 1
 - B. Suspect 2
 - C. Suspect 3
 - D. Suspect 4

45. The RCMP officer explains that a chromatography test was used to help compare the ink found on an envelope with the ink from each suspect's pen. Which of the following steps is **not** important when carrying out a chromatography test?
- A. Watch the action of the water as it reaches the coloured line on the test paper.
 - B. Empty the water from the cup into a storage container.
 - C. Draw a line with a pen on a strip of test paper.
 - D. Hang the strip of test paper so it touches the water in the bottom of a cup.

Use the following information to answer question 46.



46. The RCMP officer infers that the canoe was **most likely** taken by someone who
- A. walked to the canoe in shoes, took off his or her shoes, and met a friend
 - B. walked to the canoe in barefeet, untied the canoe, and hid the canoe
 - C. met another person and they both carried the canoe away
 - D. met another person and they both dragged the canoe away

The officer says that because the canoe appears to have been stolen, it is best for him to fly all of you back to the summer camp.

Use the following information to answer question 47.

On the dashboard of the RCMP's airplane, you see the following chart.

AIR SPEEDS—Muskrat 131

Taxi	5 km/h
Take off	70 km/h
Cruise Flight—with floats	110 km/h
Cruise Flight—with wheels	130 km/h

47. From the chart, you infer that the airplane flies more slowly with floats than with wheels because the floats
- A. increase thrust
 - B. decrease thrust
 - C. increase drag
 - D. decrease drag

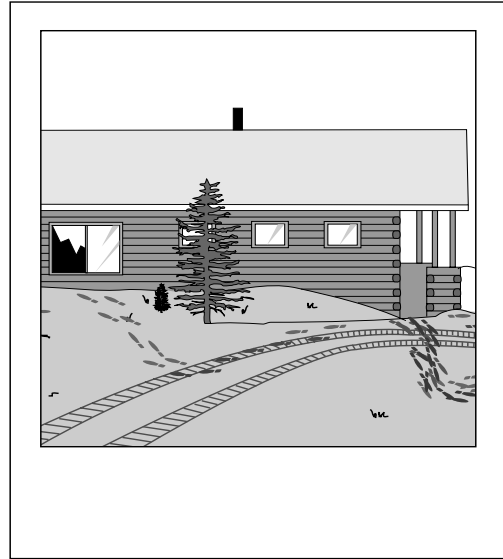
The RCMP officer assures you that when the canoe is found, it will be returned to the summer camp.

INVESTIGATING A BREAK-IN

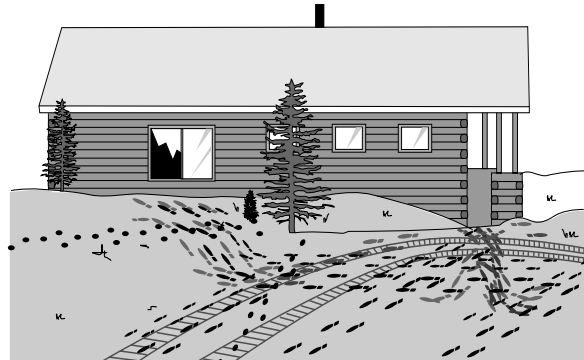
A police officer is investigating a break-in.

Use the following information to answer questions 48 and 49.

The police officer took a picture of the crime scene immediately after the break-in. However, the police officer was suddenly called away from the crime scene to assist with the investigation of a serious accident.



Later that day, the police officer returns to the scene to gather more evidence. On your way home from school, you meet the police officer. This is the scene that you and the officer see.



48. The police officer explains that footprints will be difficult to use as evidence because
- A. the original footprints have been disturbed too much
 - B. many of the footprints are not deep enough
 - C. there are too few footprints
 - D. the new footprints are not clear enough
49. As you look at the evidence, the police officer tells you that the tire tracks can be used to
- A. determine the number of people involved in the break-in
 - B. identify the tires of a suspect's vehicle
 - C. identify the make and model of the vehicle
 - D. pinpoint the exact time of the crime

Use the following information to answer question 50.

The police officer shows you the notebook he uses to record evidence for the investigation.

Date found	Time found	Type of evidence	Number of items	Tag identification number	

50. The officer tells you that he is going to label the final column with the words
- A. “Found by”
 - B. “Size of evidence”
 - C. “Location found”
 - D. “Age of evidence”

*You have now completed the test.
If you have time, you may wish to check your answers.*