Grade 6 Released 2017 Alberta Provincial Achievement Test

Science

Alberta Provincial Achievement Testing

Alberta

This document contains a full release of the 2017 Grade 6 Science Provincial Achievement Test.

A test blueprint and an answer key that includes the difficulty, reporting category, unit, and item description for each question are also included. These materials, along with the program of studies and subject bulletin for Grade 6 Science, provide information that can be used to inform instructional practice.

The Assessment Highlights is an additional document that provides information about the overall test, the test blueprints, and student performance on the Grade 6 Science Provincial Achievement Test. Commentary on student performance at the acceptable standard and the standard of excellence on the provincial achievement test is also provided. This information is intended for teachers and is best used in conjunction with the multi-year and detailed school reports that are available to schools via the Stakeholder File Exchange (SFX). **Assessment highlights reports** for all provincial achievement test subjects and grades are **posted on the Alberta Education website every year** in the fall.

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2017 Test Blueprint and Item Descriptions

The following blueprint shows the reporting categories and topics by which questions were classified on the 2017 Grade 6 Science Provincial Achievement Test.

Topic	Question Distribution by Reporting Category		Number of Questions (Percentage of Total Test)
	Knowledge	**Skills**	
Inquiry and Problem Solving	**0**	**11** (8,13, 20, 26, 28, 29, 33, 34, 38, 43, 48)	**11 Questions** (22%)
Aerodynamics and Flight	**9** (1, 3, 4, 5, 9, 10, 11, 15, 16)	**5** (2, 6, 7, 12, 14)	**14 Questions** (28%)
Sky Science	**4** (17, 18, 19, 25)	**4** (21, 22, 23, 24)	**8 Questions** (16%)
Evidence and Investigation	**2** (31, 32)	**5** (27, 30, 35, 36, 37)	**7 Questions** (14%)
Trees and Forests	**5** (39, 40, 41, 45, 46)	**5** (42, 44, 47, 49, 50)	**10 Questions** (20%)
Number of Questions (Percentage of Total Test)	**20 Questions** (40%)	**30 Questions** (60%)	**Total Test 50 Questions** (100%)

Additional Information

The table below provides information about each question: the keyed response, the difficulty of the item (the percentage of students who answered the question correctly on the English form of the test), the reporting category, the topic, and the item description.

Question	Key	Correct Response (%)	Reporting Category	Topic	Item Description
1	B	83.7	Knowledge	Aerodynamics and Flight	Explain how air confined in a space reacts to an outside force. (5.2)
2	B	49.8	Skills	Aerodynamics and Flight	Identify the explanation for experimental results by applying knowledge of Bernoulli's principle. (5.3)
3	D	66.7	Knowledge	Aerodynamics and Flight	Explain why penguins are unable to fly. (5.5/5.4)
4	C	79.3	Knowledge	Aerodynamics and Flight	Identify the purpose of specified bird adaptations. (5.5)
5	A	40.5	Knowledge	Aerodynamics and Flight	Relate the means for propulsion used by birds to those used by airplanes. (5.6)
6	D	70.2	Skills	Aerodynamics and Flight	Identify an accurate graphic representation of oxygen concentrations during a combustion reaction. (5.8)
7	C	82.1	Skills	Aerodynamics and Flight	Identify the most streamline position of an athlete in a given scenario, (5.7)
8	D	65.9	Skills	Inquiry and Problem Solving	Evaluate a dichotomous key to classify a type of airplane. (1.9/5.6)
9	A	69.2	Knowledge	Aerodynamics and Flight	Recognize the structure of a bird that functions like an elevator of an airplane. (5.5/6.5)
10	A	50.6	Knowledge	Aerodynamics and Flight	Identify the purpose of a parachute. (6.1/5.7)
11	D	48.8	Knowledge	Aerodynamics and Flight	Explain how the different parts of a hot-air balloon influence its flight. (6.2/5.1)

Question	Key	Correct Response (%)	Reporting Category	Topic	Item Description
12	C	74.5	Skills	Aerodynamics and Flight	Analyze a diagram of hot-air balloons and relate the internal air temperature in each balloon to its height above the ground. (6.2)
13	C	76.4	Skills	Inquiry and Problem Solving	Identify an experimental question based on data gathered using an elastic band plane. (1.1/6.6)
14	B	63.5	Skills	Aerodynamics and Flight	Identify constant variables in an experiment. (6.4)
15	D	63.0	Knowledge	Aerodynamics and Flight	Identify the purpose of a specific control surface on an aircraft. (6.5)
16	A	63.0	Knowledge	Aerodynamics and Flight	Recognize how ailerons affect the fight of an airplane. (6.4/6.5)
17	A	78.3	Knowledge	Sky Science	Identify a celestial object in our solar system that emits light. (7.1)
18	D	67.8	Knowledge	Sky Science	Identify why the location of a constellation appears to change in the night sky. (7.2)
19	D	66.8	Knowledge	Sky Science	Identify the direction from which celestial bodies appear and disappear. (7.3)
20	A	77.9	Skills	Inquiry and Problem Solving	Analyze a shadow stick investigation and identify the graph that accurately represents the investigative data. (2.2/7.5)
21	C	58.6	Skills	Sky Science	Identify during which moon phase the Moon is furthest from the Sun. (7.8)
22	D	66.9	Skills	Sky Science	Evaluate a source to determine an appropriate comparison between two planets. (7.9)
23	C	66.9	Skills	Sky Science	Determine the month in which the Sun is a relative height above the horizon. (7.6)
24	D	70.4	Skills	Sky Science	Recognize the order of the phases of the Moon. (7.7)

Question	Key	Correct Response (%)	Reporting Category	Topic	Item Description
25	A	77.2	Knowledge	Sky Science	Classify an unknown celestial object based on characteristics provided in a source. (7.9/7.12)
26	A	81.3	Skills	Inquiry and Problem Solving	Analyze information presented about planets and identify a conclusion that can be made from the information. (2.4/7.9)
27	A	69.1	Skills	Evidence and Investigation	Infer which footprint characteristic would be most valuable for an investigator. (8.3)
28	D	75.4	Skills	Inquiry and Problem Solving	Analyze a crime scene and make an inference based on the evidence shown. (2.2/8.2)
29	A	77.5	Skills	Inquiry and Problem Solving	Infer the distance travelled given previous observations in the form of a graph. (2.4/2.2)
30	C	57.8	Skills	Evidence and Investigation	Determine the sequence of events in a given scenario (8.1)
31	B	67.5	Knowledge	Evidence and Investigation	Describe the footprint impression left by someone who is walking. (9.2)
32	C	69.1	Knowledge	Evidence and Investigation	Evaluate a scenario to determine a characteristic of a fabric sample left at a crime scene. (9.3)
33	A	77.8	Skills	Inquiry and Problem Solving	Infer a possible conclusion based on observations given in a graph. (2.4/8.4e)
34	C	67.9	Skills	Inquiry and Problem Solving	Identify the manipulated variable in a chromatography experiment. (1)
35	B	83.2	Skills	Evidence and Investigation	Identify an unknown sample of fabric based on the characteristics of that fabric. (8.4d)
36	B	74.0	Skills	Evidence and Investigation	Identify a fingerprint characteristic using a legend. (8.4e)

| Question	Key	Correct Response (%)	Reporting Category	Topic	Item Description
37	D	78.0	Skills	Evidence and Investigation	Evaluate a scene to determine which suspect was present based on soil characteristics. (9.3/9.4a/TF10.4)
38	B	71.2	Skills	Inquiry and Problem Solving	Evaluate an experimental design to determine the responding variable in the experiment. (1.5c)
39	D	73.5	Knowledge	Trees and Forests	Identify a reason why the lumber industry values forests. (10.1)
40	C	84.2	Knowledge	Trees and Forests	Identify a benefit of a decaying log. (10.2/10.3)
41	C	66.3	Knowledge	Trees and Forests	Classify deciduous and coniferous tree characteristics. (10.4)
42	B	55.4	Skills	Trees and Forests	Identify a specified leaf arrangement and shape using a set of leaf diagrams. (10.6)
43	D	69.3	Skills	Inquiry and Problem Solving	Analyze experimental data to reach a conclusion. (2.4)
44	B	77.6	Skills	Trees and Forests	Evaluate the perspectives of four speakers related to a forest issue. (10.10)
45	B	78.0	Knowledge	Trees and Forests	Interpret the growth pattern of a tree. (10.7)
46	A	53.9	Knowledge	Trees and Forests	Identify an action that would be the most harmful to a forest ecosystem. (10.9)
47	A	78.5	Skills	Trees and Forests	Determine the species of tree that is most valuable for the pulp and paper industry based on given data. (10.8)
48	C	62.8	Skills	Inquiry and Problem Solving	Identify where a graph should be presented in a lab report. (2.2/10.3)
49	A	82.2	Skills	Trees and Forests	Classify a tree based on its leaf type using a key. (10.5)
50	C	80.2	Skills	Trees and Forests	Identify characteristics of the nutrient cycle based on a concept map. (10.3)

2017 Provincial Achievement Test Questions

The questions presented in this document are from the previously secured 2017 Grade 6 Science Provincial Achievement Test and are representative of the questions that form provincial achievement tests. These questions are released by Alberta Education for teacher and student use.

*Use the following information to answer question 1.*

Jennifer and Ezekiel conduct an experiment to learn about the properties of air. Jennifer covers the opening at the bottom of the syringe while Ezekiel pushes on the plunger. They observe the plunger moving in the syringe barrel.
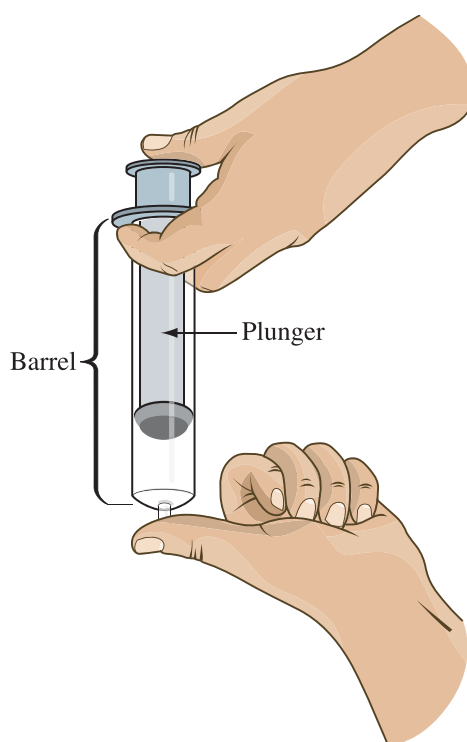
Barrel

Plunger

1. Which of the following statements **best** explains why the plunger can move in the syringe barrel?

- **A.** There is less air pressure outside the syringe.
- **B.** The air inside the syringe is being compressed.
- **C.** There is greater air pressure outside the syringe.
- **D.** The air inside the syringe is being pulled downward by gravity.

Marcel places a strip of paper between the pages of his textbook so that half of the paper hangs over the front of the book.

Strip of
paper
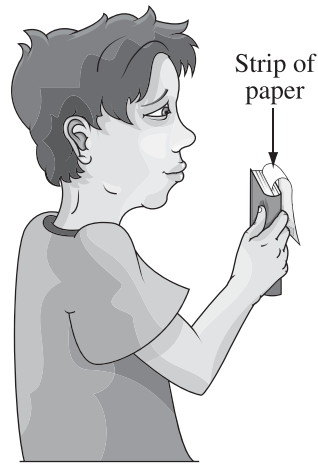
2. If Marcel blows air over the top of the paper, it will **most likely**

  A. lift up because there is an area of low pressure below the paper
  B. lift up because there is an area of low pressure above the paper
  C. remain still because there is an area of low pressure below the paper
  D. remain still because there is an area of low pressure above the paper

While observing penguins at the zoo, Jeremy explained to his brother that the enclosure does not have a roof because penguins cannot fly.

3. Jeremy explained that a penguin cannot fly because

    A.   drag forces created by body shape prevent flight
    B.   thrust forces cannot be generated by their leg muscles
    C.   the force of gravity is less than the lift force that their wings can generate
   **D.**   the force of gravity is greater than the lift force that their wings can generate

Swifts are birds that have physical characteristics such as cone-shaped heads and long, tapered wings. These characteristics help swifts fly quickly and for long distances.
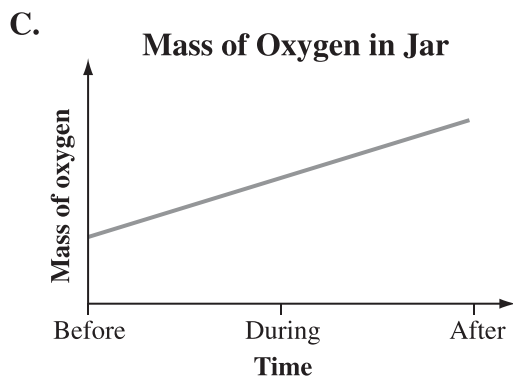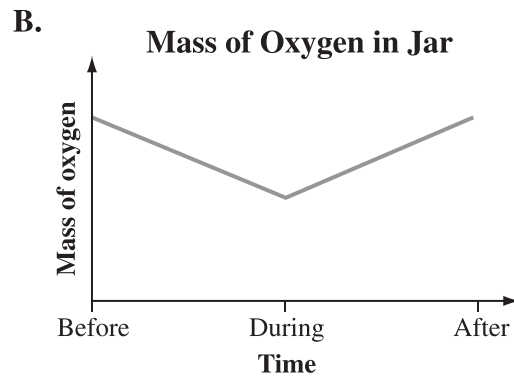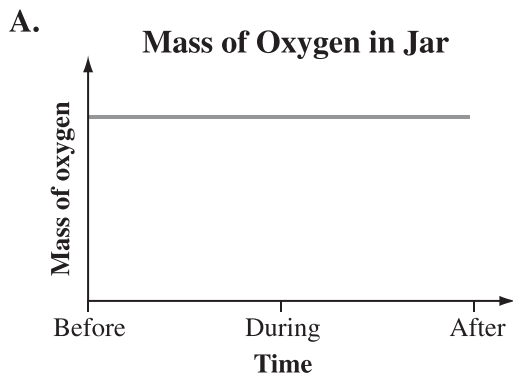

4. The physical characteristics described above **mainly** allow the swift to

    A. increase both lift and drag
    B. decrease both lift and drag
    C. increase lift and decrease drag
    D. decrease lift and increase drag

5. Which part of an airplane has a function that is **most similar** to the function of a bird's chest muscles in flight?

    A. Engine
    B. Rudder
    C. Aileron
    D. Fuselage

Candle Experiment

Sealed jar

Lit candle
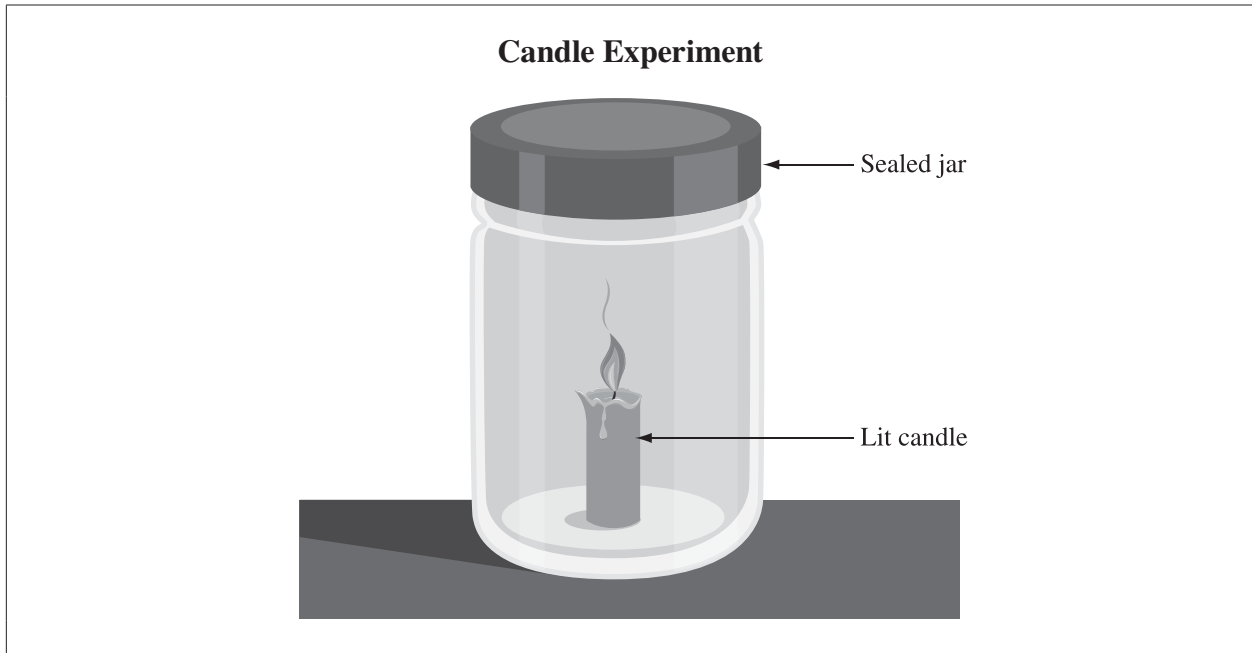
6. Which of the following graphs **most accurately** represents the mass of oxygen in the sealed jar before, during, and after the candle burns?

A.

Mass of Oxygen in Jar

Mass of oxygen

Before   During   After

Time

B.

Mass of Oxygen in Jar

Mass of oxygen

Before   During   After

Time

C.

Mass of Oxygen in Jar

Mass of oxygen

Before   During   After

Time

D.

Mass of Oxygen in Jar

Mass of oxygen

Before   During   After

Time
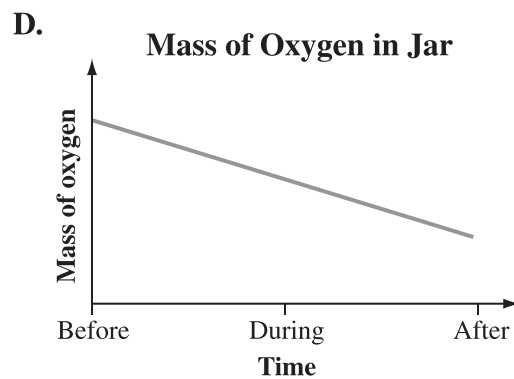
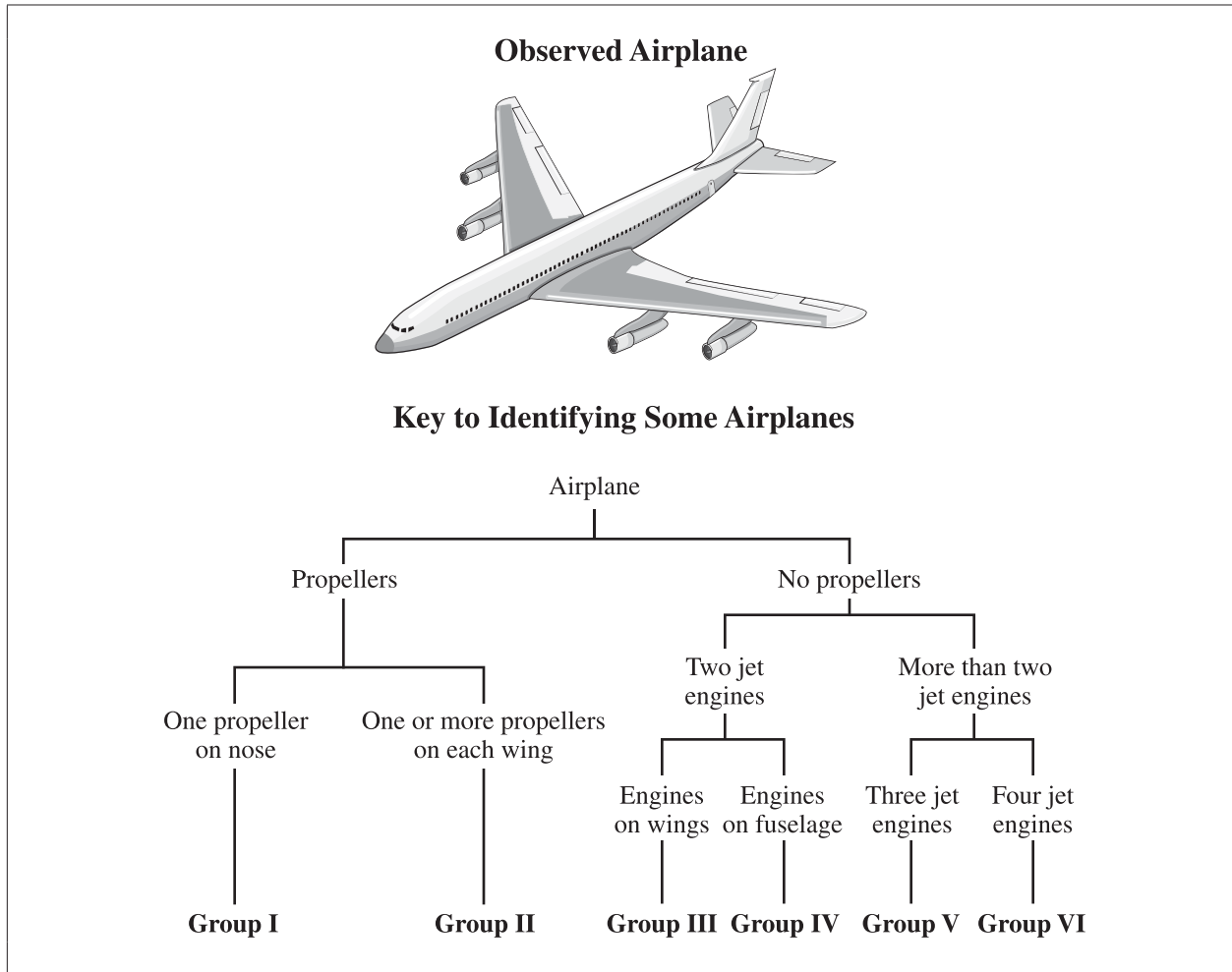**7.** Which of the following cycling positions would be the **most** efficient for reducing drag forces?

A.

B.

C.

D.

Observed Airplane

Key to Identifying Some Airplanes

Airplane

Propellers   No propellers

One propeller   One or more propellers   Two jet   More than two
on nose   on each wing   engines   jet engines

                                          Engines   Engines   Three jet   Four jet
                                          on wings   on fuselage   engines   engines

Group I   **Group II**   **Group III Group IV**   **Group V Group VI**

8. The observed airplane should be classified as

   A. Group II
   B. Group III
   C. Group V
   D. Group VI

9. Which of the following physical characteristics of a bird function **most like** the elevators of an airplane?

   A. Tail feathers
   B. Pointy beaks
   C. Curved wings
   D. Chest muscles

10. Parachutes reduce the speed of a falling object by

    A.   increasing drag forces acting on the object
    B.   decreasing drag forces acting on the object
    C.   increasing the force of gravity acting on the object
   **D.**   decreasing the force of gravity acting on the object

Use the following information to answer question 11.
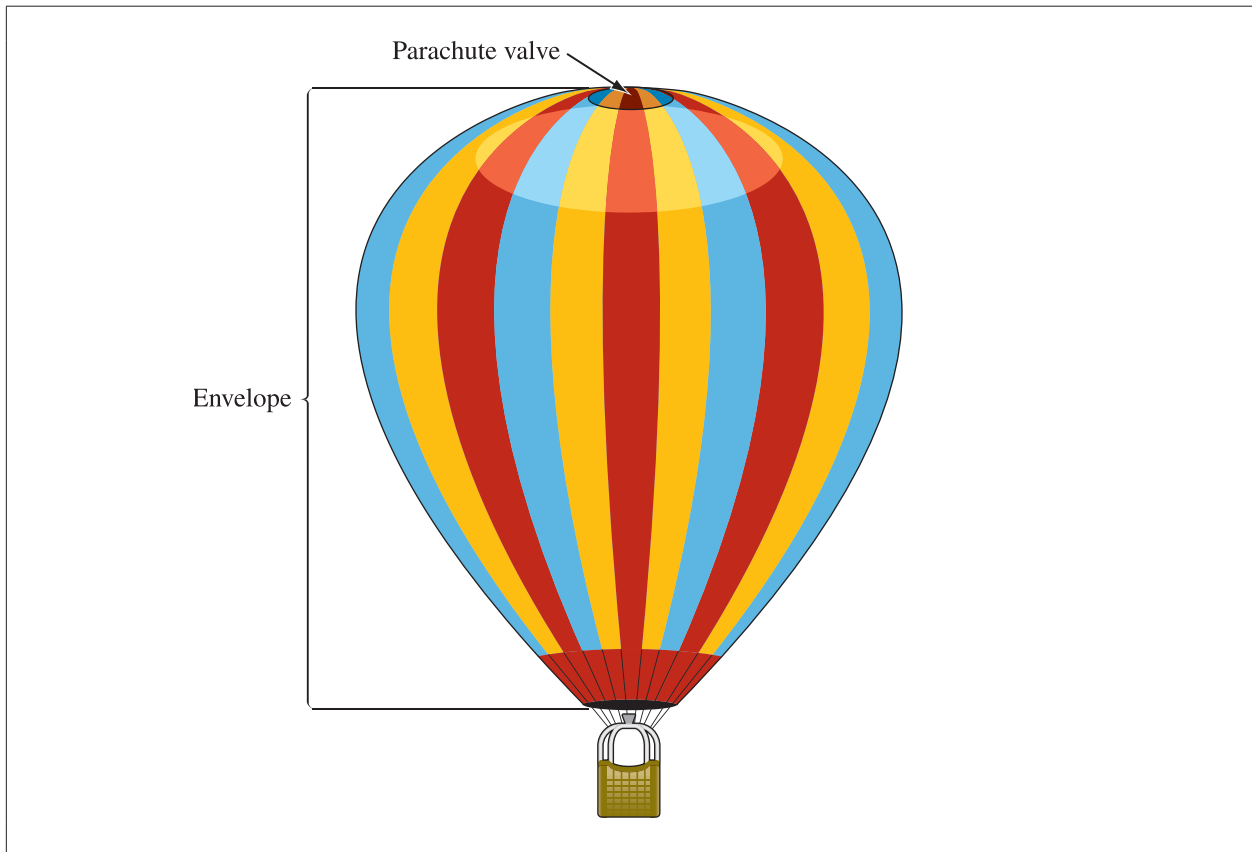
11. Which of the following statements correctly explains what happens when a hot-air balloon's parachute valve is first opened?

    A.   Air enters the envelope and the hot-air balloon rises.
    B.   Air enters the envelope and the hot-air balloon falls.
    C.   Air exits the envelope and the hot-air balloon rises.
    D.   Air exits the envelope and the hot-air balloon falls.
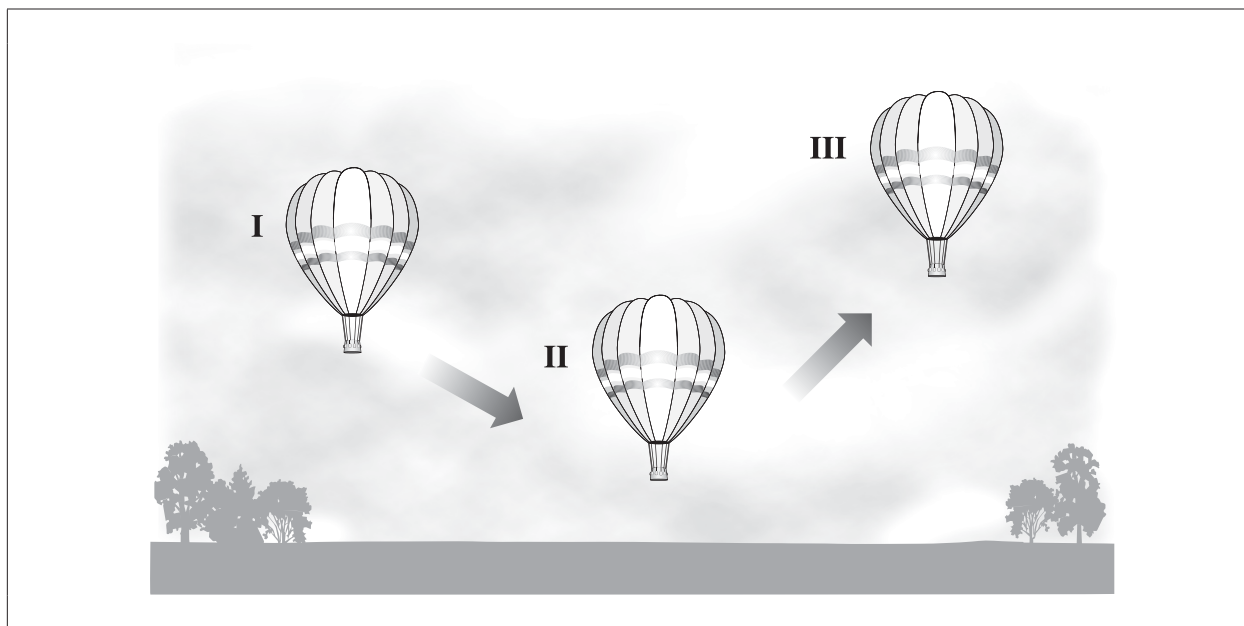
12. Based on the diagram above, which of the following rows orders the temperature of the air inside the balloon from the **highest** temperature to the **lowest** temperature?

Row	Highest Temperature		Lowest Temperature
A.	II	I	III
B.	II	III	I
C.	III	I	II
D.	III	II	I

Mallory conducts a test with a model airplane powered by an elastic band propeller. She constructs the model plane and launches it three times. Before each launch, she twists the elastic band a different number of times. The results of her test are shown in the table and graph below.

Launch	Number of Times Elastic Band Was Twisted
1	5
2	10
3	15

Distance Travelled by the Model Airplane
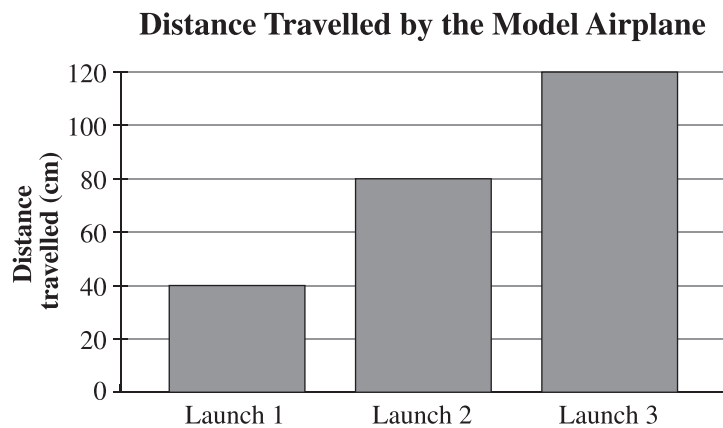
13. Based on the information in the table and in the graph, which of the following questions is Mallory **most likely** trying to test?

A. How does an elastic band affect the drag on a model airplane?

B. How does an elastic band affect the speed of a model airplane?

C. How does the number of twists of the elastic band affect the distance a model airplane travels?

D. How does the number of twists of the elastic band affect the time a model airplane is in the air?

A skeg is an immovable fin that is fixed onto the rear underside of a surfboard. It improves the stability of the surfboard.
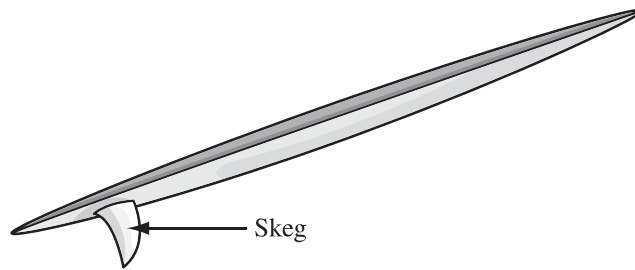
Skeg

14. The skeg on a surfboard is **most similar** in function to which component of an airplane?

    A.   Horizontal stabilizer
    B.   Vertical stabilizer
    C.   Wing
    D.   Flap

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15. One of the **main** purposes of the rudder on an aircraft is to

    A.   control lift
    B.   control roll
    C.   assist in changing the flight speed
    D.   move the nose to the left or the right

16. Ailerons are control surfaces that are **mainly** responsible for

    A.   rolling the airplane left and right
    B.   regulating the speed of the airplane
    C.   steering the nose of the airplane left and right
    D.   pointing the nose of the airplane up and down

17. Which of the following celestial objects emits light?

    A. Star
    B. Moon
    C. Comet
    D. Asteroid

Use the following information to answer question 18.

The constellation Cepheus changes its position in the sky over the course of the night.

18. The position of Cepheus changes because

    A. the constellation is revolving through space
    B. the constellation is rotating around the Sun
    C. Earth is revolving around the Sun
    D. Earth is rotating on its axis

19. *To an observer on Earth's equator, the Moon and Sun appear to rise in the* ____*i*____ *and set in the* ____*ii*____ *.*

The statements above are completed by the information in row

Row	*i*	*ii*
A.	west	east
B.	west	west
C.	east	east
D.	east	west

17

Using a shadow stick, Julia collects the following data to study how the position of the Sun in the sky affects shadow length.

Time of Day	Length of Shadow (cm)
9:00	182
9:30	152
10:00	129
10:30	112
11:00	100
11:30	92.4
12:00	89.1
12:30	88.7
13:00	93.2
13:30	101
14:00	109
14:30	124

20. Which of the following graphs **best** represents the data collected by Julia?

A.

Shadow Length Throughout a Day

Shadow Length

Time of Day
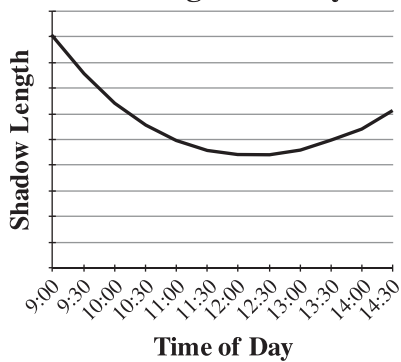
B.

Shadow Length Throughout a Day

Shadow Length

Time of Day
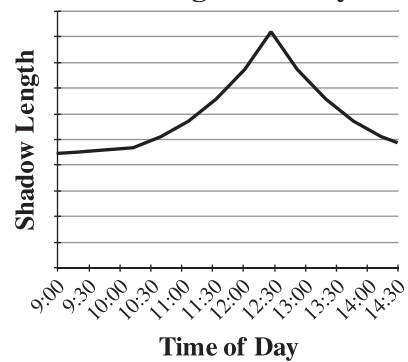
C.

Shadow Length Throughout a Day

Shadow Length

Time of Day
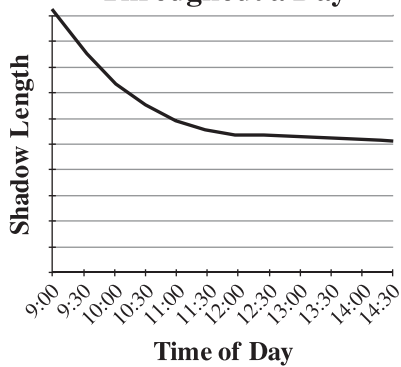
D.

Shadow Length Throughout a Day

Shadow Length

Time of Day

Lunar Phases for August
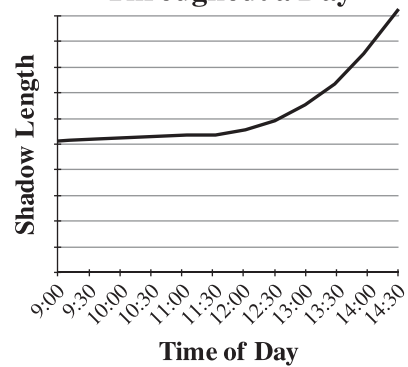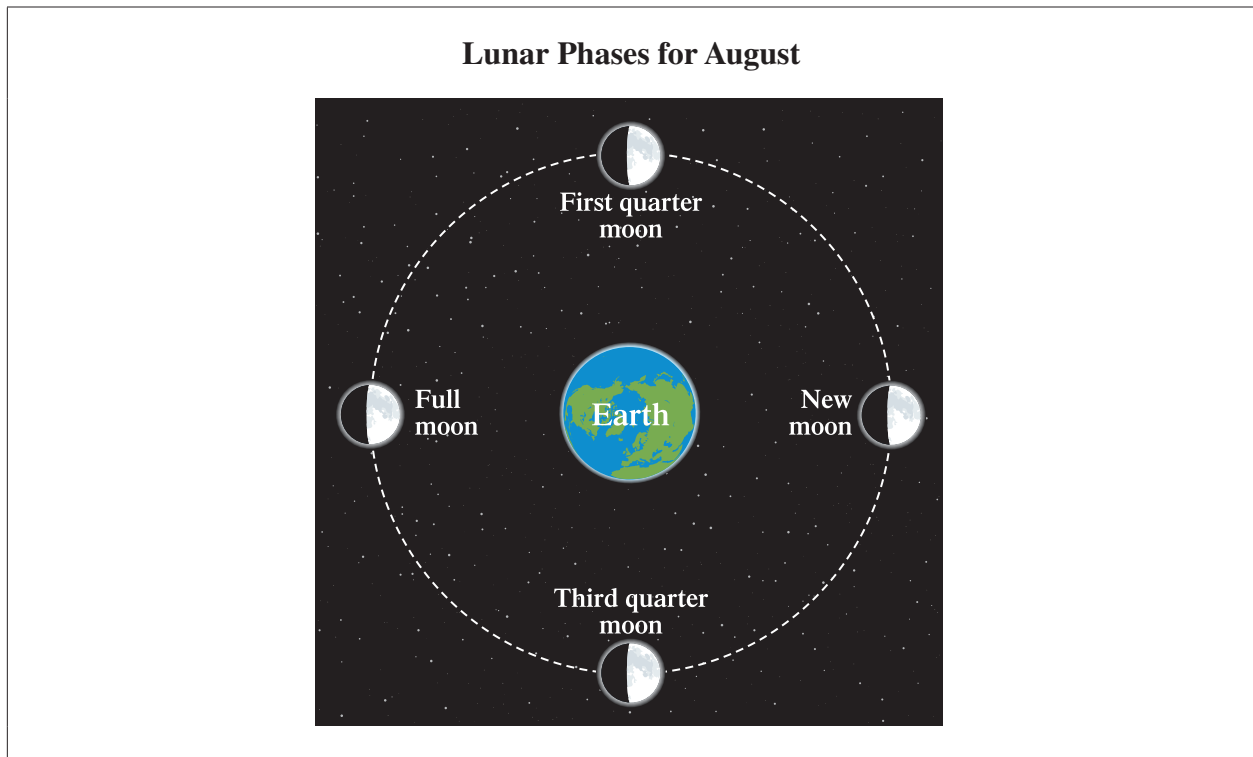
21. During which of the lunar phases shown above is the Moon furthest from the Sun?

    A.   New moon
    B.   First quarter moon
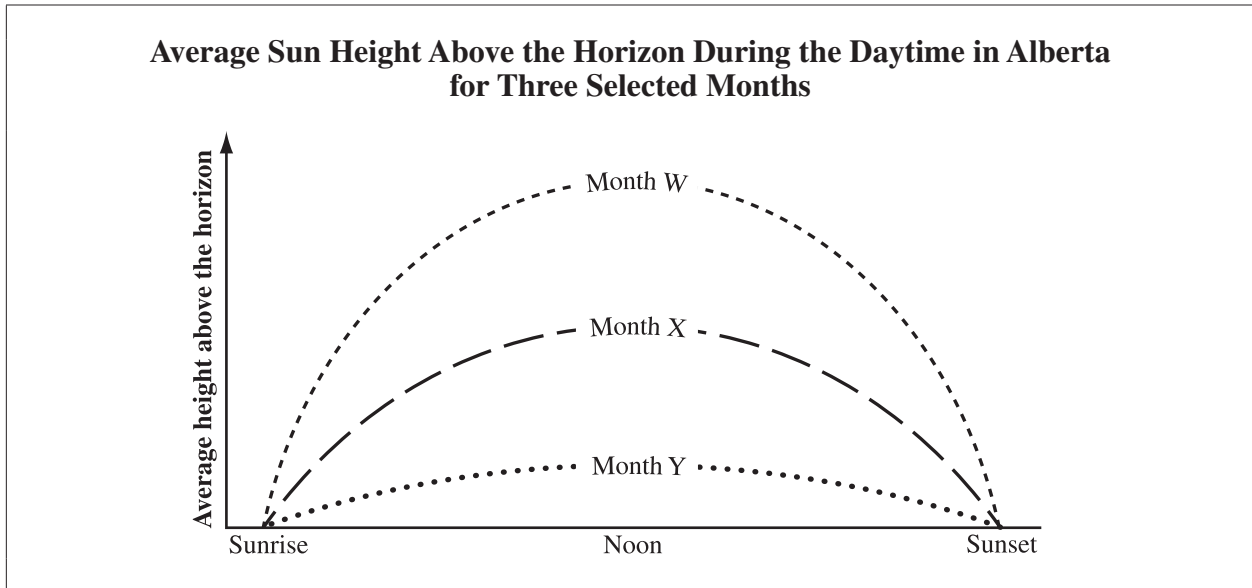   **C.**   Full moon
    D.   Third quarter moon

Comparing Jupiter to Earth

	Jupiter	Earth
Diameter (km)	142 984	12 756
Day length (Earth hours)	10	24
Year length (Earth years)	12	1
Number of moons (natural satellites)	63	1

22. When comparing Jupiter to Earth, Jupiter has a

A.   smaller diameter
B.   shorter orbit around the Sun
C.   smaller number of natural satellites
D.   shorter period of rotation on its axis

Average Sun Height Above the Horizon During the Daytime in Alberta for Three Selected Months

23. Which of the following rows could identify Month W, Month X, and Month Y?

Row	Month W	Month X	Month Y
A.	December	March	July
B.	December	July	March
C.	July	March	December
D.	July	December	March

Sam uses index cards to help him study the phases of the Moon. He writes the appropriate phase of the Moon on the back of each card and places them in the order shown below. Sam places two of the cards in the wrong order.
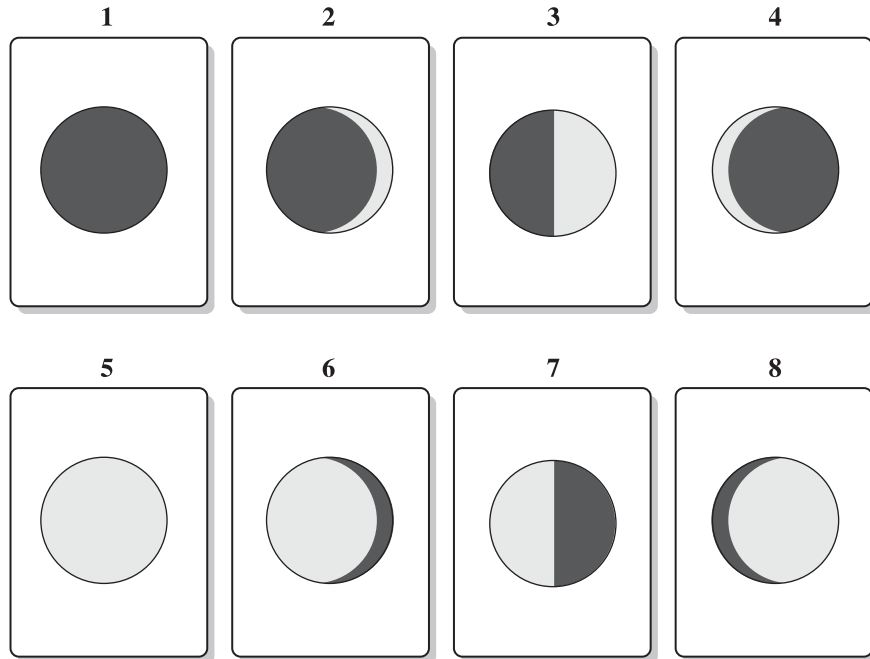
24. Which two cards must be switched with one another to place them in the correct order?

    A. 2 and 6
    B. 2 and 8
    C. 4 and 6
    D. 4 and 8

An unknown object, Object X, is discovered in a distant galaxy. Astronomers gather the following information about the unknown object.

Characteristics of Object X

- Solid surface

- Revolves around a star

- Evidence of liquid water on its surface

25. Based on the characteristics described above, which of the following celestial objects is Object X **most similar** to?

A. Earth
B. Jupiter
C. Earth's Moon
D. Halley's comet

Facts About Planets in the Solar System

Planet	Type	Approximate Distance From the Sun (million km)	Diameter (compared to Earth)	Mass ($\times 10^{21}$ kg)
Mercury	Rocky	57.9	0.382	330.2
Mars	Rocky	227.9	0.532	641.9
Venus	Rocky	108.2	0.949	4 868.5
Earth	Rocky	149.6	1.00	5 974.2
Neptune	Gaseous	4 497.1	3.883	102 430
Uranus	Gaseous	2 871.0	4.007	86 832
Saturn	Gaseous	1 427.0	9.449	568 460
Jupiter	Gaseous	778.3	11.209	1 899 000

26. Which of the following conclusions is supported by the information presented in the table?

A. The gaseous planets have more mass than the rocky planets.
B. The larger planets are closer to the Sun than the smaller planets.
C. The gaseous planets have smaller diameters than the rocky planets.
D. The rocky planets are further from the Sun than the gaseous planets.

A police officer reviews a crime scene diagram of a store that has been robbed.
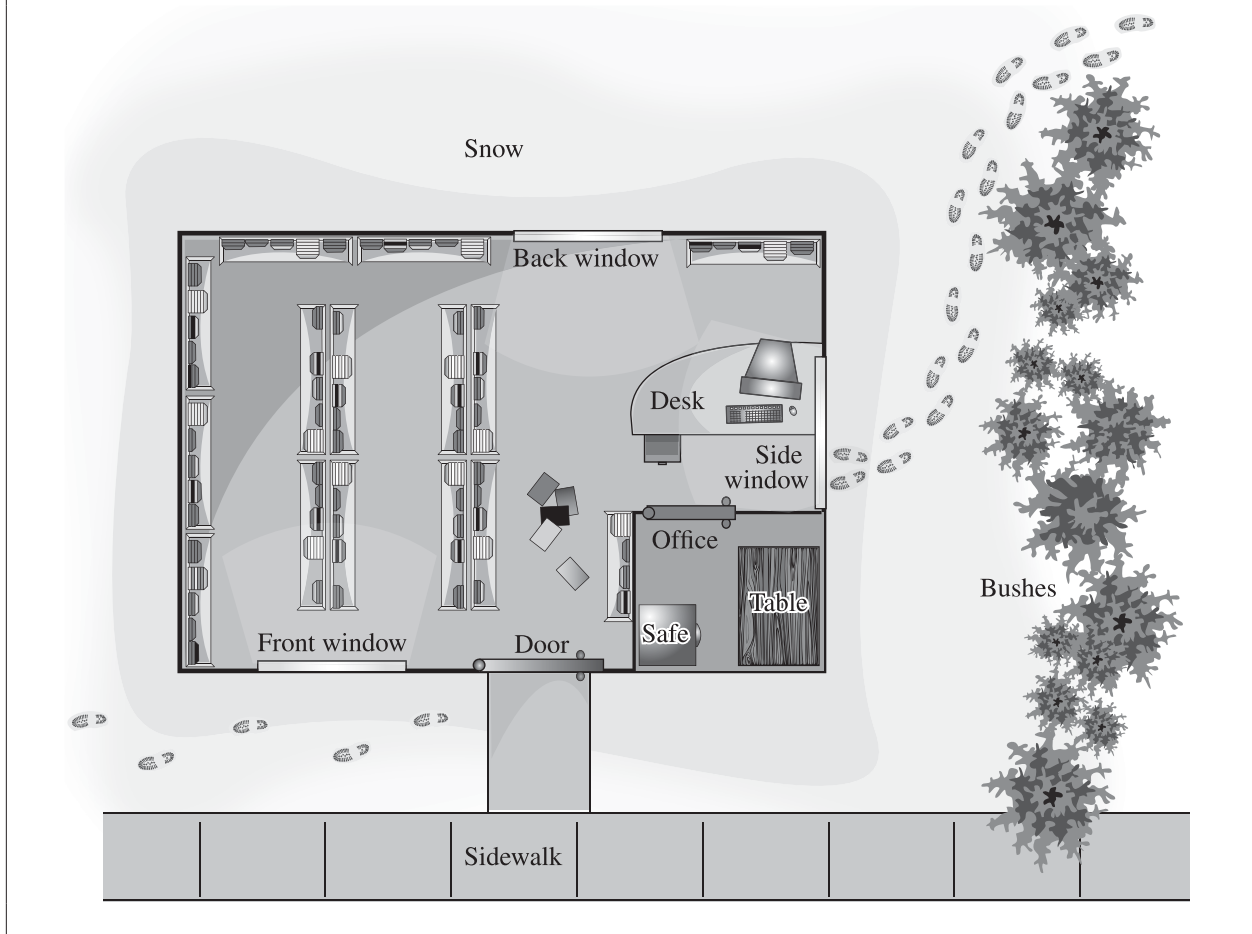

27. Which of the following footprint characteristics would **best** assist an investigator in determining the weight of a suspect?

    A. Depth
    B. Width
    C. Pattern
    D. Length

28. Based on the diagram of the crime scene above, an inference that can be made is that the intruder

    A. entered and exited the store through a window
    B. could not enter the office because the door was locked
    C. paced in the bushes until all of the store employees left
    D. left the crime scene more quickly than when he or she approached it

Two suspects leave a crime scene in a vehicle. The police search for the suspects. They use the graph below to determine the possible distance the suspects could have travelled after leaving the crime scene.

**Possible Driving Distance from the Crime Scene
Based on the Time After the Crime Was Committed**
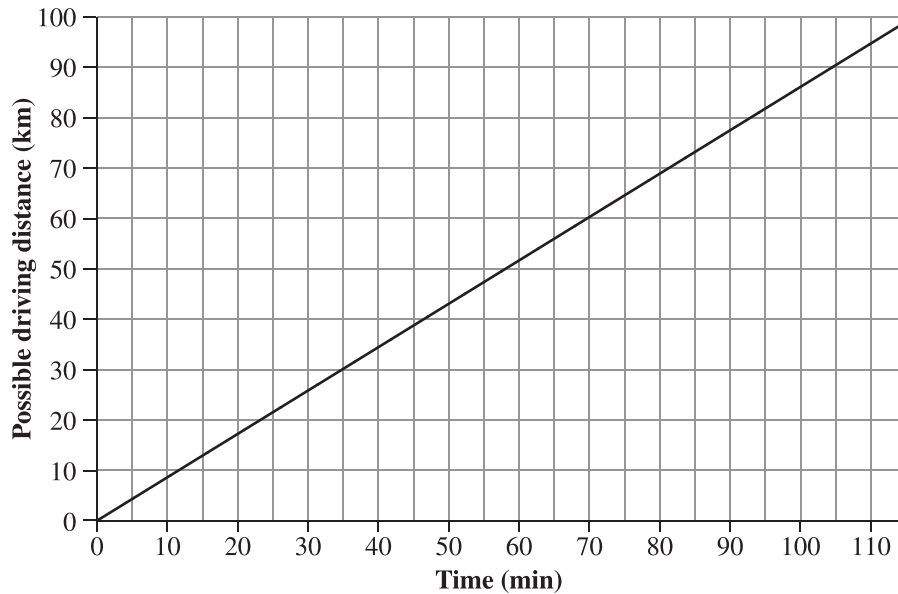
29. Using the information given above, what is the possible distance from the crime scene that the suspects could have travelled 60 minutes after the crime was committed?

A.   52 km
B.   70 km
C.   88 km
D.   100 km

Alex left his hockey stick outside after recess. When he returned to get it, he found that it had been broken.

Legend

>>>>>>>>	Bike track **Q**
<<<<<<<<	Bike track **R**
👟	Shoe print **S**
👟	Shoe print **T**
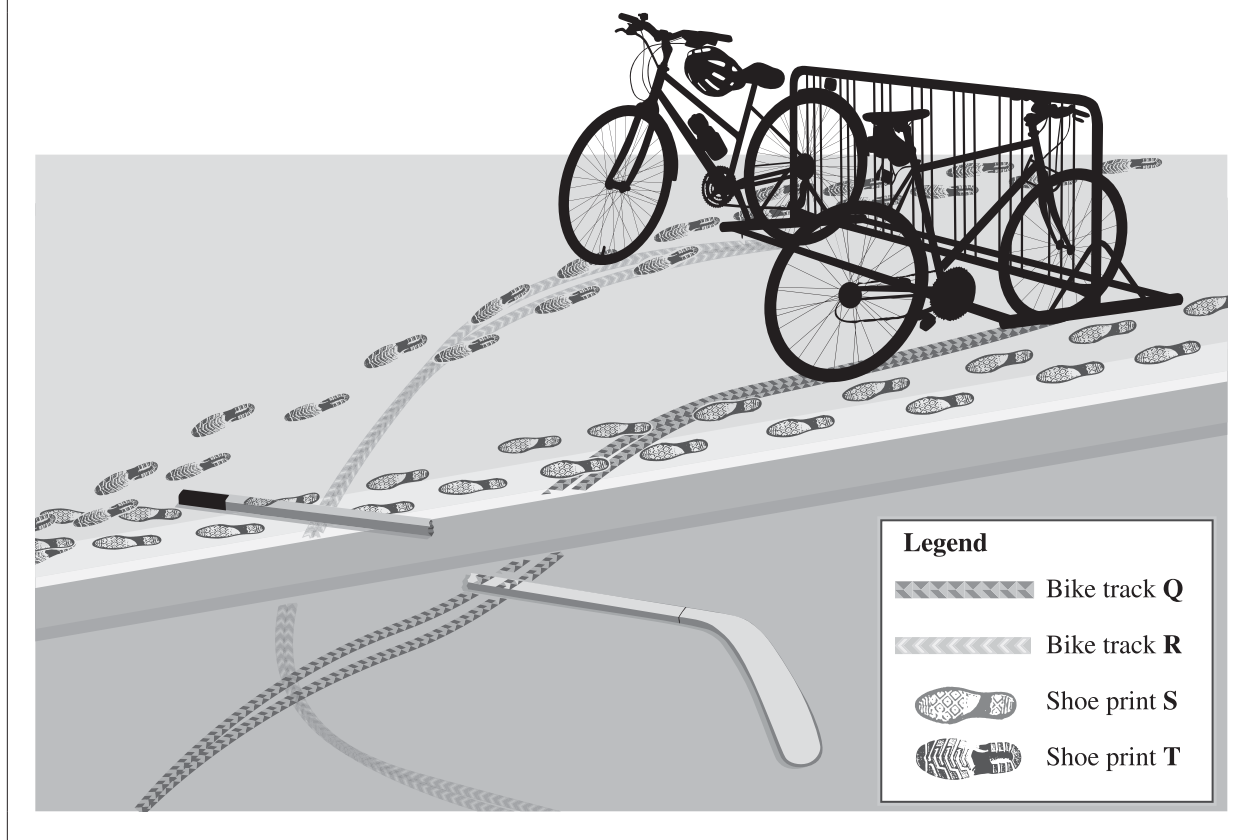
30. Based on the information above, the order in which the bike tracks and the shoe prints were made from first to last was

    A. Shoe print T, Shoe print S, Bike track Q, Bike track R
    B. Shoe print T, Shoe print S, Bike track R, Bike track Q
    C. Bike track R, Bike track Q, Shoe print S, Shoe print T
    D. Bike track R, Bike track Q, Shoe print T, Shoe print S

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31. When compared with footprints left by a person who is running, footprints left by a person who is walking are generally

    A. closer together with only the toe being clearly visible
    B. closer together with both the toe and the heel being clearly visible
    C. farther apart with only the toe being clearly visible
   **D.** farther apart with both the toe and the heel being clearly visible

At a robbery crime scene, police officers found pieces of torn fabric caught between the posts of a fence.

32. Which of the following characteristics of the fabric can be **most easily** observed without either touching or removing it from the scene?

    A. Absorbency
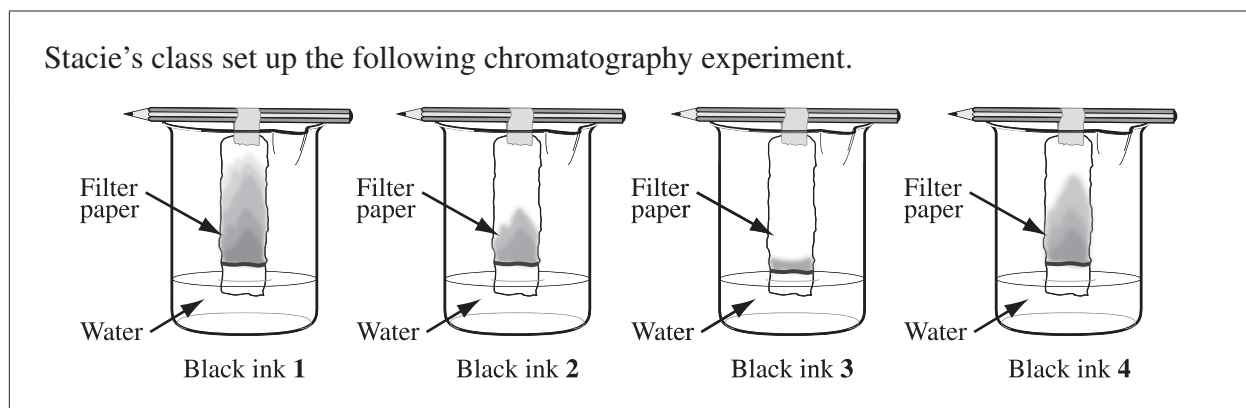   **B.** Durability
    C. Colour
    D. Type

Use the following information to answer question 33.

The students in a Grade 6 class had their right index fingerprints analyzed. The results of the analysis are presented in the graph below.

Right Index Fingerprint Type Frequency
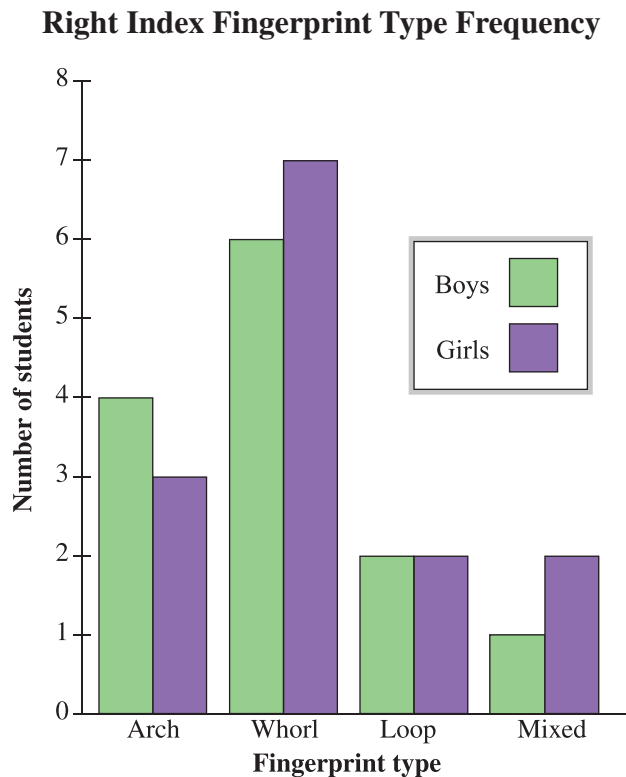
33. Which of the following conclusions could be correctly made about the Grade 6 class?

    A. Less than half of students have a right index finger with an arch fingerprint.
    B. More girls than boys have a right index finger with a loop fingerprint.
    C. Less girls than boys have right index fingers with whorl fingerprints.
    D. Most students have a right index finger with a mixed fingerprint.

Stacie's class set up the following chromatography experiment.

| Black ink **1** | Black ink **2** | Black ink **3** | Black ink **4** |

34. In the experiment above, the manipulated variable is the

A. colour of the pen
B. length of filter paper
C. type of black ink used
D. volume of water added to the beaker

An investigator analyzes a piece of fabric that was found at a crime scene.

Characteristics of Crime Scene Fabric

- Stretch   3.2 mm
- Flammability   melts
- Absorbency   6 mL

He then compares the characteristics of the fabric with those of known fabric types.

Type of Fabric	Stretch (mm)	Flammability	Absorbency (mL)
Cotton	3.0	Burns	4.0
Fleece	3.0	Melts	8.0
Nylon	1.5	Burns	0.0
Spandex	3.5	Melts	0.2

35. The fabric that was found at the crime scene is **most likely**

A. cotton
B. fleece
C. nylon
D. spandex

Fingerprint Characteristics

Legend

|	
Fork	A single ridge that splits into two ridges
Lake	A single ridge that splits into two ridges and reunites shortly afterwards
Delta	A triangular ridge pattern
Island	A short ridge that is separate from other ridges

36. Which of the following fingerprint characteristics is identified in the diagram above?

    A. Fork
    B. Lake
    C. Delta
    D. Island

A person entered a school outside of school hours and left dirty footprints on the custodian's newly cleaned floors.
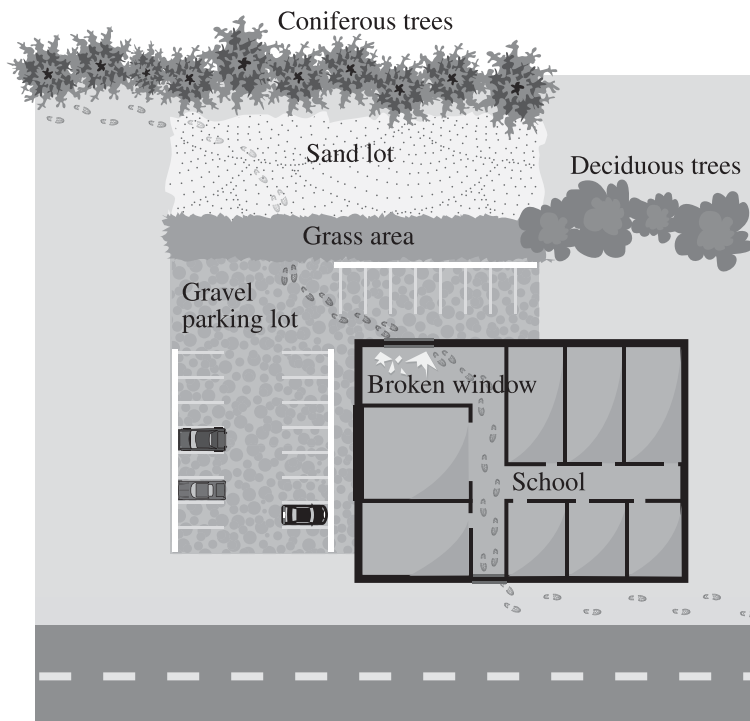
The police took soil samples from the shoes of four suspects.

Suspect	Soil Samples from Shoes
1	Leaves and pebbles
2	Pine needles and pebbles
3	Leaves, grass, and pebbles
4	Pine needles, sand, and pebbles

37. The suspect who would **most likely** have left the footprints is

    A.   Suspect 1
    B.   Suspect 2
    C.   Suspect 3
    D.   Suspect 4

The heights of two poplar trees grown in different locations are recorded over a five-year period. Both trees have the same exposure to sunlight and receive the same amount of water. Both trees experience the same air temperature. The resulting heights of both trees are recorded in the graph below.
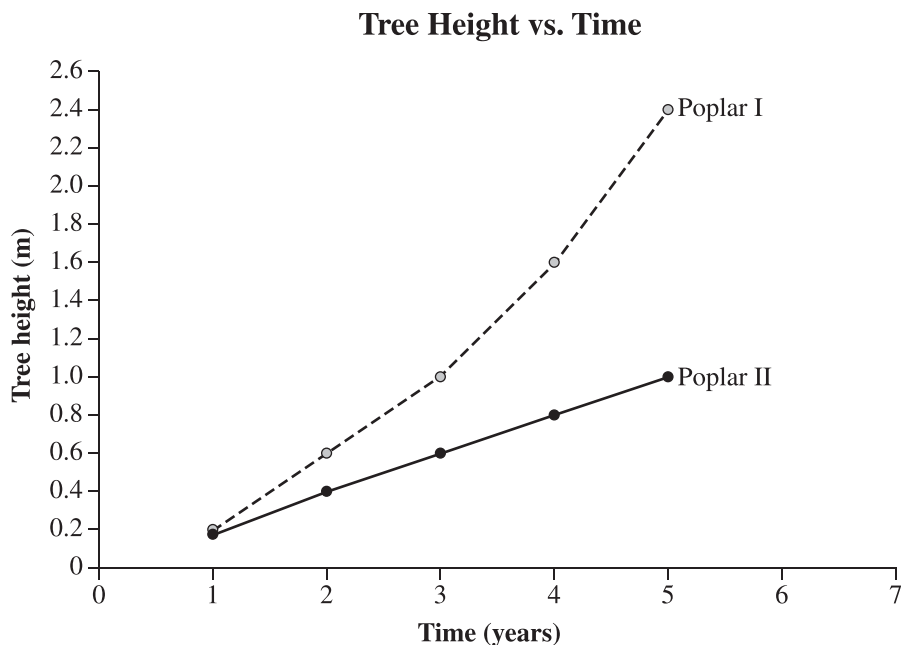
Tree Height vs. Time

38. The responding variable in this experiment is

    A. time
    B. tree height
    C. temperature
    D. amount of water given

39. The lumber industry **mainly** values forests as

    A. an important recreation area for humans
    B. an environment where many organisms live
    C. a producer of important gases to sustain life
    D. a source of primary resources and materials

Leroy found a log as he walked through the forest.
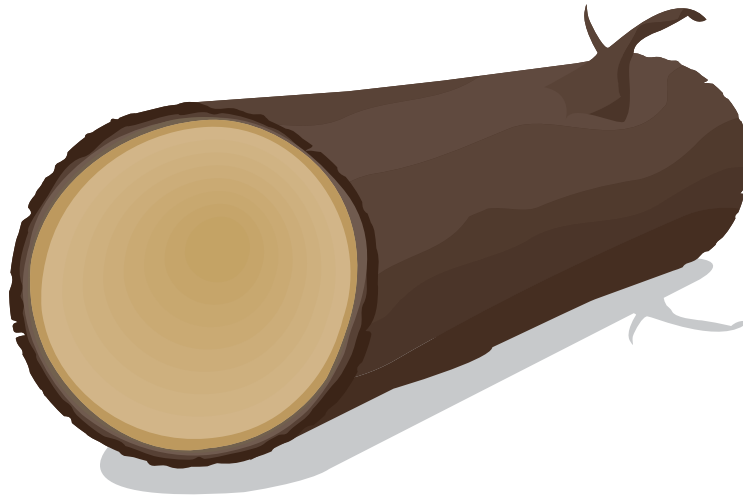
40. As the log above decays, it will

    A. remove hydrogen from the air
    B. remove water from the air
    C. add nutrients to the soil
    D. add oxygen to the soil

41. Which of the following charts accurately organizes information about deciduous and coniferous trees?

A.

Deciduous	Coniferous
• Small, waxy needles • Has cones • Example: Spruce tree	• Broad, large leaves • Has flowers • Example: Oak tree

B.

Deciduous	Coniferous
• Small, waxy needles • Has flowers • Example: Oak tree	• Broad, large leaves • Has cones • Example: Spruce tree

C.

Deciduous	Coniferous
• Broad, large leaves • Has flowers • Example: Oak tree	• Small, waxy needles • Has cones • Example: Spruce tree

D.

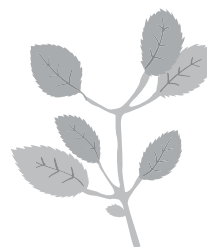| Deciduous	Coniferous
• Broad, large leaves • Has cones • Example: Oak tree	• Small, waxy needles • Has flowers • Example: Spruce tree

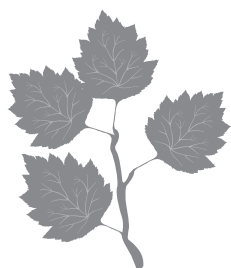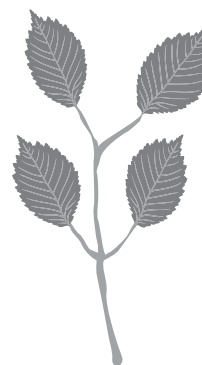**Examples of Leaf Arrangements and Shapes**

Example 1

Example 2

Example 3

Example 4

42. Which of the following rows identifies the examples that have alternate leaf arrangements and an ovate leaf shape?

Row	Alternate Leaf Arrangement	Ovate Leaf Shape
A.	Example 3	Example 1
B.	Example 3	Examples 2 and 4
C.	Examples 1, 2, and 4	Example 1
D.	Examples 1, 2, and 4	Examples 2 and 4

A student conducts an experiment to determine the effects of salt in soil on the germination and growth of seeds. The following chart shows the results.

Effects of Salt on Germination and Growth of Seeds

Mass of Salt in Soil (g)	Volume of Water Applied per Week (mL)	Percentage of Seed Germination (%)	Average Plant Height at Three Weeks (cm)	Percentage of Living Plants After Six Weeks (%)
0	100	84	10	80
1	100	62	7	35
2	100	42	4	8

43. Which of the following conclusions could be made from the results of this experiment?

A. The more salt there is in the soil, the taller the plants grow.
B. The more water there is in the soil, the shorter the plants grow.
C. The more water there is in the soil, the greater the percentage of living plants.
D. The more salt there is in the soil, the lower the percentage of seeds germinated.

Use the following information to answer question 44.

Issue: Should we allow developers to cut down trees to create more ski resorts in Alberta's national parks?

Speaker I "Removing too many trees will disrupt the natural ecosystem that the parks are meant to preserve."

Speaker II "Tourism dollars help fund the high costs of maintaining the parks."

Speaker III "An increasing population requires more recreational facilities."

Speaker IV "Cutting down trees leads to more soil erosion."

44. Which of the speakers above would **most likely** be against the development of new ski resorts in Alberta's national parks?

A. Speakers I and III
B. Speakers I and IV
C. Speakers II and III
D. Speakers II and IV

A Section of Tree Rings Magnified
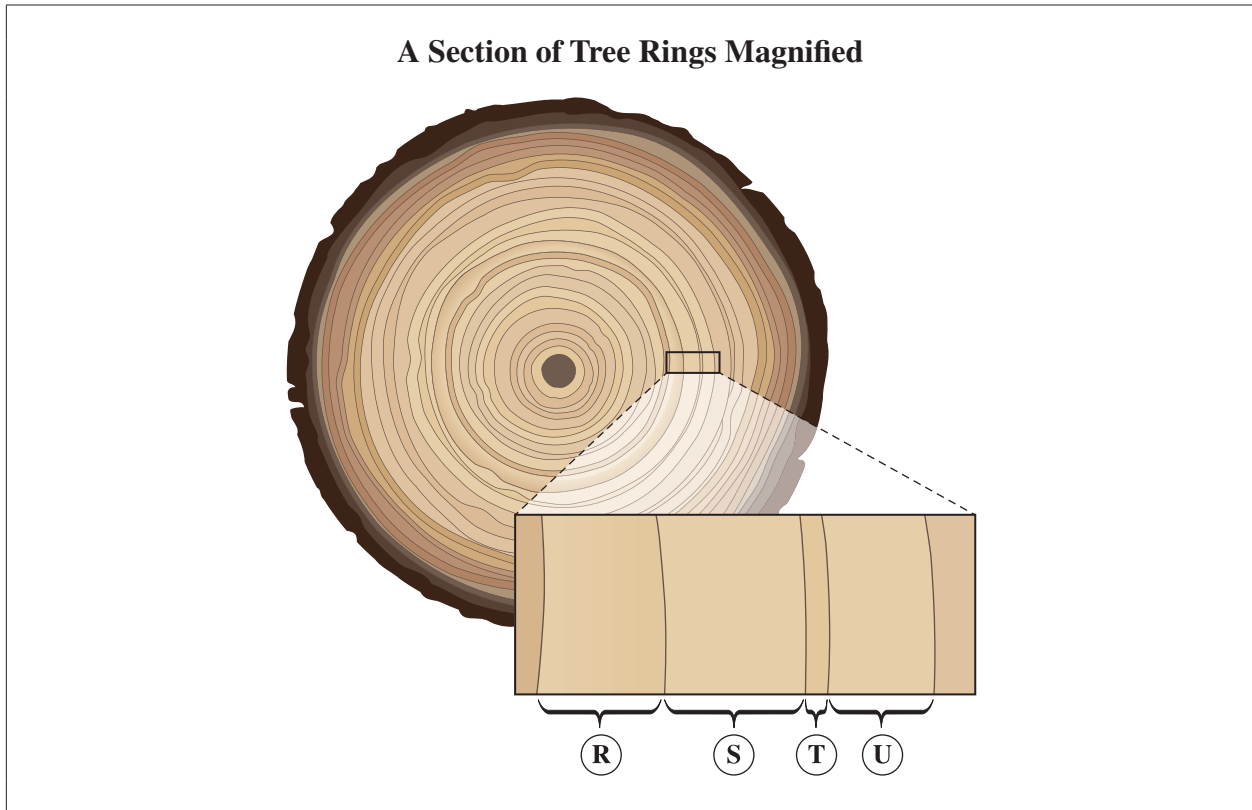
45. The tree ring identified as **T** **most likely** indicates that there was a

   A. fall wildfire
   B. dry summer
   C. rainy spring
   D. warm winter

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46. Which of the following actions would have the **most negative** impact on a forest ecosystem?

   A. Clearing forests to increase the area of farmland
   B. Leaving a larger uncut area around a protected forest
   C. Cutting down a forest to stop an infestation of bark beetles
   D. Removing dead growth on the forest floor by setting prescribed fires in forested areas

A chart at the science fair lists some of the uses of several different tree species.

Tree	Some Uses
Black spruce	Pulp, newsprint, fine paper
Douglas fir	Structural lumber, boats, flooring, railway ties
Jack pine	Construction lumber, siding, pulp and paper
Lodgepole pine	Construction lumber, boats, flooring, railway ties
Red cedar	Shingles, posts, deck materials, boats, doors
White ash	Baseball bats, hockey sticks, furniture
White birch	Plywood, toys, clothespins
White spruce	Construction lumber, newsprint, paper products

47. Which of the following tree species is important to the newspaper industry?

A. Black spruce
B. Jack pine
C. Red cedar
D. White ash

A Grade 6 class conducts an experiment to test the growth rate of spruce tree seedlings in different temperatures. They write up their experiment using the following outline.

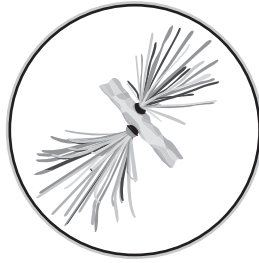**Sections of a Science Lab Report**

1 Experimental Question
2 Hypothesis
3 Materials and Design
4 Observations
5 Conclusions

48. In which of the sections above would students place a graph showing the growth of the spruce tree seedlings at different temperatures?

A. Hypothesis
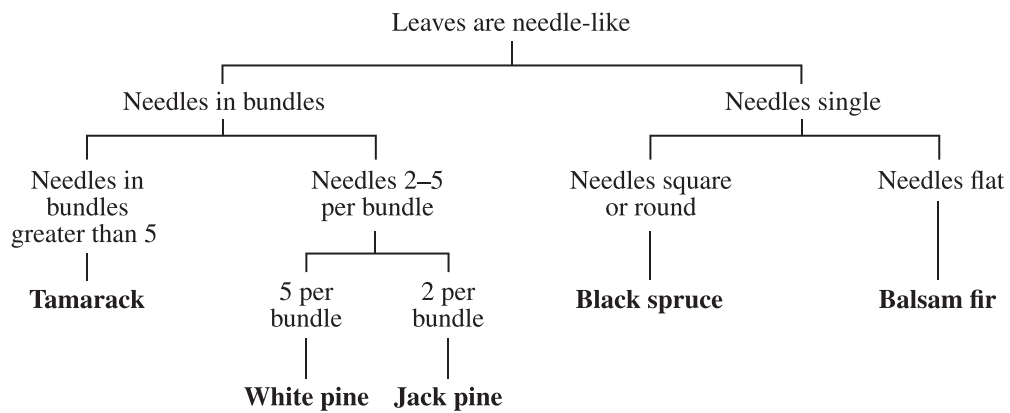B. Materials and Design
C. Observations
D. Conclusions

Amelia wants to identify the tree from which she gathered the following leaf sample.

She uses the table below to guide her identification.

Classifying Trees with Needle-like Leaves

Leaves are needle-like

Needles in bundles   Needles single

Needles in bundles greater than 5   Needles 2–5 per bundle   Needles square or round   Needles flat

Tamarack

5 per bundle   2 per bundle   **Black spruce**   **Balsam fir**

White pine   **Jack pine**

49. Amelia's leaf sample is from a

   A. tamarack
   B. white pine
   C. balsam fir
   D. black spruce

A student created the following concept map.

Section 1: _____
- provide useful building products

Section 2: _____
- produce oxygen from carbon dioxide
- enrich the soil

Uses of Trees and Forests

Section 3: _____
- provide food, homes, and shelter for wildlife

Section 4: _____
- add beauty and enjoyment to lives of people
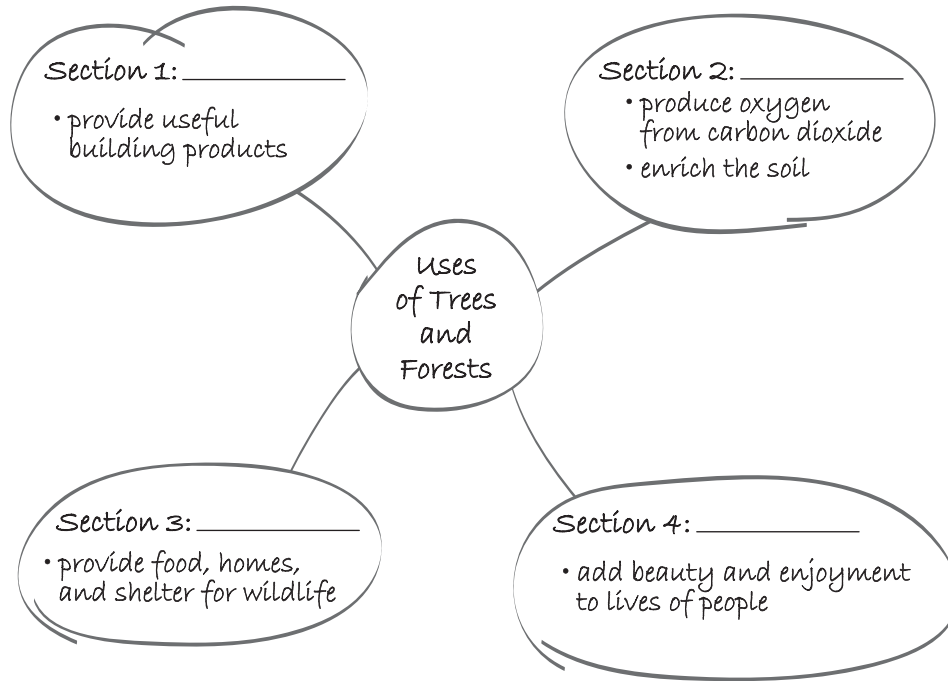
50. The sections of the concept map above that relate **most directly** to the nutrient cycle are sections

- **A.** 1 and 2
- **B.** 1 and 3
- **C.** 2 and 3
- **D.** 3 and 4

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