Grade 4
Science Practice Test Book

4PTSC

Alaska

Alaska Department of Education
& Early Development

Standards Based Assessments

Spring 2012

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STUDENT'S LAST NAME	STUDENT'S FIRST NAME	MI

STATE STUDENT ID NUMBER

BIRTHDATE			
Month	Day	Year	
Jan			
Feb			
Mar	0	0	0 0
Apr	1	1	1
May	2	2	2
Jun	3	3	3
Jul		4	4
Aug		5	5
Sep		6	6
Oct		7	7
Nov		8	8 8
Dec		9	9 9

TEACHER USE ONLY

Fill in all that apply.

- Ⓢ Modified – Altered Exam No Score Generated
- Ⓢ Absent
- Ⓢ Student Refusal
- Ⓢ Parent Refusal
- Ⓢ Suspension
- Ⓢ Invalid No Score Generated

SERIAL#

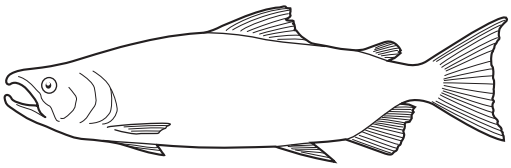
SCIENCE—SAMPLE QUESTIONS

Directions:

Read Sample Questions A and B. For Sample A, fill in the circle that goes with the answer you choose. Be sure to fill in the circle completely and make your mark heavy and dark. If you want to change your answer, completely erase the mark you made before making a new mark. For Sample B, write your answer in the space provided.

SAMPLE A

The picture below shows a Chinook salmon.



Chinook Salmon

Where does this animal live?

Ⓐ trees

Ⓑ caves

Ⓒ water

Ⓓ land

GO ON

SAMPLE B

Four animals are shown below.

Elephant Bear Hawk Butterfly

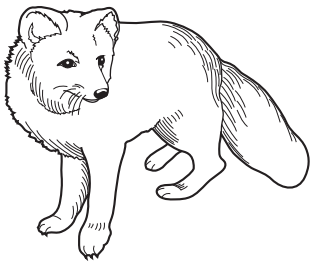
A. Classify these animals into two different groups.

Group 1	Group 2

B. Explain why you grouped the animals into these two groups.

STOP

1. The drawing below shows an arctic fox.



arctic fox

Which statement is an observation of the arctic fox in the drawing?

Ⓐ The arctic fox has two ears.

Ⓑ The arctic fox eats mice during the summer.

Ⓒ The arctic fox lives farther north than other types of foxes.

Ⓓ The arctic fox has fur that changes color during the winter.

---

2. Liquid cooking oil was poured into a container. Which statement **best** describes a property of the cooking oil after it was poured into the container?

Ⓐ Its color changed.

Ⓑ Its mass increased.

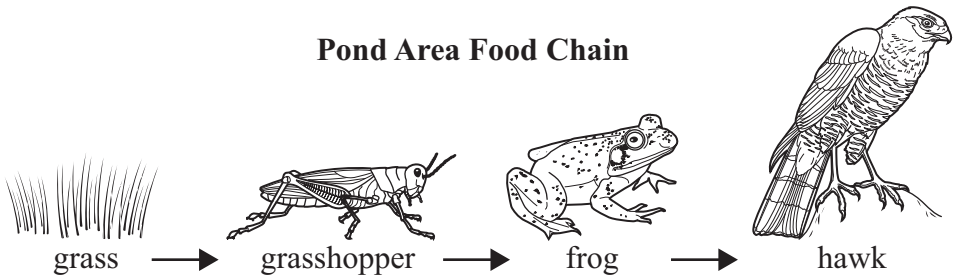
Ⓒ Its volume stayed the same.

Ⓓ Its temperature quickly increased.

GO ON

3. A pond area food chain is shown.

Pond Area Food Chain



The pond area experiences a drought. There is less water in the pond where the frogs live. What will **most likely** happen first if the water level in the pond continues to decrease?

Ⓐ There will be more frogs.

Ⓑ There will be fewer hawks.

Ⓒ There will be taller grasses.

Ⓓ There will be smaller grasshoppers.

---

4. Benjamin Franklin invented many different things. Among his inventions were bifocal glasses, the lightning rod, and a type of iron stove. Which personal quality **most likely** led to the invention of these things?

Ⓐ humor

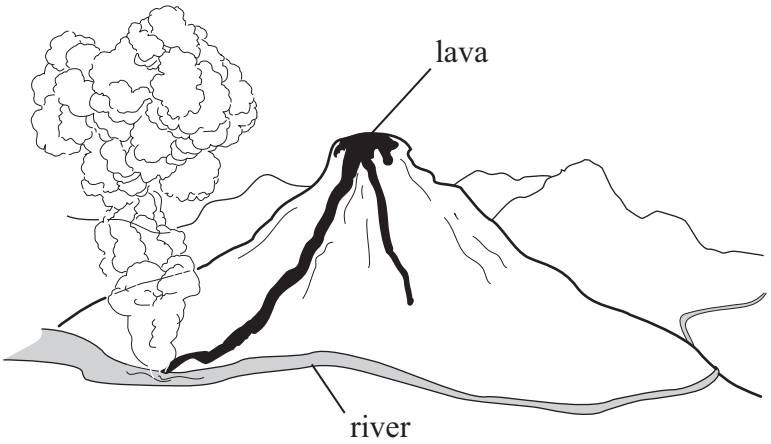
Ⓑ honesty

Ⓒ curiosity

Ⓓ leadership

GO ON

5. The picture below shows an active volcano in a mountain range.



When hot lava enters a river, steam forms. Which statement **best** explains why the steam forms?

Ⓐ The lava increases the temperature of the river water.

Ⓑ The lava decreases the temperature of the river water.

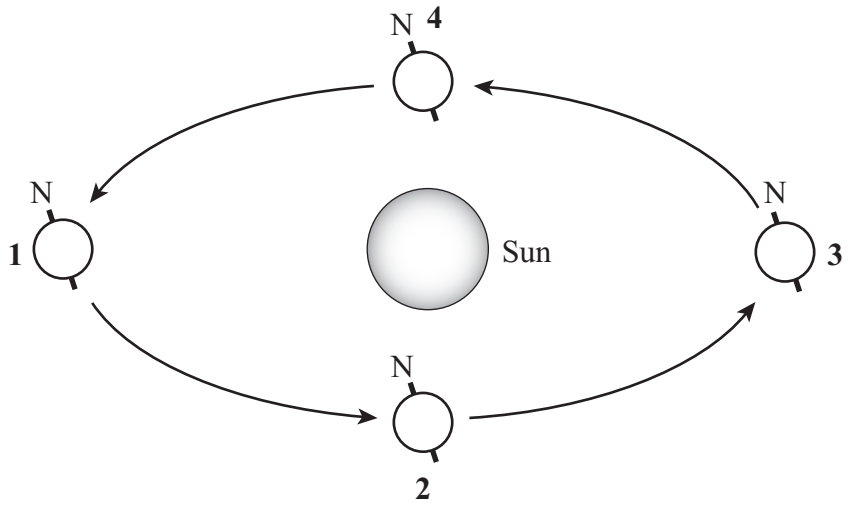
Ⓒ The river water causes the lava to change from a liquid to a gas.

Ⓓ The river water causes the lava to change from a gas to a liquid.

GO ON

6. The drawing below shows the positions of Earth during different seasons.

Positions of Earth



Which statement describes the position of Earth when Alaska has the **most** daylight hours?

Ⓐ Alaska has the most daylight hours at position 1, when it is summer.

Ⓑ Alaska has the most daylight hours at position 2, when it is winter.

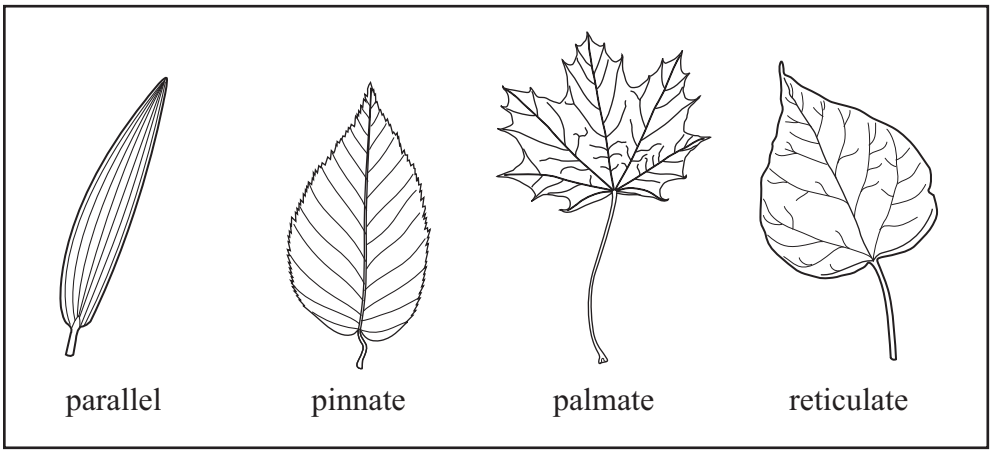
Ⓒ Alaska has the most daylight hours at position 3, when it is summer.

Ⓓ Alaska has the most daylight hours at position 4, when it is winter.

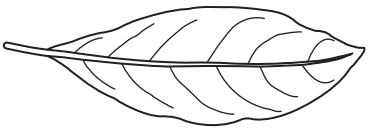
GO ON

7. Scientists can classify leaves by the patterns of their veins.

Leaf Type Classification



Unknown Leaf



Based on the pattern of its veins, the unknown leaf is **most likely** which type of leaf?

Ⓐ parallel

Ⓑ pinnate

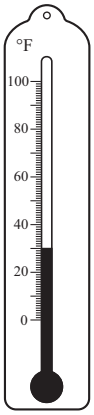
Ⓒ palmate

Ⓓ reticulate

GO ON

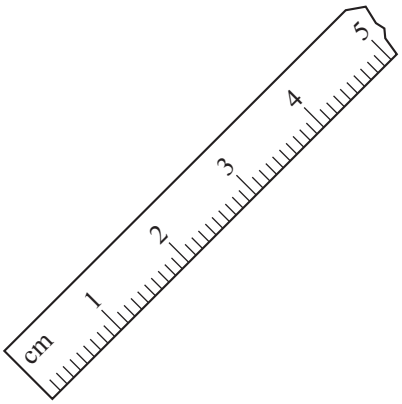
8. A student wants to count the number of tiny petals on an alpine wildflower. Which tool would be **most** useful to the student?

Ⓐ



thermometer

Ⓑ

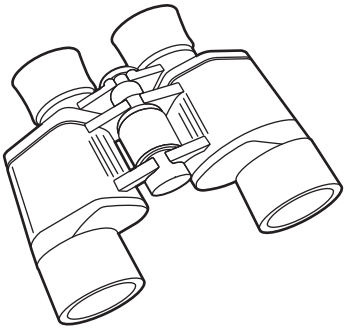


ruler

Ⓒ

hand lens

Ⓓ



binoculars

GO ON

9. Study the data table below.

Rubber Band Test

Set of Materials	Rubber Bands to Use	
	Inside School	Outside School
1	1 thin band	1 thin band
2	1 thin band	1 thick band
3	6 thin bands	6 thin bands
4	6 thin bands	1 thick band

Two students want to know how temperature affects rubber bands. They decide to test rubber bands inside and outside their school during the winter. The students plan to stretch each rubber band until it breaks. Which set of materials should be used for this test?

Ⓐ set 1

Ⓑ set 2

Ⓒ set 3

Ⓓ set 4

---

10. Which action **most likely** causes large rocks to become smaller pieces of rock?

Ⓐ melting inside of Earth

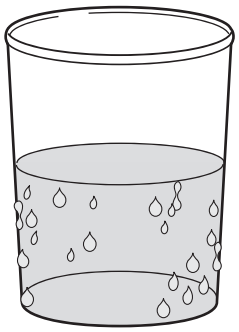
Ⓑ weathering by wind and water

Ⓒ cementing by mud and minerals

Ⓓ being pressed between layers of soil

GO ON

11. The picture below shows water droplets on the outside of a glass that contains water.



Which action would **most likely** cause water from the air to form water droplets on the outside of the glass?

Ⓐ A glass containing hot water is placed in a cold room.

Ⓑ A glass containing cold water is placed in a cold room.

Ⓒ A glass containing hot water is placed in a warm room.

Ⓓ A glass containing cold water is placed in a warm room.

GO ON

12. Study the picture of the Big Dipper below.

Big Dipper Stars at Night

Which picture **best** predicts how the Big Dipper would appear to move in the night sky?

Ⓐ

Ⓑ

Ⓒ

Ⓓ

GO ON

13. A student moved an unknown material from a small glass container to a larger glass container. The student recorded observations made before and after the material was moved.

Student Observations

- shape stayed the same
- size stayed the same
- volume stayed the same

Which of the following is **most likely** the unknown material?

Ⓐ air

Ⓑ milk

Ⓒ rock

Ⓓ juice

---

14. Which process causes the **fastest** changes to the surface of Earth?

Ⓐ a large glacier forming on a mountain

Ⓑ strong winds wearing away a rock cliff

Ⓒ a major earthquake happening in a mountain range

Ⓓ many waves on a lake moving pebbles onto a beach

GO ON

This question is worth 2 points.

15. A student recorded air temperatures on Monday and Tuesday.

Air Temperature Information

Time	Monday	Tuesday
8:00 AM	45°F	50°F
9:00 AM	47°F	52°F
10:00 AM	48°F	53°F
11:00 AM	50°F	55°F
12:00 PM	52°F	57°F
1:00 PM	?	?

A. Describe a pattern in the student's recorded data.

_____

_____

_____

B. Based on the pattern, predict the **most likely** air temperature at 1:00 PM for each day.

Monday: _____°F

Tuesday: _____°F

GO ON

16. A student is investigating how a fossil can form. The student followed the directions as shown.

Investigation Directions

1. Flatten a piece of clay until it is 1 cm thick.
2. Place a leaf onto the clay.
3. Press the leaf down firmly into the clay.
4. Slowly lift the leaf out of the clay.
5. Let the clay dry overnight.

Which type of fossil did the student **most likely** make during the investigation?

Ⓐ a cast fossil

Ⓑ a track fossil

Ⓒ an imprint fossil

Ⓓ a preserved fossil

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17. After observing several dogs running, students ask the following question:

Do dogs with long hair run faster than dogs with short hair?

How can the students **best** answer their question?

Ⓐ record the weights and heights of many dogs

Ⓑ measure the speeds and hair lengths of many dogs

Ⓒ research to find the type of dog with the longest hair

Ⓓ race one long-haired dog against one short-haired dog

GO ON

18. Students investigated the effect of water temperature on the growth of bean plants. The students used four bean plants. Each plant was 12 cm tall. The students watered each plant with the same amount of water at a different temperature.

Bean Plant Investigation

Bean Plant	**Temperature of Water** (°C)	**Height after Two Weeks** (cm)
1	25	32
2	30	28
3	35	22
4	40	15

Which statement **best** describes the results of the investigation?

Ⓐ Bean plants did not grow when watered with cooler water.

Ⓑ Bean plants did not grow when watered with warmer water.

Ⓒ The cooler the water used, the less the bean plants grew.

Ⓓ The warmer the water used, the less the bean plants grew.

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19. Which statement **best** identifies a basic need of all animals?

Ⓐ They need to eat.

Ⓑ They need to hide.

Ⓒ They need to jump.

Ⓓ They need to smell.

GO ON

20. The data table shows how many paper clips a magnet picked up during an investigation.

Magnet Investigation

Trial	Number of Paper Clips
1	10
2	11
3	9
4	11
5	10
6	?

How many paper clips will the magnet **most likely** pick up during trial 6?

Ⓐ 6 paper clips

Ⓑ 7 paper clips

Ⓒ 10 paper clips

Ⓓ 12 paper clips

---

21. A teacher opens a can of food in the front of a classroom. Soon, all of the students in the classroom can smell the food. Which statement identifies a property of a gas that allows all of the students to smell the food?

Ⓐ A gas has no mass.

Ⓑ A gas has a large mass.

Ⓒ A gas takes the shape of its container.

Ⓓ A gas keeps its shape when placed in a container.

22. Many stars can be seen in the sky at night. Which statement **best** explains why the Sun appears brighter than the stars seen in the night sky?

Ⓐ The Sun is bigger than the stars seen in the night sky.

Ⓑ The Sun is smaller than the stars seen in the night sky.

Ⓒ The Sun is closer to Earth than the stars seen in the night sky.

Ⓓ The Sun is farther from Earth than the stars seen in the night sky.

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23. Which statement **best** identifies a living thing that depends on another living thing to survive?

Ⓐ A wolf drinks water.

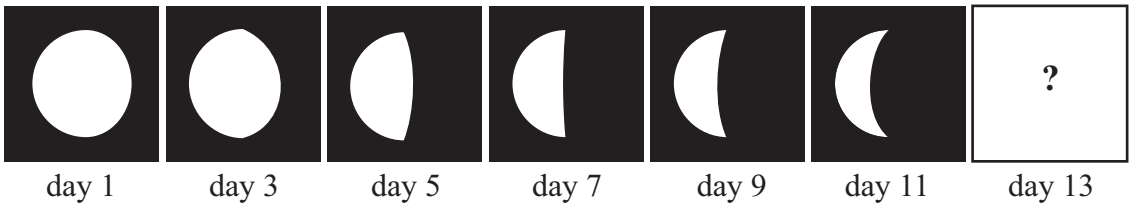
Ⓑ A moose eats a plant.

Ⓒ A spruce tree grows in soil.

Ⓓ A salmonberry plant absorbs sunlight.

24. The chart shows observations of the Moon.

Observations of the Moon



Which drawing shows how the Moon would **most likely** appear on day 13?

Ⓐ

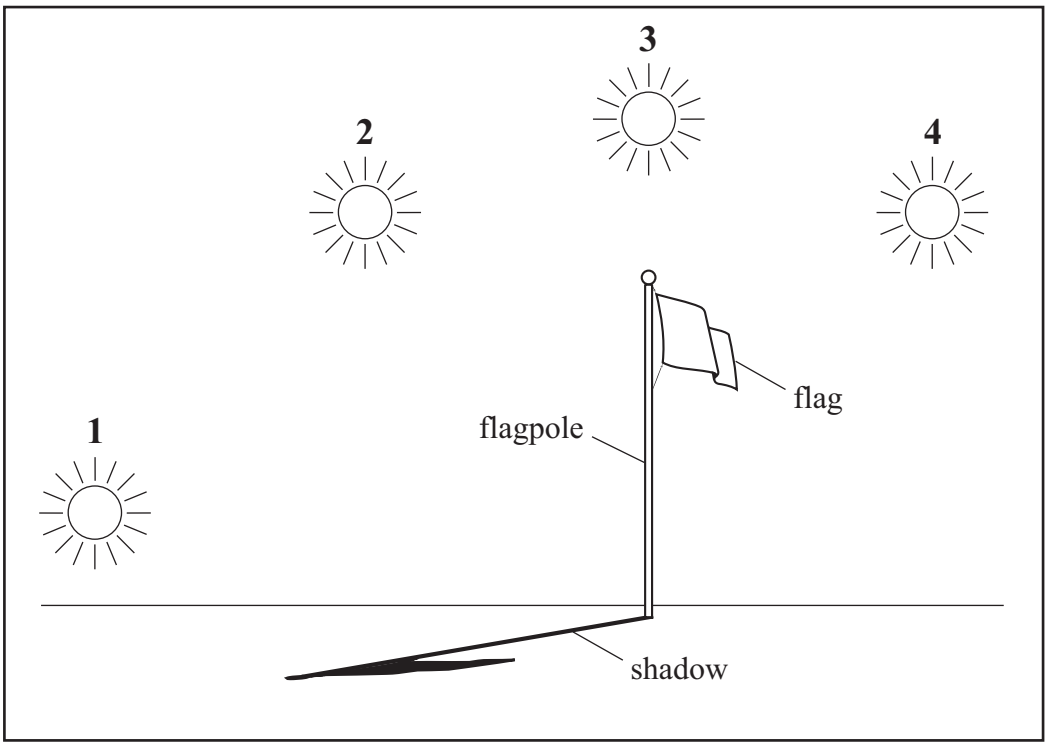
Ⓑ

Ⓒ

Ⓓ

GO ON

25. The picture shows how the Sun appeared to change position during a day. A shadow from a flagpole and flag is also shown.



Which position of the Sun **most likely** caused the shadow shown in the picture?

Ⓐ position 1

Ⓑ position 2

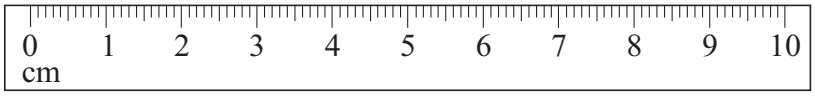
Ⓒ position 3

Ⓓ position 4

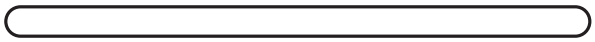
GO ON

26. A drawing of a metric ruler is shown below.

Metric Ruler

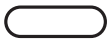


A student has four rubber bands. Which rubber band is about 4 cm long?

Ⓐ 

Ⓑ

Ⓒ

Ⓓ 

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27. Which physical characteristic do some organisms have that helps them survive in the Arctic?

Ⓐ growing tall to hide in trees

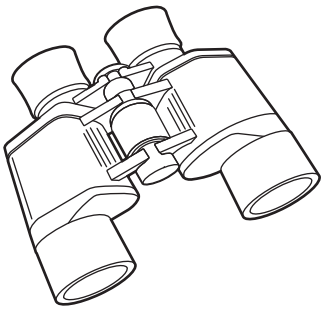
Ⓑ changing fur color to hide from predators

Ⓒ developing large paws to protect themselves from the wind

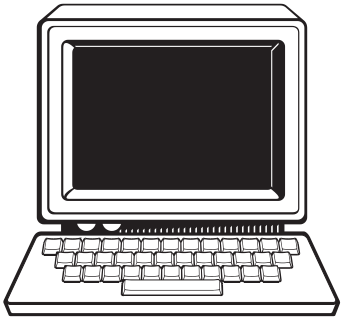
Ⓓ producing shallow root systems to protect themselves from the cold air

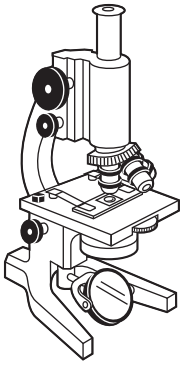
GO ON

28. A student watches two birds building a nest near the top of a tree. Which tool would the student find **most** helpful for watching the birds?

Ⓐ 

Ⓑ

Ⓒ 

Ⓓ 

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29. Which statement describes a property of water that **most likely** causes large rocks to break apart?

Ⓐ Water expands when it freezes.

Ⓑ Water forms droplets as it falls.

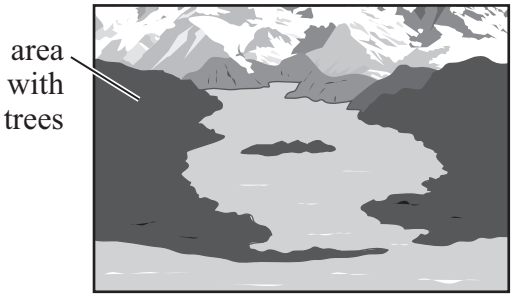
Ⓒ Water turns into a gas when it boils.

Ⓓ Water takes the shape of its container.

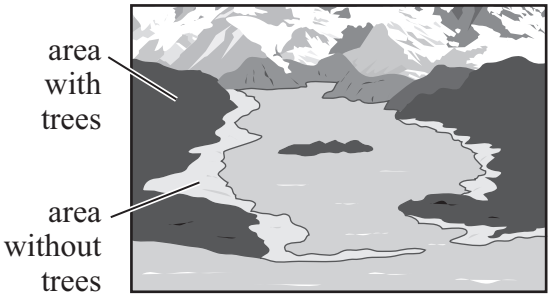
GO ON

30. Lituya Bay is along the coast of Alaska.

Lituya Bay Before



Lituya Bay After



In 1958, there were three major events that occurred one after another. During the events, many trees surrounding Lituya Bay were knocked down by large amounts of ocean water. Which set of events **most likely** caused the change around Lituya Bay?

Ⓐ earthquake ⟶ landslide ⟶ tsunami

Ⓑ landslide ⟶ avalanche ⟶ earthquake

Ⓒ avalanche ⟶ volcanic activity ⟶ flood

Ⓓ tsunami ⟶ landslide ⟶ volcanic activity

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31. For many years, people have been curious about the stars. In the past, people have shared what they knew about the stars through stories and drawings. Which pair of tools would be **most** helpful for people today to gather and share information about stars?

Ⓐ a notebook and a calculator

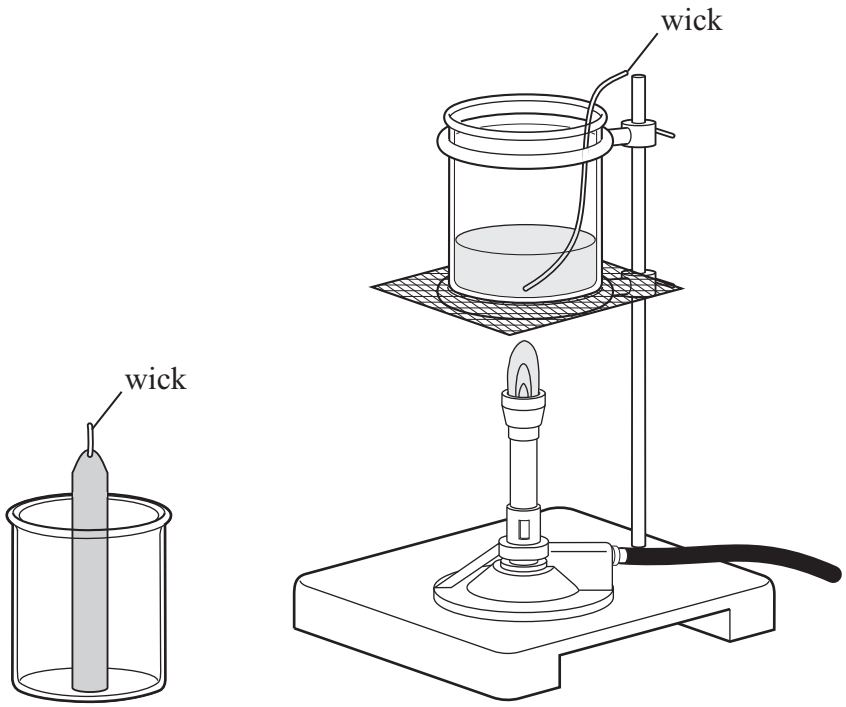
Ⓑ a telescope and a computer

Ⓒ a calculator and a microscope

Ⓓ a microscope and a telescope

GO ON

32. A teacher puts a wax candle in a jar. Then, the teacher heats the jar as shown.



before after

After a few minutes of heating, the candle has melted. Which statement **best** describes the melted candle?

Ⓐ It is a solid because it fills the jar.

Ⓑ It is a liquid because it fills the jar.

Ⓒ It is a solid because it takes the shape of the jar.

Ⓓ It is a liquid because it takes the shape of the jar.

GO ON

33. A student gives a red toy car a push on a wooden floor. The student then pushes the same red toy car on a cement floor. Which question is the student **most likely** investigating?

Ⓐ How fast does a toy car usually roll?

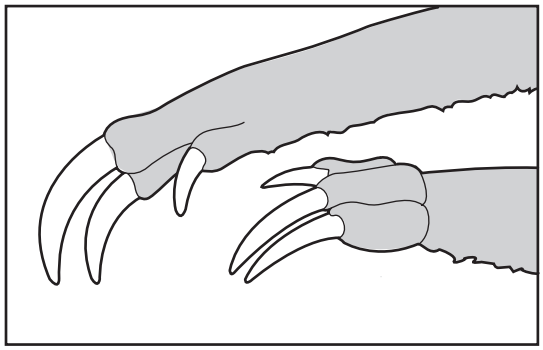
Ⓑ What is the best way to make a toy car roll?

Ⓒ Which surface allows a toy car to roll farther?

Ⓓ Does color have an effect on the distance a toy car rolls?

---

34. The drawing shows the front feet of an animal.



Which activity does this animal **most likely** do very well?

Ⓐ flying

Ⓑ digging

Ⓒ jumping

Ⓓ swimming

35. Algae are organisms that live in water. Scientists discovered a new type of red algae near Knight Island in Prince William Sound. Which statement is **most likely** a positive effect of this discovery?

Ⓐ Scientists studying the red algae are disturbing local wildlife.

Ⓑ The red algae may help scientists better understand local food webs.

Ⓒ Visitors to Alaska may want to collect the red algae and take it home.

Ⓓ The red algae may be moved by boat to other areas when people travel.

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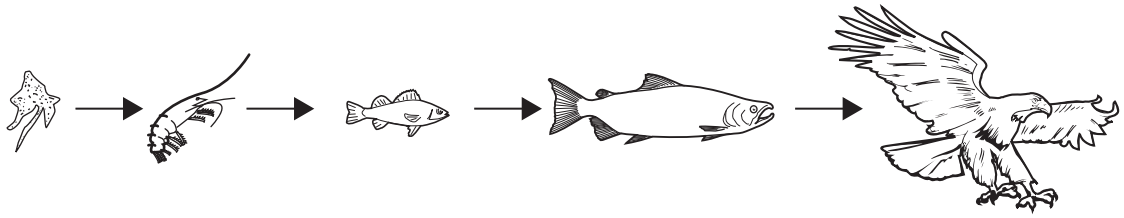
36. A food chain is shown below.

Food Chain



plankton krill small fish salmon eagle

Which type of organism will **most likely** increase if the krill population decreases?

Ⓐ plankton

Ⓑ small fish

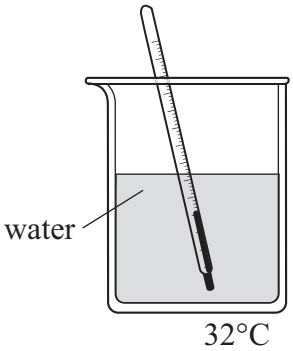
Ⓒ salmon

Ⓓ eagle

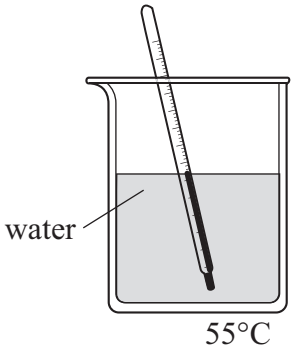
GO ON

37. In which container will the liquid water **most likely** change into a gas fastest?

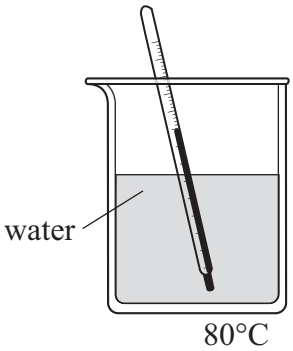
Ⓐ



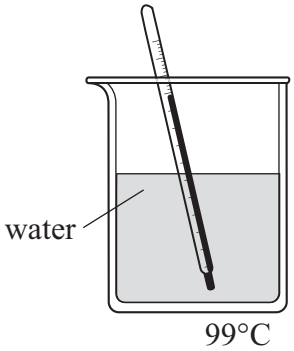
Ⓑ



Ⓒ

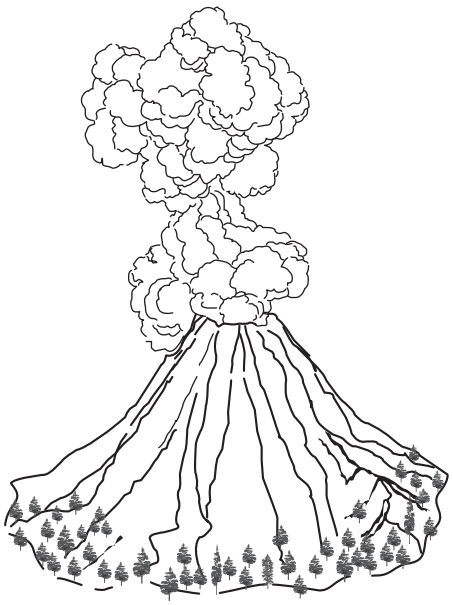


Ⓓ



GO ON

38. The drawing below shows a volcano.



volcano

Which statement is an inference based on the drawing?

Ⓐ The volcano is shaped like a cone.

Ⓑ The volcano has stopped erupting.

Ⓒ There is magma inside the volcano.

Ⓓ There are trees at the base of the volcano.

---

39. Sand is a type of soil that is made of very tiny pieces of material. Which process **most likely** forms sand?

Ⓐ the rotation of Earth

Ⓑ the growth of animals

Ⓒ the decay of large trees

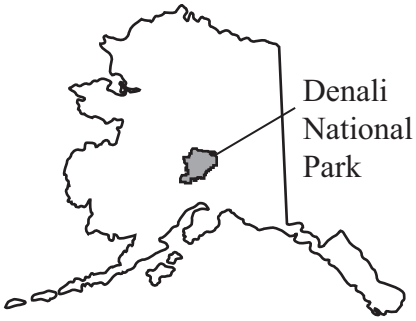
Ⓓ the weathering of rocks

GO ON

This question is worth 2 points.

40. In 2005, a fossil of a dinosaur track was discovered in Denali National Park.

Fossil Location



Fossil Information

- three toes
- many years old
- about 23 cm long and 15 cm wide

Describe one positive effect and one negative effect of this dinosaur fossil discovery.

One Positive Effect: _____

_____

_____

_____

One Negative Effect: _____

_____

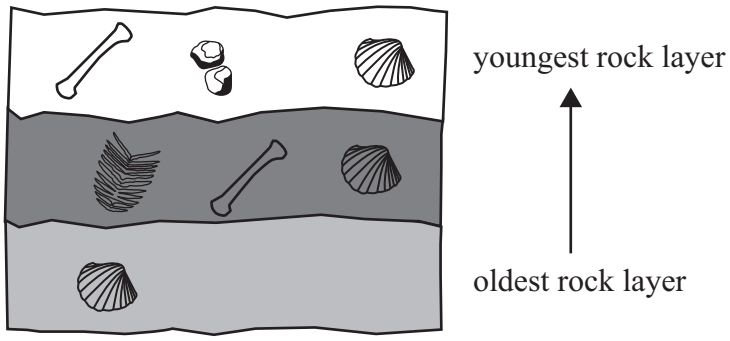
_____

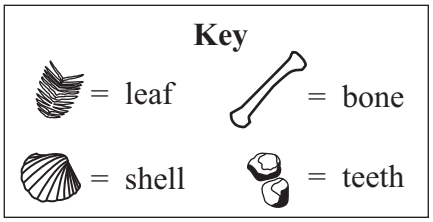
_____

GO ON

41. The drawing below shows fossils in three rock layers.

Rock Layers with Fossils

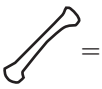




Based on the drawing, which type of fossil **most likely** represents the oldest type of organism?

Ⓐ = leaf

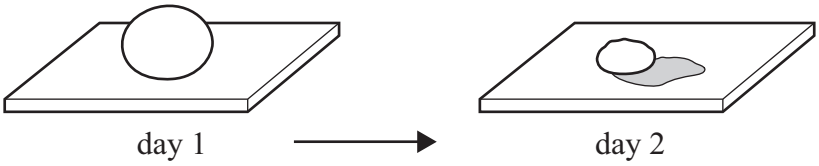
Ⓑ = shell

Ⓒ  = bone

Ⓓ = teeth

GO ON

42. A student made a snowball and left it on a shelf outside. The next day, the student observed the snowball.



Which statement **best** explains a change in the snowball?

Ⓐ The air temperature increased, causing part of a solid to become a liquid.

Ⓑ The air temperature decreased, causing part of a solid to become a liquid.

Ⓒ The air temperature increased, causing part of a liquid to become a solid.

Ⓓ The air temperature decreased, causing part of a liquid to become a solid.

43. A student observed two objects and made a list of information describing each object.

Descriptions of Two Objects

Object W	Object X
• square • green • 2 centimeters	• rectangle • brown • 4 centimeters

Which properties of the objects did the student **most likely** observe and describe in each list?

Ⓐ shape, color, and length

Ⓑ shape, length, and temperature

Ⓒ size, color, and texture

Ⓓ size, temperature, and color

---

44. Which tool would **best** help a person observe the parts of a plant cell?

Ⓐ hand lens

Ⓑ telescope

Ⓒ binoculars

Ⓓ microscope

45. A student measured the resting heart rate of another student and recorded the results in a data table.

Resting Heart Rate Investigation

Student	**Resting Heart Rate** (heartbeats/minute)
1	85

The students conclude that the resting heart rate is 85 heartbeats/minute. Which action would **best** help the students make sure their conclusion is correct?

Ⓐ repeat the investigation measuring the student's resting heart rate

Ⓑ measure the student's heart rate again after exercising for one minute

Ⓒ compare the student's resting heart rate to a teacher's resting heart rate

Ⓓ talk to a teacher about the resting heart rates of other students in the class

---

46. Which change is **most likely** caused by a thunderstorm?

Ⓐ a glacier moving

Ⓑ a stream flooding

Ⓒ a volcano erupting

Ⓓ a mountain forming

47. The chart below shows food sources for several organisms living in Alaska.

Alaska Organisms

Organisms	Food Source
moose	plants
wolves	other animals
muskoxen	plants
bears	plants and other animals
plants	make their own food

Which food chain is based on the information in the chart?

Ⓐ bears → plants → muskoxen

Ⓑ wolves → bears → moose

Ⓒ moose → muskoxen → plants

Ⓓ plants → moose → wolves

---

48. Which list includes **only** examples of matter that can take the shape of a container?

Ⓐ oil, air, and rock

Ⓑ water, air, and milk

Ⓒ sand, ice, and wood

Ⓓ nail, stick, and paper

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SERIAL#

Alaska

Grade 4

Practice Test Book

Form 4PTSC

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