

STUDENT NAME _____
(please print)

Grade

8

New Jersey Student Learning Assessment—Science (NJSLA—S) Practice Test

FORM
A

Grade 8



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Sample Items

This test booklet contains several different types of test questions. See the samples below, which will help you understand how to respond to each question type.

Record/mark your answers by circling the answer in the test booklet. If you need to change an answer, be sure to erase your first answer completely. **Only the answers you write in your test booklet will be scored.**

One of the questions will ask you to write a response. Write your response in the box provided in the test booklet. Be sure to keep your response within the provided space. Only responses written within the provided space will be scored.

Sample Item 1. Multiple-Choice (Select one answer.)

Which claim about the Sun is accurate?

- A. The Sun appears smaller and brighter than other stars because it is the closest star to Earth.
- B. The Sun appears larger and brighter than any other star because it is the closest star to Earth.
- C. The Sun appears larger and less bright than other stars because it is the farthest star from Earth.
- D. The Sun appears smaller and less bright than any other star because it is the farthest star from Earth.

Sample Item 2. Multi-Select (Select multiple answers.)

Select **two (2)** answers for this item. The risk of an earthquake happening is **higher**

- A. in the South than in Alaska.
- B. on the West Coast than in the Northeast.
- C. on the East Coast than on the West Coast.
- D. in Alaska than in the center of the country.
- E. in the center of the country than on the West Coast.

Sample Item 3. Multi-Select Box Item (Select one answer for each box.)

A student claims that a soccer ball has less energy after it hits a wall. Select the correct word from each box to complete the statement that explains why this claim is true.

When a soccer ball hits the wall, **Y** of the soccer ball's energy is transferred to the air in the form of **Z**.

Y

- A.** all
- B.** some
- C.** none

Z

- A.** light
- B.** sound

Sample Item 4. Constructed Response (Write out your answer.)

Many New Jersey towns have started programs to reduce the amount of traffic on roads as a means to help improve air quality. Give **two (2)** examples of programs that would help reduce traffic and improve air quality.

Answers to Sample Questions

1. **A (B) C D**
2. **A (B) C (D) E**
3. **Y**
A (B) C
Z
A (B)

4. Carpooling is one means to reduce the number of cars on the roads. Using public transit when available would also decrease the number of individual cars. Both of these measures would help improve air quality.



Unit 2 Practice Test

Directions:

Today you will take Unit 2 of the Grade 8 New Jersey Student Learning Assessment-Science (NJSLA-S) Practice Test. You will be able to use a calculator and a periodic table.

Read each question. Then, follow the directions to answer each question. Circle the answer or answers you have chosen in your test booklet. If you need to change an answer, be sure to erase your first answer completely.

If a question asks you to show or explain your work, you must do so to receive full credit. Only responses written within the provided space will be scored.

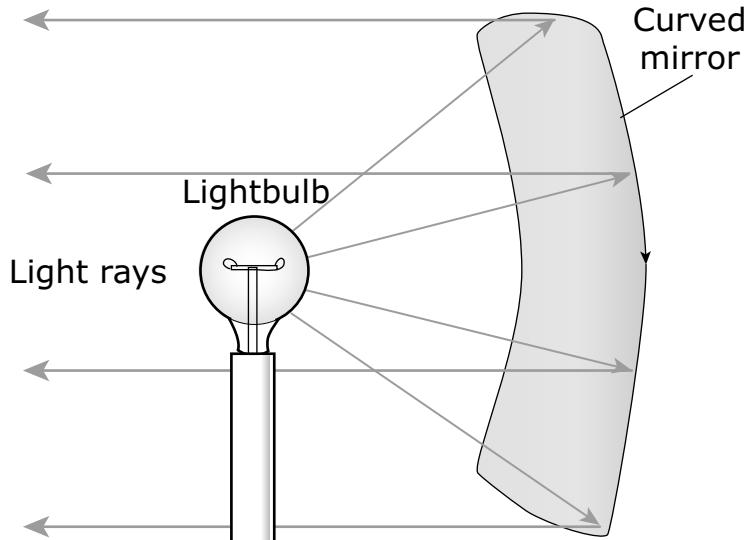
If you do not know the answer to a question, you may go on to the next question. If you finish early, you may review your answers and any questions you did not answer in this unit **ONLY**. Do not go past the stop sign.



Use the information below to answer questions 1-3.

Lighthouses provide light to ships navigating the ocean.

Lighthouse technology in the late 1800s included curved mirrors, as shown in Figure 1, to direct light toward ships at sea.



**Figure 1. Lighthouse Projection Method
Used in the Late 1800s**

Modern lighthouse technology projects light by using lenses like the one shown in Figure 2.

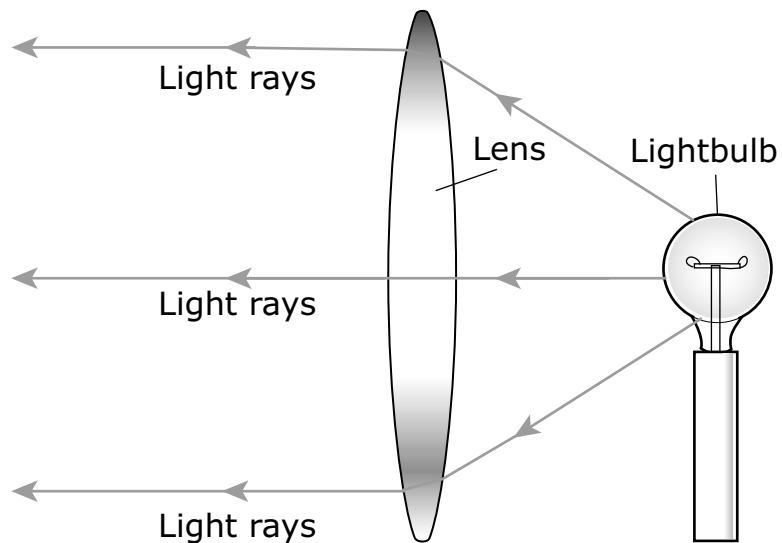


Figure 2. Modern Lighthouse Projection Method

When a ray of light passes from one medium to another, as shown in Figure 3, it undergoes some changes.

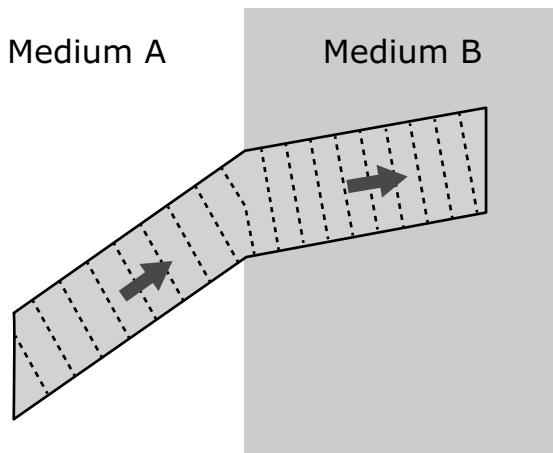


Figure 3. Path of Light

1. Figure 1 demonstrates how lighthouses in the 1800s directed bright light toward ships.

Complete the sentence by choosing the correct answer from each box.

In the projection method shown in Figure 1, light waves travel **X** until they **Y** the surface of the **Z**.

Box X

- A.** through a vacuum
- B.** in straight lines

Box Y

- A.** bend upon entering
- B.** reflect off
- C.** are absorbed by

Box Z

- A.** lightbulb
- B.** air
- C.** mirror

2. Figure 2 shows one model of light projection.

The answer to which question **most accurately** clarifies the role of the lens in Figure 2?

- A.** Does the lens transmit or reflect light waves?
- B.** Does the lens change the color of the light waves?
- C.** How far out at sea can light waves be seen using lenses?
- D.** How does the lens transfer matter from one side to the other?

3. Foghorns are another method of warning ships that they are close to the shore. Foghorns emit low-pitched sound waves in all directions that can be heard on ships when visibility is low. Low-pitched waves have longer wavelengths that are less likely to be blocked by barriers such as rocks.

Compare the warning signals emitted by a lighthouse with those emitted by a foghorn.

Select all the correct answers. You may select more than one answer for each scenario.

Lighthouse:

- A.** The signal is transmitted by compression and expansion of air particles.
- B.** The signal system is designed to focus the wave in a specific direction.
- C.** The signal transmits energy.

Foghorn:

- A.** The signal is transmitted by compression and expansion of air particles.
- B.** The signal system is designed to focus the wave in a specific direction.
- C.** The signal transmits energy.

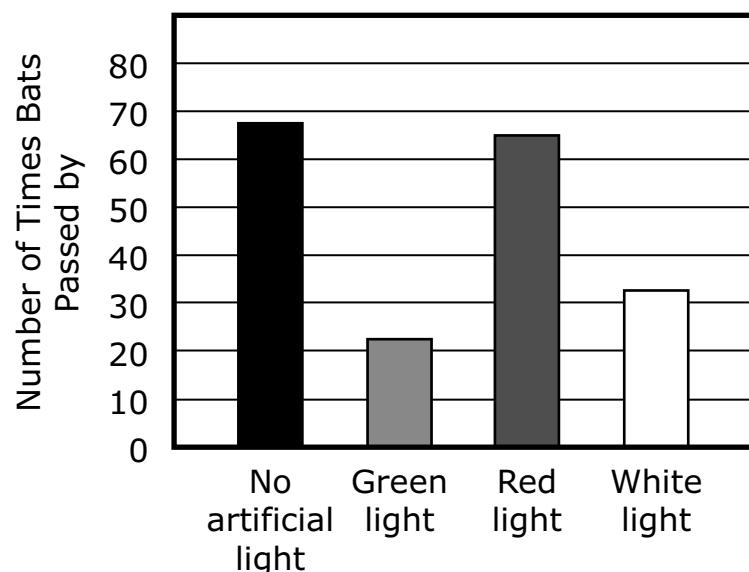
Use the information below to answer questions 4-7.

Bat activity can be affected by artificial lighting.

Because bats often rest during the day and hunt at night, they use their sense of hearing to help locate prey in the dark.

A hunting bat emits high-pitched sound waves that reflect off insects. The external structure of the bat's ear, which is composed of cartilage, funnels the reflected sound waves to the inner ear. The bat's brain then identifies the location of an insect based on the amount of time it takes for the reflected sound waves to reach the bat's ears.

A group of researchers set up a study using white, green, and red lights in an otherwise dark natural habitat. The researchers measured the activity of two types of bats by recording the number of times a bat passed by. The researchers took measurements for five days in both early summer and late summer for four years. Their results are shown in the graph.

Effect of Colored Lights on Bat Activity**Figure 1.**

Based on the information about bats, two students construct claims about the body systems a bat uses when it hunts.

Student 1: A bat's nervous system tells the bat where its prey is located. Then the bat's muscular system allows the bat to fly and catch the prey.

Student 2: A bat uses its respiratory system to produce sounds. Then the bat's nervous system tells the bat where the prey is located.

4. Which question can **best** be answered by analyzing the data in Figure 1?

- A. Why are bats not attracted by green light?
- B. Can bats distinguish a green grasshopper from a red ant at night?
- C. Are bats likely to be affected by green lights and red lights shining together?
- D. What color light should be used to observe bat activity without affecting their behavior?

5. Identify the independent variable in this investigation and the body system that would be **most** affected by this factor.

Complete the sentences by choosing the correct answer from each box.

The independent variable in this investigation is the **Y**. The investigation provided evidence that the bats' **Z** is reacting to a stimulus and affecting the behavior of the bats.

Box Y

- A. type of bat
- B. observed activity
- C. color of light

Box Z

- A. muscular system
- B. nervous system
- C. circulatory system

6. Which statement **best** compares the claims of the two students?

- A. Student 2's claim explains how ears send information to the brain, and Student 1's claim explains how the brain sends messages to the muscles for immediate action.
- B. Student 2's claim explains how the brain is not needed to process information, and Student 1's claim explains how muscle memory is used to capture prey.
- C. Student 1's claim explains how the brain stores memories, and Student 2's claim explains how these memories are used to locate prey.
- D. Student 1's claim explains how the brain reacts to sounds, and Student 2's claim explains how these sounds are stored as memories.

7. A city council proposes adding light fixtures that produce white light to roads and parking lots in one area of a community. A student claims that the action will result in an increase in the population of insects in the area. Which scientific reasoning **best** supports the student's claim?

- A. Bats will be more visible in white light, allowing insects to evade them.
- B. Insects will be likely to hide from white light, preventing bats from preying on them.
- C. Bats will travel to different areas to avoid the white lights, so the bats will eat fewer insects in the area.
- D. Larger prey will be more visible in the white lights than insects will, which will lead bats to change their diet.

Use the information below to answer questions 8-12.

A student is investigating why some parts of a bicycle rusted when left outside. The student learned that the rusted parts of the bike were made of iron.

In the investigation, the student places small pieces of iron into four test tubes, each test tube having different variables. Figure 1 shows variables and observations after 10 days.

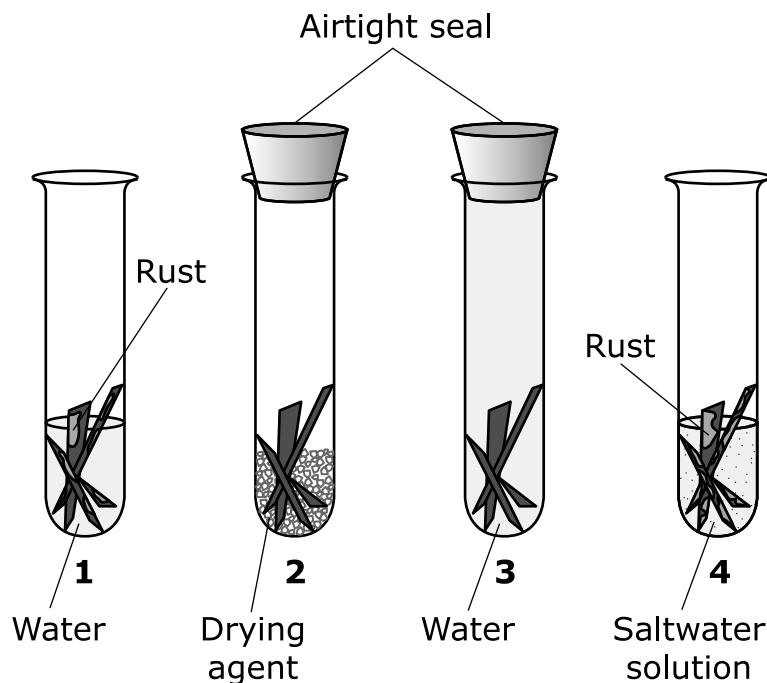


Figure 1. Rust Investigation

To better understand the process of rusting, the student researched the characteristics of samples of iron and rust. The information is shown in Table 1.

Table 1. Characteristics of Iron and Rust

Characteristic	Iron	Rust
Physical state at room temperature	Solid	Solid
Density (g/cm³)¹	7.87	5.24
Mass of sample (g)	250	167
Melting point (°C)	1,535	1,539

¹g/cm³—grams per cubic centimeter

8. Based on Figure 1, which data is the student trying to produce by conducting the investigation?

- A. the components that produce rust
- B. the types of metal that rust the fastest
- C. the amount of rust that forms every 10 days
- D. the amount of mass lost during the rusting process

9. Based on Figure 1, identify which test tubes show evidence of a chemical reaction.

Complete the sentence by choosing the correct answer from each box.

Evidence of a chemical reaction is shown in **Y** because the iron pieces **Z**.

Box Y

- A. test tube 1 only
- B. test tube 4 only
- C. both test tubes 1 and 4

Box Z

- A. formed a new shape
- B. changed in temperature
- C. formed a new substance

10. The elements Iron (Fe) and Oxygen (O) are found in a molecule of rust. Based on Figure 1, describe the atoms and molecules in the reactants and product of the rust reaction.

Complete the sentences by choosing the correct answer from each box.

The types of atoms found in the reactants and products are **X**. During the reaction, the atoms form **Y** molecules. The number of atoms in the reactants will be **Z** the number of atoms in the product.

Box X

- A.** the same
- B.** different

Box Y

- A.** identical
- B.** different

Box Z

- A.** equal to
- B.** less than
- C.** greater than

11. Two groups of students made claims about why the iron parts of a bicycle would rust when left outdoors near the ocean. Based on Figure 1, identify which student group was correct for each claim.

Select one option for each claim.

Claim A

- A.** Group 1: A bicycle will rust only when the air is salty.
- B.** Group 2: A bicycle will rust more quickly when the air is salty.

Claim B

- A.** Group 1: A bicycle will rust outdoors because water and oxygen are in the atmosphere.
- B.** Group 2: A bicycle will rust outdoors because only oxygen is in the atmosphere.

12. Based on Table 1, identify the properties that provide evidence that iron and rust are not the same substance.

Complete the table by choosing the correct answer from each box.

Properties	Evidence or Not Evidence
Physical state at room temperature	W
Density	X
Mass	Y
Melting point	Z

Box W

A. Evidence

B. Not Evidence

Box X

A. Evidence

B. Not Evidence

Box Y

A. Evidence

B. Not Evidence

Box Z

A. Evidence

B. Not Evidence

Use the information below to answer questions 13-16.

The number of diamondback terrapin nests is dropping in Jamaica Bay on Long Island, New York.



Figure 1. Diamondback Terrapin

Diamondback terrapins, shown in Figure 1, are a species of turtle that are part of the Jamaica Bay ecosystem. Terrapins use their hind legs to dig a hole in the sand, deposit their eggs, and cover them up again to make a nest. Researchers following the same group of 1,200 female terrapins observed that the number of nests has dropped by 50% over the last 10 years.

The loss of marshland in Jamaica Bay and increased pollution from human activities have led to high levels of nitrogen in the water. This increase in nitrogen promotes the growth of algae. The terrapins eat the algae instead of their normal diet of aquatic plants, snails, clams, and crabs. Algae is lower in protein and difficult for the terrapins to digest.

Researchers analyzed terrapin feces to determine what the terrapins in Jamaica Bay ate. Figure 2 shows the frequency of prey items in the feces of Jamaica Bay diamondback terrapins.

Diet of Diamondback Terrapins in Jamaica Bay

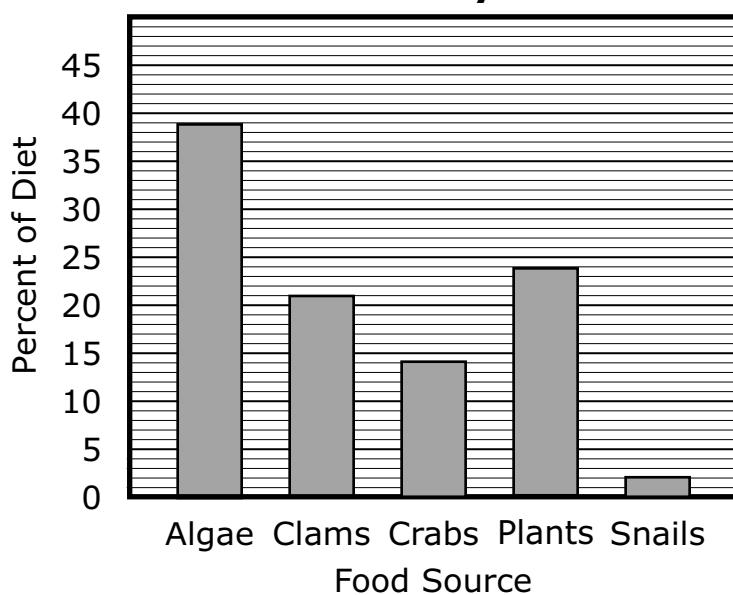


Figure 2.

13. This item has two parts. First, answer Part A. Then answer Part B.

Part A

Scientists also studied a population of diamondback terrapins that live in Oyster Bay, about forty miles north of Jamaica Bay. Table 1 lists the items in the terrapins' diet in approximately one month.

Table 1. Diet of Terrapins in Oyster Bay

Item	Amount in Diet (g)
Algae	24
Clams	19
Crabs	20
Plants	28
Snails	29
Total	120

Based on Figure 2 and Table 1, what is the difference between the percentage of algae in the diet of Jamaica Bay terrapins and the percentage of algae in the diet of Oyster Bay terrapins?

- A.** 5%
- B.** 15%
- C.** 19%
- D.** 20%

(Item 13 continued)

Part B

What conclusion about the two ecosystems can be drawn based on this information?

Complete the sentences by choosing the correct answer from each box.

The percentage of algae in the diet of Oyster Bay terrapins is **Y** than the percentage of algae in the diet of Jamaica Bay terrapins. This suggests that the Oyster Bay ecosystem **Z** than the Jamaica Bay ecosystem.

Box Y

- A.** less
- B.** greater

Box Z

- A.** has a larger area
- B.** contains more pollution
- C.** is healthier for terrapins

14. Which statement **best** explains why the number of terrapin nests decreased in Jamaica Bay?

- A.** The algae reduced the amount of sunlight that reaches terrapins, so the terrapins have less energy for reproduction.
- B.** The increased proportion of algae in the terrapins' diet does not provide as much of the nutrients needed for reproduction.
- C.** Decreased amounts of nutrients in the ecosystem have meant that there are fewer female terrapins to carry out reproduction.
- D.** Reproduction remained the same, but the increased presence of algae caused the terrapins to move their nests to the marshland.

15. Figure 3 shows a partial food web for Jamaica Bay.

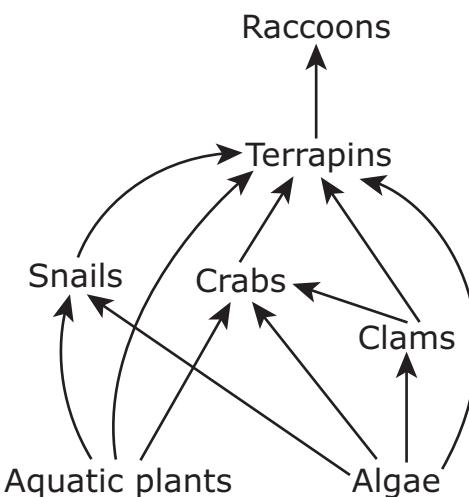


Figure 3. Partial Food Web for Jamaica Bay

Which statements **best** predict the effects on the Jamaica Bay food web if nothing is done to stop pollution from entering the Jamaica Bay ecosystem?

Select **two** of the five statements.

- A. Raccoons will become extinct.
- B. Clam and crab populations will need to find other food sources.
- C. The snail population will increase due to more available resources.
- D. The terrapin population will decrease due to a lack of appropriate resources.
- E. The diversity of aquatic plants will increase due to a change in the health of the ecosystem.

16. Researchers suggest introducing a non-native algae consumer to the Jamaica Bay ecosystem. Which statements represent benefits associated with the introduction of this non-native species?

Select **three** of the five statements.

- A.** The new consumer will eat the same prey as terrapins.
- B.** The new consumer will attract new predators to the ecosystem.
- C.** The new consumer will reduce the amount of algae in Jamaica Bay.
- D.** The new consumer will force terrapins to eat more clams, crabs, plants, and snails.
- E.** The new consumer will improve water clarity and allow aquatic plants to receive more sunlight.

Use the information below to answer questions 17–20.

The water cycle affects the composition of soil.

A student and family plan a trip to the Delaware Water Gap National Recreation Area (DEWA). Before leaving on the trip, the student researches DEWA and finds that a “water gap” refers to an area where a river cuts through a mountain. The location of the recreation area with a cut-away image of the Delaware Water Gap is shown in Figure 1.

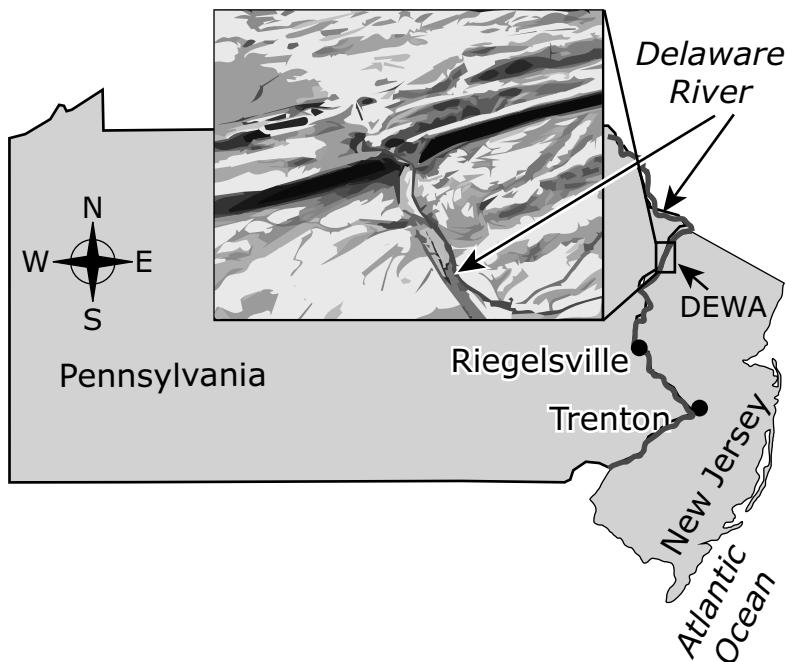


Figure 1. Delaware Water Gap National Recreation Area and Water Gap

Figure 2 shows annual amounts of precipitation at DEWA.

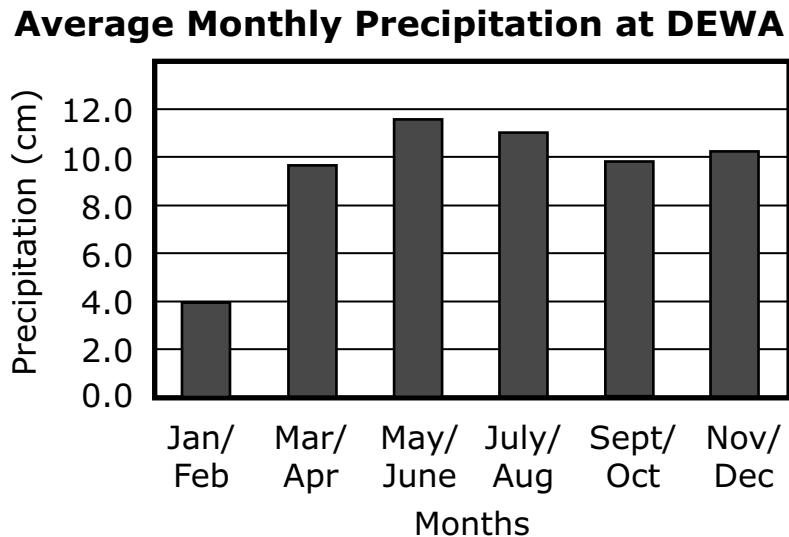


Figure 2.

The student constructed the model in Figure 3 to demonstrate the effects of temperature on the water cycle.

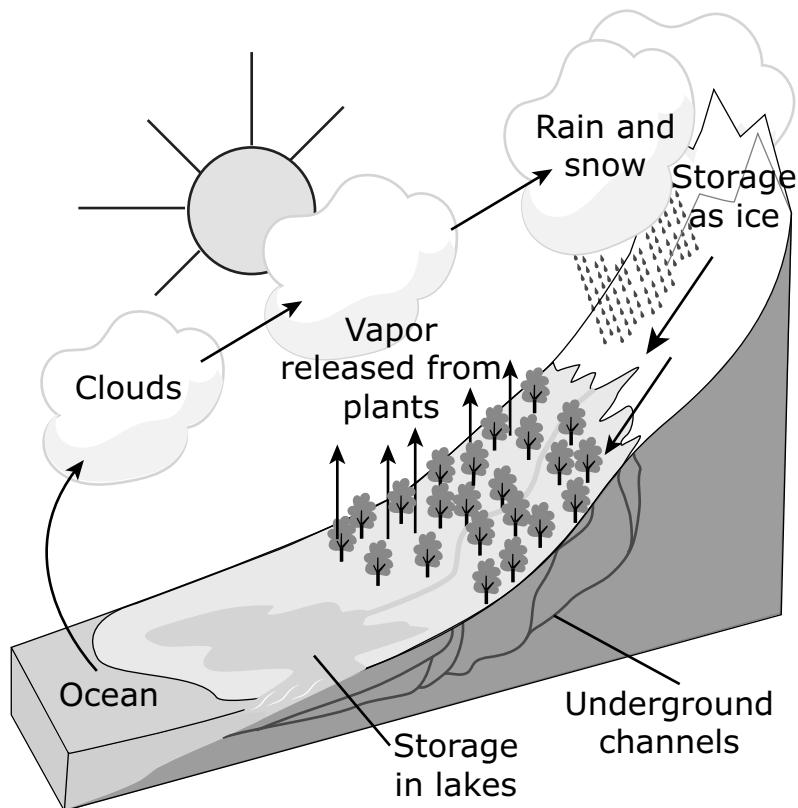


Figure 3. Water Cycle Model

17. Identify the type of data shown in Figure 2 and predict when the amount of weathering and erosion at DEWA would be expected to be the highest.

Complete the sentences by choosing the correct answer from each box.

The data shown in Figure 2 are an example of **X** data. The amount of weathering and erosion at DEWA would be expected to be highest in **Y**. This is because precipitation causes **Z** in the rate of weathering and erosion.

Box X

- A.** qualitative
- B.** quantitative

Box Y

- A.** Jan/Feb
- B.** May/June
- C.** July/Aug

Box Z

- A.** an increase
- B.** a decrease
- C.** no change

18. Use Figure 3 to describe the water cycle.

Complete the sentences by choosing the correct answer from each box.

Figure 3 shows that, at sea level, where air temperatures are the highest, **X** of water occurs. Figure 3 also shows that freezing temperatures can cause **Y**, which with gravity, often leads to water falling to the ground as solid precipitation. Then as **Z**, the water moves across the surface, eventually flowing into the lake and the ocean.

Box X

- A.** condensation
- B.** evaporation
- C.** runoff

Box Y

- A.** crystallization
- B.** runoff
- C.** transpiration

Box Z

- A.** condensation
- B.** crystallization
- C.** runoff

19. Table 1 shows the percentages of the minerals quartz and gypsum in samples from five collection sites. Site 1 is north of the DEWA. Sites 2–5 are south of the DEWA, with Sites 4 and 5 being located near the city of Trenton.

Table 1. Percentages of Minerals

Site	Quartz (%)	Gypsum (%)
1	0.00	0.00
2	8.56	0.67
3	35.08	1.01
4 and 5 Average	45.16	1.33

Based on this information, the student claims that the results of erosion caused by the Delaware River will be greatest near Trenton. Which **two** pieces of evidence best support the student's claim?

Select **two** of the five statements.

- A.** Sites 1–3 had lower percentages of gypsum than of quartz.
- B.** Trenton is closer to the Delaware Water Gap than the other sites.
- C.** Trenton is a larger city than the other sites, which may cause a greater amount of erosion.
- D.** The data show higher percentages of gypsum and quartz the closer the samples are to Trenton.
- E.** Trenton lies downstream of the DEWA, where sediments from erosion may exist in greater amounts.

20. Scientists collected erosion and weathering data from three collection sites in the Delaware River. The average of the total suspended rock and soil sediments is a measure of erosion, and the total dissolved solids is a measure of weathering. The data are shown in Table 2.

Table 2. Erosion and Weathering Data

Collection Station	Average Total Suspended Rock and Soil Sediments (tons/km ² /year)	Average Total Dissolved Solids (tons/km ² /year)
DEWA	11.47	16.94
Riegelsville	30.24	77.99
Trenton	41.71	86.34

Use Figure 1 to explain the data shown in Table 2. In your response, be sure to do the following:

- describe the trend in the data shown in Table 2.
- explain one factor that could be the cause of the trend in the data.

Enter your response in your answer document. Support your answer with evidence from the data.

Use Figure 1 to explain the data shown in Table 2. In your response, be sure to do the following:

- identify what information is needed to determine if this factor explains the trend in the data.
- explain how this information would be interpreted.

Enter your response in your answer document. Support your answer with evidence from the data.





You have reached the end of Unit 2 of the test.

- **Review your answers from Unit 2.**

