STUDENT NAME _____
(please print)

Grade

8

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

FORM

A

Spring 2024

SCHOOL USE ONLY:

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 3 Practice Test

Directions:

Today you will take Unit 3 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 1–5.

Even though lunar and solar eclipses occur with about equal frequency, lunar eclipses are visible from Earth more often than solar eclipses.

When a moon or planet moves into the shadow of another celestial body, an eclipse occurs. Figure 1 models two types of eclipses. Models are not drawn to scale.

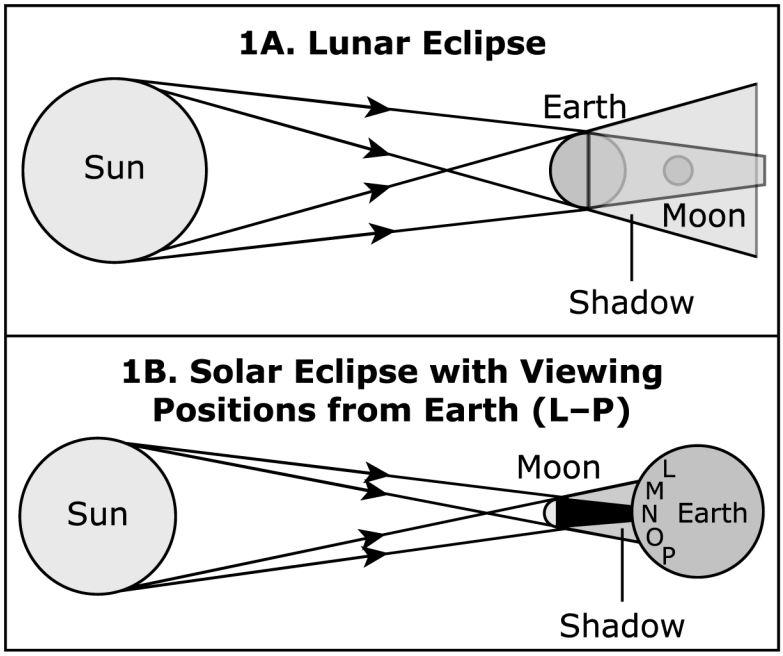

Figure 1. Eclipses

Table 1 provides distance and size data for Earth, the Moon, and the Sun.

Table 1. Distance and Diameter of Earth, Moon, and Sun

Celestial Body	Average Distance from Earth (km)	Diameter (km)
Earth	n/a	6,371
Moon	384,000	3,480
Sun	149,000,000	1,392,000

1. Based on Figure 1, identify which statements describe a lunar eclipse, a solar eclipse, or both types of eclipses.

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

Happens during a full moon

A. Solar eclipse

B. Lunar eclipse

Reduces solar radiation reaching Earth

A. Solar eclipse

B. Lunar eclipse

Occurs when one celestial body moves into the shadow of another

A. Solar eclipse

B. Lunar eclipse

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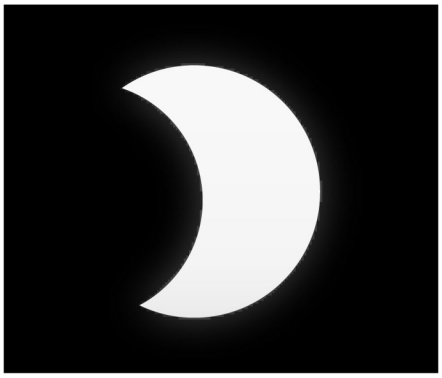
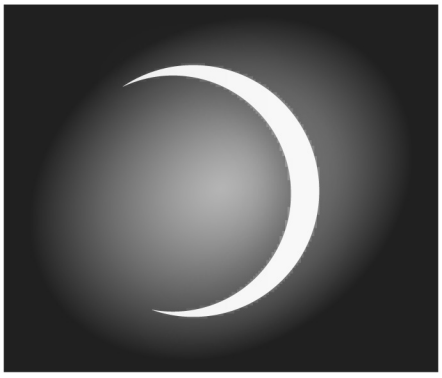
2. Based on Figure 1B, how would the Sun appear to an observer at Position N during the height of a solar eclipse?

A.

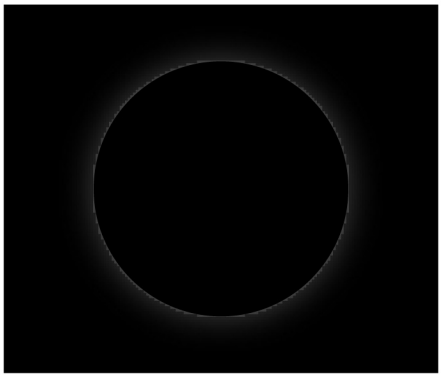


B.



(Item 2 continued)

C.



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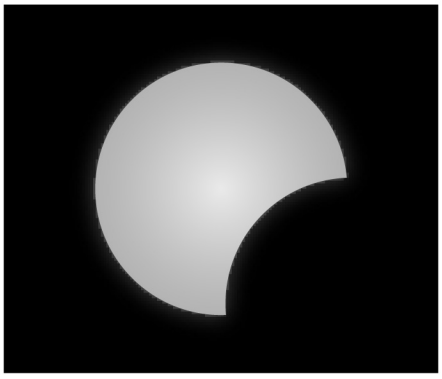

3. Which questions about eclipses can be answered by analyzing Figure 1?

Select **two (2)** of the five choices.

A. How often do solar and lunar eclipses occur?

B. What time of year do solar and lunar eclipses occur most often?

C. Is Earth always the same distance from the Sun during solar and lunar eclipses?

D. How does the alignment of the Sun-Moon-Earth system differ between eclipses?

E. What is the relationship between shadow production and viewing of eclipses from Earth?

4. A student claims that from the same location on Earth, a lunar eclipse will be visible for longer than a solar eclipse. Based on the data, explain whether the claim is supported or is not supported.

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

Because of the Moon's size and distance from the Earth, the shadow cast on the Moon is **X** during a lunar eclipse than the shadow cast on Earth during a solar eclipse. As a result, it takes longer for **Y** to pass through the shadow during a lunar eclipse. Therefore, the student's claim **Z** supported.

X

A. larger

B. smaller

Y

A. the Sun

B. the Moon

C. Earth

Z

A. is

B. is not

5. Scientists predicted that three lunar eclipses and one solar eclipse would be visible from New Jersey in 2022. Based on the data, explain why lunar eclipses are more commonly viewed than solar eclipses.

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

When the Moon moves through Earth's shadow during a lunar eclipse, the eclipse is visible from wherever the Moon is above the horizon, which is [X] percent of Earth. When the Moon moves in front of the Sun during a solar eclipse, the shadow cast by the Moon is [Y] than Earth; therefore, solar eclipses are visible only [Z].

[X]

A. 25

B. 50

C. 75

D. 100

[Y]

A. larger

B. smaller

[Z]

A. for one minute

B. within a narrow path

C. from the equator

D. at high noon

Use the information below to answer questions 6–10.

A student observes that an electric teakettle causes water to boil.

In an electric teakettle, electricity is converted to heat by the heating element in the base. The heat in the kettle is then transferred to the water. If enough heat is transferred, water reaches its boiling point (100°C). The components of an electric teakettle are shown in Figure 1.

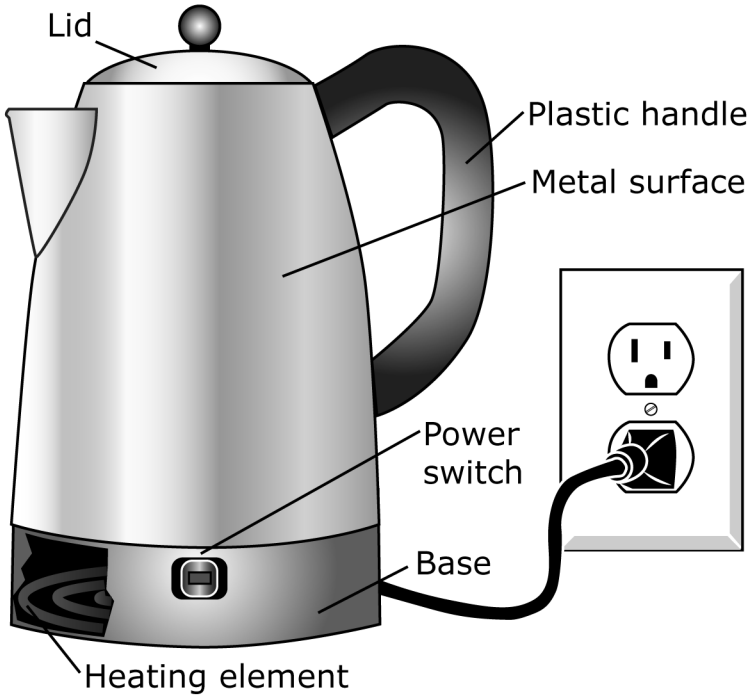

Figure 1. Electric Teakettle

The student investigates how the water's mass and initial temperature affect the time it takes for the water to boil in an electric teakettle. The student performs different investigations by adding water to a 1-liter electric teakettle and recording how long it takes for the water to boil. The student records the mass and temperature of the water during each investigation. The results are shown in Table 1.

Table 1. Time Needed for Water to Boil

Investigation	Mass of Water (grams)	Initial Temperature of Water (°C)	Time for Water to Boil (seconds)
1	500	25	131
2	1,000	25	262
3	1,000	50	174

6. Based on Figure 1, which piece of evidence explains why heat transfers from hotter to cooler regions of water in the teakettle?

A. The teakettle requires electricity to operate.

B. The teakettle has a metal surface and a plastic handle.

C. The water heats up until it reaches its boiling point and turns into a gas.

D. The heat moves from the water near the heating element to the surrounding water.

7. Based on Figure 1, a student claims that only the water near the base of the teakettle will become warm. Identify whether the student's claim is supported or is not supported.

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

Water is made of molecules that **X** in the teakettle and have **Y** contact with one another. Therefore, the student's claim **Z** supported.

X

A. move

B. do not move

Y

A. no

B. constant

Z

A. is

B. is not

8. Based on Figure 1, an answer to which question would **best** help refine the explanation for what happens when enough heat is transferred to water for it to reach 100°C?

A. How high can the temperature of the water rise?

B. How does the added heat affect the state of the water?

C. How can the heat transferred to the water be measured?

D. How is energy transferred from the teakettle to the water?

9. Based on Table 1, determine the relative amount of energy required for each sample of water to reach the boiling point.

Choose the table that correctly orders the samples from the **least** (top) to the **most** (bottom) amount of energy required to reach boiling point.

A.

Energy Required to Reach Boiling Point	Conditions of the Water
Least energy ↓ **Most energy**	1,500 grams of water below 0 °C
	1,500 grams of water at 25 °C
	1,000 grams of water at 25 °C

B.

Energy Required to Reach Boiling Point	Conditions of the Water
Least energy ↓ **Most energy**	1,000 grams of water at 25 °C
	1,500 grams of water at 25 °C
	1,500 grams of water below 0 °C

(Item 9 continued)

C.

Energy Required to Reach Boiling Point	Conditions of the Water
Least energy ↓ **Most energy**	1,500 grams of water at 25 °C
	1,000 grams of water at 25 °C
	1,500 grams of water below 0 °C

D.

Energy Required to Reach Boiling Point	Conditions of the Water
Least energy ↓ **Most energy**	1,000 grams of water at 25 °C
	1,500 grams of water below 0 °C
	1,500 grams of water at 25 °C

10. Based on Table 1, a student claims that when comparing the three investigations in their initial states, the molecules of water in Investigation 3 moved the fastest. Identify whether the student's claim is supported or is not supported.

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

As the temperature of water [X], the [Y] energy of the molecules increases. Therefore, the student's claim [Z] supported.

[X]

A. decreases

B. increases

[Y]

A. average kinetic

B. potential

[Z]

A. is

B. is not

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Use the information below to answer questions 11–13.

Modern corn evolved from ancient grass.

Between 6,000 and 10,000 years ago, Native Americans living in Mexico began the process of domesticating[1] a wild grass. This grass, known as teosinte (*Zea mays parviglumis*) eventually became the cultivated corn known as maize (*Zea mays mays*). Teosinte and maize are shown in Figure 1.

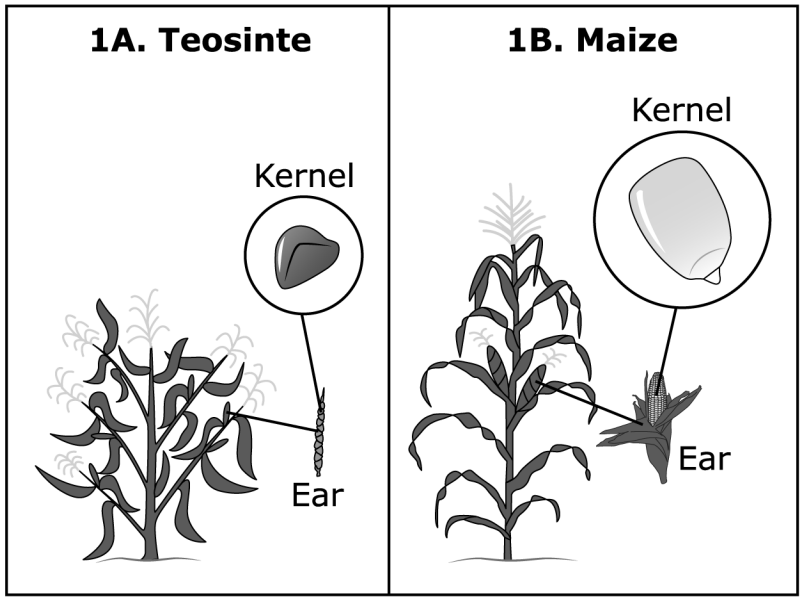

Figure 1. Teosinte and Maize

[1]domesticating—the process of adapting wild plants and animals for human use

GO ON →

Some characteristics of teosinte and maize are shown in Table 1.

Table 1. Characteristics of Teosinte and Maize

Characteristic	Teosinte	Maize
Average ear length (cm)	5–8	30
Average number of ears per plant	100+	2–3
Average number of kernels per ear	5–12	Up to 1,000
Kernel structure	Encased in hard coating	Soft kernels; soft, thin tissue
Arrangement of genes	Similar to maize	Similar to teosinte

Figure 2 shows the evolution of maize from teosinte, through when humans began growing and domesticating it, to modern times.

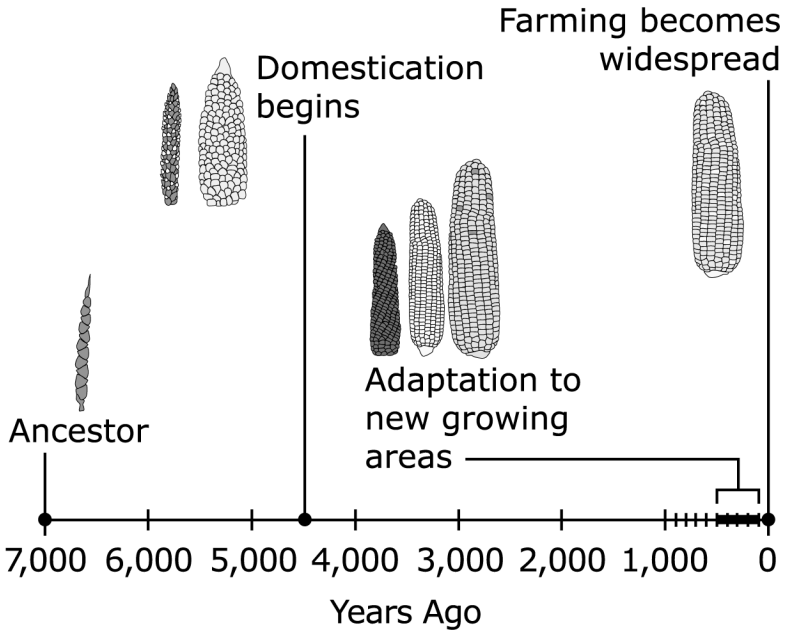

Figure 2. Evolution of Maize

The gene, *t* in teosinte and *T* in maize, controls the number of branches on each plant and the size of the ears and kernels. To test the hypothesis that maize is a domesticated form of teosinte, parent plants (P) were crossed to produce hybrid-offspring (F1). The crossbreeding experiment is shown in Figure 3.

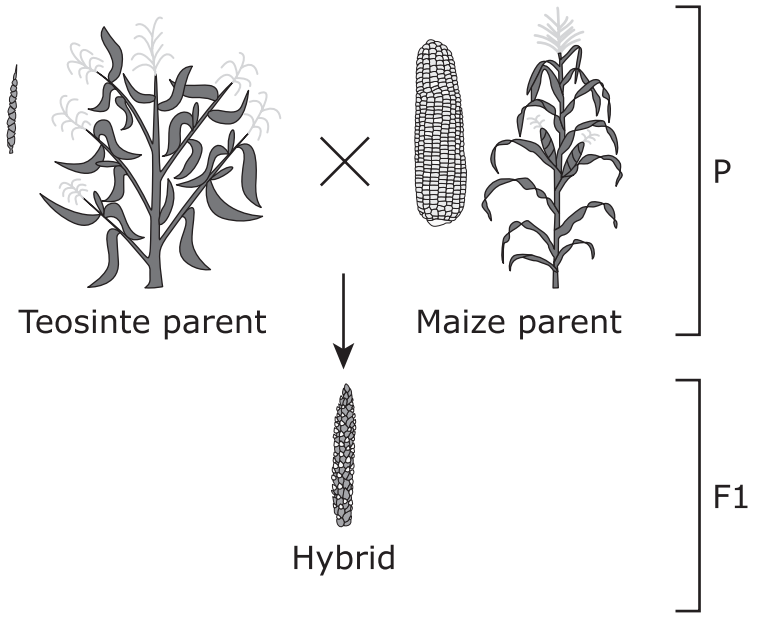

Figure 3. Crossbreeding Experiment

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11. Which question can **best** be answered by analyzing the data?

A. Why did kernel color change prior to domestication?

B. Which genes are responsible for different kernel colors?

C. Was teosinte consumed by humans prior to domestication?

D. What caused the significant changes to maize during the domestication period?

12. Based on the data, identify whether each claim about the evolution of maize is supported or is not supported.

Select all the correct answers.

Some early maize varieties resembled teosinte.

A. Supported

B. Not supported

Evolutionary changes to the structure of the maize plant led to fewer ears per plant.

A. Supported

B. Not supported

Evolutionary pressures on kernel structure were unchanged over 7,000 years.

A. Supported

B. Not supported

13. When hunters and gatherers began farming, maize became an early agricultural crop. Based on the data, explain this process.

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

During the domestication period, ancient farmers likely saved and planted maize kernels from plants that had **Y**. This was the earliest form of **Z**.

Y

A. softer kernels and smaller ears

B. softer kernels and larger ears

C. fewer branches and more ears

D. more branches and smaller ears

Z

A. natural selection

B. selective breeding

C. genetic modification

Use the information below to answer questions 14–17.

Living shorelines are nature-based solutions that help restore and preserve New Jersey's coastal habitats.

Three types of living shorelines are described in Table 1.

Table 1. Three Types of Living Shorelines

Type of Living Shoreline	Description
Natural	These include native vegetation, clean sediment, and may include biodegradable organic materials.
Hybrid	These incorporate native vegetation and clean sediment with human-made biodegradable materials such as coconut fiber logs and bags of oyster shells, which can be seeded with native oysters.
Structural	These are human-made structures, including concrete breakwaters and stone or concrete retaining walls.

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Figure 1 shows a natural living shoreline (1A), a hybrid living shoreline (1B), and a structural living shoreline (1C) at high tide.

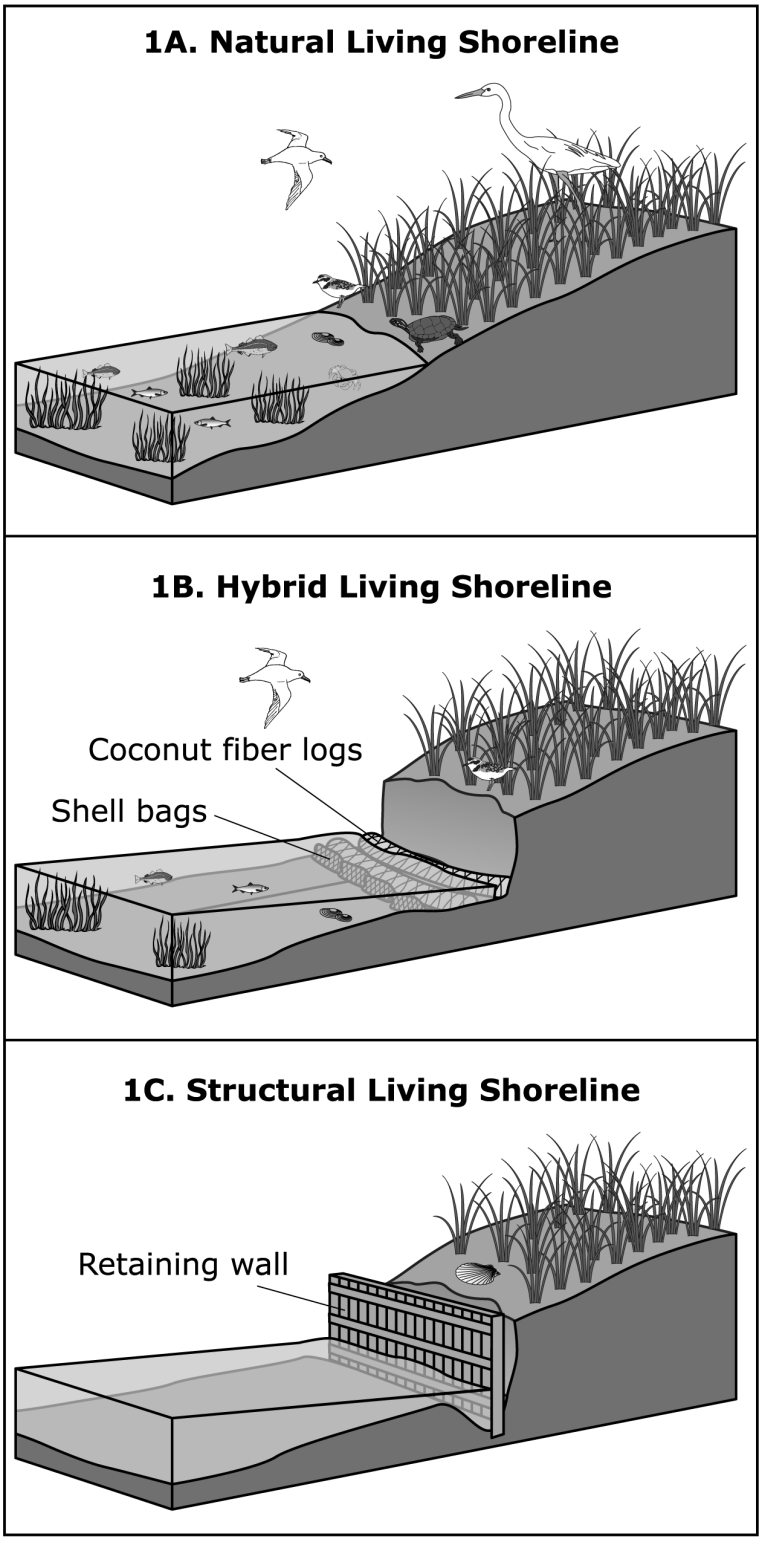

Figure 1. Types of Living Shorelines

GO ON →

14. Based on the data, which environment would benefit **most** from the construction of a structural living shoreline?

A. the nearshore area, below the low-tide line where sandbars form

B. a back dune area, away from direct exposure to marine influences

C. the area between high- and low-tide lines, where active erosion occurs

D. a bay or lagoon, rich in nutrients, where saltwater mixes with freshwater

15. Figure 2 shows a roll of plastic netting that is sometimes used at construction sites.

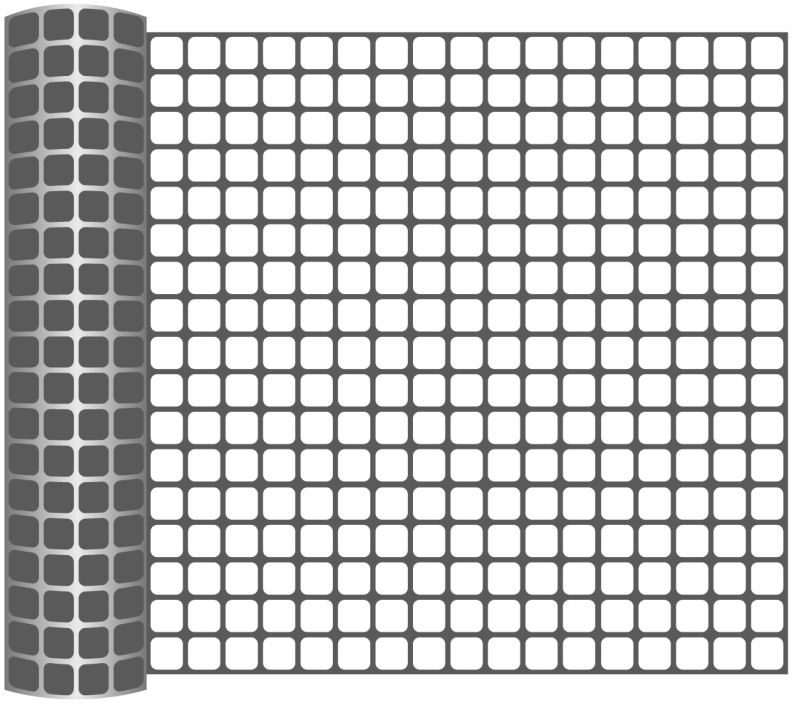

Figure 2. Plastic Netting

A student claims that because coconut fiber logs biodegrade quickly, plastic netting is a better choice to string across the shoreline. Based on Figure 1 and Figure 2, which is the **best** argument against the student's claim?

Plastic netting

A. lets less water pass through than coconut fiber logs.

B. needs to be replaced less frequently than coconut fiber logs.

C. is more likely to entangle local wildlife than coconut fiber logs.

D. will not hold up to severe storms as well as coconut fiber logs.

16. A company specializing in creating living shorelines claims that hybrid living shorelines provide certain benefits that natural and structural living shorelines do not. Based on the data, explain why the company's claim is supported.

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

Hybrid living shorelines provide for [Y] than natural living shorelines and they create a [Z] between aquatic and terrestrial ecosystems compared to structural living shorelines.

[Y]

A. more natural habitat

B. less species disruption

C. greater erosion control

[Z]

A. higher energy environment

B. more natural connection

C. distinct separation

17. Based on the data, before a living shoreline is installed, which questions should be answered to ensure the **greatest** probability of success and that the **most** appropriate design is chosen?

Select **two (2)** of the five options.

A. Has the potential site been cleared of debris?

B. Does the potential site have high priority for installation?

C. How much erosion does the shoreline experience at the potential site?

D. What are the pros and cons associated with installation at the potential site?

E. Do state regulations allow for installation without permits at the potential site?

Use the information below to answer questions 18–21.

Two species of Hawaiian birds compete for nectar from the same two species of trees.

The ʻapapane (*Himatione sanguinea*) and ʻamakihi (*Chlorodrepanis virens*) are species of honeycreepers found in the Hawaiian islands. Both species primarily feed on the same two types of flowering trees: *Metrosideros* and *Sophora*. Figure 1 shows images of the four organisms.

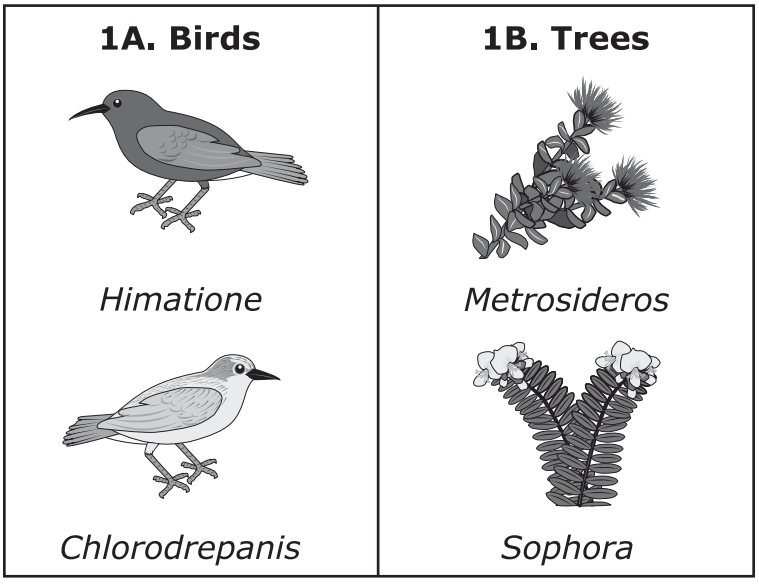

Figure 1. Birds and Trees on Island

Metrosideros and *Sophora* are equally common on the island, but their flowering seasons occur during different times of the year. Low-flowering season is the part of the tree's flowering season when it has the lowest number of flowers in bloom. The high-flowering season is when it has the largest number of flowers in bloom.

Table 1 contains information about the flowering seasons of the two types of trees.

Table 1. Tree Species Flowering Season Information

Type of Tree	Month	Flowering Season	Average Number of Flowers	Average Sugar Concentration in Nectar over Length of Study (%)
Metrosideros	February	Low	5	9
	June	High	103	9
Sophora	February	High	318	15
	June	Low	34	15

GO ON →

Scientists observed the two types of birds over the course of a year. They recorded the amount of time birds of each species were observed perched on each type of tree. Figure 2 shows the relative amount of time the birds were observed in both types of trees during the trees' low- and high-flowering seasons.

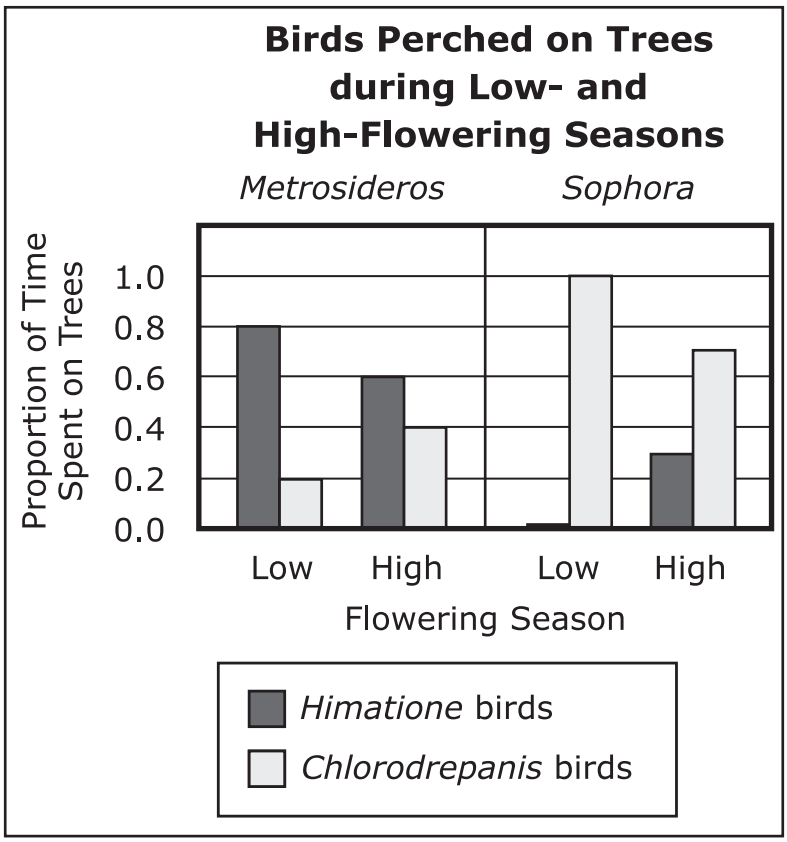

Figure 2.

GO ON →

18. Based on Table 1, make a claim about how many birds will visit each tree and explain why this claim is supported by the data.

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

The number of birds found on *Metrosideros* trees will be [X] the number of birds found on *Sophora* trees. *Metrosideros* trees produce [Y] *Sophora* trees during each flowering season. *Metrosideros* trees also produce nectar with a [Z] *Sophora* trees do.

[X]

A. greater than

B. fewer than

C. similar to

[Y]

A. more flowers than

B. fewer flowers than

C. a similar number of flowers as

[Z]

A. higher sugar concentration than

B. lower sugar concentration than

C. similar sugar concentration as

19. Use Figure 2 to compare the amount of time spent by *Himatione* and *Chlorodrepanis* birds on each type of tree.

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

Himatione birds are on *Sophora* trees **X** *Chlorodrepanis* birds are on *Metrosideros* trees. This suggests that *Chlorodrepanis* birds are **Y** *Himatione* birds for available food resources.

X

A. more often than

B. less often than

C. exactly as often as

Y

A. less competitive than

B. more competitive than

C. as competitive as

20. Make a claim that is supported by Table 1 and Figure 2 that indicates whether *Himatione* birds or *Chlorodrepanis* birds have a larger population on the island.

Explain how both the average number of flowers and sugar concentrations in the nectar of *Metrosideros* and *Sophora* trees support your claim about the relative sizes of the *Himatione* and *Chlorodrepanis* bird populations.

Enter your answer in the box.

(Item 20 continued)

Explain how the proportion of *Metrosideros* and *Sophora* trees found on the island supports your claim about the relative sizes of the *Himatione* and *Chlorodrepanis* bird populations.

Enter your answer in the box.

(Item 20 continued)

Explain how the proportion of *Himatione* and *Chlorodrepanis* birds seen on *Metrosideros* and *Sophora* trees supports your claim about the relative sizes of the *Himatione* and *Chlorodrepanis* bird populations.

Enter your answer in the box.

21. Scientists placed 10 decoys of *Chlorodrepanis* birds and 10 decoys of *Himatione* birds in a green room filled with red flowers. The scientists then released a hawk from the island in the room and recorded which bird decoys the hawk picked up. The scientists replaced the red flowers with yellow flowers and repeated the experiment.

Identify the variables in this experimental design and what the experiment was **most likely** testing.

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

The independent variable is the [X] and the dependent variable is the [Y]. The experiment was most likely testing how the [Z] affects the hawk's ability to locate its prey.

[X]

A. flower color

B. number of bird decoys

C. hawk's decoy selection

[Y]

A. flower color

B. number of bird decoys

C. hawk's decoy selection

[Z]

A. room size

B. background environment

C. size of the bird population

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You have reached the end of Unit 3 of the test.

- **Review your answers from Unit 3.**