New Jersey NJSLA Grade 5 Science Practice

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STUDENT NAME _____
(please print)

Grade
5

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

FORM
A

Grade 5

Unit 1 Practice Test

Directions:

Today you will take Unit 1 of the Grade 5 New Jersey Student Learning Assessment - Science (NJSLA-S) Test.

Follow the directions to answer each question. Mark your answers by completely filling in the circles in your answer document. **Only answers you provide in your answer document will be scored.** Do not make any pencil marks outside the circles in your answer document. 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. Write your response in the space provided in your answer document. 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 and 2.

An electric current can produce motion.

A simple electric motor in two steps of development is shown in Figure 1.

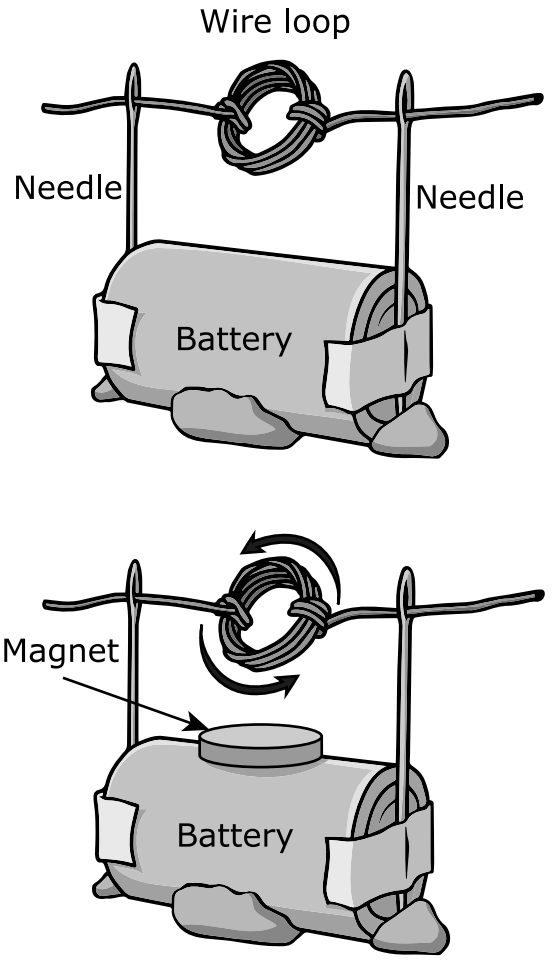


Figure 1. Electric Motor

1. In the image showing the wire spinning, energy is being converted from one form to another. In your answer folder, choose the option that correctly matches each part of the electric motor with the role it plays in the conversion of energy.

A.

	Battery	Wire Coil	Magnet
Supplies electric current	X		
Carries electric current		X	
Causes the coil to spin	X		

B.

	Battery	Wire Coil	Magnet
Supplies electric current	X		
Carries electric current			X
Causes the coil to spin	X		

C.

	Battery	Wire Coil	Magnet
Supplies electric current		X	
Carries electric current			X
Causes the coil to spin			X

D.

	Battery	Wire Coil	Magnet
Supplies electric current	X		
Carries electric current		X	
Causes the coil to spin			X

2. Which device could be operated with a similar conversion of electrical energy to motion energy?

A. a radio

B. a remote-controlled car

C. a light bulb

D. a television set

Use the information below to answer questions 3 and 4.

Figure 1 shows two identical soccer balls thrown at a wall, but one soccer ball bounces back farther away from the wall than the other.

Two students threw a soccer ball against a wall that was 15 feet away, as shown. The dot on each wall shows where the soccer ball hit it. The distance each soccer ball bounced back from the wall is shown.

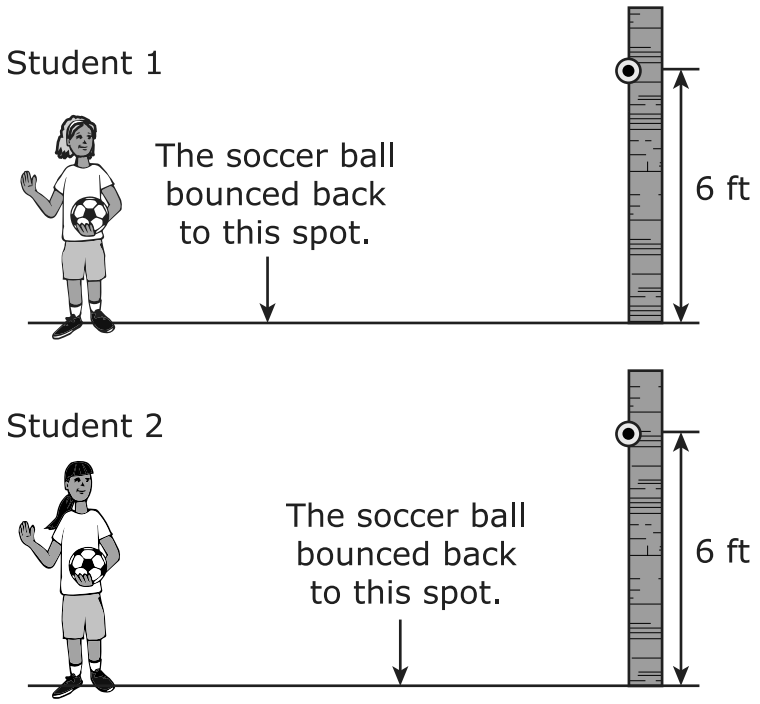


Figure 1. Students Throwing Soccer Balls

3. Which observation provides evidence that student 1 threw the ball with more energy than student 2?

A. The ball bounced back closer to student 1 than student 2.

B. The ball bounced back closer to student 2 than student 1.

C. The ball hit the wall at a higher point for student 1 than student 2.

D. The ball hit the wall at a higher point for student 2 than student 1.

4. A student claims that the soccer ball has less energy after it hits the wall. Explain if this claim is true.

Complete the sentence by choosing the correct answers from the boxes.

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

Box Y

A. all

B. some

C. none

Box Z

A. light

B. sound

Use the information below to answer questions 5 and 6.

A student on the way to school in January observes that some icy roads have been treated with sand and others with salt.

Snow and ice make roads dangerous and difficult to drive. Spreading sand or salt on roads helps make roads safer. Table 1 shows a comparison between salt and sand treatments.

Table 1. Using Salt or Sand on Roads

Characteristic	Sand	Salt
Tires skid less in the ice or snow	Yes	No
Melts ice or snow	No	Yes
Cost	Less expensive	More expensive
Temperature for use	Any	Above 10°F
Environmental issues	• Collects in drainage ditches • Mixes with groundwater	• Mixes with groundwater • Kills vegetation • Damages roads

5. A student claims that sand is better than salt to treat snow-covered winter roads. Which statement **best** supports this claim?

A. Sand has no negative environmental effects.

B. Sand melts ice and is less expensive than salt.

C. Sand provides grip for tires and melts ice on roads.

D. Sand provides grip for tires and is less expensive than salt.

6. For each road condition given, indicate whether sand or salt is the better treatment.

Snow-covered roads with an air temperature of 0°F

A. Salt

B. Sand

Icy roads with air temperature of 20°F

A. Salt

B. Sand

Icy roads with air temperature of 5°C

A. Salt

B. Sand

Use the information below to answer questions 7–9.

At night, a street light appears bigger and brighter than other street lights on the same street, just like some stars in the sky.

A student lives on a street that is long and straight. While walking home at night, the student observes three street lights at different distances. Data about each light are shown in Table 1.

Table 1. Brightness and Distances of Street Lights

Street Light	Brightness	Distance from the Student (km)
X	Medium	1
Y	Low	2
Z	Very low	3

In Table 2, data about three stars are shown.

Table 2. Brightness and Distances of Three Stars

Star	Brightness	Distance from Earth
The Sun	Very high	Far
Arcturus	Very low	Farther
Polaris	Very, very low	Farthest

7. Which statement describes how the brightness of light relates to distance?

A. The less bright the street light appears, the closer the student is to it.

B. The brighter the street light appears, the closer the student is to it.

C. The less bright the star appears, the closer it is to Earth.

D. The brighter the star appears, the farther it is from Earth.

8. Describe how the brightness of a star appears to change because of distance.

Complete the sentences by choosing the correct answers from the boxes.

Based on Tables 1 and 2, street light **Y** has the same brightness as Arcturus. If the student moves away from Arcturus, the brightness of this star would appear to **Z**.

Box Y

A. X

B. Y

C. Z

Box Z

A. increase

B. decrease

C. stay the same

9. Which claim 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.

Use the information below to answer questions 10–12.

Earthquakes can strike anywhere on Earth, but they occur more frequently in certain areas.

Figure 1 highlights areas in the United States from lowest to highest risk of experiencing an earthquake.

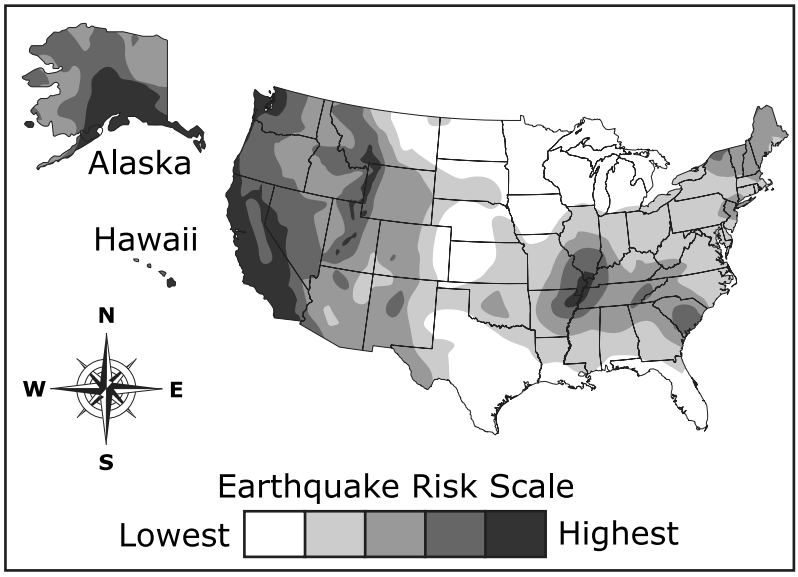


Figure 1. Earthquake Risk

10. Which is a valid statement, based on the map?

The **highest** risk of an earthquake happening is

A. on the West Coast.

B. on the East Coast.

C. in the Northeast.

D. in the South.

11. Based on the map, choose the option that shows the locations in correct order from **highest** (top) to **lowest** (bottom) risk of an earthquake happening.

A. Northern Alaska
Northern Central United States
Northern New Jersey
Southern New Jersey
Southern portion of the West Coast

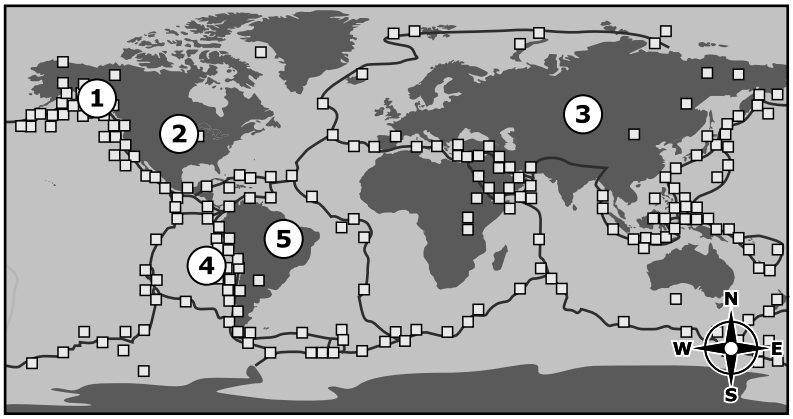
B. Southern portion of the West Coast
Northern Alaska
Northern New Jersey
Southern New Jersey
Northern Central United States

C. Northern New Jersey
Southern New Jersey
Northern Alaska
Southern portion of the West Coast
Northern Central United States

D. Northern Central United States
Southern New Jersey
Northern New Jersey
Northern Alaska
Southern portion of the West Coast

12. Locations where earthquakes occur are found around the world, but when viewed on a map, they are observed to follow a pattern.

The map shows five locations numbered 1 to 5. Identify the two locations where major earthquakes would **most likely** occur in the future.



KEY
= Earthquakes — = Continental boundaries

Figure 2. Map of Major Earthquakes since 1900

Select the **two** correct locations from the five options.

A. Location 1

B. Location 2

C. Location 3

D. Location 4

E. Location 5

Use the information below to answer questions 13–17.

Once a welcome part of the ecosystem in many New Jersey woodlands, the white-tailed deer are now unwelcome residents.

Overpopulation of deer has been an issue in New Jersey for many years.

Table 1 shows the population of white-tailed deer in New Jersey from 1850–2015.

Table 1. White-tailed Deer Population

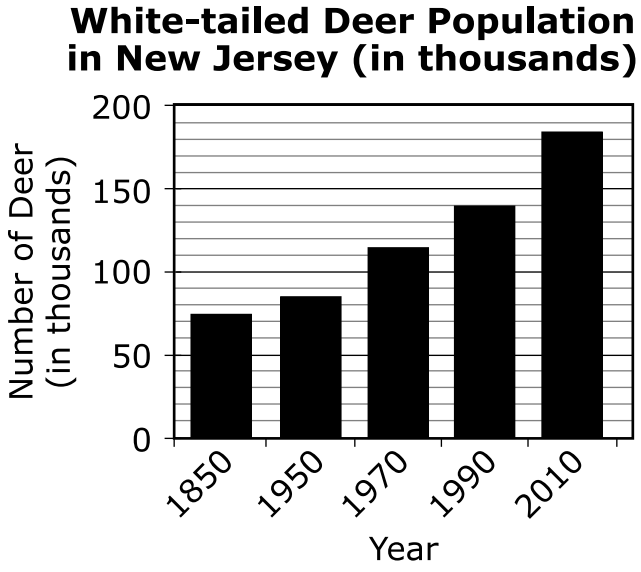
Year	Deer Population
1850	75,000
1900	50,000
1950	85,000
1960	90,000
1970	95,000
1980	110,000
1990	190,000
2000	155,000
2010	115,000
2015	100,000

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

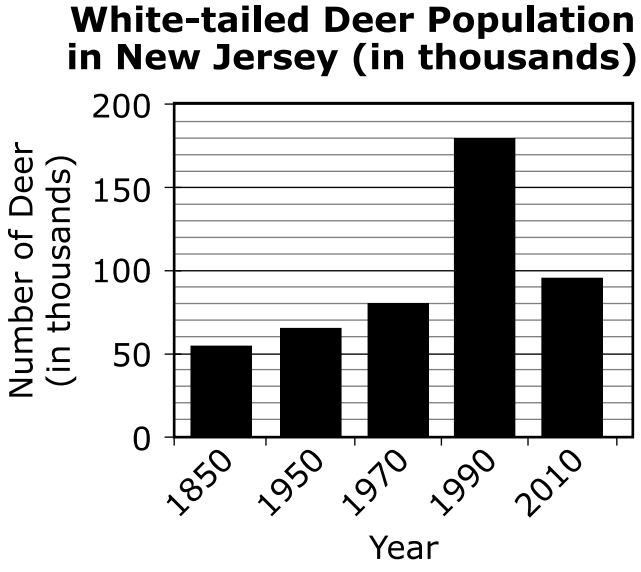
Part A

Researchers count deer at the same time and same locations each year. Using the data in Table 1, choose the bar graph showing the number of deer recorded for each given year.

A.



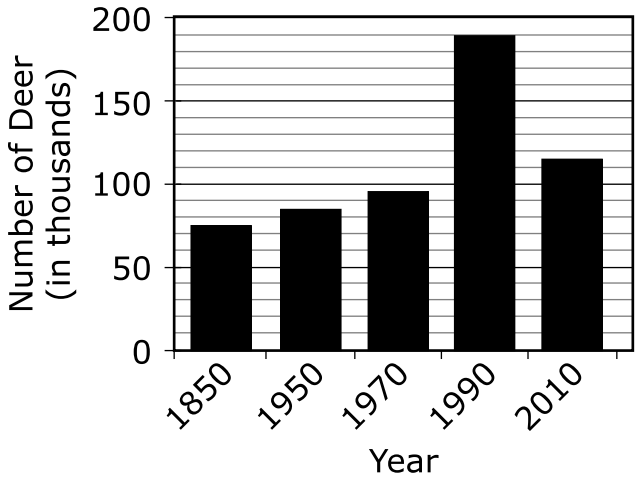
B.



(Item 13 continued)

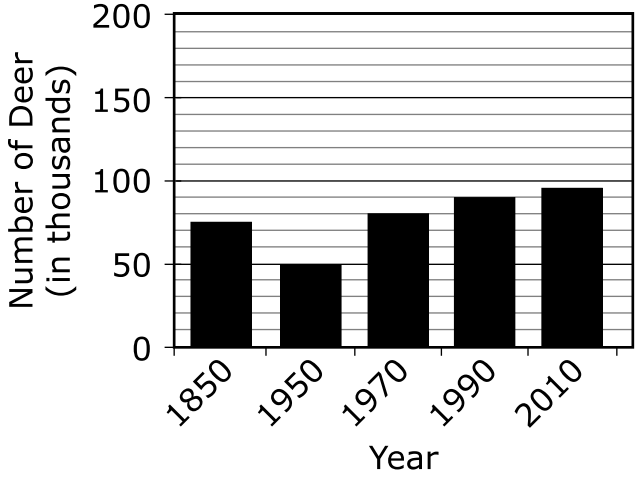
C.

White-tailed Deer Population in New Jersey (in thousands)



D.

White-tailed Deer Population in New Jersey (in thousands)



(Item 13 continued)

Part B

Select from the boxes to describe the pattern shown in the deer population data.

The deer population [Y] until 1990 and then the population started [Z].

Box Y

A. decreased

B. increased

C. stayed the same

Box Z

A. decreasing

B. increasing

14. Which questions should scientists study in order to best understand the changing deer populations throughout the last 25 years?

Select the **two** of the five questions.

A. When are deer more active?

B. Has the average size of a deer changed?

C. How much deer habitat has been lost to housing development?

D. Has the number of the deer's natural predators changed?

E. Why does the color of the deer's coat change from summer to winter?

15. Town planners in New Jersey have created possible solutions to reduce the deer population. Based on the data in Table 1, in what year did these programs first start showing results?

A. 1980

B. 1990

C. 2000

D. 2010

E. 2015

16. The development of land has caused the deer populations in some parts of New Jersey to more than triple over the past years. Deer density is how many deer are counted in a specific area. Table 2 shows the deer density and land development levels for a location in Mercer County, NJ.

Table 2. Deer Density and Land Development

Year	Land Development (change from open land to houses and businesses)	Deer Density (number of deer per acre)
1940	Low	31
1970	Medium	56
1980	Medium	72
1990	Very High	101
2000	High	112
2010	High	114

Based on Table 2, predict how deer populations and land development affect people and their environment.

Complete the sentences by choosing the correct answers from the boxes.

Deer density **X** as land development increases. This is a result of **Y** deer in the specific area, which causes a(n) **Z** in problems for people and their environment.

Box X

A. increases

B. decreases

C. stays the same

(Item 16 continued)

Box Y

A. more

B. less

C. the same amount of

Box Z

A. increase

B. decrease

17. Many New Jersey towns have started programs to decrease the deer population and reduce the negative effects that deer are having on people and the environment.

Some of the solutions to decrease deer populations are shown in Table 3.

Table 3. Solutions to Deer Overpopulation

Solution	Description
Increased hunting	• Change hunting laws to allow more deer to be hunted in a season
Move deer out of area	• Trap and move deer to places that can support a large population
Block and barricade	• Build barriers and fences to keep deer away from roads, farms, and backyards
Sprays	• Use chemicals to keep deer away from roads, farms, and backyards

Choose **two** solutions for reducing deer populations and explain why each of these solutions would be more effective than the solutions not chosen.

Enter your response in your answer document. Support your answer with evidence from the data in Table 3.

Explain why each of the other two solutions would be less effective.

Enter your response in your answer document. Support your answer with evidence from the data in Table 3.

Unit 2 Practice Test

Directions:

Today you will take Unit 2 of the Grade 5 New Jersey Student Learning Assessment - Science (NJSLA-S) Test.

Follow the directions to answer each question. Mark your answers by completely filling in the circles in your answer document. **Only answers you provide in your answer document will be scored.** Do not make any pencil marks outside the circles in your answer document. If you need to change an answer, be sure to erase your first answer completely.

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Use the information below to answer questions 1-2.

When water changes from a liquid to a solid, some properties of the water may change.

Students conduct an investigation in a classroom on the effects of temperature change on water. Figure 1 shows a plastic bag containing cold water. It is placed in a freezer. The bag, which holds 100 milliliters of water, is cooled in a freezer for 24 hours.

Figure 1. Frozen Water in Plastic Bag

The volume and weight of the water in the bag are measured every 6 hours for 24 hours. The data are shown in Table 1.

Table 1. Volume and Weight of Water in Freezer

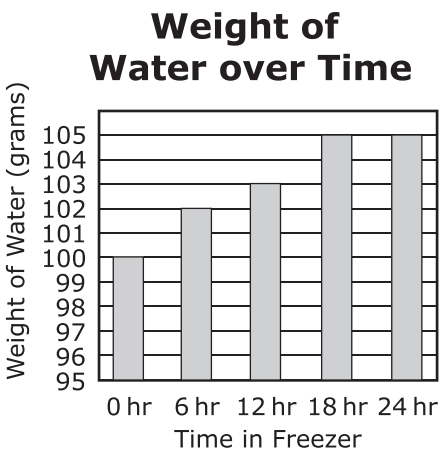
Time (hr)	Volume (mL)	Weight (g)
0	100	100
6	102	100
12	103	100
18	105	100
24	105	100

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

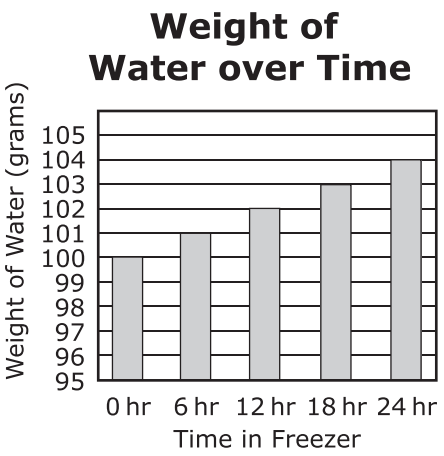
Part A

Using Table 1, select the option that shows the weight of the water for each 6-hour period.

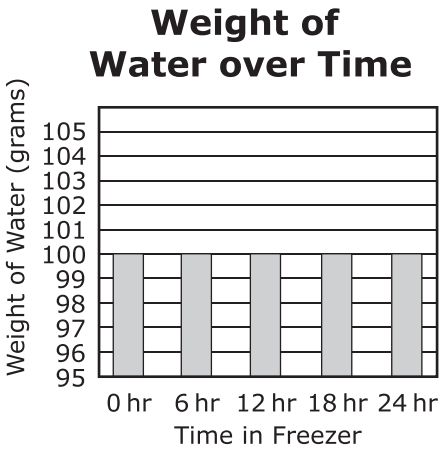
A.



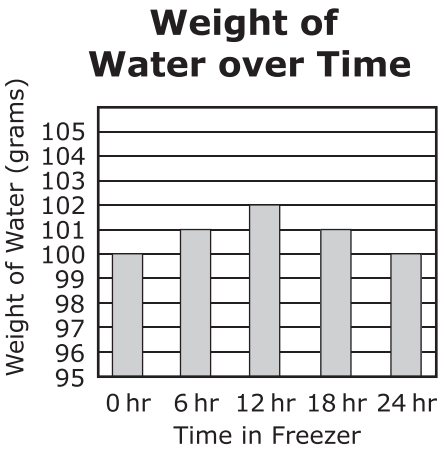
B.



C.



D.



(Item 1 continued)

Part B

Describe the pattern in the weight of the water over time.

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

The weight of the water **Z**.

Box Z

A. decreases

B. increases

C. remains the same

2. Students want to conduct a new investigation using a larger bag of water. Using Table 1, predict the weight of 300 grams of water after 72 hours.

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

In the new investigation, the weight of water is predicted to be **Y** grams after 72 hours. This demonstrates that **Z** in a system over time.

Box Y

A. 300

B. 315

C. 600

D. 900

Box Z

A. weight of matter is conserved

B. weight can increase

C. volume is conserved

Use the information below to answer questions 3-6.

Four types of fossils of extinct species are found in two locations. Paleontologists can gather important information about organisms from these species and the environment in which they lived.

Figure 1 shows the types of fossils that were found at each location and the time period when the species of the organisms that created the fossils lived. The key indicates if each organism lived in a marine or land environment.

Location	Age (in millions of years)					
	65	150	240	350	472	520
1						
2						

KEY

Ammonite (marine) 	Archaeopteryx (land) 
Blastoid (marine) 	Trilobite (marine) 

Figure 1. Ages of Fossil Types in Two Locations

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

Part A

Using Figure 1, calculate the approximate amount of time each species lived on Earth.

Select the option that correctly shows how long each species likely lived on Earth, from the shortest to the longest amount of time.

A.

Shortest Time ↓	Archaeopteryx
	Ammonite
	Blastoid
Longest Time	Trilobite

B.

Shortest Time ↓	Trilobite
	Blastoid
	Ammonite
Longest Time	Archaeopteryx

C.

Shortest Time ↓	Trilobite
	Ammonite
	Blastoid
Longest Time	Archaeopteryx

D.

Shortest Time ↓	Archaeopteryx
	Blastoid
	Ammonite
Longest Time	Trilobite

(Item 3 continued)

Part B

Identify the organism that lived for the shortest amount of time and then determine the type of environment that organism inhabited.

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

The organism that likely lived on Earth for the shortest time lived in a **Z** environment.

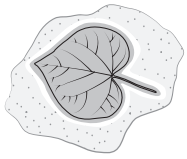
Box Z

A. marine

B. land

4. Scientists discovered two additional fossils, Fossil X and Fossil Y, at Location 1. The approximate ages of the fossils were determined and are shown in Table 1.

Table 1. Additional Fossil Types: Location 1

Fossil	Picture of Fossil	Age of Fossil (in millions of years)
X		50–present
Y		50–60

Based on Figure 1 and Table 1, describe how the environment changed at Location 1 over time.

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

Based on fossil evidence, Location 1 changed to a **Y** environment **Z** million years ago.

Box Y

A. land

B. marine

Box Z

A. 50

B. 55

C. between 50–55

D. between 60–65

5. Based on Figure 1, identify which questions can be answered by analyzing the data.

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

Question	Can or Cannot Be Answered
What was the environment at each location over time?	W
How did the climate change at each location over time?	X
How many fossils were found at each location over time?	Y
What types of fossils were found at each location over time?	Z

Box W

A. Can be answered

B. Cannot be answered

Box X

A. Can be answered

B. Cannot be answered

Box Y

A. Can be answered

B. Cannot be answered

Box Z

A. Can be answered

B. Cannot be answered

6. A student claims that the fossils at one of the locations provide evidence that the environment had changed. Identify the information that supports this claim.

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

At Location [**X**], the fossils of the [**Y**] show the area had species that [**Z**].

Box X

A. 1

B. 2

Box Y

A. ammonite and trilobite

B. archaeopteryx and blastoid

Box Z

A. were both marine and terrestrial

B. survived over 400 million years

Use the information below to answer questions 7-10.

Two cities can be across the world from each other, yet have very similar climates.

The climate of a city may be more similar to a city that is farther away than it is to a city that is closer.

The locations of eight cities around the world are shown on the map in Figure 1. The average temperatures and the average annual precipitation of the cities are shown in Table 1.

Figure 1. Locations of Eight Cities around the World

Table 1. Climate Data for Eight Cities around the World

City	Average High Temperature (°F)	Average Low Temperature (°F)	Precipitation (inches)
Adak	52	32	61
Richland	75	34	7
Needles	95	54	4
Los Angeles	75	57	16
Klaksvik	52	37	56
Athens	82	50	16
Tehran	81	37	9
Riyadh	95	57	4

7. Based on Table 1, select the option that shows cities that have been correctly paired with another city that has similar annual precipitation.

A. Adak and Riyadh

Richland and Tehran

Needles and Klaksvik

Los Angeles and Athens

B. Adak and Klaksvik

Richland and Tehran

Needles and Riyadh

Los Angeles and Athens

C. Adak and Athens

Richland and Klaksvik

Needles and Tehran

Los Angeles and Riyadh

D. Adak and Klaksvik

Richland and Athens

Needles and Riyadh

Los Angeles and Tehran

8. Which statement is **best** supported by the data?

A. Adak and Tehran are far from each other and have similar temperatures.

B. Needles and Riyadh are far from each other and have similar temperatures.

C. Needles and Riyadh are far from each other and have very different temperatures.

D. Needles and Richland are far from each other and have very different temperatures.

9. A student makes claims about which cities have climates that are very similar to each other. Based on Table 1, identify which claims are supported by the data.

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

Claim	Supported or Not Supported by Data
Athens and Tehran, because they have the greatest amount of precipitation.	W
Adak and Klaksvik, because they have the same average high temperature.	X
Klaksvik and Tehran, because they have the same average low temperature.	Y
Richland and Los Angeles, because they have the lowest amount of precipitation.	Z

Box W

A. Supported by data

B. Not supported by data

Box X

A. Supported by data

B. Not supported by data

Box Y

A. Supported by data

B. Not supported by data

Box Z

A. Supported by data

B. Not supported by data

10. Figure 2 shows the location of Newark, NJ, in relation to the other eight cities.

Figure 2. Location of Newark, New Jersey, on World Map

Table 2 shows the average climate data for Newark, NJ.

Table 2. Climate Data for Newark, New Jersey

Average High Temperature (°F)	Average Low Temperature (°F)	Precipitation (inches)
63	46	46

Compare the climate data of Newark to the other eight cities. Based on the data, identify the two cities that have a climate most similar to Newark and describe their climate.

(Item 10 continued)

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

The two cities that have the most similar climate to Newark are **Y**. They are all similar because they all have **Z** conditions than other cities.

Box Y

A. Klaksvik and Adak

B. Los Angeles and Adak

C. Klaksvik and Richland

D. Los Angeles and Richland

Box Z

A. cooler and dryer

B. cooler and wetter

C. warmer and dryer

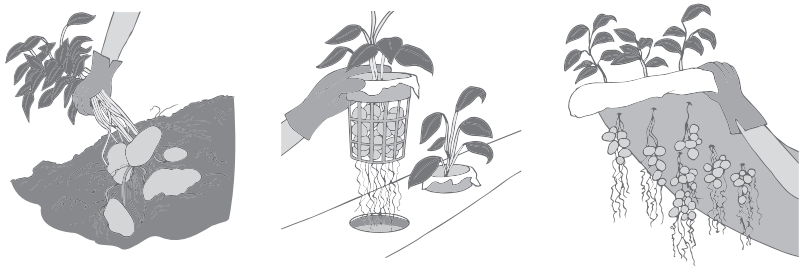
D. warmer and wetter

Use the information below to answer questions 11-13.

Potatoes are usually grown in soil, but some potatoes are able to grow without soil.

Potato plants were grown with three different methods as shown in Figure 1.

1. Soil: planted in pots with soil
2. Water: placed in pots with water and small stones added for support
3. Air: suspended in the air on platforms with holes to let the roots hang down



1. Soil 2. Water 3. Air

Figure 1. Potato Plants Growing Methods

For all three methods shown in Table 1, the potatoes were given water with nutrients added.

Table 1. Data for Potatoes Grown by Different Methods

Growing Method	Average Number of Potatoes per Plant	Average Weight per Potato (grams)	Total Weight per Plant (grams)
Soil	6.5	29	188.5
Water	6.5	12	78
Air	28	12	336

11. A student claims that potatoes can be successfully grown without soil. Based on Table 1, which statements **best** support this claim?

Select **two** of the five statements.

A. The heaviest potatoes were grown in soil.

B. The greatest number of potatoes were grown in air.

C. Both water and air produced the same average weight per potato.

D. Both soil and air produced plants with a greater total weight than water.

E. Both soil and water produced the same average number of potatoes per plant.

12. The soil was weighed at the beginning and end of the experiment. The weight did not change.

This is evidence that potato plants mainly get what they need for growth from the

A. soil only.

B. air and soil.

C. air and water.

D. water and soil.

13. Figure 2 shows how plants use their leaves to make food for growth in a natural environment.

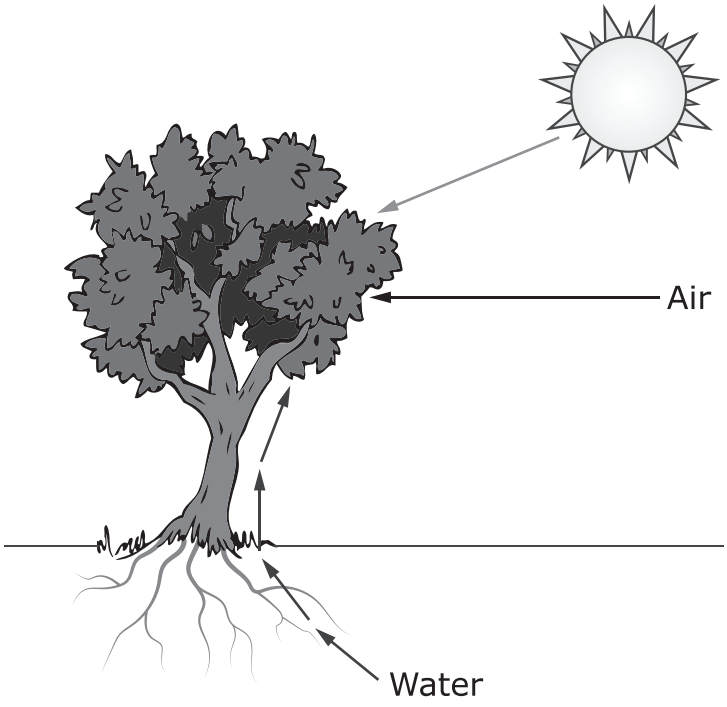


Figure 2. Tree Making Food

Based on Figure 1 and Figure 2, explain what plants need in their natural environment for growth.

(Item 13 continued)

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

In their natural environment, plants need the energy from **Y** in order to use **Z** to make their own food for growth.

Box Y

A. air

B. soil

C. water

D. sunlight

Box Z

A. soil and air only

B. soil and water only

C. water and air only

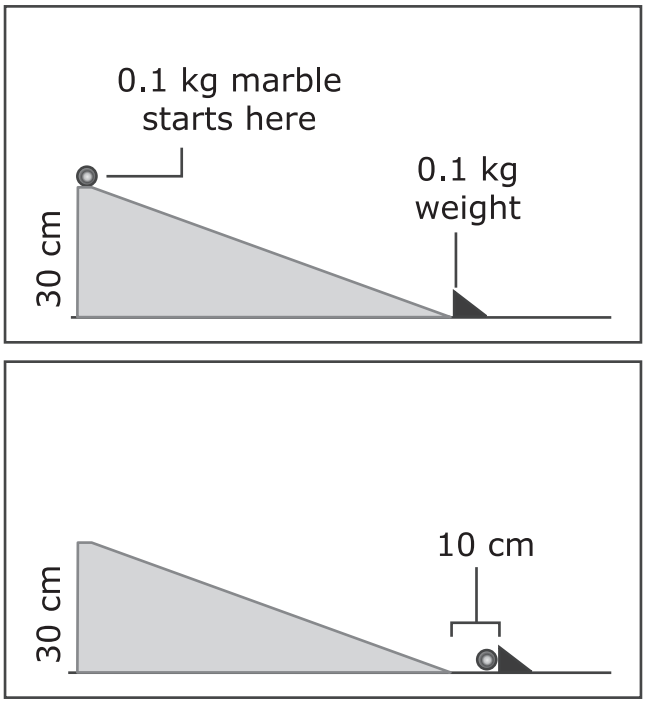
D. soil, water, and air

Use the information below to answer questions 14-17.

Marbles can roll down ramps at different speeds.

A classroom experiment consists of two investigations. Students roll the same marble down each of two ramps. The ramp used in Investigation 1 is 30 centimeters high; the ramp used in Investigation 2 is 60 centimeters high. When the marble comes to the end of each ramp, it collides with and pushes a 0.1 kilogram weight along the track.

Investigation 1



Investigation 2

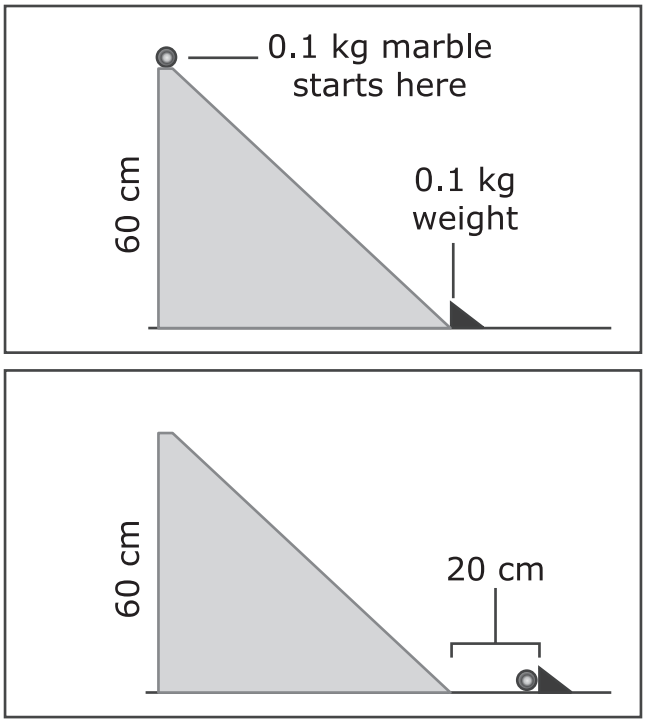


Figure 1. Marble Investigations

GO ON →

14. Which questions could the students be attempting to answer based on the investigations shown?

Select **two** of the five questions.

A. Does changing the height of the ramp affect the speed of the marble?

B. Does changing the height of the ramp affect the weight of the marble?

C. Does changing the height of the ramp affect the path the marble takes?

D. Does changing the height of the ramp affect how far the 0.1 kg weight is pushed?

E. Does changing the height of the ramp affect where the 0.1 kg weight begins to move?

15. In Investigation 2, predict the results if the weight of the marble increases. Provide an explanation for the prediction.

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

In Investigation 2, the height of the ramp and the marble remain the same. Predict the results if a 0.2 kg weight is used. Provide an explanation for the prediction.

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

16. Describe the results of Investigations 1 and 2.

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

In Investigation 1, the speed of the marble at the collision with the 0.1 kg weight was **Y** the speed of the marble in Investigation 2.

In Investigation 2, the energy transferred from the marble to the 0.1 kg weight was **Z** the energy transferred from the marble to the 0.1 kg weight in Investigation 1.

Box Y

A. the same as

B. less than

C. greater than

Box Z

A. the same as

B. less than

C. greater than

17. Investigation 3 changes the ramp size. The new ramp will be 90 centimeters in length and 15 centimeters in height.

The students make four claims based on the results of Investigation 3. Based on Figure 1, identify if each claim is or is not supported by the data.

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

Claim	Claim Is or Is Not Supported by Data
The marble moves faster down the ramp.	W
The marble makes less noise when it hits the weight.	X
The marble has less energy when it hits the weight.	Y
The marble rolls the same distance after it hits the weight.	Z

Box W

A. Supported by data

B. Not supported by data

Box X

A. Supported by data

B. Not supported by data

Box Y

A. Supported by data

B. Not supported by data

Box Z

A. Supported by data

B. Not supported by data

NJSLA–S Practice Test Answer and Alignment Document
Science: Grade 5 – Unit 1

Items 1-2

Domain: Physical Science
Phenomenon: An electric current can produce motion.

Item 1

UIN: 518039_01[1]
Item Type: Technology Enhanced
Standards alignment: DCI: PS3.B; SEP: CEDS; CCC: E&M
Screen Reader (SR)/Assistive Technology (AT)/Paper Key: D
Key: A correct response will look like this:

	Battery	Wire Coil	Magnet
Supplies electric current	●	○	○
Carries electric current	○	●	○
Causes the coil to spin	○	○	●

Rationale:
The battery produces electrical energy.
The wire coil transmits the electric current.
The magnet causes the wire coil to spin and converts electrical energy to motion energy.

Item 2

UIN: 518039_02
Item Type: Multiple Choice
Standards alignment: DCI: PS3.B; SEP: CEDS; CCC: E&M
Key: B
Rationale:
A toy car converts electrical energy to motion energy, while the three other foils all convert electrical energy into either sound or light energy.

[1] The UIN (Unique Identification Number) can be used to find an item in the New Jersey Digital Item Library (https://nj.digitalitemlibrary.com/)

Items 3–4

Domain: Physical Science

Phenomenon: Two of the same type of ball are thrown at a wall, but one ball bounces back farther away from the wall than the other.

Item 3

UIN: 518022_01

Item Type: Multiple Choice

Standards alignment: DCI: PS3.A; SEP: CEDS; CCC: E&M

Key: A

Rationale:

More energy will cause the ball to bounce farther away from the wall, which would cause the ball to land closer closer to Student 1, as shown in the figure.

Answer B is invalid based on the diagram.

Answers C and D are invalid based on the diagram; both students hit the ball against the wall at the same height.

Item 4

UIN: 518022_03

Item Type: Technology Enhanced

Standards alignment: DCI: PS3.A; SEP: EAE; CCC: E&M

SR/AT/Paper Key: Box Y: B; Box Z: B

Key: A correct response will look like this:

When the soccer ball hits the wall, [some ▾] of the soccer ball's energy is transferred to the air in the form of [sound. ▾]

Rationale:

Only some of the ball's energy is transferred to the air as sound. Light is not produced at all. If all of the energy were transferred, the ball would not have enough energy to bounce back away from the wall; and if none were transferred, a sound would not be produced.

Items 5–6

Domain: Earth and Space Science

Phenomenon: A student on the way to school in January observes that some icy roads had been treated with sand and others with salt.

Item 5

UIN: 518047_01

Item Type: Multiple Choice

Standards alignment: DCI: ESS3.B; SEP: EAE; CCC: C and E

Key: D

Rationale:

The table shows that tires skid less because sand helps the tires grip the road, and sand is also less expensive than salt. The table also states that sand does not melt ice and has some environmental impacts, making answers A, B, and C invalid.

Item 6

UIN: 518047_02

Item Type: Technology Enhanced

Standards alignment: DCI: ESS3.B; SEP: CEDS; CCC: C and E

SR/AT/Paper Key: B; A; B

Key: A correct response will look like this:

Rationale:

The table shows:

Snow-covered roads: Sand helps the tires grip the road and salt does not help melt snow-covered roads when the air temperature is below 10°F.

Icy roads with air temperature of 20°F: Salt works when the temperature is above 10°F.

Icy roads with air temperature of 5°F: Sand would be better, since the temperature is below 10°F, and salt only works when the temperature is above 10°F. Sand helps the tires grip the road.

Item 7–9

Domain: Earth and Space Science

Phenomenon: At night, a street light appears bigger and brighter than other street lights on the same street, just like some stars in the sky.

Item 7

UIN: 518019_05

Item Type: Multiple Choice

Standards alignment: DCI: ESS1.A; SEP: AID; CCC: S, P, and Q

Key: B

Rationale:

Table 1 shows street light X is closest to the student (1 km), and it appears the brightest (medium). Answer A is the opposite, therefore invalid.

Table 2 shows similar information as Table 1 for the relative distance and brightness of stars. The farther away the star is, the less bright it appears. Answers C and D are opposite of the information in the table, and therefore invalid.

Item 8

UIN: 518019_06

Item Type: Technology Enhanced

Standards alignment: DCI: ESS1.A; SEP: AID; CCC: S,P, and Q

SR/AT/Paper Key: Box Y: C; Box Z: B

Key: A correct response will look like this:

Based on Tables 1 and 2, street light [Z ▾] has the same brightness as Arcturus. If the student moves away from Arcturus, the brightness of this star would appear to [decrease. ▾]

Rationale:

Tables 1 and 2 show street light Z's brightness is "very low," which is the same level of brightness as Arcturus. The farther away the star, the less bright it appears. The Sun is the closest star and its brightness is very high.

Item 9

UIN: 518019_07

Item Type: Multiple Choice

Standards alignment: DCI: ESS1.A; SEP: EAE; CCC: S,P, and Q

Key: B

Rationale:

Table 2 shows that the Sun appears larger because it is the closest star to Earth and it is the brightest.

Items 10–12

Domain: Earth and Space Science

Phenomenon: Earthquakes can strike anywhere on Earth, but they occur more frequently in certain areas.

Item 10

UIN: 518037_01

Item Type: Multiple Choice

Standards alignment: DCI: ESS2.B; SEP: AID; CCC: PAT

Key: A

Rationale:

The West Coast consists mainly of yellow and orange areas, which, according to the earthquake risk scale, represent the highest risk for earthquakes. The East Coast, Northeast, and South all contain mostly light or dark green areas, with some yellow in the South. According to the risk scale, these colors represent a lower risk than the orange color of the West Coast.

Item 11

UIN: 518037_03

Item Type: Technology Enhanced

Standards alignment: DCI: ESS2.B; SEP: AID; CCC: PAT

SR/AT/Paper Key: B

Key: A correct response will look like this:

Earthquake Risk in the United States

Highest ↓	Southern portion of the West Coast
	Northern Alaska
	Northern New Jersey
	Southern New Jersey
Lowest	Northern Central United States

Rationale:

According to the earthquake risk scale, the southern portion of the West Coast has the highest risk for earthquakes, because the colors are mostly orange and yellow. The northern coast of Alaska is next, as the colors are mostly yellow and dark green. Northern NJ is next because the color is dark green. Southern NJ is next because the color is light green. The upper Midwest is last because that area is light blue.

Item 12

UIN: 518037_04
Item Type: Technology Enhanced
Standards alignment: DCI: ESS2.B; SEP: AID; CCC: PAT
SR/AT/Paper Key: A and D
Key: 1 and 4. A correct response will look like this:

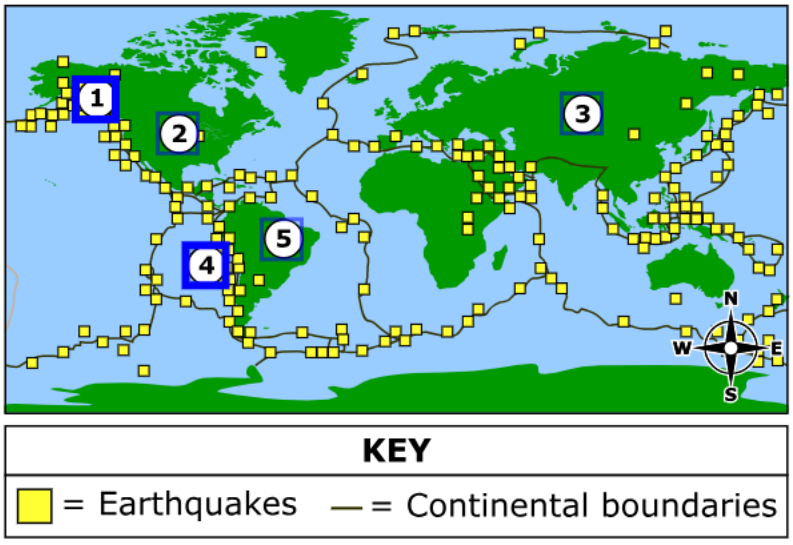


Figure 2. Map of Major Earthquakes since 1900

Rationale:
Locations 1 and 4 show areas where earthquakes most likely will occur. As shown on the map, both areas have experienced numerous major earthquakes since 1900. Also, locations 1 and 4 are along continental boundaries where two tectonic plates are colliding, making earthquakes occur. Locations 2, 3, and 5 are not located on or directly next to a continental plate boundary, and do not fit either of these descriptions.

Items 13–17

Domain: Life Science

Phenomenon: Once a welcome part of the ecosystem in many New Jersey woodlands, the white-tailed deer are now unwelcome residents.

Item 13

UIN: 519011_01a

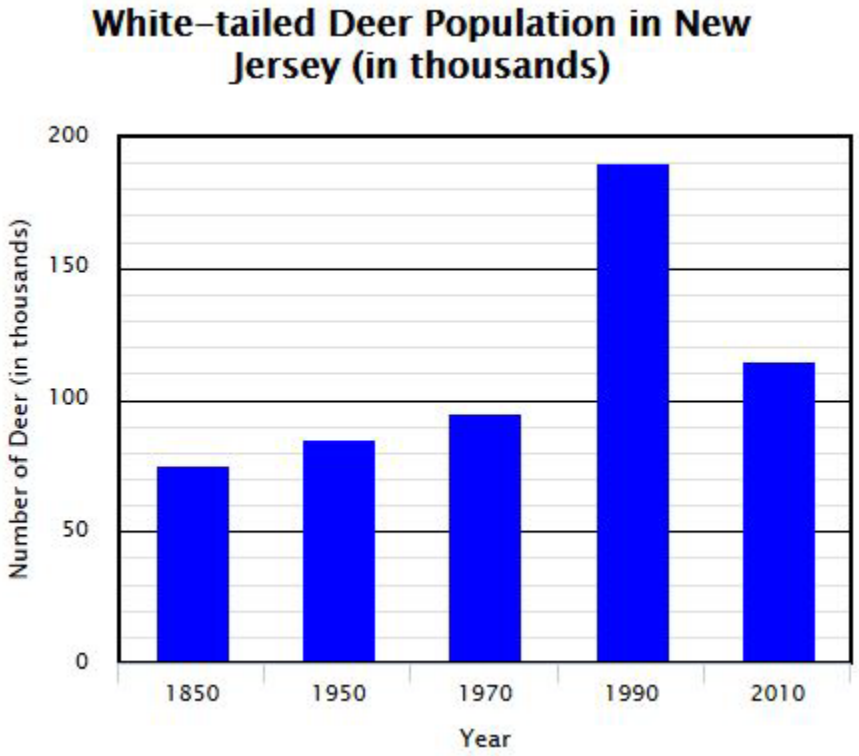
Item Type: Technology Enhanced

Standards alignment: DCI: LS2.C; SEP: AID; CCC: S & SM

SR/AT/Paper Key: Part A: C; Part B: Box Y: B; Box Z: A

Key: Bar Graph: The values of the editable bars going from left to right should be 75, 85, 95, 190, 115. A correct response will look like this:

Part A



Part B

The deer population [increased ▾] until 1990

and then the population started [decreasing. ▾]

Rationale:

The table shows the following data: the population increased from 75,000 in 1850, to 85,000 in 1950, to 95,000 in 1970. In 1990, the population reached the highest number at 190,000, but it then decreased to 115,000 in 2010.

Item 14

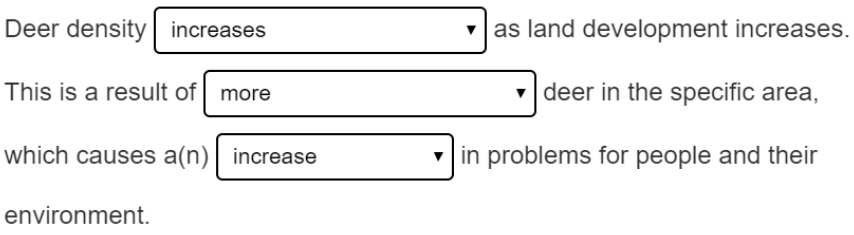
UIN: 519011_02a
Item Type: Multiple Choice
Standards alignment: DCI: LS2.C; SEP: AQDP; CCC: C and E
Key: C and D
Rationale:
Only C (How much deer habitat has been lost to development) and D (Has the number of the deer's natural predators changed) would affect the change in the deer population. The other three foils are questions that would not have an effect on the deer population.

Item 15

UIN: 519011_03a
Item Type: Technology Enhanced
Standards alignment: DCI: LS4.D; SEP: AID; CCC: PAT
Key: 2000
Rationale:
The table shows the population of deer decreased from 190,000 in 1990 to 155,000 in 2000, so the decrease in population indicates the program showed results due to the decrease in the population.

Item 16

UIN: 519011_04a
Item Type: Technology Enhanced
Standards alignment: DCI: LS4.D; SEP: AID; CCC: C and E
SR/AT/Paper Key: Box X: A; Box Y: A; Box Z: A
Key: A correct response will look like this:



Rationale:
The table shows as land development increases (high), the number of deer per acre also increases. Because there are more deer found on the same amount of land, this will most likely cause more problems for the human population.

Item 17

UIN: 519011_05a

Item Type: Constructed Response

Standards alignment: DCI: LS4.D; SEP: EAE; CCC: S & SM

Sample student response: The best solution would be to increase hunting. This will permanently remove some of the deer from these areas. Another effective solution would be to use deer spray. This will keep deer out of gardens and therefore they will not be eating plants and crops. The deer spray will not injure the deer. The least effective solution would be to move deer out of the area. If deer are moved to another area, they can move back to where they originally came from and cause the same problems they did before. Or they could become somebody else's problem. Finally, another solution that would be less effective is using fences to block the deer. Using fences would only work if large areas of land were fenced. Building these fences would cost a lot of money.

Key:

This item has 4 quality points:

- 1 point for choosing one effective solution for reducing deer population and explaining why.
- 1 point for choosing a second effective solution for reducing deer population and explaining why.
- 1 point for choosing a less effective solution for reducing deer population and explaining why.
- 1 point for choosing a second less effective solution for reducing deer population and explaining why.

Rationale:

Students can justify any of the four solutions as being more or less effective than the others based on their own opinion, as long as they can support their choice.

NJSLA-S Online Practice Test Answer and Alignment Document
Science: Grade 5 – Unit 2

Items 1–2

Domain: Physical Science

Phenomenon: When water changes from a liquid to a solid, certain properties of the water change while others remain the same.

Item 1

UIN: 518010_03[1]

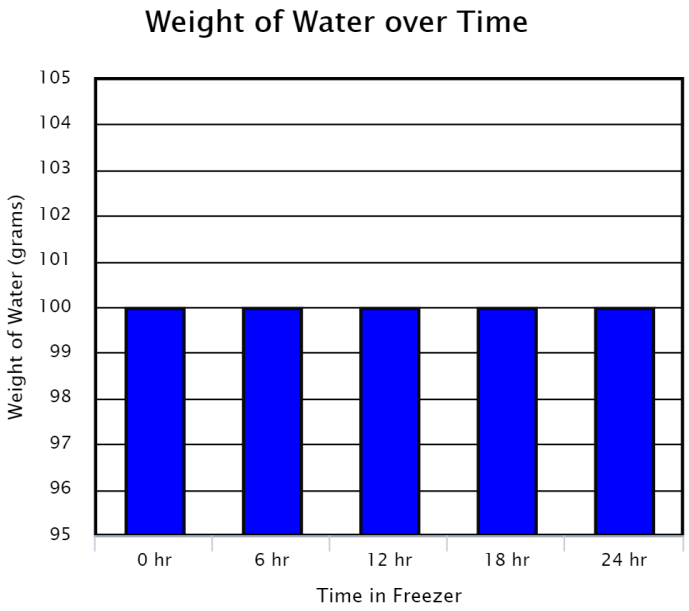
Item Type: Technology Enhanced

Standards Alignment: DCI: PS1.A; SEP: UMCT; CCC: PAT

Screen Reader (SR)/Assistive Technology (AT)/Paper Key: Part A: C; Part B: C

Key: Bar Graph: The values of the editable bars going from left to right should be 100, 100, 100, 100, 100. A correct response will look like this:

Part A



Part B

The weight of the water [remains the same] .

Rationale:

The bar graph shows the weight of the water remains the same at 100 grams over the 24-hour time period. Phase change does not affect the weight of the water.

[1] The UIN (Unique Identification Number) can be used to find an item in the New Jersey Digital Item Library (https://nj.digitalitemlibrary.com/)

Item 2

UIN: 518010_07
Item Type: Technology Enhanced
Standards Alignment: DCI: PS1.A; SEP: PACI; CCC: PAT
SR/AT/Paper Key: Box Y: A; Box Z: A
Key: A correct response will look like this:

In the new investigation, the weight of water is predicted to be [300] grams after 72 hours. This demonstrates that [weight is conserved] in a system over time.

Rationale: Even though the water will remain in the freezer 72 hours instead of 24 hours, the weight of the water will still be 300 grams, showing the weight of matter is conserved.

Items 3–6

Domain: Life Science
Phenomenon: Four types of fossils of extinct species are found in two locations. Paleontologists can gather important information about organisms from these species and the environment in which they lived.

Item 3

UIN: 518059_07
Item Type: Technology Enhanced
Standards Alignment: DCI: LS4.A; SEP: UMCT; CCC: S,P, and Q
SR/AT/Paper Key: Part A: A; Part B: B
Key: A correct response will look like this:

Part A

Shortest Time ↓ Longest Time	Archaeopteryx
	Ammonite
	Blastoid
	Trilobite

Part B

The organism that likely lived on Earth for the shortest time lived in a [land] environment.

Rationale:
According to the Age of Fossils table, archaeopteryx lived for 85 million years, ammonite lived for 175 million years, blastoid lived for 232 million years, and trilobite lived for 280 million years. Archaeopteryx lived the shortest amount of time and it was a land organism.

Item 4

UIN: 518059_08
Item Type: Technology Enhanced
Standards Alignment: DCI: LS4.A; SEP: OECI; CCC: PAT
SR/AT/Paper Key: Box Y: A; Box Z: D
Key: A correct response will look like this:

Based on fossil evidence, Location 1 changed to a [land] environment [between 60–65] million years ago.

Rationale: According to the Age of Fossils table, ammonite was a marine organism in Location 1 that lived 65 million years ago. Looking at Table 1, Additional Fossil Information, fossils of a leaf and archaeopteryx, both land organisms, lived in Location 1 between 50 and 60 million years ago. Therefore, Location 1 was land at least 60 million years ago. Somewhere between 60 and 65 million years ago, Location 1 changed from marine to land.

Item 5

UIN: 518059_09
Item Type: Technology Enhanced
Standards Alignment: DCI: LS4.A; SEP: AQDP; CCC: SC
SR/AT/Paper Key: Box W: A; Box X: B; Box Y: B; Box Z: A
Key: A correct response will look like this:

Question	Can Be Answered	Cannot Be Answered
What was the environment at each location over time?	◉	○
How did the climate change at each location over time?	○	◉
How many fossils were found at each location over time?	○	◉
What types of fossils were found at each location over time?	◉	○

Rationale:

- By looking at the type of fossils that were found at each location, it can be determined whether the organisms lived in either a marine or a land environment.
- There are no data in the Age of Fossils table that describe the type of climate or how the climate may have changed in each location.
- Only the type of fossils are shown in the Age of Fossils table, not how many were found at each location.
- The different types of fossils are identified in the Age of Fossils table.

Question 1: By looking at the type of fossils that were found at each location, it can be determined whether the organisms lived in either a marine or a land environment.
Question 2: There are no data in the Age of Fossils table that describe the type of climate or how the climate may have changed in each location.
Question 3: Only the type of fossils are shown in the Age of Fossils table, not how many were found at each location.
Question 4: The different types of fossils are identified in the Age of Fossils table.

Item 6

UIN: 518059_05
Item Type: Technology Enhanced
Standards Alignment: DCI: LS4.A; SEP: EAE; CCC: SC
SR/AT/Paper Key: Box X: B; Box Y: B; Box Z: A
Key: A correct response will look like this:

At Location [2] , the fossils of the [archaeopteryx and blastoid]
show the area had species that [were both marine and terrestrial] .

Rationale:
The types of fossils (ammonite and trilobite) at Location 1 were both created from marine organisms. The fossils at Location 2 (archeopteryx and blastoid) were created from both terrestrial and marine organisms, therefore in that location the environment changed.

Items 7–10

Domain: Earth and Space Science
Phenomenon: Two cities can be across the world from each other, yet have very similar climates.

Item 7

UIN: 518043_01
Item Type: Technology Enhanced
Standards Alignment: DCI: ESS2.D; SEP: AID; CCC: PAT
SR/AT/Paper Key: B
Key: A correct response will look like this:

City 1	City 2
Adak	Klaksvik
Richland	Tehran
Needles	Riyadh
Los Angeles	Athens

Rationale:
These cities show similar amounts of annual precipitation.

- Annual precipitation in Adak is 61 inches and annual precipitation in Klaksvik is 56 inches.
- Annual precipitation in Richland is 7 inches and annual precipitation in Tehran is 9 inches.
- Annual precipitation in Needles is 4 inches and annual precipitation in Riyadh is also 4 inches.
- Annual precipitation in Los Angeles is 16 inches and annual precipitation in Athens is also 16 inches.

Item 8

UIN: 518043_03
Item Type: Multiple Choice
Standards Alignment: DCI: ESS2.D; SEP: CEDS; CCC: PAT
Key: B
Rationale:

- Adak and Tehran are far from each other, but their average highs are very different. Adak's average high temperature is 52°F and Tehran is 81°F.
- Needles and Riyadah are far from each other. Their average high temperatures are the same at 95°F and their average low temperatures are similar at 54°F and 57°F respectively.
- Needles and Riyadah are far from each other, but their average high and low temperatures are very similar.
- Needles and Richland are close to each other, yet have very different average temperatures.

Item 9

UIN: 518043_07
Item Type: Technology Enhanced
Standards Alignment: DCI: ESS2.D; SEP: EAE; CCC: PAT
SR/AT/Paper Key: Box W: B; Box X: A; Box Y: A; Box Z: B
Key: A correct response will look like this:

Claim	Supported by Data	Not Supported by Data
Athens and Tehran, because they have the greatest amount of precipitation.	○	◉
Adak and Klaksvik, because they have the same average high temperature.	◉	○
Klaksvik and Tehran, because they have the same average low temperature.	◉	○
Richland and Los Angeles, because they have the lowest amount of precipitation.	○	◉

Rationale:

- Neither Athens nor Tehran have the greatest amount of precipitation. Adak has the greatest amount of precipitation at 61 inches.
- Adak and Klaksvik both have the same average high temperature of 52°F .
- Klaksvik and Tehran both have the same average low temperature of 37°F .
- Neither Richland nor Los Angeles have the lowest amount of precipitation. Riyadh and Needles have the lowest amount of precipitation at 4 inches.

Item 10

UIN: 518043_08
Item Type: Technology Enhanced
Standards Alignment: DCI: ESS2.D; SEP: OECI; CCC: S,P, and Q
SR/AT/Paper Key: Box Y: A; Box Z: B
Key: A correct response will look like this:

The two cities that have the most similar climate to Newark are
Klaksvik and Adak . They are all similar because they all have
cooler and wetter conditions than other cities.

Rationale:
The average high and low in Klaksvik are 52°F and 37°F, with 56 inches of precipitation per year. The average high and low in Adak are 52°F and 32°F, with 61 inches of precipitation per year. The average high and low in Newark are 63°F and 46°F, with 46 inches of precipitation per year. Even though the temperatures are similar, the precipitation for Newark is more similar to the precipitation in Klaksvik and Adak. These three cities are cooler and have more precipitation than the other cities listed.

Items 11–13

Domain: Life Science
Phenomenon: Potatoes are usually grown in soil , but some potatoes are able to grow without soil.

Item 11

UIN: 518035_01
Item Type: Technology Enhanced
Standards Alignment: DCI: LS1.C; SEP: EAE; CCC: E&M
Key: B, C
Rationale:

A. The heaviest potatoes were grown in soil but this does not support the claim that potatoes can be successfully grown without soil.
B. The greatest number of potatoes were grown in air (28), therefore soil is not needed.
C. Both water and air produced the same average weight per potato (12 grams), which shows that potatoes can be successfully grown without soil.
D. Although it is true that both soil and air produced plants with greater total weight than water, this does not support the claim that potatoes can be successfully grown without soil.
E. Although it is true that both soil and water produced the same average number of potatoes per plant, this does not support the claim that potatoes can be successfully grown without soil.

Item 12

UIN: 518035_04
Item Type: Multiple Choice
Standards Alignment: DCI: LS1.C; SEP: CEDS; CCC: E&M
Key: C
Rationale:
Since the weight of the soil did not change from the beginning to the end of the experiment, the soil therefore did not provide the majority of nutrients to the plants. C is the only option that does not include soil.

Item 13

UIN: 518035_05
Item Type: Technology Enhanced
Standards Alignment: DCI: LS1.C; SEP: OECI; CCC: S & SM
SR/AT/Paper Key: Box Y: D; Box Z: C
Key: A correct response will look like this:

In their natural environment, plants need the energy from [sunlight] in order to use [water and air only] to make their own food for growth.

Rationale:
In nature, plants receive energy from sunlight, not air, soil, or water. They then use water and air, not soil, to make food.

Items 14–17

Domain: Physical Science
Phenomenon: Marbles can roll down ramps at different speeds.

Item 14

UIN: 519001_01a
Item Type: Technology Enhanced
Standards Alignment: DCI: PS3.A; SEP: AQDP; CCC: E&M
Key: A, D
Rationale:

A. The height of the ramp changes from 30 centimeters in Investigation 1 to 60 centimeters in Investigation 2, so this is a possible question.
B. The weight of the marble does not change in either investigation.
C. The path the marble takes does not change in either investigation.
D. The height of the ramp changes from 30 centimeters in Investigation 1 to 60 centimeters in Investigation 2 and there is a measuring tape at the end of the ramp, so this is a possible question.
E. Even though the height of the ramp changes from 30 centimeters in Investigation 1 to 60 centimeters in Investigation 2, the weight is placed at 0 centimeters on the tape for both investigations.

Item 15

UIN: 519001_02a
Item Type: Constructed Response
Standards Alignment: DCI: PS3.A; SEP: PACI; CCC: E&M
Sample student response:
If the weight of the marble increases in Investigation 2, then the marble will move faster down the ramp and the weight will move farther because more energy is being transferred.
If the height of the ramp and the weight of the marble remain the same but the weight now is 0.2 kilograms instead of 0.1 kilogram, the weight will not move as far. Although the same amount of energy is transferred, more energy would be required because the weight is heavier.
Key:
This item has 4 quality points:

- 1 point for predicting the results if the weight of the marble increases.
- 1 point for explaining the prediction.
- 1 point for predicting the results if a 0.2 kg weight is used.
- 1 point for explaining the prediction.

Rationale:
Students can make other predictions as long as they are able to justify those predictions with data from the investigations.

Item 16

UIN: 519001_07b
Item Type: Technology Enhanced
Standards Alignment: DCI: PS3.B; SEP: DUM; CCC: E&M
SR/AT/Paper Key: Box Y: B; Box Z: C
Key: A correct response will look like this:

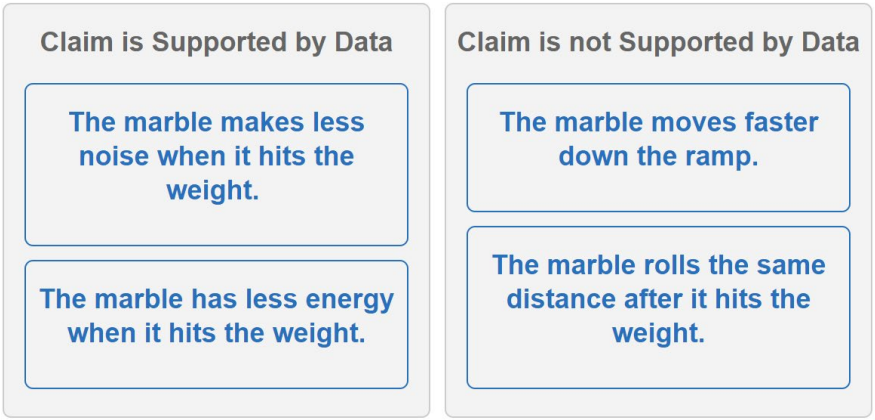
In Investigation 1, the speed of the marble at the collision with the 0.1 kg weight was [less than] the speed of the marble in Investigation 2.

In Investigation 2, the energy transferred from the marble to the 0.1 kg weight was [greater than] the energy transferred from the marble to the 0.1 kg weight in Investigation 1.

Rationale:
The speed of the marble in Investigation 1 is less than Investigation 2 because the ramp is not as high.
The energy transferred from the marble to the weight in Investigation 2 was greater (shown by the weight being moved farther along) than in Investigation 1, because more speed means more energy transferred.

Item 17

UIN: 519001_11
Item Type: Technology Enhanced
Standards Alignment: DCI: PS3.B; SEP: EAE; CCC: C and E
SR/AT/Paper Key: Box W: B; Box X: A; Box A; Box Z: B
Key: A correct response will look like this:



Rationale:

- The marble will make less noise in Investigation 3 because the marble will be moving slower, therefore less energy will be transferred and less noise created.
- The marble will have less energy in Investigation 3 because the marble will be moving slower.
- The marble will move slower down the ramp in Investigation 3 because the marble will have less energy.
- The marble will not move the same distance after it hits the weight because it will have less energy.