

Not for student use.

Minnesota Comprehensive Assessments-Series III

Science Item Sampler Script
Grade 8



ITEM SAMPLERS ARE NOT SECURE TEST MATERIALS. THIS ITEM
SAMPLER SCRIPT MAY BE COPIED OR DUPLICATED.

**MINNESOTA COMPREHENSIVE ASSESSMENTS
ITEM SAMPLER
GRADE 8 SCIENCE SCRIPT**

FOR USE BY TEST MONITOR ONLY.

This script is to be read aloud by a Test Monitor to students who are taking their test online or in a regular, large print, or braille test book.

Students must be given their testing ticket or a test book prior to starting testing.

PRIOR TO ONLINE TEST ADMINISTRATION:

- **ATTENTION:** Prior to administering the script in conjunction with an online test, verify with your District or School Assessment Coordinator that the correct test for the science script has been assigned. **If not set up correctly, the student’s test will not match the script.**

GENERAL INSTRUCTIONS FOR TEST MONITORS:

- Prior to test administration, review the *Testing Directions: Online* or *Testing Directions: Paper* for detailed policy and procedure information for test administration. Ensure you know how testing is scheduled and when students will stop testing for the day.
- Read scripted instructions to students, as directed, and refer to the applicable *Testing Directions* throughout the test administration.
 - Refer to the *Testing Directions: Online* if using the script in conjunction with the online test.
 - Refer to the *Testing Directions: Paper* if using the script in conjunction with the regular, large print, or braille test book.
- For braille, Test Monitors should also refer to the *Test Monitor Notes for Braille* included with the braille test book.
- This script contains two sets of instructions: the first set is used for administering the script with the online test, and the second set is used for administering the script in conjunction with the regular, large print, or braille test book. Use the tabs on the pages to confirm you are using the correct script.
 - Refer to pages 6–25 when using the script in conjunction with an online test.
 - Refer to pages 26–40 when using the script in conjunction with the regular, large print, or braille test.
 - In these sections, read aloud to students **ONLY** what is in **BOLD TYPE**.
- Do not discuss test content with the student during or after the test.
- Do not discuss any portion of the test or the student’s performance with others.
- Read the applicable guidelines on the following pages for reading the script aloud or signing the script (if the student requires the script to be signed).
- For signed interpretation, also refer to the *Guidelines for Administration of Accommodations* for detailed American Sign Language (ASL) guidance. Contact your District or School Assessment Coordinator for these guidelines, as needed.

GUIDELINES FOR READING THE SCRIPT ALOUD

General Guidelines

- Read aloud test content in **bold type** exactly as written, as steadily and clearly as possible without changing, emphasizing, or adding information.
- Do not paraphrase, clarify, define, or translate any part of the questions, answer options, or instructions in the script.
- This script is the only source you may use to read the test to the student. Reading any test content from the test book or screen is not allowed and will require the test to be invalidated.
- Respond to student questions using only the scripted directions and guidance provided in the *Testing Directions: Online* or *Testing Directions: Paper*.

Respond to the Student's Needs

- Adjust your reading speed and volume if requested by the student.
- After a question has been read, allow the student time to respond. If the pause has been lengthy, you may ask, "Do you want me to repeat the question or any part of it again?" before continuing.

Maintain Neutrality

- Communicate in a neutral tone and maintain a neutral facial expression and posture.
- Do not attempt to determine the correct answer to a question while reading, as this may result in pauses or changes in inflection that may mislead the student or suggest the correct answer.
- Be careful to give equal emphasis to each answer option. If the student chooses an answer before all the answer options have been read, ask, "Do you want the other answer options read?" before continuing.

GUIDELINES FOR SIGNED INTERPRETATION OF SCRIPT

General Guidelines

- Sign test content in **bold type** as steadily and clearly as possible without changing, emphasizing, or adding information.
- Do not clarify or define any part of the questions, answer options, or instructions in the script.
- This script is the only source you may use to sign the test to the student. Signing any test content from the test book or screen is not allowed and will require the test to be invalidated.
- Respond to student questions using only the scripted directions and guidance provided in the *Testing Directions: Online* or *Testing Directions: Paper*.

Use Professional Judgment when Signing

- Do your best to use the same signs if the student requests a portion to be repeated.
- Use signs that are conceptually accurate, with or without simultaneous voicing.
- When using an ASL sign that can represent more than one concept or English word, you must adequately contextualize the word to reduce any ambiguity. You may also spell the word after signing it to remove any doubt about which word is intended.
- If you are unsure how to sign and/or pronounce an unfamiliar word, advise the student of the uncertainty and spell the word.
- In cases where signs give clues to the answer, finger spelling must be used.

Respond to the Student's Needs

- Adjust your signing speed if requested by the student.
- Spell any words requested by the student.
- After a question has been signed, allow the student time to respond. If the pause has been lengthy, you may ask, "Do you want me to sign the question or any part of it again?" before continuing.

Use Appropriate Physical/Facial Expressions

- Use facial expressions consistent with sign-language delivery; do not use expressions that may be interpreted by the student as approval or disapproval of the student's responses.
- Do not attempt to determine the correct answer to a question while signing, as this may result in pauses or changes in inflection that may mislead the student or suggest the correct answer.
- Be careful to give equal emphasis to each answer option. If the student chooses an answer before all the answer options have been signed, ask, "Do you want the other answer options signed?" before continuing.

SCRIPT FOR USE WITH THE ONLINE ITEM SAMPLER

After reading the applicable scripted instructions in the *Testing Directions: Online*, say the following before you begin reading the questions on page 7.

After I read each question, I will pause for as much time as you need to answer the question. Then I will read the next question. You may ask me to repeat any questions as many times as you need.

READ ONLY WHAT IS IN BOLD TYPE

GRADE 8 SCIENCE ITEM SAMPLER SCRIPT
FOR USE WITH ONLINE ITEM SAMPLER

Title Page:

Lake Superior

Select the Blue arrow at the top to go on.

Scene:

About ten thousand (10,000) years ago, the last glaciers melted around the Lake Superior area and filled the lake with water. For the past few hundred years, agricultural and manufacturing developments have caused pollution in the lake.

Beginning at the top and continuing clockwise, the diagram is labeled: Ontario, Lake Superior, Michigan, Wisconsin, Minnesota.

Question number one (1):

Which observation suggests that Minnesota was covered by glaciers in the past?

Choose one of the following answers. (Read answers aloud.)

- A. Rocks have fossils.**
- B. Rocks show wind erosion.**
- C. Rocks show chemical weathering.**
- D. Rocks have scrapes and striations.**

Select the Blue arrow at the top to go on.

Scene:

To learn more about the pollution in Lake Superior, scientists travel in a boat to collect samples from different areas of the lake. Before going out on the lake, the scientists must study the local weather in order to safely travel on the lake.

Question number two (2):

Based on the air pressure data, which two (2) weather predictions will most likely be accurate?

Select the two (2) weather predictions you want to choose.

The table has two columns and four rows. The columns are labeled, from left to right: **Time of Day, Air Pressure (millibars)**. The **Time of Day** column is labeled, from top to bottom: **Six a.m. (6 a.m.), Noon, Six p.m. (6 p.m.), Midnight**. The answer options are titled: **Weather Predictions**. The top row is labeled, from left to right: **Fair weather, Strong winds, Cirrus clouds**. The bottom row is labeled, from left to right: **Heavy rain, Stratus clouds**.

Select the Blue arrow at the top to go on.

Scene:

The scientists on the boat discover many pollutants in the lake sediment.

The diagram is labeled, from left to right: **Sediment sample, Sediment sample**. The table is titled: **Pollutants Found in Lake Superior Sediments**. The table has one column and eight rows. The column is labeled, from top to bottom: **Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Pesticides, Zinc**.

Question number three (3):

Based on the data collected, which testable question are the scientists trying to answer?

Choose one of the following answers. (Read answers aloud.)

- A. What is the source of the pollution?**
- B. Which pollutants are found in the lake?**
- C. Which pollutants have been in the water the longest?**
- D. What effect does the pollution have on the lake ecosystem?**

Select the Blue arrow at the top to go on.

Scene:

Mercury is one (1) pollutant found in Lake Superior. The largest source of mercury pollution comes from burning coal in power plants. Data shows that air currents can carry pollutants from power plants that are hundreds of miles away.

Question number four (4):

Show how these factors would most likely change if people began to use less energy.

Drag a change into each box.

The boxes are titled: **Changes When Less Energy is Used**. The boxes are labeled, from left to right: **Amount of Coal Burned**, **Amount of Mercury Released**, **Condition of the Lake**. The **Amount of Coal Burned** answer options are labeled, from top to bottom: **increases**, **decreases**. The **Amount of Mercury Released** answer options are labeled, from top to bottom: **increases**, **decreases**. The **Condition of the Lake** answer options are labeled, from top to bottom: **improves**, **declines**.

Select the Blue arrow at the top to go on.

Title Page:

Water Bottle Rocket

Select the Blue arrow at the top to go on.

Scene:

Water bottle rockets are made by adding water to a bottle and pumping air into it. The flight time and height depend on the shape and the size of the water bottle rocket and the amounts of water and air you pump into the bottle.

The diagram is labeled, from left to right: Water, Air Pump.

Question number five (5):

Some of the air that is pumped into the bottle dissolves in the water. What type of change happens when air dissolves in water?

Choose one of the following answers. (Read answers aloud.)

- A. Chemical**
- B. Color**
- C. Molecular**
- D. Physical**

Select the Blue arrow at the top to go on.

Question number six (6):

Students place six hundred fifty (650) milliliters of water into the water bottle. Convert six hundred fifty (650) milliliters to liters.

You can use the calculator to help you answer this question.

Enter your answer in the box. The box is labeled: Six hundred fifty (650) milliliters equals (=) (blank) liters.

Select the Blue arrow at the top to go on.

Question number seven (7):

Select the words that complete the sentence.

As the student pumps air into the bottle, the pressure (Choose: Decreases, increases, stays the same) and the distance between particles (Choose: Decreases, increases, stays the same).

Select the Blue arrow at the top to go on.

Scene:

To build and launch a water bottle rocket, select a bottle below. Select the amount of water in milliliters (mL) you want to add and the pressure of air in kilopascals (kPa) you want to pump into the bottle. Then select “Run.” The water bottle rocket will launch, and data will be recorded in the table. Repeat as necessary.

The column on the left reads, from top to bottom: Step one (1): Select a bottle. The bottles are labeled, from left to right: Two liters (2L), One liter (1L), One liter (1L), Wide. Step two (2): Add water. The box is labeled: Milliliters (mL). Step three (3): Pump air. The box is labeled: Kilopascals (kPa). The button on the bottom is labeled: RUN. The table has six columns and five rows. The columns are labeled, from left to right: Trial, Bottle, Water (milliliters (mL)), Air (kilopascals (kPa)), Height (meters (m)), Flight Time (seconds (sec.)). The button on the bottom of the table is labeled: Clear All.

Question number eight (8):

Gravity acts on the water bottle rocket. Identify the direction in which gravity acts on the water bottle rocket during flight.

Drag the arrows into the diagram.

The diagram is titled: Water Bottle Rocket Flight. The answer choices are titled: Arrows.

Select the Blue arrow at the top to go on.

Question number nine (9):

What is the average speed of the water bottle rocket when it travels twenty (20) meters in five (5) seconds?

You can use the calculator to help you answer this question.

Choose one of the following answers. (Read answers aloud.)

- A. Four (4) meters per second**
- B. Fifteen (15) meters per second**
- C. Twenty-five (25) meters per second**
- D. One hundred (100) meters per second**

Select the Blue arrow at the top to go on.

Question number ten (10):

Select the one (1) liter (L) water bottle and an air pressure of three hundred kilopascals (300 kPa). Run several trials with different amounts of water.

Which statement is supported by the results of this experiment?

Choose one of the following answers. (Read answers aloud.)

- A. As the volume of water increases, the maximum height of the rocket decreases.
- B. As the volume of water increases, the maximum height of the rocket stays constant.
- C. As the volume of water increases, the maximum height of the rocket increases and then decreases.
- D. As the volume of water increases, the maximum height of the rocket decreases and then increases.

Select the Blue arrow at the top to go on.

Question number eleven (11):

Use the simulation to determine the relationship between the amount of water and flight time in water bottle rockets. Use a two (2)-liter bottle and set the air pressure to three hundred kilopascals (300 kPa) for one hundred, two hundred, three hundred, four hundred, and five hundred milliliters (100, 200, 300, 400, and 500 mL) of water.

Graph the flight time data for each trial.

Select the location on the graph to plot each point.

The graph is titled: **Flight Time versus Volume of Water**. The horizontal axis is labeled: **Volume of Water (milliliters (mL))**. The vertical axis is labeled: **Flight Time (seconds)**.

Select the Blue arrow at the top to go on.

Question number twelve (12):

Perform three (3) trials in a controlled experiment to test how the amount of water added to the bottle affects the height of the flight.

After you perform the three (3) trials, go on to the next question.

Select the Blue arrow at the top to go on.

STOP

Repeat any questions as requested by the student. The student may review answers online before continuing. Refer to the *Testing Directions: Online* if stopping testing for the day at this point.

Title Page:

Pea Plant Experiment

Select the Blue arrow at the top to go on.

Scene:

A student plants pea seeds in containers. Each container has the same type of soil and receives the same amounts of water and light. The pea seeds grow into mature plants.

Question number one (1):

What two (2) substances do plants take in to make sugars during photosynthesis?

Choose one of the following answers. (Read answers aloud.)

- A. Soil and light**
- B. Water and oxygen**
- C. Soil and carbon dioxide**
- D. Water and carbon dioxide**

Select the Blue arrow at the top to go on.

Scene:

The student collects the seeds from the mature pea plants. Some of the seeds are green and some are yellow. The student records the data about seed color in a table.

The table is titled: **Number of Pea Seeds**. The table has two columns and two rows. The rows are labeled, from top to bottom: **Green, Yellow**.

Question number two (2):

Which graph best shows the information from the table?

Choose one of the following answers. (Read answers aloud.)

- A. The graph is titled: **Pea Seeds**. The graph is labeled, from left to right: **Yellow color, Green color**.
- B. The graph is titled: **Pea Seeds**. The horizontal axis is labeled: **Color of Seeds**. The vertical axis is labeled: **Number of Seeds**.
- C. The graph is titled: **Pea Seeds**. The graph is labeled, from left to right: **Green color, Yellow color**.
- D. The graph is titled: **Pea Seeds**. The horizontal axis is labeled: **Number of Seeds**. The vertical axis is labeled: **Color of Seeds**.

Select the **Blue arrow at the top to go on**.

Question number three (3):

Reproduction is important for a species to survive. Select one factor that might affect a species. Then select the most likely outcome of that factor.

Drag the factor and the outcome into the box.

The boxes are labeled, from left to right: Factor, Outcome. The Factor answer options are labeled, from top to bottom: large amount of genetic diversity, small number of organisms, negative change in environment. The Outcome answer options are labeled, from top to bottom: decreased chance of species survival, increased chance of species survival, no chance of species survival.

Select the Blue arrow at the top to go on.

Scene:

The student uses yellow pea seeds for a different experiment. The student divides these seeds into two (2) groups. One group of yellow pea seeds receives half as much water as the other group. After one (1) month, the group of plants that received less water is shorter than the other group of plants.

The diagram is labeled, from left to right: More water, Less water.

Question number four (4):

Several types of variables are found in this experiment. Identify each of the four (4) variables shown as changed, measured, or kept the same.

Drag the variables into the diagram.

The boxes on the left are labeled, from top to bottom: Variables Changed, Variables Measured, Variables Kept the Same. The diagram on the right is titled: Pea Plant Experiment. Beginning at the top right and continuing clockwise, the diagram is labeled: Amount of light, Height of plant, Size of container, Amount of water. The answer options are labeled, from left to right: Amount of water, Amount of light, Height of plant, Size of container.

Select the Blue arrow at the top to go on.

Title Page:

Satellites

Select the Blue arrow at the top to go on.

Scene:

Satellites are natural or artificial objects that orbit a planet or star. The Moon and Earth are both natural satellites. For thousands of years, humans have used natural satellites and stars to determine the time of day and predict the change of the seasons.

Question number five (5):

Satellites move in regular, predictable patterns. Identify which two (2) properties keep satellites moving in regular, predictable patterns.

Select two (2) properties you want to choose.

The answer options are titled: Properties. Density, Friction, Gravity, Inertia, Magnetism, Speed.

Select the Blue arrow at the top to go on.

Scene:

The first artificial satellite, Sputnik, was launched in nineteen fifty-seven (1957). Since then, many other countries, including the United States, have launched artificial satellites. These satellites are powered by an energy source such as batteries or the Sun.

Question number six (6):

Scientists use rockets to launch satellites from Earth. Identify which energy types are involved in launching a rocket.

Drag an energy type into each box.

The diagram is titled: **Launching a Rocket**. Beginning at the top right and continuing clockwise, the diagram is labeled: **Energy of moving rocket**, **Energy released into atmosphere**, **Energy stored in fuel cells**. The answer options are titled: **Energy Types**. The row is labeled, from top to bottom: **chemical**, **electrical**, **heat**, **mechanical**.

Select the Blue arrow at the top to go on.

Scene:

Scientific research also uses artificial satellites. Scientists use images from satellites to observe changes in the sizes of glaciers.

Question number seven (7):

The glacier in the satellite image appears white and the land appears brown. Which statement explains why objects appear to be different colors?

Choose one of the following answers. (Read answers aloud.)

- A. Objects reflect all wavelengths of light.**
- B. Objects refract all wavelengths of light.**
- C. Objects reflect some wavelengths of light and absorb others.**
- D. Objects refract some wavelengths of light and absorb others.**

Select the Blue arrow at the top to go on.

Question number eight (8):

As the glacier melts, the volume of water in the lake near the glacier increases. Every three (3) square kilometers of ice that melts adds one million (1,000,000) liters of water to the lake.

The table is titled: Glacier Size Over Time. The table has two rows and three columns. The rows are labeled, from top to bottom: Year, Area (square kilometers (km²)).

Assume the glacier melts at the same rate through two thousand twenty (2020). Graph the volume of water in the lake from nineteen eighty (1980) to two thousand twenty (2020).

You can use the calculator to help you answer this question.

Drag the top of each bar to the correct height.

The graph is titled: Lake Water Volume. The horizontal axis is labeled: Year. The vertical axis is labeled: Volume (millions of liters (L)).

Select the Blue arrow at the top to go on.

Scene:

Communication is a common use of artificial satellites. They receive and send electromagnetic waves to transmit radio, telephone, and television signals.

The diagram is labeled: Artificial satellite.

Question number nine (9):

Internet services use satellite signals. People can use the Internet in homes to replace some older technologies. Identify which items people can replace by using the Internet.

Select the items you want to choose.

The diagram is titled: Items. Beginning at the top left and continuing clockwise, the diagram is labeled: Refrigerator, Stove, Books, Newspapers, Lamp.

Select the Blue arrow at the top to go on.

Question number ten (10):

Which statement describes why sound waves cannot travel beyond Earth's atmosphere to the satellites?

Choose one of the following answers. (Read answers aloud.)

- A. Sound waves need light to move.**
- B. Sound waves cannot travel in air.**
- C. Sound waves need particles to move.**
- D. Sound waves cannot travel fast enough.**

Select the Blue arrow at the top to go on.

Scene:

The global positioning system, known as GPS, uses artificial satellites. People can use a GPS device to get directions to a location.

Question number eleven (11):

A compass and a GPS device have similar features and different features. Identify which features are similar and which are different.

The diagram is labeled, from left to right: Compass, GPS device.

Drag each feature into the correct box.

The answer options are labeled, from left to right: Shows which direction is north, Cost, Numbers of functions, Includes a map. The boxes are labeled, from left to right: Similar, Different.

STOP

When the student reaches the end of the test, repeat any questions as requested by the student. The student may review answers online before submitting the test. Refer to the *Testing Directions: Online* for information on collection and return of test materials.

SCRIPT FOR USE WITH THE PAPER ITEM SAMPLER TEST BOOKS

After reading the applicable scripted instructions in the *Testing Directions: Paper*, say the following before you begin reading the questions on page 28.

After I read each question, I will pause for as much time as you need to answer the question. Then I will read the next question. You may ask me to repeat any questions as many times as you need.

READ ONLY WHAT IS IN BOLD TYPE

GRADE 8 SCIENCE ITEM SAMPLER SCRIPT
FOR USE WITH PAPER ITEM SAMPLER TEST BOOKS
SEGMENT 1

We will now begin Segment One (1).

Title Page:

Lake Superior

Scene:

About ten thousand (10,000) years ago, the last glaciers melted around the Lake Superior area and filled the lake with water. For the past few hundred years, agricultural and manufacturing developments have caused pollution in the lake.

Beginning at the top and continuing clockwise, the diagram is labeled: Ontario, Lake Superior, Michigan, Wisconsin, Minnesota.

Question number one (1):

Which observation suggests that Minnesota was covered by glaciers in the past?

Choose one of the following answers. (Read answers aloud.)

- A. Rocks have fossils.**
- B. Rocks show wind erosion.**
- C. Rocks show chemical weathering.**
- D. Rocks have scrapes and striations.**

Scene:

To learn more about the pollution in Lake Superior, scientists travel in a boat to collect samples from different areas of the lake. Before going out on the lake, the scientists must study the local weather in order to safely travel on the lake.

Question number two (2):

Based on the air pressure data, which two (2) weather predictions will most likely be accurate?

Circle the two (2) weather predictions you want to select.

The table has two columns and four rows. The columns are labeled, from left to right: Time of Day, Air Pressure (millibars). The Time of Day column is labeled, from top to bottom: Six a.m. (6 a.m.), Noon, Six p.m. (6 p.m.), Midnight. The answer options are titled: Weather Predictions. The top row is labeled, from left to right: Fair weather, Strong winds, Cirrus clouds. The bottom row is labeled, from left to right: Heavy rain, Stratus clouds.

Scene:

The scientists on the boat discover many pollutants in the lake sediment.

The diagram is labeled, from left to right: Sediment sample, Sediment sample. The table is titled: Pollutants Found in Lake Superior Sediments. The table has one column and eight rows. The column is labeled, from top to bottom: Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Pesticides, Zinc.

Question number three (3):

Based on the data collected, which testable question are the scientists trying to answer?

Choose one of the following answers. (Read answers aloud.)

- A. What is the source of the pollution?
 - B. Which pollutants are found in the lake?
 - C. Which pollutants have been in the water the longest?
 - D. What effect does the pollution have on the lake ecosystem?
-

Scene:

Mercury is one (1) pollutant found in Lake Superior. The largest source of mercury pollution comes from burning coal in power plants. Data shows that air currents can carry pollutants from power plants that are hundreds of miles away.

Question number four (4):

Show how these factors would most likely change if people began to use less energy.

Each change is labeled A, B, C, D, E, or F. Write the letter of the correct change into each box. You may use each letter one (1) time. Three of the labels will be used.

The boxes are titled: **Changes When Less Energy is Used**. The boxes are labeled, from left to right: **Amount of Coal Burned**, **Amount of Mercury Released**, **Condition of the Lake**. The **Amount of Coal Burned** answer options are labeled, from top to bottom: **A. increases**, **B. decreases**. The **Amount of Mercury Released** answer options are labeled, from top to bottom: **C. increases**, **D. decreases**. The **Condition of the Lake** answer options are labeled, from top to bottom: **E. improves**, **F. declines**.

STOP

When the student reaches the end of the segment, repeat any questions as requested by the student. The student may review answers and must seal the segment before continuing. Refer to the *Testing Directions: Paper* if stopping testing for the day at this point.

GRADE 8 SCIENCE ITEM SAMPLER SCRIPT
FOR USE WITH PAPER ITEM SAMPLER TEST BOOKS
SEGMENT 2

We will now begin Segment Two (2).

Title Page:

Pea Plant Experiment

Scene:

A student plants pea seeds in containers. Each container has the same type of soil and receives the same amounts of water and light. The pea seeds grow into mature plants.

Question number five (5):

What two (2) substances do plants take in to make sugars during photosynthesis?

Choose one of the following answers. (Read answers aloud.)

- A. Soil and light**
- B. Water and oxygen**
- C. Soil and carbon dioxide**
- D. Water and carbon dioxide**

Scene:

The student collects the seeds from the mature pea plants. Some of the seeds are green and some are yellow. The student records the data about seed color in a table.

The diagram on the left is labeled, from left to right: Yellow, Green. The table is titled: Number of Pea Seeds. The table has two columns and two rows. The rows are labeled, from top to bottom: Green, Yellow.

Question number six (6):

Which graph best shows the information from the table?

Choose one of the following answers. (Read answers aloud.)

- A. The graph is titled: Pea Seeds. The graph is labeled, from left to right: Yellow color two hundred forty-five (245), Green color two hundred fifty-five (255).
- B. The graph is titled: Pea Seeds. The horizontal axis is labeled: Color of Seeds. The vertical axis is labeled: Number of Seeds.
- C. The graph is titled: Pea Seeds. The graph is labeled, from left to right: Green color two hundred forty-five (245), Yellow color two hundred fifty-five (255).
- D. The graph is titled: Pea Seeds. The horizontal axis is labeled: Number of Seeds. The vertical axis is labeled: Color of Seeds.

Question number seven (7):

Reproduction is important for a species to survive. Select one factor that might affect a species. Then select the most likely outcome of that factor.

Each factor is labeled A, B, or C, and each outcome is labeled D, E, or F. Write the letter of the correct factor and the outcome into each empty box. Use one letter for the factor and one letter for the outcome.

The boxes are labeled, from left to right: Factor, Outcome. The Factor answer options are labeled, from top to bottom: A. large amount of genetic diversity, B. small number of organisms, C. negative change in environment. The Outcome answer options are labeled, from top to bottom: D. decreased chance of species survival, E. increased chance of species survival, F. no chance of species survival.

Scene:

The student uses yellow pea seeds for a different experiment. The student divides these seeds into two (2) groups. One group of yellow pea seeds receives half as much water as the other group. After one (1) month, the group of plants that received less water is shorter than the other group of plants.

The diagram is labeled, from left to right: More water, Less water.

Question number eight (8):

Several types of variables are found in this experiment. Identify each of the four (4) variables shown as changed, measured, or kept the same.

Each variable is labeled A, B, C, or D. Write the letter of the correct variable or variables in each empty box. Use each letter one (1) time.

The boxes on the left are labeled, from top to bottom: Variable/Variables Changed, Variable/Variables Measured, Variable/Variables Kept the Same. The diagram on the right is titled: Pea Plant Experiment. Beginning at the top right and continuing clockwise, the diagram is labeled: Amount of light, Height of plant, Size of container, Amount of water. The answer options are labeled, from left to right: A. Amount of water, B. Amount of light, C. Height of plant, D. Size of container.

Title Page:

Satellites

Scene:

Satellites are natural or artificial objects that orbit a planet or star. The Moon and Earth are both natural satellites. For thousands of years, humans have used natural satellites and stars to determine the time of day and predict the change of the seasons.

Question number nine (9):

Satellites move in regular, predictable patterns. Identify which two (2) properties keep satellites moving in regular, predictable patterns.

Circle two (2) properties you want to select.

The answer options are titled: Properties. The answer options are labeled, from top to bottom: Density, Friction, Gravity, Inertia, Magnetism, Speed.

Scene:

The first artificial satellite, Sputnik, was launched in nineteen fifty-seven (1957). Since then, many other countries, including the United States, have launched artificial satellites. These satellites are powered by an energy source such as batteries or the Sun.

The diagram on top is titled: Sputnik. The bottom diagram is titled: Modern Artificial Satellite.

Question number ten (10):

Scientists use rockets to launch satellites from Earth. Identify which energy types are involved in launching a rocket.

Each energy type is labeled A, B, C, or D. Write the letter of the correct energy type in each empty box. Three of the energy types will be used.

The diagram is titled: Launching a Rocket. Beginning at the top and continuing clockwise, the diagram is labeled: Energy of moving rocket, Energy released into atmosphere, Energy stored in fuel cells. The answer options are titled: Energy Types. The answer options are labeled, from top to bottom: A. chemical, B. electrical, C. heat, D. mechanical.

Scene:

Scientific research also uses artificial satellites. Scientists use images from satellites to observe changes in the sizes of glaciers.

The diagram is titled: **Satellite Image of Glacier, Nineteen sixty (1960)**. The key below the diagram is labeled, from top to bottom: equals (=) **Glacier**, equals (=) **Land**, equals (=) **Water**. The diagram on the next page is titled: **Satellite Image of Glacier, Nineteen eighty (1980)**. The key below the diagram is labeled, from top to bottom: equals (=) **Glacier**, equals (=) **Land**, equals (=) **Water**. The diagram on the next page is titled: **Satellite Image of Glacier, Two thousand (2000)**. The key below the diagram is labeled, from top to bottom: equals (=) **Glacier**, equals (=) **Land**, equals (=) **Water**.

Question number eleven (11):

The glacier in the satellite image appears white and the land appears brown. Which statement explains why objects appear to be different colors?

Choose one of the following answers. (Read answers aloud.)

- A. Objects reflect all wavelengths of light.**
- B. Objects refract all wavelengths of light.**
- C. Objects reflect some wavelengths of light and absorb others.**
- D. Objects refract some wavelengths of light and absorb others.**

Question number twelve (12):

As the glacier melts, the volume of water in the lake near the glacier increases. Every three (3) square kilometers of ice that melts adds one million (1,000,000) liters of water to the lake.

The table is titled: Glacier Size Over Time. The table has three columns and two rows. The rows are labeled, from top to bottom: Year, Area (square kilometers (km²)).

Assume the glacier melts at the same rate through two thousand twenty (2020). Graph the volume of water in the lake from nineteen eighty (1980) to two thousand twenty (2020).

You can use the calculator to help you answer this question.

Write a plus sign (+) above each bar where the top of the bar should be.

The graph is titled: Lake Water Volume. The horizontal axis is labeled: Year. The vertical axis is labeled: Volume (millions of liters (L)).

Scene:

Communication is a common use of artificial satellites. They receive and send electromagnetic waves to transmit radio, telephone, and television signals.

The diagram is labeled: Artificial satellite.

Question number thirteen (13):

Internet services use satellite signals. People can use the Internet in homes to replace some older technologies. Identify which items people can replace by using the Internet.

Circle the names of the items you want to select.

The diagram is titled: Items. Beginning at the top left and continuing clockwise, the diagram is labeled: Refrigerator, Stove, Books, Newspapers, Lamp.

Question number fourteen (14):

Which statement describes why sound waves cannot travel beyond Earth's atmosphere to the satellites?

Choose one of the following answers. (Read answers aloud.)

- A. Sound waves need light to move.**
 - B. Sound waves cannot travel in air.**
 - C. Sound waves need particles to move.**
 - D. Sound waves cannot travel fast enough.**
-

Scene:

The global positioning system, known as GPS, uses artificial satellites. People can use a GPS device to get directions to a location.

Question number fifteen (15):

A compass and a GPS device have similar features and different features. Identify which features are similar and which are different.

The diagram is labeled, from left to right: Compass, GPS device.

Each feature is labeled A, B, C, or D. Write the letter of each feature in the correct box. You will use each letter one (1) time.

The answer options are labeled, from left to right: A. Shows which direction is north, B. Cost, C. Number of functions, D. Includes a map. The boxes are labeled, from left to right: Similar, Different.

STOP

When the student reaches the end of the test, repeat any questions as requested by the student. The student may review answers and must seal the final segment when finished. Refer to the *Testing Directions: Paper* for information on collection and return of test materials.

