Teacher Guide

Directions for Test Administration

Science

High School

Science Table of Contents

(Page is intentionally blank.)

Purpose

The Directions for Test Administration (DTA) is required for administration. The DTA provides the exact wording of the items to be read aloud by the TA during administration, the materials needed in preparation of the test, and guidelines for how to present the items to the student. Please use the DTA in conjunction with the Test Administration Manual (TAM) and the MSAA Online Assessment System User Guide for Test Administrators for detailed instructions.

MSAA Administration Materials

Document	Purpose
Test Administration Manual (TAM)	The TAM provides policies and procedures for TAs and TCs to prepare for the administration of the test, including a vocabulary list for ASL translation, tactile graphics, word boards or word banks, and AT/AAC devices.
Directions for Test Administration (DTA)	The DTA provides all directions for a successful one-to-one MSAA administration and includes directions and scripts for each item of the test.
MSAA Online Assessment System User Guide for Test Administrators	The user guide for TAs provides technical information and troubleshooting tips, plus step-by-step instructions to navigate the MSAA Online Assessment System, such as how to complete the Learner Characteristics Inventory (LCI); how to pause, resume, and submit a test for scoring; when to contact the MSAA Service Center; and how to administer the Student Response Check (SRC).

Directions

Become familiar with and follow all directions for test administration provided in the TAM. All text that TAs are to say aloud is boldfaced, and all text providing directions for what TAs are to do is in italics.

Please see the example below:

Item 1

3.ESS.2.1.1: Use observations to describe weather conditions.

Teacher Script	
SAY	**Sofia observes a tree bending as air blows on it outside.** *Indicate the picture to the student.*
ASK	**Which word can Sofia use to describe the weather?** *Indicate and read each response option to the student.* **foggy** **windy** **sleepy**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ A. foggy ○ ***B. windy*** ○ C. sleepy ○ D. No Response

Boldfaced text: TA reads item text to the student.

Italicized text: Directions for what the TA is to do.

NOTE: For certain items, there is alternative text provided. Alternative text may appear in the SAY and/or ASK sections. It is **required** that TAs read the alternative text provided.

Beginning Science High School

Items 1–6 Cluster Stimulus

Teacher Script	
SAY	**Sarah's science class is experimenting with toy cars. There are two ramps set up to face each other. Toy cars are released at the top of each ramp. The cars move down the ramps and hit each other. Sarah observes that one car has more damage from the collision than the other car.** **Experiment 1** **Sarah wants to know why one car had more damage after the collision than the other car. She experiments with two undamaged toy cars using two ramps of the same height set up to face each other. One car has a small bumper attached to the front of the car, and the other car has a large bumper attached to the front of the car.** **She places one toy car at the top of each ramp and releases them at the same time so that they collide at the bottom of the ramps.** **Sarah made this model to show the collision between the cars in her experiment.** *Indicate and read the model to the student.* **The model is titled Toy Car Collision. It shows two ramps positioned to form a V with a flat bottom where the two ramps meet. Each ramp has one toy car on it. A car with a small bumper and a car with a large bumper are at the bottom of the ramps. The cars are touching each other. An arrow points from the car with the small bumper to the car with the large bumper. Another arrow points from the car with the large bumper to the car with the small bumper.** **Sarah organizes the results of her experiment in a data table.** *Indicate and read the data table to the student.* **The data table is titled Experiment One: Amount of Damage after Collision. It compares the damage to the car with a small bumper and the damage to the car with a large bumper after the collision. The car with the small bumper has major damage after the collision. The car with the large bumper has minor damage after the collision.**

Continued on next page

Teacher Script	
SAY	**Experiment 2** **Sarah wonders if the position of the cars when they are released on the ramps affects the amount of damage to the car with a small bumper.** **She performs a second experiment with two undamaged cars, a car with a small bumper and a car with a large bumper. She releases each car at the same time at three different positions: top, middle, and bottom of the ramps. She makes a model that shows the three positions.** *Indicate and read the model to the student.* **The model is titled Experiment Two: Positions Setup. It shows two ramps positioned to form a V with a flat bottom where the two ramps meet. There are three positions labeled on both ramps: top, middle, bottom.** **The data table shows the damage to the car with a small bumper after each collision in Sarah's second experiment.** *Indicate and read the data table to the student.* **The data table is titled Experiment Two: Damage versus Position on Ramps. It compares the damage to the car with the small bumper after the collision at three different positions: top, middle, and bottom of the ramp. When the cars are released from the top of the ramps, the car with the small bumper has major damage after the collision. When the cars are released from the middle of the ramps, the car with the small bumper has moderate damage after the collision. When the cars are released from the bottom of the ramps, the car with the small bumper has minor damage after the collision.** **Experiment 3** **Sarah then wonders if the size of the bumper affects the amount of damage to a car after a collision.** **She builds two different bumper designs and attaches each bumper to a toy car.** **Sarah then repeats the collision experiment two more times. This time she sees what happens when an undamaged car with a small bumper collides with a car that either has a small or medium bumper.** **The results of Sarah's third experiment are listed in the data table.** *Indicate and read the data table to the student.* **The data table is titled Experiment Three: Damage versus Bumper Size. It compares the damage after the collision between a car with a small bumper to another car with a small bumper and to a car with a medium bumper. The cars with a small bumper have major damage after the collision. The car with a medium bumper has moderate damage after the collision.**

Item 1

HS.PS.2.3.1: Use a model to identify how forces are acting in a collision system.	
Teacher Script	
SAY	**Here is a model that Sarah made for Experiment 1.** *Indicate and read the model to the student.* **The model is titled Toy Car Collision. It shows two ramps positioned to form a V with a flat bottom where the two ramps meet. Each ramp has one toy car on it. A car with a small bumper and a car with a large bumper are at the bottom of the ramps. The cars are touching each other. An arrow points from the car with the small bumper to the car with the large bumper. Another arrow points from the car with the large bumper to the car with the small bumper.**
ASK	**Which part of the model shows the forces acting on the cars?** *Indicate and read each response option to the student.* **birds** **erasers** **arrows**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ A. birds ○ B. erasers ○ ***C. arrows*** ○ D. No Response

Item 2

HS.PS.2.3.2: Make a claim about how a particular device functions to minimize the forces on a macroscopic object during a collision.

Teacher Script	
SAY	**Sarah reviews the results from Experiment 1.** *Indicate and read the data table to the student.* **The data table is titled Experiment One: Amount of Damage after Collision. It compares the damage to the car with the small bumper and the damage to the car with the large bumper after the collision. The car with a small bumper has major damage after the collision. The car with a large bumper has minor damage after the collision.**
ASK	**Which claim can be made about the effect of large bumpers?** *Indicate and read each response option to the student.* **The large bumper caused the car to move faster.** **The large bumper protected the car from damage.** **The large bumper decreased the weight of the car.**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ A. The large bumper caused the car to move faster. ○ ***B. The large bumper protected the car from damage.*** ○ C. The large bumper decreased the weight of the car. ○ D. No Response

Item 3

HS.PS.2.3.3: Select, evaluate, or change a design to a device that minimizes the forces on a macroscopic object during a collision.

Teacher Script	
SAY	**Sarah reviews the results from Experiment 1.** *Indicate and read the data table to the student.* **The data table is titled Experiment One: Amount of Damage after Collision. It compares the damage to the car with the small bumper and the damage to the car with the large bumper after the collision. The car with a small bumper has major damage after the collision. The car with a large bumper has minor damage after the collision.** **She then reviews the results from Experiment 3.** *Indicate and read the data table to the student.* **The data table is titled Experiment Three: Damage versus Bumper Size. It compares the damage after the collision between a car with a small bumper to another car with a small bumper and to a car with a medium bumper. The cars with a small bumper have major damage after the collision. The car with a medium bumper has moderate damage after the collision.**
ASK	**Which bumper design <u>most</u> reduces force during a collision?** *Indicate and read each response option to the student.* **large bumper** **small bumper** **medium bumper**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ ***A. large bumper*** ○ B. small bumper ○ C. medium bumper ○ D. No Response

Item 4

HS.PS.3.2.1: Identify questions that would determine if an object's kinetic energy is changing or if an object's potential energy is changing in a system.	
Teacher Script	
SAY	**Sarah wants to know whether the potential energy of the cars changes as the cars move down the ramp. Here is her model from Experiment 1.** *Indicate and read the model to the student.* **The model is titled Toy Car Collision. It shows two ramps positioned to form a V with a flat bottom where the two ramps meet. Each ramp has one toy car on it. A car with a small bumper and a car with a large bumper are at the bottom of the ramps. The cars are touching each other. An arrow points from the car with the small bumper to the car with the large bumper. Another arrow points from the car with the large bumper to the car with the small bumper.**
ASK	**Which question will help Sarah find out how the potential energy of the cars changes?** *Indicate and read each response option to the student.* **What are the colors of the cars?** **Is the surface of the ramp hot or cold?** **How far do the cars move down the ramp?**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ A. What are the colors of the cars? ○ B. Is the surface of the ramp hot or cold? ○ ***C. How far do the cars move down the ramp?*** ○ D. No Response

Item 5

HS.PS.3.2.2: Use models to show how energy changes when an object's position is moved or when the (particles) making up an object change their motion.

Teacher Script	
SAY	**Sarah looks at her setup for Experiment 2. She wonders if the position of the cars on the ramps when they are released affects how much kinetic energy the cars have when they collide.** **Her model shows three different positions on the ramps.** *Indicate and read the model to the student.* **The model is titled Experiment Two: Positions Setup. It shows two ramps positioned to form a V with a flat bottom where the two ramps meet. There are three positions labeled on both ramps: top, middle, bottom.** **She also looks at how much damage occurred to the cars after the collision when the cars were released from different positions on the ramps.** *Indicate and read the data table to the student.* **The data table is titled Experiment Two: Damage versus Position on Ramps. It compares the damage to the car with the small bumper after the collision at three different positions: top, middle, and bottom of the ramp. When the cars are released from the top of the ramps, the car with the small bumper has major damage after the collision. When the cars are released from the middle of the ramps, the car with the small bumper has moderate damage after the collision. When the cars are released from the bottom of the ramps, the car with the small bumper has minor damage after the collision.**
ASK	**Where should cars be released on the ramps in order to have the <u>most</u> kinetic energy when they collide?** *Indicate and read each response option to the student.* **top** **middle** **bottom**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ ***A. top*** ○ B. middle ○ C. bottom ○ D. No Response

Item 6

HS.PS.3.2.3: Develop or use models to describe how energy is conserved at the macroscopic or particle level when energy is transferred or converted from one form to another.

Teacher Script	
SAY	**Sarah added the potential energy (PE) and kinetic energy (KE) values for each car to her model of the collision in Experiment 1. Her model shows that as cars move down the ramp, potential energy changes into kinetic energy. One part of her model shows the energy of the cars in Joules (J) before the collision.** *Indicate and read the model to the student.* **The model is titled Experiment One before Collision. It shows two ramps positioned to form a V with a flat bottom where the two ramps meet. Each ramp has one toy car on it. A car with a small bumper and a car with a large bumper are at the top of the ramps. The potential energy of the car with the small bumper equals one-two-hundred-seventieth Joule. The kinetic energy of the car with the small bumper equals zero Joules. The potential energy of the car with the large bumper equals one-two-hundred-seventieth Joule. The kinetic energy of the car with the large bumper equals zero Joules.** **The other part of Sarah's model shows that the energy of the cars in Joules (J) after the collision is unknown.** *Indicate and read the model to the student.* **The model is titled Experiment One after Collision. It shows two ramps positioned to form a V with a flat bottom where the two ramps meet. Each ramp has one toy car on it. A car with a small bumper and a car with a large bumper are at the bottom of the ramps. The cars are touching each other. The potential energy and kinetic energy values for each car are unknown.**
ASK	**How should Sarah complete the model to show that there is no change in each car's total amount of energy?** *Indicate and read each response option to the student.* **show that the PE decreases and the KE increases for each car** **show that the PE increases and the KE stays the same for each car** **show that the PE doubles and the KE decreases by half for each car**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ A. show that the PE decreases and the KE increases for each car ○ ***B. show that the PE increases and the KE stays the same for each car*** ○ C. show that the PE doubles and the KE decreases by half for each car ○ D. No Response

Items 7–12 Cluster Stimulus

Teacher Script	
SAY	**Tamara is at school doing a biology project. While working on her project, she learns about many different organisms.** **Tamara learns that many organisms look different from each other. However, almost all of them have a protein called catalase in their bodies. Catalase helps quickly break down hydrogen peroxide (H_2O_2) into water (H_2O) and two oxygen atoms (O_2). H_2O_2 forms naturally in the body as a byproduct of normal life processes.** **In addition, Tamara learns that the ancestors of present-day organisms also had catalase in their bodies. Her teacher shows her a data table that describes how the size of the catalase protein changed for an ancestor of an organism and a present-day organism.** *Indicate and read the "Size of Catalase Protein in Organisms" data table to the student.* **The data table is titled Size of Catalase Protein in Organisms. The table compares the size of the catalase protein in an ancestral organism to a present-day organism. The size of the catalase protein is large in the ancestral organism. The size of the catalase protein is small in the present-day organism.** **Tamara's teacher also tells her that because many different organisms have catalase, data on catalase can indicate patterns of relatedness between those organisms. The teacher shows Tamara a chart that lists partial catalase amino acid sequences in three organisms.** *Indicate and read the "Partial Catalase Amino Acid Sequences" chart to the student.* **The chart is titled Partial Catalase Amino Acid Sequences. It has two columns and three rows. Column one is titled Organism. Column two is titled Catalase Amino Acid Sequence. Row one, dog, circle, square, star, right triangle. Row two, cow, circle, square, star, pentagon. Row three, fungus, circle, square, heart, trapezoid.** **The teacher also shows Tamara a data table that lists partial catalase DNA sequences in three additional organisms.** *Indicate and read the "Partial Catalase DNA Sequences" data table to the student.* **The data table is titled Partial Catalase DNA Sequences. It has two columns and three rows. Column one is titled Organism. Column two is titled Catalase DNA Sequence. Row one, fly, ACA, GAA, TTC. Row two, mouse, CGT, CCG, TCC. Row three, monkey, CGC, CAT, GGC.**

Item 7

HS.PS.1.2.1: Use provided information to complete a model of a chemical reaction.

Teacher Script	
SAY	**Tamara wants to use a model to show how catalase helps break down hydrogen peroxide (H_2O_2) into water (H_2O) and two oxygen atoms (O_2) inside different organisms. She uses these shapes to represent oxygen (O) and hydrogen (H).** *Indicate and read the diagram to the student.* **The diagram shows a triangle labeled oxygen and a hexagon labeled hydrogen.**
ASK	**Which model shows the equation: H_2O_2 yields H_2O plus O_2?** *Indicate and read each response option to the student.* *[For students who are blind or visually impaired, read "The model shows a rectangle plus a rectangle yielding a semicircle."]* **Model X** *[For students who are blind or visually impaired, read "The model shows an upward arrow joined to a diamond yielding an octagon plus two diamonds joined together."]* **Model Y** *[For students who are blind or visually impaired, read "The model shows two hexagons joined to two triangles yielding two hexagons joined to a triangle plus two triangles joined together."]* **Model Z**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ A. Model X ○ B. Model Y ○ ***C. Model Z*** ○ D. No Response

Item 8

HS.PS.1.2.2: Use the periodic table as a model to identify or classify elements that will behave similarly in chemical reactions.

Teacher Script	
SAY	**Tamara knows that when hydrogen peroxide (H_2O_2) is broken down by catalase, oxygen (O) and hydrogen (H) react to form water (H_2O). She wonders if there are other elements that react like oxygen (O).** **She looks at part of the periodic table.** *Indicate and read the "Part of the Periodic Table" diagram to the student.* **The diagram includes the group labels five A, six A, and seven A. Group five A includes the elements nitrogen, N, and phosphorus, P. Group six A includes the elements oxygen, O, and sulfur, S. Group seven A includes the elements fluorine, F, and chlorine, Cl.**
ASK	**Which element will react <u>most</u> like oxygen (O) in a chemical reaction?** *Indicate and read each response option to the student.* **sulfur (S)** **boron (B)** **fluorine (F)**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ ***A. sulfur (S)*** ○ B. boron (B) ○ C. fluorine (F) ○ D. No Response

Item 9

HS.PS.1.2.3: Use the periodic table to construct an explanation for specific chemical reactions.

Teacher Script	
SAY	**Tamara learns that when elements react, a certain number of electrons are needed to fill the outer shell of the elements in order to be stable. When hydrogen peroxide (H_2O_2) is broken down by catalase, 2 hydrogen (H) atoms react with 1 oxygen (O) atom to form water (H_2O).** **The data table shows electron information about hydrogen and oxygen.** *Indicate and read the "Electron Information for Hydrogen and Oxygen" data table to the student.* **This data table compares the number of electrons in the outer shell of each element, and the number of electrons each element needs in its outer shell to be stable. Hydrogen, H, has one electron in its outer shell. Hydrogen needs two electrons in its outer shell to be stable. Oxygen, O, has six electrons in its outer shell. Oxygen needs eight electrons in its outer shell to be stable.**
ASK	**Based on the data table, how do 2 H atoms and 1 O atom react to form H_2O in the catalase reaction?** *Indicate and read each response option to the student.* **After reacting, H has 1 electron and O has 6 electrons in their outer shells.** **After reacting, H has 2 electrons and O has 1 electron in their outer shells.** **After reacting, H has 2 electrons and O has 8 electrons in their outer shells.**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ A. After reacting, H has 1 electron and O has 6 electrons in their outer shells. ○ B. After reacting, H has 2 electrons and O has 1 electron in their outer shells. ○ ***C. After reacting, H has 2 electrons and O has 8 electrons in their outer shells.*** ○ D. No Response

Item 10

HS.LS.4.1.1: Use the provided information to identify how organisms have changed over time.	
Teacher Script	
SAY	**Tamara looks at the catalase protein data table.** *Indicate and read the "Size of Catalase Protein in Organisms" data table to the student.* **The data table is titled Size of Catalase Protein in Organisms. The table compares the size of the catalase protein in an ancestral organism to a present-day organism. The size of the catalase protein is large in the ancestral organism. The size of the catalase protein is small in the present-day organism.**
ASK	**How did this organism change over time?** *Indicate and read each response option to the student.* **The organism can move faster.** **The organism can make louder noises.** **The organism has smaller catalase proteins.**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ A. The organism can move faster. ○ B. The organism can make louder noises. ○ ***C. The organism has smaller catalase proteins.*** ○ D. No Response

Item 11

HS.LS.4.1.2: Use various types of data (DNA sequences, amino acid sequences, structures found in organisms, embryos, fossils) to draw conclusions about patterns of relatedness among organisms.	
Teacher Script	
SAY	**Tamara wonders how the presence of catalase in different organisms can show evidence of those organisms being related. She looks at the information in the data table.** *Indicate and read the "Partial Catalase Amino Acid Sequences" data table to the student.* **The data table is titled Partial Catalase Amino Acid Sequences. It has two columns and three rows. Column one is titled Organism. Column two is titled Catalase Amino Acid Sequence. Row one, dog, circle, square, star, right triangle. Row two, cow, circle, square, star, pentagon. Row three, fungus, circle, square, heart, trapezoid.**
ASK	**Based on the amino acid data table, which organism is <u>most</u> closely related to the cow?** *Indicate and read each response option to the student.* **dog** **fungus** **chicken**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ ***A. dog*** ○ B. fungus ○ C. chicken ○ D. No Response

Item 12

HS.LS.4.1.3: Describe how patterns in data comparing structures found in organisms, embryos, and/or fossils are evidence for biological evolution and common ancestry of living things.

Teacher Script	
SAY	**Tamara wonders how DNA information about catalase can provide further information about organisms and common ancestry. She looks at the information in the catalase DNA data table.** *Indicate and read the "Partial Catalase DNA Sequences" data table to the student.* **The data table is titled Partial Catalase DNA Sequences. It has two columns and three rows. Column one is titled Organism. Column two is titled Catalase DNA Sequence. Row one, fly, ACA, GAA, TTC. Row two, mouse, CGT, CCG, TCC. Row three, monkey, CGC, CAT, GGC.** **Tamara claims it is more likely that a mouse shares an earlier common ancestor with a monkey than with a fly.**
ASK	**What information from the catalase DNA data table supports Tamara's claim?** *Indicate and read each response option to the student.* **The sequences of the fly and the mouse are most alike.** **The sequences of the monkey and the fly are most alike.** **The sequences of the mouse and the monkey are most alike.**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ A. The sequences of the fly and the mouse are most alike. ○ B. The sequences of the monkey and the fly are most alike. ○ ***C. The sequences of the mouse and the monkey are most alike.*** ○ D. No Response

Item 13

HS.LS.2.2.1: Use the provided information to identify factors that affect population size and/or biodiversity.	
Teacher Script	
SAY	**The data table shows how snakes affect the percent of rabbits that survive in an area.** *Indicate and read the data table to the student.* **The title of the data table is How Many Rabbits Survive? Seventy-eight percent of rabbits survive in an area with snakes. One hundred percent of rabbits survive in an area with no snakes.**
ASK	**Based on the data table, which factor affects how many rabbits survive?** *Indicate and read each response option to the student.* **cars** **plants** **snakes**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ A. cars ○ B. plants ○ ***C. snakes*** ○ D. No Response

Item 14

HS.LS.2.2.2: Interpret data to describe the effect of a factor in a specific ecosystem.	
Teacher Script	
SAY	**Red squirrels were the only kind of squirrel on an island for many years. People later brought gray squirrels to the island. The graph shows how the red squirrel population changed after gray squirrels were put on the island.** *Indicate and read the graph to the student.* **The graph is titled Change in Red Squirrel Population. It shows how the number of red squirrels changed over ten years. In year two, there were ninety red squirrels. In year four, there were seventy red squirrels. In year six, there were forty-five red squirrels. In year eight, there were thirty red squirrels. In year ten, there were two red squirrels.**
ASK	**According to the graph, how did gray squirrels affect the population of red squirrels?** *Indicate and read each response option to the student.* **Red squirrels increased in number.** **Red squirrels decreased in number.** **Red squirrels had larger places to live.**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ A. Red squirrels increased in number. ○ ***B. Red squirrels decreased in number.*** ○ C. Red squirrels had larger places to live. ○ D. No Response

Item 15

HS.LS.2.2.3: Use mathematical representations (e.g., averages, trends, graphs) to explain how a specific factor affects the biodiversity or sizes of populations in ecosystems of different scales.

Teacher Script	
SAY	**Maria learned that animals attack some birds' nests. This data table shows how the thickness of the forest affects how often a nest is attacked.** *Indicate and read the data table to the student.* **The title of the data table is Forest Thickness and Nest Attacks. It compares the percent of forest thickness and the percent of nests attacked per day. At ten percent forest thickness, nine percent of nests are attacked per day. At thirty percent forest thickness, eight percent of nests are attacked per day. At fifty percent forest thickness, six percent of nests are attacked per day. At seventy percent forest thickness, four percent of nests are attacked per day. At ninety percent forest thickness, two percent of nests are attacked per day.**
ASK	**Which explanation is supported by the data in the data table?** *Indicate and read each response option to the student.* **Thick forests allow nests to be hidden better, so they have fewer nests attacked each day.** **Thick forests have more places for birds to make nests, so they have more nests attacked each day.** **Thick forests have more places for predators to hide, so they have more nests attacked per day.**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ ***A. Thick forests allow nests to be hidden better, so they have fewer nests attacked each day.*** ○ B. Thick forests have more places for birds to make nests, so they have more nests attacked each day. ○ C. Thick forests have more places for predators to hide, so they have more nests attacked per day. ○ D. No Response

Item 16

HS.ESS.1.6.1: Use data to identify patterns about ancient Earth materials, meteorites, or other planetary surfaces.	
Teacher Script	
SAY	**Alya learns that the soil on the Moon contains elements from the Sun. The data table lists information about the Moon and the Sun.** *Indicate and read the "Moon Soil" data table to the student.* **The data table lists the types of elements in Moon soil and whether the element is from the Sun. Helium and neon are in Moon soil and are from the Sun.**
ASK	**What do the data show about elements?** *Indicate and read each response option to the student.* **There are many clouds around Earth.** **It is fun to play outside when it is raining.** **Elements travel from the Sun to the Moon.**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ A. There are many clouds around Earth. ○ B. It is fun to play outside when it is raining. ○ ***C. Elements travel from the Sun to the Moon.*** ○ D. No Response

Item 17

HS.ESS.1.6.2: Ask questions about ancient Earth materials, meteorites, or other planetary surfaces that can be used to construct an account of Earth's formation and early history.

Teacher Script	
SAY	**Dante learns that Earth is made up of elements that can be classified as either heavy or light. He finds a data table that lists information about heavy and light elements and their location inside Earth.** *Indicate and read the "Types of Elements inside Earth" data table to the student.* **The data table compares types of elements inside Earth. Heavy elements sink and are found in the core layer of Earth. Light elements float and are found in the crust layer of Earth.** **Dante also learns that the core is a layer deep in the center of Earth, while the crust is a layer on Earth's surface.**
ASK	**Which question can be answered by using these data?** *Indicate and read each response option to the student.* **How did the layers of Earth form?** **Are there many elements that float?** **Why do scientists study the universe?**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ ***A. How did the layers of Earth form?*** ○ B. Are there many elements that float? ○ C. Why do scientists study the universe? ○ D. No Response

Item 18

HS.ESS.1.6.3: Use evidence (e.g., data about ancient Earth materials, meteorites, other planetary surfaces) to explain Earth's formation and early history.	
Teacher Script	
SAY	**Sam learns that some craters on Earth were caused millions of years ago by asteroid impacts. He finds data that compare the estimated crater size millions of years ago to the current size of different craters. The data table lists some of the data.** *Indicate and read the "Comparing Sizes of Craters over Time" data table to the student.* **The title of the data table is Comparing Sizes of Craters over Time. Millions of years ago the Chesapeake Bay crater had an estimated size of eighty-five kilometers and has a current crater size of forty kilometers; millions of years ago the Kara crater had an estimated size of one hundred twenty kilometers and has a current crater size of sixty-five kilometers; millions of years ago the Acraman crater had an estimated size of ninety kilometers and has a current crater size of forty kilometers.** **Sam also learns that currently there are few craters on Earth's surface.**
ASK	**How do Sam's data help explain why there are few craters?** *Indicate and read each response option to the student.* **The asteroids that struck Earth make craters of different sizes.** **The craters become smaller over time as Earth's surface is changed.** **The size of craters decreases as fewer asteroids impact Earth's surface.**
Student Response	
RECORD	*Fill in the circle for the student's response.* ○ A. The asteroids that struck Earth make craters of different sizes. ○ ***B. The craters become smaller over time as Earth's surface is changed.*** ○ C. The size of craters decreases as fewer asteroids impact Earth's surface. ○ D. No Response


msaa
Multi-State Alternate Assessment