



ARIZONA SCIENCE TEST

Computer-Based
Sample Test
Scoring Guide
Grade 8 Science



Created September 2020
Prepared by the Arizona Department of Education

About the Sample Test Scoring Guide

The AzSCI Sample Test Scoring Guides provide details about the items, student response types, correct responses, and related scoring considerations for AzSCI Sample Test items.

Within this guide, each item is presented with the following information:

- Item number
- Domain (Reporting Category)
- Science and Engineering Practices (SEP) Group (Reporting Category)
- Content Standard
- SEP
- Crosscutting Concepts (CC)
- Phenomenon
- TAGS
- Item Type

The items included in this guide are representative of the kinds of items that students can expect to experience when taking the computer-based test for AzSCI Grade 8 Science.

AzSCI items are aligned to at least two of the three multidimensional science standards. Each item will be aligned to a content standard and either a science and engineering practice (SEP) or a crosscutting concept (CC), some items may be aligned to both an SEP and a CC. Item information may vary due to alignment requirements; for example, AzSCI items will only contribute to a student's SEP Group score if it is aligned to the SEP listed within the standard text, as noted within this field. Items not aligned to a dimension (SEP Group, SEP, and CC) will be left blank.

Item Number	1
Item Title	Drought!
Domain (<i>Reporting Category</i>)	Earth and Space Science
Science and Engineering Practices (SEP) Group (<i>Reporting Category</i>)	Sensemaking
Content Standard	7.E1U2.7
SEP	Analyzing and Interpreting Data
Crosscutting Concepts (CC)	Patterns
Phenomenon	Long-range forecasts predicted continued drought in Arizona in 2019, despite higher than normal precipitation in late 2018.
TAGS	G3
Item Type	Multiple Choice

This question has **two** parts. First answer Part A. Then answer Part B.

Part A

During late 2018, Arizona had a short period of significantly above-normal precipitation. However, weather scientists continued to recommend that people plan for drought through 2019.

Based on **Figures 1, 2, and 3**, which statement describes a reason that weather scientists expected continued drought?

- A. The precipitation is usually higher late in the year.
- B. The precipitation was a short-term weather event.
- C. The temperatures need to decrease for the drought to end.
- D. The temperatures are too high for continued precipitation.

Part B

Which statement describes evidence the weather scientists **most likely** used to make the recommendation?

- A. Arizona has had a consistent pattern of drought for over 10 years.
- B. Arizona has had a consistent pattern of above-normal precipitation.
- C. Only part of Arizona was predicted to get precipitation in the next three months.
- D. All of Arizona was predicted to have higher-than-normal temperatures over the next three months.

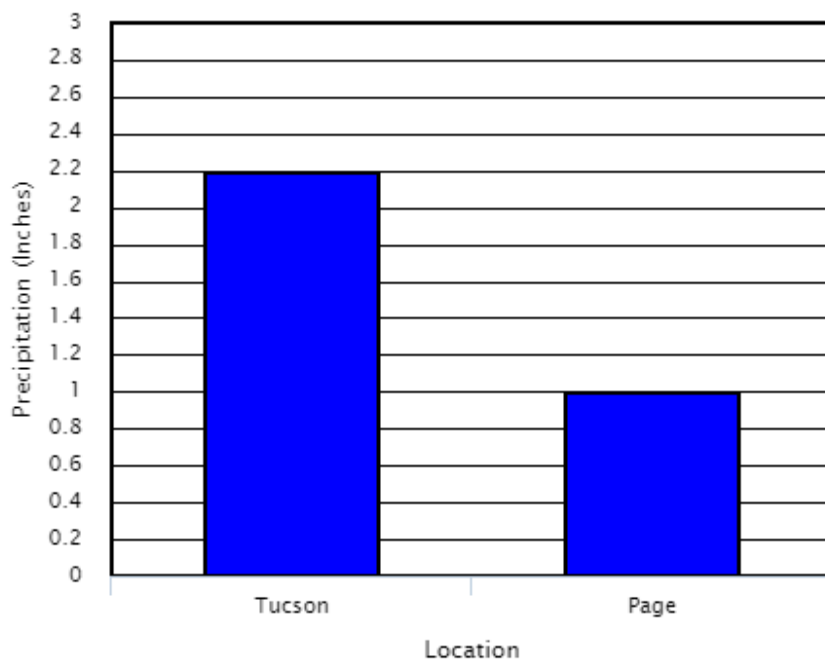
(1 point)

Item Number	2
Item Title	Drought!
Domain (<i>Reporting Category</i>)	Earth and Space Science
Science and Engineering Practices (SEP) Group (<i>Reporting Category</i>)	Critiquing
Content Standard	8.E1U3.7
SEP	Obtaining, Evaluating, and Communication of Information
Crosscutting Concepts (CC)	Patterns
Phenomenon	Long-range forecasts predicted continued drought in Arizona in 2019, despite higher than normal precipitation in late 2018.
TAGS	S3
Item Type	Bar Graph

Use the data in **Table 1** to create a bar graph that shows the average annual precipitation for the month that flooding is **most likely** to occur in each city.

Drag the top of each bar to the correct height.

Average Annual Precipitation



Score	Scoring Rubric
1	Student raises bar for Tucson to 2.2 and the bar for Page to 1.0.
0	The response is incorrect or irrelevant.

Item Number	3
Item Title	Floating Magnets
Domain (<i>Reporting Category</i>)	Physical Science
Science and Engineering Practices (SEP) Group (<i>Reporting Category</i>)	<i>Item will not contribute to SEP Group score.</i>
Content Standard	7.P3U1.3
SEP	Construct Explanations and Design Solutions
Crosscutting Concepts (CC)	Cause and Effect
Phenomenon	Ceramic ring magnets are arranged on a wood dowel so that magnets placed on the wood dowel are stable and float above any magnet(s) below. Floating magnet is acted upon by both gravitational and magnetic forces.
TAGS	G3
Item Type	Multiple Choice

Which sentence should a student include when constructing an explanation of why the red magnet is **not** floating in Setup B in **Figure 1**?

- A. The combined magnetic and gravitational forces acting on the red magnet are equal to the force that the base is applying to the magnet.
- B. The combined magnetic and gravitational forces acting on the red magnet are less than the force that the base is applying to the magnet.
- C. The combined gravitational force, magnetic force, and force applied by the base are acting on the red magnet in the same direction.
- D. The combined magnetic force and force applied by the base oppose the gravitational force acting on the red magnet.

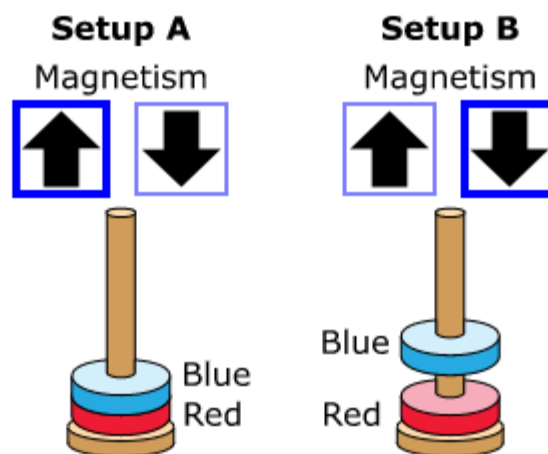
(1 point)

Item Number	4
Item Title	Floating Magnets
Domain (<i>Reporting Category</i>)	Physical Science
Science and Engineering Practices (SEP) Group (<i>Reporting Category</i>)	Sensemaking
Content Standard	7.P2U1.2
SEP	Developing and Using Models
Crosscutting Concepts (CC)	Cause and Effect
Phenomenon	Ceramic ring magnets are arranged on a wood dowel so that magnets placed on the wood dowel are stable and float above any magnet(s) below. Floating magnet is acted upon by both gravitational and magnetic forces.
TAGS	S3
Item Type	Hot Spot

A magnetic force acts on the red magnet in Setup A and Setup B. The arrows in the diagram represent possible directions of the magnetic force from the blue magnet.

For each setup, select the arrow that represents the direction of the magnetic force acting on the red magnet from the blue magnet.

Select only **one** arrow for **each** setup.



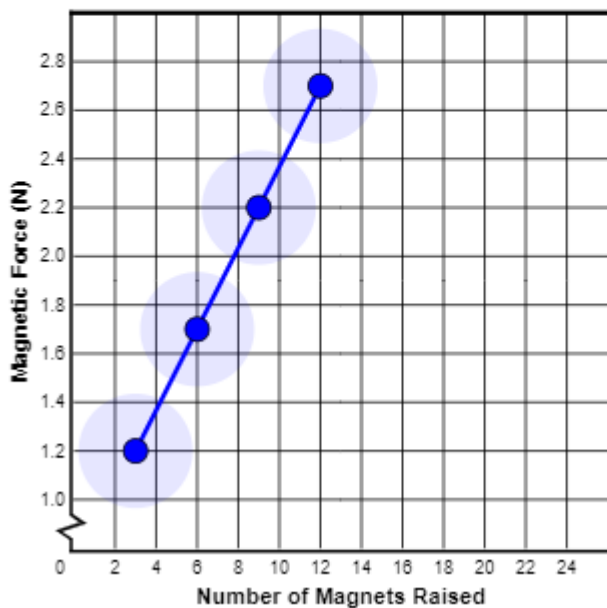
Score	Scoring Rubric
1	For Setup A the blue magnet pulls up (up arrow) on the red magnet. For Setup B, the blue magnet pushes down (down arrow) on the red magnet.
0	The response is incorrect or irrelevant.

Item Number	5
Item Title	Floating Magnets
Domain (<i>Reporting Category</i>)	Physical Science
Science and Engineering Practices (SEP) Group (<i>Reporting Category</i>)	Sensemaking
Content Standard	7.P2U1.1
SEP	Analyzing and Interpreting Data
Crosscutting Concepts (CC)	Patterns
Phenomenon	Ceramic ring magnets are arranged on a wood dowel so that magnets placed on the wood dowel are stable and float above any magnet(s) below. Floating magnet is acted upon by both gravitational and magnetic forces.
TAGS	S3
Item Type	Line Graph

Use the data in Table 1 and Table 2 to show the magnetic force needed to raise the magnets in each trial.

Plot a location on the coordinate grid for each of the four data points from the table. A line segment will connect the points.

Strength of Magnetic Force



Score	Scoring Rubric
1	Student plots points (3, 1.2), (6, 1.7), (9, 2.2) and (12, 2.7).
0	The response is incorrect or irrelevant.

Item Number	6
Item Title	Carbon Cycle
Domain (<i>Reporting Category</i>)	Physical Science
Science and Engineering Practices (SEP) Group (<i>Reporting Category</i>)	Sensemaking
Content Standard	8.P1U1.1
SEP	Developing and Using Models
Crosscutting Concepts (CC)	Energy and Matter
Phenomenon	Matter and energy involved in sustaining grasshoppers move through the biosphere through the carbon cycle.
TAGS	S3
Item Type	Multiple Choice

Which statement **best** describes the chemical reaction shown in **Figure 1**?

- A. Glucose is broken down into smaller molecules to be used by the body.
- B. Food is produced using chemical compounds and energy from the sun.
- C. Compounds are broken down to produce oxygen for the organism to breathe.
- D. Energy for movement is released by the breakdown of carbon as atoms are rearranged.

(1 Point)

Item Number	7
Item Title	Carbon Cycle
Domain (<i>Reporting Category</i>)	Life Science
Science and Engineering Practices (SEP) Group (<i>Reporting Category</i>)	Sensemaking
Content Standard	6.L2U1.14
SEP	Developing and Using Models
Crosscutting Concepts (CC)	Systems and System Models
Phenomenon	Matter and energy involved in sustaining grasshoppers move through the biosphere through the carbon cycle.
TAGS	S3
Item Type	Gap Match Table

Use the model in **Figure 2** to show how carbon cycles through an ecosystem. Starting with “A grasshopper molts its exoskeleton,” put the remaining events in the correct order from top to bottom.

1	A grasshopper molts its exoskeleton.
2	Decay occurs.
3	Carbon dioxide is released into the atmosphere.
4	Plants take in carbon dioxide from the atmosphere.
5	Plants produce glucose.
6	The grasshopper takes in carbon molecules.

Score	Scoring Rubric
1	From top to bottom: <ol style="list-style-type: none">1. A grasshopper molts its exoskeleton.2. Decay occurs.3. Carbon dioxide is released into the atmosphere.4. Plants take in carbon dioxide from the atmosphere.5. Plants produce glucose.6. The grasshopper takes in carbon molecules.
0	The response is incorrect or irrelevant.

Item Number	8
Item Title	Carbon Cycle
Domain (<i>Reporting Category</i>)	Physical Science
Science and Engineering Practices (SEP) Group (<i>Reporting Category</i>)	Sensemaking
Content Standard	8.P1U1.1
SEP	Developing and Using Models
Crosscutting Concepts (CC)	Energy and Matter
Phenomenon	Matter and energy involved in sustaining grasshoppers move through the biosphere through the carbon cycle.
TAGS	S3
Item Type	Match - Table Grid

The process of cell respiration shown in **Figure 1** includes several events. Determine whether each event in the table is part of the process or **not** part of the process.

Select **all** the correct answers.

Event	Part of the Process	NOT Part of the Process
Some molecules are released during respiration.	<input checked="" type="radio"/>	<input type="radio"/>
Atoms combine to form new molecules.	<input checked="" type="radio"/>	<input type="radio"/>
Molecules keep their same arrangements.	<input type="radio"/>	<input checked="" type="radio"/>
Added energy causes atoms to break down.	<input type="radio"/>	<input checked="" type="radio"/>

Score	Scoring Rubric
1	Part of the process: Rows 1 & 2 Not part of the process: Rows 3 & 4
0	The response is incorrect or irrelevant.

Item Number	9
Item Title	Carbon Cycle
Domain (<i>Reporting Category</i>)	Life Science
Science and Engineering Practices (SEP) Group (<i>Reporting Category</i>)	<i>Item will not contribute to SEP Group score.</i>
Content Standard	6.L2U1.14
SEP	Engaging in Argument from Evidence
Crosscutting Concepts (CC)	Energy and Matter
Phenomenon	Matter and energy involved in sustaining grasshoppers move through the biosphere through the carbon cycle.
TAGS	G3
Item Type	Multiple Choice

A student makes a claim that an atom of carbon in a grasshopper's body could once have been an atom in the body of a prehistoric animal. Which evidence **best** supports this claim?

- A. Figure 2 shows that grasshoppers molt their exoskeletons.
- B. Figure 1 shows that carbon is present when energy is produced.
- C. Figure 1 shows that carbon atoms are used in more than one type of molecule.
- D. Figure 2 shows that carbon continually circulates through the ground, the atmosphere, and living things.

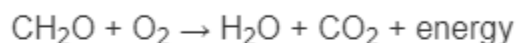
(1 Point)

Item Number	10
Item Title	Carbon Cycle
Domain (<i>Reporting Category</i>)	Physical Science
Science and Engineering Practices (SEP) Group (<i>Reporting Category</i>)	Sensemaking
Content Standard	8.P1U1.1
SEP	Developing and Using Models
Crosscutting Concepts (CC)	Energy and Matter
Phenomenon	Matter and energy involved in sustaining grasshoppers move through the biosphere through the carbon cycle.
TAGS	G3
Item Type	Multiple Choice, Multiple Response

This question has **two** parts. First answer Part A. Then answer Part B.

Part A

The equation shows a reaction that occurs during the decomposition of a grasshopper's body.



formaldehyde + oxygen \rightarrow water + carbon dioxide + energy

In which way does this process compare to the cell respiration process in **Figure 1**?

- A. Both processes release extra oxygen into the atmosphere.
- B. One process is the reverse of the other process.
- C. Both processes result in the same types of molecules being produced.
- D. One process produces larger molecules than the other process.

Part B

Which statements about both the decay and cell respiration processes are true?

Choose **two** correct answers.

- A. Atoms are broken down to produce energy.
- B. No atoms are lost during the chemical reaction.
- C. New atoms are produced through chemical change.
- D. Different types of atoms are needed for each new substance.
- E. Atoms are rearranged to form different compounds.

(1 Point)

Item Number	11
Item Title	Jar Ecosystems
Domain (<i>Reporting Category</i>)	Earth and Space Science
Science and Engineering Practices (SEP) Group (<i>Reporting Category</i>)	Sensemaking
Content Standard	7.E1U1.5
SEP	Developing and Using Models
Crosscutting Concepts (CC)	Systems and System Models
Phenomenon	Plants inside a closed glass terrarium can remain alive for a long period of time using only the resources within the terrarium.
TAGS	S3
Item Type	Match - Table Grid

The table shows three observations about the terrarium. Select boxes to indicate whether the observed event resulted from a transfer of energy, a transfer of matter, or both.

Select **all** the correct answers for each observation. You may select more than one answer in each row.

Observation	Transfer of Energy	Transfer of Matter
Plants increased in size, producing new leaves and stems.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sunlight caused the temperature to increase.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The number of water droplets decreased during the day.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Score	Scoring Rubric
1	Both columns: Rows 1 & 3 Column 1 only: Row 2
0	The response is incorrect or irrelevant.

Item Number	12
Item Title	Jar Ecosystems
Domain (<i>Reporting Category</i>)	Earth and Space Science
Science and Engineering Practices (SEP) Group (<i>Reporting Category</i>)	<i>Item will not contribute to SEP Group score.</i>
Content Standard	7.E1U1.5
SEP	Constructing Explanations and Designing Solutions
Crosscutting Concepts (CC)	Cause and Effect
Phenomenon	Plants inside a closed glass terrarium can remain alive for a long period of time using only the resources within the terrarium.
TAGS	G3
Item Type	Multiple Choice, Multiple Choice

This question has **two** parts. First answer Part A. Then answer Part B.

Part A

Which statement describes a conclusion the student can draw from observations of the terrarium?

- A. Plant roots capture more energy in the evening than in the morning.
- B. Plants use nutrients from the soil to produce energy that helps them grow.
- C. Energy from the sun helps water move from the plants and soil into the air inside the jar.
- D. Water is cycled from the top to the bottom of the jar as the temperature inside the jar increases.

Part B

Which statement describes evidence from the student's observations that supports the answer to Part A?

- A. The temperature inside the terrarium was higher during the day.
- B. The plants slowly increased in size over the month of observation.
- C. The plants produced enough energy from food to grow new stems and leaves.
- D. The amount of water that formed on the inside of the jar was greatest on sunny days.

(1 Point)

Item Number	13
Item Title	Jar Ecosystems
Domain (<i>Reporting Category</i>)	Earth and Space Science
Science and Engineering Practices (SEP) Group (<i>Reporting Category</i>)	<i>Item will not contribute to SEP Group score.</i>
Content Standard	7.E1U1.5
SEP	Constructing Explanations and Designing Solutions
Crosscutting Concepts (CC)	Energy and Matter
Phenomenon	Plants inside a closed glass terrarium can remain alive for a long period of time using only the resources within the terrarium.
TAGS	S3
Item Type	Multiple Response

Which statements best describe characteristics of the model ecosystem inside the terrarium shown in **Figure 1**?

Select **two** correct answers.

- A. Matter is lost in the form of heat as the plants grow in the model ecosystem.
- B. Sunlight is an input that drives changes in the model ecosystem.
- C. Water provides energy for the production of food by the plants.
- D. Matter is created as water moves from the soil into the air of the terrarium.
- E. Matter from water and soil gets recycled inside the jar but cannot leave the jar.

(1 Point)

Item Number	14
Item Title	Jar Ecosystems
Domain (<i>Reporting Category</i>)	Life Science
Science and Engineering Practices (SEP) Group (<i>Reporting Category</i>)	Sensemaking
Content Standard	6.L2U1.14
SEP	Developing and Using Models
Crosscutting Concepts (CC)	Cause and Effect
Phenomenon	Plants inside a closed glass terrarium can remain alive for a long period of time using only the resources within the terrarium.
TAGS	S3
Item Type	Fill in Blank

The student constructs another terrarium with rocks, soil, and plants, but this time earthworms are added to the ecosystem. Earthworms release nutrients into the soil. The student adds water, seals the lid, and places the terrarium where it is exposed to sunlight. In what ways will the addition of earthworms **most likely** affect the terrarium ecosystem?

Enter your answer in the box to complete the sentence.

Even though the earthworms will benefit the plants by providing nutrients, they will also compete with the plants for limited resources.

Score	Scoring Rubric
1	The student enters “water” (not case sensitive)
0	The response is incorrect or irrelevant.

Item Number	15
Item Title	Jar Ecosystems
Domain (<i>Reporting Category</i>)	Earth and Space Science
Science and Engineering Practices (SEP) Group (<i>Reporting Category</i>)	Sensemaking
Content Standard	7.E1U1.5
SEP	Developing and Using Models
Crosscutting Concepts (CC)	Energy and Matter
Phenomenon	Plants inside a closed glass terrarium can remain alive for a long period of time using only the resources within the terrarium.
TAGS	G3
Item Type	Inline Choice

The student wrote a statement about the terrarium. Complete the sentences by selecting the correct answers from the drop-down menus.

During the daytime, the terrarium light energy, which the thermal energy in the terrarium. This change in energy within the terrarium. The collection of water inside the terrarium shows that matter is as energy flows in the system.

Score	Scoring Rubric
1	During the daytime, the terrarium absorbs light energy, which increases the thermal energy in the terrarium. This change in energy helps water move within the terrarium. The collection of water inside the terrarium shows that matter is recycled as energy flows in the system.
0	The response is incorrect or irrelevant.