Tennessee TCAP 2023
Grade 5 Science

Exam Materials
Pages 2 - 14

Answer Key Materials
Page 15

Tennessee Comprehensive Assessment Program

TCAP

Science
Grade 5 Item Release

TN Department of Education

TS03S4992_4

00. The table shows some properties of three stars.

Star Data

Star	Diameter (kilometers)	Temperature (degrees Celsius)	Distance from Earth (light-years)
Sun	1.4 million	5,500	0.000016
Betelgeuse	1.4 billion	3,200	640
Rigel	105 million	12,000	800

Which conclusion is **correct** based on the star data?

A. Rigel is the hottest, so it looks the dimmest from Earth.

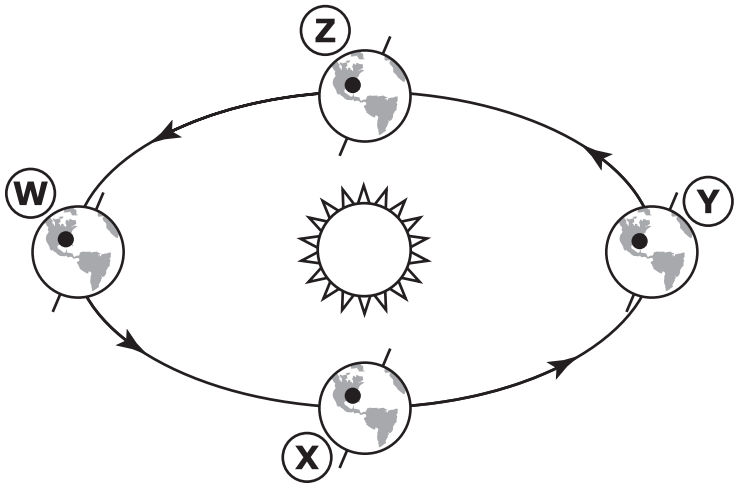
B. The sun has the smallest diameter, so it looks the smallest from Earth.

C. Betelgeuse is farthest from Earth, so it looks the largest from Earth.

D. The sun is closest to Earth, so it looks the brightest from Earth.

TS02S4010_2

00. The diagram shows Earth at four points in its orbit around the sun. The dot on Earth represents the location of Tennessee.



Note: Figure is not drawn to scale.

Tennessee has the same number of daylight hours and nighttime hours two times each year. At which two points in Earth's orbit does this occur?

A. Points W and Y

B. Points X and Z

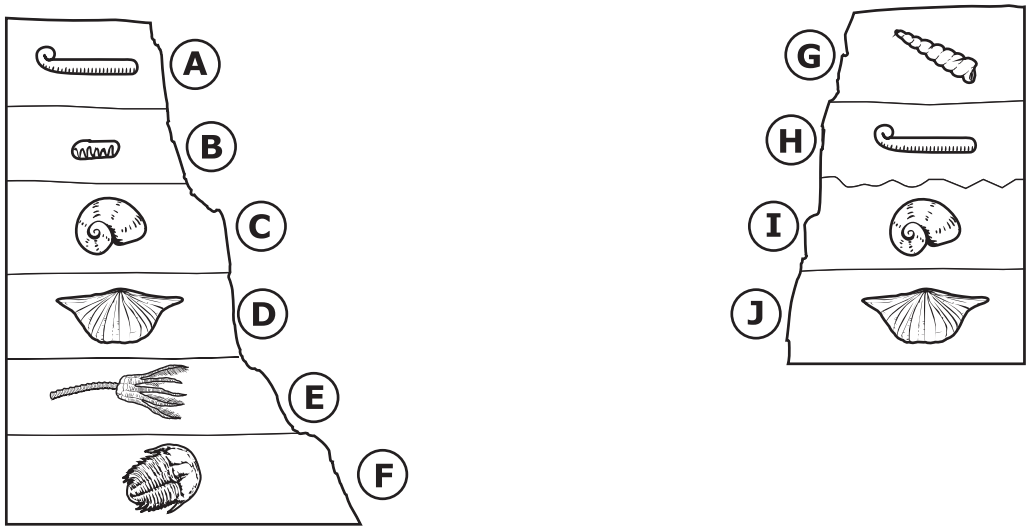
C. Points W and X

D. Points Y and Z

TS02S2500_4

00. The diagram shows two cliffs that are located very close to each other. Both cliffs have rock layers that contain fossils.

Fossils in Rock Layers in Two Cliffs



Which statement correctly compares the ages of the rock layers?

A. Rock layer F is the same age as rock layer E.

B. Rock layer J is younger than rock layer D.

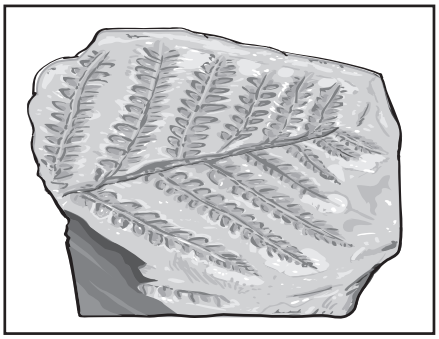
C. Rock layer B is the same age as rock layer A.

D. Rock layer A is older than rock layer G.

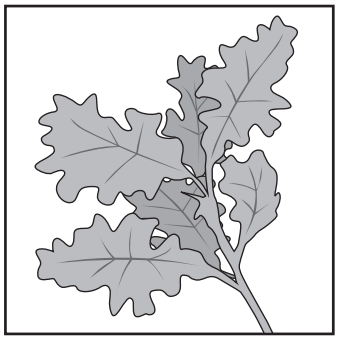
TS02S3052_2

00. Scientists found a fossilized plant. The scientists compared features of the fossilized plant to four plants that are living today. The scientists determined the types of habitats where the plants that are living today grow.

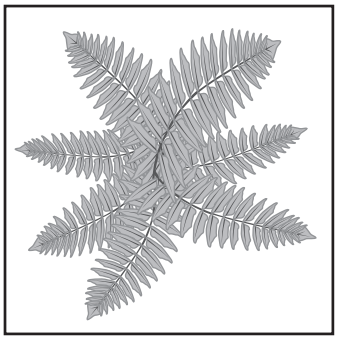
Fossilized Plant



Plants That Are Living Today



Habitat: Forests or fields



Habitat: Shady moist woodlands or wetlands

Habitat: On the border of a forest and a field

Habitat: Open fields receiving direct sunlight

Based on this information, which of these describes a habitat where the fossilized plant **most likely** lived?

A. deep within a dry forest

B. in a wetland

C. near the edge of a dry forest

D. in an open sunny field

TS02S2961_1

00. Animals with light brown or gray fur tend to live in open, sunny areas. Animals with black fur tend to live in areas that are filled with shadows.

In which habitat would an animal with black fur **most likely** survive better than an animal with light-colored fur?

A. a forest that has many trees growing close together

B. a desert that has deep sand and only a few plants

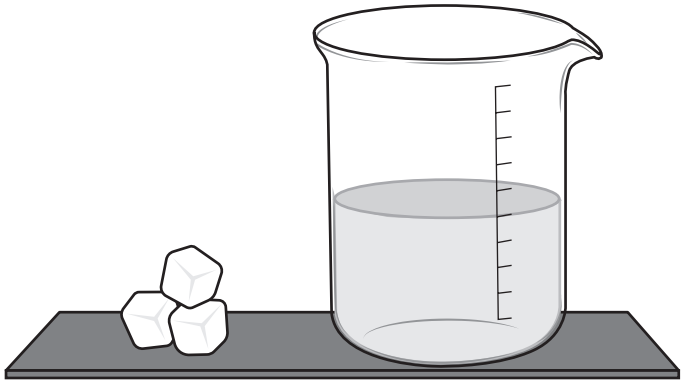
C. a tundra that has snow covering the ground and no growing plants

D. a mountain region that has evergreen trees spread far apart

TS03S4972_3

00. A student investigates sugar cubes by following the steps shown.

- Measure the mass of an empty beaker.
- Measure the mass of three sugar cubes.
- Pour water into the beaker and measure the mass of the water and beaker.
- Add the three sugar cubes to the water in the beaker. Once the sugar cubes can no longer be seen, measure the mass of the beaker again.

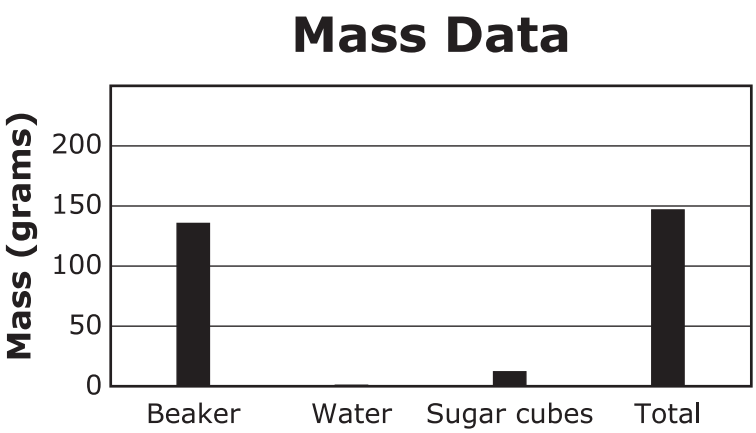


Student's Data

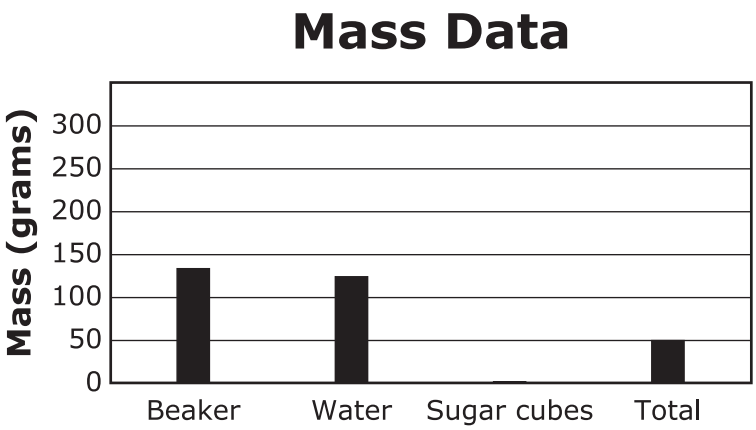
	Mass (g)
Beaker	135
Beaker with water	260
Three sugar cubes	10

Which bar graph represents the amount of matter present after the sugar cubes can no longer be seen?

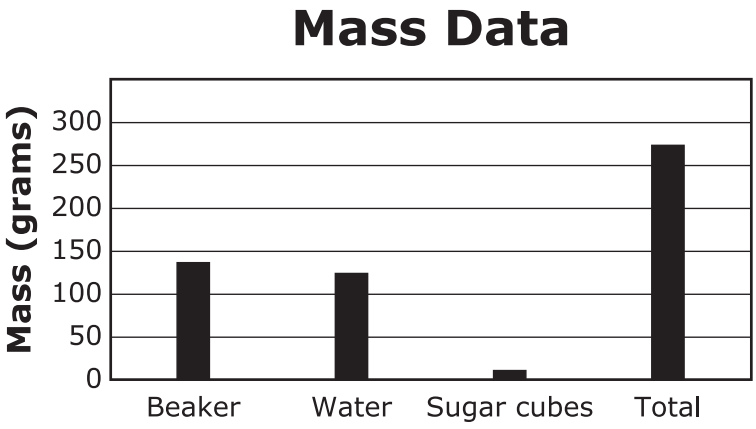
A.



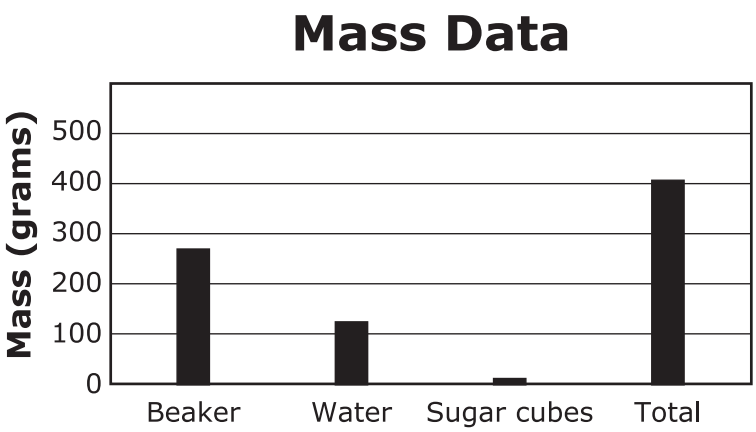
B.



C.



D.


Mass Data
Mass (grams)
500
400
300
200
100
0
Beaker
Water
Sugar cubes
Total

TS02S4005_4

00. Students combined substances in four investigations. Their data are shown in the table.

Combining Substances Data

Investigation	Substance 1	Substance 2	Result
1	Vinegar	Water	Both clear liquids combine and remain clear.
2	Oil	Water	The oil floats on top of the water.
3	Milk	Water	The milk becomes thinner.
4	Vinegar	Milk	Solids form and float in the milk.

Which investigation resulted in a change in the chemical properties of the substances?

A. Investigation 1

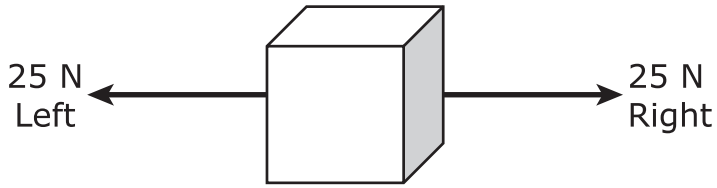
B. Investigation 2

C. Investigation 3

D. Investigation 4

TS04M6581_1,4

00. The diagram shows the forces in newtons (N) acting on a block that is not moving.



Which **two** ways can the forces be changed so the block starts to move toward the right?

A. Increase the force pointing to the right.

B. Decrease the force pointing to the right.

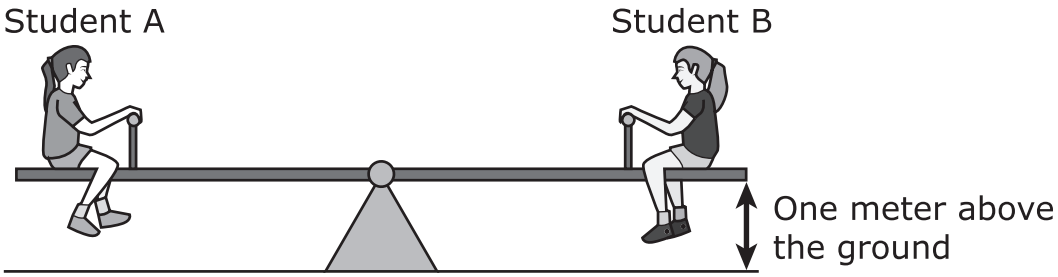
C. Increase the force pointing upward.

D. Decrease the force pointing to the left.

E. Increase the force pointing to the left.

TS03S4984_1

00. Two students are on a seesaw during recess. When Student A is at ground level, Student B is two meters above the ground. When the seesaw is completely horizontal, each student is exactly one meter above the ground.



When Student A is two meters above the ground, where is Student B?

A. at ground level

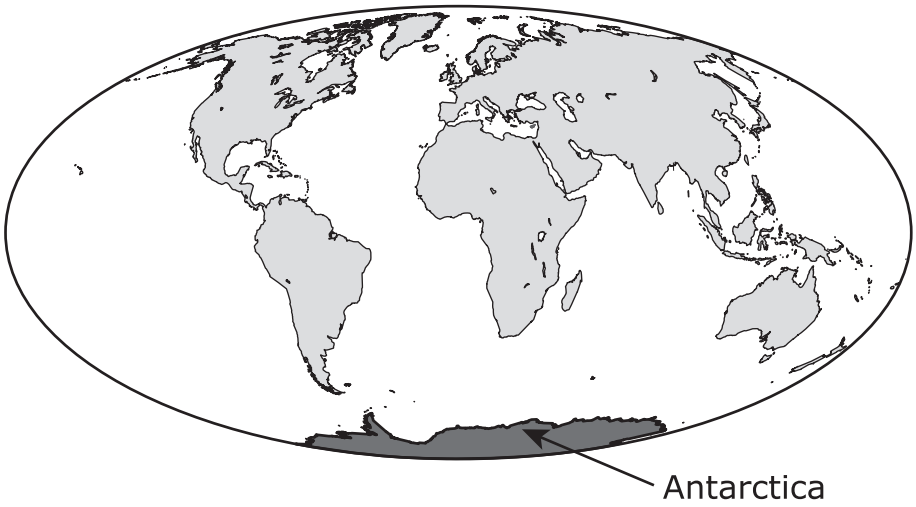
B. one meter above the ground

C. two meters above the ground

D. one and a half meters above the ground

TS03S5213_3

00. A student claims that people cannot live in Antarctica. He claims they would be upside down and fall off the surface of Earth.



The student's claim is

A. correct, since Antarctica is on the bottom of Earth.

B. correct, since gravity pulls everything from north to south.

C. incorrect, since gravity pulls everything to Earth's center.

D. incorrect, since people living in Antarctica are held to the surface by the atmosphere.

Metadata – Grade 5

Items

Page Number	UIN	Grade	Item Type	Key	DOK	TN Standards	SEP	CCC
1	TS03S4992	5	MC	D	2	5.ESS1.1	DATA	
2	TS02S4010	5	MC	B	2	5.ESS1.5	MOD	
3	TS02S2500	5	MC	D	3	5.ESS1.7	DATA	PAT
4	TS02S3052	5	MC	B	2	5.LS4.1	CEDS	SF
5	TS02S2961	5	MC	A	2	5.LS4.2		SF
6	TS03S4972	5	MC	C	2	5.PS1.2	MATH	SPQ
9	TS02S4005	5	MC	D	2	5.PS1.4	DATA	
10	TS04M6581	5	MS	A,D	2	5.PS2.1	MOD	CE
11	TS03S4984	5	MC	A	2	5.PS2.2	MATH	PAT
12	TS03S5213	5	MC	C	2	5.PS2.3	ARGS	CE

Metadata Definitions:

UIN	Unique letter/number code used to identify the item.
Grade	Grade level or Course.
Item Type	Indicates the type of item. MC=Multiple Choice; MS=Multiselect
Key	Correct answer.
DOK	Depth of Knowledge (cognitive complexity) is measured on a three-point scale. 1 = Recall or simple reproduction of information; 2 = Skills and concepts: comprehension and processing of text; 3 = Strategic thinking, prediction, elaboration.
TN Standards	Primary educational standard assessed. This includes the science ideas that students need to understand at each grade level.
SEP	Science and Engineering Practices: These are the essential practices of scientists and engineers which help students figure out explanations for phenomena or solutions for design problems.
CCC	Cross Cutting Concepts: These are concepts that permeate all science disciplines and provide a lens through which students can apply their science ideas to phenomena or design problems.