

Tennessee Comprehensive Assessment Program

TCAP

TNReady—Science
Grade 4 Item Release





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Table of Contents

Metadata Interpretation Guide – Science 4

Science Grade 4..... 5

Metadata Interpretation Guide – Science

Item Information

Item Code: TNS10220	Passage Title:
Standard Code: 0307.1.1	Passage Code:
Standard Text: Identify specific parts of a plant and describe their function.	
Reporting Category: Cells, Flow of Matter & Energy, Heredity	
Correct Answer: B	DOK Level: 2

Item Code: Unique letter/number code used to identify the item.	Passage Title: (if listed): Title of the passage(s) associated with this item.
Standard Code: Primary educational standard assessed.	Passage Code: (if listed): Unique letter/number code used to identify the passage(s) that go with this item.
Standard Text: Text of the educational standard assessed.	
Reporting Category: Text of the Reporting Category the standard assesses.	
Correct Answer: Correct answer. This may be blank for constructed response items where students write or type their responses.	DOK Level (if listed): Depth of Knowledge (cognitive complexity) is measured on a four-point scale. 1= Recall; 2= Skill/Concepts; 3= Strategic Thinking; 3-4 = Strategic/Extended Thinking

Science Grade 4

Item Information

Item Code: TNS10203

Passage Title:

Standard Code: 0407.1.1

Passage Code:

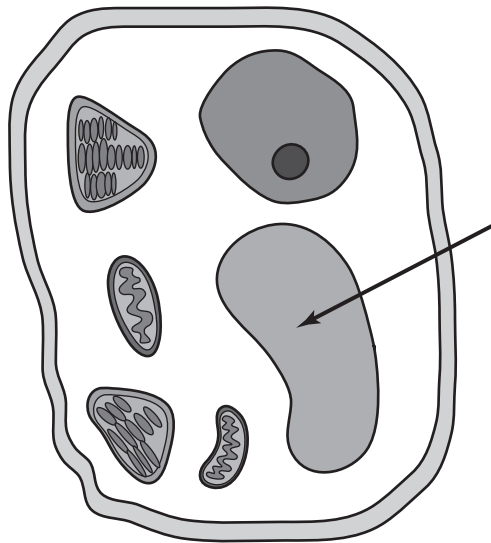
Standard Text: Compare basic structures of plant and animal cells.

Reporting Category: Cells, Flow of Matter & Energy, Heredity

Correct Answer: D

DOK Level: 2

A cell is shown in the picture below.



The arrow is pointing to which part found in plant and animal cells?

- A** nucleus
- B** chloroplast
- C** cytoplasm
- D** vacuole

Item Information

Item Code: TNS20433	Passage Title:
Standard Code: 0407.10.1	Passage Code:
Standard Text: Identify different forms of energy, such as heat, light, and chemical.	
Reporting Category: Matter and Energy	
Correct Answer: B	DOK Level: 2

Propane gas is often used to heat homes. The propane gas provides heat through which type of energy?

- A** wind
- B** chemical
- C** nuclear
- D** light

Item Information

Item Code: TNS20604	Passage Title:
Standard Code: 0407.10.2	Passage Code:
Standard Text: Determine which surfaces reflect, refract, or absorb light.	
Reporting Category: Matter and Energy	
Correct Answer: C	DOK Level: 2

Which object best refracts light?

- A** a wooden block
- B** a black trash bag
- C** a glass of water
- D** a rubber tire

Item Information

Item Code: TNS00206	Passage Title:
Standard Code: 0407.10.2	Passage Code:
Standard Text: Determine which surfaces reflect, refract, or absorb light.	
Reporting Category: Matter and Energy	
Correct Answer: A	DOK Level: 1

When light hits a black cloth, most of the light is

- A** absorbed
- B** increased
- C** reflected
- D** refracted

Item Information

Item Code: TNS10090

Passage Title:

Standard Code: 0407.10.3

Passage Code:

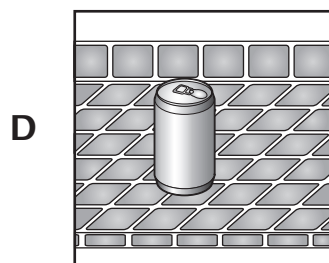
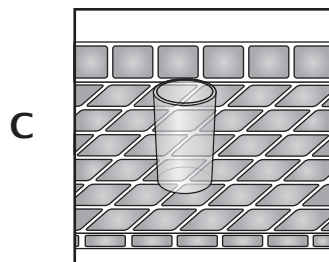
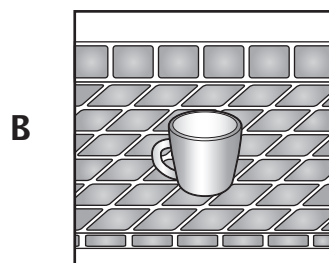
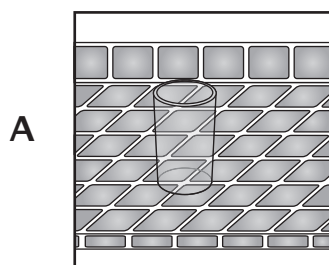
Standard Text: Determine whether a material is transparent, translucent, or opaque.

Reporting Category: Matter and Energy

Correct Answer: A

DOK Level: 1

Which object is transparent?



Item Information

Item Code: TNS10254

Passage Title:

Standard Code: 0407.11.1

Passage Code:

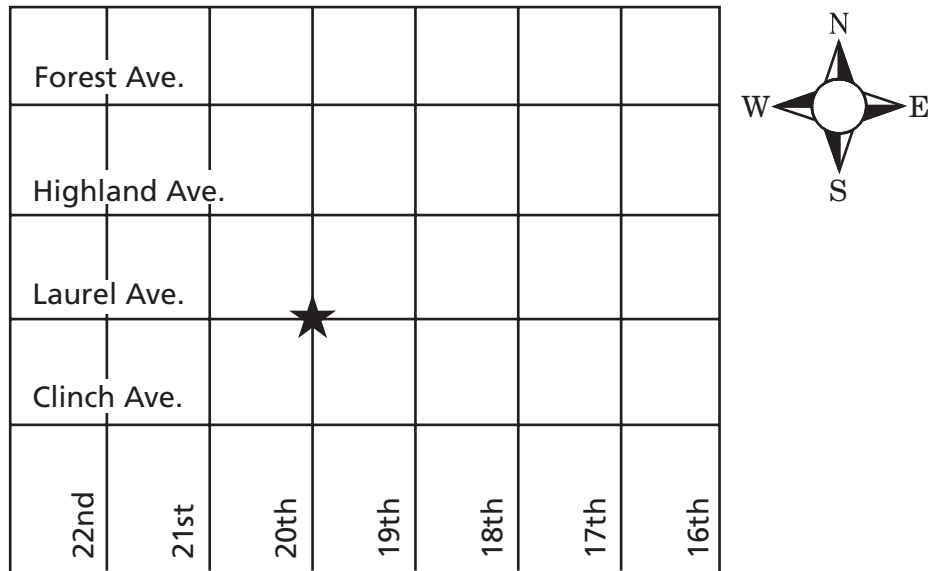
Standard Text: Describe the position of an object relative to fixed reference points.

Reporting Category: Motion, Forces in Nature

Correct Answer: C

DOK Level: 2

Pictured below is a section of a map.



If a person is standing at 20th and Laurel Ave., which intersection is two blocks east and one block north?

- A** 18th and Forest Ave.
- B** 22nd and Forest Ave.
- C** 18th and Highland Ave.
- D** 22nd and Highland Ave.

Item Information

Item Code: TNS20609

Passage Title:

Standard Code: 0407.11.2

Passage Code:

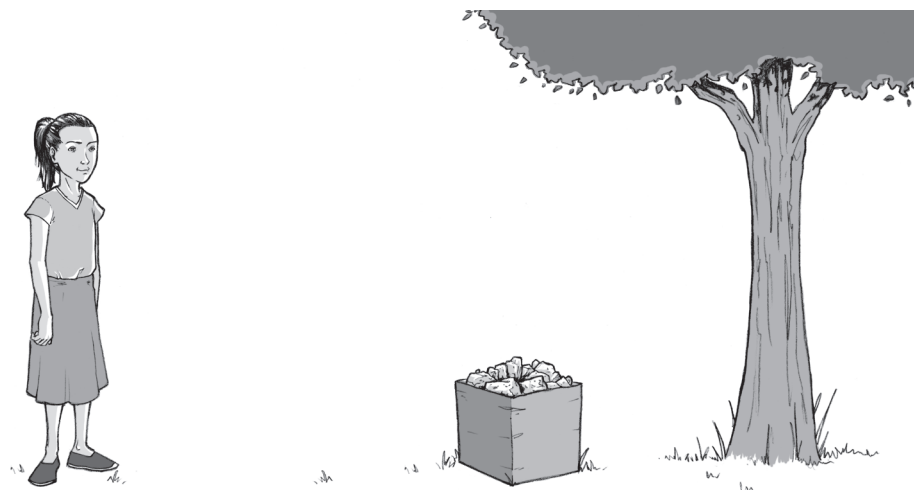
Standard Text: Identify factors that influence the motion of an object.

Reporting Category: Motion, Forces in Nature

Correct Answer: D

DOK Level: 2

The picture shows a student with a box of rocks next to a tree.



Which factor will most likely make it easier to move the box closer to the tree?

- A adding rocks to the box
- B squeezing the sides of the box together
- C using a heavier box
- D removing rocks from the box

Item Information

Item Code: TNS02291	Passage Title:
Standard Code: 0407.11.3	Passage Code:
Standard Text: Determine the relationship between speed and distance traveled over time.	
Reporting Category: Motion, Forces in Nature	
Correct Answer: C	DOK Level: 2

Tran rode his bike to the park in 10 minutes. It took him 20 minutes to ride his bike home using the same route.

Which statement about Tran's speed is correct?

- A** Tran pedaled faster while riding home.
- B** Tran pedaled slower while riding to the park.
- C** His bike moved twice as fast going to the park as it did returning home.
- D** His bike moved at the same speed going to the park and returning home.

Item Information

Item Code: TNS01917

Passage Title:

Standard Code: 0407.11.3

Passage Code:

Standard Text: Determine the relationship between speed and distance traveled over time.

Reporting Category: Motion, Forces in Nature

Correct Answer: A

DOK Level: 2

Four people traveled from Memphis, Tennessee, to Jackson, Mississippi.**Who traveled at the greatest speed?**

- A** Frank, who took the bus from Memphis to Jackson in 4 hours
- B** Pam, who drove a truck from Memphis to Jackson in 5 hours
- C** Scott, who drove his sports car from Memphis to Jackson in $5\frac{1}{2}$ hours
- D** Linda, who rode her motorcycle from Memphis to Jackson in $4\frac{1}{2}$ hours

Item Information

Item Code: TNS10257

Passage Title:

Standard Code: 0407.12.1

Passage Code:

Standard Text: Identify how magnets attract or repel one another.

Reporting Category: Motion, Forces in Nature

Correct Answer: D

DOK Level: 2

The toy carts below have a magnet on each end. Which toy carts will attract each other?



Item Information

Item Code: TNS20439

Passage Title:

Standard Code: 0407.12.2

Passage Code:

Standard Text: Determine how an electrically charged material interacts with other objects.

Reporting Category: Motion, Forces in Nature

Correct Answer: C

DOK Level: 2

A student rubbed a foam cup briskly against a piece of wool. The student then held the cup over some pieces of paper.



What will most likely happen to the pieces of paper?

- A** They will stick to the table.
- B** They will stick to her shirt.
- C** They will be attracted to the cup.
- D** They will move away from the cup.

Item Information

Item Code: TNS20372

Passage Title:

Standard Code: 0407.2.1

Passage Code:

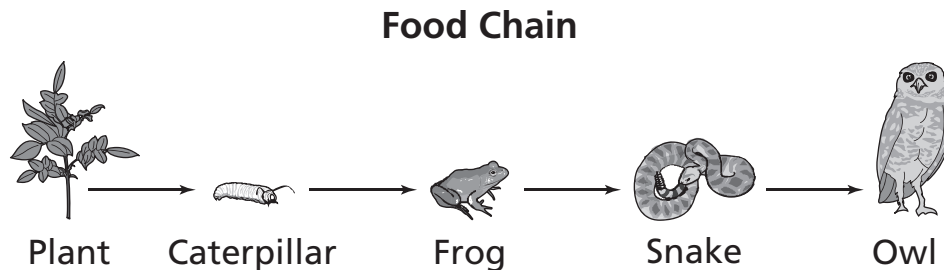
Standard Text: Recognize the impact of predation and competition on an ecosystem.

Reporting Category: Interdependence, Biodiversity & Change

Correct Answer: B

DOK Level: 2

A food chain is shown below.



If another predator of the frog was living in this ecosystem, which population would most likely increase first?

- A Plant
- B Caterpillar
- C Snake
- D Owl

Item Information

Item Code: TNS10157

Passage Title:

Standard Code: 0407.3.1

Passage Code:

Standard Text: Determine how different organisms function within an environment in terms of their location on an energy pyramid.

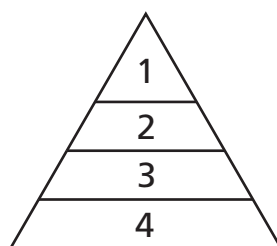
Reporting Category: Cells, Flow of Matter & Energy, Heredity

Correct Answer: D

DOK Level: 2

The diagram shows an energy pyramid.

Energy Pyramid



An oak tree provides food for many animals. The oak tree is found at which level of the energy pyramid?

- A 1
- B 2
- C 3
- D 4

Item Information

Item Code:	TNS01944	Passage Title:	
Standard Code:	0407.4.1	Passage Code:	
Standard Text:	Draw conclusions about the relationship between reproduction and the survival of a species.		
Reporting Category:	Cells, Flow of Matter & Energy, Heredity		
Correct Answer:	A	DOK Level:	1

For the survival of all species, they must

- A** reproduce
- B** build shelter
- C** be able to swim
- D** make their own food

Item Information

Item Code:	TNS20591	Passage Title:	
Standard Code:	0407.4.1	Passage Code:	
Standard Text:	Draw conclusions about the relationship between reproduction and the survival of a species.		
Reporting Category:	Cells, Flow of Matter & Energy, Heredity		
Correct Answer:	B	DOK Level:	2

What will most likely happen if frog eggs are not fertilized?

- A** The frog population will increase.
- B** The frog population will decrease.
- C** The frog population will lay more eggs.
- D** The frog population will find another habitat.

Item Information

Item Code: TNS00168

Passage Title:

Standard Code: 0407.4.2

Passage Code:

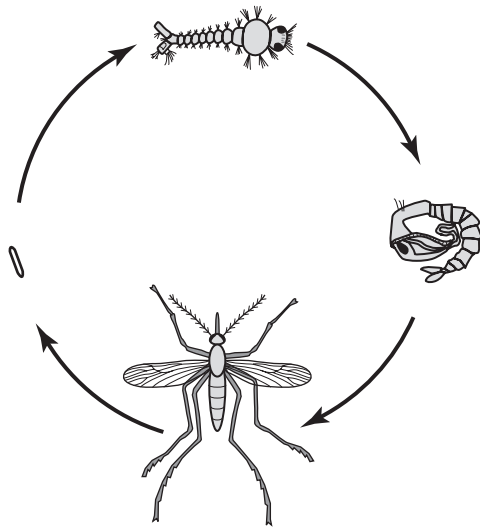
Standard Text: Distinguish between complete and incomplete metamorphosis.

Reporting Category: Cells, Flow of Matter & Energy, Heredity

Correct Answer: B

DOK Level: 1

Look at the picture of the mosquito's life cycle.



Which is true about the mosquito life cycle?

- A The mosquito has five stages of growth.
- B The mosquito goes through complete metamorphosis.
- C The mosquito goes through incomplete metamorphosis.
- D The young mosquitoes look similar to adult mosquitoes.

Item Information

Item Code: TNS10234

Passage Title:

Standard Code: 0407.4.2

Passage Code:

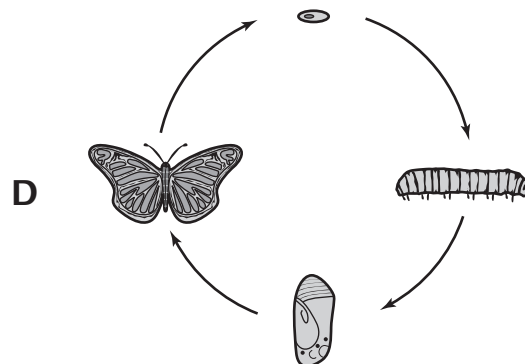
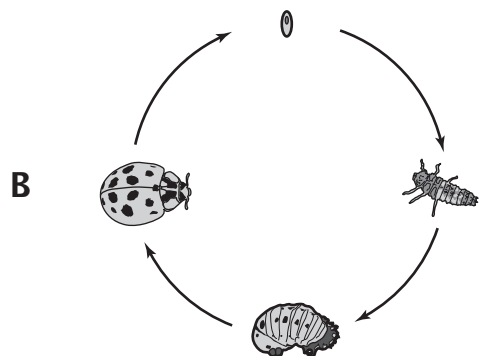
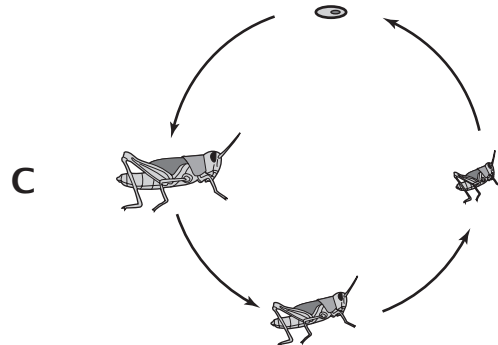
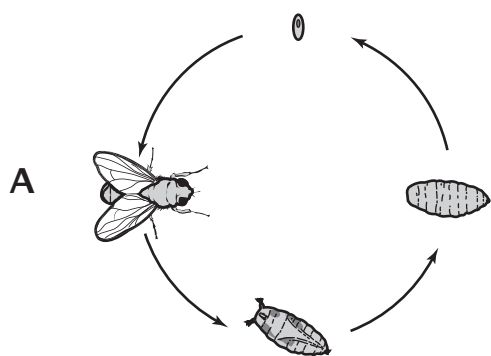
Standard Text: Distinguish between complete and incomplete metamorphosis.

Reporting Category: Cells, Flow of Matter & Energy, Heredity

Correct Answer: C

DOK Level: 2

Incomplete metamorphosis can best be shown using which diagram?



Item Information

Item Code: TNS10163

Passage Title:

Standard Code: 0407.5.1

Passage Code:

Standard Text: Determine how a physical or behavioral adaptation can enhance the chances of survival.

Reporting Category: Interdependence, Biodiversity & Change

Correct Answer: B

DOK Level: 2

A tortoise has a hard outer shell. The shell gives the tortoise a better chance to survive by

- A** helping the tortoise to swim.
- B** protecting the tortoise from predators.
- C** helping the tortoise to find more food.
- D** keeping the tortoise from getting too hot.

Item Information

Item Code: TNS10319

Passage Title:

Standard Code: 0407.5.1

Passage Code:

Standard Text: Determine how a physical or behavioral adaptation can enhance the chances of survival.

Reporting Category: Interdependence, Biodiversity & Change

Correct Answer: A

DOK Level: 2

Some snakes that live in the desert spend time underground during the day. How does this behavior most likely help these snakes survive?

- A** They will stay cool.
- B** They will find food faster.
- C** They will breathe more oxygen.
- D** They will have more space to live.

Item Information

Item Code: TNS01934	Passage Title:
Standard Code: 0407.5.2	Passage Code:
Standard Text: Infer the possible reasons why a species became endangered or extinct.	
Reporting Category: Interdependence, Biodiversity & Change	
Correct Answer: A	DOK Level: 2

Sheep and goats were brought to an island by human settlers. Some years later, a certain species of plant that grew only on that island became extinct.

Which of these explains how the sheep and goats most likely made the plant extinct?

- A** They ate too many of the plants.
- B** They introduced disease to the plants.
- C** They spread the seeds of the plants across the island.
- D** They competed with the plants for water and sunlight.

Item Information

Item Code: TNS10167

Passage Title:

Standard Code: 0407.6.1

Passage Code:

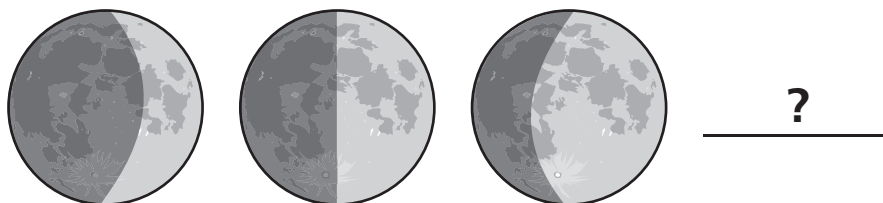
Standard Text: Organize the phases of the moon in the correct sequence.

Reporting Category: The Universe, The Earth, The Atmosphere

Correct Answer: C

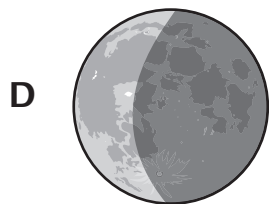
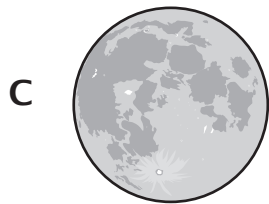
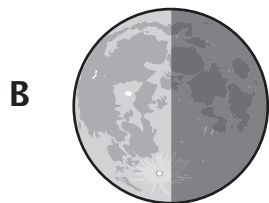
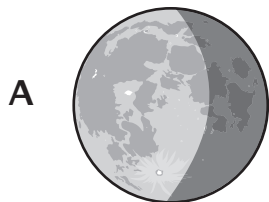
DOK Level: 2

The diagram below shows a sequence of moon phases.



(Item 21, continued from the previous page)

Which picture correctly completes the sequence?



Item Information

Item Code: TNS02654

Passage Title:

Standard Code: 0407.6.1

Passage Code:

Standard Text: Organize the phases of the moon in the correct sequence.

Reporting Category: The Universe, The Earth, The Atmosphere

Correct Answer: A

DOK Level: 2

Which of these shows the phases of the moon as it changes from full moon to new moon?

A



B



C



D



Item Information

Item Code: TNS20209

Passage Title:

Standard Code: 0407.6.2

Passage Code:

Standard Text: Infer that the moon's phases are caused by the revolution of the moon and earth around the sun.

Reporting Category: The Universe, The Earth, The Atmosphere

Correct Answer: C

DOK Level: 2

Why does the moon change phases when viewed from Earth?

- A** The sun revolves around Earth.
- B** The moon rotates on its axis.
- C** The moon revolves around Earth.
- D** The sun blocks the view of the moon.

Item Information

Item Code:	TNS20211	Passage Title:	
Standard Code:	0407.7.2	Passage Code:	
Standard Text:	Analyze how different earth materials are utilized to solve human problems or improve the quality of life.		
Reporting Category:	The Universe, The Earth, The Atmosphere		
Correct Answer:	B	DOK Level:	2

Penicillin, which is made from mold, is used to treat many types of infections. Why is penicillin important to humans?

- A** Penicillin makes oxygen.
- B** Penicillin helps treat illness.
- C** Penicillin is a food source.
- D** Penicillin is used to make clothing.

Item Information

Item Code:	TNS10879	Passage Title:	
Standard Code:	0407.7.2	Passage Code:	
Standard Text:	Analyze how different earth materials are utilized to solve human problems or improve the quality of life.		
Reporting Category:	The Universe, The Earth, The Atmosphere		
Correct Answer:	D	DOK Level:	2

Why is calcium an earth material that is important to humans?

- A** It gives humans energy.
- B** It gives humans oxygen.
- C** It helps keep humans warm.
- D** It helps build strong bones and teeth.

Item Information

Item Code: TNS00186

Passage Title:

Standard Code: 0407.7.2

Passage Code:

Standard Text: Analyze how different earth materials are utilized to solve human problems or improve the quality of life.

Reporting Category: The Universe, The Earth, The Atmosphere

Correct Answer: B

DOK Level: 2

Which best explains how copper is used?

- A** Copper can be cut into paper.
- B** Copper can be stretched into wires.
- C** Copper can be used to fuel automobiles.
- D** Copper can be burned to produce energy.

Item Information

Item Code:	TNS10874	Passage Title:	
Standard Code:	0407.8.1	Passage Code:	
Standard Text:	Identify the basic features of the water cycle and describe their importance to life on earth.		
Reporting Category:	The Universe, The Earth, The Atmosphere		
Correct Answer:	D	DOK Level:	1

A glass of ice water left on a table will form small beads of water on the outside of the glass. Which part of the water cycle does this most likely represent?

- A** collection
- B** evaporation
- C** precipitation
- D** condensation

Item Information

Item Code: TNS10246
Standard Code: 0407.8.2
Standard Text: Distinguish between weather and climate.
Reporting Category: The Universe, The Earth, The Atmosphere
Correct Answer: C

Passage Title:

Passage Code:

DOK Level: 2

Students recorded observations about the environment in the data table below.

Data Table

Observation	Tuesday 10 A.M.	Wednesday 10 A.M.	Thursday 10 A.M.
Temperature (°F)	68	72	75
Sky	Mostly Cloudy	Partly Cloudy	Clear
Wind Speed (mph)	8–12	3–7	0
Rainfall Collected (inches)	0	0.1	0

The data in the table best describes the environment's

- A season.
- B climate.
- C weather.
- D moon phase.

Item Information

Item Code: TNS10247

Passage Title:

Standard Code: 0407.9.1

Passage Code:

Standard Text: Choose an appropriate tool for measuring a specific physical property of matter.

Reporting Category: Matter and Energy

Correct Answer: D

DOK Level: 2

Students wanted to find out how much liquid soap was in a container.



Which tool would best help the students measure the volume of liquid soap in milliliters?

- A** ruler
- B** pan balance
- C** thermometer
- D** graduated cylinder

Item Information

Item Code:	TNS10328	Passage Title:	
Standard Code:	0407.9.2	Passage Code:	
Standard Text:	Determine the mass, volume, and temperature of a substance or object using proper units of measurement.		
Reporting Category:	Matter and Energy		
Correct Answer:	C	DOK Level:	2

Students were making observations of a pond. Which units should the students use to record the temperature of the pond water?

- A** miles per hour
- B** grams
- C** degrees Celsius
- D** liters

Item Information

Item Code: TNS20432	Passage Title:
Standard Code: 0407.9.3	Passage Code:
Standard Text: Interpret the causes and effects of a physical change in matter.	
Reporting Category: Matter and Energy	
Correct Answer: C	DOK Level: 2

Which best describes the change that happens when water is frozen?





- A** A liquid changes to a gas.
- B** A gas changes to a solid.
- C** A liquid changes to a solid.
- D** A solid changes to a liquid.

Item Information





Item Code:	TNS20140	Passage Title:	
Standard Code:	2.0407.INQ.1	Passage Code:	
Standard Text:	Select an investigation that could be used to answer a specific question.		
Reporting Category:	Interdependence, Biodiversity & Change		
Correct Answer:	C	DOK Level:	2

Some students are studying the birds in their area. They want to find out if the birds prefer one type of seed better than others. The students put up bird feeders with different seeds. Which set of seeds in their feeders is likely to get the best results?





A

Feeder 1	Feeder 2	Feeder 3	Feeder 4
			
Safflower Seeds	Safflower Seeds	Corn Seeds	Corn Seeds





B

Feeder 1	Feeder 2	Feeder 3	Feeder 4
			
Corn Seeds	Corn Seeds	Sunflower Seeds	Sunflower Seeds

C

Feeder 1	Feeder 2	Feeder 3	Feeder 4
			
Sunflower Seeds	Safflower Seeds	Corn Seeds	Mixed Seeds

D

Feeder 1	Feeder 2	Feeder 3	Feeder 4
			
Safflower Seeds	Mixed Seeds	Safflower Seeds	Mixed Seeds

Item Information

Item Code:	TNS10909	Passage Title:	
Standard Code:	3.0407.TE.2	Passage Code:	
Standard Text:	Recognize the connection between a scientific advance and the development of a new tool or technology.		
Reporting Category:	The Universe, The Earth, The Atmosphere		
Correct Answer:	D	DOK Level:	2

Years ago a scientist was working with different types of energy. The scientist discovered a form of energy that could travel through solid objects. This energy could be used to make images of the solid objects. This discovery led to which tool?

- A** a scale
- B** a microscope
- C** a thermometer
- D** an x-ray machine

Item Information

Item Code: TNS10881

Passage Title:

Standard Code: 4.0407.INQ.1

Passage Code:

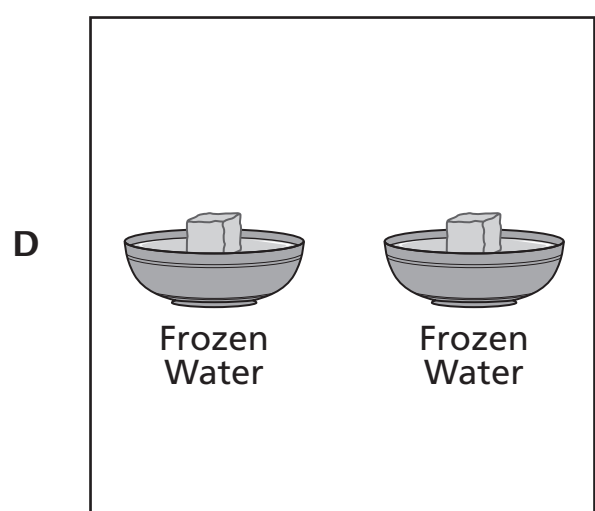
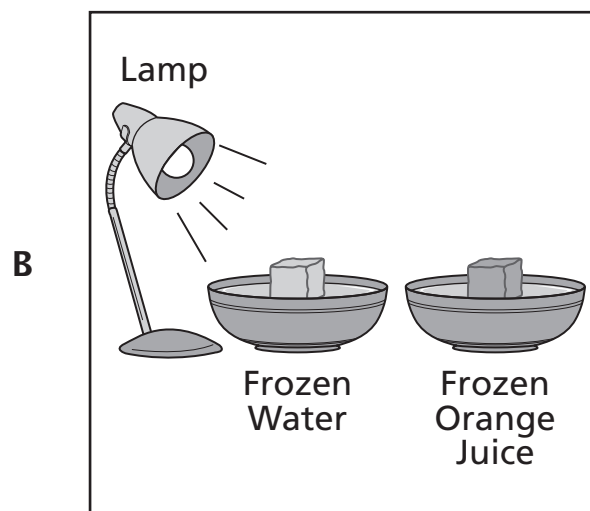
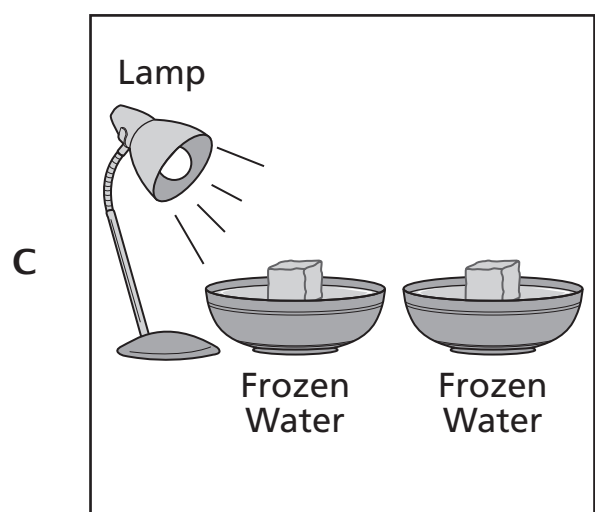
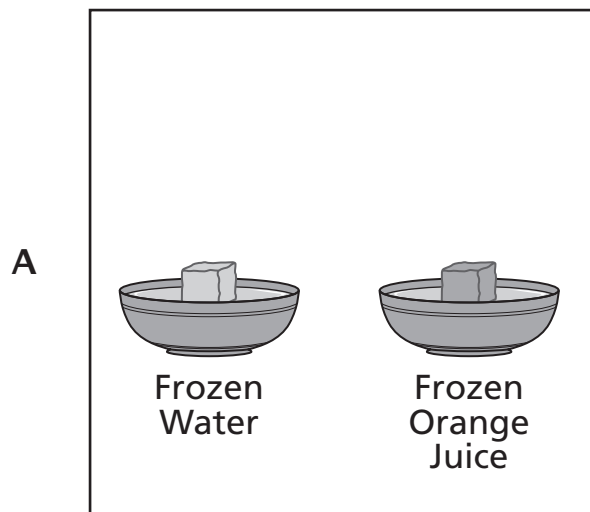
Standard Text: Select an investigation that could be used to answer a specific question.

Reporting Category: Matter and Energy

Correct Answer: A

DOK Level: 2

A group of students wants to know if two different frozen substances will melt at the same rate. What is the best way to set up the investigation?



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Assessment Program TCAP
TNReady—Science
Grade 4 Item Release
Spring 2017

