IQ: INVESTIGATING THE QUESTIONS

2013-2015
Released Test

Aligned to the Standards

CONTENT BUILDER FOR THE PLC

Science
Grade 5

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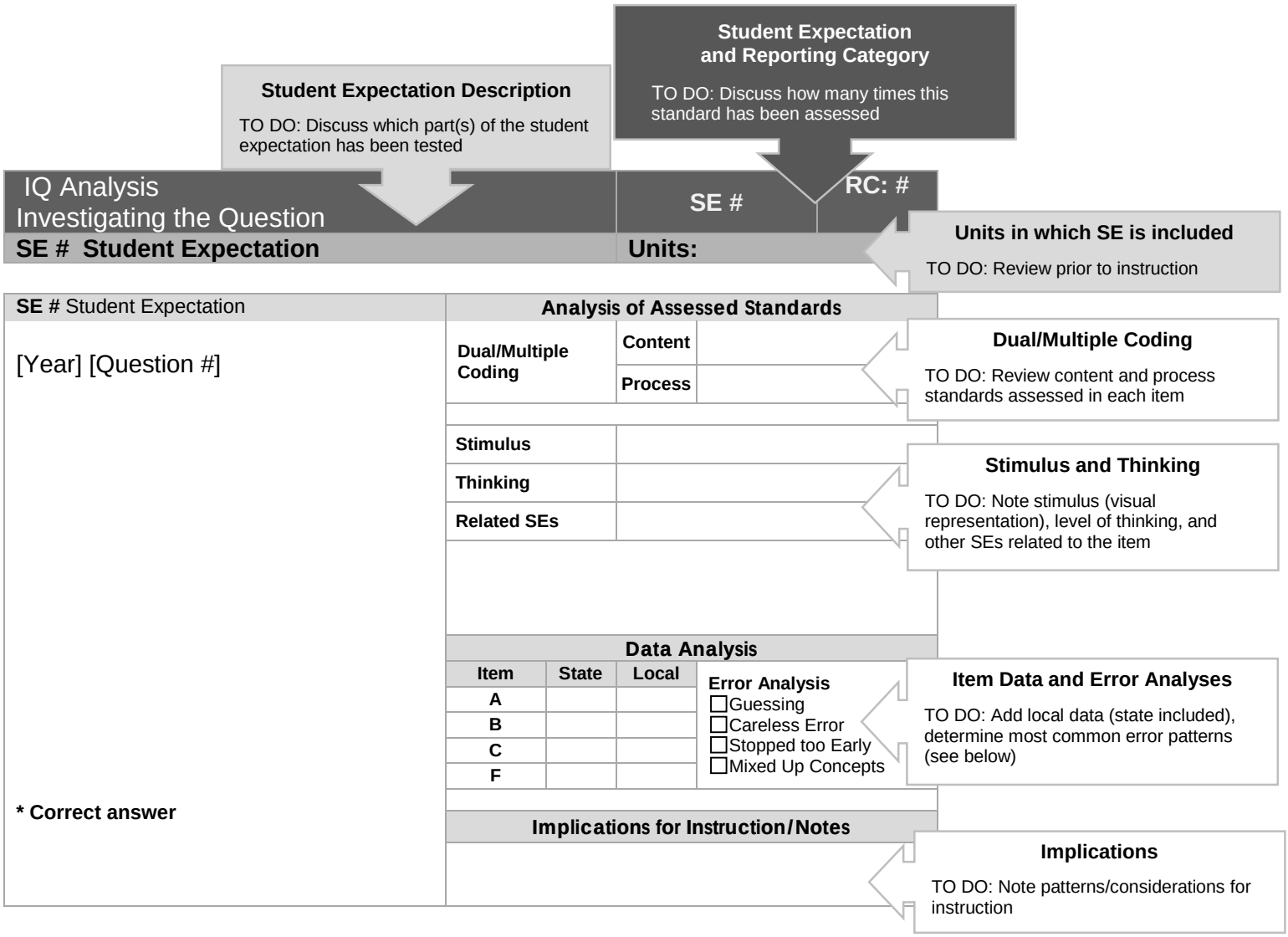
Users Guide - IQ [Investigating the Questions] Released Tests



Error Analysis | Type of Errors

The pattern of incorrect responses (highly chosen or distributed) indicates students may have made one or more of these error types:

- **Guessing**: Generally represented by equal distribution of incorrect answers. Students may not know how to start or may not know what the question is about.
- **Careless Errors:** Students cannot complete content specific procedures accurately. Make low-level, careless mistakes.
- **Stopped Too Early:** Students cannot transfer learning between contexts (item doesn't look like samples used in class), or they stop too early in problem solving.
- **Mixed Up Concepts:** Students misunderstand the underlying concepts. They may mix up concepts often related to academic vocabulary.

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IQ Analysis | Investigating the Question	SE 3.5(C)	RC: 1
SE: 3.5(C)	**Units:**	

3.5(C) predict, observe, and record changes in the state of matter caused by heating or cooling

2015 – Q12

12 A student observed liquid wax dripping down the side of a burning candle. After putting out the candle's flame, the student left the room. Several hours later the student observed that there was no longer any liquid on the side of the candle. Which statement explains what most likely happened to the liquid wax?

F The heat given off by the flame caused the candle wax to evaporate.

G The liquid wax changed back into a solid as it cooled.

H The liquid wax condensed and was absorbed by the candle.

J None of the above

*** Correct answer (G)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	10	
G*	80	
H	4	
J	6	

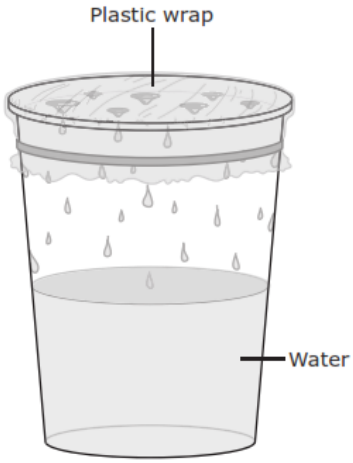
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

3.5(C) predict, observe, and record changes in the state of matter caused by heating or cooling

2014 – Q7

7 A student makes a model of the water cycle by using a cup, some water, and plastic wrap. After the student places the model near a sunny window, moisture forms on the inside of the plastic wrap.



What change is the student most likely observing in this model?

A Freezing

B Condensation

C The warming of air

D The formation of clouds

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.3(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	**1**	
B*	**78**	
C	**9**	
D	**13**	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

3.5(C) predict, observe, and record changes in the state of matter caused by heating or cooling

2013 – Q38

38 Some students put two ice cubes on separate plates. One ice cube had a mass of 80 grams. The other had a mass of 40 grams. Which result would be the same for both ice cubes in this investigation?

F The time it took each ice cube to melt completely

G The temperature at which each ice cube melted

H The amount of liquid produced on each plate

J The total volume of each ice cube

*** Correct answer (G)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	**17**	
G*	**60**	
H	**11**	
J	**12**	

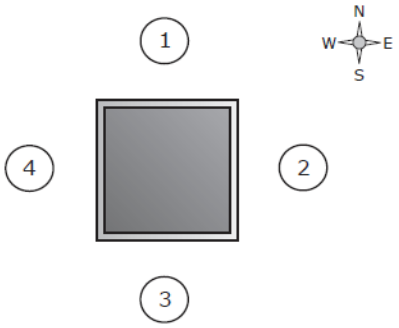
Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

3.6(B) demonstrate and observe how position and motion can be changed by pushing and pulling objects to show work being done such as swings, balls, pulleys, and wagons

2015 – Q43

43 Four students stand facing a box. The diagram below shows an overhead view of the box. The numbered circles represent the positions of the students.



What do the students need to do to slide the box to the northeast?

A Students 1 and 2 push, and Students 3 and 4 pull.

B Students 1 and 4 push, and Students 2 and 3 pull.

C Students 2 and 3 push, and Students 1 and 4 pull.

D Students 3 and 4 push, and Students 1 and 2 pull.

*** Correct answer (D)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	7	
B	7	
C	8	
D*	77	

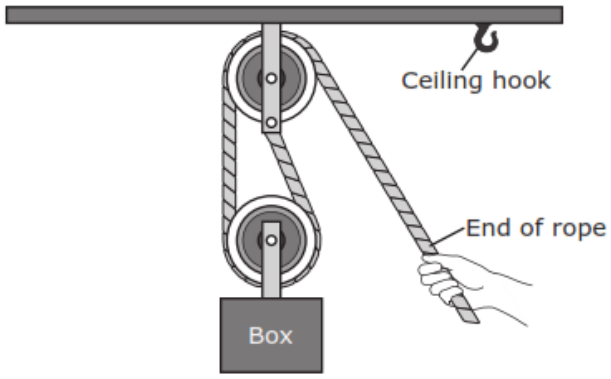
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

3.6(B) demonstrate and observe how position and motion can be changed by pushing and pulling objects to show work being done such as swings, balls, pulleys, and wagons

2014 – Q36

36 The picture below shows a pulley system that can be used to lift a box.



Which of these should a person do to lift the box?

F Tie the end of the rope to the box

G Tie the end of the rope to the ceiling hook

H Pull the end of the rope downward

J Allow the end of the rope to move upward

*** Correct answer (H)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	4	
G	17	
H*	76	
J	3	

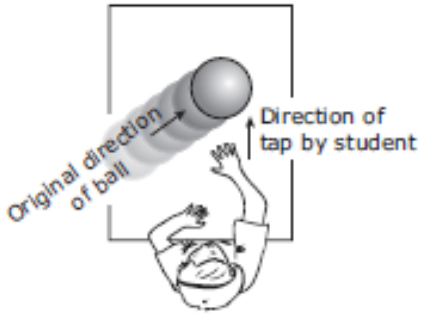
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

3.6(B) demonstrate and observe how position and motion can be changed by pushing and pulling objects to show work being done such as swings, balls, pulleys, and wagons

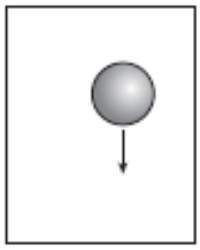
2013 – Q1

1 The diagram below shows a view of a ball from above a table. The ball is rolling across the table. A student lightly taps the rolling ball in the direction shown below

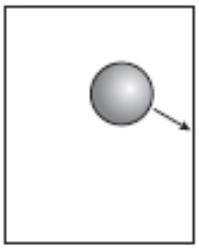


In which direction does the ball most likely move after the student taps the ball?

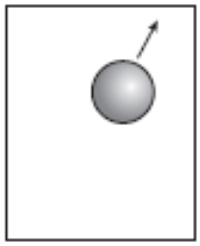
A



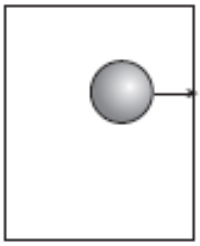
C



B



D



*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	8	
B*	86	
C	4	
D	2	

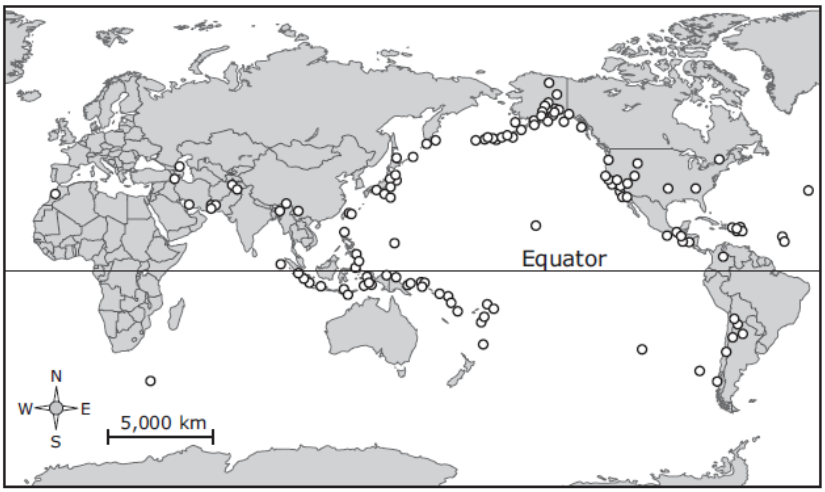
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

3.7 (B) investigate rapid changes in the Earth's surface such as volcanic eruptions, earthquakes, and landslides

2015 – Q28

28 A scientist was studying a type of event that occurred on Earth in various places within a 30-day period. The circles indicate where the events happened.



The events being studied involved rapid changes to Earth's surface at the locations shown on the map. What type of event do the circles on the map most likely represent?

F Landslides, because they are all located along ocean coastlines

G Volcanoes, because they occur only near the equator

H Earthquakes, because they occur on land and on the ocean floor

J Floods, because heavy rains can make riverbeds deeper and create deltas

*** Correct answer (H)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(G)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	16	
G	10	
H*	57	
J	17	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

IQ Analysis | Investigating the Question	SE 3.8 (D)	RC: 3
3.8 (D)	**Units:**	

3.8 (D) identify the planets in Earth's solar system and their position in relation to the Sun

2014 – Q42

42 One of the brightest objects in the night sky is a planet that is closer to the sun than Earth is. What is the name of this planet?

F Mars

G Saturn

H Jupiter

J Venus

*** Correct answer (J)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	24	
G	3	
H	4	
J*	69	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

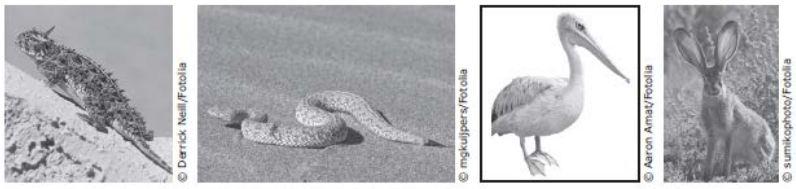
3.9 (A) observe and describe the physical characteristics of environments and how they support populations and communities within an ecosystem

2015 – Q9

9 An African savanna is a grassland with shrubs and a few small trees. It has warm temperatures all year long, a dry winter season, and a rainy summer season. Which group of animals is most likely supported by an African savanna?

A

B



C

D

*** Correct answer (D)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	7	
B	8	
C	2	
D*	82	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

3.9 (A) observe and describe the physical characteristics of environments and how they support populations and communities within an ecosystem

2014 – Q11

11 A teacher is setting up the terrarium shown below in a science classroom.

Which of these organisms is best suited for the terrarium?

A Blue jay

B Lobster

C Snail

D Water lily

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.4(A)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	32	
B	9	
C*	51	
D	8	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

3.10(C) investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady bugs

2015 – Q37

37 Some species of rain forest frogs reproduce in the moist leaf litter on the forest floor. These frogs do not need a nearby body of water to complete their life cycle. Which stage of the typical frog life cycle is most likely missing from their life cycle?

A Egg

B Tadpole

C Froglet

D Adult frog

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	10	
B*	63	
C	18	
D	9	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

3.10(C) investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady bugs

2013 – Q11

11 At which stage in the life cycle of a plant are seeds produced?

A

Seedling

B

Sprouting seed

C

Mature plant

D

Young plant

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	11	
B	15	
C*	67	
D	6	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

4.7 (A) | **Units:**

4.7 (A) examine properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants

2014 – Q12

12 Several students investigate the characteristics of soil. The students observe samples of common soils. In one sample they observe that water drains through the soil easily. When they rub the soil between their fingers, it feels rough and scratchy, and its particles feel hard. The soil the students observed is most likely —

F clay

G silt

H loam

J sand

*** Correct answer (J)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	15	
G	16	
H	12	
J*	56	

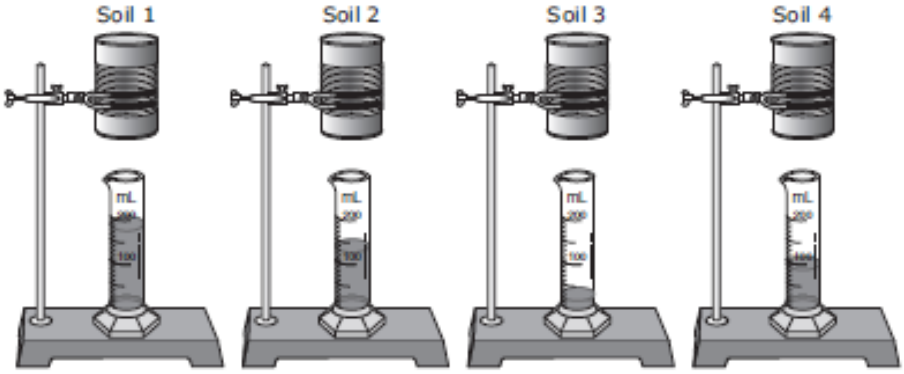
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

4.7 (A) examine properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants

2013 – Q12

12 A student conducts an investigation using four identical cans, each with a hole in the bottom. The student fills each can with a different type of soil and then adds 200 milliliters (mL) of water to each can. The graduated cylinders in the diagram below show the amount of water that drains through the soil and out the bottom of each can.



Some plants have roots that reach very deep underground. Which type of soil will most likely stop water from flowing to the deepest roots of these plants?

F Soil 1

G Soil 2

H Soil 3

J Soil 4

*** Correct answer (H)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	14	
G	2	
H*	83	
J	2	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

IQ Analysis | Investigating the Question	SE 4.7(C)	RC: 3
4.7 (C)	**Units:**	

4.7 (C) identify and classify Earth's renewable resources, including air, plants, water, and animals; and nonrenewable resources, including coal, oil, and natural gas; and the importance of conservation

2015 – Q26

26 Resources can be classified as renewable or nonrenewable. Which of these resources is classified in the same category as coal?

F Wood

G Wind

H Corn oil

J Petroleum

*** Correct answer (J)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	11	
G	3	
H	15	
J*	71	

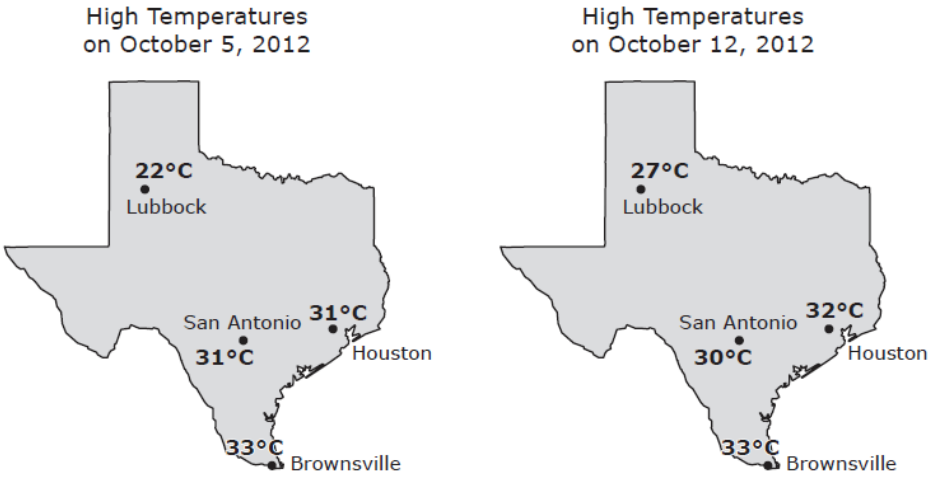
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

4.8 (A) measure and record changes in weather and make predictions using weather maps, weather symbols, and a map key

2015 – Q14

14 A student studies two Texas maps that showed some high temperatures for two days in October 2012.



Source: *The Old Farmer's Almanac*

How many degrees Celsius did the high temperature increase in the city that had the greatest change in high temperature?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

*** Correct answer (5)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
5	62	
	37	
	0	
	0	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

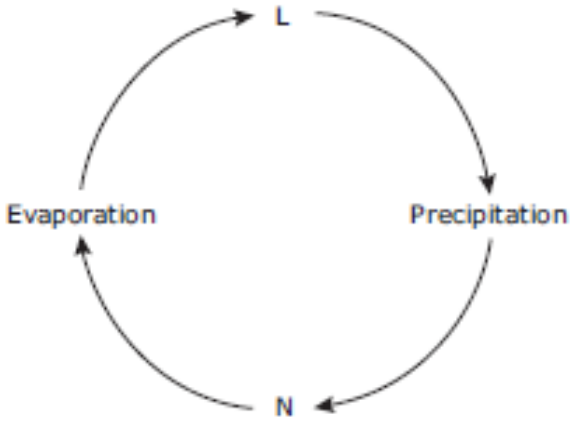
Implications for Instruction/Notes

IQ Analysis | Investigating the Question	SE 4.8(B)	RC: 3
4.8(B)	**Units:**	

4.8(B) describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process

2013 – Q28

28 A diagram of the stages in the water cycle is shown below.



Which of these observations would most likely be seen at Stage N?

F Water flowing downhill

G Fog forming along a highway

H The water level of a lake decreasing

J Dark clouds forming in the sky

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.3(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	71	
G	6	
H	14	
J	9	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

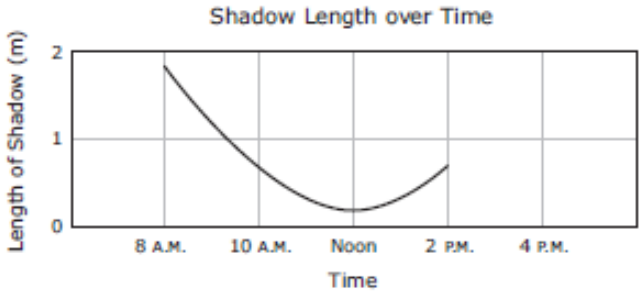
Implications for Instruction/Notes

4.8(C) | **Units:**

4.8(C) collect and analyze data to identify sequences and predict patterns of change in shadows, tides, seasons, and the observable appearance of the Moon over time

2013 – Q7

7 The graph below shows changes in the length of the shadow of a tree during part of a day.



If this day continues to be sunny, what will most likely happen to the length of the shadow from 2 P.M. to 4 P.M.?

A The length of the shadow will stay the same.

B The length of the shadow will decrease and then increase.

C The length of the shadow will increase.

D The length of the shadow will decrease.

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	3	
B	10	
C*	74	
D	13	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.5(A) classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy

2015 – Q2

2 A teacher gives a student four clear sealed containers. Each container holds a different substance. The student records some observations about the substance in each container.

Student Observations

Container	Observations
1	The substance takes the shape of the container and is clear. Small particles float on top of the substance.
2	The substance is hard and cube-shaped. The surface of the substance is shiny.
3	The substance is not visible, and the container appears empty.
4	The substance is cold and made of crystals.

Based on these observations, which container most likely holds only gas?

F Container 1

G Container 2

H Container 3

J Container 4

*** Correct answer (H)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.02(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	14	
G	2	
H*	83	
J	1	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.5(A) classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy

2015 – Q8

8 Some students investigate the properties of four objects using a hand lens, a magnet, and a beaker containing water. Their observations are recorded in the table.

Observed Properties

Object	Mass (g)	Observations
Cork	2	• Light brown • Has small holes • Floats in water
Marble	2	• Blue • Shiny • Sinks in water
Wood cube	2	• Light brown • Not attracted by a magnet • Floats in water
Rubber stopper	2	• Black • Sinks in water • Not attracted by a magnet

Which statement identifies a property that could be used to classify these objects into two different groups?

F Density can be used to separate objects that sink in water from objects that do not.

G Magnetism can be used to separate objects that are attracted by a magnet from objects that are not.

H Solubility can be used to separate objects that dissolve in water from objects that do not.

J Physical state can be used to separate objects that are solids from objects that are not.

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.04(A)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	**80**	
G	**11**	
H	**4**	
J	**5**	

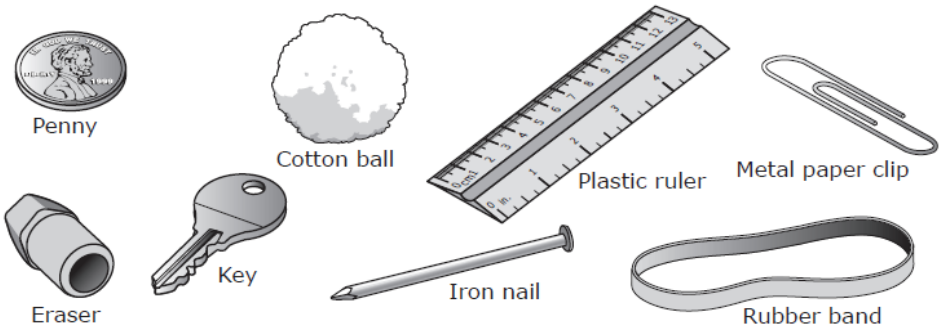
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.5(A) classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy

2015 – Q23

23 A student classifies the objects shown based on their physical properties.



Which property **cannot** be used to classify these objects into more than one group?

A Magnetism

B Mass

C Electrical conductivity

D Solubility in water

*** Correct answer (D)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.02(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	12	
B	21	
C	14	
D*	53	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.5(A) classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy

2015 – Q29

29 A science class tested three properties of different materials. The results are shown in the table below.

Material	Conducts electricity?	Conducts heat?	Is flexible?
Wood	No	No	No
Plastic	No	No	Yes
Copper	Yes	Yes	Yes
Steel	Yes	Yes	No

Based on the table, which material would be best to use to insulate electrical wires?

A Wood

B Plastic

C Copper

D Steel

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.02(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	13	
B*	47	
C	32	
D	8	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.5(A) classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy

2014 – Q14

14 A student measures the mass of several substances and records the results in the table below.

Substances for Investigation

Substance	Mass (g)
Water	125
Toothpicks	5
Table salt	30
Sugar cubes	20
Alcohol	98
Cooking oil	75
Marbles	40
Plastic cubes	35

What is the difference in grams between the total mass of the liquid substances and the total mass of the solid substances used in the investigation?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

*** Correct answer (168)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
168	**56**	
	44	
	0	
	0	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.5(A) classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy

2014 – Q23

23 A teacher wears protective gloves to lift a metal pan filled with boiling water from a hot plate. Why are the protective gloves necessary?

A The metal pan creates thermal energy.

B The metal pan insulates thermal energy.

C The metal pan conducts thermal energy.

D The metal pan reduces thermal energy.

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.1(A)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	**17**	
B	**14**	
C*	**66**	
D	**4**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.5(A) classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy

2014 – Q33

33 Objects that blow into a swimming pool or that are dropped into the pool by swimmers need to be removed. These objects include foam cups, keys, and coins. Which of the following explains a useful method for removing some of these objects?

A The keys and coins are less dense than water, so they can be easily picked up off the bottom of the pool by divers.

B The foam cups have the same density as water, so they can be crumbled up for removal by the pool filter.

C The foam cups are less dense than water, so they can be removed from the surface with a pool cleaning net.

D The keys and coins have the same density as water, so they can be washed away when the pool is drained.

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	16	
B	6	
C*	73	
D	5	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.5(A) classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy

2014 – Q39

39 A cook uses the ingredients listed below to prepare a meal.

Ingredients

- Sugar cubes
- Salt
- Cooking oil
- Carrots
- Butter

Which table correctly shows the physical properties of these ingredients when placed in hot water?

A

Ingredient	Physical Property
Sugar cubes	Solid that becomes a liquid and floats
Salt	Solid that becomes a liquid and sinks
Cooking oil	Liquid that floats
Carrots	Solid that does not dissolve
Butter	Solid that dissolves

C

Ingredient	Physical Property
Sugar cubes	Solid that does not dissolve
Salt	Solid that dissolves
Cooking oil	Liquid that sinks
Carrots	Solid that does not dissolve
Butter	Solid that becomes a liquid and floats

B

Ingredient	Physical Property
Sugar cubes	Solid that dissolves
Salt	Solid that dissolves
Cooking oil	Liquid that sinks
Carrots	Solid that dissolves
Butter	Solid that becomes a liquid and floats

D

Ingredient	Physical Property
Sugar cubes	Solid that dissolves
Salt	Solid that dissolves
Cooking oil	Liquid that floats
Carrots	Solid that does not dissolve
Butter	Solid that becomes a liquid and floats

*** Correct answer (D)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.02(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	**10**	
B	**5**	
C	**9**	
D*	**76**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.5(A) classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy

2013 – Q2

2 Which of these is the best conductor of electricity?

F Glass rod

G Cotton string

H Plastic tubing

J Copper penny

*** Correct answer (J)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	6	
G	3	
H	8	
J*	83	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.5(A) classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy

2013 – Q10

10 A teacher mixes a white powder into a beaker of water. The powder cannot be seen in the water. The teacher then heats the mixture until the water evaporates and the powder can be seen again. Which property of the powder is the teacher demonstrating?

F Solubility

G Density

H Conductivity

J Mass

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.02(A)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	82	
G	9	
H	6	
J	3	

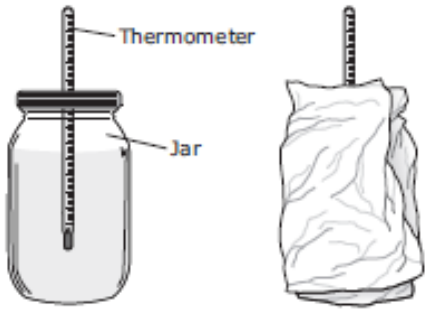
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.5(A) classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy

2013 – Q26

26 A teacher sets up an experiment using five jars like the ones shown below. The teacher keeps one jar unwrapped as the control. The other four jars are wrapped with equal thicknesses of four different materials.



The jars are each filled with an equal amount of water that is 92°C. Students observe and record the water temperature in each jar after 10 minutes. The results are shown in the table below.

Water Temperature After 10 Minutes

Material Wrapping Jar	Water Temperature (°C)
No wrapping (control)	84
Newspaper	87
Construction paper	87
Paper towel	85
Cotton towel	90

Which property of the materials wrapping the jars are the students most likely investigating?

F State of matter

G Thermal energy insulation

H Thermal energy production

J Ability to conduct electricity

*** Correct answer (G)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.02(A)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	8	
G*	65	
H	23	
J	3	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.5(A) classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy

2013 – Q33

33 A student reads the label on the bottle of salad dressing shown below.

Why would the student shake the salad dressing well before using it?

A Vinegar and oil have different densities.

B Vinegar and oil easily form a solution.

C Vinegar and oil both contain water.

D Vinegar and oil are both liquids.

*** Correct answer (A)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.02(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A*	**52**	
B	**27**	
C	**4**	
D	**18**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.5(B) identify the boiling and freezing/melting points of water on the Celsius scale

2015 – Q35

35 Cracks in the seafloor called hydrothermal vents send streams of hot water into the ocean. The water from a vent is 387°C. How many degrees above the boiling point of water is this temperature?

A 175°C

B 287°C

C 387°C

D 487°C

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	9	
B*	76	
C	6	
D	9	

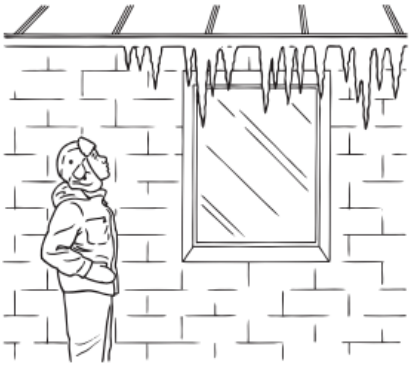
Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.5(B) identify the boiling and freezing/melting points of water on the Celsius scale

2014 – Q2

2 A student observes ice forming on the edge of a school building.



At what temperature did the water outside the school building most likely begin to change to ice?

F 100°C

G 32°C

H 25°C

J 0°C

*** Correct answer (J)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	3	
G	8	
H	5	
J*	84	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.5(B) identify the boiling and freezing/melting points of water on the Celsius scale

2013 – Q14

14 A student measures the temperature of water being heated on a hot plate. The student observes that the temperature of the water is 53°C. How many more degrees Celsius must the temperature rise before it reaches the boiling temperature of water?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

*** Correct answer (47)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
47	80	
	20	
	0	
	0	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.5(C) demonstrate that some mixtures maintain physical properties of their ingredients such as iron filings and sand

2015 – Q42

42 Some people add sugar to their hot tea. Which property of the sugar remains the same when the sugar is in the tea solution?

F The taste of the sugar

G The size of the sugar crystals

H The color of the sugar

J The texture of the sugar

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	79	
G	6	
H	6	
J	9	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.5(C) demonstrate that some mixtures maintain physical properties of their ingredients such as iron filings and sand

2014 – Q29

29 A student made a mixture using equal amounts of salt and pepper. The salt grains were the same size as the pepper grains. What should the student do to most easily separate the pepper from the salt?

A Use a pair of tweezers to remove each grain of pepper

B Run a small magnet through the mixture to attract the pepper

C Put the mixture in water and filter the pepper out of the water

D Use a strainer with a fine wire screen to remove the pepper

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(B)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	12	
B	11	
C*	60	
D	18	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.5(C) demonstrate that some mixtures maintain physical properties of their ingredients such as iron filings and sand

2013 – Q21

21 A mixture of beads was placed in a container, as shown below. The beads are of various sizes, and each one is made of plastic, glass, or steel.

The mixture would be easy to separate because all the beads —

A are less dense than water

B are solids

C have the same mass

D are attracted to a magnet

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	**11**	
B*	**75**	
C	**5**	
D	**9**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.5(D) identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving salt in water or adding lemon juice to water

2015 – Q15

15 A student adds 10 grams of four different powdered solids into four different beakers. The student then adds 100 mL of water to each beaker, stirs the mixtures, and allows them to sit for half an hour before recording observations. Which question is the student most likely trying to answer with this investigation?

A At what water temperature do the substances dissolve?

B How much water is needed to cause a substance to change state?

C What causes a substance to sink when put in water?

D Which substances dissolve in water?

*** Correct answer (D)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(B)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	7	
B	12	
C	6	
D*	75	

Error Analysis
☐ Guessing
☐ Careless Error
☐ Stopped too Early
☐ Mixed Up Concepts

Implications for Instruction/Notes

5.5(D) identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving salt in water or adding lemon juice to water

2014 – Q17

17 When a powdered drink mix was added to water, the liquid turned orange. A student decided the taste was too strong, so he poured out half of the liquid and added more water. Which of the following most likely occurred when more water was added?

A The physical state changed.

B The orange color became lighter.

C The liquid had a sweeter taste.

D None of the above

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	13	
B*	54	
C	13	
D	20	

Error Analysis
☐ Guessing
☐ Careless Error
☐ Stopped too Early
☐ Mixed Up Concepts

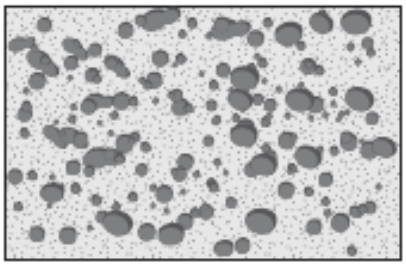
Implications for Instruction/Notes

5.5(D) identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving salt in water or adding lemon juice to water

2013 – Q40

40 A worker built a sidewalk and pressed some large salt particles into the concrete while it was still wet. When the concrete was dry, the worker washed the sidewalk with water. The picture below shows the sidewalk after it was washed.

Holes in Concrete



What most likely happened to the salt?

F It evaporated into a gas.

G It turned into concrete.

H It dissolved in the water.

J It turned into a solid.

*** Correct answer (H)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	7	
G	13	
H*	66	
J	13	

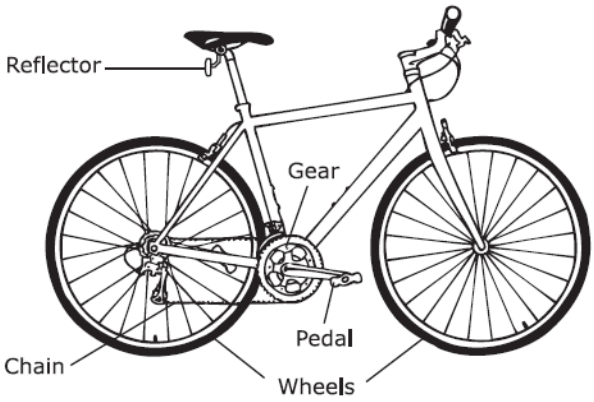
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(A) explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy

2015 – Q1

1 Many people ride a bicycle for fun and exercise. Some people ride a bicycle to work because it saves money and benefits the environment by reducing the use of fossil fuels.



Which of these is **not** an example of the bicycle using mechanical energy?

A The pedals, gears, and chain help turn the wheels.

B The wheels turn when the bicycle moves.

C The front wheel guides the bicycle as it moves.

D The reflector allows the bicycle to be seen at night.

*** Correct answer (D)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	4	
B	5	
C	5	
D*	87	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(A) explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy

2015 – Q39

39 When a bat searches for prey at night, it makes sounds as it flies, and it uses the sounds' echoes to find its prey. When the bat flies and listens to echoes to locate prey, it is using —

A thermal energy and light energy

B sound energy and thermal energy

C mechanical energy and sound energy

D light energy and mechanical energy

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	**1**	
B	**32**	
C*	**65**	
D	**2**	

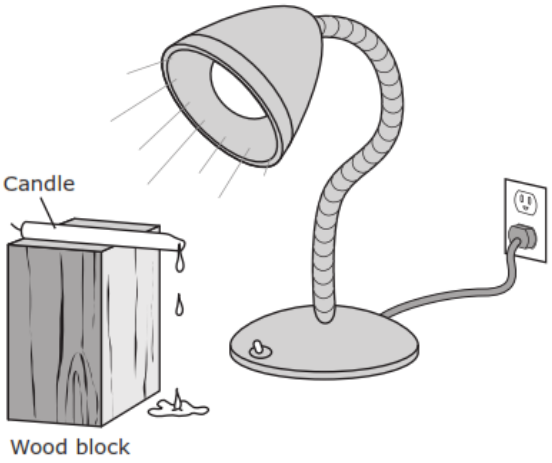
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(A) explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy

2014 – Q19

19 A class is learning about states of matter. The teacher shows the students how to set up the investigation shown in the diagram.



What kinds of energy are needed in this investigation to change the state of matter of the candle?

A Light, mechanical, and thermal

B Electrical and thermal

C Mechanical, light, and electrical

D Thermal and mechanical

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	**24**	
B*	**55**	
C	**15**	
D	**5**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

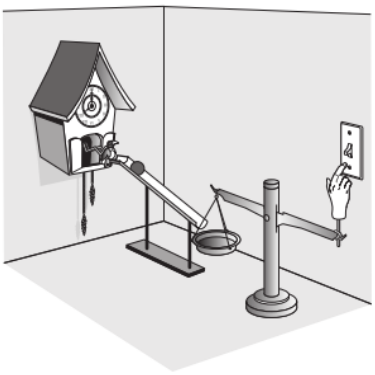
5.6(A) explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy

2014 – Q44

44 Rube Goldberg was an artist who drew cartoons that showed a very complicated way to do a simple task. The picture below shows a cartoon like the ones Goldberg drew.

How to Turn On a Light Switch the Rube Goldberg Way

1. The bird in the clock hits the ball.
2. The ball rolls down the ramp.
3. The ball falls into the balance pan.
4. The balance pan moves down.
5. The hand moves up.
6. The switch turns on.



Which form of energy is used to turn on the switch?

F Light energy

G Thermal energy

H Electrical energy

J Mechanical energy

*** Correct answer (J)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	4	
G	1	
H	10	
J*	84	

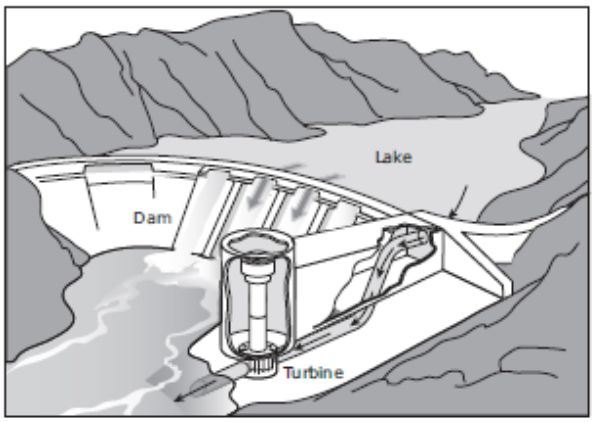
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(A) explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy

2013 – Q6

6 Water flows through turbines in dams like the one shown below. The flowing water makes the turbines spin.



What type of energy is used to make the turbines spin in this type of dam?

F Light energy

G Thermal energy

H Sound energy

J Mechanical energy

*** Correct answer (J)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	2	
G	8	
H	1	
J*	89	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

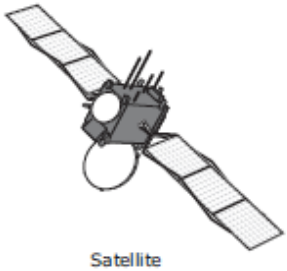
5.6(A) explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy

2013 – Q18

18 Three different objects that use the same source of energy are shown below.

Energy-efficient house

Calculator



Satellite

What is the energy source for these objects?

F Light energy

G Mechanical energy

H Sound energy

J Electrical energy

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	**63**	
G	**8**	
H	**0**	
J	**28**	

Error Analysis

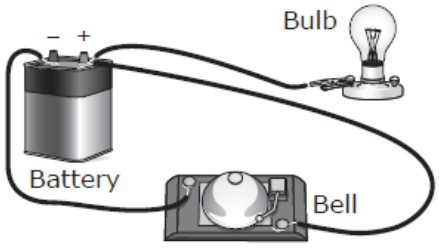
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(B) demonstrate that the flow of electricity in circuits requires a complete path through which an electric current can pass and can produce light, heat, and sound

2015 – Q4

4 A group of students built the circuit shown below.



The lightbulb does not glow. Which statement explains this observation?

F The battery is not charged.

G The lightbulb is not part of a complete circuit.

H The circuit does not have a switch.

J The bell uses most of the energy from the battery.

*** Correct answer (G)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.3(A)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	1	
G*	79	
H	9	
J	10	

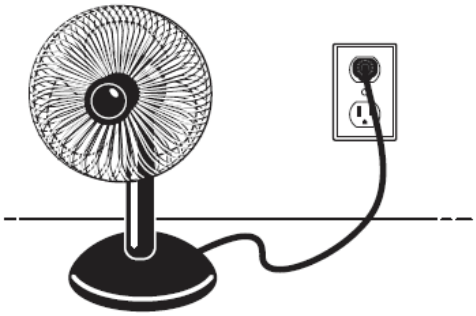
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(B) demonstrate that the flow of electricity in circuits requires a complete path through which an electric current can pass and can produce light, heat, and sound

2015 – Q16

16 Many types of fans are used in homes. One type of electric fan is shown below.



In addition to mechanical energy, which of these is produced as electric current passes through the circuit of this fan?

F Heat

G Mass

H Light

J Water vapor

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	74	
G	9	
H	11	
J	5	

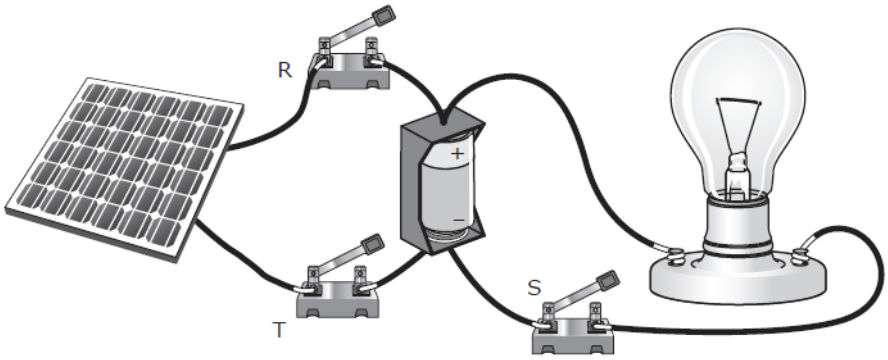
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(B) demonstrate that the flow of electricity in circuits requires a complete path through which an electric current can pass and can produce light, heat, and sound

2015 – Q25

25 A simplified diagram of a system using solar energy is shown.



To recharge the battery for later use without lighting the bulb, which of the following switches should be closed?

A Switch S only

B Switches R and S only

C Switches R and T only

D Switches R, S, and T

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.4(A)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	**24**	
B	**8**	
C*	**49**	
D	**19**	

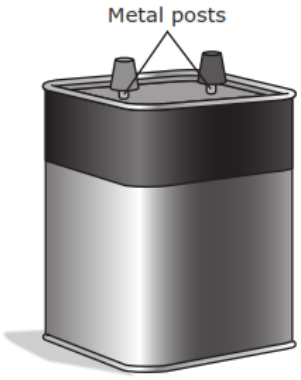
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(B) demonstrate that the flow of electricity in circuits requires a complete path through which an electric current can pass and can produce light, heat, and sound

2014 – Q15

15 The diagram shows the metal posts that are usually found on a battery.



The battery can be connected to a bell and a switch to produce sound. Which statement best explains why there are two metal posts on the battery?

A The battery needs only one metal post to connect to the bell, but the other metal post is present in case the first post fails to work.

B The battery needs to form a complete circuit that starts with one metal post and ends with the other metal post.

C One metal post makes a complete circuit with the switch, and the other metal post makes a complete circuit with the bell.

D One metal post makes the bell start to ring, and the other metal post makes the bell ring louder.

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(F)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	3	
B*	75	
C	19	
D	3	

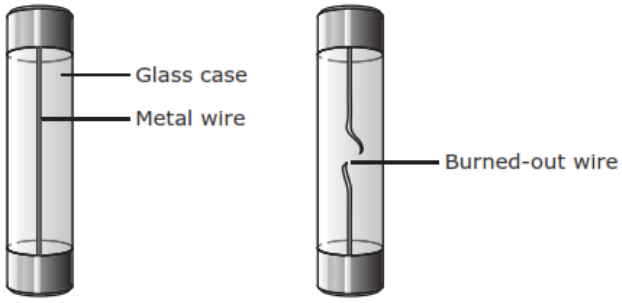
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(B) demonstrate that the flow of electricity in circuits requires a complete path through which an electric current can pass and can produce light, heat, and sound

2014 – Q26

26 Most cars have lights, power locks, radios, and other equipment that use electricity. Electric circuits power this equipment. Each circuit has a fuse that completes it. The picture below shows one type of fuse a car may have.



Which of these describes one thing that could happen if the wire in a car fuse burns out?

F The car's lights will burn brighter.

G The car's radio will not work.

H The car's turn signal will blink too slowly.

J The car's power windows will open faster.

*** Correct answer (G)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

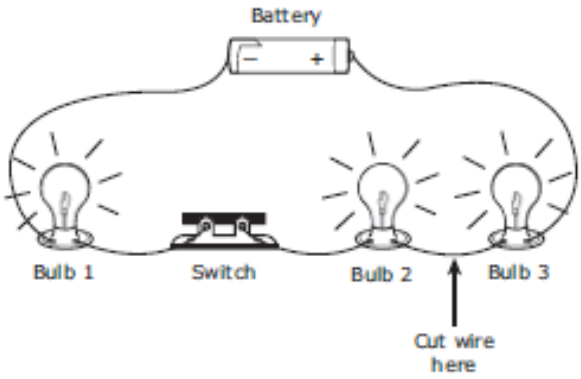
Item	State	Local
F	6	
G*	79	
H	14	
J	1	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(B) demonstrate that the flow of electricity in circuits requires a complete path through which an electric current can pass and can produce light, heat, and sound

2013 – Q16



16 The diagram shows a series circuit with three lit bulbs. How many of the bulbs will remain lit if the wire is cut at the point shown by the arrow?

F 0

G 1

H 2

J 3

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	63	
G	21	
H	10	
J	6	

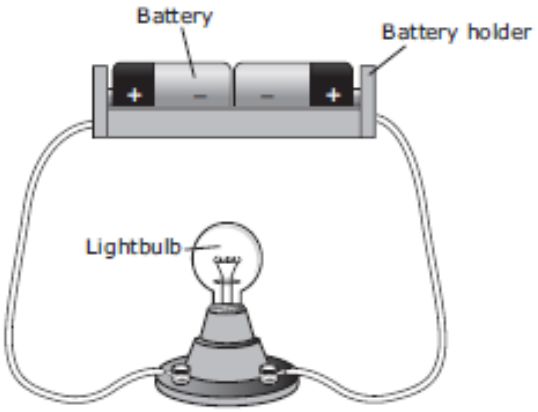
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(B) demonstrate that the flow of electricity in circuits requires a complete path through which an electric current can pass and can produce light, heat, and sound

2013 – Q35

35



Which of these changes to the electric circuit shown above will cause the lightbulb to light up?

A Straightening the wire so that the current can flow more easily

B Adding a switch and more wire so that the current can flow more easily

C Turning one battery so that its positive end connects to the other battery's negative end

D Making the length of wire the same on both sides of the lightbulb

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	4	
B	14	
C*	78	
D	3	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.6(B) demonstrate that the flow of electricity in circuits requires a complete path through which an electric current can pass and can produce light, heat, and sound

2013 – Q43

43 A string of lights with small bulbs is shown below. The bulbs are connected by wire that is covered with an insulator.

When the lights are on, electricity travels in —

A a complete circuit

B a sound wave

C a light ray

D an incomplete path

*** Correct answer (A)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A*	83	
B	1	
C	6	
D	9	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

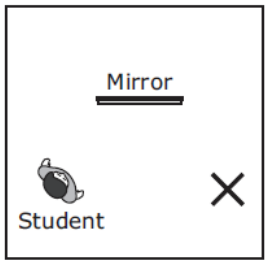
SE: 5.6(C) **Units:**

5.6(C) demonstrate that light travels in a straight line until it strikes an object or travels through one medium to another and demonstrate that light can be reflected such as the use of mirrors or other shiny surfaces and refracted such as the appearance of an object when observed through water

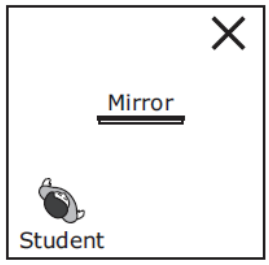
2015 – Q6

6 A student looks into a mirror and sees an image of an object. Which diagram shows an X where the object is most likely located?

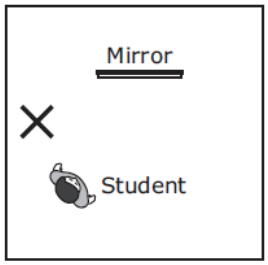
F



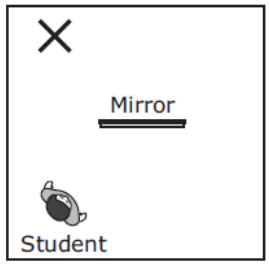
H



G



J



*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	84	
G	8	
H	6	
J	2	

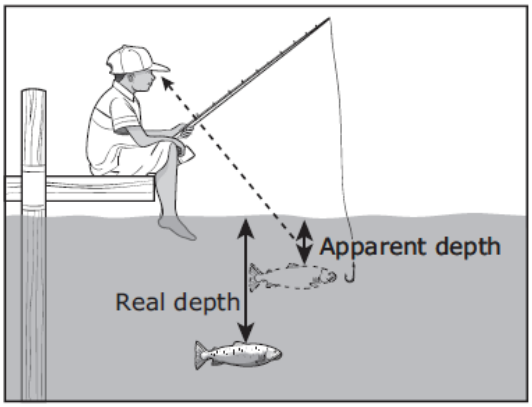
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(C) demonstrate that light travels in a straight line until it strikes an object or travels through one medium to another and demonstrate that light can be reflected such as the use of mirrors or other shiny surfaces and refracted such as the appearance of an object when observed through water

2015 – Q19

19 The diagram below shows a fish being viewed from above the water.



The fish appears to be closer to the surface than it really is. What causes this difference?

A Light is reflected.

B Light is refracted.

C Light is focused.

D Light is blocked.

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	18	
B*	78	
C	2	
D	2	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(C) demonstrate that light travels in a straight line until it strikes an object or travels through one medium to another and demonstrate that light can be reflected such as the use of mirrors or other shiny surfaces and refracted such as the appearance of an object when observed through water

2015 – Q36

36 In 1859, Henry Bursill published a book of hand shadows. The picture below shows one of these hand shadows.

Which property of light makes it possible to produce hand shadows?

F Light can be refracted.

G Light is a form of energy.

H Light travels in straight lines.

J Light can be separated into different colors.

*** Correct answer (H)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	32	
G	7	
H*	59	
J	2	

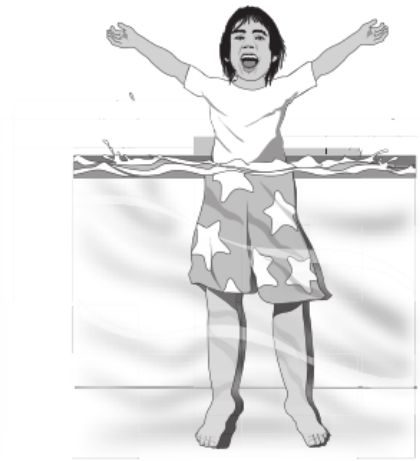
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(C) demonstrate that light travels in a straight line until it strikes an object or travels through one medium to another and demonstrate that light can be reflected such as the use of mirrors or other shiny surfaces and refracted such as the appearance of an object when observed through water

2014 – Q4

4 The picture below shows a child standing in a swimming pool.



Why does the lower part of the child appear so much different in size from the upper part?

F The light rays that travel through water and then into air are refracted.

G The light rays that travel through water and then into air are enlarged.

H The light rays that travel through air and then into water are reflected.

J The light rays that travel through air and then into water are reduced.

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	73	
G	14	
H	10	
J	3	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(C) demonstrate that light travels in a straight line until it strikes an object or travels through one medium to another and demonstrate that light can be reflected such as the use of mirrors or other shiny surfaces and refracted such as the appearance of an object when observed through water

2014 – Q22

22 Some students paint the inside of several boxes. They paint each box a different color. They observe that the inside of the box painted white looks brighter than the others. What is the most likely reason this box looks brighter?

F More light is reflected off white paint.

G More light is refracted by white paint.

H More light passes through white paint.

J More light is absorbed by white paint.

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	54	
G	10	
H	11	
J	25	

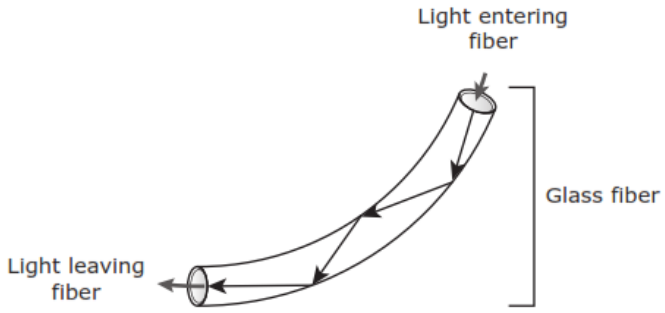
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(C) demonstrate that light travels in a straight line until it strikes an object or travels through one medium to another and demonstrate that light can be reflected such as the use of mirrors or other shiny surfaces and refracted such as the appearance of an object when observed through water

2014 – Q40

40 The model shows a special glass fiber that is thinner than some metal wires. When light enters one end of the fiber, it moves through the fiber as shown.



After the light leaves the fiber, it travels —

F in a straight line

G back into the fiber

H around the fiber

J in a curve

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.3(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	75	
G	4	
H	4	
J	17	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(C) demonstrate that light travels in a straight line until it strikes an object or travels through one medium to another and demonstrate that light can be reflected such as the use of mirrors or other shiny surfaces and refracted such as the appearance of an object when observed through water

2013 – Q4

4 Which of these best demonstrates the reflection of light?

F Looking through the glass of a large window

G Looking at an image formed on a silver spoon

H Looking at a lightbulb that is glowing

J Looking at a star on a clear night

*** Correct answer (G)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	17	
G*	77	
H	4	
J	3	

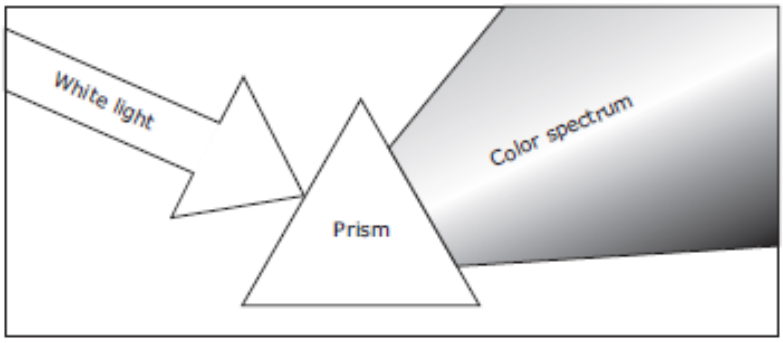
Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.6(C) demonstrate that light travels in a straight line until it strikes an object or travels through one medium to another and demonstrate that light can be reflected such as the use of mirrors or other shiny surfaces and refracted such as the appearance of an object when observed through water

2013 – Q23

23 When light travels through air into a prism, it bends and separates into many colors.



In which other situation does light bend?

A When light moves through air into water

B When light hits a wall

C When light passes through outer space

D When light hits a mirror

*** Correct answer (A)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.4(A)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A*	60	
B	5	
C	3	
D	31	

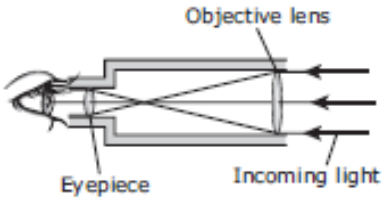
Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.6(C) demonstrate that light travels in a straight line until it strikes an object or travels through one medium to another and demonstrate that light can be reflected such as the use of mirrors or other shiny surfaces and refracted such as the appearance of an object when observed through water

2013 – Q31

31 Scientists use telescopes to make distant objects appear closer. Some parts of a telescope are shown below.



Which of the following best describes how the objective lens of this telescope helps a scientist observe the moon?

A The objective lens produces light.

B The objective lens blocks light.

C The objective lens reflects light.

D The objective lens refracts light.

*** Correct answer (D)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.3(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	**60**	
B	**5**	
C	**3**	
D*	**31**	

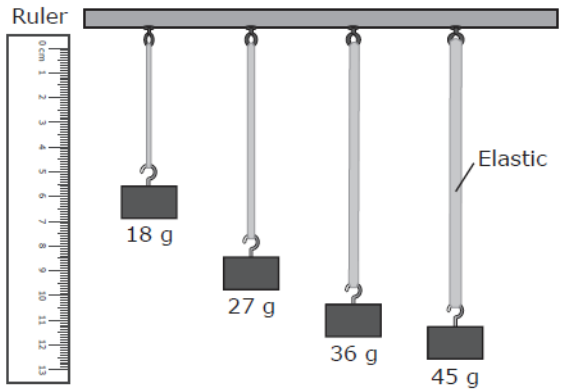
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(D) design an experiment that tests the effect of force on an object

2015 – Q31

31 A student designs an experiment to test the effect of the width of a piece of elastic on the elastic's ability to stretch. The student selects four pieces of elastic with different widths but the same length. The student then attaches blocks with different masses to the pieces of elastic. The results of the student's experiment are shown below.



What should the student do to improve this experiment?

A Use blocks of equal mass on the four pieces of elastic

B Use blocks with enough mass to cause the four pieces of elastic to break

C Use more than four pieces of elastic and four blocks

D Use four pieces of elastic with different lengths but the same width

*** Correct answer (A)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(A)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A*	**43**	
B	**12**	
C	**12**	
D	**33**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(D) design an experiment that tests the effect of force on an object

2014 – Q10

10 A student observes that the craters on the moon are different sizes. The student designs an experiment to study the formation of craters. The materials for the experiment are marbles and a pan of flour. The student makes a hypothesis that the size of the craters made on the surface of the flour will depend on the height from which the marble is dropped. Some of the steps in the student's experiment are described below.

1. Fill a round pan with flour
2. Smooth out the flour in the pan
3. _____
4. For each trial, measure the size of the crater formed and then smooth out the flour again

Which of these is most likely Step 3 in the student's experiment?

F Drop the same marble from different heights into the pan of flour

G Drop marbles of different masses from the same height into the pan of flour

H Drop marbles of different sizes from different heights into the pan of flour

J Drop a single marble one time into the pan of flour

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(A)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	50	
G	14	
H	30	
J	6	

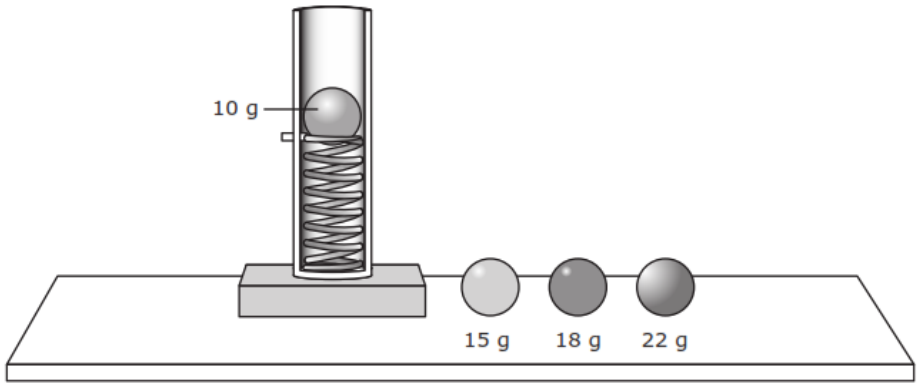
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(D) design an experiment that tests the effect of force on an object

2014 – Q31

31 A student designs an experiment to test the force of a spring using a spring launcher and four spheres with the same diameter but with different masses.



What other piece of equipment would be most useful for this experiment?

A A graduated cylinder to measure the volume of each sphere before the sphere is launched

B A beaker to collect the spheres after they are launched

C A stopwatch to measure how long it takes to load each sphere on the spring

D A meterstick to measure the height each sphere reaches after the sphere is launched

*** Correct answer (D)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.4(A)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	11	
B	3	
C	8	
D*	77	

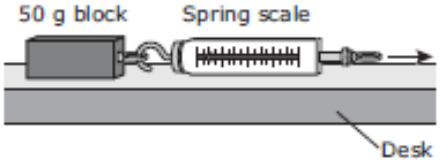
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.6(D) design an experiment that tests the effect of force on an object

2013 – Q41

41 A student uses a spring scale to pull a 50-gram block horizontally across a wood desk. Then the student pulls the block the same distance across surfaces of carpet, sandpaper, and glass.



Which question is this investigation most likely designed to answer?

A How do blocks of different sizes react to force?

B How do different surfaces affect the amount of force needed to move a block?

C How do blocks affect spring scales?

D How does the mass of a block change when it is pulled across a desk?

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(B)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	10	
B*	69	
C	5	
D	16	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

SE: 5.7(A) **Units:**

5.7(A) explore the processes that led to the formation of sedimentary rocks and fossil fuels

2015 – Q20

20 Fossil fuels formed over long periods of time after particles in water settled to the sea floor and formed marine mud. What kinds of particles needed to be present in the marine mud in order for fossil fuels to form?

F Mostly sand and a few small bits of wood

G Mostly decaying organisms

H Mostly lava and a few sedimentary rocks

J Mostly metal minerals

*** Correct answer (G)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	7	
G*	75	
H	14	
J	4	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.7(A) explore the processes that led to the formation of sedimentary rocks and fossil fuels

2015 – Q44

44 Some students make a model to show one of the first steps in the formation of sedimentary rock. The students pour 2 centimeters of light-colored sand into a clear plastic box. Then they add 1 centimeter of gravel. Finally they pour 2 centimeters of dark-colored sand on top of the gravel. Which characteristic of sedimentary rock does this model best show?

F Sedimentary rock is made of layers.

G Sedimentary rock is cemented bits of rock.

H Sedimentary rock is often limestone.

J Sedimentary rock is common in Texas.

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.3(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	82	
G	11	
H	4	
J	3	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.7(A) explore the processes that led to the formation of sedimentary rocks and fossil fuels

2014 – Q20

20 All of these are related to the formation of oil or natural gas **EXCEPT** –

F decomposed animals

G decayed plants

H sedimentary rocks

J active volcanoes

*** Correct answer (J)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	11	
G	7	
H	28	
J*	53	

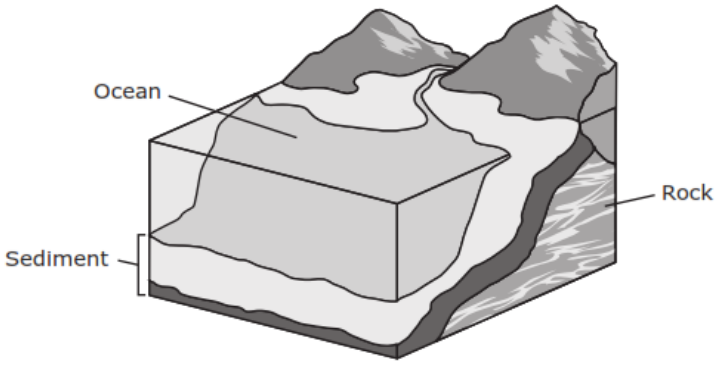
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.7(A) explore the processes that led to the formation of sedimentary rocks and fossil fuels

2014 – Q32

32 The model below shows layers of sediment on the floor of an ocean.



Which of the following best explains how these layers can become rock over many years?

F Sand in the sediment melts and turns into rock.

G The weight of the water compacts the sediment into rock.

H Changing water temperatures turn sand in the sediment into rock.

J Pollution caused by humans turns the sediment into rock.

*** Correct answer (G)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.3(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	14	
G*	70	
H	13	
J	4	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.7(A) explore the processes that led to the formation of sedimentary rocks and fossil fuels

2013 – Q17

17 The diagram below shows the sequence of the processes that turn solid rock into sandstone.

Which two processes best complete this diagram?

A Melting and cooling

B Erosion and compaction

C Compaction and cementation

D Evaporation and dissolving

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	14	
B	37	
C*	43	
D	6	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.7(B) recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice

2015 – Q22

22 The photograph below shows a canyon in northern Arizona.

Canyon walls

Which of these describes how this canyon was most likely formed?

F Floods eroded the sandstone away from the canyon walls.

G Glaciers eroded the canyon rock as they melted and moved.

H Ice wedged into cracks in the rock and weathered the canyon walls.

J Wind blew large rocks that smashed against the canyon walls.

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	53	
G	14	
H	19	
J	13	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.7(B) recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice

2015 – Q40

40 A wide U-shaped valley is shown in the photograph below.

This valley was most likely formed by —

F flash flooding

G a glacier

H a hurricane

J melting snow

*** Correct answer (G)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	23	
G*	67	
H	6	
J	3	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

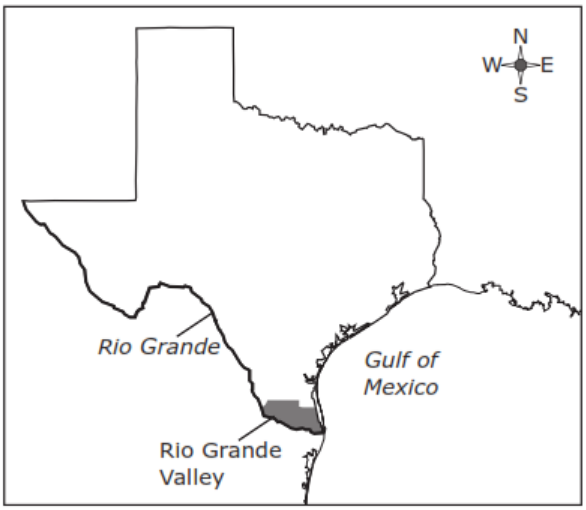
Implications for Instruction/Notes

5.7(B) recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice

2014 – Q8

8 The Rio Grande Valley is located at the southern tip of Texas at the end of a long river known as the Rio Grande.

Location of the Rio Grande Valley



How did the delta at the end of the Rio Grande form?

F Sand and mud from the Gulf of Mexico were washed ashore by tsunamis.

G The river cut through the solid bedrock of the valley.

H The river deposited large amounts of sediment from land erosion.

J Hurricanes pushed soil and debris from the Gulf of Mexico onto the land.

*** Correct answer (H)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	5	
G	18	
H*	72	
J	4	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.7(B) recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice

2014 – Q24

24 A student hiking in a rocky area on a mountain notices that wide, deep cracks have formed in some of the large rocks. Some of the cracks are so large that the rocks have broken apart. Which process most likely caused these rocks to crack and break?

F Erosion by wind

G Water freezing and thawing

H Erosion by fast-moving water

J Sediments being deposited

*** Correct answer (G)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	24	
G*	48	
H	19	
J	9	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.7(B) recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice

2013 – Q20

20 Glaciers are masses of ice that move slowly on land. Which of these features was most likely formed by a glacier?

F A wide valley

G A deep ocean

H A lava flow

J A mountain range

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	62	
G	13	
H	2	
J	23	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.7(C) identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels

2015 – Q7

7 An energy company wants to build a hydroelectric power plant. Which of these characteristics of an area is most important to the development of a hydroelectric power plant?

A The area has a cool, rainy climate.

B The area is located in a valley with very little wind and frequent heavy fog.

C The area has a river that flows rapidly from nearby mountains through a valley.

D The area has no geysers or hot springs.

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	15	
B	7	
C*	68	
D	9	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.7(C) identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels

2015 – Q38

38 A group of fifth-grade students was researching alternative energy resources in the school library. Each student made a list of resources. Which list contains only alternative energy resources?

F

Alternative Energy Resources
• Wind
• Solar
• Oil
• Geothermal

H

Alternative Energy Resources
• Hydroelectric
• Coal
• Gas
• Wind

G

Alternative Energy Resources
• Biofuel
• Coal
• Geothermal
• Solar

J

Alternative Energy Resources
• Solar
• Biofuel
• Wind
• Geothermal

*** Correct answer (J)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	10	
G	8	
H	8	
J*	74	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

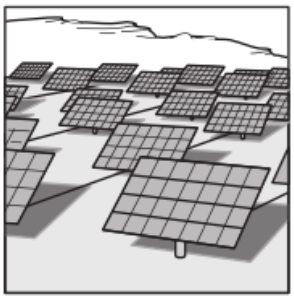
5.7(C) identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels

2014 – Q6

6 Which of the methods of generating electricity shown below does **NOT** use alternative energy resources?

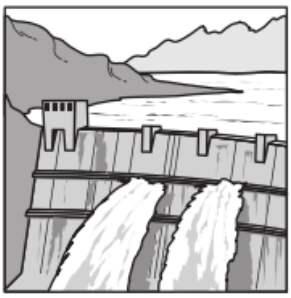
F

H



G

J



*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	**72**	
G	**4**	
H	**8**	
J	**16**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.7(C) identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels

2014 – Q38

38 Which alternative energy source is generated beneath Earth's crust and can be used to heat buildings?

F Hydroelectric energy

G Geothermal energy

H Wind energy

J Solar energy

*** Correct answer (G)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	**6**	
G*	**81**	
H	**1**	
J	**12**	

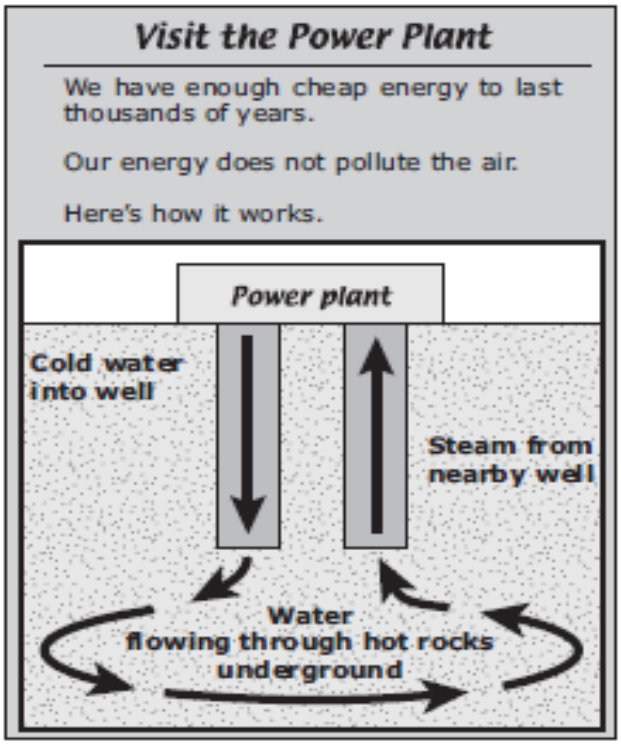
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.7(C) identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels

2013 – Q24

24 The poster shown below advertises tours of a power plant.



This power plant produces electricity most likely by using —

F fossil fuels

G biofuels

H solar energy

J geothermal energy

*** Correct answer (J)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	11	
G	13	
H	14	
J*	62	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.7(C) identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels

2013 – Q30

30 Many cities are taking actions to cause less harm to the environment. Which action produces energy from an alternative source?

F Burning coal to heat homes

G Replacing lawns with plants that require less water

H Using biofuels to generate electricity

J Building a new water-treatment plant to improve water quality

*** Correct answer (H)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.1(B)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	**15**	
G	**16**	
H*	**54**	
J	**15**	

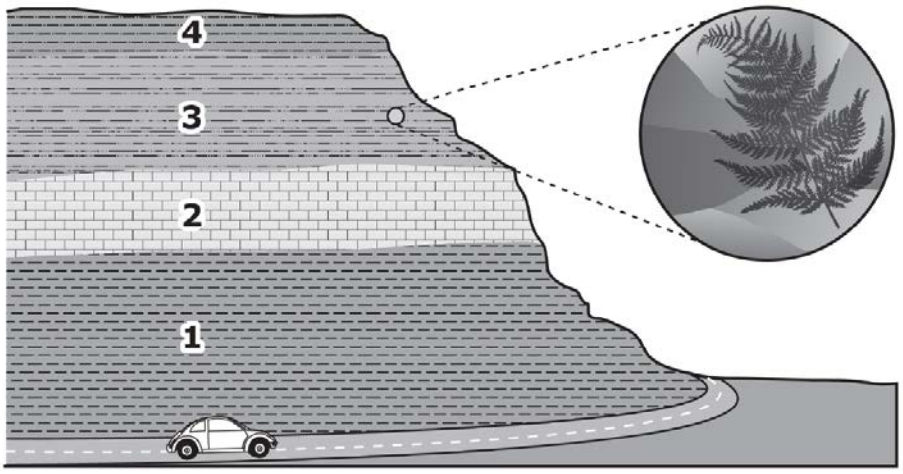
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.7(D) identify fossils as evidence of past living organisms and the nature of the environments at the time using models

2013 – Q9

9 The diagram below shows rock layers next to a road.



Layer 3 contains many plant fossils. Layer 3 most likely formed in which of these environments?

A Desert

B Forest

C Ocean

D Tundra

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	7	
B*	83	
C	3	
D	7	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

IQ Analysis | Investigating the Question	SE 5.8(A)	RC: 3
5.8(A)	**Units:**	

5.8(A) differentiate between weather and climate

2014 – Q18

18 Each school year for 30 years, the amount of rain that fell at a school was measured and recorded. Tracking rainfall over a long period provides the most information about which characteristic of an area?

F Climate

G Temperature of one day

H Weather

J Type of soil

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	71	
G	2	
H	26	
J	1	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.8(A) differentiate between weather and climate

2013 – Q37

37 Which of these best describes climate rather than weather?

A Wind speed is changing as a storm moves through an area.

B The temperature is decreasing in a slow-moving cold front.

C Annual high temperatures in the summer have increased over many decades.

D The rainfall during one year was greater than the rainfall during the following year.

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

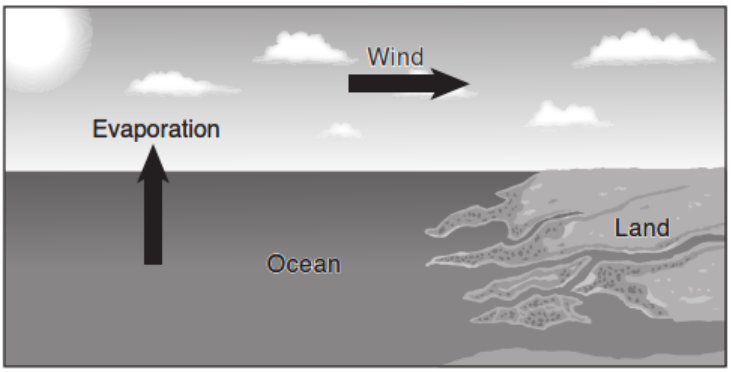
Item	State	Local
A	11	
B	15	
C*	49	
D	24	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.8(B) explain how the Sun and the ocean interact in the water cycle

2014 – Q27



27 The diagram above shows the process of evaporation over the ocean. What is the most likely effect of this process on the land areas nearby?

A Increased drought conditions

B Decreased erosion of the shoreline

C Increased precipitation

D Decreased solar energy

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	16	
B	17	
C*	62	
D	5	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.8(B) explain how the Sun and the ocean interact in the water cycle

2013 – Q15

15 Which of the following events in the water cycle is an example of solar energy being absorbed?

A Water vapor condensing to form clouds

B Water evaporating from the surface of an ocean

C Rain freezing as it falls toward the ground

D Clouds releasing precipitation over a mountain

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	21	
B*	73	
C	3	
D	4	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.8(C) demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky

2015 – Q18

18 A student draws diagrams of her house and the location of the sun in the sky. Which diagram below does **not** correctly represent the location of the sun at the time indicated?

F

H

G

J

*** Correct answer (H)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	12	
G	21	
H*	51	
J	16	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.8(C) demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky

2015 – Q33

33 A student is looking for evidence that Earth is always rotating on its axis. Which of the following would provide the best evidence?

A The different amount of rain that falls each day

B The appearance of shadows changing throughout the day

C The presence of other planets in the night sky

D The different phases of the moon in a month

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.3(A)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	3	
B*	67	
C	6	
D	24	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.8(C) demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky

2014 – Q1

1 Some students used a globe to model the rotation of Earth. They shaded in Texas on the globe, as shown below. They rotated the globe and observed that Texas was in exactly the same place after each rotation.

The students could rotate the globe quickly or slowly. If the globe could rotate only at the rate that Earth actually rotates, about how long would each complete rotation take?

A 30 days

B 60 minutes

C 24 hours

D 365 days

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.3(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	**2**	
B	**1**	
C*	**86**	
D	**10**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

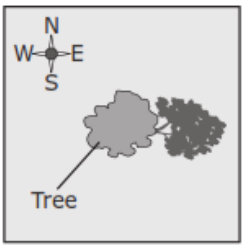
Implications for Instruction/Notes

5.8(C) demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky

2014 – Q35

35 Shadows cast by objects change throughout the day. The picture below shows the shadow cast by a tree at 3:00 P.M.

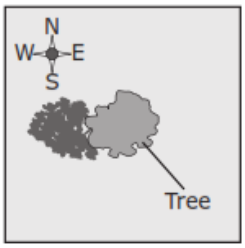
View from Above



Which picture shows how the tree's shadow most likely looked at 9:00 A.M.?

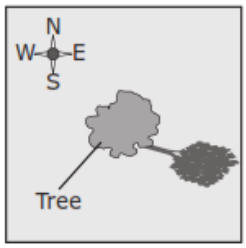
A

View from Above



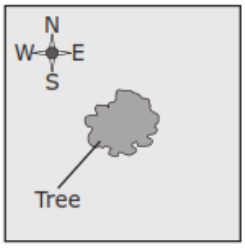
C

View from Above



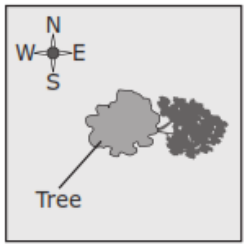
B

View from Above



D

View from Above



*** Correct answer (A)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

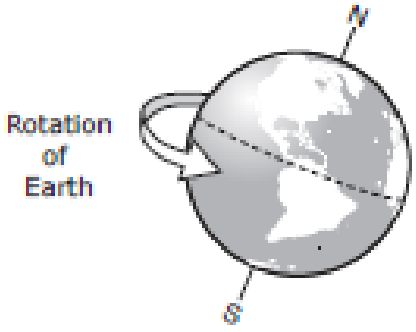
Item	State	Local
A*	**63**	
B	**8**	
C	**18**	
D	**11**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.8(C) demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky

2013 – Q5



5 Which of these cycles is a direct result of Earth's rotation?

A Day and night

B Moon phases

C Rainfall and evaporation

D Seasons

*** Correct answer (A)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A*	84	
B	2	
C	0	
D	14	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.8(C) demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky

2013 – Q32

32 On which side of a house in Texas should a window be placed so that the people inside the house can see the sunrise each day through the window?

F North

G South

H East

J West

*** Correct answer (H)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	16	
G	8	
H*	54	
J	22	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.8 (D) identify and compare the physical characteristics of the Sun, Earth, and Moon

2015 – Q10

10 Some characteristics of objects in the solar system are listed below.

Characteristics of Some Objects in the Solar System

- The core temperature is 15 million degrees Celsius.
- Meteor craters can be found on the surface.
- The source of light is the sun.
- Water covers most of the surface.
- Rocks and dust can be found on the surface.

Which of the listed characteristics describe both Earth and the moon?

F
- The core temperature is 15 million degrees Celsius.
- Meteor craters can be found on the surface.
- Water covers most of the surface.
- Rocks and dust can be found on the surface.

G
- Meteor craters can be found on the surface.
- The source of light is the sun.
- Rocks and dust can be found on the surface.

H
- The core temperature is 15 million degrees Celsius.
- Water covers most of the surface.
- Rocks and dust can be found on the surface.

J
- Meteor craters can be found on the surface.
- The source of light is the sun.
- Water covers most of the surface.
- Rocks and dust can be found on the surface.

*** Correct answer (G)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	15	
G*	53	
H	6	
J	26	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.9(A) observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements

2015 – Q11

11 The table below lists ways that four organisms obtain energy.

Methods for Obtaining Energy

Organism	Method
Oak tree	Produces food through photosynthesis
Mushroom	Absorbs nutrients from decomposing plants and animals
Cottontail rabbit	Eats grasses, twigs, and bark
Mountain lion	Preys on deer, wild hogs, and rodents

Which organism obtains energy without depending on another organism?

A Oak tree

B Mushroom

C Cottontail rabbit

D Mountain lion

*** Correct answer (A)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A*	79	
B	8	
C	8	
D	5	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.9(A) observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements

2015 – Q21

21 The table below lists the preferred diet of several types of birds.

Preferred Diets of Birds

Type of Bird	Preferred Diet
American goldfinch	Seeds from grasses and wildflowers
Eastern bluebird	A large variety of insects
Lesser goldfinch	Seeds from sunflower plants
Purple martin	Winged insects
Yellow warbler	Caterpillars, moths, mosquitoes, and beetles

Based on this information, which two types of birds do **not** compete for food resources?

A Purple martin and yellow warbler

B Eastern bluebird and purple martin

C Lesser goldfinch and eastern bluebird

D American goldfinch and lesser goldfinch

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(G)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	9	
B	12	
C*	43	
D	37	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.9(A) observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements

2015 – Q27

27 A student observes the following activities while walking in a park.

- A fire ant digging a tunnel in sandy soil
- A blue jay drinking water from a puddle
- A bee collecting pollen from a tree
- A hawk circling in the air over a tree

Which of these living organisms was interacting with another living organism in the environment?

A Fire ant

B Blue jay

C Bee

D Hawk

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	**6**	
B	**6**	
C*	**66**	
D	**22**	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.9(A) observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements

2014 – Q21

21 A prickly pear cactus is shown below.

The roots of the prickly pear cactus spread out in a wide underground network. How does this type of root system benefit a prickly pear cactus?

A By producing fruit and storing water

B By capturing sunlight and getting rid of waste materials

C By absorbing water and supporting the plant in loose, sandy soil

D By releasing nutrients into the sandy soil and taking in oxygen

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	**28**	
B	**6**	
C*	**58**	
D	**8**	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.9(A) observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements

2014 – Q41

41 Some facts about birds called cattle egrets are listed below.

Cattle Egrets

1. They have yellow bills and light-orange legs.
2. They make nests in trees away from predators.
3. They eat ticks off cattle while the cattle graze.
4. They are often found in the same fields as cattle.

Which of these facts best describes how these birds depend on other animals to survive?

A Fact 1

B Fact 2

C Fact 3

D Fact 4

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	**2**	
B	**19**	
C*	**74**	
D	**5**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.9(A) observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements

2013 – Q3

3 Some beetles break down the remains of dead animals. Some mushrooms break down the remains of dead trees. How do these actions most benefit plants?

A By returning nutrients to the soil

B By releasing oxygen into the air

C By making space for new animals

D By decreasing the population of herbivores

*** Correct answer (A)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A*	**82**	
B	**10**	
C	**4**	
D	**5**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.9(A) observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements

2013 – Q25

25 Some facts about a bird called the painted redstart are listed in the box shown below.

Facts About the Painted Redstart

1. Builds nests on hillsides covered with dense vegetation
2. Usually raises one group of young each year
3. Hunts for insects and spiders on plant leaves
4. Feeds on sugar water and peanut butter at feeders

Which fact best describes one way this bird changes its environment to meet its needs?

A Fact 1

B Fact 2

C Fact 3

D Fact 4

*** Correct answer (A)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A*	**46**	
B	**10**	
C	**23**	
D	**21**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.9(A) observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements

2013 – Q29

29 In fall and winter many trees lose their leaves in response to cooler temperatures and —

A a decrease in average wind speed

B fewer hours of daylight

C an increase in humidity

D more direct sunlight

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	**13**	
B*	**47**	
C	**32**	
D	**8**	

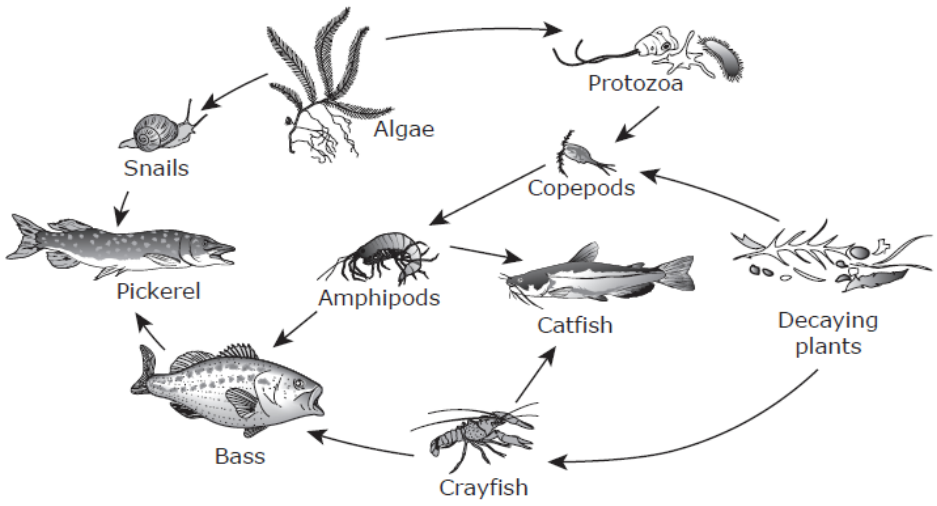
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.9(B) describe how the flow of energy derived from the Sun, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers

2015 – Q17

17 A freshwater ecosystem has various food webs. One of these food webs is shown below.



Which organisms transfer the most energy within the food web?

A Bass, because they are predators in this web

B Copepods, because they support two chains in this web

C Crayfish, because they are at the bottom of this web

D Algae, because they are the producers in this web

*** Correct answer (D)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.3(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	18	
B	14	
C	7	
D*	61	

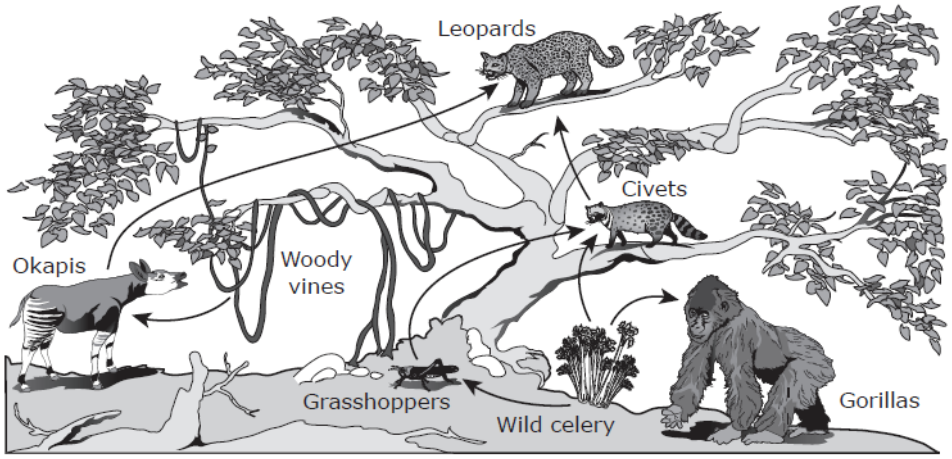
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.9(B) describe how the flow of energy derived from the Sun, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers

2015 – Q32

32 A food web for some organisms in an African rain forest is shown below.



Which organisms in this food web eat only consumers?

F Okapis

G Civets

H Leopards

J Gorillas

*** Correct answer (H)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.3(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	7	
G	8	
H*	75	
J	10	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.9(B) describe how the flow of energy derived from the Sun, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers

2014 – Q9

9 Which table shows the correct role of each organism in the food chain below?

Algae ⟶ shrimp ⟶ arctic cod ⟶ ringed seals ⟶ polar bears

A

Organism	Role
Algae	Producers
Shrimp	Consumers
Arctic cod	Consumers
Ringed seals	Consumers
Polar bears	Consumers

C

Organism	Role
Algae	Producers
Shrimp	Producers
Arctic cod	Consumers
Ringed seals	Consumers
Polar bears	Consumers

B

Organism	Role
Algae	Decomposers
Shrimp	Producers
Arctic cod	Producers
Ringed seals	Producers
Polar bears	Consumers

D

Organism	Role
Algae	Producers
Shrimp	Decomposers
Arctic cod	Decomposers
Ringed seals	Decomposers
Polar bears	Consumers

*** Correct answer (A)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A*	**73**	
B	**11**	
C	**9**	
D	**7**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.9(B) describe how the flow of energy derived from the Sun, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers

2014 – Q28

28 In a food chain, energy does **NOT** flow directly from —

F producer to decomposer

G producer to consumer

H consumer to decomposer

J consumer to producer

*** Correct answer (J)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	**30**	
G	**11**	
H	**12**	
J*	**47**	

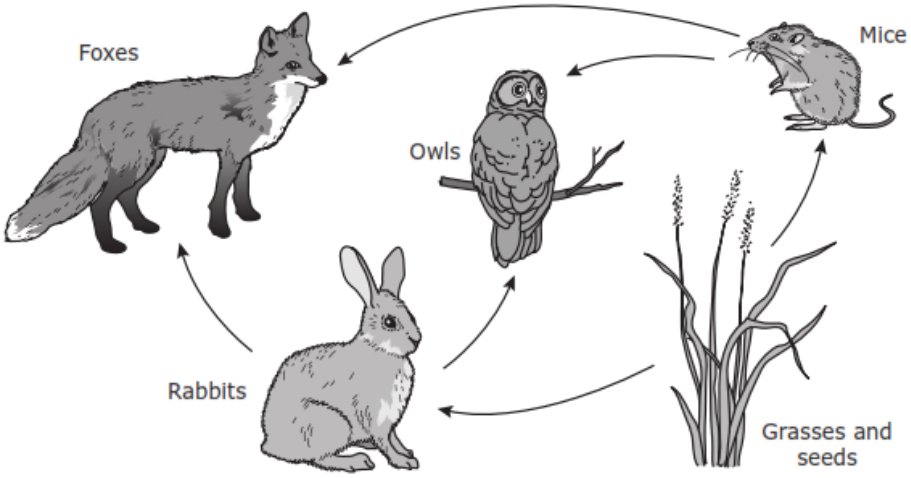
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.9(B) describe how the flow of energy derived from the Sun, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers

2014 – Q37

37 The food web below is made up of organisms that live in a forest.



Which change would most likely occur if all the producers in this ecosystem were removed?

A The mice would become the new producers.

B All the animals would either die or move away.

C The number of mice would increase.

D All the animal populations would increase.

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.3(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	4	
B*	83	
C	6	
D	7	

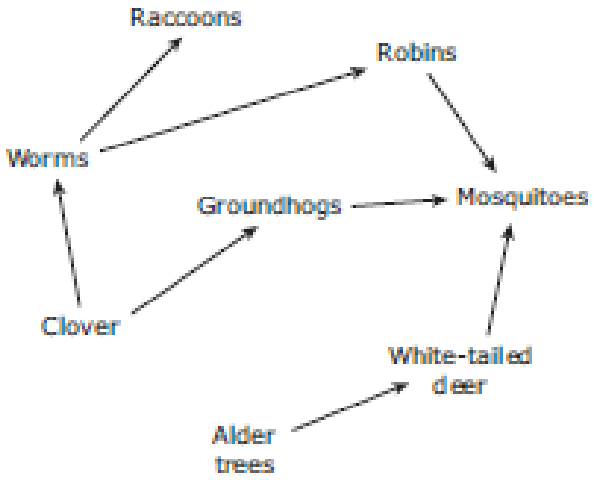
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.9(B) describe how the flow of energy derived from the Sun, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers

2013 – Q8

8 The food web below represents organisms in a field.



What role do raccoons play in this food web?

F Prey

G Producer

H Decomposer

J Consumer

*** Correct answer (J)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.3(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	**10**	
G	**6**	
H	**9**	
J*	**75**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.9(B) describe how the flow of energy derived from the Sun, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers

2013 – Q27

27 The diets of several types of prairie animals are described in the table below.

Diets of Some Prairie Animals

Type of Animal	Foods Eaten
Badger	Prairie dogs, rabbits
Prairie dog	Leaves, stems, and roots of grasses
Grasshopper	Grasses, wildflowers
Sparrow	Insects, seeds
Coyote	Prairie dogs, rabbits
Eagle	Prairie dogs, rabbits, coyotes

Which of the following prairie food chains is in the correct order?

A Eagles → prairie dogs → coyotes

B Wildflowers → badgers → grasshoppers

C Sparrows → seeds → insects

D Grasses → prairie dogs → badgers

*** Correct answer (D)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	**14**	
B	**3**	
C	**12**	
D*	**71**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

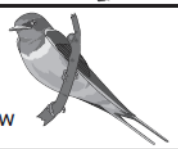
Implications for Instruction/Notes

5.9(C) predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways

2015 – Q30

30 The nesting habits of four types of birds are described in the table below.

Nesting Habits

Type of Bird	Nest Description
 Baltimore oriole	The nest hangs from thin branches in tall trees.
 Barn swallow	The nest is attached under the roof of a house or barn.
 Downy woodpecker	The nest is dug into rotting or decaying trees.
 Belted kingfisher	The nest is built in tunnels or burrows.

If all the dead branches and dying trees in a wooded area are removed, which bird's nesting habit would be most affected?

F Baltimore oriole

G Barn swallow

H Downy woodpecker

J Belted kingfisher

*** Correct answer (H)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	36	
G	4	
H*	57	
J	3	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.9(C) predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways

2014 – Q25

25 Prairie dogs eat plants and dig underground tunnels. Prairie dog tunnels help break up hard prairie soils, and the animals' waste adds nutrients to the soil. In the past, large groups of prairie dogs lived in many parts of the U.S. Great Plains, but people have destroyed most of these colonies.

Which of these will most likely happen when prairie dogs are removed from an area?

A The population of predators that eat prairie dogs will decrease.

B The population of plants that prairie dogs eat will decrease.

C The nutrients in the soil will increase.

D The number of underground tunnels will increase.

*** Correct answer (A)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A*	**78**	
B	**10**	
C	**8**	
D	**4**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.9(C) predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways

2014 – Q43

43 Wild Texas hogs, similar to the one shown below, are descended from hogs brought here from other countries.

These wild hogs eat many different kinds of foods, including plants, fungi, and insects. Besides being very destructive to the habitats of other animals, how do wild hogs most likely harm other animals?

A By competing with other animals for food

B By moving slower than most other animals

C By causing other animals to reproduce more

D By eating foods that no other animals eat

*** Correct answer (A)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A*	78	
B	3	
C	10	
D	9	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.9(C) predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways

2013 – Q36

36 The picture below shows a type of plant called kudzu. Kudzu is a fast-growing Asian vine that was introduced into the United States. Kudzu quickly uses available resources and can completely cover the plants in an area.

What effect does the rapid growth of kudzu most likely have on an ecosystem?

F The variety of native plants decreases.

G The water supply in the area increases.

H Weather patterns in the area change.

J The number of other plants increases.

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	59	
G	13	
H	7	
J	21	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.9(D) identify the significance of the carbon dioxide-oxygen cycle to the survival of plants and animals

2015 – Q13

13 Which statement best describes the relationship between humans and plants in the carbon dioxide–oxygen cycle?

A Humans depend on oxygen released into the air by plants, and plants depend on carbon dioxide that humans release into the air.

B Plants produce carbon dioxide as a product of photosynthesis and release it into the air to provide energy for humans.

C Plants depend primarily on energy supplied by oxygen for photosynthesis, a process which releases carbon dioxide needed by humans.

D Humans and plants use gases in the air and the energy of sunlight to produce their own food.

*** Correct answer (A)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A*	83	
B	9	
C	6	
D	2	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.9(D) identify the significance of the carbon dioxide-oxygen cycle to the survival of plants and animals

2014 – Q5

5 Animals and plants use substances that cycle through the environment. Which substance is needed by plants to survive and is released into the environment by animals?

A Oxygen

B Sugar

C Salt

D Carbon dioxide

*** Correct answer (D)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	20	
B	0	
C	0	
D*	79	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.9(D) identify the significance of the carbon dioxide-oxygen cycle to the survival of plants and animals

2013 – Q42

42 Many types of plants grow in a forest ecosystem. How do plants affect the air that forest animals breathe?

F Plants use oxygen from the air to make food.

G Plants release pollution into the air.

H Plants release energy from the sun into the air.

J Plants take in carbon dioxide and release oxygen into the air.

*** Correct answer (J)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	**8**	
G	**5**	
H	**3**	
J*	**83**	

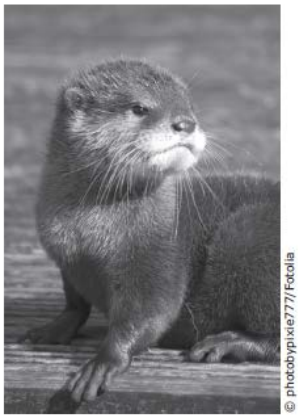
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

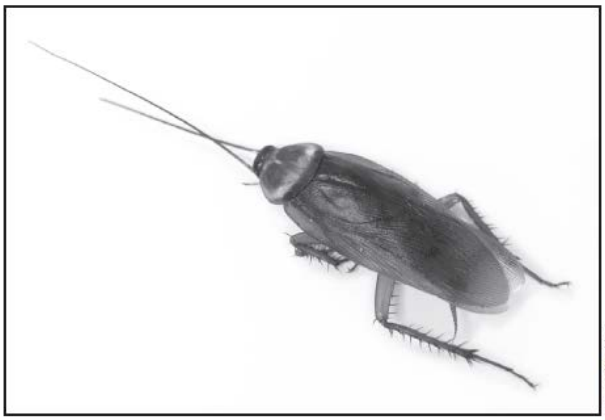
Implications for Instruction/Notes

5.10(A) compare the structures and functions of different species that help them live and survive such as hooves on prairie animals or webbed feet in aquatic animals

2015 – Q5

5 The whiskers of a river otter and the antennae of a cockroach are shown below.





How do structures such as whiskers and antennae benefit organisms?

A They help the organisms detect their surroundings.

B They help the organisms eat food quickly.

C They help the organisms fight predators.

D None of these

*** Correct answer (A)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A*	67	
B	2	
C	2	
D	29	

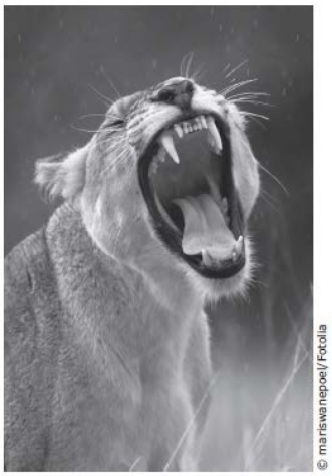
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

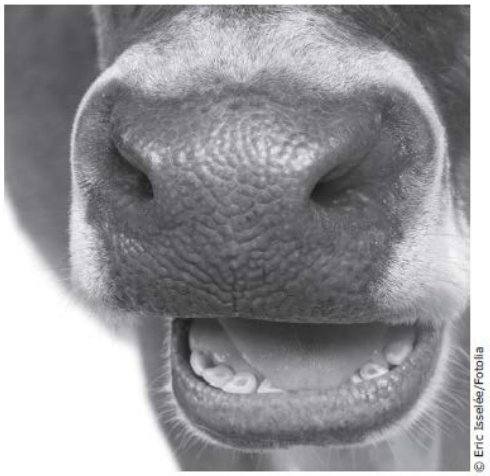
Implications for Instruction/Notes

5.10(A) compare the structures and functions of different species that help them live and survive such as hooves on prairie animals or webbed feet in aquatic animals

2015 – Q34

34 Some animals, such as lions, have pointed teeth, while other animals, such as cattle, have flat teeth.





The difference in the shape of these animals' teeth is most closely related to —

F the type of organisms the animals consume

G the sounds the animals make

H the habitat the animals live in

J the type of predators the animals have

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	**79**	
G	**3**	
H	**8**	
J	**11**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.10(A) compare the structures and functions of different species that help them live and survive such as hooves on prairie animals or webbed feet in aquatic animals

2014 – Q16

16 The ocotillo is a desert plant with long, straight branches. Its leaves are small and appear for only a short time after a rain. Most of the time, the branches of the ocotillo do not have leaves. Maple trees grow in areas where water is more abundant than in the desert. Maple leaves can be very large and are present for most months of the year.

Ocotillo leaves

Maple leaves

Ocotillo plants are better adapted for surviving in the desert than maple trees because the characteristics of ocotillo leaves —

F allow more sunlight to reach the soil

G prevent the plant from producing flowers

H encourage the release of carbon dioxide from the stems

J reduce the amount of water lost through evaporation

*** Correct answer (J)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	**26**	
G	**6**	
H	**9**	
J*	**58**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.10(A) compare the structures and functions of different species that help them live and survive such as hooves on prairie animals or webbed feet in aquatic animals

2014 – Q34

34 Most kangaroos have large, heavy tails, while spider monkeys have long, thin tails. Kangaroo tails are useful when the kangaroos are hopping and also when they are crawling around on the ground to feed. Spider monkey tails are useful when the spider monkeys are moving through trees. Both of these animals use their tails primarily for —

F grabbing and holding their food

G supporting and balancing their body

H attracting the attention of other animals

J carrying their young

*** Correct answer (G)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

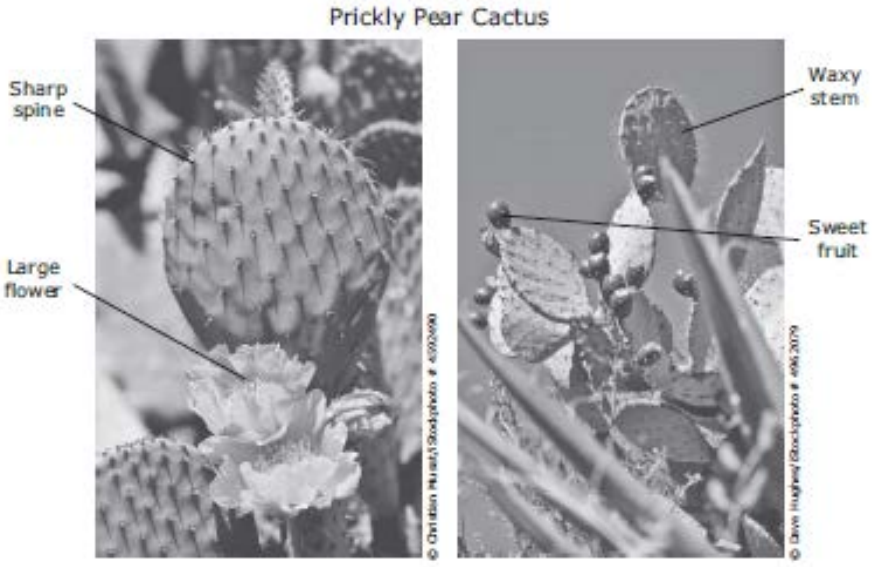
Item	State	Local
F	18	
G*	75	
H	3	
J	3	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.10(A) compare the structures and functions of different species that help them live and survive such as hooves on prairie animals or webbed feet in aquatic animals

2013 – Q22



22 Which two traits best help a cactus conserve water in the dry conditions of a West Texas desert ecosystem?

F Large flowers and sweet fruit

G Sweet fruit and sharp spines

H Sharp spines and waxy stems

J Waxy stems and large flowers

*** Correct answer (H)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	16	
G	8	
H*	53	
J	22	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

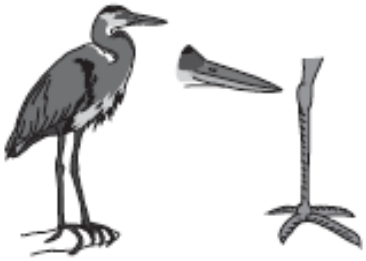
Implications for Instruction/Notes

5.10(A) compare the structures and functions of different species that help them live and survive such as hooves on prairie animals or webbed feet in aquatic animals

2013 – Q44

44 Eagles catch fish in rivers with their talons. They fly with the fish to a tree branch and tear the fish into small pieces. Which bird most likely catches and eats its food the way an eagle does?

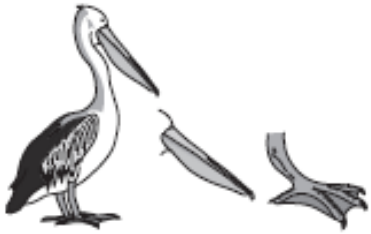
F



H

G

J



*** Correct answer (G)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	5	
G*	87	
H	1	
J	6	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.10(B) differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors such as an animal learning tricks or a child riding a bicycle

2015 – Q3

3 A farmer keeps bees to pollinate crops. The farmer makes several observations about the bees.

- Bees make return trips to drink sugar water from a bowl placed 40 meters from their hive.
- Bees have dark eyes and black-and-yellow stripes.
- Bees produce honey from the nectar they collect.
- Bees will sting when threatened or disturbed.

Which of these observations describes a learned behavior?

A Bees make return trips to drink sugar water from a bowl placed 40 meters from their hive.

B Bees have dark eyes and black-and-yellow stripes.

C Bees produce honey from the nectar they collect.

D Bees will sting when threatened or disturbed.

*** Correct answer (A)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A*	65	
B	1	
C	17	
D	17	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.10(B) differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors such as an animal learning tricks or a child riding a bicycle

2015 – Q41

41 A group of students made the observations listed below about the size, shape, and appearance of their hands.

1. Two students have scars on their hands.
2. Five students have pointer fingers that are longer than their ring fingers.
3. Nine students have ring fingers that are longer than their pointer fingers.
4. Six students have rings on their fingers.
5. Seven students have pointer fingers and ring fingers that are the same length.

Which of the students' observations describe inherited traits?

A Observations 2 and 5 only

B Observations 1, 3, and 4 only

C Observations 2, 3, and 5 only

D All the observations

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.02(C)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	10	
B	5	
C*	75	
D	10	

Error Analysis
☐Guessing
☐Careless Error
☐Stopped too Early
☐Mixed Up Concepts

Implications for Instruction/Notes

5.10(B) differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors such as an animal learning tricks or a child riding a bicycle

2014 – Q3

3 The caterpillars of monarch butterflies eat milkweed leaves. Milkweed leaves contain sap that is toxic to many animals but not to monarch butterfly caterpillars. This sap makes the monarch butterfly caterpillars toxic to predators and protects them from being eaten.

Which of these is an inherited trait of monarch butterfly caterpillars?

A The size of the milkweed leaves that the caterpillars eat

B The ability of the caterpillars to eat toxic leaves without being harmed

C The number of milkweed leaves the caterpillars eat each day

D The number of leaves on the milkweed plants that the caterpillars visit each summer

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.02(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	4	
B*	87	
C	7	
D	2	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.10(B) differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors such as an animal learning tricks or a child riding a bicycle

2014 – Q30

30 Which of these is a learned behavior of a dog?

F Begging for food

G Drinking water

H Panting on a hot day

J Chewing on a bone

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	72	
G	4	
H	12	
J	12	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.10(B) differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors such as an animal learning tricks or a child riding a bicycle

2013 – Q13

13 Fox squirrels live in the trees of city parks throughout Texas. Each spring they build nests of twigs and leaves in the tops of the trees. Fox squirrels are often found near park benches, waiting to be fed by visitors.

Fox squirrel

For fox squirrels, which of these is a learned behavior?

A Building a nest each spring

B Taking food from people

C Having a long, bushy tail

D Having sharp claws

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	27	
B*	71	
C	1	
D	1	

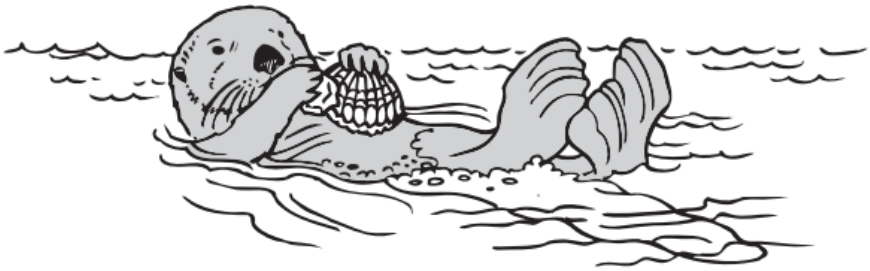
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.10(B) differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors such as an animal learning tricks or a child riding a bicycle

2013 – Q19

19 A scientist observes sea otters using rocks to break open clamshells.



Which of these investigations would best help the scientist determine whether this skill is a learned or an inherited behavior?

A Determining what sizes and kinds of rocks are used most often by sea otters

B Determining whether shellfish are an important food source in the diet of sea otters

C Raising young sea otters away from adult otters that use rocks and observing whether the young otters use rocks

D Observing families of sea otters over time to see whether adults that use rocks have offspring that use rocks

*** Correct answer (C)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	5.2(B)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	**5**	
B	**8**	
C*	**50**	
D	**37**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.10(B) differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors such as an animal learning tricks or a child riding a bicycle

2013 – Q39

39 Crayfish live in water and often hide under rocks or plants. They come out to look for food and will eat both plants and animals.

Which of these is a trait that a crayfish most likely inherits from its parents?

A The average distance it travels each day

B The number of legs it has

C The amount of food it eats each day

D The type of plants in its habitat

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Readiness
	Process	
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	**5**	
B*	**81**	
C	**8**	
D	**6**	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.10(C) describe the differences between complete and incomplete metamorphosis of insects

2015 – Q24

24 Some students examined two samples of pond water with a hand lens over three days. Each day they compared what they saw with pictures of samples their teacher had labeled. Their observations are listed below.

- On Day 1 the students identified mosquito eggs and mosquito larvae in one water sample and dragonfly nymphs in the other water sample.
- On Day 2 the students saw that the mosquito larvae had curled up and stopped moving.
- On Day 3 the students saw that a dragonfly with wings had developed from one of the nymphs.

Based on their observations, the students concluded that mosquitoes undergo complete metamorphosis while dragonflies undergo incomplete metamorphosis. Which of these explains why the students' conclusion is correct?

F The mosquito life cycle includes larvae that become pupae, while the dragonfly life cycle includes adults that develop directly from nymphs.

G The mosquito life cycle includes larvae with wings, while the dragonfly life cycle includes nymphs.

H The mosquito life cycle includes eggs that hatch in water, while the dragonfly life cycle includes nymphs that develop in water.

J The mosquito life cycle includes nymphs that hatch from eggs, while the dragonfly life cycle includes adults that develop directly from larvae.

*** Correct answer (F)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.04(A)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F*	61	
G	13	
H	17	
J	9	

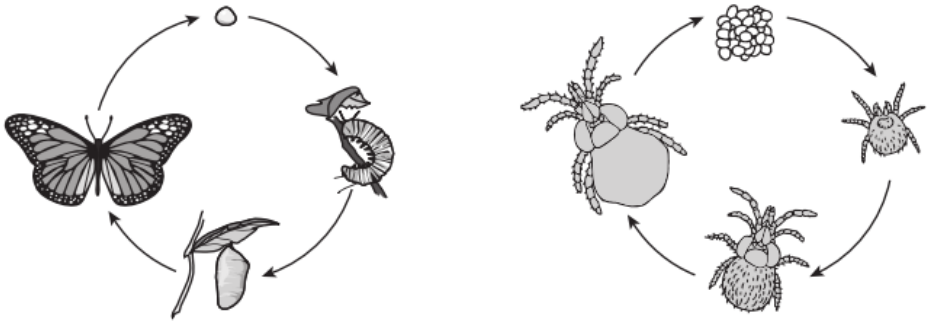
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.10(C) describe the differences between complete and incomplete metamorphosis of insects

2014 – Q13

13 The life cycles of a butterfly and a chigger are shown below.



How is the life cycle of chiggers different from the life cycle of butterflies?

A Chigger larvae have legs.

B Chiggers have a nymph phase.

C Chiggers go through metamorphosis.

D Chigger larvae hatch from eggs.

*** Correct answer (B)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
A	12	
B*	75	
C	9	
D	4	

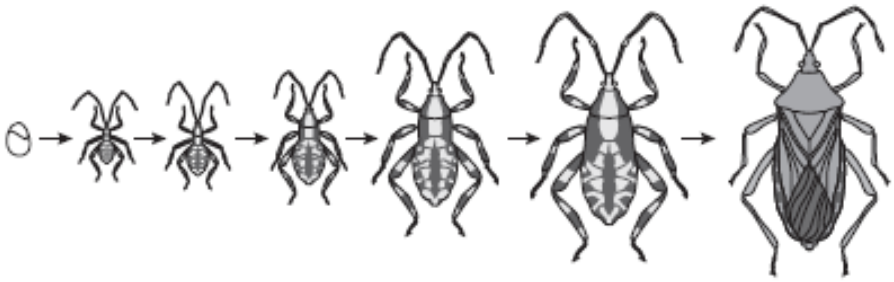
Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

5.10(C) describe the differences between complete and incomplete metamorphosis of insects

2013 – Q34

34 The stages in the development of an insect are shown below.



Which observation best supports the conclusion that this insect undergoes incomplete metamorphosis?

F The insect changes color when it becomes an adult.

G The first stage of the insect's development is as an egg.

H The insect undergoes more than four stages in its development.

J The insect has similar body parts throughout its development.

*** Correct answer (J)**

Analysis of Assessed Standards

Dual Coding	**Content**	Supporting
	Process	5.2(D)
Stimulus		
Thinking		
Related SEs		

Data Analysis

Item	State	Local
F	9	
G	5	
H	26	
J*	60	

Error Analysis
- ☐ Guessing
- ☐ Careless Error
- ☐ Stopped too Early
- ☐ Mixed Up Concepts

Implications for Instruction/Notes

IQ Analysis | Investigating the Question	SE	RC:
	Units:	

	Analysis of Assessed Standards		
	Dual Coding	Content	
		Process	
	Stimulus		
	Thinking		
	Related SEs		

Data Analysis			
Item	State	Local	Error Analysis ☐Guessing ☐Careless Error ☐Stopped too Early ☐Mixed Up Concepts

Implications for Instruction/Notes

*** Correct answer ( )**

	Analysis of Assessed Standards		
	Dual Coding	Content	
		Process	
	Stimulus		
	Thinking		
	Related SEs		

Data Analysis			
Item	State	Local	Error Analysis ☐Guessing ☐Careless Error ☐Stopped too Early ☐Mixed Up Concepts

Implications for Instruction/Notes

*** Correct answer ( )**