



FCAT SCIENCE Dailies



2003

Strand A: Matter

SC.A. 1.2.1 (AA) *The student determines that the properties of materials (e.g., density and volume) can be compared and measured (e.g., using rulers, balances, and thermometers).*

3rd, 4th, 5th

1. George wanted to find out what the volume of a rock was that he found at the beach. Which of the following is the best way for George to do this?



- A. Use a scale, place the rock on it and record the weight of the rock.
- B. Use a metric tape, measure the height of the rock and record it.
- C. Use a metric tape, measure the width of the rock and record it.
- D. Use a graduated cylinder with water and record how much water the rock displaced?

2. The teacher gave each group of students 4 equal sized containers with a different liquid in each one. Each container had 50mL of the liquid. The students were to determine the density of each liquid and layer them. Which of the following is **best** to do to determine the density of each?



- F. Experiment by pouring the liquids on top of each other.
- G. Predict which liquid is densest then layer according to prediction.
- H. Weigh each liquid on a scale and layer them according to weight.
- I. Change the amount of liquid in each container.

SC.A. 1.2.2 (CS) *The student knows that common materials (e.g. water) can be changed from one state to another by heating and cooling*

4th

1. Which of the following will change a liquid to a solid?

- A. evaporation
- B. melting
- C. freezing
- D. condensation



2. Ling placed 20 grams each of water, orange juice and brewed coffee in an ice tray. She wanted to see which one would have more mass after it was frozen. Which of the following will most likely be Ling's conclusion?

- F. Each has a mass greater than 20 grams.
- G. Each will have a mass less than 20 grams.
- H. The water will be more than 20 grams.
- I. The mass of each liquid will be the same.

SC.A.1.2.3 (CS) The student knows that the weight of an object always equals the sum of its parts

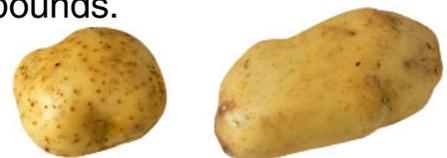
3rd

1. Matthew received an unknown mixture in his science class that weighed 60 grams. After sorting the mixture's contents into 5 groups, he weighed each group and got the following results:

Group	Weight
1	7 grams
2	12 grams
3	21 grams
4	5 grams
5	? grams

What is the weight of group 5?

- A. 20 grams
 - B. 15 grams
 - C. 50 grams
 - D. 25 grams
2. Rachel bought 1 pound of potatoes. She peeled the potatoes. She then weighed the peeled potatoes. They weighed less than one pound. Which of the following predictions would be correct if Rachel weighed the peels with the potatoes?
- F. The peels and potatoes should weigh one and a half pounds.
 - G. The peels and potatoes should weigh half a pound.
 - H. The peels and potatoes should weigh one pound.
 - I. The peels and potatoes should weigh two pounds.



SC.A 1.2.4 (AA) The student knows that different materials are made by physically combining substances and that different objects can be made by combining different materials.

3rd, 4th, 5th

1. Honey Bunches of Oats is Hunter's favorite breakfast cereal. This cereal has nuts, oat clusters, and flakes in it. What is Honey Bunches of Oats?

- A. solution
- B. mixture
- C. element
- D. molecule



2. Which of the following best describes the difference between a cereal and salt water?

- F. cereal is a mixture, salt water is a solution
- G. cereal is a solution, salt water is a mixture
- H. cereal is a solution, salt water is an element
- I. cereal is an element, salt water is a mixture



SC. A. 1.2.5 (CS) The student knows that materials made by chemically combining two or more substances may have properties that differ from the original materials.

5th

1. Which of the following is an example of a chemical change?

- A. folding paper
- B. burning paper
- C. cutting paper
- D. wrapping paper



2. What is the difference between a physical and chemical change?

- F. a physical change produces a new substance, a chemical change does not
- G. a chemical change can be seen, a physical change cannot
- H. a chemical change and a physical change are the same
- I. a chemical change produces a new substance, a physical change does not

SC.A.2.2.1 (CS) The student knows that materials may be made of parts too small to be seen without magnification

3rd, 4th

1. Merry wanted to examine the tiny living organisms in pond water. She placed some pond water in a glass and looked at it. She did not see any tiny organisms. Which of the following would be the best tool for Merry to use to determine if there were organisms in the pond water?



- A. a dropper
- B. a pair of binoculars
- C. a microscope
- D. a telescope
2. The students in Mr. Santo's class each received a slide containing salt. The students were asked to observe the salt with just their eyes. The students then had to predict what the grain of salt would look like when viewed under a microscope. Which prediction would be correct?
- F. The grain of salt will look the same.
- G. The grain of salt will look yellow.
- H. The grain of salt will look like a plant.
- I. The grain of salt will look like a crystal.

Nature of Matter

Answer Key

SC.A. 1.2.1

- 1. D** To use the displacement method, fill half of a measuring cup with water. Record the level of the water. Add the rock to the water. Record the level of the water. The difference between the two levels equals the volume of the rock.
- 2. H** Since equal sized containers and volumes were used the easiest way to determine density is to weigh each container.

SC.A. 1.2.2

- 1. C** Freezing changes most liquids to a solid. Alcohol cannot be frozen.
- 2. I** Either a loss or a gain of heat energy accompanies phase changes. Mass is conserved during heating and cooling.

SC.A. 1.2.3

- 1. B** Add all the weights and subtract from 60 – the original weight. The weight of an object equals the sum of its parts.
- 2. H** The best prediction is that the potato and peels should weigh one pound. The weight will definitely not increase. The weight might decrease a bit due to losing some water in the peeling process but not that much.

SC.A. 1.2.4

- 1. B** Honey Bunches of Oats is a mixture because most of the substances in this cereal can be easily separated.
- 2. F** Cereal is a mixture and salt water is a solution. Salt is dissolved in water.

SC.A. 1.2.5

- 1. B** When paper is burned it creates a new substances, one of which is carbon dioxide. Folding, cutting and wrapping paper does not change paper chemically only physically.
- 2. I** Chemical changes produce new substances and physical changes do not.

SC.A. 2.2.1

- 1. C** She will see the tiny organisms that live in pond water. She will see small particles when she uses a microscope.
- 2. I** Microscopes are used to see things that cannot be seen with only eyes. You will be able to see that salt is really a crystal.

Strand B: Energy

SC. B.1.2.1 (AA) The student knows how to trace the flow of energy in a system.

3rd, 4th, 5th

1. Mary put an egg into some water in a pot and let the water boil until the egg was cooked. How was thermal energy (heat) transferred to the egg during this process?



- A. Insulation allowed the heat to transfer from the pot through the water to the egg.
- B. Convection currents transferred heat from the pot through the water to the egg.
- C. Radiation currents moved heat through the water, then through the pot to the egg.
- D. Conduction transferred heat from the pot through the water to the egg.

2. Gloria is making a simple electrical circuit using materials that include a battery, two wires and a light bulb. She used all of the materials but the light bulb would not light up. Which is the best explanation of why the light bulb did not light up?

- F. The wire is not insulated.
- G. She needs to create a series circuit.
- H. The circuit is broken
- I. She needs to create a parallel circuit.

SC.B. 1.2.2 (AA) The student recognizes various forms of energy (e.g. heat, light, and electricity).

3rd, 4th, 5th

1. Gregory wanted to learn how to shoot a bow and arrow. He placed the arrow in the bow, stretched the bow, and then let the arrow go toward a safe target. What type of energy does a stretched bowstring have?

- A. kinetic
- B. chemical
- C. potential
- D. electrical



2. What type of energy does the arrow have after it has been shot?

- F. kinetic
- G. chemical
- H. potential
- I. electrical



SC.B. 1.2.3 (CS) The student knows that most things that emit light also emit heat.

5th

1. Josh wanted to know how hot the bulb on his desk lamp got. When he put his hand near the light bulb he could feel some heat. What could Josh do to measure how hot the lamp on his desk really got?

- A. He could place a cloth under the lamp and then feel the cloth.
- B. He could put a crayon under the lamp to see if it would melt.
- C. He could place a thermometer under the lamp.
- D. He could place a glass of ice under the lamp.



2. Electricity is needed in order for a light bulb to light up. When a lamp is plugged into the socket and turned on it will light up. Which of the following explains the energy changes that took place when the light bulb lit up?

- F. electrical > mechanical > light
- G. electrical > heat > light
- H. heat > light > electrical
- I. electrical > mechanical > chemical



SC.B.1.2.4 (CS) The student knows the many ways in which energy can be transformed from one type to another. (Assessed as B.1.2.2)

4th

1. Joann made some hot chocolate to drink. She stirred the hot chocolate milk with a metal spoon and noticed that the spoon handle felt warmer after resting in the hot chocolate for a few minutes. What type of energy transfer was she observing?
 - A. solar power transfer
 - B. electrical current transfer
 - C. heat transfer
 - D. fossil fuel transfer

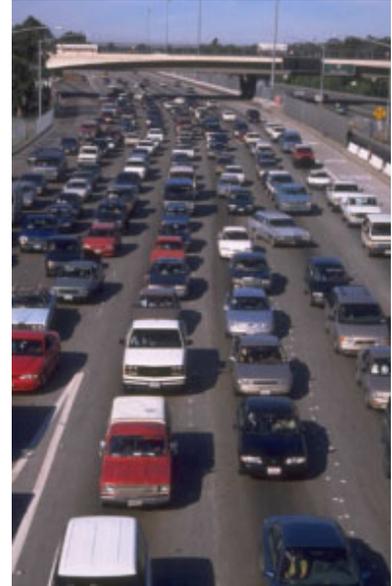
2. Peter's brother put gas in the car so she could drive to the library. Gas is fuel that powers the car. What type of energy change takes place when the car is started and moves forward?
 - F. kinetic energy to mechanical energy
 - G. electrical energy to potential energy
 - H. chemical potential energy to kinetic energy
 - I. hydroelectric energy to kinetic energy



SC.B. 1.2.5 (CS) The student knows that various forms of energy (e.g., mechanical, chemical, electrical, magnetic, nuclear, and radiant) can be measured in ways that make it possible to determine the amount of energy that is transformed. (also assesses 1.2.6)

5th

1. The newspaper had an article that stated that there are many more white cars than darker cars that travel the highways in Florida. This is because white cars reflect the sun's rays and darker cars absorb them. Which of the following would be the **best** way to prove that this statement is right?



- A. take a ride in each color car to see which is hotter
- B. touch a white car after it has been in the sun to feel the heat
- C. touch a black car after it has been in the sun to feel the heat
- D. put a thermometer in each color car and record the temperature
2. Jasmine wanted to build a solar cooker to make a snack called "S'Mores." She covered a small box with aluminum foil. She placed a cookie sandwich that contained chocolate and marshmallows in the solar cooker. She placed the solar cooker in the sun. After thirty minutes the chocolate and marshmallows melted. Which of the following explains why they melted?
- F. because of the sun's magnetic energy
- G. because of the sun's radiant energy
- H. because of the sun's electrical energy
- I. because of the sun's mechanical energy

Energy

Answer Key

SC.B. 1.2.1

- 1. B** Convection occurs when the water at the bottom of the pot is heated. The water becomes less dense and rises. Gradually the currents rise and fall in the water and circulate until the water is heated and causes the egg to cook. Radiation uses electromagnetic waves to transfer heat. Insulation blocks energy flow. Conduction is the direct transfer of heat between objects that touch and is how the pot was heated.
- 2. H** There must be a complete circuit for the electricity to flow to the light bulbs. If the circuit is broken the electricity cannot flow.

SC.B. 1.2.2

- 1. C** Once the arrow is stretched it has potential energy.
- 2. F** Once the arrow is shot and moving through the air it has kinetic energy. The faster an object goes the more kinetic energy it has.

SC.B. 1.2.3

- 1. C** He could do a, b, and d but he would not know how hot the bulb in his lamp got. The only way he could determine the amount of heat that the light bulb gave off was to place a thermometer under the lamp.
- 2. G** Electrical energy is changed to light and heat energy.

SC.B. 1.2.4

- 1. C** The heat from the hot chocolate was transferred to the spoon.
- 2. H** Gas has chemical potential energy. When it is burned the chemical potential energy transforms into kinetic energy.

SC.B. 1.2.5

- 1. D** The most accurate way to determine which car stays the coolest is to use a thermometer to check the temperatures. The other three statements are opinions not facts.
- 2. G** The sun radiates heat.

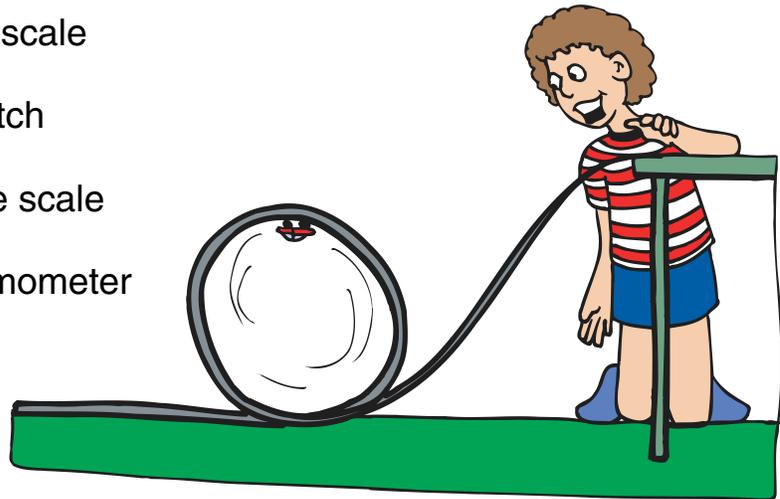
Strand C: Force and Motion

Benchmark: SC.C.1.2.1 (CS) The student understands that the motion of an object can be described and measured.

3rd, 4th

1. Mary and Andrew were playing with their small toy cars. They set up a ramp to see which car would travel the farthest. Which of the following tools would be best to use to measure how fast and far the cars traveled?

- A. stopwatch and balance scale
- B. metric tape and stopwatch
- C. metric tape and balance scale
- D. balance scale and thermometer



2. What would Mary and Andrew need to know in order to calculate the average speed of the cars?
- F. distance and direction
 - G. time and acceleration
 - H. acceleration and distance
 - I. distance and time

Benchmark: SC.C.1.2.2 (CS) The student knows that waves travel at different speeds through different materials.

5th

1. Sound can travel through many different kinds of materials. Which of the following does sound travel through the fastest?

- A. solid .
- B. liquid
- C. gas
- D. plasma



2. Light also travels through many different kinds of materials. Which of the following materials will allow light to easily travel through it?

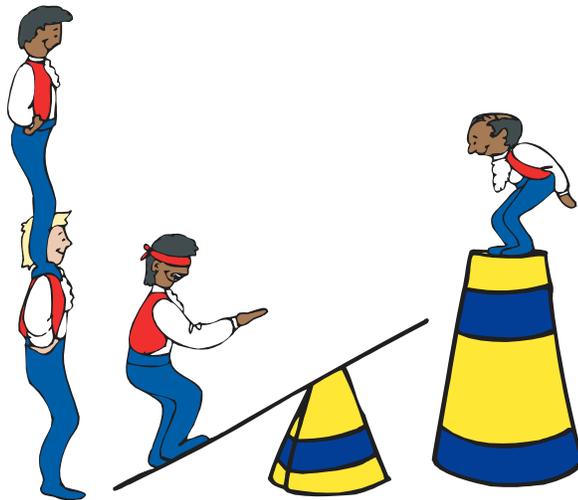
- F. wood
- G. glass
- H. cardboard
- I. tile

Benchmark: SC.C.2.2.1 (CS) The student recognizes the forces of gravity, magnetism and electricity operate simple machines.

5th

1. Henry visited the circus. He saw a man standing on one end of a seesaw. All of a sudden a large object came down on the other end of the seesaw and propelled the man way up high into the tent. He came down and landed in the net without getting hurt. The seesaw is an example of which simple machine?

- A. pulley
- B. wedge
- C. lever
- D. axle



2. Which force caused the man to fall into the net?

- F. friction
- G. gravity
- H. speed
- I. inertia

Benchmark: SC.C.2.2.3 (CS) The student knows that the more massive an object is, the less effect a given force has.

4th, 5th

1. Which of the following would take more force to lift?
 - A. 1 pound of feathers
 - B. 1 pound of rocks
 - C. 1 pound of cotton candy
 - D. 1 pound of coffee

2. A ping pong ball, baseball, kickball and tennis ball were in a box on the playground. Which of the ball would take more force to throw?
 - F. kickball
 - G. tennis ball
 - H. baseball
 - I. ping pong ball

Benchmark: SC.C.2.2.4 (AA) The student knows that the motion of an object is determined by the overall effect of all of the forces acting on the object. (Also assesses C.2.2.2)

3rd, 4th, 5th

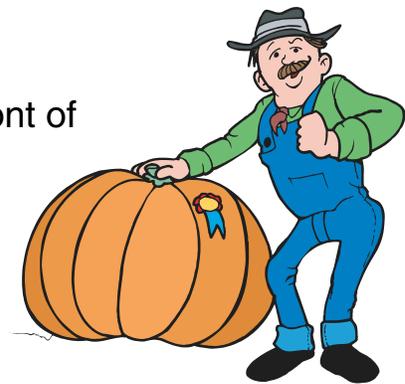
1. John and his friend were kicking soccer balls down the field. What would John need to do to kick the ball farther than his friend?

- A. run faster down the field
- B. stop the ball
- C. keep kicking the ball with the same force in the same direction.
- D. keep kicking the ball with a stronger force in the same direction.



2. Fred wanted to move a large pumpkin out by the front of his house. He began to roll the pumpkin but didn't get very far because it was heavy. His friend Harry came along to help. What would Fred and Harry need to do in order to move the pumpkin together?

- F. Fred should push down while Harry pushes forward on the pumpkin.
- G. Harry should push the pumpkin and Fred should pull it up.
- H. Both boys should work together to push the pumpkin in the same direction.
- I. Each boy should push the pumpkin in different directions.



Force and Motion Answer Key

SC.C. 1.2.1

- 1. B** A metric tape is needed to measure distance and a stop watch is needed to measure time.
- 2. I** To calculate speed you need to know the distance traveled and the time it took to travel that distance

SC.C. 1.2.2

- 1. A** Sound travels the fastest through a solid. Sound travels faster in water than in air.
- 2. G** Light will pass through objects that are transparent. Glass is transparent. The other objects are not transparent.

SC.C. 2.2.1

- 1. C** The seesaw is an example of a lever. The board is the lever. The part that the board is resting on is the fulcrum.
- 2. G** Gravity pulls objects down. What goes up must come down. This is due to gravity.

SC.C. 2.2.3

- 1. B** Even though all the items weigh the same rocks have more mass. It takes more force to lift one pound of rocks than one pound of feathers, cotton candy, or coffee.
- 2. F** The more massive an object the more force is needed to move it. The kickball has more mass than the other balls and would require more force to throw it.

SC.C. 2.2.4

- 1. D** He would have to apply more force to his soccer ball to make it go farther than his friend's soccer ball.
- 2. H** Both boys would have to apply a force and push the pumpkin in the same direction. When two forces are acting in the same direction they create a much stronger force. The total force on the wagon would be the sum of the individual forces.

Strand D: Processes that Shape the Earth

SC.D 1.2.1 (AA) The student knows that larger rocks can be broken down into smaller rocks, which in turn can be broken down to combine with organic material to form soil.

3rd, 4th, 5th

1. The small rocks in soil come from which of the following:
 - A. particles from dead plant and animals
 - B. large rocks that have broken down into smaller pieces
 - C. trees that have fallen and started to decay
 - D. salt crystals that have combined with other salt crystals to form small stones



2. Which of the following combinations would form a soil good for growing most plants?
 - F. a combination of sand and minerals
 - G. a mixture of dead plants and animals
 - H. a combination of large rocks that are broken down into smaller rocks and mixed with organic matter.
 - I. a combination of large rocks that are broken down and mixed with smaller clay and sand particles



SC.D.1.2.2 (AA) The student knows that 75 percent of the surface of the earth is covered by water. (assessed as SC.D.1.2.4)

3rd, 4th, 5th

1. What part of the Earth's surface is covered by land?

- A. 25 percent
- B. 45 percent
- C. 75 percent
- D. 90 percent



2. Which covers more of the surface of the Earth?

- F. continents
- G. lakes and rivers
- H. oceans and seas
- I. polar caps

SC.D.1.2.3 (CS) The student knows that the water cycle is influenced by temperature, pressure, and the topography of the land.

4th, 5th

1. What happens when warm very moist air travels from the ocean and moves inland over hot, dry land?
 - A. the air mass sinks and forms an early morning fog
 - B. clouds are built up and move quickly over the land
 - C. clouds are built up and it rains at the beach
 - D. air mass rises, clouds built up, and it rains



2. When a warm moist air mass moves toward a mountain range what happens?
 - F. Clouds are built up and it rains just after it crosses the peaks of the mountains.
 - G. Clouds are built up and it rains before it crosses the peaks of the mountains.
 - H. No clouds are formed and the warm air just cools off.
 - I. No clouds are formed and a cool breeze comes down from the mountain.

SC.D. 1.2.4 (AA) The student knows that the surface of the earth is in a continuous state of change as waves, weather, and shifts of the land constantly change and produce many new features. (Also assesses D.1.2.1, D.1.2.2, D.1.2.5)

3rd, 4th, 5th

1. Mountains and valleys are formed and changed by shifts in the Earth's crust. Which of the following is true?
 - A. These changes are constantly taking place.
 - B. These changes only took place thousands of years ago.
 - C. These changes occurred only when the earth was first formed.
 - D. These changes will not occur in the future.

2. Shifts in the Earth's crust take place during which of the following?

- F. hurricanes
- G. tornadoes
- H. volcanic eruptions
- I. earthquakes



Short Response

When Samantha was a little girl the hill by her house was pointed. Now that Samantha is grown she has noticed that the hill is no longer as pointed as it was when she was small. Explain to Samantha why the shape of the hill changed over the years.

Extended Response

Felicia wanted to know what would happen if she filled a plastic bottle full of water, capped it, and placed it in the freezer overnight. Felicia filled a bottle with water. She put the cap on it and placed it in the freezer. She left it in the freezer over night. When she got up the next morning she noticed that the plastic bottle cracked.

Part A. Explain why the plastic bottle cracked?

Part B. How does Felicia's experiment model how rocks crack?

SC.D 1.2.5 (AA) The student knows that some changes in the earth's surface are due to slow processes and some changes are due to rapid processes. (Assessed as D.1.2.4)

3rd, 4th, 5th

1. Which is an example of a rapid change that occurs to the surface of the Earth?

- A. erosion of mountains
- B. earthquakes
- C. wind and rain wearing down the surface of the rocks
- D. large rocks broken by roots of trees growing into them

2. Which is an example of a slow change in the Earth's surface?

- F. earthquake
- F. mud slide
- H. volcanic eruption
- I. erosion of mountains

SC.D 2.2.1 (CS) The student knows that reusing, recycling, and reducing the use of natural resources improves and protects the quality of life. (Assessed as G.2.2.3)

4th, 5th

1. What is an example of reducing the amount of natural resources we use?
 - A. buying cars that get better gas mileage
 - B. using natural fertilizers
 - C. making a compost pile of dead plants
 - D. participating in a beach clean up

2. Why is recycling our natural resources important?
 - F. we can makes things out of recycled materials and save resources
 - G. it saves money to recycle
 - H. many people depend on recycling for their jobs
 - I. the amount of natural resources is limited and should not be wasted.

Processes That Shape the Earth Answer Key

SC.D. 1.2.1

- 1. B** Most small rocks and sand were once part of larger rocks that have been worn down and broken apart in time by wind, rain, running water, freezing and thawing or the roots of trees or plants. This process is called erosion or weathering.
- 2. H** Fertile soil, or soil that is good for growing plants needs the nutrients that are in the humus or the organic matter of dead plants and animals. Small rocks or sand keep the mixture loose so that roots can grow and water can drain through the soil.

SC.D. 1.2.2

- 1. A**
- 2. H** The Earth is called the water planet. 75% of the surface of the Earth is covered by water. 97% of the water is salt, 1% fresh and 2% frozen.

SC.D. 1.2.3

- 1. D** As warm moist air that comes in from the ocean and moves inland, the heat from the land makes the air rise. As the air rises it cools and forms clouds. The clouds continue to rise and build as they move further inland and form storm clouds that can no longer hold the moisture and it rains.)
- 2. G** As an air mass rises to cross the mountains it cools and forms rain clouds. Before it crosses the mountains it rains. That is why the western parts of the Rocky Mountains are forests and the eastern side is dryer and has a more desert-like climate.

SC.D. 1.2.4

- 1. A** The surface of the earth is constantly changing because of a continuous process of change caused by waves, weather, and shifts in the land caused by earthquakes, volcanoes, and movement of the plates.
- 2. I** Earthquakes can shift the crust of the Earth and cause new land formations.

SR The hill near Samantha’s house was no longer pointed because of weathering. Rain, snow, wind and ice are types of weather that cause changes to Earth’s surface.

ER. Part A The bottle in Felicia’s experiment showed how water expands and cracks the bottle.

Part B The same thing happens to rocks when water freezes inside their cracks and openings. The water in the cracks expands and breaks up the rocks.

SC.D. 1.2.5

- 1. B** Earthquakes happen very rapidly.
- 2. I** Erosion of mountains is a slow process.

SC.D. 2.2.1

- 1. A** Reducing means using less of a natural resource. The only correct answer is A because by buying cars that get better gas mileage we would use less gasoline. This would help in **reducing** the amount of the natural resource oil. Oil is refined to produce gasoline. Although using natural fertilizers, making a compost pile and participating in a beach clean up are all good environmental activities, they are not examples of how we can reduce the use of a natural resource.
- 2. I** Although all answers are important to do, only I answers the question by identifying how the environment would benefit.

Strand E: Earth and Space

SC.E.1.2.1 (AA) The student knows that the tilt of the Earth on its own axis as it rotates and revolves around the sun causes changes in season, length of day, and energy available.

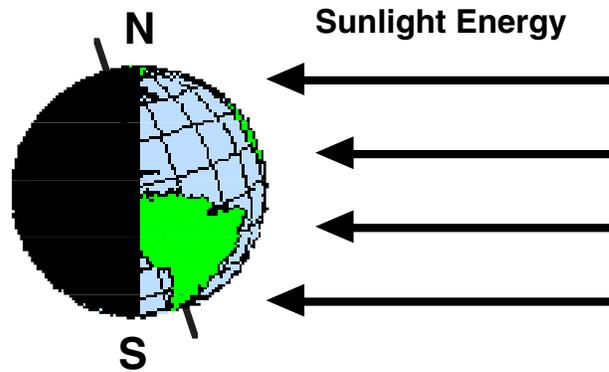
3rd, 4th, 5th

1. The Earth is tilted on its own axis as it rotates. Which of the following is caused as a result of the Earth's tilt?
 - A. changes in seasons
 - B. length of the year
 - C. day and night
 - D. moon phases

2. Which of the following is a result of the tilt of the Earth on its own axis as it revolves around the sun?
 - F. day and night
 - G. leap years
 - H. solar eclipses
 - I. length of daylight hours

Short Response

3. The diagram below shows the Earth tilted on its axis and the direction of light energy supplied by the Sun.



Describe the seasons in the Northern Hemisphere and how it compares to the seasons in the Southern Hemisphere.

SC.E.1.2.2 CS The student knows that the combination of the Earth's movement and the Moon's own orbit around the Earth results in the appearance of cyclical phases of the Moon.

3rd, 5th

1. Juan likes to look at the sky at night. He noticed that the moon seems to change its shape from day to day, but that the shapes always happen in the same order. Which of the following causes the phases of the moon?
 - A. Over the course of a month, different parts of the moon's reflected sunlight are visible from Earth.
 - B. The moon reflects differing amounts of sunlight as it revolves around the Earth.
 - C. The moon rotates more slowly than the Earth, with one rotation every 27.3 days.
 - D. The moon's orbit is shaped like an ellipse

2. Why is it difficult to see a "New Moon" from the Earth?
 - F. The positions of the moon, the Earth, and the sun allow us to see the entire sunlit half of the moon.
 - G. The moon is between the Earth and the sun, and we cannot see the sunlit half.
 - H. The moon's sunlit surface appears as a growing crescent.
 - I. The moon's sunlit part is about to disappear from Earth's view.

SC.E.1.2.3 (CS) The student knows that the sun is a star and that its energy can be captured or concentrated to generate heat and light for work on Earth.

5th

1. Many of the forms of energy we use on Earth are transformed from sunlight energy. Which of the following transforms energy from the sun?
 - A. hydroelectric dams
 - B. windmills
 - C. geothermal collectors
 - D. solar water heaters

2. Which of the following forms of energy come to Earth directly from the sun?
 - F. chemical energy and light energy
 - G. electricity and heat energy
 - H. heat energy and light energy
 - I. light energy and mechanical energy

SC.E.1.2.4 (CS) The student knows that the planets differ in size, characteristics, and composition and that they orbit the Sun in our solar system. (Also assesses E.1.2.5)

3rd, 4th

1. The planets in our solar system come in many different sizes. Which of the following is the largest planet in our solar system?

- A. Earth
- B. Saturn
- C. Jupiter
- D. Mars

2. One planet is known as the “Red Planet” due to the composition of the planet’s soil. Which planet is known as the “Red Planet”?

- F. Earth
- G. Saturn
- H. Jupiter
- I. Mars

SC.E.2.2.1 (CS) The student knows that, in addition to the Sun, there are many other stars that are far away.

4th

1. Xavier and his friend Jim were making observations one evening with identical flashlights. They observed that the farther apart they stood from one another, the dimmer their flashlights appeared to be, and the closer they came to one another, the brighter their flashlights appeared. They looked up at the night sky, which was full of twinkling stars. What conclusion might they draw about the stars from their flashlight model?
 - A. Two similar sized stars of equal distance from Earth may vary in brightness.
 - B. Two stars of differing size may be of equal brightness.
 - C. Two stars of varying brightness may be equal distances from Earth.
 - D. Two similar sized stars of equal brightness may vary in distance from Earth.

2. Jill and her father observed the Big and Little Dippers at the same time each evening for four weeks, using a tree in her yard as a reference point. They made sketches of their observations and noticed that the constellations changed their positions relative to the tree in her yard over this time period. What caused this apparent change of position?
 - F. The Earth was revolving around the sun.
 - G. The constellations were revolving through phases of the night sky.
 - H. The Earth was rotating on its axis.
 - I. The constellations were rotating around a point in the night sky.

Earth and Space

Answer Key

SC. E. 1.2.1

- 1. A** Changes in the seasons are caused due to the tilt of the Earth on its axis as it revolves around the sun.
- 2. I** The amount of daylight varies as the Earth's axis is tilted towards or away from the sun at various points in its revolution around the sun each year. Day and night are caused by the Earth's rotation. Leap years are an invention of man to keep track of time. Solar eclipses are caused by the positions of the Earth, the sun and the moon relative to one another.
- 3. SR** Due to the tilt of the Earth and the direction of sunlight energy, this part of the Earth is getting less direct rays from the sun. The Northern Hemisphere is having summer. The Southern Hemisphere is tilted more toward the sun, and getting more direct rays from the sun, so the Southern Hemisphere is having summer.

SC.E. 1.2.2

- 1. A** The moon revolves around the Earth. Depending on its position, we may see the entire moon, part of it, or none of its lit side.
- 2. G** A new moon appears dark in the sky because its lit side is facing completely away from the Earth due to its position.

SC.E. 1.2.3

- 1. D** Solar water heaters use energy from the sun to heat water for use in home and businesses.
- 2. H** Only heat and light come directly from the sun. The other forms of energy, chemical, electrical and mechanical, are transformations of heat and light.

SC.E. 1.2.4

- 1. C** Jupiter is the largest planet in our solar system. Our entire Earth could fit in the single "Giant Red Spot" located on the surface of Jupiter.
- 2. I** Mars is known as the "Red Planet". Its reddish color comes from iron that has oxidized on the surface of this planet.

SC.E. 2.2.1

- 1. D** All the statements are true, but only D can be correct based on the flashlight activity, which controlled brightness and size and used distance as the variable.
 - A -controls size and distance, with brightness as a variable.
 - B- controls brightness, with size as a variable.
 - C- controls distance, with brightness as a variable.
- 2. F** The constellations appear to change their position in the night sky because, as Earth's orbit around the sun, we see different parts of the sky.

Strand F: Processes of Life

SC.F.1.2.1 (CS) The student knows that the human body is made of systems with structures and functions that are related.

4th, 5th

1. Which human body system's primary job is to breakdown nutrients for use throughout the body?
 - A. respiratory system
 - B. digestive system
 - C. circulatory system
 - D. skeletal system

2. Daniella recorded her breathing rates and heart beat when she was exercising. Study the chart below.

<i>Five minutes of Exercise</i>					
	Resting	Jumping Rope	Running Track	Shooting Hoops	Swimming Laps
Breaths per minute	20	45	52	30	48
Heart beats per minute	55	125	148	65	145

What two body systems was Daniella focusing on with the data she recorded?

- F. muscular & skeletal system
- G. circulatory & nervous system
- H. respiratory & circulatory system
- I. nervous & excretory system

3. Based on the data in the chart, which exercise works Daniella's body more?

- A. jumping rope
- B. running track
- C. shooting hoops
- D. swimming laps

SC.F.1.2.2 (CS) The student knows how all animals depend on plants.

3rd, 5th

1. James was walking through the wooded area of a park when he noticed a family of woodpeckers living in a hole in a dead tree. He wondered why the woodpeckers were living there. What would be the main reason for the woodpeckers to live in a hole in a dead tree?
 - A. food
 - B. oxygen
 - C. shelter
 - D. water

2. Kelp forest of the oceans and trees of the rainforests benefit planet Earth in many ways. Which is a product of **BOTH** the rainforest trees and kelp forests of the world?
 - F. home to many species of fish
 - G. wood to create furniture
 - H. flowers that produce medicine
 - I. oxygen to breathe

SC.F.1.2.3 (AA) The student knows that living things are different but share similar structures

3rd, 4th, 5th

1. K.J. was reading a list of animal structures.

Structure	Animal
feathers	parrot
fur	squirrel
scales	trout
shell	clam

Which of the following **best** describes what all of the above structures provide for the animals listed?

- A. they are sensory organs
 - B. they help deliver oxygen throughout the body
 - C. they eliminate waste
 - D. they are body coverings
2. The skeleton of a mouse and the exoskeleton of a crab are similar in what **main** way?
- F. both provide a strong muscular system
 - G. both provide lungs to breath
 - H. both provide strength and body support
 - I. both provide oxygen and protection

Short Response

Think about two different plants that grow in your neighborhood. Describe two similar structures of the plants and explain how they are alike.

Extended Response

Ben and Jeri were comparing their two pets. Ben had a tree frog and Jeri had a rabbit. Describe two or more similar structures of both pets and explain how they are alike.

SC.F.1.2.4- (CS) The student knows that similar cells form different kinds of structures.

4th, 5th

1. Jenna and Cody collided at recess. Jenna put a small bag of ice on the bump on her head. Cody put a small bag of ice on the ankle that he twisted. What type of cells helped them register the pain and the coldness of the ice?
 - A. epithelial cells
 - B. nerve cells
 - C. muscle cells
 - D. connective cells

2. What type of cell is primarily at work when a snail retracts into its shell or an octopus reaches for a crab?
 - F. blood cells
 - G. nerve cells
 - H. epithelial cells
 - I. muscle cells

SC.F.2.2.1- (CS) The student knows that many characteristics of an organism are inherited from the parents of the organism, but that other characteristics are learned from an individual's interactions with the environment.

3rd, 4th, 5th

1. When you began to tie your shoes you were demonstrating what kind of characteristic?
 - A. inherited
 - B. learned
 - C. innate
 - D. recessive

2. John is the only one in his class that can roll his tongue Marina and George are double jointed. Which of the following best describes these traits?
 - F. the traits are recessive
 - G. the traits are innate
 - H. the traits are inherited
 - I. the traits are learned

Processes of Life

Answer Key

SC.F.1.2.1

- 1. B** The digestive system breaks down the foods we eat.
- 2. H** The respiratory system regulates breathing and the circulatory system regulates heart beats.
- 3. B** Running laps around the track raises her heart rate and breathing rates.

SC.F.1.2.2

- 1. C** Although woodpeckers may find mites and other insect to eat on the tree bark, the best answer is shelter. The tree provides a home for the family of birds and helps to protect them until they are old enough to fly and take care of themselves.
- 2. I** Plants in the rainforest provide oxygen for all animals. The kelp plants in the ocean help to provide oxygen for fish and other sea creatures.

SC.F.1.2.3

- 1. D** Feathers, fur, scales, and shells are all body coverings that help protect the animal.
 - 2. H** The skeleton and exoskeleton both provide body support. The mouse has an internal skeleton and the crab's skeleton is on the outside of its body.
- SR** (only two items AND explanations needed)—Both are vertebrate animals because they have backbones and an internal skeletal structure. Both animals have strong rear legs, which help them to move or hop. Both have eyes that help them sense the world around them. Both have lungs to breath air.
- ER** Comparing grass and a palm tree, both have a root system under the ground to absorb water and nutrients. Both have leaves to use during photosynthesis. Both have a seed to reproduce. Comparing a rose bush and a cactus plant, both have thorns and flowers.

SC.F. 1.2.4

- 1. B** Nerve cells send signals to the brain.
- 2. I** Muscle cells allow animals to retract or extend appendages.

SC.F. 2.2.1

- 1. B** You learned from watching someone in your environment or someone taught you how to tie your shoes.
- 2. H** Being able to roll your tongue and being double jointed are inherited traits.

Strand G: How Living Things Interact with Their Environment

SC.G.1.2.1 (CS) The student knows ways that plants, animals and protists interact.

4th, 5th

1. Lauren and her family went to a lake on a warm, sunny day. They observed that there were more tadpoles under the algae in the lake than out in the open uncovered water. How were the tadpoles interacting with the algae?
 - A. the tadpoles were using the algae for warmth
 - B. the tadpoles were using the algae for shelter
 - C. the algae was using the tadpoles for food
 - D. the algae was using the tadpoles for shelter

2. What is missing from the diagram below?

SUN --> GREEN PLANTS --> _____ --> CARNIVORE

- F. herbivore
- G. decomposer
- H. producer
- I. protist

SC.G.1.2.2 (AA) The student knows that living things compete in a climatic region with other living things and that structural adaptations make them fit for an environment.

4th, 5th

1. The ocean has many levels where different types of organisms compete. What are the most common resources that living things compete for on the ocean's surfaces?
 - A. salt, oil, water
 - B. air, sunlight, warmth
 - C. cool water, darkness, crabs
 - D. coral, sand, seaweed

2. Many forests have little grass growing directly beneath the trees. What best explains why trees are more successful than grass as they compete in this environment?
 - F. trees get more oxygen higher up
 - G. trees grow taller and get less sunlight
 - H. grass grows too slow for the sun to get to its leaves
 - I. grass gets less sunlight

Short Response

3. David is using the computer to design a polar region inhabited by animals. Think about an animal that could survive in this environment and describe at least two of its structural adaptations.

Short Response

4. Owls have many structural adaptations that help them as predators in woodland settings. Describe at least two structural adaptations of owls that make them strong predators.

SC.G.1.2.3 (AA) The student knows that green plants use carbon dioxide, water, and sunlight energy to turn minerals and nutrients into food for growth, maintenance, and reproduction

4th, 5th

1. Delaney covered both sides of a leaf on a healthy plant with a black piece of construction paper. After 7 days she observed that the covered leaf was much paler than the other leaves. What best explains why this reaction occurred?
 - A. there was an increase in chlorophyll
 - B. there was an increase in yellow pigment
 - C. there was a decrease in chlorophyll
 - D. here was a decrease in yellow pigment

2. During a drought the farmers were concerned about their orange groves. What would best help them keep healthy crops?
 - F. installing fans
 - G. rotating crops
 - H. using pesticides
 - I. using irrigation

Short Response

Name the process that green plants use to make minerals and nutrients for them to grow and reproduce. Explain how this process works.

Short Response

Troy placed similar plants in two different locations. He provided all plants with the same amount of water. He made the following data chart as he observed the two groups of plants for three weeks.

Observations				
	Location	Week 1	Week 2	Week 3
Group 1 -	near a sunny window	green healthy	green grew 2 cm	green grew 2 cm
Group 2 -	in a dark closet	green healthy	light green drooping	pale green wilted & dying

How would you explain why Group 2 plants reacted the way they did?

SC.G.1.2.4 (CS) The student knows that some organisms decompose dead plants and animals into simple minerals and nutrients for use by living things and thereby recycle matter. (assessed as G.1.2.6.)

3rd, 5th

1. JP's class went on a walk through the woods and noticed that particular areas had many mushrooms growing in it. Later that year he observed that the same areas had more new green plants growing in it than similar surrounding areas. Mushrooms have most likely changed this ecosystem in what way?
 - A. the mushrooms digested the seeds of green plants and planted them in soil
 - B. the mushrooms produced energy using photosynthesis
 - C. the mushrooms decomposed material and enriched the soil
 - D. the mushrooms provided shade for the new plants

2. What is one source of nutrients found in soil?
 - F. photosynthesis
 - G. decomposed organic materials
 - H. decomposed inorganic material
 - I. transpiration

SC.G.1.2.5 (CS) The student knows that some organisms decompose dead plants and animals into simple minerals and nutrients for use by living things and thereby recycle matter. (assessed as G.1.2.6.)

3rd, 4th, 5th

1. Study the chart below that illustrates a backyard food web.

Sun --> Flowering Penta Plant --> Zebra Butterfly -->Lizard -->Mocking Bird

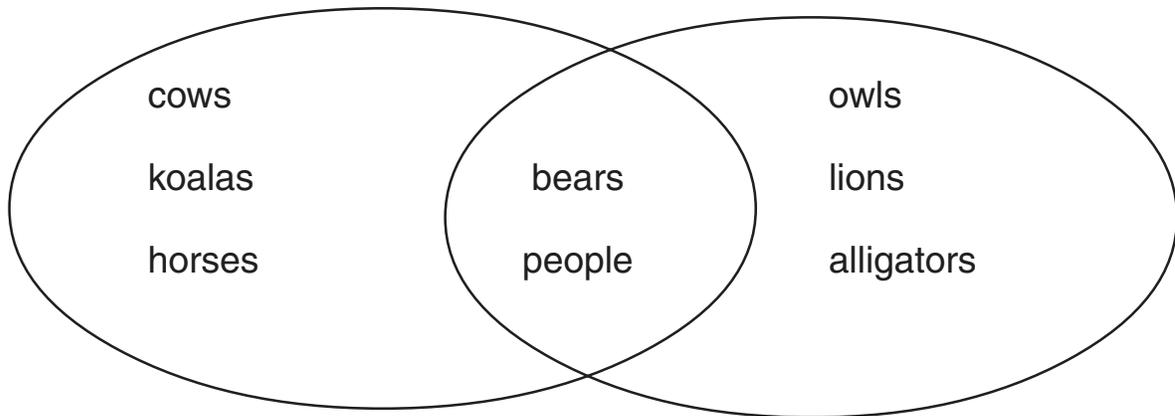
What is the flow of energy in this food chain?

- A. The mockingbird gets energy from the lizard. The lizard gets energy from the penta plant. The penta plant gets energy from the sun.
- B. The zebra butterfly gets energy from the lizard. The mockingbird gets energy from the penta plant. The penta plant gets energy from the sun.
- C. The penta plant gets energy from the sun. The mockingbird gets energy from the lizard. The zebra butterfly gets energy from the lizard.
- D. The mockingbird gets energy from the lizard. The lizard gets energy from the zebra butterfly. The zebra butterfly gets energy from the penta plant. The penta plant gets energy from the sun.

2. Olga and Ron were classifying groups of animals using a Venn Diagram. How could you label the two classification groups "A" & "B"?

A. _____

B. _____



Which of the following best describes the classification of bears and people?

- F. invertebrates – vertebrates
- G. omnivores – invertebrates
- H. herbivores – vertebrates
- I. vertebrates – omnivores

SC.G.1.2.6 (CS) The student knows that organisms are growing, dying, and decaying and that new organisms are being produced from the materials of dead organisms. (also assessed as G.1.2.5.)

3rd, 4th, 5th

1. Rotting leaves on a forest floor provide something to the dropped seeds from plants. What do the rotting leaves provide?
 - A. nutrients for the new plant's roots to absorb
 - B. chlorophyll for the new plant's leaves to absorb
 - C. mold for the new plant's seed to decay
 - D. fungus for the new plant's to eat

2. Brandon observed that when he opened a split coconut it had mold growing inside. Where was the mold getting most of its energy?
 - F. from the sun's energy
 - G. from the rainwater
 - H. from the white "meat" of the coconut
 - I. from the soil near the coconut

SC.G.1.2.7 (CS) The student knows that variations in light, water, temperature, and soil content are largely responsible for the existence of different kinds of organisms and population densities in an ecosystem)

4th, 5th

1. While walking over a bridge Ashli and Taylor noticed that most of the fish population was located in one area of the shallow pond below them. They recorded their observations over four days on the following chart:

Day	Comments	Time	# of fish Under bridge	# of fish near shore	# of fish center of pond
1	sunny/warm	noon	12	5	3
2	sunny/warm	noon	15	3	2
3	cloudy/warm	noon	6	8	6
4	sunny/warm	noon	14	3	3

What would be the best conclusion they could draw from their data that explains why the fish seemed to prefer being under the bridge?

- A. the fish population preferred to be away from shore
- B. the fish population preferred to be in the shade
- C. the fish population preferred to be away from people
- D. the fish population preferred to be in open water

2. If Johnny Appleseed had planted apple seeds in the desert, would it be likely that the plants would have thrived and flourished if enough water was provided?
- F. yes, because water would be what they needed to survive
 - G. yes, if the seeds were planted deep enough
 - H. no, because there is not enough oxygen in the desert
 - I. no, because the desert soil would not contain the needed nutrients

SC.G.2.2.1 (AA) The student knows that all living things must compete for Earth's limited resources; organisms best adapted to compete for the available resources will be successful and pass their adaptations (traits) to their offspring. (Also assessed as B.2.2.2., B.2.2.3)

4th, 5th

1. As part of their habitat is being destroyed, the osprey, a large predatory bird, must adapt to the changing environment. Parent birds choose the tallest treetops to build their nests and protect their young. As the their natural habitat is being destroyed, where might the osprey build their nests in order to adapt to this change?
 - A. telephone poles
 - B. bushes
 - C. roof tops
 - D. mail boxes

2. The seeds of the milkweed plant form in a pod that eventually bursts open. When it does, the seeds have an attached very light white feathery parachute. Which answer **best** explains how this attachment increases the milkweed offspring's chances for survival?
 - F. the seeds are eaten by birds and then dropped
 - G. the seeds are carried in water to another shore
 - H. the seeds are carried by the wind to other areas
 - I. the seeds attach to animals and carried elsewhere

Short Response

A watering hole in Africa is shared by many organisms. Elephants are one animal competing for this resource. Describe two or more adaptations that an adult elephant would pass to its offspring that allow it to obtain water.

Short Response

Certain animals have developed adaptations to establish territory or dominance. Choose an animal and describe two or more ways that it communicates dominance and territorial boundaries with other animals of the same species.

SC.G.2.2.2 (CS) The student knows that the size of a population is dependent upon the available resources within its community.

5th

1. Kayli's class recorded the number of egrets that visited a lake before and after some of the tall grasses and reeds were removed on March 15th*

Date of Visit	3/12	3/13	3/14	3/15*	3/16	3/17	3/18	3/19
Number of Egrets	12	11	10	2	5	5	4	4

What would be the best conclusion Kayli's class could make based on the data table above?

- A. The removal of the plants from the habitat negatively affected the egret population
 - B. The removal of the plants from the habitat positively affected the egret population
 - C. The egret population negatively affected the plants that were removed
 - D. The egret population positively affected the plants that were removed
2. A large population of local frogs had declined over the last few years. When the scientists researched possible explanations they came up with a few reasons. What would be the **best** choice for the decline in the frog population?
- F. neighborhood children were catching the frogs
 - G. pesticides were used to rid the area of insects
 - H. tadpoles had not yet hatched
 - I. the scientists had an inaccurate count

SC.G.2.2.3 (CS) The student understands that changes in the habitat of an organism may be beneficial or harmful. (also assessed as D.2.2.1)

4th, 5th

1. Baby sea turtles head toward light from the moon reflecting off the ocean after they hatch. The coastal residents observed many new baby sea turtle hatchlings heading away from the ocean. What change in the sea turtles' habitat had most likely confused them?
 - A. a change in the direction of the wind
 - B. their mother calling them to sea
 - C. the clouds covering the moon
 - D. the streetlights next to the beach

2. A local city recently built a sanctuary for water birds and mammals. They recorded the number of muskrats and herons in the area before, during, and after construction of the park.

	One year Before Construction	During Construction	One Year After	Two years After
# of herons	11	3	9	18
# of muskrats	10	1	2	4

Based on the information on this chart, would you say that the sanctuary was a success for the animals two years after it was built?

- F. yes, because both animals populations increased
- G. yes, for the herons, but no for the muskrat population
- H. no, for the herons, but yes for the muskrat population
- I. no, for both the herons and muskrat populations

How Living Things Interact with Their Environment

Answer Key

SC.G.1.2.1

1. B

2. F A herbivore would complete the food chain.

SC.G.1.2.2

1. B Most animals need food, sun and oxygen

2. I Grass needs sun in order to make its own food. The tall trees block the sun's light. The grass does not get enough sun needed for it to produce its own food.

3. SR One animal could be a polar bear because of its insulating layers of fat and thick fur. Another adaptation the polar bear has is the white fur that allows it to camouflage in the white snow. A third structural adaptation is the thick padding on its paws that protect its paws from the cold ice or snow on which it walks. The penguin uses many structural adaptations. For example, the ability to swim quickly in ice-cold water allows it to escape from prey. The blubber acts as an insulator from the cold temperatures. Its webbed feet combined with the fat on the belly are structural adaptations that protect the eggs from the elements.

4. SR (Only two of the following points need to be explained) An owl has many structural adaptations that help it survive as a consumer. First it has excellent vision for night hunting as well as peripheral vision. Its talons also are strong and sharp for claspng prey. The wings of an owl are designed so that the owl can swoop down on its prey with little noise.

SC.G.1.2.3

1. C The green chlorophyll is used up in the absence of sunlight and not replenished. Photosynthesis cannot occur and the leaf starts to die.

2. I Irrigating with a sprinkler type system would provide the much-needed water. Fans would increase the rate of evaporation. It is difficult to rotate crops that are trees. Pesticides would not help the plants to grow at this point because they need water to survive.

3. SR Green plants create their own energy using the process called photosynthesis.

4. SR Group 2 reacted this way because of a lack of sunlight. When sunlight was removed, the leaves were unable to photosynthesize and so the plant started to die. The healthy plants in Group 1 had what they needed to survive: water, sunlight and air.

SC.G.1.2.4

1. C The mushrooms would break down the organic material and add nutrients to the soil.

2. G Decomposed organic materials leave the soil nutrient rich.

SC.G.1.2.5

1. D This follows the flow of energy from the sun all the way to the mockingbird.

2. I Bears and people eat both plants and animals and are classified as omnivores. Both are vertebrate animals.

SC.G.1.2.6

1. A The new plant's roots will absorb some of the nutrients left behind by the rotting leaves in the soil.

2. H The mold was growing as it decomposed the meat of the coconut.

SC.G.1.2.7

1. B The fish might have been too warm in other parts of the shallow pond.

2. I It is unlikely that apple seeds would grow in a desert that has sand and high temperatures.

SC.G.2.2.1

1. A Ospreys have often used telephone poles as a platform for their nests as more land is developed by humans.

2. H The parachute catches a passing breeze and is deposited in a less populated area.

- 3. SR** The elephant's trunk allows it to obtain water while still being able to keep its head high to look out for danger. Elephants travel in groups called herds. This protects the youngest or the weakest elephants. Elephants also have a thick tough skin, which allows them to retain water longer. Most elephants are skillful swimmers as well. This behavioral adaptation is passed on to its offspring.
- 4.SR** A pet cat might establish its territory by spraying a scent on nearby trees. It might also hiss at another cat to tell it to stay away. When it arches its back and has its hair stand straight up, it appears bigger thus scaring another cat away. The tiger might use its roar to scare away other tigers. It also might scratch a tree at a boundary to mark its territory and leave a scent for other tigers.

SC.G.2.2.2

- 1. A** The population of egrets declined because they were negatively affected when the plants were removed from the lake. They lost shelter and their food resource, the small fish that they preyed on, lost their habitat.
- 2. G** The pesticides would deplete the insect population, leaving little or no food for the frogs.

SC.G.2.2.3

- 1. D** Development of hotels and installation of lights along coastlines has harmed the sea turtle population. When the turtles hatch, instead of heading toward the ocean they head toward the lights. Many are run over as they cross the road. There is an effort by many hotels to use special lights that are not very bright. This seems to be working.
- 2. G** The heron population increased from the original count, but the muskrats increased only slightly after two years.

Strand H: Nature of Science

SC.H.1.2.1 (AA) The student knows that it is important to keep accurate records and descriptions to provide clues on causes of discrepancies in repeated experiments.

3rd, 4th, 5th

1. Why is it **most** important to keep accurate records during an experiment?
 - A. Records help others repeat the experiment to get the same or almost the same results.
 - B. Records show that the experimenter is working on a project.
 - C. Records show what the experimenter did.
 - D. Records can be kept in a notebook and saved.

2. A team of students decided to repeat an experiment because the results they got were different from the group that previously did the experiment. Which of the following would be the **best** to try first?
 - F. re-test and try again
 - G. review the records and see if they did anything differently
 - H. ask an expert to see what went wrong
 - I. try another experiment to see if that one works

SC.H.1.2.2 (AA) The student knows that a successful method to explore the natural world is to observe and record, and then analyze and communicate the results.

3rd, 4th, 5th

1. Which of the following is the **best** way that scientists have success when they explore and learn about the natural world?
 - A. reading books and magazines about the natural world
 - B. going on-line to search for information
 - C. completing experiments in the lab
 - D. observing and recording, then analyzing and communicating data

2. Why do scientists publish the results of their experiments?
 - F. so that other scientists can see that they are working
 - G. to make money
 - H. so that other scientists can learn from what they did
 - I. so that publishers can print books on science

3. A number of birds that make their nests near a lake have decreased over the last three years. What should scientists do **first** to help the birds?
- A. relocate the birds to another lake
 - B. collect eggs and hatch them back in the lab
 - C. observe the lake region for a period of time and gather information
 - D. provide extra food for the birds

Short Response

When scientists make important discoveries, it is important for them to communicate this to others. Explain why.

Extended Response

Your class has decided to do an experiment to see how color effects temperature. They have covered four identical shoeboxes with different colors of construction paper and placed a thermometer in each box. They are going outside to see which box absorbs the most energy. List the steps that your class should follow to complete the experiment.

SC.H.1.2.4 (AA) The student knows that to compare and contrast observations and results is an essential skill in science. (assessed as SC.E. 1.2.2)

3rd, 4th, 5th

1. Several teams of scientists have been working on new ways to help animals after an oil spill. How can they learn to improve existing methods?
 - A. compare and contrast observations and results from previous oil spills
 - B. try new methods to see if they work
 - C. create their own methods to help the animals
 - D. ask the people who live in the area what to do

2. Cristina wants to find out if plants grow better in water than in soil. She puts a tomato plant in water and places it in the sun. What else should Cristina do to find out if plants will grow better in water than in soil?
 - F. Grow a tomato plant in soil and compare it to the one grown in water.
 - G. Add fertilizer to the plant.
 - H. Place one plant in the sun and one in the dark and compare them.
 - I. Grow some plants in soil.

SC.H.1.2.5 (CS) The student knows that a model of something is different from the real thing, but can be used to learn something about the real thing.

3rd, 4th, 5th

1. The auto industry uses dummies in test cars to see what happens when the car crashes into a wall at different speeds. Which of the following best explains why using dummies is helpful?
 - A. Dummies really tell us what would happen to a real person.
 - B. Dummies are an important tool to use to test what happens to real people in a crash.
 - C. Scientists learn a great deal from the dummies by examining what happens to them during a crash.
 - D. Dummies are good models of people.

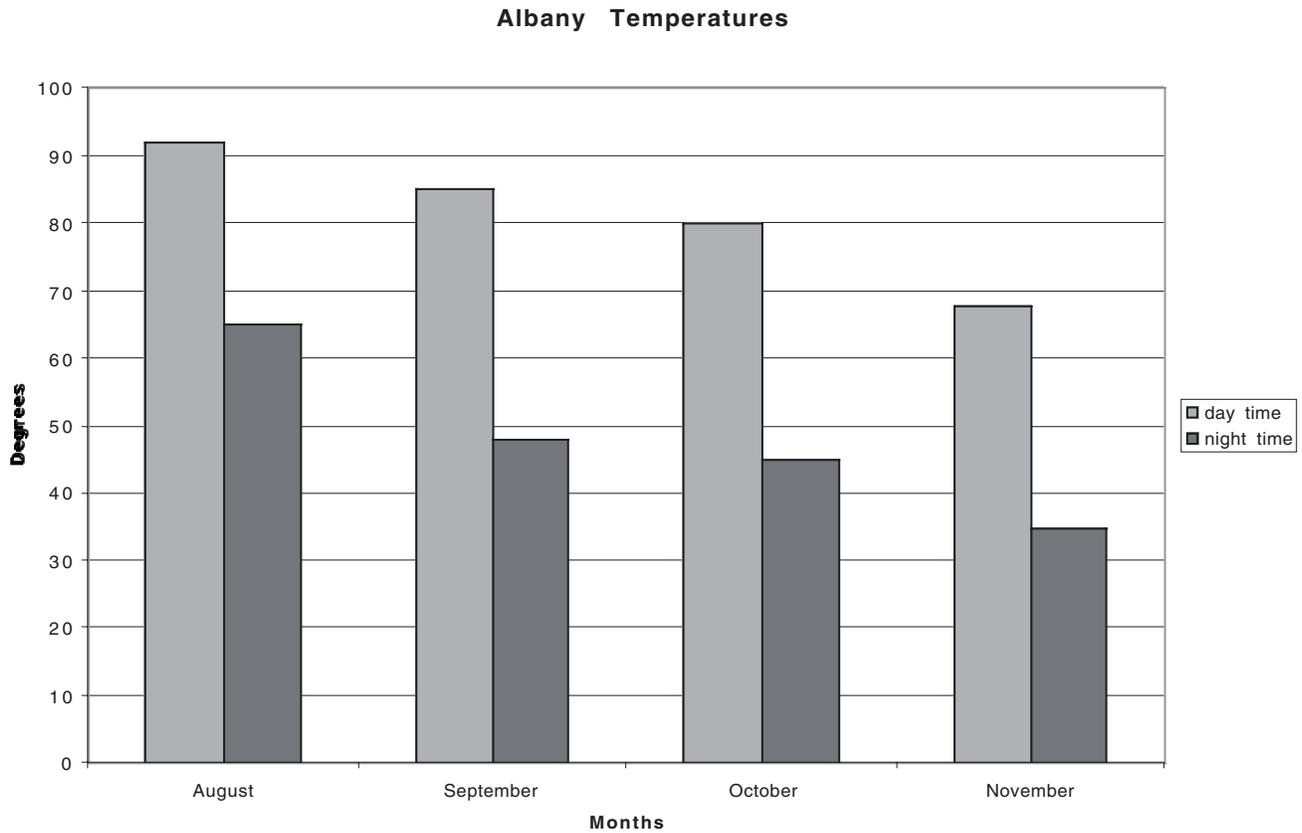
2. Scientists want to test a new type of building material to see if it would make the building stronger in an earthquake. How could they safely test this new material?
 - F. Use the material in an earthquake region and see what happens after an earthquake.
 - G. Set up a model using the new material and simulate an earthquake to see how the material works.
 - H. Use a device to measure the strength of the material.
 - I. They cannot test the material until it is used on a building during an earthquake.

SC.H.2.2.1 (CS) The student knows that natural events are often predictable and logical.

3rd, 4th, 5th

1. Mary has packed a warm jacket for her trip this summer. She is going to visit her aunt who lives high in the mountains. Why did she need to pack a jacket?
 - A. The last time she visited her aunt in the summer it was very cold at night.
 - B. She bought a new jacket and she just wanted to wear it.
 - C. Her aunt has not seen her new jacket.
 - D. Mary likes to wear jackets on vacation.

2. Using the information on the following chart, what temperature range will probably occur during October in Albany next year?



- F. 60-90 degrees
- G. 35-68 degrees
- H. 45-80 degrees
- I. 48-85 degrees

SC.H.3.2.1 (AA) The student understands that people, alone or in groups, invent new tools to solve problems and do work that affects aspects of life outside of science. (Also assesses SC.H.3.2.3)

3rd, 4th, 5th

1. Billy is packing his backpack to go on a hiking trip. Which of the following tools would come in handy the most while hiking through the woods?
- A. a hammer
 - B. a compass
 - C. a pencil
 - D. a saw

Short Response

An island off the coast had no bridge. The people on the island had to use a ferry to get to the mainland. A bridge was built to connect the island to the mainland. List changes that could occur because of the bridge.

SC.H.3.2.4 (AA) The student knows that through the use of science processes and knowledge, people can solve problems, make decisions, and form new ideas.

3rd, 4th, 5th

1. Susie decided to conduct an experiment to see what would happen to different substances when vinegar is added to them. She put a few drops of vinegar in some baking soda, some flour, and some sugar, separately. Then she recorded her observations. What scientific term is used to describe the substances she tested with the vinegar?
- A. hypotheses
 - B. specimens
 - C. variables
 - D. controls

Short Response

Marc's class designed a rocket that uses air pressure and water to test NASA's formula for the appropriate amount of fuel to use in a rocket. Describe at least two things the class will have to measure to find out if NASA's formula works for their rocket.

Nature of Science

Answer Key

SC.H.1.2.1

- 1. A** When accurate records are kept a person doing the same experiment should get similar results.
- 2. G** Records are an important step in any experiment and scientists refer back to the records of what happened to see if anything was done differently. If an experiment did not come out the same or nearly the same, then something was done differently in the second experiment and the records and observations provide important clues.

SC.H.1.2.2

- 1. D** Scientists use skills such as observing, recording observations and above all communicating the results of their work so that other can benefit.
- 2. H** When scientists publish their results it helps other to learn.
- 3. D**
- 4.SR** It is important in the scientific community to communicate results. This helps other scientists that are working on similar projects to learn from one another. It helps scientists to use their time wisely and not repeat experiment that have already been done successfully.
- 5.ER**
 1. Record the starting temperature on the thermometer in each box.
 2. Place the boxes in the sunlight and on the same surface.
 3. Wait for a set period of time, such as five minutes and record the temperature on the thermometer in each box.
 4. Wait for another set period of time and record the temperature again.
 5. Compare the results of the data that was collected.
 6. Make a list of the observations that could be made regarding the various boxes and the temperatures.
 7. From these observations, the class could be able to make some conclusions on whether the color of the box affected the temperature or not.

SC.H.1.2.4

- 1. A** Scientists compare successful methods that have been used in other situations to learn what worked and what could be changed to make it more successful.
- 2. F** Cristina needs to also put a tomato plant in soil so that she can compare the two plants. This is necessary for her to do so that she can reach a conclusion.

SC.H.1.2.5

- 1. C** Even though dummies are models of real people it is a great way to simulate what could happen to real people in a crash.
- 2. G** Scientists use models to learn about the real thing, especially when things like earthquakes cannot be easily predicted as to exactly when and where they will take place. Scientists use models that are built on a smaller scale than the real thing. They do this especially when they want to test something like a new bridge design or material for a skyscraper.

SC.H.2.2.1

- 1. A** Weather follows a pattern and can often be predicted. Mary observed the weather during her visit the summer before and knew that the climate would probably be similar.

2. H

SC.H.3.2.1

- 1. B** A compass is a tool that people often bring with them hiking to find their way when they get lost.
- 2. SR** Students should list at least 2 to three changes. Some examples of changes are:
 1. The island could have more visitors since it is easier to get to the island
 2. The island could have traffic problems due to more cars
 3. The ferryboat may stop running since people can drive to the island.
 4. More people would like to live on the island since it is easier to get there
 5. The island may have to hire a traffic officer to direct the traffic

SC.H.3.2.4

- 1. C** Variables are different items in an experiment that are tested under similar conditions.
- 2. SR** The class needs to measure the amount of water, the height of the rocket after launch and how much air pressure is pumped into the rocket.