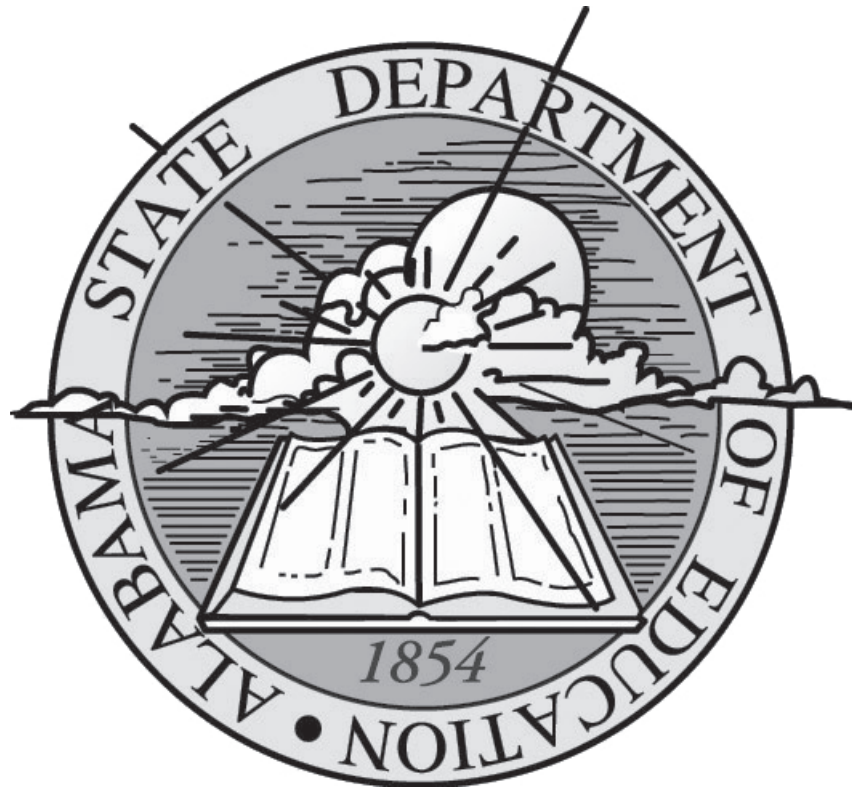


# *Alabama Science Assessment: Grade Five*

## **Item Specifications**



Dr. Joseph B. Morton  
State Superintendent of Education  
Alabama State Department of Education  
Montgomery, Alabama

December 2007

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## INTRODUCTION

This bulletin provides specific information about the *Alabama Science Assessment: Grade Five*. Educators representing each state school board district, as well as both city and county school systems, served on the committees that determined the eligible content for the *Alabama Science Assessment: Grade Five* and reviewed, revised, and approved the actual items.

The content standards for the *Alabama Science Assessment: Grade Five* are found in the *Alabama Course of Study: Science*, Bulletin 2005, No. 20, pages 39–42. The content standards for the *Alabama Science Assessment: Grade Five* are specifically referenced in this document.

Teachers must be familiar with this document if they teach content that relates to the standards measured on *Alabama Science Assessment: Grade Five*. Furthermore, teachers must use this document in focusing instruction on content standards.

An item specification has a distinct purpose and provides essential information concerning the testing of a content standard. Item specifications will follow this order:

<b>CONTENT STANDARD</b>	Broad area of content to be assessed
<b>ITEM TYPE</b>	All multiple-choice
<b>ELIGIBLE CONTENT</b>	Clarification and elaboration of a content standard (where applicable)
<b>SAMPLE ITEMS</b>	Item formats to test each content standard

The sample items in this bulletin will **not** be found on the *Alabama Science Assessment: Grade Five*. The number of sample items in this bulletin does not necessarily reflect the weight of the content on the test. The correct answer for each item is indicated by an asterisk (\*). In order to identify the weight of the content, the chart on page 2 shows the number of items for each *Alabama Science Assessment: Grade Five* content standard.

**CONTENT STANDARDS  
GRADE 5**

<b>CONTENT STANDARDS</b>	<b>POINTS POSSIBLE</b>
<b>Physical Science</b>	<b>36</b>
1. Identify evidence of chemical changes through color, gas formation, solid formation, and temperature change.	6
2. Define mass, volume, and density.	6
3. Use everyday indicators to identify common acids and bases.	6
4. Describe forms of energy, including chemical, heat, light, and mechanical.	6
5. Contrast ways in which light rays are bent by concave and convex lenses.	6
6. Compare effects of gravitational force on Earth, on the Moon, and within space.	6
<b>Life Science</b>	<b>18</b>
7. Identify common parts of plant and animal cells, including the nucleus, cytoplasm, and cell membrane.	6
8. Identify major body systems and their functions, including the circulatory system, respiratory system, excretory system, and reproductive system.	6
9. Describe the relationship of populations within a habitat to various communities and ecosystems.	6
<b>Earth and Space Science</b>	<b>12</b>
10. Identify spheres of Earth, including the geosphere, atmosphere, and hydrosphere.	6
11. Compare distances from the Sun to planets in our solar system.	6
<b>TOTAL POINTS POSSIBLE</b>	<b>66</b>

# PHYSICAL SCIENCE

## Content Standard 1

Identify evidence of chemical changes through color, gas formation, solid formation, and temperature change.

### Item Type

Multiple-choice

### Eligible Content

- Identify examples of chemical change as evidenced by color change including the changes in appearance to the Statue of Liberty and the Statue of Vulcan, the formation of rust on the USS Alabama, the production of light when a glow stick is used, changes when baking a cake, changes when cleaning a penny with vinegar and salt, and changes to ripening fruits and vegetables like green tomatoes.
- Identify examples of chemical change as evidenced by temperature change that occurs when mixing baking soda and vinegar, mixing concrete, and composting materials.
- Identify examples of chemical change as evidenced by the formation of a gas that occurs when mixing baking soda and vinegar, burning wood, baking a cake, and placing effervescent tablets in water.
- Identify examples of chemical change as evidenced by the formation of a solid that occurs when a nail rusts and the formation of rust on the USS Alabama.

**Note:** Distinguish differences between chemical and physical changes.

### Sample Multiple-Choice Items

1. A student places a pan containing liquid cake batter into a hot oven. The student observes a chemical reaction when
  - A the batter sticks to the pan.
  - \* B the cake batter changes color.
  - C steam rises from the warm cake.
  - D the pan increases in temperature.
2. A teacher mixes two liquids which are the same temperature together in a glass. A thermometer in the glass shows a temperature increase of several degrees. This change in temperature indicates
  - \* A a chemical change.
  - B a change in state of matter.
  - C a mixture has been produced.
  - D the densities of the liquids have increased.

3. Study the table below.

Compost Pile Observations

Day	Action	Observation
1	vegetable peels, eggshells, shredded newspapers, and water are placed into the compost pile	all items are mixed and look wet after adding water
5	compost pile is turned and mixed	compost pile is warmer than surrounding air
10	compost pile is turned and mixed	compost pile is warmer than surrounding air
15	no action taken	ingredients are small, crumbly, and black

The materials in this compost pile have undergone a chemical change when

- A the compost pile is turned.
- \*B the compost pile feels warm.
- C water is added.
- D vegetable peels are added.

---

4. Which activity below does *not* represent a chemical change?

- A burning logs
- B ripening pears
- C decaying leaves
- \*D melting ice cubes



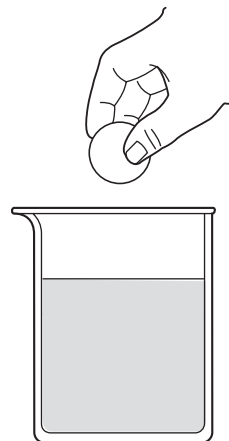
5. Which student correctly identifies evidence of a chemical change?

**Students' Observations**

Student	Action	Observation
1	hammer a nail into a board	nail appears smaller
2	hold a magnet over a paper clip	magnet attracts the paper clip
3	put a rusty metal hook in a mixture of vinegar and water	rusty metal hook becomes shiny
4	put an ice cube in a warm cup	ice cube melts

- A** student 1  
**B** student 2  
**\*C** student 3  
**D** student 4

6. A student places a solid effervescent (seltzer) tablet into a liquid. The student knows a chemical change has occurred if



- \*A** a gas is produced.  
**B** the solid tablet sinks.  
**C** a mixture is produced.  
**D** the solid tablet dissolves.

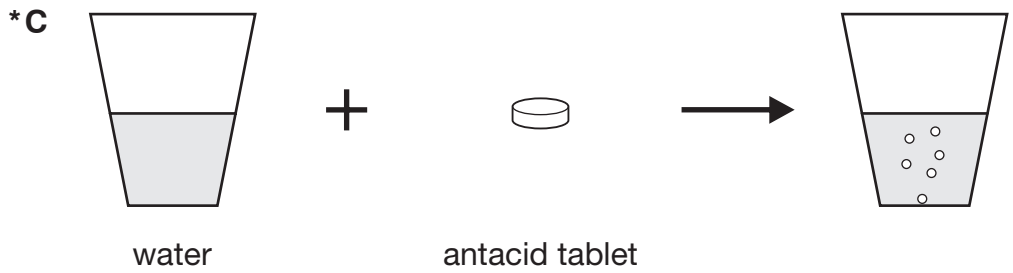
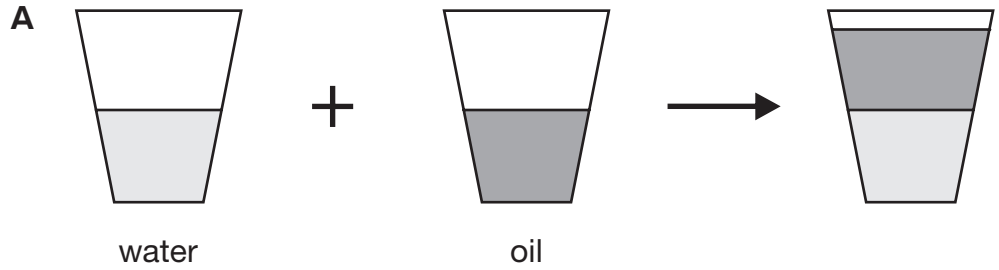
7. Students are given the following materials:

- orange juice
- warm water
- baking soda
- ice
- jar
- spoon

They placed orange juice, warm water, and ice in the jar and stirred with the spoon. Then the students added baking soda. Which observation is evidence of a chemical change?

- A** The ice melted.  
**B** The water turned orange.  
**C** The materials were mixed with a spoon.  
**\*D** The materials produced bubbles.

8. Students drew pictures of four different experiments. Which picture *most likely* represents an experiment where there was a chemical change?



## Content Standard 2

**Define mass, volume, and density.**

### Item Type

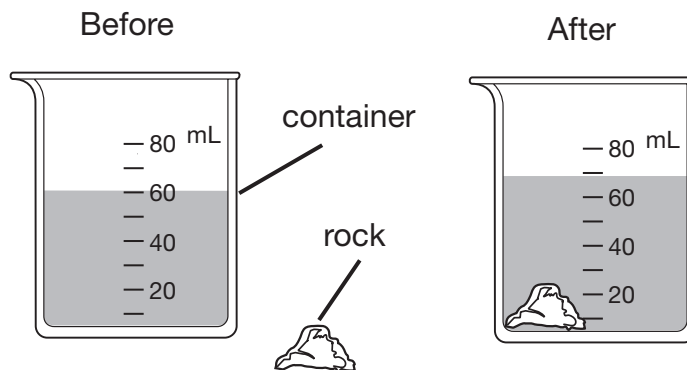
Multiple-choice

### Eligible Content

- Define mass as the amount of matter in an object.
- Define volume as the amount of space an object takes up.
- Define density as the amount of mass per unit volume.

### Sample Multiple-Choice Items

1. Students want to determine the volume of a rock. They place 60 mL of water in a container and add the rock. By calculating the change in the water level, they estimate that the rock has a volume of about 8 mL. Which characteristic of the rock is measured by the markings on the container?



- A how much matter it contains
- \*B how much space it takes up
- C the amount of gravity pulling on it
- D the amount of potential energy in it

2. A student measured four different properties of an object. The measurements were recorded in a chart. Which property of matter was X in this investigation?

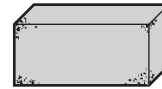
**Properties of an Object**

Property	Description of Property
W	amount of matter in the object
X	amount of space the object takes up
Y	amount of mass per unit volume of the object
Z	amount of force of gravity on the object

- A mass  
 B weight  
 \*C volume  
 D density
3. Students make four piles with an equal mass of dirt, rocks, sugar, and feathers. Which pile has the *greatest* volume?
- A a 1 kg pile of dirt  
 B a 1 kg pile of rocks  
 C a 1 kg pile of sugar  
 \*D a 1 kg pile of feathers

4. Students determine the mass and height of four objects but are unsure of the volume of each object. Which object has a high mass but would have a small volume?

\*A



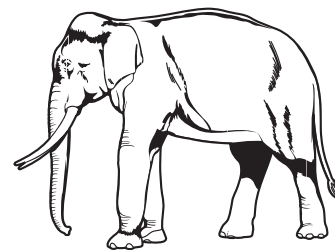
brick

B



flower

C



elephant

D



balloon

5. Which method would be used to determine the density of an object?
- A Compare the mass and the weight.
  - \*B Compare the mass and the volume.
  - C Measure the volume and multiply by the mass.
  - D Measure the length and width and multiply by two.

6. A student has two boxes that are the same size. Each box contains the same kind of shirts. Box 1 has twice as many shirts as Box 2. Which statement correctly describes the two boxes of shirts?
- A The two boxes of shirts have the same density and mass.
  - \*B The two boxes of shirts have different densities and different masses.
  - C The two boxes of shirts have the same mass, but different densities.
  - D The two boxes of shirts have the same density, but different masses.

7. What is being measured in this investigation?

**Investigation Procedures**

1. Add 100 mL of water into a 400 mL container.
2. Carefully place a rock into the container with water.
3. Measure the height of the water in the container.
4. Subtract 100 mL from the amount in step 3.

- A mass of the rock
  - B weight of the rock
  - \*C volume of the rock
  - D density of the rock
8. Two blocks of wood are the same size, but one floats in water and one sinks. This occurs because they have different
- A masses, but the same density.
  - B volumes, but the same density.
  - \*C masses and different densities.
  - D volumes and different densities.

### Content Standard 3

Use everyday indicators to identify common acids and bases.

#### Item Type

Multiple-choice

#### Eligible Content

- Recognize that red (purple) cabbage juice as a common indicator turns bright pink in the presence of an acid and green or yellow in the presence of a base.
- Recognize that grape juice turns deep red in the presence of an acid and blue in the presence of a base.
- Recognize that the color of black tea becomes lighter in the presence of an acid and darker in the presence of a base.
- Recognize the characteristics of common items as indicators contained in acids like citrus fruits, vinegar, and carbonated cola soft drinks, as well as common bases like a bar of soap, ammonia, baking soda, and antacids.

#### Sample Multiple-Choice Items

- |   |   |
|---|---|
| <p>1. An indicator changed from red to blue when students tested</p> <ul style="list-style-type: none"><li>A lemon juice.</li><li>*B a bar of soap.</li><li>C white vinegar.</li><li>D a cola drink.</li></ul> <p>2. Which item is <i>not</i> a common base?</p> <ul style="list-style-type: none"><li>*A vinegar</li><li>B bar of soap</li><li>C ammonia</li><li>D baking soda</li></ul> | <p>3. A scientist mixes rainwater and cabbage juice. The cabbage juice turns green. The scientist correctly concludes that the rainwater is</p> <ul style="list-style-type: none"><li>A neutral.</li><li>*B a base.</li><li>C an acid.</li><li>D an indicator.</li></ul> <p>4. Which group of substances would <i>most likely</i> be classified as acids?</p> <ul style="list-style-type: none"><li>A soap, ammonia, limewater</li><li>B ammonia, vinegar, baking soda</li><li>*C vinegar, orange juice, lemon juice</li><li>D orange juice, limewater, baking soda</li></ul> |
|---|---|

5. Three common substances were tested using different indicator tests and the results were recorded. Which student lists the substances in the correct order from *most* acidic to *most* basic?

**Testing pH Results**

<b>Substance</b>	<b>Indicator Test Used</b>	<b>Result</b>
ammonia	tea	Tea color darkened.
lemonade	red cabbage juice	Solution turned red violet.
milk	purple grape juice	Solution turned bright purple.

**Acids and Bases**

<b>Student</b>	<b>Substances Listed From Most Acidic to Most Basic</b>
1	ammonia, lemonade, milk
2	lemonade, milk, ammonia
3	milk, ammonia, lemonade
4	ammonia, milk, lemonade

- A student 1
- \*B student 2
- C student 3
- D student 4

6. A student is using red cabbage juice to identify acids and bases. Which table correctly groups the items tested?

A

Acids	Bases
bar of soap ammonia baking soda	citrus fruit vinegar soft drink

B

Acids	Bases
citrus fruit ammonia vinegar	bar of soap soft drink baking soda

C

Acids	Bases
ammonia vinegar soft drink	bar of soap citrus fruit baking soda

\*D

Acids	Bases
citrus fruit vinegar soft drink	bar of soap ammonia baking soda

7. A student added an unknown solution to cabbage juice, and the solution changed from purple to dark green. Which statement correctly identifies the solution?

A The solution is neutral.

B The solution is a weak acid.

C The solution is a strong acid.

\*D The solution is a strong base.



## Content Standard 4

**Describe forms of energy, including chemical, heat, light, and mechanical.**

### Item Type

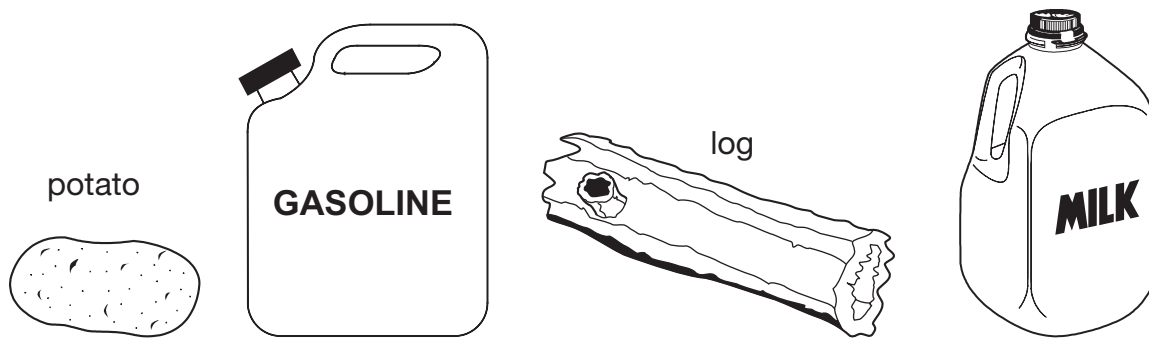
Multiple-choice

### Eligible Content

- Describe chemical energy as related to food, burning, batteries, and matches.
- Describe heat energy as related to insulation, refrigerators, air conditioners, the Sun, and a stovetop.
- Describe light energy as related to the light bulb, fire, the Sun, a flashlight, and a lightning bug or firefly.
- Describe mechanical energy as related to compressed springs, stretched rubber bands, a bow and arrow, and a hammer and nail.

### Sample Multiple-Choice Items

1. Study the objects below.



Which statement describes how these objects are alike?

- A They release light energy when they are used.
- \*B They produce heat energy when they are used.
- C None of them have chemical energy until they are used.
- D None of them have potential energy until they are used.

2. Study the picture below.



Which form of energy can a person feel from a lit candle?

- \*A heat energy
- B kinetic energy
- C chemical energy
- D mechanical energy

3. Which object *best* represents mechanical energy?

- A a leaf on an oak tree
- B the batteries in a flashlight
- \*C the wheel on a moving tractor
- D the water evaporating from a sidewalk

4. Which form of energy is stored in a flashlight battery?

- \*A chemical
- B heat
- C kinetic
- D mechanical

5. Which activity is *not* an example of chemical energy?

- A food entering a stomach
- B burning a piece of wood
- \*C sunlight coming to Earth
- D turning on a battery-powered toy

## Content Standard 5

**Contrast ways in which light rays are bent by concave and convex lenses.**

### Item Type

Multiple-choice

### Eligible Content

- Describe how the shape of a lens affects light.
- Describe what happens when light enters a lens.
- Compare concave and convex lenses and how they bend light.

**Note:** Items may use graphics to show bending of light.

### Sample Multiple-Choice Items

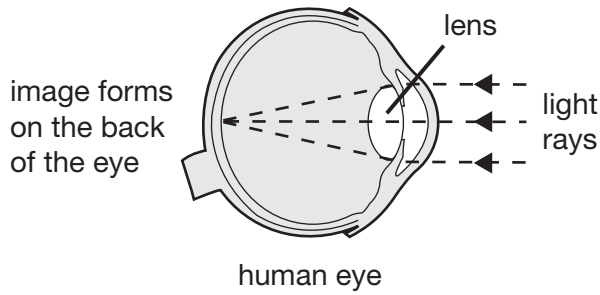
1. Which student correctly compares a concave lens and a convex lens?

**Students' Comparison of Lenses**

<b>Student</b>	<b>Concave Lens</b>	<b>Convex Lens</b>
1	will focus light rays to a single point	will spread light rays out
2	objects appear upside down	objects appear right-side up
3	will reflect most light rays backward	will bend light rays inward
4	causes light rays to spread out	bends light rays toward one another

- A student 1
- B student 2
- C student 3
- \*D student 4

2. Study the drawing below.



Which sentence correctly describes how light rays travel through the lens in the human eye?

- \*A Light rays come together through the convex lens.
- B Light rays come together through the concave lens.
- C Light rays are first spread apart and then come together through the convex lens.
- D Light rays are first spread apart and then come together through the concave lens.

3. Which student correctly identified the shape of the lens and direction that light rays are bent for a convex lens?

**How Different Lenses Bend Light**

Student	Shape Of Lens	Direction Light Rays Are Bent
1	thinner in the middle	outward
2	thinner in the middle	inward
3	thicker in the middle	outward
4	thicker in the middle	inward

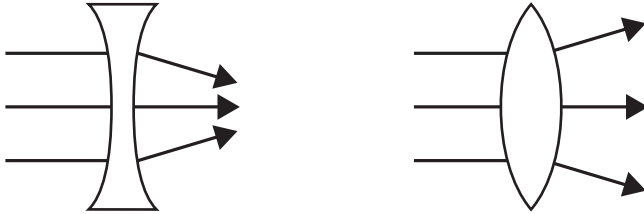
- A student 1
- B student 2
- C student 3
- \*D student 4

4. Which two drawings correctly illustrate how light rays travel through two lenses?

\*A



B



C



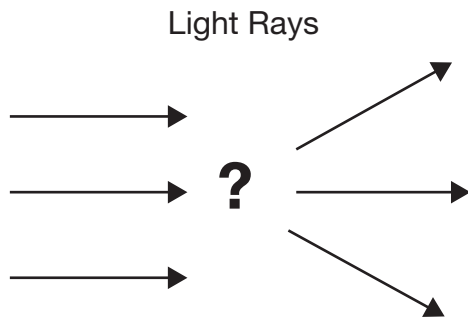
D



5. People who cannot see distant objects very well are nearsighted. They usually are given concave lenses to improve their vision. Which statement *best* describes how concave lenses improve their vision?

- A The lenses bend light rays outward to focus the image on the back of the eye instead of behind it.
- B The lenses reflect light rays inward to focus the image on the back of the eye instead of behind it.
- \*C The lenses bend light rays outward to focus the image on the back of the eye instead of in front of it.
- D The lenses reflect light rays inward to focus the image on the back of the eye instead of in front of it.

6. Study the light rays below.

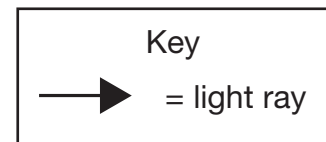
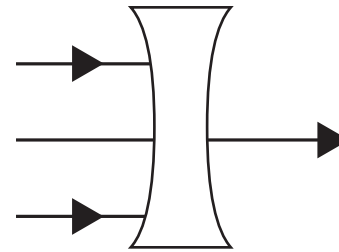


Through which object did the light rays travel?

- A a convex lens
- \*B a concave lens
- C a clear water drop
- D a clear glass window pane

7. Study the illustration below.

**Concave Lens**



Which statement describes the path of the top and bottom light rays as they travel through the lens?

- A Both light rays will bend toward the top of the lens.
- B Both light rays will come out the same direction as they came into the lens.
- C The top light ray will bend toward the bottom of the lens, and the bottom light ray will bend toward the top of the lens.
- \*D The top light ray will bend toward the top of the lens, and the bottom light ray will bend toward the bottom of the lens.

## Content Standard 6

**Compare effects of gravitational force on Earth, on the Moon, and within space.**

### Item Type

Multiple-choice

### Eligible Content

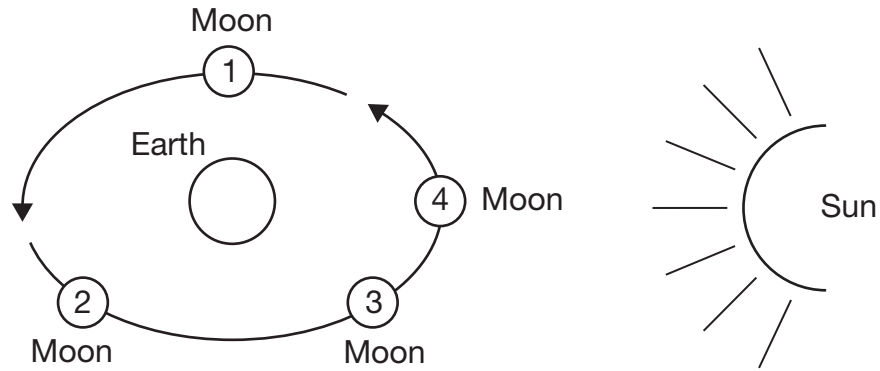
- Compare weight on Earth versus on the Moon versus in space.
- Determine if an object weighs more or less on a more massive planet.
- Recognize that mass is different than weight.
- Recognize the effects of tides on Earth.

**Note:** The Moon's gravity is approximately one-sixth that of Earth.

### Sample Multiple-Choice Items

- Planet X has the same diameter as Earth but two times the mass of Earth. The same object is weighed on the surface of Earth and on the surface of Planet X. The object would weigh about
  - the same on Planet X as on Earth.
  - one half as much on Planet X as on Earth.
  - \* twice as much on Planet X as on Earth.
  - four times as much on Planet X as on Earth.
- An object is sent to the Moon from Earth in a spacecraft. Which observation correctly describes what happens to the mass and weight of the object on the surface of the Moon?
  - Both the mass and weight of the object decrease.
  - Both the mass and weight of the object stay the same.
  - The mass of the object decreases, and the weight of the object increases.
  - \* The weight of the object decreases, and the mass of the object stays the same.

3. Which position of the Moon causes the *greatest* gravitational pull in one direction on Earth?



- A position 1
- B position 2
- C position 3
- \*D position 4

4. Study the table below.

**Astronauts' Mass and Weight Measurements on Different Objects**

Astronaut	Object in Our Solar System	Mass	Weight
X	Moon	68 kilograms	25 pounds
Y	Mars	68 kilograms	57 pounds
Z	Earth	60 kilograms	132 pounds

Which statement correctly compares the weight of two of these astronauts?

- A On Mars, astronaut Z would weigh more than astronaut Y.
- B On Earth, astronaut X would weigh more than astronaut Y.
- C On the Moon, astronaut X would weigh less than astronaut Y.
- \*D On the Moon, astronaut Z would weigh less than astronaut X.



5. Study the table below. On which two planets would an object weigh more than on Earth?

**Comparing Gravitational Pull of the Planets**

Gravitational Pull	Planet
1 (Least Pull)	Mars
2	Mercury
3	Uranus
4	Venus
5	Earth
6	Saturn
7	Neptune
8 (Greatest Pull)	Jupiter

- A Mars and Mercury  
B Uranus and Saturn  
C Venus and Mercury  
\*D Neptune and Jupiter
6. An object weighs ten pounds on the Moon. On Earth, the same object would weigh about
- A two times less.  
B two times more.  
C six times less.  
\*D six times more.

7. Which statement correctly compares an astronaut on Earth and on the Moon?
- A The mass of an astronaut is greater on Earth than on the Moon.  
B The mass of an astronaut is greater on the Moon than on Earth.  
\*C The weight of an astronaut is greater on Earth than on the Moon.  
D The weight of an astronaut is greater on the Moon than on Earth.
8. A spacecraft is traveling from Mercury to Jupiter. Where would the spacecraft experience the *greatest* gravitational force?
- A Earth  
\*B the Sun  
C the Moon  
D within space

## Content Standard 7

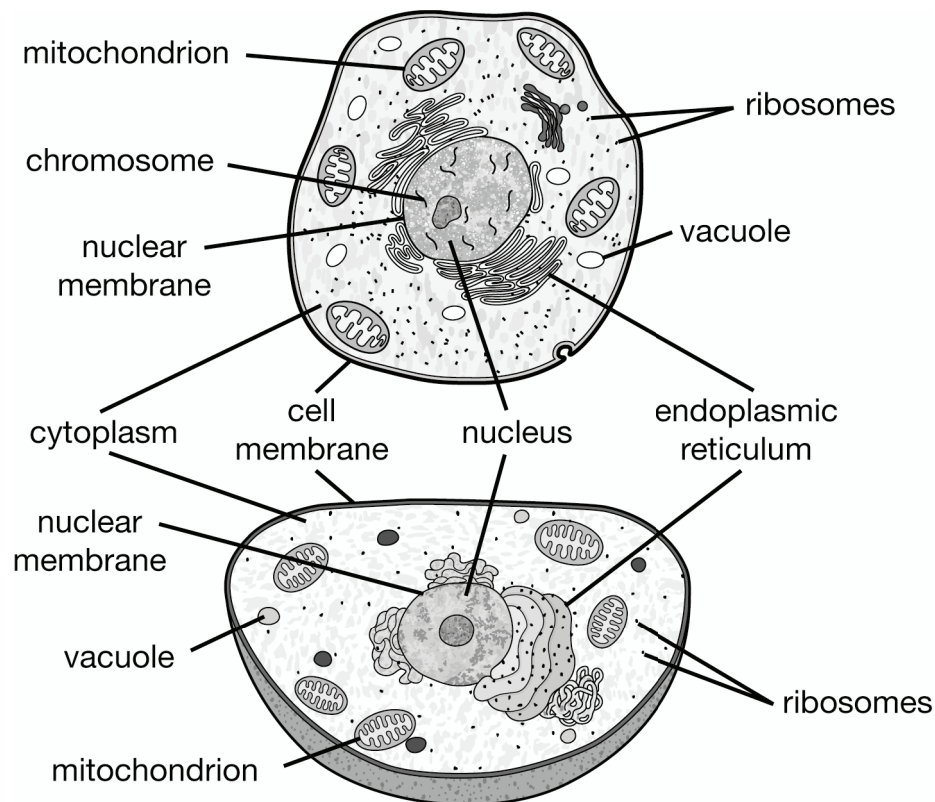
Identify common parts of plant and animal cells, including the nucleus, cytoplasm, and cell membrane.

### Item Type

Multiple-choice

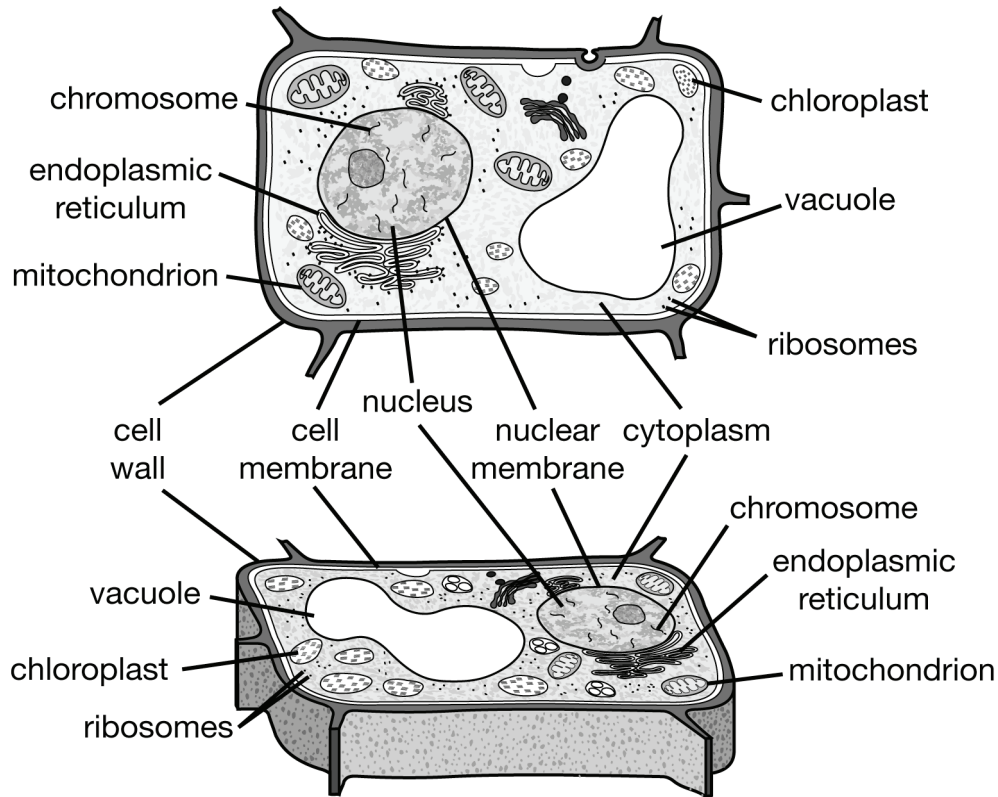
### Eligible Content

- Identify and describe the function of the nucleus.
- Identify and describe the function of the cytoplasm.
- Identify and describe the function of the cell membrane.
- Identify and describe the function of vacuoles.
- Identify and describe the function of mitochondria.
- Sample animal cell graphics:



**Note:** Compare plants and animal cells.

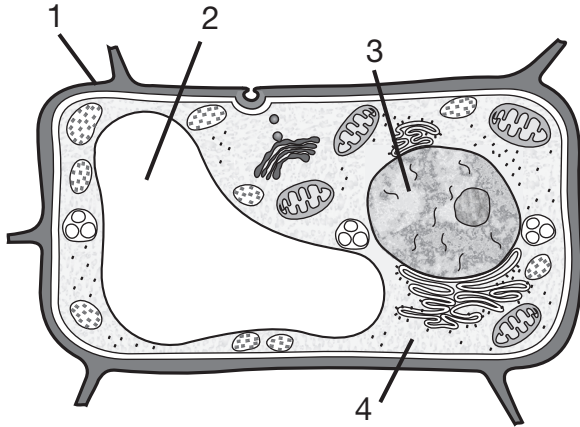
- Identify and describe the function of chloroplasts.
- Identify and describe the function of the cell wall.
- Sample plant cell graphics:



### Sample Multiple-Choice Items

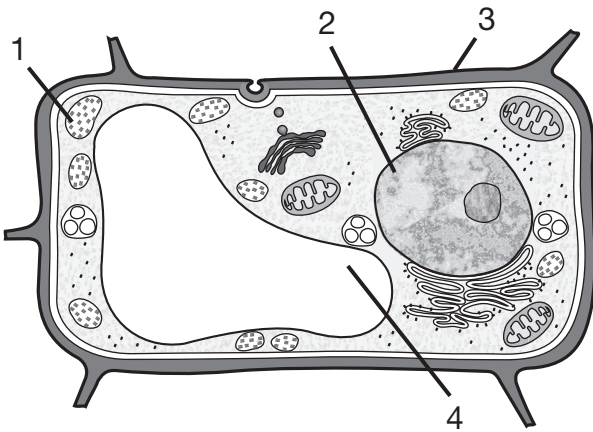
- How can a student decide if a cell is from a plant or an animal?
  - If the cell has a cell wall, it must be from a plant.
  - If the cell has cytoplasm, it must be from a plant.
  - If the cell has a nucleus, it must be from an animal.
  - If the cell has a cell membrane, it must be from an animal.
- How are chloroplasts and mitochondria similar?
  - Both capture and use the Sun's energy.
  - Both change energy from one form to another.
  - Both combine oxygen with food to produce energy.
  - Both contain chlorophyll to make food and release energy.

3. Study the plant cell below. Which part is found *only* in a plant cell?



- \*A part 1
- B part 2
- C part 3
- D part 4

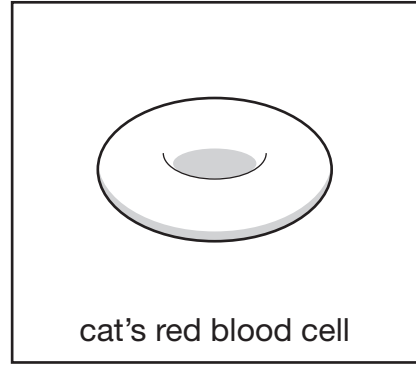
4. Which two cell parts exist in plant cells but *not* in animal cells?



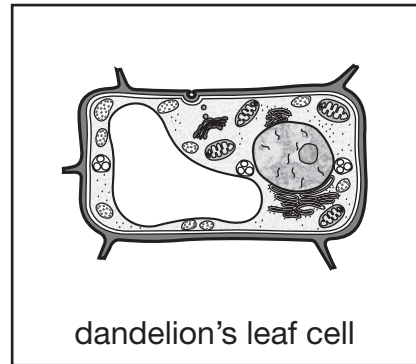
- A 1 and 2
- \*B 1 and 3
- C 2 and 4
- D 3 and 4

5. Which cell contains chloroplasts?

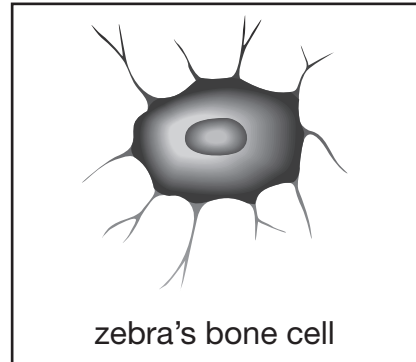
A



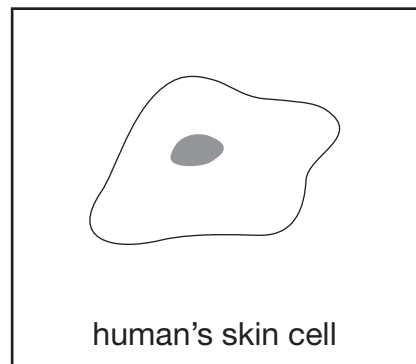
\*B



C

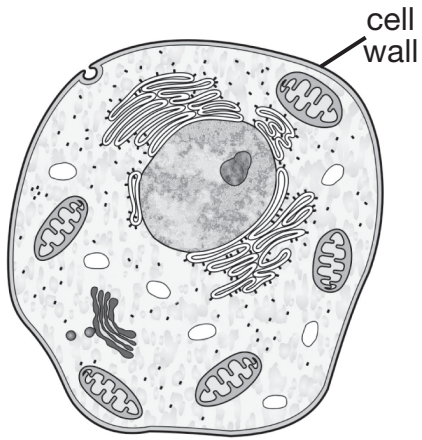


D

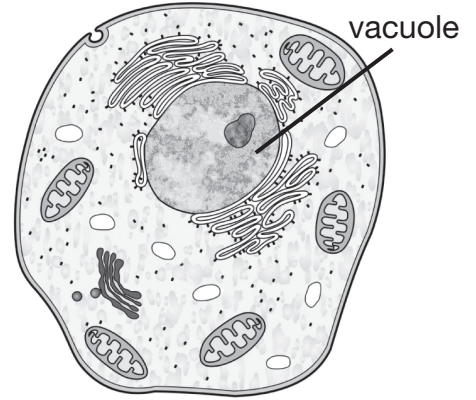


6. Which cell is labeled correctly?

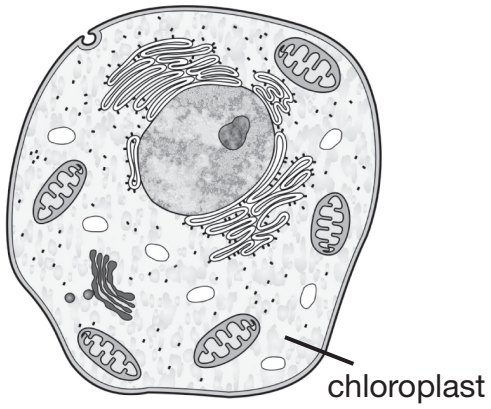
A



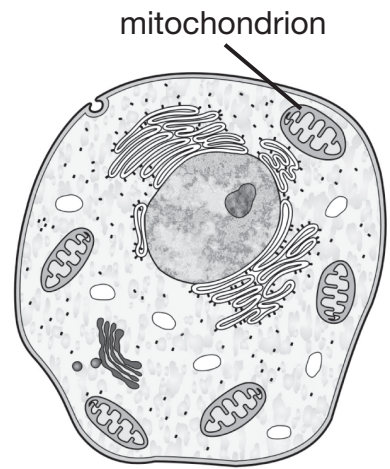
C



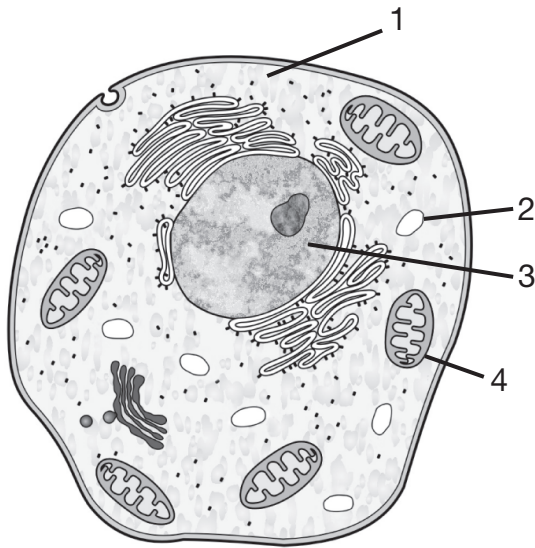
B



\*D



7. Study the cell below. In which structure are waste materials stored in the cell?



- A structure 1
- \*B structure 2
- C structure 3
- D structure 4

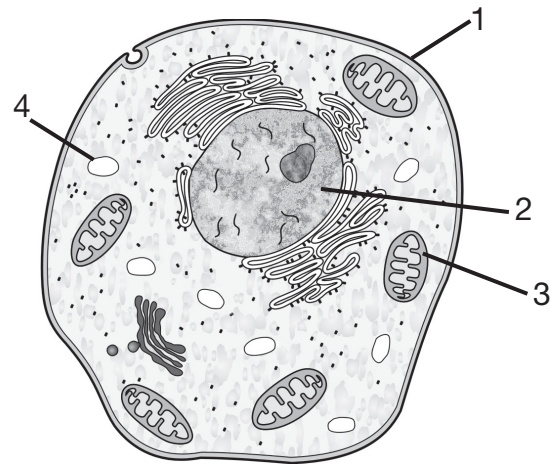
8. Which statement *best* completes the list?

**Shared Characteristics of Plant and Animal Cells**

1. Both cells have a nucleus.
2. Both cells have at least one vacuole.
3. \_\_\_\_\_

- A Both cells use sunlight.
- B Both cells have chloroplasts.
- C Both cells possess a cell wall.
- \*D Both cells contain mitochondria.

9. Which cell part contains the material necessary for controlling the activities in a bird's cells?



- A part 1
- \*B part 2
- C part 3
- D part 4

## Content Standard 8

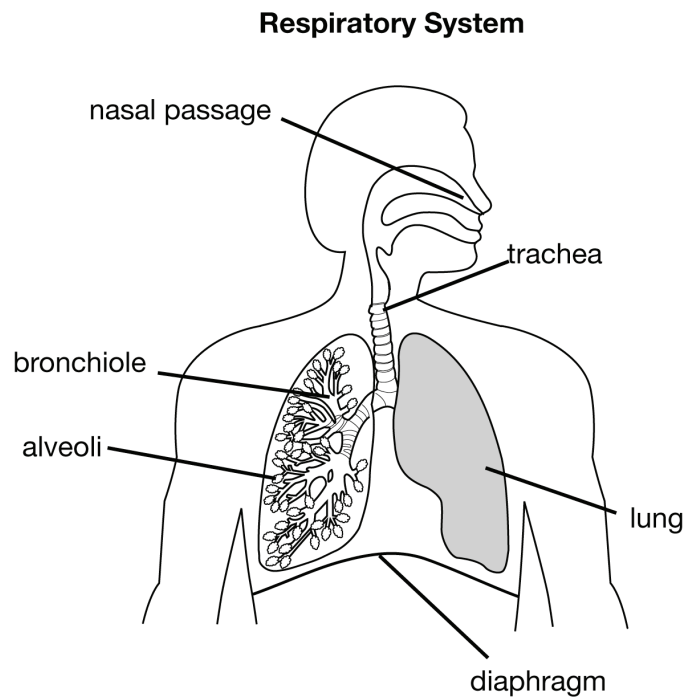
Identify major body systems and their functions, including the circulatory system, respiratory system, excretory system, and reproductive system.

### Item Type

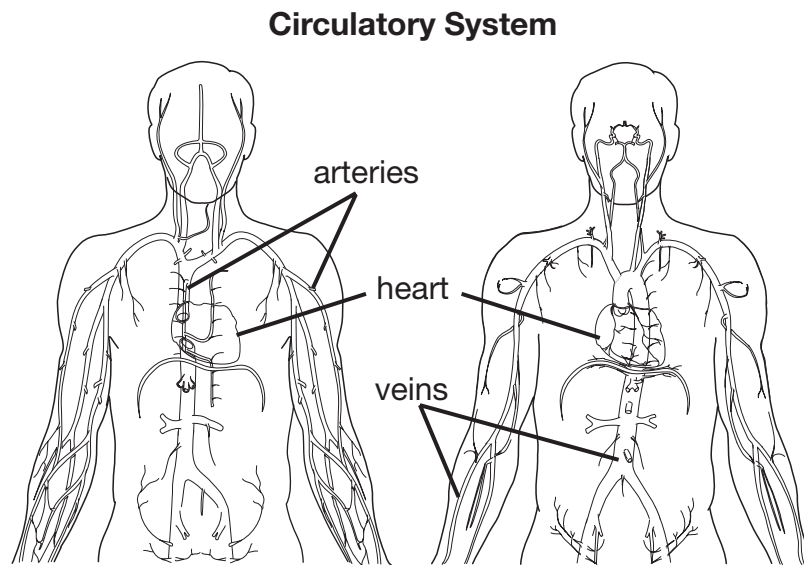
Multiple-choice

### Eligible Content

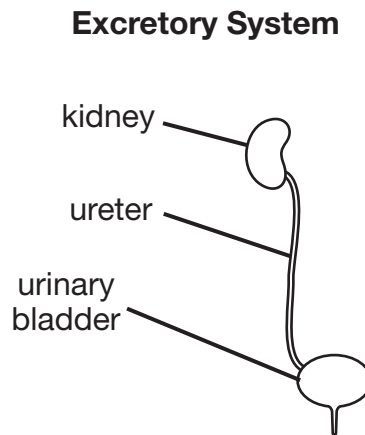
- Identify the respiratory system and its functions. Include the nasal passage, trachea, lung, diaphragm, alveoli, and bronchioles.
- Sample graphic:



- Identify the circulatory system and its functions. Include the heart, arteries, and veins.
- Sample graphic:



- Identify the excretory system and its functions. Include the kidneys, ureters, and urinary bladder.
- Sample graphic:



**Note:** The reproductive system will be addressed.

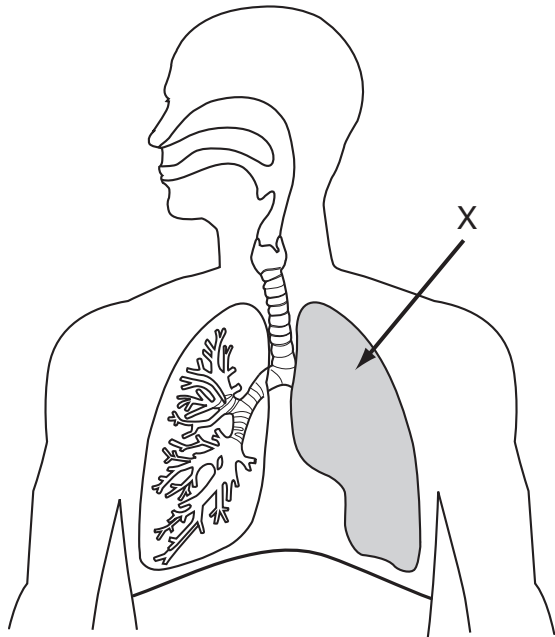
**Note:** Items may also address the interconnectedness of systems and how all systems work and function together.



## Sample Multiple-Choice Items

1. The circulatory and the excretory systems *both* aid in
- A removing oxygen from the body.
  - \*B removing waste products from the body.
  - C moving blood throughout the body.
  - D moving oxygen and nutrients throughout the body.

2. Which body system includes organ X?



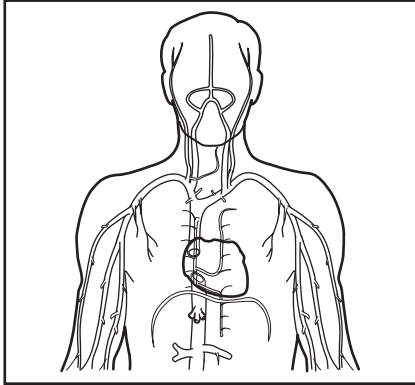
- A excretory system
- B circulatory system
- \*C respiratory system
- D reproductive system

3. A student scraped a knee while climbing a tree. Which body system responds by transporting white blood cells to the wound?
- A skeletal system
  - B digestive system
  - C excretory system
  - \*D circulatory system

4. What is a major function of the excretory system?
- A to provide the body with oxygen
  - \*B to remove wastes from the body
  - C to provide the body with support
  - D to remove carbon dioxide from the blood

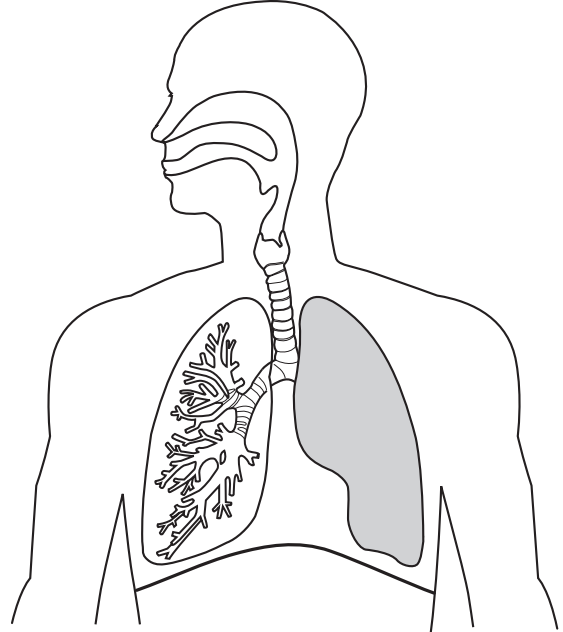
5. Which body system includes arteries and veins?
- A excretory system
  - \*B circulatory system
  - C respiratory system
  - D reproductive system

6. Which statement *best* describes a function of this body system?



- \*A It transports oxygen to cells.
  - B It filters wastes from the blood.
  - C It produces cells for reproduction.
  - D It gets oxygen from the atmosphere.
7. Which statement correctly identifies a body system and its main function?
- A The respiratory system gives the body shape and produces heat.
  - B The circulatory system provides the basic framework for the body.
  - \*C The reproductive system produces offspring.
  - D The excretory system takes in oxygen and removes carbon dioxide from blood.

8. Which statement correctly describes the body system shown in the picture?



- A The circulatory system moves blood throughout the body.
- B The respiratory system moves blood throughout the body.
- C The circulatory system moves gases in and out of the body.
- \*D The respiratory system moves gases in and out of the body.

## Content Standard 9

**Describe the relationship of populations within a habitat to various communities and ecosystems.**

### Item Type

Multiple-choice

### Eligible Content

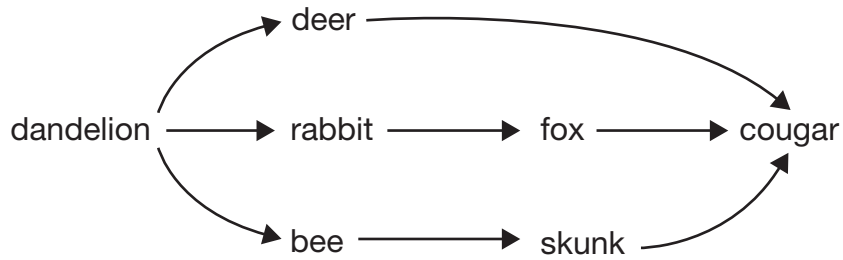
- Describe the relationships between consumers, producers, plant eaters, meat eaters, and plant and meat eaters.
- Describe the relationships associated with population, community, and ecosystem hierarchies.
- Know the terms biotic, abiotic, mutualism, commensalism, and symbiosis.

### Sample Multiple-Choice Items

1. Certain bacteria live in the digestive systems of cows. The bacteria receive nutrients from food the cows eat. This relationship is mutualistic because the cows
- A need to find extra food.
  - \*B can digest food more easily.
  - C inherit a dangerous disease.
  - D develop painful stomach cramps.

2. Kudzu is a common plant found in Alabama. Which statement correctly describes a relationship between kudzu and an abiotic factor in an ecosystem?
- A A deer eats kudzu.
  - \*B The Sun helps kudzu grow.
  - C Kudzu vines cover nearby trees.
  - D Kudzu leaves provide shelter for insects.

3. Study the food web below.



Using this food web, which statement *best* describes a relationship between the populations in this community?

- A The skunks provide energy to the bees.
- \*B The rabbits provide energy to the foxes.
- C The deer receive energy from the cougars.
- D The dandelions receive energy from the bees.

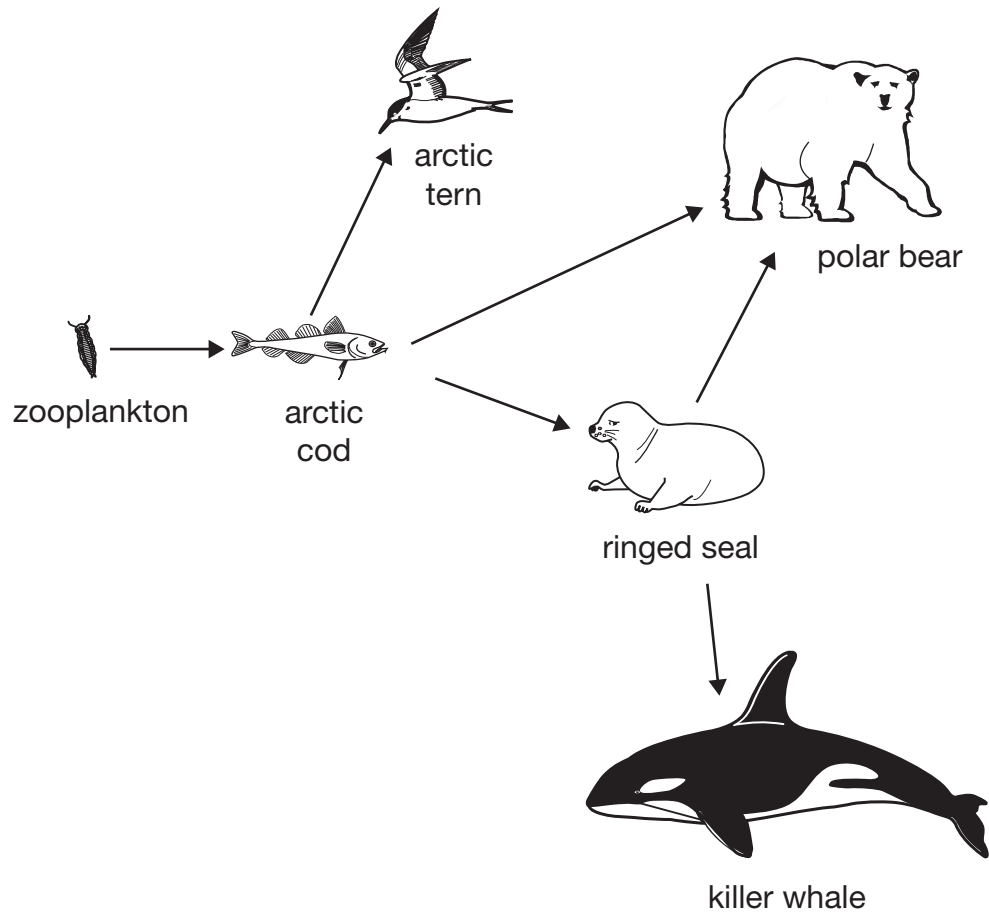
4. Which statement describes a mutualistic relationship between populations of insects and wildflowers in a prairie ecosystem?

- \*A Both the insect and wildflower populations benefit from one another.
- B Both the insect and wildflower populations are unaffected by one another.
- C The wildflower populations are harmed, but the insect populations benefit.
- D The insect populations are harmed, but the wildflower populations benefit.

5. A certain species of vine grows on the trunk of a tree. The vine uses the tree to help it reach sunlight. Its relationship with the tree is a type of symbiosis called commensalism. This relationship means that

- A the vine takes nutrients from the tree.
- B the vine chokes the tree limbs that it surrounds.
- \*C the tree is not harmed by the climbing vine.
- D the tree benefits from having the vine grow on it.

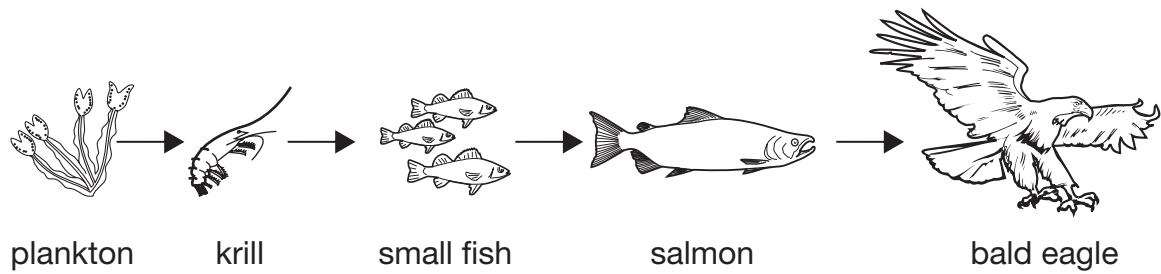
6. Study the food web below.



Which statement *best* describes the flow of energy in this food web?

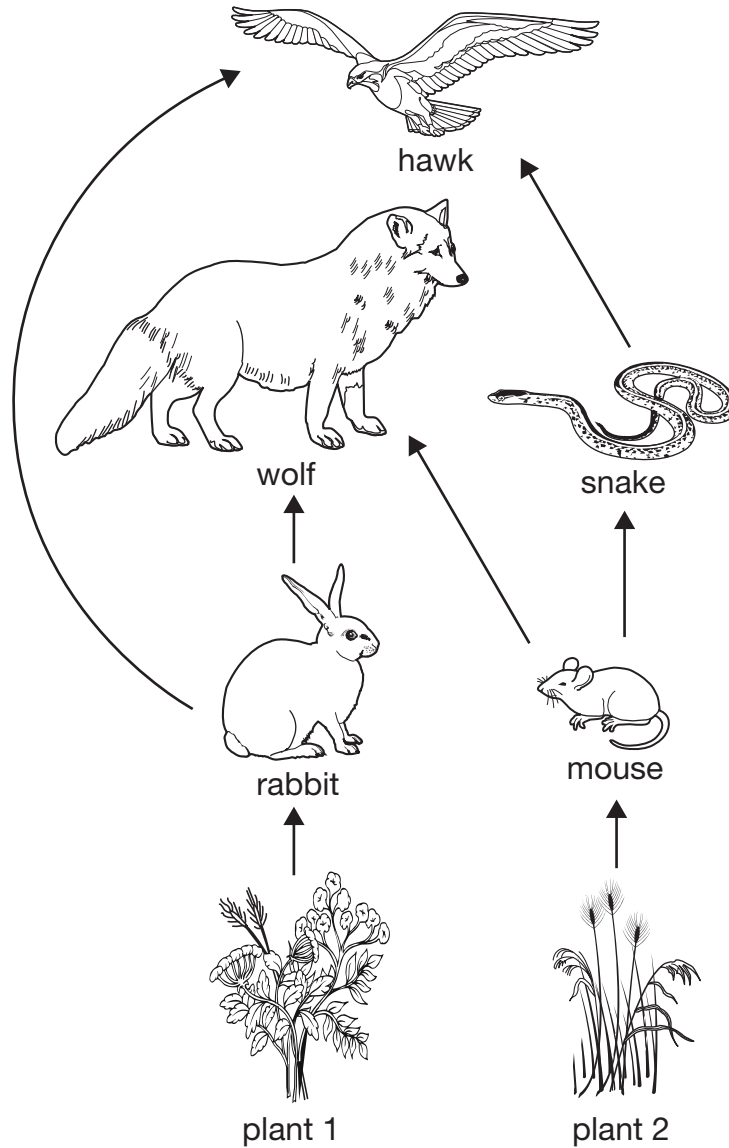
- A The arctic tern provides energy to the arctic cod.
- B The polar bear provides energy to the ringed seal.
- C The killer whale provides energy to the ringed seal.
- \*D** The zooplankton provides energy to the arctic cod.

7. How would the community *most likely* change if krill were removed?



- A The salmon population would increase.
- B The small fish population would increase.
- C The plankton population would decrease.
- \*D The bald eagle population would decrease.

8. Which statement describes what would *most likely* happen if snakes were removed from this food web?



- A The rabbits would eat more wolves.
- \*B The hawks would eat more rabbits.
- C The wolves would eat fewer mice.
- D The mice would eat fewer seeds.

## Content Standard 10

Identify spheres of Earth, including the geosphere, atmosphere, and hydrosphere.

### Item Type

Multiple-choice

### Eligible Content

- Identify the geosphere as the layer on Earth where rocks are formed and where volcanoes, caves, and earthquakes exist.
- Identify that the atmosphere is where weather occurs.
- Identify that the hydrosphere contains Earth's liquid water.
- Know the prefixes geo-, hydro-, and atmos-.
- Distinguish between the parts of the different spheres.
- Recognize that the water cycle is associated with all spheres.

### Sample Multiple-Choice Items

1. Orbiting weather satellites would be found in which of these layers?

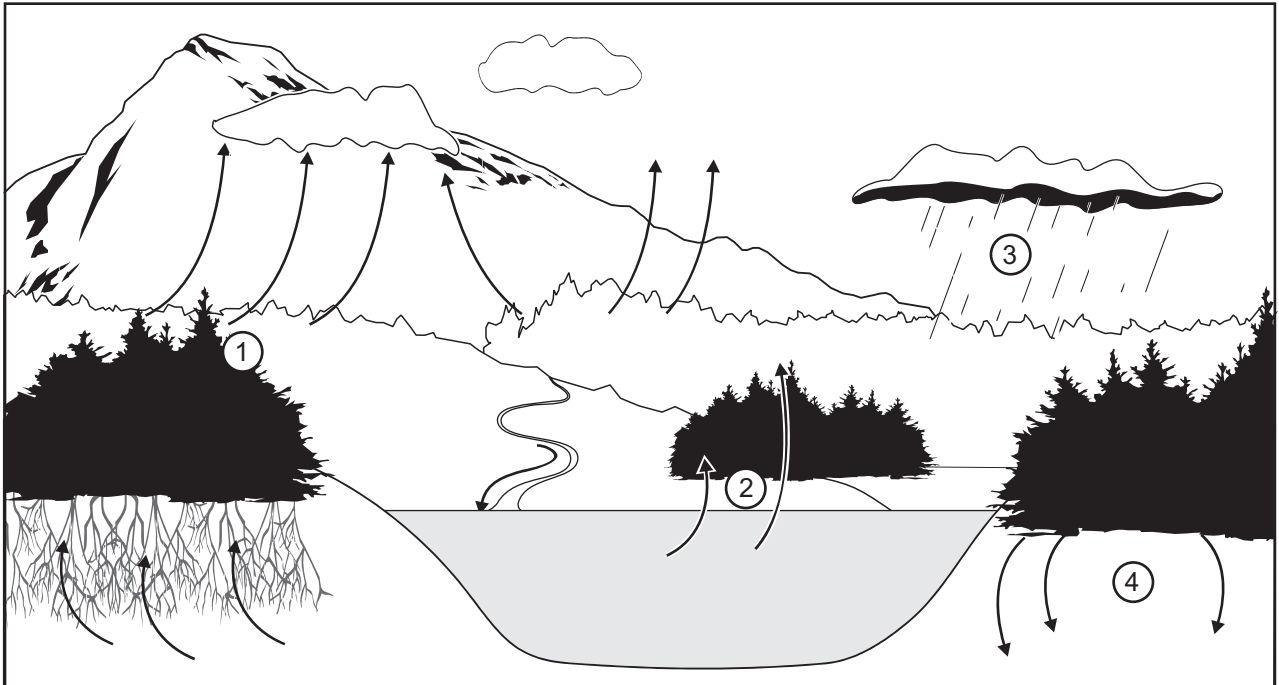
- \*A atmosphere
- B geosphere
- C hydrosphere
- D lithosphere

2. In which two spheres of Earth are the effects of both volcanoes and earthquakes found?

- \*A geosphere and hydrosphere
- B geosphere and mesosphere
- C stratosphere and hydrosphere
- D stratosphere and thermosphere



3. Which part of the water cycle occurs in both Earth's geosphere and hydrosphere?



- A 1  
B 2  
C 3  
\*D 4

4. Which statement describes an activity that takes place in the hydrosphere?
- A Lava from a volcano hardens to form new rocks.
- B When warm air rises, cooler air flows in, creating wind.
- C Harmful rays from the Sun are absorbed by gas particles.
- \*D Water soaks through rocks and soil to underground caves.

5. Which statement *best* describes the location of a mountain?
- A It is a part of the stratosphere found above the geosphere.
- \*B It is a part of the geosphere found beneath the atmosphere.
- C It is a part of the atmosphere found above the hydrosphere.
- D It is a part of the hydrosphere found beneath the troposphere.

6. Which student has correctly selected *all* the spheres that a tornado may affect?

**Spheres of Earth that Tornadoes Affect**

Student	Hydrosphere	Geosphere	Atmosphere
1	X		
2	X	X	X
3		X	
4	X	X	

- A student 1
- \*B student 2
- C student 3
- D student 4

- 
7. Water evaporating from the surface of a lake moves from the
- A atmosphere to the geosphere.
  - B geosphere to the hydrosphere.
  - \*C hydrosphere to the atmosphere.
  - D atmosphere to the hydrosphere.

## Content Standard 11

### Compare distances from the Sun to planets in our solar system.

#### Item Type

Multiple-choice

#### Eligible Content

- Relate each planet's distance from the Sun to the planet's characteristics.
- Compare characteristics of the planets based on their distances from the Sun.
- Know that revolution is based on the distance from the Sun.
- Compare the relative distance, in miles and/or kilometers (km), between planets and the Sun.

**Note:** Items will not involve calculations.

#### Sample Multiple-Choice Items

1. Which statement *best* describes Mars' distance in relation to the Sun?  
**A** It is closer to the Sun than is Earth.  
**\*B** It is closer to the Sun than is Jupiter.  
**C** It is farther from the Sun than is Saturn.  
**D** It is farther from the Sun than is Neptune.
2. Which of these planets is farthest from the Sun?  
**A** Jupiter  
**\*B** Neptune  
**C** Saturn  
**D** Uranus

3. Study the table below. A planet closer to the Sun takes less time to orbit the Sun one time. According to the table, which planet is closest to the Sun?

**Planets and Their Orbits**

<b>Planet</b>	<b>Time to Orbit the Sun One Time</b>
Jupiter	about 12 Earth years
Mars	about 687 Earth days
Mercury	about 88 Earth days
Neptune	about 165 Earth years

- A** Jupiter
- B** Mars
- \*C** Mercury
- D** Neptune

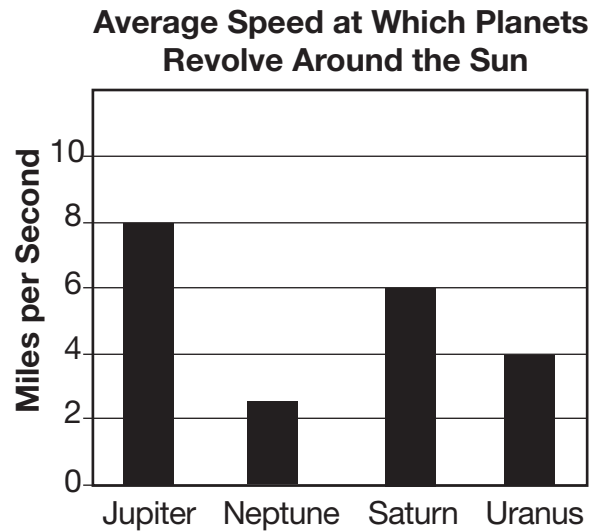
4. In general, planets that are farther from the Sun have cooler surface temperatures. Which of these four planets is the *third closest* to the Sun?

**Planets and Their Temperatures**

Planet	Average Surface Temperature
Jupiter	-166 degrees F
Mars	-76 degrees F
Mercury	662 degrees F
Venus	900 degrees F

- A Jupiter
  - \*B Mars
  - C Mercury
  - D Venus
5. Light from the Sun is traveling through space. Which statement describes its path?
- A The light will reach Venus before it reaches Mercury.
  - \*B The light will reach Earth before it reaches Uranus.
  - C The light will reach Saturn before it reaches Mars.
  - D The light will reach Neptune before it reaches Jupiter.

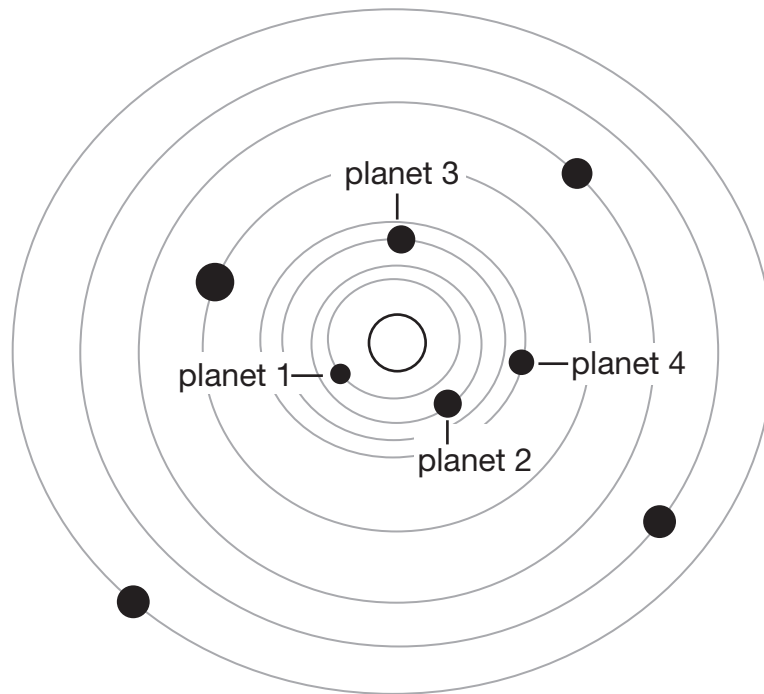
6. Study the bar graph below. The farther a planet is from the Sun, the slower its average orbiting speed. According to the graph, which planet is *farthest* from the Sun?



- A Jupiter
- \*B Neptune
- C Saturn
- D Uranus

7. The Sun is at the center of our solar system. What is the name of planet 3?

### Solar System



- \*A Earth
- B Mars
- C Mercury
- D Venus







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