

2015-2016

5th Grade Milestones Study Guide



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Atlanta Public Schools

2015-2016

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Georgia Milestones Study Guide

5th GRADE

The Grade 5 Science EOG assessment has a total of 75 selected-response (multiple-choice) items only.

Sample Questions

(DOK 1: Life Science)

Standard: S5L3 Students will diagram and label parts of various cells (plant, animal, single-celled, multi-celled).

b. Identify parts of a plant cell (membrane, wall, cytoplasm, nucleus, chloroplasts) and of an animal cell (membrane, cytoplasm, and nucleus), and determine the function of the parts.

Standard: S5CS4 Students will use ideas of system, model, change, and scale in exploring scientific and technological matters. a. Observe and describe how parts influence one another in things with many parts.

Q1. Which of these BEST describes the function of the cell membrane?

- A. It produces energy for cell functions.
- B. It is responsible for cell reproduction.
- C. It controls what enters and leaves the cell.
- D. It stores water and nutrients until needed by the cell.

Explanation of Correct Answer: The correct answer is choice **(C)** It controls what enters and leaves the cell. Choice (A) is incorrect. Energy is manufactured elsewhere in the cell. Choice (B) is incorrect because the membrane is not responsible for cell reproduction. Choice (D) is incorrect because the function of storing materials is done elsewhere in the cell.

(DOK 1: Earth Science)

Standard: S5E1. Students will identify surface features of the earth caused by constructive and destructive processes. a. identify surface features caused by constructive processes.

Q2. Which of these landforms is formed by deposition?

- A. A mountain near a lake
- B. A canyon between two cliffs
- C. A delta near the mouth of a river
- D. A pool at the bottom of a waterfall

Explanation of Correct Answer: the correct answer is choice **(C)** a delta near the mouth of a river. Deposition is the process by which sediments settle over time. As a river flows into a larger water body, the river slows. This allows sediments in the water to sink to the ground. Over time, the sediments build up to form a delta. Choice (A) is incorrect because a mountain is formed by the movement of earth's tectonic plates. Choice (B) is incorrect because a canyon is typically formed through erosion: as a river flows across the land, its water picks up and carries away sediments. Choice (D) is incorrect because deposition refers to the settling of sediments, not the pooling of water

(DOK 2: Life Science)

Standard: S5E3. Students will diagram and label parts of various cells (plant, animal, single-celled, multi-celled. c. explain how cells in multi-celled organisms are similar and different in structure and function to single-celled organisms.

Q3. A scientist uses a microscope to compare tiny multi-celled and single-celled organisms.

Which statement about multi-celled and single-celled organisms is true?

- A. Multi-celled organisms can reproduce, but single-celled organisms cannot
- B. Multi-celled organisms have cell membranes, but single-celled organisms do not
- C. Multi-celled organisms can move within their environment, but single-celled organisms cannot
- D. Multi-celled organisms have different cells for different jobs, but single-celled organisms do not.

Explanation of Correct Answer: The correct answer is choice **(D)** Multi-celled organisms have different cells for different jobs, but single-celled organisms do not. A single-celled organism consists of only one cell that can perform all the necessary life functions. In contrast, multi-celled organisms have cells that have adapted to perform specific functions. Choices (A) and (C) are incorrect because both single-celled and multi-celled organisms can reproduce and move within their environments. Choice (B) is incorrect because all cells have cell membranes.

(DOK 2: Physical Science)

Q4. A teacher is demonstrating physical and chemical changes to her class.

Which action should she use to demonstrate a chemical change?

- A. cutting a piece of paper
- B. folding a piece of paper
- C. tearing a piece of paper
- D. burning a piece of paper

Explanation of Correct Answer: The correct answer is choice **(D)** burning a piece of paper. Chemical changes occur when matter is changed from one form to another without creating a new substance. When paper is burned, new substances (smoke and ash) are created. Choices (A), (B), and (C) are incorrect because they all represent physical changes. The paper is changed, but a new substance is not created.

(DOK 3: Physical Science)

Standard: S5P2 Students will explain the difference between a physical change and a chemical change. b. Recognize that the changes in state of water (water vapor/steam, liquid, ice) are due to temperature differences and are examples of physical change.

Standard: S5CS8 Students will understand important features of the process of scientific inquiry. a. Scientific investigations can take many different forms, including observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments.

Students observed as small drops of water collected on the outside of a glass.



Q5. Which statement BEST describes why the water vapor in the air formed liquid water on the outside of the glass?

- A. The humidity outside the glass turns the vapor to liquid water.
- B. The water vapor pulls the water from inside the glass to outside the glass.
- C. The temperature of the water inside the glass is colder than the air outside the glass.
- D. The temperature of the water inside the glass is warmer than the air outside the glass.

Explanation of Correct Answer: The correct answer is choice **(C)**. The temperature of the water inside the glass is colder than the air outside the glass. The cold temperature on the outside of the glass causes the water vapor on the outside of the glass to form liquid water on the surface of the glass. Choices (A) and (B) are incorrect. The humidity level is not as important to the formation of water vapor as the lower temperature. Choice (D) is incorrect because water vapor would not form on the outside of a glass that is warmer than the air that surrounds the glass.

(DOK 3: Physical Science)

Standard: S5P2. Students will explain the difference between a physical change and a chemical change. c. Investigate the properties of a substance before, during, and after a chemical reaction to find evidence of change.

Q6. A group of students is performing an experiment in science class. The students drop an antacid tablet into a glass of water. The antacid tablet begins to dissolve and bubbles start to form.

Which would MOST LIKELY explain why bubbles are formed?

- A. The antacid tablet is chemically changing because gas is being released.
- B. The antacid tablet is chemically changing because a solid is changing shape.
- C. The antacid tablet is physically changing because the water becomes cloudy.
- D. The antacid tablet is physically changing because the water is getting very warm.

Explanation of Correct Answer: the correct answer is choice **(A)** the antacid tablet is chemically changing because gas is being released. The antacid tablet consists of certain chemicals that react with the chemicals in the water. As a result of this reaction, new substances form; some of these new substances take the form of gas that bubbles out of solution. Choice (B) is incorrect because a change of shape is an example of a physical change, not a chemical change. Choices (C) and (D) are incorrect because the release of gas bubbles is a sign of a chemical change. In addition, the change in shape of the antacid table is not caused by the water becoming cloudy or getting very warm.

(DOK 3: Physical Science)

Standard: S5P3. Students will investigate the electricity, magnetism, and their relationship. d. Compare a bar magnet to an electromagnet.

Q7. A scientist is going to conduct research in the forest. She will bring a magnet as one of her research supplies.

Which magnet would be BEST for the scientist to bring on her trip to the forest and why?

- A. A bar magnet because it has two different poles
- B. An electromagnet because its strength is constant
- C. A bar magnet because it does not need a power source
- D. An electromagnet because it can attract more materials

Explanation of Correct Answer: the correct answer is choice **(C)** a bar magnet because it does not need a power source. In the forest, the scientist may not have access to a source of electricity, but she can use a bar magnet regardless. Choice (A) is incorrect because all magnets have two different poles. Choice (B) is incorrect because an electromagnet's strength depends on the current that flows through it. Choice (D) is incorrect because an electromagnet may be stronger than a bar magnet, but it does not attract more materials.

Standards/Units	Dates	Number of Items	Question #'s
Cells & Microorganisms (LS)	8/17 – 9/14	6 Items	1-4 (Samples 2,9)
Classification (LS)	10/15 – 11/5	5 Items	5-8 (Sample 10)
Genetics (LS)	9/16 – 10/13	5 Items	9-12 (Sample 1)
Electricity/Magnetism (PS)	1/12 – 2/26	6 Items	13-16 (Samples 3,6)
Chemical & Physical Change (PS)	11/9 – 1/8	5 Items	17-20 (Sample 4)
Earth Science (ES)	3/1 – 3/31	7 Items	21 – 24 (Samples 5, 7, 8)
Total	N/A	34 Items	1 - 34

SAMPLE QUESTIONS

1. A student grouped his classmates based on certain characteristics. The table shows the characteristic used to describe each group.

Student Characteristics

Group	Characteristic
1	Tall height
2	Brown eyes
3	Ride bicycles
4	Like spaghetti

Which two groups are described by an inherited characteristic?

- A. Group 1 and Group 2
- B. Group 1 and Group 4
- C. Group 2 and Group 3
- D. Group 3 and Group 4

2. Microorganisms were discovered after the microscope was invented in the 1600s. Since then scientists have found ways that microorganisms can be harmful.

Which of these describes one way that some microorganisms are harmful?

- A. They are used to make certain types of food
- B. They are used to make certain fuels for energy
- C. They cause diseases that can be spread to others
- D. They break down waste matter in the environment

3. A student walks on a carpet while wearing a pair of rubber shoes. He touches a metal doorknob and feels a small shock.

Which of these BEST explains what causes the student to experience the shock?

- A. The flow of energy due to gravity acting on the pair of shoes.
- B. The flow of charges due friction between the carpet and the pair of shoes.
- C. The flow of charges due to friction between the student's fingers and the doorknob.
- D. The flow of heat due to a difference in temperature between the student's fingers and the doorknob.

4. A group of students investigated physical and chemical changes using paper. The students recorded their observations in a table.

Student	Folding	Burning	Cutting	Tearing
1	Physical	Chemical	Chemical	Physical
2	Chemical	Physical	Chemical	Chemical
3	Physical	Physical	Physical	Chemical
4	Physical	Chemical	Physical	Physical

Which student correctly recorded all the changes that took place?

- A. Student 1
 - B. Student 2
 - C. Student 3
 - D. Student 4
5. The table shows data collected by a scientist about two geologic processes.

Geologic Processes

Process	Rate of Increase in Thickness of Earth's Surface	Amount of Heat Produced
1	Fast	A lot
2	Slow	Very little

Which processes are MOST LIKELY described in the table?

- A. Process 1 is a volcanic eruption, and process 2 is deposition.
- B. Process 1 is deposition, and process 2 is a volcanic eruption.
- C. Process 1 is a volcanic eruption, and process 2 is an earthquake.
- D. Process 1 is an earthquake, and process 2 is a volcanic eruption.

6. A student reads that electromagnets are used in devices such as car motors and toasters.

Which of these BEST describes why electromagnets are used in these devices instead of bar magnets?

- A. Electromagnets are permanent magnets.
- B. Electromagnets can be turned on and off.
- C. Electromagnets last longer than bar magnets.
- D. Electromagnets are usually smaller than bar magnet.

7. A dam constructed on a river can store large amounts of water behind it. Which of these describes another reason for building a dam?

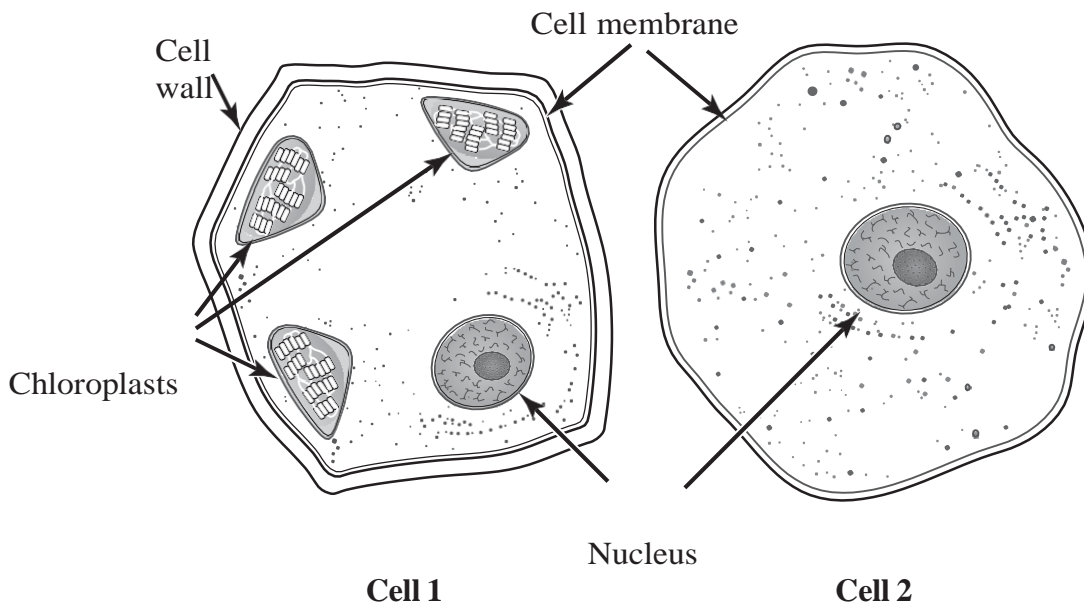
- A. Dams help prevent forest fires.
- B. Dams help prevent floods near rivers.
- C. Dams help prevent erosion along riverbanks.
- D. Dams help prevent pollution from getting into rivers.

8. A student went to a river in the mountains and observed that some rocks were smooth and round, while others were rough and jagged. She noticed that the rocks were all made from the same type of mineral.

Which of these BEST explains the student's observations?

- A. The rough, jagged rocks are from a volcanic eruption far away.
- B. The rough, jagged rocks were blown into the water by wind erosion.
- C. The smooth, round rocks are much newer than the rough, jagged rocks.
- D. The smooth, round rocks have been weathered longer than the rough, jagged rocks.

Four students examined the cells shown.



9. Each student made an observation about one of the cells.

Student 1: Cell 1 is a plant cell because it has a cell wall.

Student 2: Cell 2 is an animal cell because it has a nucleus.

Student 3: Cell 1 is a plant cell because it has chloroplasts.

Student 4: Cell 2 is an animal cell because it has a cell membrane.

Which students are correct?

- A. Student 1 and student 2
- B. Student 2 and student 3
- C. Student 1 and student 3
- D. Student 2 and student 4

10. A teacher takes his class on a field trip to a park to study plants and sort them into groups. The students create a table that contains their observations about each plant. One plant, labeled x, is unknown.

Plant	Amount of Light for Best Growth	Method of Reproduction	Height (in centimeters)	Soil Conditions
1	Sunny	Spores	61	Damp
2	Sunny	Seeds	914	Wet
3	Sunny	Seeds	4	Dry
4	Shady	Seeds	46	Damp
X	Shady	Spores	3	Wet

Based on the information in the table, which plant is MOST LIKELY related to plant x?

- A. Plant 1 because both plants makes spores.
- B. Plant 2 because both plants grow in wet soil.
- C. Plant 3 because both plants are short.
- D. Plant 4 because both plants grow in the shade.

Item	Standard Element	Characteristics of Science	DOK Level	Correct Answer	Explanation
1	S5L2a	S5 CS 8a	2	A	The correct answer is choice (A) Group 1 and Group 2. A person's height and eye color are determined by genes that the person inherits from his or her parents. Choices (B) and (D) are incorrect because genes do not determine whether a person likes spaghetti (Group 4) choice (C) is incorrect because genes do not determine whether a person rides bicycles (Group 3).
2	S5L4b	S5 CS 7b	2	C	The correct answer is choice (c) they cause diseases that can be spread to others. Microorganisms that cause contagious diseases include the bacteria that cause pneumonia, the fungi that cause athlete's foot, and the protozoa that cause malaria; many people also consider viruses microorganisms. Choices (a), (b), and (d) are incorrect because these statements describe ways that
3	S5P3a	S5CS1c	2	B	The correct answer is choice (B). The flow of charges due to friction between the carpet and the pair of shoes. as the person walks across the carpet, the resulting friction causes charges to build up as static electricity. When the person touches the metal doorknob, the charges are released, causing a shock and possibly a spark. Choice (A) is incorrect because gravity is an attractive force between objects with mass; it does not cause electric charges to build up in an object. Choice (C) is incorrect between friction is the force that causes electric charges to build up as the person walks across the carpet; contact with the metal doorknob releases those charges. Choice (D) is incorrect because heat is generated by vibrating particles; these vibrations do not cause electric charges to build up in an object.

Item	Standard Element	Characteristics of Science	DOK Level	Correct	Explanation
4	S5P2a	s5 CS 8a	2	D	The correct answer is choice (D) student 4 folding, cutting, and tearing are physical changes; they do not involve chemical reactions that produce new substances. Burning is a chemical change; the chemical composition of the paper changes as it burns. Choice (A) is incorrect because cutting is a physical change. Choice (B) is incorrect because student 2 has misidentified each change. Choice (C) is incorrect because burning is a chemical change and tearing is a physical change
5	S5E1a	s5 CS 4a	3	A	The correct answer is choice (A) process 1 is a volcanic eruption, and process 2 is deposition. During a volcanic eruption, molten rock flows from beneath earth's surface to earth's surface, rapidly increasing the thickness of the surface while producing lots of heat. During deposition, sediments settle to earth's surface, slowly increasing the thickness of the surface while producing very little heat. Choice (B) is incorrect because processes 1 and 2 have been reversed. Choices (B) and (D) are incorrect because earthquakes do not modify the thickness of the earth's surface.
6	S5P3d	s5 CS 1c	2	B	The correct answer is choice (B) electromagnets can be turned on and off. Running electricity through an electromagnet creates an attractive force that helps the device to perform work. When the work has been performed and the attractive force is no longer needed, the electricity can be turned off. Choice (A) is incorrect because electromagnets are temporary magnets. Choice (C) is incorrect because electromagnets do not necessarily last longer than bar magnets. Choice (D) is incorrect because electromagnets and bar magnets each come in many different sizes.

Item	Standard Element	Characteristics of Science	DOK Level	Correct Answer	Explanation
7	S5E1c	S5 CS 4a	2	B	The correct answer is choice (B) dams help prevent floods near rivers. The dam interrupts and allows people to control the flow of a river. Choice (A) is incorrect because dams have nothing to do with forest fires. Choice (C) is incorrect because a dam can increase erosion downstream of the dam by depriving riverbanks of new sediments. Choice (D) is incorrect because dams can cause or exacerbate water pollution by changing the temperature, composition, and quality of the water upstream and downstream of the dam.
8	S5E1b	S5 CS 8a	2	D	The correct answer is choice (D) the smooth, round rocks have been weathered longer than the rough, jagged rocks. Over time, weathering agents such as wind and moving water wear away jagged or protruding edges from rocks. The longer a rock is exposed to these agents, the smoother and rounder it becomes. Choice (A) is incorrect because volcanic eruptions are more likely to spew ash than rocks great distances. Choice (B) is incorrect because wind is no more likely to blow jagged rocks than smooth rocks. Choice (C) is incorrect because the opposite is likely true: the smooth, round rocks are older and thus have been weathered longer.
9	S5L3b	S5 CS 4b	2	C	The correct answer is choice (C) student 1 and student 3. Plant cells have cell walls and chloroplasts, but animal cells do not. Choices (A), (B), and (D) are incorrect because both plant cells and animal cells have nuclei and cell membranes.
10	S5L1b	S5 CS 8a	2	A	The correct answer is choice (A) plant 1 because both plants make spores. Choice (B) is incorrect because soil conditions are not used to assign plants into groups. Choice (C) is incorrect because plant height is different at different times in the life cycle. Choice (D) is incorrect because amount of light needed is less important than method of reproduction in assigning plants into groups.

Unit 1: Cells and Microorganisms (8/17 – 9/14)

In this unit, you will study life science. You will explain how magnifiers such as microscopes or hand lenses are used to observe cells and their structure. You will recognize and determine the functions of plant and animal cell structures (i.e., cell membrane, cell wall, cytoplasm, nucleus, chloroplasts). You will distinguish between the structure and function of cells in multi-celled organisms and single-celled organisms. You will identify beneficial microorganisms and explain why they are beneficial, and you will identify harmful microorganisms and explain why they are harmful.

KEY TERMS

Very small objects and parts of objects can be seen by **magnifying** them so they appear larger. Magnification can also make it easier to see small details of an object. (S5L3a)

A **microscope** is used to magnify objects. Some objects are too small to be seen without magnification. (S5L3a)

Cells are the smallest unit of life and make up all living things. Cell structures perform basic life functions for the cell such as making energy, growing, repairing, and getting rid of waste. Cells can look different and perform different roles in an organism. All cells come from other cells. (S5L3b) Cells are made up of many different parts. This table shows where you will find some cell **structures** and describes some of the **functions** of these cell parts. (S5L3b)

	Animal Cell	Plant Cell
Cell Wall	not found in animal cells	<ul style="list-style-type: none">outer layer of a cellprovides support and structure to cellmost plant cell walls are rigid
Cell Membrane	outer layer of the cell	separates the cell wall from everything inside the cell
Cytoplasm	<ul style="list-style-type: none">the fluid and cell parts found within the cellall cell activity happens in the cytoplasm	<ul style="list-style-type: none">the fluid and cell parts found within the cellall cell activity happens in the cytoplasm
Nucleus	the part that controls all the activity in a cell	the part that controls all the activity in a cell
Chloroplast	not found in animal cells	produces sugar for the plant to use and to store

Single-celled organisms are made up of one cell, and all cell functions are performed by the one cell. Single-celled organisms are individual living organisms. (S5L3c)

Multi-celled organisms are made up of more than one cell. Different cells perform different functions within the organism. Multi-celled organisms have cells that depend on each other for the organism to survive. (S5L3c)

Microorganisms are living things that are too small to be seen without magnification. They are not plants or animals, and they live on every part of the planet Earth. (S5L4a)

Some microorganisms are **beneficial** to people and the environment. Other microorganisms can be **harmful** and can cause **disease** and death. (S5L4a, b)

Bacteria are single-celled microorganisms. There are many different kinds of bacteria. Some bacteria can be used to make cheese. Bacteria are the oldest known life forms

on Earth and live in almost every environment on Earth. Many bacteria are beneficial, but many other bacteria are harmful. (S5L4a, b)

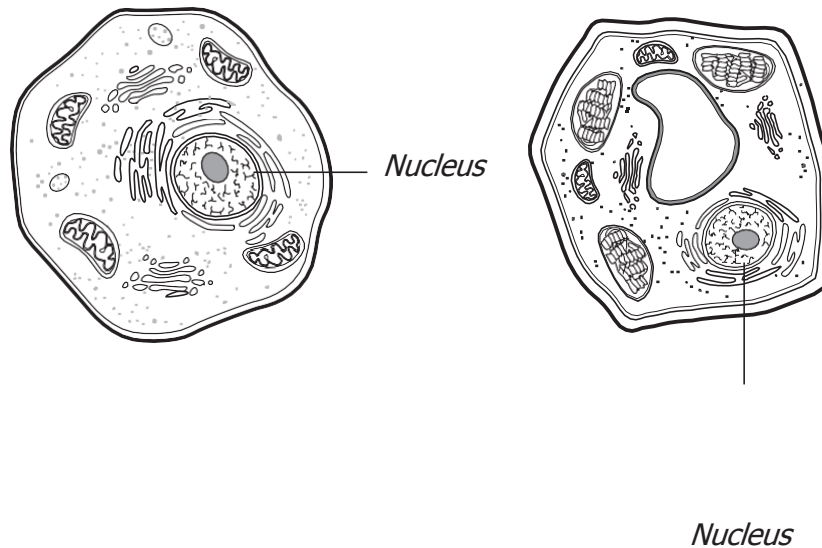
A **germ** is a microorganism that can cause a disease. Because most microorganisms live in water, the tap water you drink has been cleaned to make the water safe to drink. (S5L4b)

Microbe is another word used for microorganisms. (S5L4a)

Important Tip

✍ If you are having trouble remembering the parts of a plant cell, think of your home. The outside wall is like the cell wall, protecting what is inside and providing structure. The inside walls are like the cell membrane, which is just inside the cell walls. The cytoplasm is everything inside your home: you, the refrigerator where food is stored, everything. The nucleus is like a parent who decides what gets done and when inside the home. The chloroplasts are like the plants inside your home, making energy from the sunlight. (S5L3b)

Students identified the nucleus in an animal cell and a plant cell.

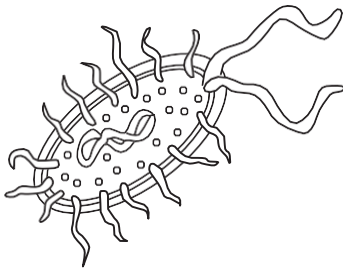


1. How is the function of the nucleus the same in both kinds of cell?
 - A. It protects the parts of the cell.
 - B. It gives the cell a rigid structure.
 - C. It controls the activities of the cell.
 - D. It regulates what enters and exits the cell.
2. In the 1670s, Antony Leeuwenhoek discovered microorganisms in the human mouth. Later these microorganisms were determined to cause dental plaque, which is harmful to teeth.

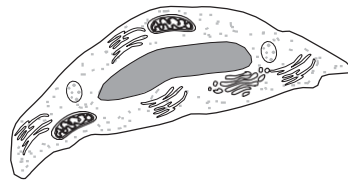
Which of these describes another way microorganisms can be harmful?

 - A. Microorganisms act on milk to make yogurt.
 - B. Microorganisms break down dead organisms.
 - C. Microorganisms break down meat before it is eaten.
 - D. Microorganisms break down sugars in your digestive system.

Students drew sketches of a microorganism and a muscle cell.



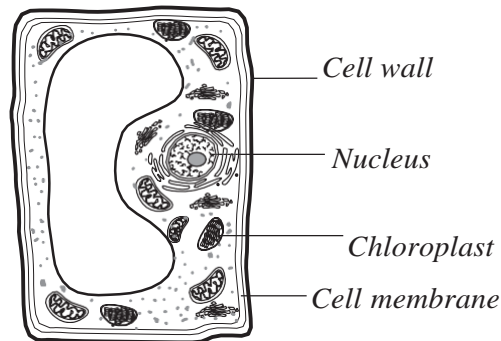
Microorganism



Muscle cell

3. How are these two cells different in function?
- A. The microorganism contains several different organelles surrounded by membranes, while the muscle cell does not.
 - B. The muscle cell has a rigid cell wall that gives structure to the cell, but the microorganism only has a cell membrane.
 - C. The muscle cell is able to reproduce by itself, but the microorganism needs to have another cell in order to reproduce.
 - D. The microorganism performs all functions within a single cell, while the muscle cell performs a certain function within an organism.

A teacher shows her class a drawing of a plant cell.



4. A student states that the function of the cell membrane is to maintain the cell's shape. The teacher states that this is incorrect.

Which description provides the correct function for the cell membrane?

- a. It provides the cell's energy.
- b. It directs the cell's activities.
- c. It stores water and nutrients for the cell.
- d. It controls what enters and leaves the cell

UNIT 2: CLASSIFICATION (10/15 – 11/5)

In this life science unit, you will learn how plants and animals are sorted into groups (i.e., fish, amphibian, reptile, bird, and mammal) and how to classify organisms. You will classify things based on their characteristics by looking for similarities and differences. You will study vertebrates and invertebrates, as well as producers, consumers, and decomposers.

KEY TERMS

You **classify** things when you organize them into **groups** based on **characteristics** they share. Scientists classify things so they can study ways those things are similar or different. A classification system can be used to identify and study species. (S5L1a)

Scientists use similarities, or things that the organisms have in common, to help them classify organisms into different groups. (S5L1a)

Sometimes scientists learn more things about a particular organism, and that new information makes them modify or change the way that the organism is classified. (S5L1a)

Animals are classified into animals with backbones, known as **vertebrates**, and animals without backbones, known as **invertebrates**. Vertebrates have a backbone, or spine, that runs the length of their body, and they are sorted into five groups: **fish, amphibian, reptile, bird, and mammal**. Primates and rodents are examples of vertebrates. (S5L1a)

Animals without backbones, known as **invertebrates**, make up 97% of all animal species. They include insects, spiders, and crabs. (S5L1a)

Plants are organisms that make their own food. They can be classified by the way in which they transport materials within the organism. They can also be classified by the way in which they reproduce.


Many plants are classified by scientists as **vascular plants**. Vascular plants have tissues that let the plant move resources like water and sugars in the plant. Grasses and fruit trees are examples of vascular plants. **Nonvascular** plants are plants that do not have the tissues that vascular plants use to move resources. The nonvascular plants rely on simpler ways to move resources. Nonvascular plants also do not have stems and grow lower to the ground. Mosses and algae are examples of nonvascular plants. (S5L1b)

Some plants use **seeds** to reproduce, while others do not. Some plants make their seeds in **flowers**, while other plants do not. Ferns are classified as plants that do not make seeds. Pine trees are classified as plants that make seeds without using flowers. Apple trees and roses are examples of plants that make seeds by using flowers. (S5L1b)

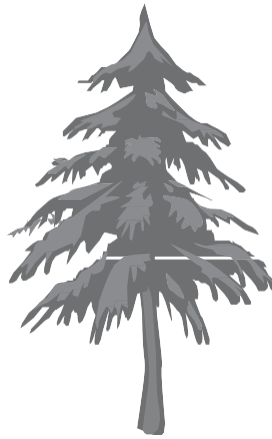
Many plants are also classified by scientists as **deciduous**. Deciduous plants shed their leaves every year. **Coniferous** plants are plants that are classified as not losing their leaves **every season**. The majority of coniferous plants are trees. Most conifers are **evergreens**, such as pine, fir, and cedar trees. (S5L1b)

Flowering plants that protect their seeds by enclosing them in a structure such as a fruit are called **angiosperms**. Non-flowering plants that keep their seeds visible, usually in a cone, are called **gymnosperms**. Coniferous plants are gymnosperms. (S5L1b)

Important Tip

 The ways scientists have classified organisms has changed over the years. In the earliest systems, organisms were either a plant or an animal. Over the years scientists have learned to base their classification on similar body structures rather than on functions. For example, dolphins and sharks both live in the water, swim, and are gray. However, dolphins are mammals and have lungs, and sharks are fish and have gills. This has led scientists to classify organisms based on similar genetic backgrounds that have resulted in similar body structures. When you work on classifying organisms, keep in mind that you should look for similar traits, and that new information may require you to modify your classification system. (S5L1a, b)

A teacher showed her students a picture of a tree that does not lose all its leaves every year.



5. How should the tree be classified?
- A. flowering
 - B. fruit bearing
 - C. non-flowering
 - D. non-seed bearing

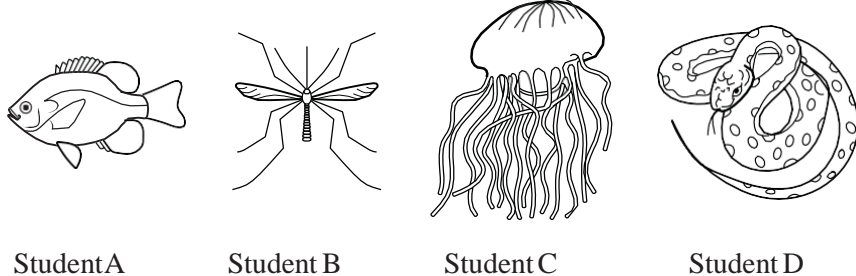
A biologist made a table to show the characteristics of six organisms.

	Habitat	Food Source	Internal Structure	Presence of Scales
Sea Stars	Water	Mostly animals	No backbone	No
Jellyfish	Water	Mostly animals	No backbone	No
Earthworms	Land	Mostly plants	No backbone	No
Birds	Land	Plants and animals	Backbone	Yes
Frogs	Land and	Mostly animals	Backbone	No
Sharks	Water	Mostly animals	Backbone	Yes

She wanted to classify the organisms into two groups.

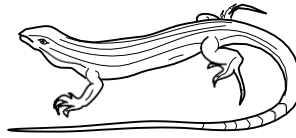
6. Which characteristic should be used to classify the organisms as vertebrates or invertebrates?
- habitat
 - food source
 - internal structure
 - presence of scales

Ms. Lee asked her students to draw pictures of invertebrates.



7. Which students correctly identified invertebrates?
- Students A and C, because both organisms live in water
 - Students B and D, because both organisms live on land
 - Students B and C, because both organisms lack backbones
 - Students A and D, because both organisms have backbones

A group of science students were asked to draw pictures of animals they observed on a field trip to a zoo.



8. In which group would all these animals be classified?
- A. Fish because they all need water
 - B. Mammals because they all have legs
 - C. Amphibia because they all have scales
 - D. Vertebrates because they all have backbones

UNIT 3: GENETICS (9/16 – 10/13)

In this life science unit, you will learn about the characteristics of learned behaviors and inherited traits. You will be able to describe what a gene is and the role genes play in the transfer of traits.

KEY TERMS

In genetics, a **trait** is a physical characteristic of an organism that is inherited from the parents. The color of your eyes is a trait. Your **genes** will determine your physical traits such as skin, eye, and hair color. Other traits, such as height and weight, might be affected by your genes but will not be completely determined by genes. The collection of your traits makes you an individual, unique in your own way. (S5L2b)

Traits are said to be common when the majority of organisms have a similar trait. Being right-handed is a common trait because most people are right-handed. (S5L2b)

An **offspring** is the product of one or more parents. You are the offspring of your parents. Yeast, which is used to make bread, is an example of the offspring of a single parent. Each parent passes an equal amount of their genetic code to the offspring. (S5L2b)

The passing of traits from parent(s) to offspring is known as **heredity**. The color of your hair is an example of a trait that is passed down from parents to offspring. A trait that has been passed down is known as a **hereditary** trait. (S5L2a)

In contrast to traits, an organism also has **learned behaviors**. These are ways organisms act and react to their environment. When you get ready for school, at some point you tie your shoes. This is an example of a learned behavior. (S5L2a)

Important Tip



The environment plays a role in making you who you are. Your genes will determine some of your traits, like hair color, but environmental factors can also affect your hair color. As an older adult, your hair will start to turn gray or white. Some scientists have hypothesized and done studies that show that stress will cause your hair to change color earlier in your life. (S5L2a)

9. Which of these is an inherited trait?
- A. Throwing a ball
 - B. Getting wrinkles
 - C. Having blue eyes
 - D. Playing the piano
10. A girl observed her younger brother and listed the behaviors she saw. Which of these was a learned behavior?
- A. blinking
 - B. reading
 - C. sleeping
 - D. swallowing

Gregor Mendel was a scientist who lived in the 1800s. He studied inherited traits in pea plants.

11. Which of these could have been one of the observations about inherited traits that he recorded?
- A. The plants with purple flowers grew in the shade.
 - B. The plants with yellow pods received more water.
 - C. The plants with shriveled pods were growing in sandy soil.
 - D. The plants with green seeds came from parents with green seeds.

Sickle cell anemia is a disease caused by the presence of a trait that changes the shape of the red blood cells.

12. What information would BEST help a researcher understand if this is an inherited trait?
- A. the age of the parents of a child with sickle cell anemia
 - B. the genes of the parents of a child with sickle cell anemia
 - C. the health of the parents of a child with sickle cell anemia
 - D. the heights of the parents of a child with sickle cell anemia

UNIT 4: ELECTRICITY/MAGNETISM (1/12 – 2/26)

In this unit on physical science, you will learn to carry out investigations to become familiar with the characteristics of magnetic forces and static electricity. You will understand that, without touching them, an object that has been electrically charged pulls on uncharged objects and may either push or pull other charged objects. You will gain an understanding of the relationship between magnetism and electricity. You will also learn about the conditions necessary for electricity to flow through an electric circuit.

KEY TERMS

Electricity is the effect of the apparent flow of electrons through a conductor. People also refer to electricity when they talk about using electrical energy to power their homes, cars, and other things. (S5P3)

Electric current is the flow of an electric charge through a conductor. When electric currents move through a conductor, they create heat and magnetic fields. Lightning, static electricity, and the movement of electricity in power lines are examples of electric currents. (S5P3)

Static electricity is the buildup of an electrical **charge** in or on the surface of an object. When two objects, like a balloon and a piece of cloth, are rubbed together, some of the electrons from one object stick to the other object. This causes the buildup of a charge on one of the objects. When a second object is brought near the first object, the buildup of the electrical charge can jump across to the second object. When the electrical charge jumps from one object to another, it is said to have discharged. This is the spark you see. (S5P3a)

Electric force is the force of attraction between two electrically charged objects or a charged object and a neutral object. When you use a balloon to pick up pieces of paper, the electric force between the balloon and pieces of paper is great enough to pick up the pieces of paper. Objects cling to each other when there is enough electric force. (S5P3a)

To make an **electric circuit**, you need at least a **power source** and a path for the electric current to flow through. You can add objects, such as light bulbs, along the path. You can also add a **switch** to start and stop the flow of an electric current to the circuit. (S5P3b)

Conductors are any type of object through which an electric current can flow. Metal wire is the most common conductor. Conductors are used in electric circuits. **Insulators** are any type of object through which an electric current cannot flow. Glass and rubber are very common **insulating materials**. Insulators are used to protect people from electric currents. (S5P3c)

Magnetism is produced when **magnetic fields** are generated. Magnetism is a C property of certain types of materials that allows them to attract or repel other objects that have this property. Magnetism is generated by the presence of magnetic fields or by the presence of an electric current. (S5P3d)

An **electromagnet** is created when an electric current flows through a wire. In general, the wire in an electromagnet is wrapped around a **core** made of a magnetic metal such as iron or steel. A magnetic field is created around the wire, turning the core into a temporary magnet. When the electric current is turned off, the magnetic field quickly fades. You can make an electromagnet using a circuit with a battery, switch, and wire wrapped around a nail. (S5P3d)

Important Tip



Electricity and magnetism are connected to each other. Electricity can produce magnetism. When an electric current flows through a wire, it creates a very small magnetic field. The field is so small it can barely be measured. If you take a wire and create a bunch of loops around it, it will generate a bigger magnetic field. If you wrap the wire around a magnetic metal core, the magnetic field generated from the wire will create a much stronger magnetic field. Magnetism can also create electricity. If you take the loops of wire and move a magnet by the wire, the magnetic field of the magnet will push the electrons in the wire around, creating an electric current. If you were to pass the magnet by the wire loops many times very, very quickly, you would create a stronger electric current. (S5P3d)

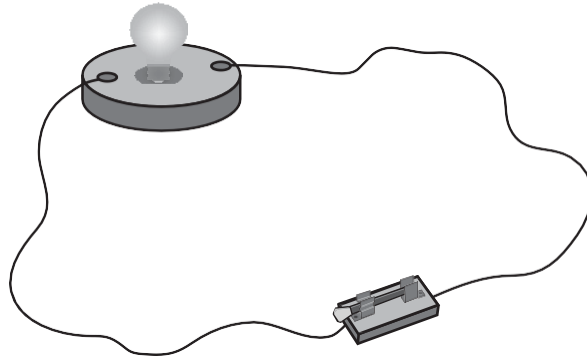
Students conducted an investigation with balloons and made the notes shown.

Balloon Observations

Action	Observation
Placed Balloon A and Balloon B next to each other	No movement
Rubbed Balloon A with a wool cloth	Balloons moved toward each other
Rubbed both balloons with a wool cloth	Balloons moved away from each other

13. What can explain the movement of the balloons?
- A. Static electricity
 - B. Gravitational pull
 - C. Current electricity
 - D. Magnetic attraction

A student in science class made this circuit, but the bulb did not light.



14. What did his teacher explain he should have done to make the bulb light?

- A. Use a power source.
- B. Use a second switch.
- C. Make both of the wires longer.
- D. Connect the bulb to only one wire.

15. A class is gathering materials to make a circuit that will light a bulb.

Which material will be the BEST conductor of electricity for the circuit?

- A. glass
- B. metal
- C. rubber
- D. wood

On a field trip to a recycling center, a class sees this magnet in use.



16. The class debates if it is a bar magnet or an electromagnet. What is the BEST evidence to explain which it is?

- A. An electromagnet is larger than a bar magnet.
- B. An electromagnet cannot be used outside when it is raining.
- C. An electromagnet must be plugged into an electrical outlet to operate.
- D. An electromagnet is a temporary magnet allowing it to release the objects.

UNIT 5: CHEMICAL/PHYSICAL CHANGES (11/9 – 1/8)

In this physical science unit, you will explain the difference between chemical and physical changes. You will conduct basic experiments and determine whether matter has changed physically by separating mixtures or chemically by observing changes in the properties of substances before, during, and after a chemical reaction. You will develop a basic understanding of the Law of Conservation of Matter.

KEY TERMS

Physical properties are any properties that are measurable and can be seen. Physical properties can be determined without changing the chemical properties of an object. Color, hardness, area, length, strength, and temperature are some examples of physical properties. (S5P2a)

Chemical properties are any properties that can only be measured by chemically changing an object. Paper starts to burn at around 450°F. At this temperature the paper combines with oxygen in the air and new substances are formed. (S5P2c)

A **physical change** happens when matter has a change in its physical properties but not its chemical properties. For example, salt can be dissolved in water but, if the water evaporates, the salt is still there. (S5P2a)

Substance is matter of any form that cannot be broken down into separate elements by physical means but can be broken down using chemical changes. (S5P2c)

A **chemical change** happens when matter breaks down into two or more substances or when more than one substance is combined to form a new substance. Hydrogen peroxide forming bubbles on its own is an example of matter breaking down into two substances. Vinegar and baking soda turning into bubbling foam is an example of two substances combining to create other substances. (S5P2c)

A **chemical reaction** is a process where two or more substances change chemically from one substance to one or more other substances. When iron is combined with air, the iron is slowly converted into rust. (S5P2c)

A **mixture** is something that contains two or more substances that are not combined chemically. Salted popcorn is an example of a mixture. (S5P2a)

Something is a mixture if you can physically **separate** the substance into the substances that made up the mixture. You can tell that salt water is a mixture because you can evaporate the water and all that will be left in the glass is some salt. (S5P2a)

States of matter are the different forms in which matter can be found. Water is a **liquid**, the state of matter that has a definite volume but no fixed shape. When water is ice, it is a **solid**. Solids have a definite shape and volume. Their shape and volume cannot be easily changed. When water is steam, or water vapor, it is a **gas**. Gases have no definite shape and take the shape of their container. (S5P2b)

Matter is anything that has mass and is in one of the states of matter. (S5P1a)

Regardless of how parts of an object are assembled, the total weight of the whole object is always

the same as the sum of the parts. (S5P1a)

Important Tip

Determining if a physical or chemical change has occurred can be hard to figure out. Two good questions to ask are the following: Does the matter still look the same? Could you change the matter back to what it was before the change? A physical change is something that can be reversed. You can tear a piece of paper, but you still have a piece of paper because only the dimensions of the paper change. A chemical change is something that cannot easily be reversed and usually means there is a different form of matter. If you took the torn piece of paper and burned it, you would have some ash. Is that ash the same as the paper, and could you change the ash back to paper? The answer is no. (S5P2a, b)

A science teacher shows his students a mixture of plastic beads and metal beads. He then uses a magnet for a demonstration.

17. What is the teacher MOST LIKELY demonstrating?
- A. Making a solution
 - B. Separating a mixture
 - C. Creating a chemical change
 - D. Changing the state of matter

A group of students place a beaker of liquid water outside. They measure the temperature of the water at different times and record its state.

Time	Temperature	Appearance
8:00	50°C	Liquid
10:00	43°C	Liquid
12:00	39°C	Liquid
2:00		Solid

18. Which BEST predicts the temperature of the water at 2:00?

- A. Lower than 39°C.
- B. Higher than 50°C.
- C. Between 39°C and 43°C.
- D. Between 43°C and 50°C.

A science teacher lit a candle and described to his students that some of the wax is burning while some of the wax is melting. Student A states that these are both physical changes. Student B states that these are both chemical changes.

19. Which statement BEST describes the students' conclusions?

- A. Student A is correct.
- B. Student B is correct.
- C. Both are incorrect, because burning wax is a chemical change and melting wax is a physical change.
- D. Both are incorrect, because burning wax is a physical change and melting wax is a chemical change.

A student is creating a potting soil mix. She combines 100 grams of sand, 200 grams of soil, and 200 grams of pebbles to make her potting soil.

20. What is the mass of the potting soil?

- A. 100 grams
- B. 200 grams
- C. 300 grams
- D. 500 grams

UNIT 6: EARTH SCIENCE (3/1 – 3/31)

In this unit on earth science, you will identify surface features of Earth caused by constructive and destructive processes. These processes include, but are not limited to, volcanoes, earthquakes, erosion, and weathering. Students should also be able to relate the role of technology and human intervention to the control of constructive and destructive processes.

KEY TERMS

Weathering is a destructive process where Earth materials such as rocks and soil are broken down into smaller parts. Weathering can also break down roads, buildings, and other materials humans make. (S5E1a)

Erosion is the movement of materials from one place to another by natural methods. Erosion can be a destructive process, such as when a landslide moves material from the top of a mountain. Erosion can also be a constructive process, such as in the Mississippi Delta. Soil is eroded from farther up the Mississippi River and is carried down to the delta where it creates new land. (S5E1a)

Deposition is the process whereby soil and rock that is eroded from one location is deposited as **sediment** in another location, such as the soil in the Mississippi Delta. (S5E1a)

Continental drift is the process of the continents slowly moving around the surface of Earth. The surface of Earth, including under the ocean, is made up of **tectonic plates**. These plates form sections of the surface of Earth, and some plates move toward or away from each other. Plates can also slide past each other. (S5E1a)

The area where two or more tectonic plates meet and show movement is called a **fault**. (S5E1a)

Trenches can be found where faults are located under the ocean. Much smaller trenches are also created by erosion. **Glaciers**, sheets of very old ice the size of states that move along Earth's surface, also create trenches as they slowly grind along the surface. (S5E1a, b)

Ridges are formed when tectonic plates collide and both push up. This creates hills and mountains. Ridges and individual mountains can also be formed in areas where **magma**, molten rock, from Earth's core pushes up between or through tectonic plates. Stone Mountain may be one of these magma-created mountains. (S5E1a)

A **volcano** is a break in Earth's crust that lets magma come out from the mantle and onto Earth's surface. Volcanoes can be found in the deep ocean and on Earth's surface. They are a constructive process. Volcanoes show up on Earth's surface where the magma can push through weakness in the crust. (S5E1a, b)

Magma is the molten rock below Earth's crust. When magma breaks the crust, it is called **lava**. Lava is thrown out by volcanoes. The islands of Hawai'i are **landforms** created by volcanoes. (S5E1a)

Tectonic plates move very slowly because they are pushing against each other with great force. **Earthquakes** happen when tectonic plates suddenly slide around. The plates shake, and the energy from that creates waves that echo through Earth. (S5E1a, b)

Earthquakes and volcanoes can both happen underwater. When earthquakes happen underwater, they can cause tsunamis. This happens when the energy released by the earthquake is transferred to the column of water above it and creates waves that travel away from the area. **Tsunamis** happen where the ocean meets the shore. The water starts to rise as the waves from the earthquake push the water up. Tsunami waves are longer than regular water waves. As a tsunami wave hits the shore, it carries much more water and creates a lot of damage. (S5E1b)

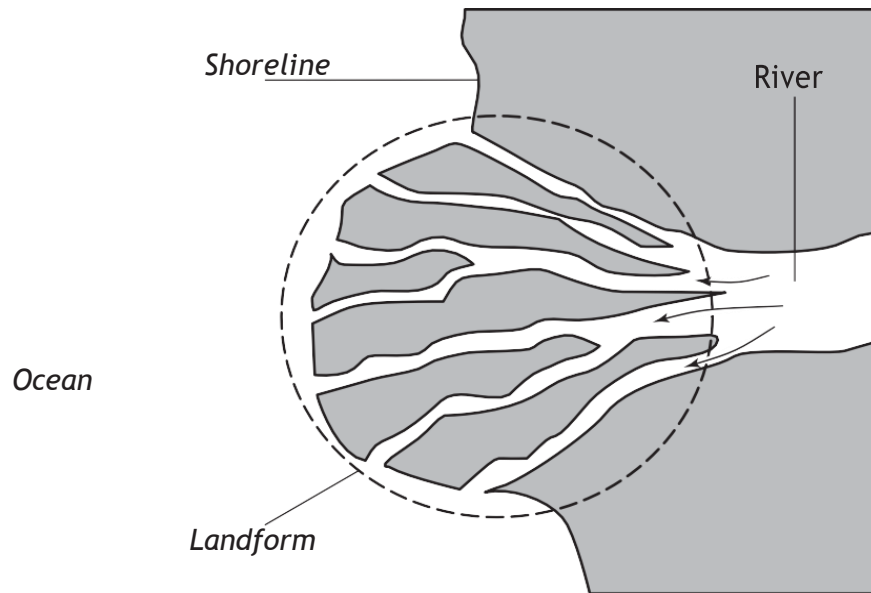
Humans can affect constructive and destructive processes and may do so to protect people or landforms when the processes will result in undesirable results. **Beach reclamation** to reduce the effects of erosion on beaches can be accomplished by dredging sand from the ocean floor and depositing it back on the beach. **Floods** can be controlled by building **dams** to hold back floodwaters and to let the excess water move downstream more slowly, or by building **levees** (earthen walls along riverbanks) to prevent rivers from going outside their banks onto surrounding land. Cities can also modify their storm drain systems or direct the drainage flows to **retention ponds** to slow the runoff of rainwater into streams and rivers to reduce the risk of flooding downstream. (S5E1c)

Scientists have a tool they use to predict earthquakes, volcanic eruptions, and tsunamis. This tool is known as a **seismograph**. Seismic waves are vibrations that move through Earth. As an earthquake or volcanic eruption starts, a seismograph detects the increase in the strength and frequency of seismic waves. (S5E1c)

Important Tips

- ✍ There are many areas on Earth where tectonic plates meet. One such area is known as the Ring of Fire, which runs from the southern tip of South America, up the Pacific Ocean side of North America, across the Bering Strait, down the Asian coastline, and alongside Japan and Australia. The tectonic plates along this area move around a lot. The crust is also thinner in this area, so there are a lot of volcanoes, which is how it got the name “Ring of Fire.” (S5E1b)
- ✍ Some areas of Earth have more weathering and erosion than other areas. There are many reasons for this. Weathering can break down rocks when water freezes, so areas that are often rainy and cold are more likely to see weathering. Windy areas also experience weathering because the wind wears down the surface of the rock. Erosion is more likely to occur in areas of moving water, such as rivers and streams. Because soil and rock moves downhill, higher areas of Earth will always see more erosion than lower areas. (S5E1a, b)

A teacher shows her class a sketch of a river flowing out to an ocean.



A student thought that the landform was caused by a volcanic eruption. The teacher said he was incorrect.

21. Which statement BEST describes what the landform is and how it was created?
- A. A fault was formed as the river eroded the beach.
 - B. An island was formed as the river eroded the beach.
 - C. A dune was formed as the river deposited sediment from upstream.
 - D. A delta was formed as the river deposited sediment from upstream.

A group of students visit the coast with their science class. A year later the students return to the same spot and observe that the beach is much smaller.

Student 1 says that the coastline was affected by erosion. Student 2 says it was affected by deposition.

22. Which student is correct and why?

- A. Student 1, due to erosion caused by ocean water
- B. Student 2, due to deposition caused by ocean water
- C. Student 1, due to erosion caused by fault movement
- D. Student 2, due to deposition caused by fault movement

A scientist recently sent this e-mail.

Dr. Draper,

I have observed an area of the coastal shoreline for the past five years. My records show that the coastal shoreline is getting narrower by approximately 0.5 meter a year.

I am recommending that we try dredging in these areas.

Sincerely,

Dr. Tran

23. Why is the scientist recommending dredging?

- A. It acts as a flood control measure.
- B. It protects the wildlife in the ocean.
- C. It reclaims beaches lost to water erosion.
- D. It forms a barrier to reduce wind erosion.

For five months, a scientist measured the depth of sand in a certain part of coastal shoreline. She recorded her observations in a table.

Month	January	February	March	April	May
Depth of Sand	115 cm	131 cm	157 cm	172 cm	191 cm

24. What is the BEST explanation of the data?

- A. Water eroding sand to create a gully.
- B. Wind depositing sand to form a dune.
- C. Rock being deposited by ocean waves.
- D. Shells washing ashore from the ocean.

Item	Standard Element	Characteristics of Science	DOK Level	Correct Answer	Explanation
1	S5L3b	S5CS4a	1	C	The correct answer is choice (C) It controls the activities of the cell. The nucleus is found in both cells. It controls the functions of the other cell parts including moving, eating, and reproducing. Choice (A) describes the cytoplasm, which is the fluid that fills the cell and protects the parts of the cell. Choice (B) describes the cell wall, which is found only in the plant cell. Choice (D) describes the cell membrane in a plant and an animal cell.
2	S5L4a	S5CS7b	2	C	The correct answer is choice (C) Microorganisms break down meat before it is eaten. Microorganisms such as those that cause dental plaque and food to rot are harmful to humans. Choices (A), (B), and (D) all are incorrect. These all describe ways that microorganisms are beneficial to humans.
3	S5L3c	S5CS4c	2	D	The correct answer is choice (D) The microorganism performs all functions within a single cell, while the muscle cell performs a certain function within an organism. Microorganisms are single-celled organisms. Choice (A) is incorrect. Microorganisms do not have membrane-bound organelles. Choice (B) is incorrect because the distinction between a microorganism and a cell from a multi-celled organism is not based on the presence of a cell wall. Choice (C) is incorrect. The distinction between a microorganism and a cell from a multi-celled organism is not based on reproduction.

Item	Standard Element	Characteristics of Science	DOK Level	Correct Answer	Explanation
4	S5L3b	S5CS1c	2	D	The correct answer is choice (D) It controls what enters and leaves the cell. Choice (A) is incorrect because the cell membrane does not provide the cell's energy. Choice (B) is incorrect because the cell membrane does not direct the cell's activities. Choice (C) is incorrect because the cell membrane does not store water and nutrients for the cell.
5	S5L1b	S5CS8a	2	C	The correct answer is choice (C) non-flowering. Choice (A) is incorrect because this tree is a conifer, which is a non-flowering plant. Choice (B) is incorrect because conifers are not fruit-bearing trees. Choice (D) is incorrect because conifers do have seeds.
6	S5L1a	S5CS8a	2	C	The correct answer is choice (C). The organisms are classified as vertebrates or invertebrates according to whether they have a backbone, that is, their internal structure. Choice (A) is incorrect because the defining characteristic of vertebrates and invertebrates is independent of habitat. Choice (B) is incorrect because the defining characteristic of vertebrates and invertebrates is independent of food source. Choice (D) is incorrect because the defining characteristic of vertebrates and invertebrates is independent of the presence of scales.

Item	Standard/ Element	Characteristics of Science	DOK Level	Correct Answer	Explanation
7	S5L1b	S5CS8a	2	C	The correct answer is choice (C). Students B and C have identified an insect and a jellyfish as lacking backbones and, therefore, being invertebrates. Choices (A) and (B) are incorrect because invertebrates are not identified by their habitats. Choice (D) is incorrect because invertebrates do not have backbones.
8	S5L1a	S5CS8a	2	D	The correct answer is choice (D). Organisms are identified as vertebrates because of the presence of backbones. Choice (A) is incorrect because, although all the organisms shown do need water, that is not the defining characteristic of fish. Choice (B) is incorrect because the defining characteristic of a mammal is not the presence of legs. Choice (C) is incorrect because amphibians do not include reptiles such as those shown.
9	S5L2a	S5CS8a	2	C	The correct answer is choice (C) having blue eyes. Choice (A) is incorrect. Throwing a ball is a learned behavior, not an inherited trait. Choice (B) is incorrect. Wrinkles are not an inherited trait. Choice (D) is incorrect. Playing the piano is not an inherited trait.
10	S5L2a	S5CS8a	2	B	The correct answer is choice (B) reading. Reading is a learned behavior. Babies do not inherit this trait from their parents. Choice (A) is incorrect because blinking is an instinct to protect the eye. Choice (C) is incorrect. Sleeping is not a learned behavior. Babies are born knowing how to sleep. Choice (D) is incorrect. Swallowing does not need to be taught.

Item	Standard Element	Characteristics of Science	DOK Level	Correct Answer	Explanation
11	S5L2b	S5CS7b	2	D	The correct answer is choice (D) The plants with green seeds came from parents with green seeds. Seed color is an inherited trait that parent plants pass along. Choices (A), (B), and (C) are incorrect. They list environmental factors that influence plant growth. They do not describe observations about inherited traits.
12	S5L2b	S5CS1c	2	B	The correct answer is choice (B) the genes of the parents of a child with sickle cell anemia. Sickle cell anemia is an inherited trait. The parents pass the genes for sickle cells to their offspring. Knowing the genes of the parents can help a researcher predict whether a child will have sickle cell anemia. Choices (A), (C), and (D) are factors that would not influence this type of inherited trait.
13	S5P3a	S5CS8a	3	A	The correct answer is choice (A) static electricity. Static electricity is an electrical charge that builds up on an object. Rubbing the wool cloth on the balloons caused the electrical charge to build up on the balloons. Choice (B) is incorrect. While gravity is working on the balloons, it does not explain the movement toward or away from each other. Choice (C) is incorrect, as current electricity is a steady stream of charges. The static electricity on the balloon is not steady. Choice (D) is incorrect, as latex balloons are not magnetic.

Item	Standard Element	Characteristics of Science	DOK Level	Correct Answer	Explanation
14	S5P3b	S5CS3a	2	A	The correct answer is choice (A) use a power source. The circuit lacks a power source. A battery is one power source for a circuit. Once the battery is added to the closed circuit, the light bulb will light. Choices (B) and (D) are incorrect. A single wire would not allow the bulb to light, and the circuit does not need an additional switch to light the light bulb. Choice (C) is incorrect because making the wires longer would not allow the bulb to light without a power source.
15	S5P3c	S5CS3a	2	B	The correct answer is choice (B) metal. Metal is a good conductor of electricity. Choices (A), (C), and (D) are incorrect as glass, wood, and rubber are poor conductors of electricity.
16	S5P3d	S5CS4a	3	D	The correct answer is choice (D) An electromagnet is a temporary magnet allowing it to release the objects. Electromagnets are temporary magnets that are caused by an electrical current. When the current turns off, the magnet no longer pulls. When the electricity flows through the arm of the crane, the crane can pick up magnetic materials. When the electricity flow stops, the magnet releases the items. Choice (A) is incorrect because electromagnets can be small or large. Choice (B) is incorrect because a magnet is not affected by rain. Choice (C) is incorrect because electromagnets can be powered by other means such as batteries.

Item	Standard Element	Characteristics of Science	DOK Level	Correct Answer	Explanation
17	S5P2a	S5CS4a	2	B	The correct answer is choice (B) separating a mixture. A mixture occurs when two or more substances are blended together but not chemically combined. The plastic and metal beads are combined, but each keeps its own individual properties. The magnet lifts the metal, which separates the mixture. Choice (A) is incorrect. In a solution the items are uniformly distributed. Choice (C) is incorrect because separating a mixture is a physical change. Choice (D) is incorrect. The materials were separated but did not undergo a change in state.
18	S5P2b	S5CS4c	2	A	The correct answer is choice (A) lower than 39°C. The temperature is decreasing. The appearance shows that the water changed states from a liquid to a solid. This occurs when there is a temperature change lowering the temperature of the water to the freezing point. Choices (B), (C), and (D) are incorrect. For the water to change from a liquid to a solid state, the temperature needed to decrease to the freezing point.
19	S5P2c	S5CS1c	2	C	The correct answer is choice (C) Both (students) are incorrect, because burning wax is a chemical change and melting wax is a physical change. Choices (A), (B), and (D) are incorrect because they do not identify the changes correctly. Melting is a physical change. The wax has not chemically changed. Burning is a chemical change. The wax has become new substances.

Item	Standard Element	Characteristics of Science	DOK Level	Correct Answer	Explanation
20	S5P1a	S5CS2a	2	D	The correct answer is choice (D) 500 grams. The mass of an object is equal to the sum of its parts. 100 grams plus 200 grams plus 200 grams equals 500 grams. Choices (A), (B), and (C) are incorrect as the sum of the parts would be equal to the mass of the mixture.
21	S5E1a	S5CS1c	2	D	The correct answer is choice (D) A delta was formed as the river deposited sediment from upstream. A delta is sediment and other materials that are deposited in a fan shape at the mouth of a river or stream. In the drawing, the flow of the river has been redirected into branches from the accumulation of sediment. Choice (A) is incorrect because faults are formed along plate boundaries, not by rivers eroding beaches. Choice (B) is incorrect because islands are not formed by rivers eroding beaches. Choice (C) is incorrect because rivers do not create dunes.
22	S5E1b	S5CS1c	2	A	The correct answer is choice (A) Student 1, due to erosion caused by ocean water. Water erosion occurs by wearing away sand from the beach over time. Choice (B) is incorrect as deposition would increase the size of the beach. Choice (C) is incorrect because fault movement causes weathering, not erosion. Choice (D) is incorrect because fault movement causes weathering, not deposition, and deposition would increase the size of the beach.

Item	Standard Element	Characteristics of Science	DOK Level	Correct Answer	Explanation
23	S5E1c	S5CS4a	2	C	<p>The correct answer is choice (C) It reclaims beaches lost to water erosion. Dredging uses machines to remove sand from the ocean floor, pump it to the surface, and place it on beaches along the shoreline. Dredging is an example of one way in which humans use technology to help control the destructive processes of nature. The new sand helps to reclaim beaches that have washed away due to erosion. Choice (A) is incorrect, as dredging does not prevent floods. Measures such as levees, dams, and storm drains help to manage flooding. Choice (B) is incorrect. Dredging does not protect wildlife in the ocean and may even disrupt their habitats. It can provide homes to animals along the shoreline such as nesting turtles. Choice (D) is incorrect. The newly reclaimed beach is still susceptible to erosion, necessitating repeat dredging.</p>
24	S5E1a	S5CS4c	2	B	<p>The correct answer is choice (B) wind depositing sand to form a dune. Deposition is the process where sediment and other materials are deposited from the action of water or wind. A sand dune is an example of a surface feature that can be created by constructive processes such as deposition. Choice (A) is incorrect because a sand dune is an example of a surface feature created by construction. Erosion is an example of deconstruction. Choices (C), and (D) are incorrect. Over time rock and shell particles can produce sand, but that would not occur in a five-month time frame.</p>

ACTIVITY

The following activities will help you continue to develop skills in **Unit 2: Classification.**

Standards: S5L1a, S5CS1a, S5CS4a, S5CS4b, S5CS5b, S5CS5d, S5CS6a

Classify Vertebrates

- Choose from fish, amphibian, reptile, bird, or mammal.
- Find 3–4 pictures of animals from the group that you selected. Use textbooks, magazines, or the Internet.
- Look at the pictures. How are the animals the same? How are they different? (Example: Fish have a backbone. They breathe using gills.)
- Research the characteristics of each animal group using your textbook, websites, and other resources in your classroom or school library.
- Repeat this for each animal group.

Draw a Vertebrate

- Choose an animal from the fish, amphibian, reptile, bird, and mammal groups.
- Create a poster for your animal. (Examples: elephant for mammals and penguin for birds)
- Add labels to show why your animal fits the description of animals in that classification group.

Create a Vertebrate

- Create a drawing of an imaginary animal that fits the classification of one of the groups.
- Use the posters and other resources to see what the characteristics of each animal group should be.

ACTIVITY

The following activities will help you continue to develop skills in **Unit 4: Electricity/Magnetism.**

Standards: S5P3a, S5P3b, S5p3c, S5p3d, S5CS1a, S5CS1b, S5CS4a, S5CS4b, S5CS5b, S5CS8a

Static Electricity

- Fill a balloon with air. Rub a wool cloth lightly across the surface.
- Investigate what attracts and repels the charged balloon.
- Use different materials, such as paper scraps, paper clips, and aluminum cans.

Electric Circuits

- Draw an electrical circuit that includes a light bulb.
- Gather batteries, battery holders, light bulbs, light bulb holders, and connectors.
- Use your drawing to create a circuit.
- Challenge! Create circuits with multiple pathways and switches.
- Draw each circuit and describe what happens to the light bulbs. Are they on? How does their brightness change?

Conductors of Electricity

- Gather a penny, foil, a piece of paper, a paper clip, a toothpick, a straw, and a washer.
- Predict which materials will conduct electricity and which will not.
- Test the materials by using the circuits. Hold each end of a wire to the material to see if the electricity flows through the material, completing the circuit and lighting the light bulb.

Playing with Magnets

- Gather a power supply, magnet wire, and a large nail.
- Create an electromagnet.
- See how your electromagnet works with different types of items.
- Challenge! Can you figure out how a bar magnet and an electromagnet are different.