

Sixth Grade Independent Projects

Hello Students,

This resource packet includes multiple projects that you can work on independently at home. Each project can be completed over multiple days, and the projects can be completed in any order.

Use the table of contents on this page to navigate through the project packet.

Sixth Grade Literacy Project: Alphabiography	1
Sixth Grade Math Project: Cookies for All!	5
Sixth Grade Science Project: Structure and Function in Living Things	7
Sixth Grade Social Science Project: Can the Olympics Unite Us?	24

Sixth Grade Literacy Project: Alphabiography

Estimated Time	Total Time 120-130 minutes
Grade Level Standard(s)	W.6.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. RL.2 Determine a theme of a text and how it is conveyed through particular details. Provide a summary of the text distinct from personal opinions or judgments. RI/RL.6.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
Caregiver Support Option	Read with student.
Materials Needed	Paper, pencil or pen
Question to Explore	How can sharing details about our lives help shape understanding of who we are?
Student Directions	This guide is designed to help you engage in an independent inquiry project. First, you will read a biography of Louis Armstrong and answer questions about the text. Then, you will write creatively about Juarez. Finally, you will create an "Alphabiography" about yourself.

Activity 1: Reading a Biography

- A. Read the biography of Louis Armstrong. Pay attention to the words that the author uses to help us understand who Louis Armstrong is. As you read, underline the words that best describe him.

Louis Armstrong By Jessica McBirney 2017

Louis Armstrong (1901-1971) was an African American trumpeter, composer, singer, and actor. Armstrong's career spanned five decades and he continues to be remembered today.

Louis Armstrong is one of the world's most famous jazz musicians. The musical style of jazz became popular around the world largely due to his talent as a cornet and trumpet player, his unique "scatting"² singing style, and his strong and charming personality. He was also an important African American public figure during the decades of racial tension leading up to the Civil Rights Movement.

Music in Hardship

Armstrong was born on August 4, 1901 in New Orleans, Louisiana. His father left the family shortly after he was born, and his mother often left him in the care of his grandmother while she went to work. Armstrong himself had to leave school in 5th grade to work and earn money for the family. The neighborhood he lived in was so poverty-stricken⁴ and run-down people called it "the battlefield."

Armstrong first fell in love with music in 1913. He developed his skills at the New Orleans Colored Waif's

Home for Boys, a facility he was sent a number of times, most notably for firing an empty round from his stepfather's pistol into the air at a New Year's Eve party. During his stay, he took cornet lessons and discovered his love for music. After he was released from the home he continued to play, sometimes in public, and gained recognition around New Orleans. Soon he was discovered by the best cornet player in the city, Joe "King" Oliver, who mentored him and let him play in some of his shows.

A Rising Star

A few years later Armstrong took over Oliver's spot in New Orleans' most popular band, Kid Ory's band. In 1919 he took a summer job playing the cornet on a riverboat. This gig⁶ taught him how to read music and introduced him to the style of jazz, which he connected with deeply.

In 1922 Armstrong moved to Chicago with Oliver to play in the Creole Jazz Band. Armstrong enjoyed certain luxuries, living in his own apartment for the first time and having his own private bath. Armstrong and Oliver became well known for playing duets, so they decided to produce some jazz records together. Over the next few years Armstrong also produced some records on his own as well as with some friends from New Orleans. Later he cut ties with Oliver and joined Fletcher Henderson's Orchestra in New York City. Henderson had a very different style and introduced him to swing music. Henderson's Orchestra was one of the first "big bands," and they frequently performed for all-white audiences, which was unusual for African American musicians at the time.

Armstrong Takes the Lead

Armstrong didn't play in New York for very long before moving back to Chicago and starting his own band, Louis Armstrong and the Hot Five. The artists who played with him enjoyed his fun personality and relaxed conducting style; he tried to feature each musician's special talents. From 1925 to 1928 they produced over 60 records, some of the most important jazz records in musical history. During that time Armstrong switched from playing cornet to playing the trumpet. He also partnered with pianist Earl "Fatha" Hines to record duets. One of their pieces, "West End Blues," is considered to be one of the most artful pieces of jazz, and it brought greater respect to the musical style and introduced it to a wider audience.

He faced several ups and downs in his career over the next few decades, but ultimately still remained popular and continued creating new music. He played briefly on Broadway in the 1930s. But, in the same decade he had to take two years off from playing and recording because his lips hurt from playing the trumpet so frequently over the years. However, he did get to restart his career after taking a rest. In the 1940s he recognized that swing music's days were numbered, so he formed a smaller band that he would play with for the rest of his career. After that, his popularity with international audiences earned him the nickname Ambassador Satch.

Legacy

Armstrong suffered a heart attack in 1959, but that did not stop him; he kept a rigorous touring schedule throughout his life and into the 1960s. In 1967 he produced one of his most well-known songs, "What a Wonderful World." In 1968 he first began having health problems, although he continued to perform sometimes. In 1971 Armstrong passed away from a heart attack he suffered while sleeping. The following year he was posthumously awarded the Grammy Lifetime Achievement Award for having made creative contributions of outstanding significance to the field of recording music. It is just one of the many honors

and awards he received.

Armstrong was a significant African American celebrity. He was the first African American jazz musician to write an autobiography, the first to get top billing in a Hollywood movie, and the first to host a national radio show. His personality won over fans of all races, nationalities, and backgrounds. For many years he tried to keep his political and social opinions about the Civil Rights Movement private, but after he saw the consequences of school segregation on TV, he made a public statement against segregation.

He was also known for his unique musical style. He was very good at musical improvisation, not only on his trumpet but also in singing. "Scatting" is a form of improvisational singing he popularized, in which the singer does not sing pre-written, real words, but instead sings whatever sounds and notes they feel fit with the music in the moment. Armstrong made scat singing an important part of jazz and blues music. He revolutionized jazz from a folksy group performance to an individual performance. He influenced and set the bar for dozens of famous musicians after him, including Billie Holiday and Frank Sinatra. A star was unveiled on the Hollywood Walk of Fame in 1960, and he was inducted into the Rock and Roll Hall of Fame in 1990.

- B. Look back at the words you underlined. Choose five words that you would use to describe Armstrong to someone else. Write those on a piece of paper. Then, write a paragraph or two explaining why you chose those words to describe Armstrong.

You just read a biography and thought about the words that writers choose to describe someone's life. Now you will write a type of biography - an alphabiography! Move to Activity 2 for your next steps.

Activity 2: Create an Alphabiography, Part I

- A. You will write an A-Z list of words to describe you. For example, for A you might write "athletic" or "artistic."

You can think about the following questions to help you:

- Who are you as a person?
- What do you like to do?
- What do you believe to be true about friendship?
- What are your dreams?
- What are your goals?
- Who is your best friend?
- When and where were you born?
- Where do you go to school?
- What do you want to change about the world?
- What do you want to change about yourself?

Activity 3: Create An Alphabiography, Part II

- A. Pick five words from Activity 2.
- B. For each of the 5 words, write a paragraph that explains what that word says about who you are.

Reflection:

- When you read your alphabiography beginning to end, does it feel like it expresses who you are? Did you pick some words that mean similar things? If so, think about picking new words that express different things about who you are.
- Did you use any literary devices in your alphabiography? Common examples of literary devices are simile, metaphor, personification, onomatopoeia, alliteration. If you didn't use any literary devices, try to go back and add a few. Literary devices are a good way to make your writing more interesting and to express your voice and personality.

Additional Activities:

- Music: Make a five song playlist to go along with your Alphabiography.
- Visual Arts: Make a collage with images that connect to your Alphabiography.

Source: Commonlit.org

Sixth Grade Math Project: Cookies for All!

Estimated Time	Total Time 120 minutes
Grade Level Standard(s)	6.RP.A: Understand ratio concepts and use ratio reasoning to solve problems. 6.NS.A: Apply and extend previous understandings of multiplication and division to divide fractions by fractions
Caregiver Support Option	Discussion about recipes and how to double or triple the amounts; help support student in asking family members their vegetarian vs. non-vegetarian preferences
Materials Needed	Paper, pencil, calculator
Question to Explore	How do I use fraction operations to increase the amount of food I'm making? What are equivalent ratios? How can I apply unit rate?
Student Directions	Explore how math can be used in the real world and help Joseph choose the best printer for his cookbook.

Activity 1: Chocolate Chip Cookies for All!

Joseph found this list of ingredients for chocolate chip cookies on the Food Network site. It makes 30 cookies.

2 1/4 cups all-purpose flour
 1 teaspoon baking soda
 1 1/2 sticks (12 tablespoons) unsalted butter
 3/4 cup packed light brown sugar
 2/3 cup granulated sugar
 2 large eggs
 1 teaspoon pure vanilla extract
 One 12-ounce bag semisweet chocolate chips

- How many cups of flour will he need to make 90 cookies?
- How many sticks of unsalted butter will he need for 180 cookies?
- How many cups of granulated sugar will he need if he only wants to make 15 cookies?

Activity 2: Joseph's Amazing Cookbook*

Joseph is writing a cookbook that includes 150 recipes, with one on each page. He decides to divide the book into three sections: vegetarian dishes, meat dishes, and desserts. He thinks that $\frac{1}{2}$ of the recipes should be

meat dishes, $\frac{1}{3}$ vegetarian, and $\frac{1}{6}$ desserts

- A. How many meat dish recipes will there be?
- B. How many vegetarian dishes will there be?
- C. How many dessert recipes will there be?

Explain in a paragraph how you solved and show all your work.

Activity 3: Adding to Joseph's Amazing Cookbook

- A. Joseph wants to include five pages of photographs for every 15 pages. Use equivalent ratios to find how many pages of photographs will be in the cookbook. Explain how you know the ratios are equivalent.
- B. Talk with members of your family and your friends to see whether they prefer vegetarian to non-vegetarian dishes. Based on your findings, write the ratio of those who prefer vegetarian to non-vegetarian.
- C. Use the ratio you found for your family to determine what the ratios of vegetarian and meat recipes to all recipes should be in Joseph's cookbook.

Activity 4: Pick a Printer

The printer gives Joseph three options for printing the books. The table shows the number of books to be printed and the cost for each option. In addition to the printing costs, Joseph estimates that it will cost \$47,000 in other fees to help advertise the books and to pay a writer and the photographer.

	Option A	Option B	Option C
Number of books	5,000	8,000	12,000
Printing cost	\$27,000	\$32,040	\$37,480

- A. Explain how to find the unit rate for each option. How much would it cost per book?
- B. Which plan do you think Joseph should choose? Explain why.

Activity 5: The Cookbook Cover (Art Connection)

Draw a picture of what you think the cookbook's cover should look like.

Activity 6: Reflection

How do ratios and unit rates show up in the real world? Why are they important to use?

*Adapted from EnVision 2.0 6th grade, courtesy of Savvas Publishing

Sixth Grade Science Project: Structure and Function in Living Things

Estimated Time	120-130 minutes
Grade Level Standard(s)	MS-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
Caregiver Support Option	Adult supervision is not required during the Slice of Life activity but please ensure that Ziplock bags are not opened during the investigation and are thrown away at its conclusion.
Materials Needed	• Paper • Pencil Optional materials: • Slice of Life: 4 slices of bread (or 1 slice cut in equal parts), 4 ziplock bags, sharpie marker, hand sanitizer (optional), soap and water • Public Service Announcement: paper, markers, scissors, glue, pictures, etc.
Question to Explore	How does understanding cell theory help us to stay healthy?
Student Directions	Identify different types of cells to differentiate harmful from helpful microbes, then create a PSA to inform your peers about staying healthy.

Activity 1: Engage

A. Read the statements on the **Microbe Anticipation Guide** below.

- First, think to yourself whether you agree or disagree with each statement and why.
- Second, ask someone else in your home and record their response and reason why.

Microbes Anticipation Guide

Statements	Agree or Disagree (+) or (-)	Reason why I agree or disagree	Agree or Disagree (+) or (-)	Reason why they agree or disagree
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All bacteria make you sick.				
Bacteria and viruses are the same thing.				
Hand washing is the best way to keep from getting sick.				
What are some new ideas that came up from your discussion with someone else in your home?				

B. **Optional:**

- a. **Slice of Life:** Looking at the growth of microbes from your hand on a slice of bread.
 - i. If you have the materials for this activity, you can begin today and collect data over the next few days.
 - ii. Materials:
 1. Slices of bread - 4
 2. Ziplock bag or a sealable plastic bag
 3. Marker
 4. Hand soap
 5. Hand sanitizer
 - iii. Bag Set-up:

Bag #1: Unwashed hands	1. Rub your unwashed hands on several common household surfaces, such as doorknobs, computer keyboards, video game remotes, or cell phones. 2. Gently rub your hands on both sides of one slice of bread for 60 seconds. 3. Place the slice of bread in a ziplock bag and add a few drops of water. Seal the
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	bag and label it #1.
Bag #2: Washed hands (Soap & Water)	1. Rub your unwashed hands on several common household surfaces, such as doorknobs, computer keyboards, video game remotes, or cell phones. 2. Wash your hands with soap and water for 20 seconds. Dry your hands on a clean towel. 3. Gently rub your hands on both sides of one slice of bread for 60 seconds. 4. Place the slice of bread in a ziplock bag adding a few drops of water. Seal the bag and label it #2.
Bag #3: Hand Sanitizer (optional)	1. Rub your unwashed hands on several common household surfaces, such as doorknobs, computer keyboards, video game remotes, or cell phones. 2. Place a few drops of hand sanitizer on your hands and rub it in well. 3. Rub your hands on both sides of one slice of bread for 60 seconds. 4. Place bread in a ziplock with a few drops of water. Seal the bag and label it.
Bag #4: Control	1. Without handling the bread too much with your hands, put it in a ziplock and seal and label it.

Place all four ziplocks in a cool, dry, dark place (for example, a paper bag or a closet) and check them every 2-3 days.

C. Collecting Data:

- For the first row in the table below, record your predictions on how you think the bread will change in each bag.
- Use the table below to record your observations each time you check the bags:

Date	Bag #1: Unwashed hands	Bag #2: Washed hands (Soap & Water)	Bag #3: Hand Sanitizer (optional)	Bag #4: Control
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Day #1: Prediction				

Activity 2: Explore and Explain

Source: <https://uploads.mktg.learning.amplify.com/remoteteaching/microbiome-lesson-1.2.pdf>

Cells are the building blocks of life, and sometimes, it only takes one block.

Read the text “Cells: The Basic Unit of Life”. As you read, annotate the text by using the active reading guidelines:

- A. Think carefully about what you read.
- B. Make a record of your thinking
 - a. Highlight challenging words, add notes to record questions, and make any connections to your own experience.
- C. Examine any visuals and images carefully.

Cells: The Basic Unit of Life

Your entire body is made of cells—trillions of them! Cells are the tiny structures that make up all living organisms, including sharks, plants, cats, insects, bacteria, and you. People often say that cells are the basic building blocks of life. That’s true, but the phrase “building blocks” makes it sound as if all cells are the same. In fact, organisms are different from one another because of the differences in their cells. There are many types of cells.

How Do We Know About the Cell?

Cells got their name from a scientist named Robert Hooke way back in 1665. Hooke used a basic microscope to look at thin slices of cork, and saw that they were made of many tiny, hollow structures that looked like rooms. In fact, Hooke thought they looked like the rooms where monks lived, so he called them cells.

The cells Hooke saw weren’t actually living cells. Cork is made from the bark of a tree called a cork oak—the cells of the bark are alive when they’re on the tree, but they die when they’re cut off for people to use.

By the time a scientist named Anton van Leeuwenhoek arrived on the scene in 1680, lenses had improved,

making it easier for scientists to see much smaller things. Van Leeuwenhoek put things like blood, rainwater, and scrapings from teeth under a microscope, and what did he see? Tiny organisms moving around! Van Leeuwenhoek argued that motion is a sign of life, and was the first scientist to say that cells are living things.

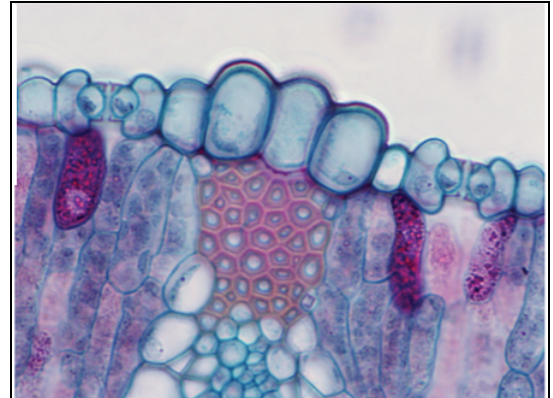
The Basic Unit of Life

All living things are made of cells, including plants and animals and other organisms like bacteria, whether they're made of just one cell or trillions of cells put together. Things that used to be alive but aren't anymore, like wood, are still made of cells—but the cells are dead. Things that were never alive, like glass and water, aren't made of cells at all.

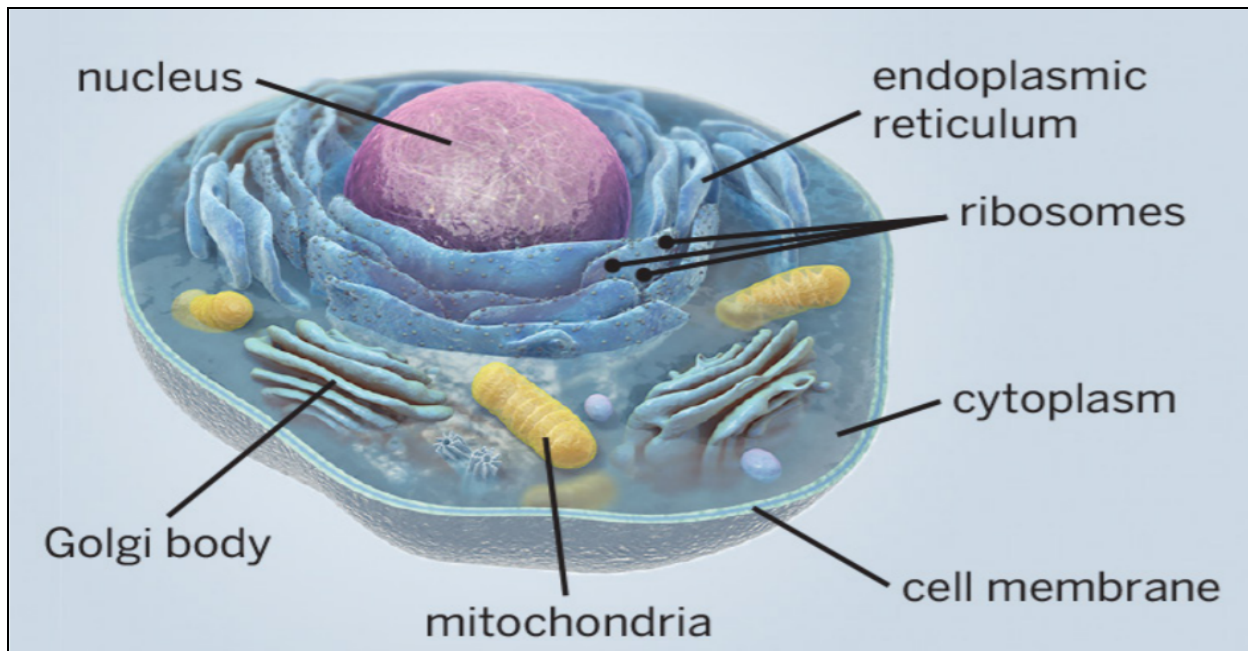
All cells have some things in common. For example, all cells are filled with a jellylike fluid called cytoplasm and enclosed by a cell membrane. This cell membrane controls which substances are allowed in and out of the cell. All cells also have tiny structures called ribosomes that make proteins using instructions from genes. All cells take in food, release energy from the food, and use the energy to do things.

The smallest living organisms are single cells. Most cells are very, very tiny: it takes trillions of them to make a human body. Cells are not the tiniest things in the world, however. Cells are made of molecules, which are much smaller than cells, and molecules are made of atoms, which are even smaller!

At the same time, many cells put together make much larger structures. A bunch of the same type of cells working together is called a tissue, like muscle tissue or nerve tissue. Different types of tissues working together are called an organ, like the brain or the liver—or the stem and leaves of a plant. Different types of organs working together are called a system, like the circulatory system or the musculoskeletal system. And different systems working together make a body like yours!



The plant cells in this photo appear 500 times larger than their actual size. The photo was taken through a microscope and shows the cells that make up the edge of a leaf. Since this photograph shows a cross-section, we can't tell exactly how long these cells are, but they are roughly 10–20 micrometers tall. Plant cells can be very different from one another, but tend to be 20–50 micrometers in length.



Organelles are cell parts that perform certain functions. This diagram shows some of the organelles in a typical human body cell. Many other kinds of cells contain the same organelles.

What's in a Cell?

Cells come in all different kinds, from the cells that make up a carrot to the cells in the human brain. However, many cells have some parts in common, called organelles. Here's a list of important organelles found in your body cells and the cells of many other organisms.

- **Nucleus:** The nucleus is a small enclosure inside a cell. It may be small, but it's very important: the nucleus is the command center of the cell, which contains its DNA and tells the cell how to behave and react.
- **Cell membrane:** The cell membrane surrounds the cell and is in charge of keeping helpful molecules inside the cell and keeping out molecules that are not helpful. In animal cells, the cell membrane is the outer layer, but plant cells have an extra layer of protection called the cell wall, which is outside of the cell membrane.
- **Mitochondria:** Mitochondria are bean shaped organelles that use glucose and oxygen molecules to release energy that the cell can use.
- **Ribosomes:** Ribosomes are tiny organelles that make proteins. They can be found floating freely in the cell or attached to the rough endoplasmic reticulum.
- **Endoplasmic reticulum:** Endoplasmic reticulum, or E.R., is responsible for making and transporting molecules around the cell. E.R. comes in two types: rough, which is covered in ribosomes, and smooth, which isn't.
- **Golgi body:** The Golgi body is like the post office of the cell—it packs proteins into little packages called vesicles and sends them wherever they're needed in the cell.
- **Cytoplasm:** Cytoplasm isn't an organelle; instead, it's a gel-like substance that fills the cell. The organelles of the cell are suspended in the cytoplasm and can move around in it.

Plant cells usually have all of the same organelles as animal cells, plus a few extra organelles that help them meet the needs of plants. These organelles include:

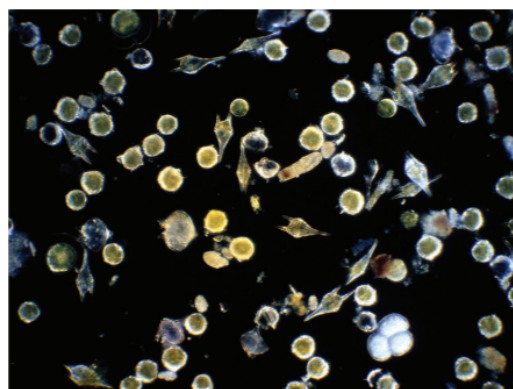
- **Cell wall:** The cell wall is the waxy outer layer that surrounds plant cells outside of the cell membrane. The cell wall offers extra protection, and its rigid structure helps the plant stand up. The cell wall also keeps the cell from stretching and bursting when too much water flows into the cell.
- **Chloroplasts:** Chloroplasts are organelles that store chlorophyll, a green substance that allows plants to turn sunlight into the molecules they need to release energy.
- **Vacuole:** Plant cells have storage in the form of vacuoles, which are large organelles that allow them to store food, waste, and water. The vacuole can also help maintain the right amount of pressure in the cell and isolate anything that might be a threat to the cell. Some animal cells also have vacuoles, but plant cell vacuoles are bigger and more common.

Using Differences in Cells to Classify Living Things

There are three domains (major types) of living things: eukarya, bacteria, and archaea. These domains are actually based on differences in the structures of cells! All organisms in the domain eukarya are made up of cells with a nucleus that contains genetic information. Some eukarya are tiny organisms that are each made up of only one cell, but most are made up of trillions of cells. Examples of eukarya include birds, pine trees, dogs, mushrooms, and humans. Almost all bacteria and archaea are tiny organisms that are each made up of only one cell with no nucleus. Instead of being contained in a nucleus, their genetic material just floats around inside the cell.

Bacteria and archaea are in different domains because they have different kinds of molecules inside their cells. It turns out that these molecules are important for determining where the organisms can live and what they can use to get energy. For example, one way bacteria and archaea cells are different has to do with their cell membranes, the barriers that separate their insides from the outside environment. The cell membranes of archaea can withstand very high temperatures and harsh chemicals. That is one reason why some archaea can sometimes be found living in places where nothing else can survive.

Cells may be tiny, but there's no life without them—everything that's alive is alive because its cells are taking in molecules, releasing energy, and doing jobs like carrying oxygen through the blood and transmitting electricity through the body. Without them, no living things would exist. So if you're reading this, thank your cells!



These tiny glowing organisms live in the ocean. Each organism is made of just one cell, and they can range in size from 10 micrometers to 2,000 micrometers! Some can even be seen with the naked eye.

Cellular School

- Compare the function of each cell organelle to structures in your school using the following table:

School Structure	Function	Cell Organelle
Main Office	Command center of the school and holds all important information.	
School Building/Walls	Outermost layer of the school, it controls what enters and exits the building.	
Boiler Room	Burns fuel to release energy and give power to the entire school.	
Classrooms	These are the locations where productivity takes place. (not always inside a room).	
Hallways	These are the pathways that move people and things around the school.	

B. Cellular School Challenge:

- a. Think of another analogy for the structures and functions of a cell, for example, a factory, a hospital, or a company. Write this on a sheet of paper.

The Human Microbiome: The World Inside You

Source: <https://uploads.mktg.learning.amplify.com/remoteteaching/microbiome-lesson-2.1.pdf>

- A. Read the text “Human Microbiome: The World Inside You” and use the information from the text to create an Instagram profile page for a helpful microorganism in your body.

- B. After you read, complete this template by adding a profile image, name, description, photos of previous posts, and other microorganisms that would be following you.

< [Search Bar] ...

[Profile Picture Placeholder]

317 posts 596 followers 689 following

[Message Button] [Follow Button]

[Bio Text Area]

Followed by: [User Placeholder]

[Grid of 6 Post Placeholders]

[Home Icon] [Search Icon] [Post Icon] [Heart Icon]

Human Microbiome: The World Inside You

There's a world filled with strange creatures. The creatures of this world are invisible, and they're not human. Aliens



sometimes threaten to invade the world these creatures call home. . . .

This world is not a far-off planet: it's your body! The creatures are called microorganisms, and your body is home to more than 100 trillion of them. Microorganisms live on your skin, in your gut, in your nose and mouth, and pretty much everywhere else on and in your body.

Your Body: Home Sweet Home for Bacteria

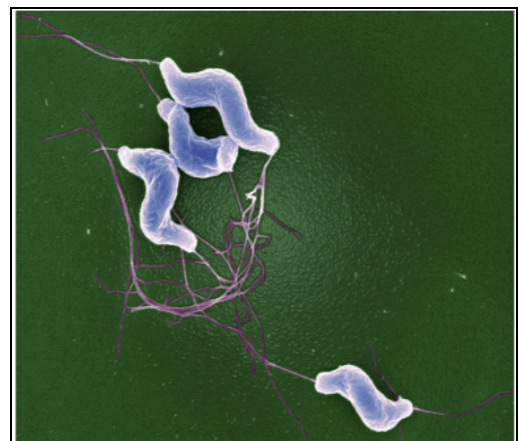
The microorganisms living in and on your body range from fungi to eyelash mites, but most of them are bacteria. Bacteria are among the smallest microorganisms on Earth. Most are made of a single cell—that's the tiny structure that makes up all living things. However, bacteria are not all the same. They come in different shapes, use different things as food, and live in different places. Thousands of different kinds of bacteria live in and on your body.

Even though they are tiny, bacteria are living things with the same basic needs that all living things share. The human body provides bacteria with the food and living space they need—that's what makes our bodies such a good environment for bacteria. One word for an environment and the organisms living there is biome, so we call the bacteria living in and on the human body "the human microbiome." All together, the bacteria living in an average human's microbiome weigh about 2 to 5 pounds. The number of bacteria in the microbiome of one human is millions of times greater than the number of people living on Earth!

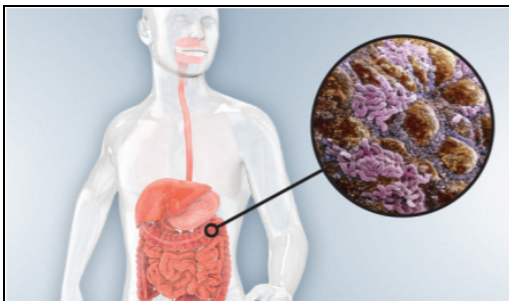
Helpful Bacteria and Alien Invaders

Most bacteria in the human microbiome won't hurt you. In fact, the opposite is true. Many bacteria do important jobs for the human body. For example, bacteria living in your gut help break down food that your body couldn't digest otherwise. Other bacteria help protect your body from infection, which helps to keep you healthy. All these helpful bacteria use the food and shelter your body provides. You depend on these bacteria, and they depend on you.

Unfortunately, not all bacteria are helpful. Harmful bacteria can invade the human microbiome through cuts, spoiled food, and even the air we breathe. An invasion of harmful bacteria or other microorganisms is called an infection, and infections can make people very sick. For example, a type of bacteria called *C. jejuni* produces a poison that harms cells from the human gut. When those cells can't function, the gut can't repair itself. This kind of *C. jejuni* infection can cause diarrhea, vomiting, and fever—all the symptoms of food poisoning.



What people call "food poisoning" isn't caused by poisoned food: it's usually an infection with harmful bacteria such as *C. jejuni*. (People added the colors in this photo to make the bacteria easier to see.)



Antibiotics and the Microbiome

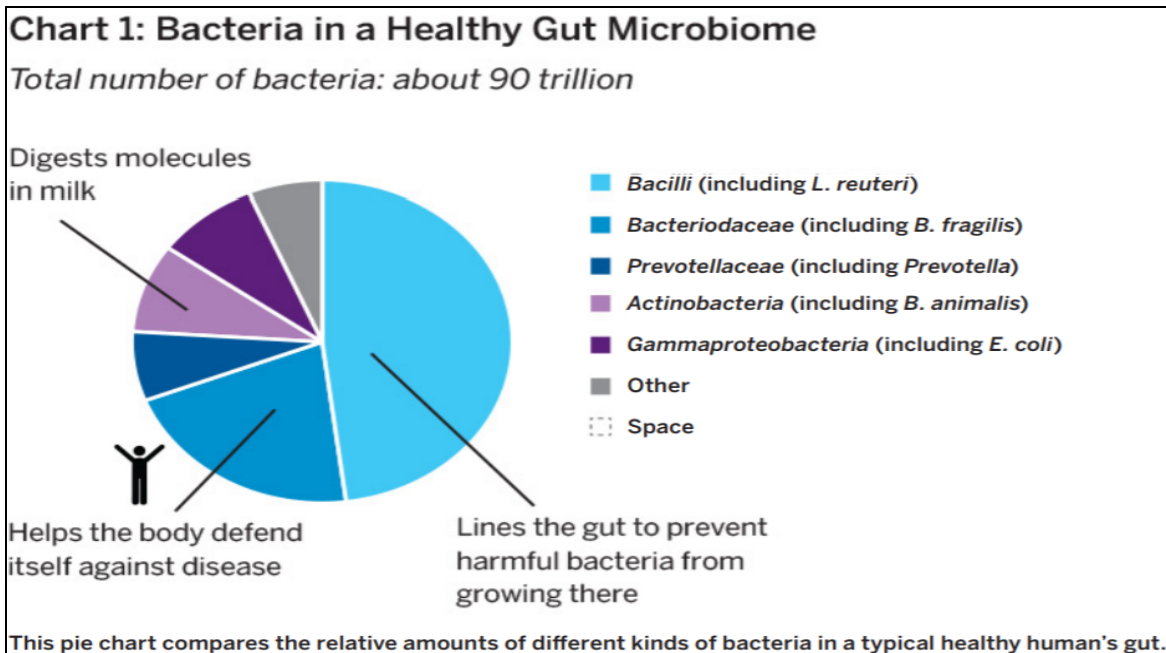
Often, doctors treat infections with antibiotics. Antibiotics are medicines that kill bacteria. Antibiotics can stop dangerous

infections, and they save millions of lives every year.

However, antibiotics don't just kill harmful bacteria—they kill helpful bacteria, too. A person who has just taken antibiotics has fewer bacteria than normal. Helpful bacteria will grow back in time, but often the bacteria that return are different from the ones that were there before. Taking antibiotics changes a person's microbiome.

Your Own Little World

Your body is the whole world to the bacteria of your microbiome. It's an environment that provides microorganisms with everything they need, including food and space to live. What you do affects your bacteria, and they affect you, too. Your body is a world in miniature—a microbiome.



Reflection: Re-engaging

- A. If you were able to start the "Slices of Life" activity, make sure to check your bags every few days and update your data log.

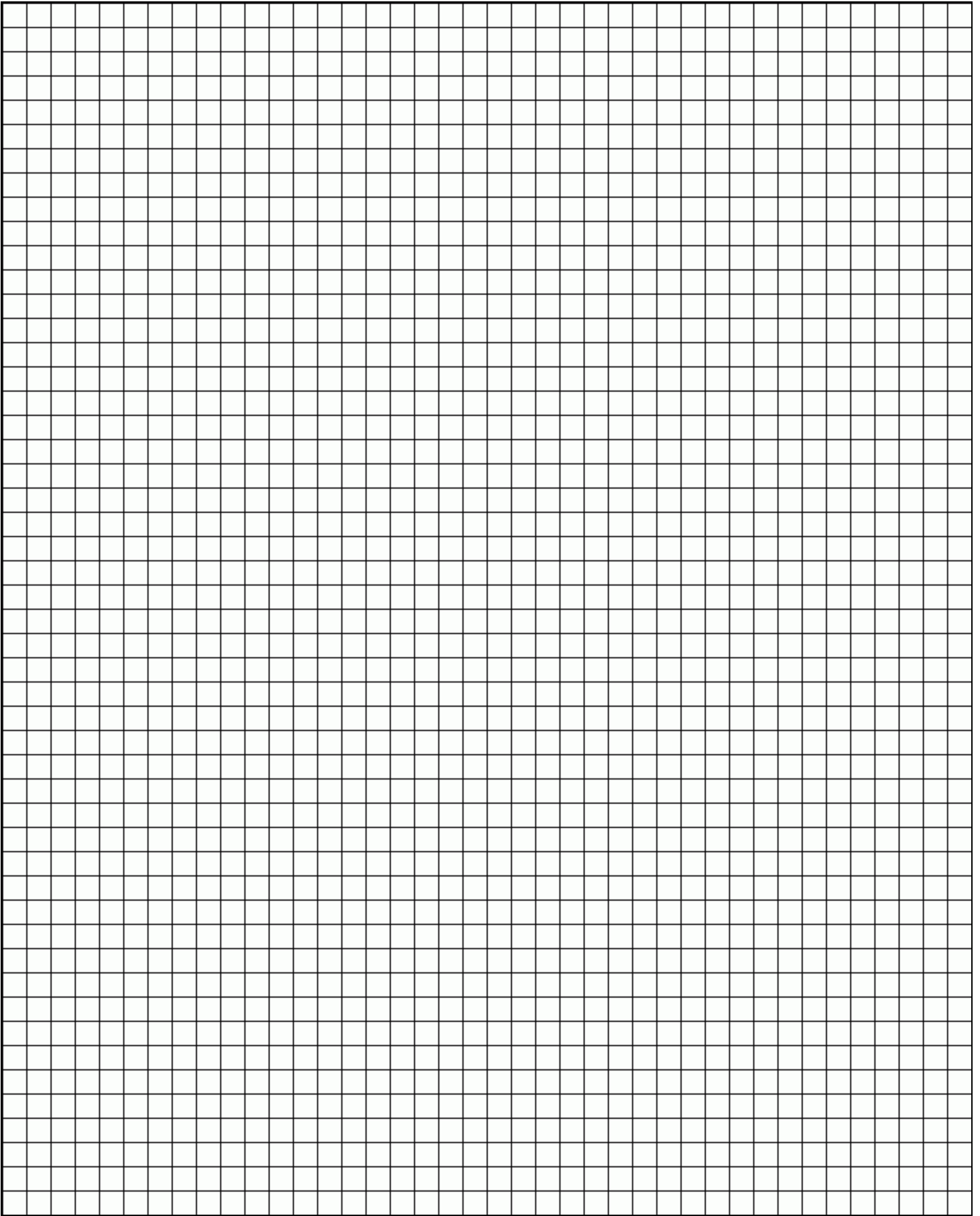
Activity 3: Explore & Explain: How Much is a Handful?

Human skin is the home of an enormous variety of helpful and harmful microbes.

- A. Use the graph paper on the next page to trace an outline of one of your hands.
- B. Estimate the surface area of your hand in square centimeters, cm^2 .
- a. To do this, count all the squares that are covered more than half with the outline of your hand. What is your number? In the example below, the surface area covered would be 41cm^2 .



- C. Scientists estimate that 1 cm^2 of skin has 100,000 cells and more than 10,000,000 microbes.
- Using your hands outline, can you calculate the number of microbes that may be on someone's hand?
 - Use the space below to show your work.



Activity 4: Explore & Explain: Spread the word, not the virus

Source: <https://uploads.mktg.learning.amplify.com/remoteteaching/microbiome-lesson-2.4.pdf> (Harmful bacteria); and, <https://uploads.mktg.learning.amplify.com/remoteteaching/microbiome-lesson-2.7.pdf> (Virus: On the Edge of Life)

The microbes that we call “germs” can be remarkably diverse.

- Read excerpts from “Harmful Bacteria” and “Viruses: On the Edge of Life”
- After reading, complete the Venn Diagram to compare and contrast the different types of “germs”.

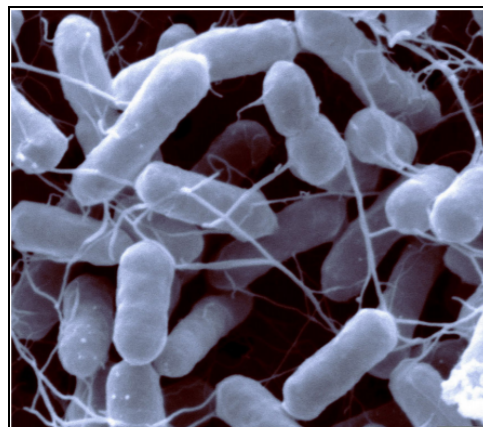
Harmful Bacteria

Bacteria: *Salmonella*

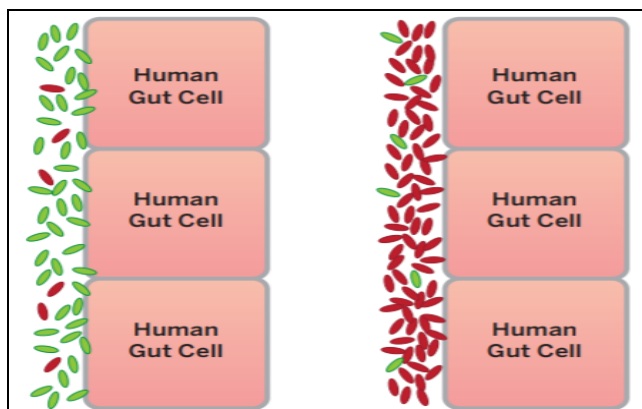
Food poisoning isn’t caused by poison at all. Instead, what we call “food poisoning” is usually caused by bacteria, including *Salmonella*, a type of bacteria commonly found in chickens and other animals. *Salmonella* finds its way into our food and water and causes thousands of cases of food poisoning every year.

Environment

Salmonella lives in the guts of all kinds of animals, especially birds and reptiles, and usually gets passed around through animal waste. Whether a person gets sick from ingesting certain kinds of *Salmonella* can depend on the amount of food and space available in his or her gut microbiome. If the gut is home to lots of beneficial bacteria, the *Salmonella* bacteria can’t get enough food and space to reproduce. On the other hand, if there are not many beneficial bacteria in the gut, the *Salmonella* population can grow and take over, causing illness—which in this case is more commonly known as food poisoning. *Salmonella* can be killed using heat, so cooking food properly is one way to keep from becoming sick.



Salmonella bacteria can cause the illness that people call “food poisoning.”



When lots of helpful bacteria (shown here in green) are present in the gut, there is little space and food available to harmful bacteria like *Salmonella* (shown here in red). This helps prevent the harmful bacteria from infecting the gut. When there are fewer helpful bacteria in the gut, there is more space and food available for harmful bacteria that can cause disease.

Normal Role in Humans

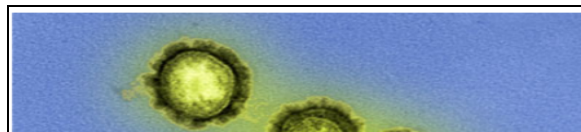
Salmonella can sometimes be found in small amounts in the guts of healthy humans, but is more likely to be found in the microbiomes of people who have recently become sick from *Salmonella* infection.

Role in Disease

In most cases, *Salmonella* causes vomiting, diarrhea, and intestinal pain for up to a week. Most people get better without treatment from a doctor, but in severe cases, *Salmonella* can leave the intestines and move into the blood, where it causes severe disease and even death.

Viruses: On the Edge of Life

Oh, no: imagine you woke up this morning with a sore throat,



an achy body, and skin that feels like it's burning up. You might have influenza, also known as the flu. Influenza is caused by a virus—a tiny structure that infects the living cells of animals, plants, and all kinds of bacteria and microorganisms. Viruses are one of the leading causes of illness in the world.

Viruses are very simple, and they exist on a microscopic scale: they're just tiny bundles of DNA covered in a coat of protein, sometimes with a layer of fat molecules for extra protection, and most of them are about 100 times smaller than the average cell—the largest are about 300 nanometers. Because viruses are so simple, scientists argue about whether they count as living organisms. On one hand, viruses aren't made of cells, which scientists consider the basic unit of life.

On the other hand, they have DNA and are able to reproduce, and they evolve through natural selection—all of which are important qualities of living things. Some scientists say that viruses are “on the edge of life.” Viruses may be simple, but they're good at what they do: reproducing. Because viruses don't have cell bodies of their own, they use the living cells of host organisms in order to reproduce. When it's time to reproduce, the virus latches onto a living cell and injects its own DNA into the body of the cell. The virus's DNA takes



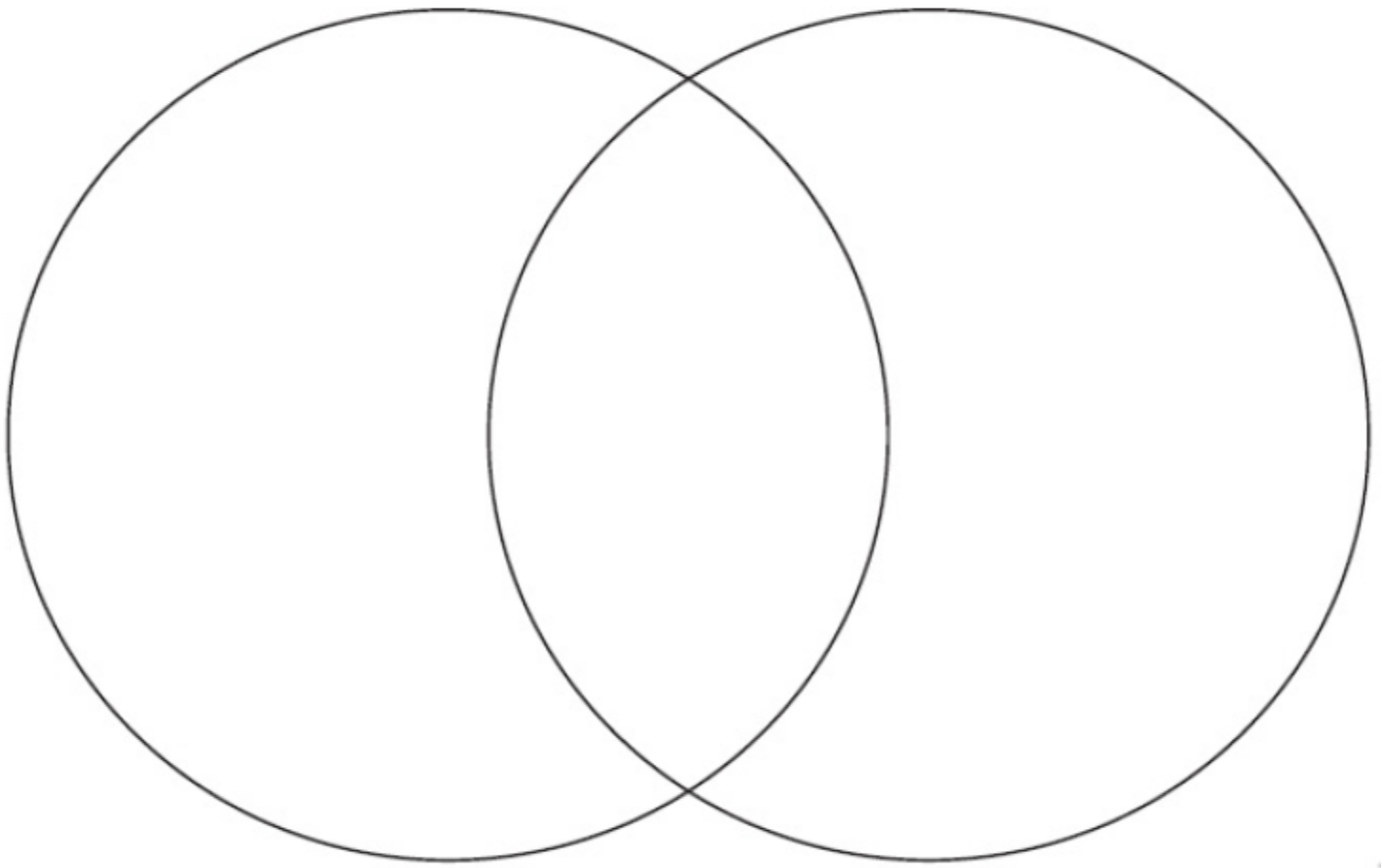
Viruses share some characteristics with living things, but not all. Some scientists say they're “on the edge of life.”

over the cell and forces it to make more viruses. When the host cell is full of new viruses, they burst out, killing the cell. Each new virus then looks for a new cell to infect, and the cycle begins again. For some viruses, this happens quickly—but some viruses hide their DNA in the host's cells for years, allowing the cells to copy the virus's DNA over and over as the cells reproduce, but not actually making the host sick. For example, people infected with HIV can have the virus in their cells for years before they develop AIDS, which is a collection of serious symptoms caused by the virus.

Because they infect living cells, viruses are hard to treat without killing the host cells as well. The antibiotic medicines used to treat bacterial infections kill bacteria, but antibiotics don't have an effect on viruses. The best way to fight viruses is to prevent them with vaccines. A vaccine is a weakened version of a virus, which can be injected into a healthy patient. The weakened virus doesn't make the patient sick, but it does prepare the patient's immune system to fight the virus in the future.

C. Completing the Venn Diagram

- a. The human organism has many potential invaders, but not all of them are the same. Use evidence from both of the excerpts above to compare and contrast the two types of microbes, **viruses** and **bacteria**.



D. Reflection: Re-engaging

- a. Respond to the following question using evidence from the readings on a sheet of paper:
 - i. How can a person be protected from both kinds of microbes?
 - ii. Are all microbes harmful? Why or why not?
- b. If you were able to start the “Slices of Life” activity, make sure to check your bags every few days and update your data log.
 - i. Which slices seem to have the least amount of change, or microbe growth? Why?

Activity 5: Elaborate & Evaluate

- A. Create a Public Service Announcement to teach your peers about staying healthy from harmful microbes, like the Covid-19 virus.
 - a. Some ways you can complete this are: making a poster or info-graphic, filming a video, making an announcement on social media pages, creating a song, or developing a short slide show if you have a computer.

- B. If you were able to start the “Slices of Life” activity, make sure to check your bags every few days and update your data log.
- Which slices seem to have the least amount of change, or microbe growth? Why?
- C. Let us revisit the statements we agreed or disagreed with at the beginning of the project.
- Complete the table below:

Statements	Agree or Disagree (+) or (-)	Evidence: <u>Cite evidence</u> from a text, investigation, personal experience, or other learning activity that supports your position.
All bacteria make you sick.		
Bacteria and viruses are the same thing.		
Hand washing is the best way to keep from getting sick.		
Did any of your responses change from the beginning to now? If so, why?		

Additional Activities:

- Math: Calculating the number of possible microbes on your hand using the graph paper in Activity: *How much is a handful?* Is a way to activate and develop math skills.
- Literacy: Utilizing in the process of Active Reading, as stated in Activity 1, is a way to engage with an informational text like the ones in this project. The Active Reading strategy can also be applied to reading other text outside of the Science classroom.
- Social Science: How does the current government (city, state, and federal) response to the COVID-19 pandemic connect to the science of microbes? Apply what you learn here to the current issues our society is facing.

Sixth Grade Social Science Project: Can the Olympics Unite Us?	
Estimated Time	Total Time 120-130 minutes
Grade Level Standard(s)	ILSSS for Inquiry Skills 6th Grade SS.IS.3.6-8: Determine sources representing multiple points of view that will assist in organizing a research plan.

	SS.IS.4.6-8.MdC: Determine the credibility of sources based upon their origin, authority, and context. SS.IS.5.6-8.MdC: Identify evidence from multiple sources to support claims, noting its limitations. SS.IS.6.6-8.MdC: Construct explanations using reasoning, correct sequence, examples, and details, while acknowledging their strengths and weaknesses.
Caregiver Support Option	Participation in <i>optional</i> extension activity
Materials Needed	Social Studies notebook, writing utensil
Question to Explore	Can the Olympics unite us? (modified from the C3 Inquiry: http://www.c3teachers.org/inquiries/olympics/)
Student Directions	This guide is designed to help you engage in an independent inquiry project, and follows the CPS Social Studies considerations for remote learning. You will understand, investigate, reflect, conclude, and optionally act to answer the question, "Can the Olympics unite us?"

Activity 1: Engaging with the Essential Question (15 min)

- In your Social Studies notebook, write the Essential Question ("Can the Olympics unite us?") as a title on the top of your page.
- Copy this definition of the word "unity" on your page:
 Unity (n) = people or groups who work together to achieve something; members share the same purpose, interest, etc.
 modified from <https://learnersdictionary.com/definition/united>
- Explain 3 ways that sports (casual games or official school/college/professional teams) can unite people.
- Write 3-5 things that you know and/or questions that you have about the Olympics.

Activity 2: How did the ancient Greek Olympics try to create unity? (25 minutes)

- In your Social Studies notebook, write the Activity 2 Question ("How did the ancient Greek Olympics try to create unity?") as a title on the top of your page. Skip 2 lines below to save space for the Activity 3 question.
- Create a t-chart on your page. The title of the left column should say "Unity in the ancient Greek Olympics." As you read and annotate sources A and B on the next page, add your notes to the left column of the t-chart to explain how the ancient Greek Olympic games tried to create a sense of unity.

Unity in the ancient Greek Olympics	

Source A - Spectators at the horse races (from <http://ancientolympics.arts.kuleuven.be/picEN/slides/P0027.jpg.html>)



This sherd of a wine-bowl (580-570 BC) depicts the horse races at the funeral games of Patroklos. The spectators are sitting on a stand, whereas normally they stood on the hills around the hippodrome. On the bowl are several short inscriptions (from right to left): 'Achilles', 'Patroklos: the games' and 'Sophilos painted me'.

Glossary:

- sherd: a broken piece of ceramic material*
- hippodrome: ancient Greek stadium for horse and chariot racing*
- hellenic: of or relating to ancient Greek culture*
- city-states: a state that has its own government and consists of a city and the area around it*

Source B - excerpts from **The Olympic Games in Antiquity; Introduction** (from https://stillmed.olympic.org/media/Document%20Library/OlympicOrg/Documents/Document-Set-Teachers-The-Main-Olympic-Topics/The-Olympic-Games-in-Antiquity.pdf#_ga=2.106652995.1369970470.1585753332-1649313563.1585753332)

Olympia, cradle of the Olympic Games

The Olympic Games as we know them today have a long history which goes back to ancient times. Although some elements of these Games were revived “as they were” when the modern Olympic Games were created, others were removed or modified.

Everything started in the Peloponnese, in Greece, some 3,000 years ago. Sports competitions were organized at Olympia and were named after their location, hence their name of “Olympic” Games. Nobody knows exactly when they began, but the first written mention of them dates back to 776 BC. It is difficult to know what gave rise to the ancient Games. Numerous versions attempt to explain them. Historically, the Games were created to provide unity to the Hellenic world, which, at that time, was split into city-states which were constantly at war. Mythology is mixed up with history, and the events that happened during this period were often explained as being the consequence of divine intervention.

These Games were held every four years. This four-year period acquired the name “Olympiad,” and was used as a date system: time was counted in Olympiads, rather than years.

The Panhellenic Games

The Games organized at Olympia led to the development of the Panhellenic Games... These Games were special because they brought the Greek world together (pan = all, hellene = Greek) at a time when Greece was not a single state, but a series of city-states (politically and economically independent communities). From Greece and the colonies (in Italy, North Africa, and Asia Minor), people travelled to take part in or attend these Games, inspired by the shared feeling of belonging to the same culture or religion.

The Sacred Truce

On the occasion of the four Panhellenic Games, a sacred truce (Ekecheiria) was proclaimed. Messengers (spondophoroi) went from city to city announcing the date of the competitions. They called for all wars to be halted before, during, and after the Games in order to enable the athletes, as well as the spectators, to travel to and from the Games sites in total safety. A climate of peace was considered important during the period of competition.

Unity in the ancient Greek Olympics	Unity in the modern Olympic movement

Activity 3: How has the modern Olympic movement created unity? (25 minutes)

- Open your Social Studies notebook and find the 2 lines that you skipped during Activity 2. Use those lines to write the Activity 3 Question (“How has the modern Olympic movement created unity?”) .
- Title the right column of your t-chart “Unity in the modern Olympic movement.” As you read and annotate sources C and D, add your notes to the right column of the t-chart to explain how the modern Olympic games have created a sense of unity.
- At the bottom of your chart, in 2-4 sentences, explain how the Olympics in ancient Greece are similar and different to the modern Olympics movement, specifically how they promote unity.

Source C - North and South Korea marched together under one flag at the Olympics (from <https://www.vox.com/world/2018/1/17/16900972/winter-olympics-opening-ceremony-north-south-korea-flag>)



North and South Korea marched under a united flag at the 2018 Winter Olympics opening ceremony in Pyeongchang on Friday in a symbolic break in tensions between the two nations over North Korea’s nuclear program.

Athletes from the two countries entered the Pyeongchang Olympic stadium together, joined hands, and marched under the Korean Unification flag, which displays the entire Korean peninsula in blue against a white backdrop.

It was a rare but not unprecedented spectacle. The two countries first displayed the flag at the 1991 World Table Tennis Championships and most recently at the 2006 Winter Olympics in Italy.

But this year’s gesture of unity comes at a crucial moment.

Tensions between North Korea and South Korea have skyrocketed as Pyongyang’s nuclear and ballistic missile programs have advanced at an astonishing pace in the past year, and North Korea’s leader, Kim Jong Un, has persistently demonstrated a readiness to make use of them.

During his New Year’s Day speech, Kim reached out to South Korea and raised the idea of starting high-level talks for the first time in two years to discuss the possibility of North Korea’s participation in the Olympics.

South Korea eagerly took him up on the offer, and through negotiations at the border village of Panmunjom, the two countries quickly agreed not only to march under a united flag but also to form a joint women’s ice hockey team, marking the first time they have contributed athletes to the same team at the Olympics.

North Korea then further pressed its charm offensive, sending Kim’s younger sister, Kim Yo Jong, to the opening ceremony – the first time a member of his immediate family has set foot in South Korea since the Korean war in the mid-20th century. She shook hands with South Korean President Moon Jae-in at the beginning of the ceremony.

Source D - Iconic Mexico City Olympic podium protest turns 50 October 16, 2018 (from <https://www.worldathletics.org/news/news/mexico-city-1968-olympic-games-protest-50th-a>)

Fifty years ago today, 16 October 1968, at the cavernous Olympic stadium in Mexico City, US sprinters Tommie Smith and John Carlos joined together to produce one of the most iconic and enduring sporting moments of the 20th century.

With a massive global platform that only an Olympic Games can provide, the freshly-minted gold and bronze medallists in the 200m chose to use their moment of glory to protest the racial inequality that was ripping their country apart. It was a protest the likes of which had never been witnessed on an international sporting stage - not before, and not since.

Just hours after their medal-winning performances --Smith broke the world record with a stunning 19.83 run-- the pair walked solemnly towards the medal podium, each carrying a shoe behind their backs, with just black socks covering their feet. As the national anthem began to play, each athlete bowed his head and raised a single black-gloved fist, Smith his right, Carlos his left. At just 24 and 23, respectively, Smith and Carlos became the subjects of an indelible image of a salute that would come to symbolise an era, inspire every generation since and one that would define, in times both bad and good, the rest of their lives.

Details of their protest were planned. The black gloves, Smith said, represented social power and unity; wearing black socks without shoes represented African-American poverty; the black scarf he wore around his neck --and the beads worn by Carlos-- symbolised the lynchings of African-Americans. All they had to do was earn their way to the podium.



Looking back: firsthand accounts from Mexico City

Excerpts from Jim Webster, who covered the Mexico City Games for the Sydney Morning Herald:

A few days later came the big race. The atmosphere among the tens of thousands in the packed stadium was electric.... I can still see the three of them on the victory dais, all wearing civil rights badges, each of the Americans with black-gloved hand raised and head bowed, with Norman upright and looking straight ahead. Even then I saw this as a moment in history that would never be repeated. All the media, officials and public around me in the packed grandstand were equally stunned. It strengthened my belief in the message they were delivering. The Americans later explained that their clenched fists symbolised black strength and unity and they had bowed their heads when "the Star-Spangled Banner" was played to express their belief that the words of freedom in the US national anthem only applied to Americans with white skin.

Activity 4: Can we still feel the unity inspired by the Olympics today? (25 minutes)

- A. In your Social Studies notebook, write the Activity 3 question at the top of a new page ("Can we still feel the unity inspired by the Olympics today?").
- B. Read and annotate sources E, F, and G below.
- C. Write and respond to the following prompts in your notebook. Use evidence from the sources to support your responses.
 1. Explain why the 2020 Tokyo Olympics have been postponed.
 2. Explain how this might impact your sense of unity and that of your community.
 3. Explain how some are finding new ways to encourage unity.

Source E - excerpts from NewsELA article "Tokyo Summer Olympics postponed until 2021 due to coronavirus" (from <https://newsela.com/read/2020-olympics-postponed-coronavirus>; 840 Lexile)

Tokyo Summer Olympics postponed until 2021 due to coronavirus

By Associated Press, adapted by Newsela staff Published: 03/24/2020

On March 24, the Tokyo Olympics that were going to take place this summer were delayed until 2021. The announcement ended weeks of guessing about whether the games would go ahead as scheduled. Concern

over the coronavirus pandemic fueled the decision.

Coronavirus is a flu-like illness. It began in China and has been spreading across the globe since December 2019. Health officials have been encouraging social distancing. This means staying home and staying away from other people to help slow the spread of the virus.

The International Olympic Committee (IOC) issued the statement. The group consulted with the Japanese prime minister and local organizers...

IOC Wanted To Go Ahead With The Games

On March 22, Bach said a decision on the games would be made in the next month. However, pressure on the organization grew. National federations and sports governing bodies spoke out against having the opening ceremony as planned on July 24. Athletes voiced their concerns as well.

Four-time Olympic hockey champion Hayley Wickenheiser was the first athlete to speak out. She objected to Bach's position that the games should go ahead as planned. Wickenheiser publicly criticized the IOC.

After the announcement to delay the games, she posted on social media site Twitter. She wrote that the decision was the "message athletes deserved to hear."

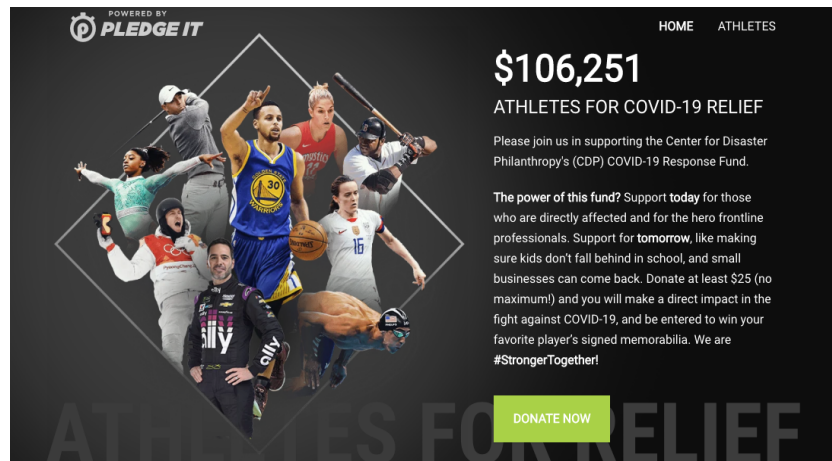
"To all the athletes: take a breath, regroup, take care of yourself and your families. Your time will come," she wrote.

"A Beacon Of Hope To The World"

The IOC and Tokyo organizers said they hope the decision to delay will be helpful. They hope this change will help the world heal from the pandemic.

The leaders agreed that the Olympic Games in Tokyo could be an inspiration. The games could be "a beacon of hope to the world during these troubled times. The Olympic flame could become the light at the end of the tunnel," the IOC statement said. "Therefore, it was agreed that the Olympic flame will stay in Japan. It was also agreed that the Games will keep the name Olympic and Paralympic Games Tokyo 2020."

Source F - Screenshot from Athletes Relief Organization (from <https://athletesrelief.org/>)



\$106,251. Athletes for COVID-19 Relief. Please join us in supporting the Center for Disaster Philanthropy's (CDP) COVID-19 Response Fund. The power of this fund? Support today for those who are directly affected and for the hero frontline professionals. Support for tomorrow, like making sure kids don't fall behind in school, and small businesses can come back. Donate at least \$25 (no maximum!) and you will make a direct impact in the fight against COVID-19, and be entered to win your favorite player's signed memorabilia. We are #StrongerTogether!

Source G - Social Media posts from Athletes supporting the Athletes Relief Organization (from <https://www.twitter.com> and <https://www.instagram.com>)



Elena Delle Donne (Twitter)

American professional basketball player and 2016 Olympic Gold Medalist

"Please consider donating to support @funds4disaster -->

athletesrelief.org

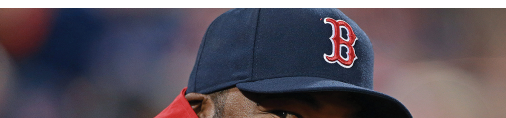
If any other athlete wants to join, all you have to do is leave me a commend w/a signed item you'd like to donate and we'll add it"

Michael Phelps

(Instagram)

American former competitive swimmer and most decorated Olympian of all time, with a total of 28 medals.

"In order to give back during this challenging time. I'm donating a "game worn" suit cap and goggles to www.athletesrelief.org. YOU can donate for a chance to win with all proceeds going directly to the CDP's COVID-19 Response Fund. I'm also challenging my fellow athletes to join in! Leave a comment below with a signed item you'd like to donate and we'll add it #StrongerTogether"



David Ortiz (Twitter)

David Américo Ortiz Arias is a Dominican-American former

professional baseball player who played 20 seasons in Major League Baseball

"It's time for everyone to unite and do their part!!! Please help the cause and donate for a chance to win some awesome memorabilia... let's go people!!!"

Simone Biles (Twitter)

Simone Arianne Biles is an American artistic gymnast with a combined total of 30 Olympic and World Championship medals.

"Please consider donating to support @funds4disaster by going to athletesrelief.org

If any other athlete would like to join in, all you have to do is head to the website, sign up & share. My autographed leo is there and waiting to be bid on for a good cause. Thanks guys!!!"



Activity 5: Communicating Conclusions and Reflection (40 minutes)

- In your Social Studies notebook, write the Essential Question on a new page: "Can the Olympics unite us?"
- Use this page to plan for and to construct your argument, using specific claims and relevant evidence from sources, that explains if/how the Olympics unite people and how that might change this year.
- Create a final product to communicate these conclusions. Examples include, but are not limited to: a speech, comic strip, movie, poster, or essay.
- Share/present your final project to your family members and/or a friend on a video call.

Optional Extension: Taking Informed Action

- Understand: Explain why the 2020 Tokyo Olympics have been postponed and how this might impact our sense of unity. Research how people feel unity and some existing solutions for new ways to encourage unity.
- Assess: Design a plan to create unity in your family or online community (heed all CDC guidelines about interacting with others). Ideas can include: social media campaign, neighborhood art walks, family game night, daily activities for your siblings, TikTok video competition, or one of your own genius ideas.
- Act: Implement one or more of your plans to create unity in your family or online community (heed all CDC guidelines about interacting with others).

Cross Content Connection:

While engaging with the Illinois State Standards for Social Studies Inquiry, scholars will practice important Literacy skills such as:

- critically examining sources representing multiple points of view.
- determining the credibility of sources based upon their origin, authority and context.
- identifying evidence from multiple sources to support claims.
- constructing explanations using reasoning, correct sequence, examples and details.