Christina School District Assignment Board

Grade Level: 7th

Week of May 4th, 2020

	Day 1	Day 2	Day 3	Day 4	Day 5
ELA	This week we will explore persuasive rhetoric. Read and complete the Persuasive Techniques in Advertising sheet. ****On the Identifying Persuasive Techniques** in the box identify the persuasive technique used and your rationale for choosing the technique.	*Review your notes from Day 1. When authors and advertisers write they always have an audience in mind. Revisit the* ***Identifying Persuasive Techniques sheet.*** *In the box identify the audience. Who is the advertiser speaking to? Review the* ***Demographics*** *sheet and complete the exercise.*	*Complete the* ***Analyzing Ads*** *sheet. Once complete analyze your data. In 1-2 paragraphs respond to the following. What do you notice? Compare and contrast the commercial shown on the two Networks. Explain whether or not the commercials matched the target audience for the show. Give specific examples of products, considering whom the products were intended. Finally, examine the commercials for your demographic. Did the commercials appeal to you, why or why not?*	*Choose one (or both) of the articles to read. As you read mark the ethos, pathos, logos and other persuasive techniques used by the author. In a paragraph identify the writer's claim and supports. What is the writer supporting, who is the target audience, what are the demographics? Cite specific evidence from the text to support the response.*	*Make your own advertisement. Use at least 3 of the persuasive techniques learned this week. Identify your target audience with demographics. Draw a picture of whatever it is you are advertising.*

Christina School District Assignment Board

Math (IM1 can be found on the HS board)	**7**	*Creating Integer Coefficients* Answer "Which One Doesn't Belong?" and justify your choice. (attached) Complete 7-51. (attached)	Complete 7-52 and 7-53, (attached)	Complete 7-54 and 7-55. (attached)	Complete 7-58 and 7-59 (attached)	Journal Entry: Summarize at least two strategies to solve an equation with fractional or decimal coefficients. Provide an example for each strategy and include a diagram. Title this entry "Solving Equations with Fractional Coefficients" and include today's date..
	7+	(Math 7+ should follow the Math 8 calendar in the 8th grade packet PLUS complete the Puzzle Investigator Problem (PIP) 5 - Three Views.. (attached)				
Science		**The Cells That Make Us (part 1):** Read the article. Underline, highlight, or annotate important information for understanding.	**The Cells That Make Us (part 2):** Reread the article and notations as necessary. Write your best answers to the following: a) According to Mike's mom, what is a cell? b) How does Mike's mom compare the cell membrane and the nuclear membrane? c) What is an organ made of? d) Why are all the different parts of the cell necessary? e) Explain how different parts of a human being work together in unison. Use evidence from the text to support your answer.	**Human Microbiome (part 1):** Read the article. Underline, highlight, or annotate important information for understanding.	**Human Microbiome (part 2):** Reread the article and notations as necessary. Write your best answers to the following: a) What is an ecosystem? b) To organize this text, the author divides it into sections with subheadings. What is described in the section with the subheading "You Are an Ecosystem"? c) Humans and microbes have "complex relationships." What information in the article best supports this statement? d) What effect do antibiotic drugs have on bacteria? e) What is the main idea of this text?	**Human Microbiome (part 3):** Reread the article and notations as necessary. Write your best answers to the following: a) Find the portion of text where the author placed the word "clouds" in quotation marks. Why might the author have done this? b) What effect has "increasing antibiotic use in the United States" had on people's microbiomes? c) Why is having a diverse and balanced microbiome important? d) What can people do to maintain a diverse and balanced microbiome? Support your answer with evidence from the text.
Social Studies		Complete Activity 1 from the document titled, "Where Would You Like to Live in the World?"	Complete Activity 2 from the document titled, "Where Would You Like to Live in the World?	Complete Activity 3 from the document titled, "Where Would You Like to Live in the World?	Complete Activity 4 from the document titled, "Where Would You Like to Live in the World?	Complete Activity 5 from the document titled, "Where Would You Like to Live in the World?

Persuasive Techniques in Advertising

The persuasive strategies used by advertisers who want you to buy their product can be divided into three categories: **pathos, logos,** and **ethos**.

Pathos: an appeal to emotion.

> An advertisement using **pathos** will attempt to evoke an emotional response in the consumer. Sometimes, it is a positive emotion such as happiness: *an image of people enjoying themselves while drinking Pepsi*. Other times, advertisers will use negative emotions such as pain: *a person having back problems after buying the "wrong" mattress*. **Pathos** can also include emotions such as fear and guilt: *images of a starving child persuade you to send money.*

Logos: an appeal to logic or reason.

> An advertisement using **logos** will give you the evidence and statistics you need to fully understand what the product does. The **logos** of an advertisement will be the "straight facts" about the product: *One glass of Florida orange juice contains 75% of your daily Vitamin C needs.*

Ethos: an appeal to credibility or character.

> An advertisement using **ethos** will try to convince you that the company is more reliable, honest, and credible; therefore, you should buy its product. **Ethos** often involves statistics from reliable experts, such as *nine out of ten dentists agree that Crest is the better than any other brand* or *Americas dieters choose Lean Cuisine*. Often, a celebrity endorses a product to lend it more credibility: *Catherine Zeta-Jones makes us want to switch to T-Mobile.*

Practice labeling **pathos, logos,** and **ethos** by placing a **P, L,** or **E** in the blank :

_____ A child is shown covered in bug bites after using an inferior bug spray.

_____ Tiger Woods endorses Nike.

_____ Sprite Zero is 100% sugar-free.

_____ A 32-oz. bottle of Tide holds enough to wash 32 loads.

_____ A commercial shows an image of a happy couple riding in a Corvette.

_____ Cardiologists recommend Ecotrin more than any other brand of aspirin.

_____ Advil Liqui-Gels provide up to 8 hours of continuous pain relief.

_____ Miley Cyrus appears in Oreo advertisements.

_____ People who need more energy drink Red Bull Energy Drink.

_____ A magazine ad shows people smiling while smoking cigarettes.

Part 2: The Power of Persuasion The persuasive messages that have made a lasting impression on you have probably been based on specific persuasive techniques, or methods, that were used to sway your heart and mind. The persuasive techniques shown in the chart can make strong arguments even more powerful. However, they can also disguise flaws in weak arguments because these techniques can lead to faulty reasoning. Faulty reasoning is a claim based on information that is incorrect, biased, or simply does not make sense. The examples below will help you be alert to common kinds of faulty reasoning.

Appeals by Association

"Sell" a product or an idea by linking it with something or someone positive or influential

Bandwagon
Taps into people's desire to belong to a group

> Don't miss the fundraiser that everyone's talking about!

Testimonial
Relies on the backing of a celebrity, an expert, or a satisfied customer

> As the lead singer of Destination Home, I know good sound when I hear it. That's why I won't go anywhere without my FX portable music player.

Emotional Appeals

Use strong feelings, rather than facts and evidence, to persuade

Appeal to Fear
Makes people feel as if their safety, security, or health is in danger

> If a hurricane hit tomorrow, would your family be safe?

Appeal to Vanity
Uses flattery to win people over

> We're looking for talented athletes like you. Join our after-school running club.

Loaded Language

Relies on words with strongly positive or negative associations

Words with Positive Associations
Bring to mind something exciting, comforting, or desirable

> Sparkling waters, silky sands, and breezy air all await you at Shongum Lake Park.

Words with Negative Associations
Call up unpleasant images, experiences, or feelings

> The calves were raised in cramped, filthy stalls.

Name _____ Persuasive

Identifying Persuasive Techniques

Directions: Identify the kind of persuasive language being used in each of the advertising slogans below.

1. Liquid Armor
   Your nails will be beautiful — and 50% stronger than they are today.

2. *Love your wife. Love your kids. Love your* **Buick.**

3. Babette's Basil
   is fresh, beautiful, and bright, bright green.

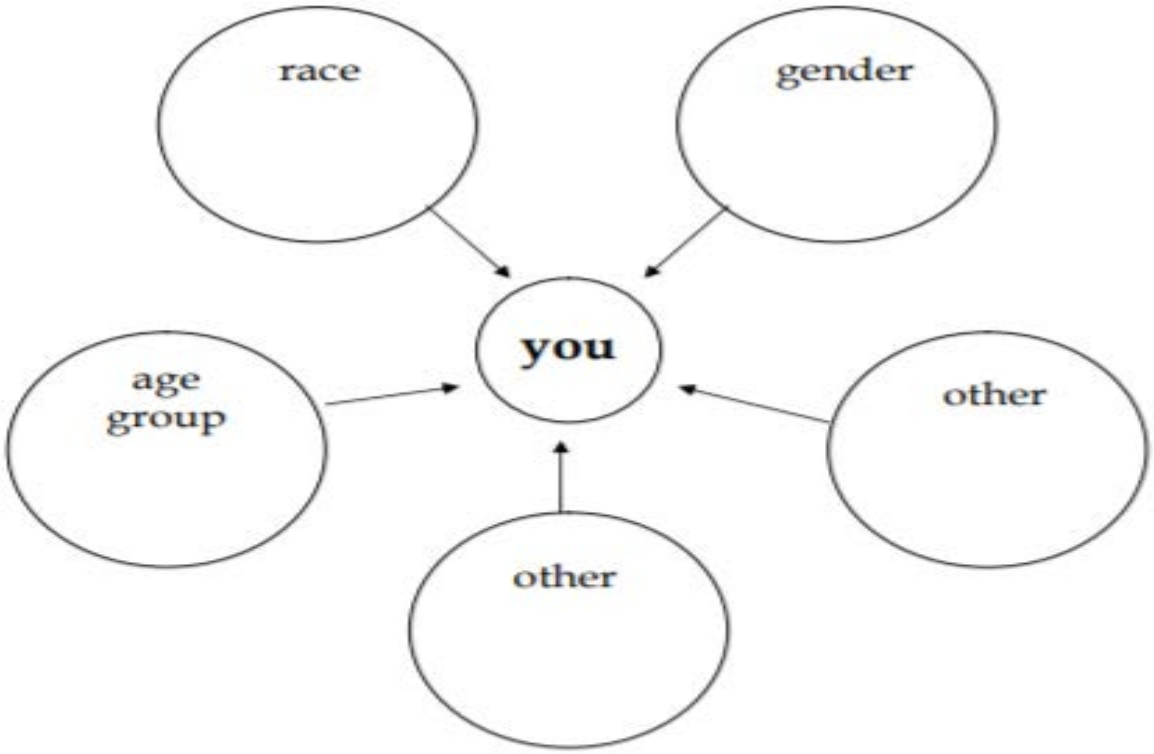
4. Congressman Louis Black trusts his money to U.S.A. Bank

5. **Do you want all of your child's dreams to come true?**
   529 College Savings Plans
   Invest TODAY for her TOMORROW.

Demographics

Demographics are the characteristics that make up a human population such as gender, age, and race. *Demographics* are how advertisers think of consumers: not as individuals, but as members of groups that tend to believe, behave, or purchase in certain patterns. Even when an advertisement is appealing to the idea of individuality (such as Burger King's "Have It Your Way" promotion), advertisers are appealing to the demographic group of "people who eat meat and like to be thought of as individuals," not to any single consumer.

Which demographic do you belong? Complete the chart.



With these demographics in mind, list of specific types of media that people expect to appeal to someone like the person you described above:

TV programs	Music	Movies
1.	1.	1.
2.	2.	2.
3.	3.	3.

Advertising isn't a random process—commercials are often carefully chosen to match the "target audience" of a particular show. The characteristics of this "target audience" are referred to as demographics. Watch your favorite show. As you watch try to determine the target audience.

Network (Lifetime, BET, Cartoon Network, etc.) _____

Age range of the target audience: □ 0 - 4 □ 5 - 9 □ 10 - 12 □ 13 - 17 □ 18 - 24 □ 25 - 35 □ 36 - 49 □ 50+

Race of the target audience □ African-American □ Asian □ Caucasian □ Hispanic □ Other

Gender of the target audience □ Male □ Female **Other** characteristics of the audience? Explain _____

_____

After the program. In at least one paragraph, explain whether or not the commercials matched the target audience for the show. Give specific examples of products, considering for whom the products were intended.

Analyzing Ads

Choose two shows to watch on two different TV Networks. Explain how each uses pathos, logos, and ethos and other persuasive techniques. Not every advertisement will use all three, but examine the ad carefully before you decide to write "none." Also list any other strategies used. Refer to the definitions and examples given earlier for help.

Network (Lifetime, BET, Cartoon Network, etc.) _____ TV **Show** _____
Age range of the target audience: □ 0 - 4 □ 5 - 9 □ 10 - 12 □ 13 - 17 □ 18 - 24 □ 25 - 35 □ 36 - 49 □ 50+
Race of target audience □ African-American □ Asian □ Caucasian □ Hispanic □ Other **Gender of target audience** □ Male □ Female

Product Name	Use of **pathos**	Use of **logos**	Use of **ethos**	Other **strategies**
Product 1				
Product 2				
Product 3				

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Product Name	Use of **pathos**	Use of **logos**	Use of **ethos**	Other **strategies**
Product 1				
Product 2				
Product 3				

Barbie's Malibu Dream house will be on Airbnb for $60 per night

Have you ever fantasized about having your own “dream house”? What kind of features, gadgets and memorabilia would you put in it? Where would it be located? Who would live there with you? Well look no further! Call three friends, jump in the bubble gum pink Jeep, and hop on the Pacific Coast Highway. The Barbie Malibu Dream house is available to rent!

It is beachy and dreamy, and it is very, very pink. Better yet? It's only $60 per night on Airbnb. With panoramic ocean views and beachy, glamorous decor, the home is a larger-than-life recreation of Barbie's signature style and hospitality. The real house even has the iconic hot pink slide from the balcony to the infinity pool below.

In addition to relaxing alongside the infinity pool that boasts uninterrupted views of the Pacific Ocean, guests will be able to unwind in a stone-clad bathtub with windows that look out over the California hills or spend time painting in Barbie's hobby room.

Among the defining features are the pink accents that range from painted walls and furniture inside, to balustrades and sun loungers outside. There is also a bright-pink, oversized large radio speaker that appears to be modelled on a toy version.

The house, of course, is absolutely stunning. There's an insane closet decked out in Barbie attire. Hanging inside a massive walk-in closet are Barbie-style clothes – including several uniforms that catalog her fashions over the last 60 years. Styles include white cat eye sunglasses, an astronaut suit, a striped bathing suit and lots of high heels.

Barbie Malibu Dream house can accommodate four guests, with access to two bedrooms, kitchen with dining, an office and craft room. Guests can also try out a myriad of activities that draw on the careers of varieties of the doll, such as fencing, exploring outer space and crafting.

There is also a personal home movie theater, and a peaceful meditation terrace. In addition to the once-in-a-lifetime chance to stay in Barbie's Dream house, some pretty inspirational women will be there, too.

The world-class fencing champion, Ibtihaj Muhammad, will offer one-on-one fencing lessons. Pilot and aerospace engineer Jill Meyers will give a behind-the-scenes tour of the Columbia Memorial Space Center. Chef Gina Clarke-Helm, founder of Malibu Seaside Chef, will cook farm-fresh food and give a hands-on cooking lesson. And because Barbie is the ultimate glam girl, celebrity hair stylist Jen Atkin will provide makeovers. Yes, she's the one who works with Kim, Khloe and Kourtney Kardashian, so be ready for that glow up.

It's all in honor of the Barbie brand's 60th Anniversary. The quintessential Dream house will bring to life what drives Barbie, from spotlighting powerful and diverse role models to showcasing underrepresented career paths and giving all girls a voice," Mattel said. Airbnb will donate to The Barbie Dream Gap Project GoFundMe initiative, which gives young girls the resources and support to follow their dreams.

Nike Basketball Camp: Helping Players Reach Their Athletic Goals

Nike is arguably the most visible sports brand on basketball courts across the nation. It's easy to spot that trademark swoosh on everything from shoes and jerseys to headbands and socks. However, Nike also leaves a more direct mark on the athletes. Every year, thousands of young players participate in a Nike basketball camp.

By partnering with US Sports Camps and other youth athletics organizations, the brand has played a significant role in developing basketball talent. Nike basketball is all about providing opportunities for boys and girls from all walks of life. You'll find Nike basketball camps in 39 states and many countries across the globe. These Nike sports camps run the gamut from youth programs for kids just learning basketball to showcases for experienced players looking to earn athletic scholarships.

Like it or not, becoming a great athlete involves instituting much structure and hard work. Nike basketball camps are known for being very organized and always keeping attendees busy. While different instructors run the various Nike sports camps, they all exist for the betterment of the players involved. Partnerships with US Sports Camps enhances the player's skill. They have overseen hundreds of programs for children ages 7-18.

The benefits of going to Nike basketball camps and other basketball camps can include fun atmosphere, confidence building, excellent instructors, focus on a variety of skills, life lessons, sweet swag and visibility to coaches/scouts. If coaches see you playing like a star, word will spread to colleges.

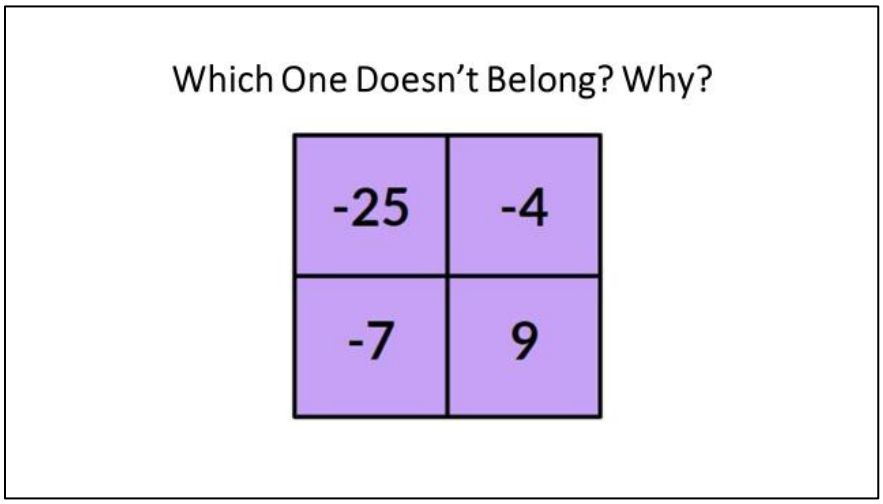
The road to becoming a successful basketball player is never a solitary journey. With more than 130 camp locations, Nike basketball programs are often the most trusted option for players in many parts of the country.

When you join the NCSA network, you create a recruiting profile that will be viewed by interested parties. The profile, which is like an online athletic resume, can be updated with personal information, statistics, highlight videos and more. NCSA staff will also provide you with an objective recruiting assessment to find out where you stand. Once you're set up, you'll be more visible to college coaches looking to fill roster positions.

More than 90 percent of U.S. colleges with athletic programs have had at least one NCSA client on their rosters. If you want to realize your athletic scholarship dreams, it's time to take control and make yourself stand out. The first step is to create a free recruiting profile with NCSA. Join today or call (866) 495-5172 with any questions.

Math 7 – Week of May 4th

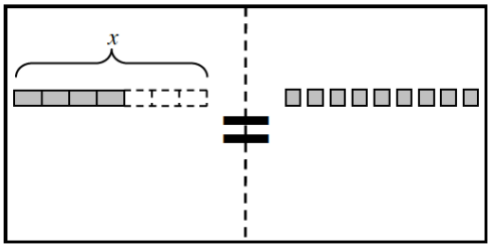
Creating Integer Coefficients



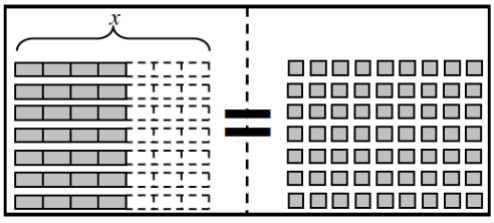
7-51 The community service club at North Middle School is planning to paint apartments at the local senior citizen center next week. The club needs your help to determine how many apartments they should be able to paint in a day. Earlier in the year, when only 4/7 of the students worked, they painted 9 apartments in one day. Next week, all of the students are available.

a. Assume that all of the student workers contribute equally to the work. If x represents the number of apartments that can be painted by all of the students in the club, use a multiplier and your understanding of scaling to represent this situation as an equation.
b. Choose a strategy to solve your equation in part (a). What does your answer represent? Be ready to share your strategy.

7-52 Janice, the club's president, began to think about how she could visualize 4/7 x to help her solve her equation (from problem 7-51). She recalled using algebra tiles to represent x. In her mind, she visualized the diagram below.



a. Does this Equation Mat represent your equation from problem 7-51? Why or why not?



b. Janice recognized that these numbers were not easy to work with, since she did not have whole tiles. After working on her paper for a while, she said, "*Maybe I can make whole tiles using more than one set of partial tiles.*" She drew the diagram shown at the left. What is her new equation as represented in this picture?

c. Answer the following questions (in any order):
    - What made Janice's strategy different than what you did in Lesson 7.1.4?
    - How many sets of 4/7 x did Janice use to get a whole number of algebra tiles?
    - Why did the right-hand side of the equation change?
    - How does the number of sets Janice used relate to the equation you wrote in part (a)?

7-53 Will the strategy of turning fractions into integers from problem 7-52 work with other equations, such as 2/3 x = 8? Consider this question as you answer the questions below.

a. How many sets of 2/3 x would make a whole number of x-tiles?
b. Solve for x using Janice's method from problem 7-52. How could you record your work on your paper?
c. Show how your solution is also the number of two thirds in 8 wholes (written 8 ÷ 2/3).

7-54 Janice wondered if the method of creating whole-number x-terms would work with decimals. Suppose an item was marked 15% off and the sale cost was $36.21. She wrote the equation below:

$$0.85x = 36.21$$

a. Why did she write 0.85 in her equation?
b. Is there a number she can multiply both sides of the equation by to get an integer coefficient (so there is no decimal)? If so, list at least one. If not, explain why not.
c. Use Janice's strategy to solve the equation. What was the original price of the item?
d. Does this method work for all equations with decimal coefficients?

    What if you wanted to solve the equation 1.2x = 14?

    What about 0.999x = 71.2? Write down your conclusion.

7-55 Solve each equation below by changing the number that x is being multiplied by (the coefficient of x) to an integer. Check your answer.

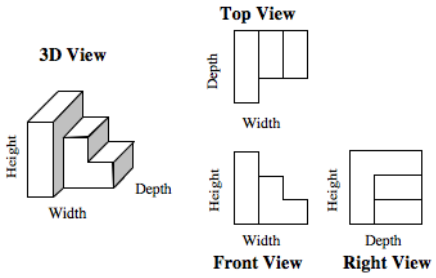
a. 5/6x = 4
b. 0.8x = 19
c. 5/3x = 12
d. 0.12x = 1

7-58 If 1/4 of x is 16, what is 3/4 of x? Justify your answer in more than one way.

7-59 LuAnn talked on her cell phone for 180 minutes, using 3/7 of her total monthly minutes. Find out how many total minutes LuAnn gets to talk in one month using at least two different methods.

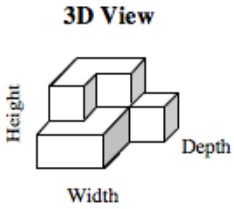
MATH 7+ - PUZZLE INVESTIGATOR PROBLEM (PIP) 5 – THREE VIEWS

Architects and designers often use three views, like the top, front, and right, to show the shape of a solid geometric object. See the example at right. If the solid contains no hidden cavities or hollow spaces, then views from the top, front, and right side give enough information to convey the shape and size.



Study the three views of the staircase-shaped block above. Look for relationships and common dimensions between the various views. It may help to build the shape if you have blocks available, or to copy the diagrams on your paper and use color or letters to show which faces are the same.

a. Anson drew three views for the blocks at right, but he forgot to label which view is which. Identify to Anson which is the top, front, and right view, and explain how you know.

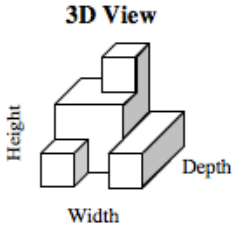


i.

ii.

iii.

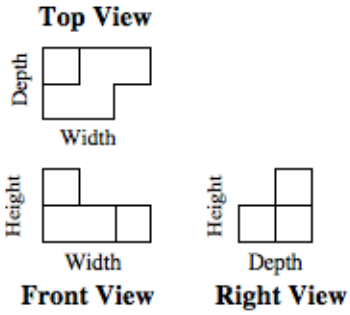
b. On graph paper, draw the three views for the shape at right. Be sure to label your diagrams with the words "height," "width," and "depth." Also label the views as top, right, or front.



c. Is it possible to add a cube to the shape and not change the right view? If so, describe all the possible ways.

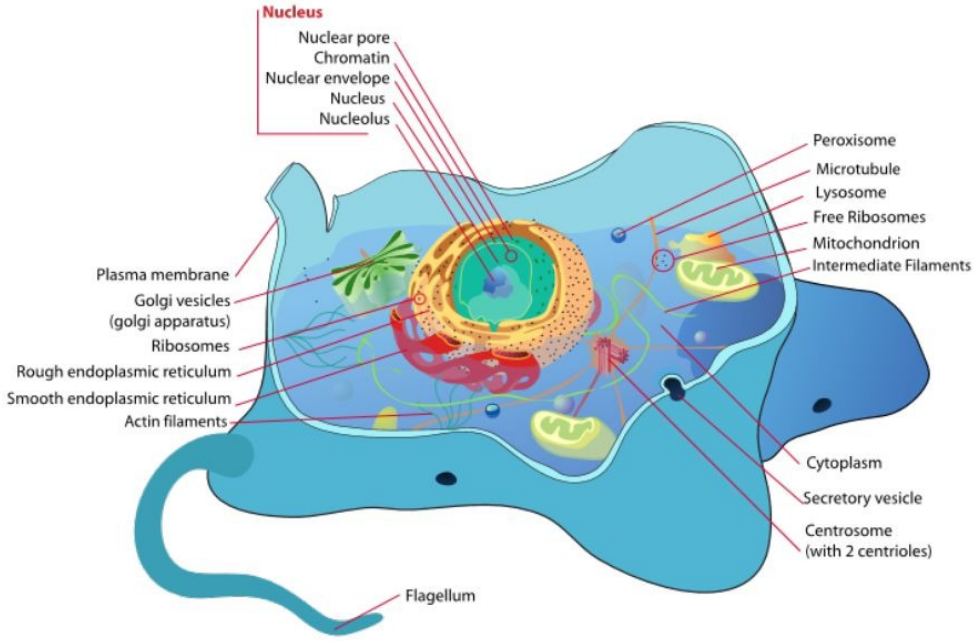
d. Is it possible to remove a cube (or several cubes) without changing the front view? Explain.

e. Anson designed a new solid and drew the top, right, and front views at right. Describe his solid. Then find its volume and surface area. Assume there are no floating cubes.



The Cells That Make Us

by ReadWorks



"Mom, I'm hurt," said Mike.

"What happened?" asked Mike's mom.

"I stumbled and fell while playing football at the playground today. I scraped my knee," said Mike.

"You poor dear. Here, let's put a Band-Aid on your knee," said his mom.

Mike's mom gingerly wiped his bleeding knee with a wet cloth and pasted a Band-Aid on it. Mike wondered aloud, "Our bodies are made of arms and legs. The arms and legs are made of blood and bones. But what are these blood and bones made of?"

Mike's mom replied, "Everything in our body is made of small units called cells. Think of it this way. Just like hundreds of thousands of bricks form a house, millions of cells form our muscles, bones, skin, and hair-eventually coming together to form the human body."

As Mike looked at his bandaged knee, he wondered, "Wow, can I see these cells?"

"You cannot see most of your cells with the naked eye," said his mom. "A cell is small. A cell is the smallest unit that can be said to be alive. You can see a lot of cells through a microscope."

"So, every part of my body consists of cells?" Mike said.

"Yeah. Not just your body, mine too," said Mike's mom. "Your pet dog, Tommy? He's made of cells. Your friend Jim's cat? She's made of cells, too. The lions we saw on safari last year, the spiders in our

storeroom. Every creature on Earth is made of cells, just like you and me."

"Wow, so an ant or an amoeba is built up of cells, like Lego blocks?"

"The ant, yes, sort of like Lego blocks. But some creatures have just a single cell, like an amoeba. They are called unicellular organisms. Other creatures, like us human beings, are collections of cells. These are called multicellular organisms. Multicellular organisms can range in size from brown algae to large animals like elephants and whales, which have trillions of cells."

"But what does a cell look like?"

"A cell consists of different parts."

"Like what?"

"So you know how you have different parts of your body that are responsible for different activities? For example, your legs help you move, your stomach helps you in digestion, and your eyes help you see. Well, different parts within cells are responsible for different functions. These different parts perform the activities that keep the cell alive."

"Wow, so how does a cell stay alive?"

"The different parts of the cell work together to keep the cell alive. Many cells have a nucleus. The nucleus is the 'brain' of the cell. It controls and coordinates all activities of the cell. The nucleus is surrounded by the nuclear membrane, which helps to protect the nucleus. In addition to the nucleus, many cells have some other parts. All the parts of the cell are contained within a cell membrane. This is the outer covering of the cell. The cell membrane can allow certain substances, like nutrients and water, to enter the cell. It also can let out waste and even block out some unwanted substances."

"It's so cool that the cell membrane can let in some things and block other things."

"Yeah. Then, between the nucleus and the cell membrane, there is the cytoplasm, which is a gel-like fluid that fills the area. And some other parts of the cell are located in the cytoplasm. Like the nucleus and cell membrane, each part has structure and function."

"Wow. Cells are like machines! What powers them?"

"Energy production usually happens in a part of the cell called the mitochondrion. Not all cells have mitochondria, but a lot of cells do. Mitochondria are usually round or oval-shaped. Sometimes they are shaped like kidney beans. Mitochondria convert food into chemical energy for the cells."

"Do we use this energy, too?"

"Absolutely. The accumulated energy in a lot of the trillions of cells in the average human body help to give us energy. It helps us have the strength to move our arms and legs, to think, and to live."

"Wow. So the cells work together?"

"Yeah. A group of human cells band together and form a tissue. There are four main types of tissue in humans. Connective tissues include blood or bones. These form connections between structures in the body. Muscle tissues form muscles, which help us move. Nervous tissues are in the brain, spinal

cord, and nerves. This type of tissue helps to control many body activities. Epithelial tissues are tissues that line or cover the different parts of the body. This type of tissue has various functions, such as protecting and filtering."

"So many cells make up different types of tissues, and the tissues have different functions in our body?"

"Exactly! The tissues are specialized for different functions, so the cells of one type of tissue work together in unison. For instance, all the cells in the muscle tissue in your calf muscles work together to help you walk or run."

"And the tissues in my biceps help me wave my hand," said Mike, waving his hand from side to side.

"That's not all," said Mike's mom. "Various types of tissue in your body team up to make an organ. Organs perform specific functions in your body. For example, your heart is made of all four types of tissue. All of the tissues in your heart work together to pump blood through your body. The heart is one of five vital organs in humans. The other vital organs are the brain, kidneys, liver, and lungs."

"So these organs are important in keeping me alive?" asked Mike.

"Yeah, and each organ performs its specific function because of the tissues that constitute it."

"And the tissues are formed by cells! That is so cool!"

"That's right. Just about everything a person does is thanks to the teams of cells that make up the tissues that make up the organs!"

"Wow! Unlike a football team competing against other teams, all the teams in the human body work together. That is amazing!"

Human Microbiome: Your Body Is an Ecosystem

This article is provided courtesy of the American Museum of Natural History.

What Is an Ecosystem?

Forests, lakes, and caves are ecosystems, and each contains a unique mix of living things, like plants and animals, and non-living things, like air, sunlight, rocks, and water. An ecosystem is a community of living things that interact with each other and with the non-living things in their environment.

You Are an Ecosystem

The human body is also an ecosystem. We are home to thousands of kinds of bacteria, viruses, fungi, and other microscopic

organisms-trillions of them. There are more microbes living on just your skin right now than there are people on Earth. And there are a thousand times more than that in your gut! Together all the microbes in and on the human body form communities that make up the human microbiome. Like fingerprints, no two human microbiomes are the same. You aren't just an ecosystem -you are a *unique* ecosystem.

Photo Credit: Gaby D'Alessandro/AMNH

The human body is an ecosystem. We are home to trillions of microbes.

Humans & Microbes

Microbes first appeared over 3.5 billion years ago. This makes them the oldest form of life on Earth. Over the past six million years, humans and microbes have coevolved to form complex relationships. Humans need a microbiome to stay healthy, and the microbiome needs environments provided by the human body in order to survive.

Photo Credit: AMNH

To avoid contamination by other bacteria, biologists study the human microbiome in a sterile environment.

Just like the plants and animals in an ocean or a desert, the species that make up a microbiome interact with each other. They rely on these interactions in order to eat, grow, and reproduce. Different species of microbes live in different places in and on our bodies. They are adapted to these environmental conditions, from the cool, dry skin of your knee to the warm, moist darkness inside your mouth.

How Do Scientists Study the Human Microbiome?

How do scientists find out which organisms make up a human microbiome? They can do experiments. James Meadows, a researcher at the University of Oregon, placed people in a "clean room": a room as free of microbes as possible. (Microbes are *everywhere*.) Scientists sealed off the room and sterilized it. They filtered the air to prevent microbes from coming in from the outside. Then they divided the space into two rooms. One stayed empty. People entered the other room, one at a time. After each person left, the researchers took a sample of the air in the room. Scientists repeated the experiment many times, and could always tell which room had been occupied. They could measure bacterial "clouds" in the room-bacteria that had come off the person's body. Because every person's microbiome is unique, they could also identify different people from their bacterial "clouds."

Scientists are just beginning to understand what roles these organisms play in human health. Some species benefit us, like gut bacteria that help digest food. Some cause harm, like pathogens that cause disease. Many simply coexist with us-it seems that most species are either benign or beneficial to humans. Scientists call these bacteria commensal (if they are harmless) or mutualistic (if they offer a benefit). Sometimes bacteria that are harmless or beneficial in one place can cause problems in another.

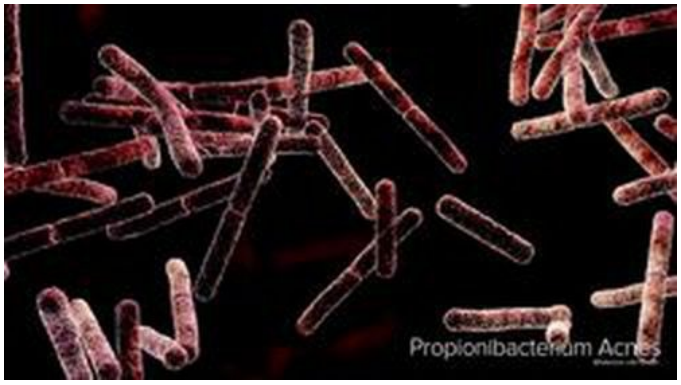


Photo Credit: AMNH

Propionibacterium acnes is commonly found on human skin where it is harmless. But if it becomes trapped in a hair follicle, it can cause acne.

Photo Credit: AMNH

Staphylococcus bacteria can help protect our skin against fungi and yeast. But they can also cause infections and even life-threatening diseases.

Competition in the Biome

Just like organisms in any ecosystem, microorganisms within the microbiome compete with each other for space and resources. They also prevent other organisms from entering the ecosystem. Some of this competition benefits us. For example, a bacteria on our skin called *Bacillus subtilis* competes with the fungus that causes athlete's foot, preventing the fungus from infecting us.

Scientists are studying how these microorganisms work in our bodies, and learning about the balance between different bacterial communities. Products like antibacterial hand sanitizers can wipe out all bacteria on a patch of skin, good and bad alike. Antibiotic drugs also destroy helpful bacteria along with their targets. Fungi evolved the ability to produce anti-bacterial chemicals as they competed with bacteria over millions of years of evolution. By studying these fungi, scientists learned how to manufacture these anti-bacterial chemicals and turn them into antibiotic drugs, which have saved

millions of lives. At the same time studies suggest that rapidly increasing antibiotic use in the United States has reduced the diversity of our microbiomes.

Being Healthy Means Having a Balanced Microbiome

We now understand that a diverse and balanced microbiome is essential for a strong immune system. Some scientists think that infants who lack exposure to microorganisms develop a higher rate of allergies, asthma, eczema, and other health problems. Studies also suggest that the microbiome plays a role in obesity and in conditions like depression.

The microbiome is so important that it is like an additional organ. It is a part of the body that serves vital functions, like the skin or kidneys. We need to preserve ecosystems in nature, so preserving our own ecosystem is important too.

Where would you like to live in the World?

Standard Benchmark	Geography 1a: Students will demonstrate mental maps of the world and its sub-regions which include the relative location and characteristics of major physical features, political divisions, and human settlements.
Grade Band	6-7
Vocabulary	Map, mental maps

A **mental map** is a person's internalized picture of a part of the Earth's surface. It contains our knowledge of the relative position of places as well as their physical environments and cultural characteristics. People have several mental maps at different scales.

ACTIVITY 1:
Directions: Pick a place and answer the questions below.

Wilmington, Delaware or Rehoboth Beach, Delaware

- What images or words come to mind for this place? On a separate sheet of paper, either draw a picture or list the words.

- Now draw an outline of the state of Delaware on the same sheet of paper from above.

Your answers above are your perception of a place or a part of your mental map! Usually our mental maps of places we live have the most details.

- How accurate was your outline of Delaware?

ACTIVITY 2:
Answer the following questions on the same sheet of paper you used for previous questions:

- **What makes a place desirable to visit?**
- **What makes a place desirable to live for a long time?**
- (your answers could include weather and climate, access to mountains or beaches, large country with big cities or small country with not a lot of people, etc.) ***Try to come up with at least Five characteristics of a place.***

ACTIVITY 3:
Directions: Use your list above (what makes a place desirable to live) to rank the countries of North and South America using the (1-5) scale below. You should be able to identify some characteristics just by looking at a physical map. You can use Google Maps to help identify where each of the countries are located.

Where would you like to live in the World?

Rate the Countries in North and South America Using the Rating Below

___Argentina ___Bolivia ___Brazil ___Chile ___Colombia ___Ecuador ___Guyana ___Paraguay ___Peru ___Suriname ___Uruguay ___Venezuela	___Antigua and ___Barbuda ___Bahamas ___Barbados ___Belize ___Canada ___Costa Rica ___Cuba ___Dominica	___Grenada ___Guatemala ___Haiti ___Honduras ___Jamaica ___Mexico ___Nicaragua ___Panama ___United States of America (USA)

1. Which countries had the highest (most desirable) ratings?

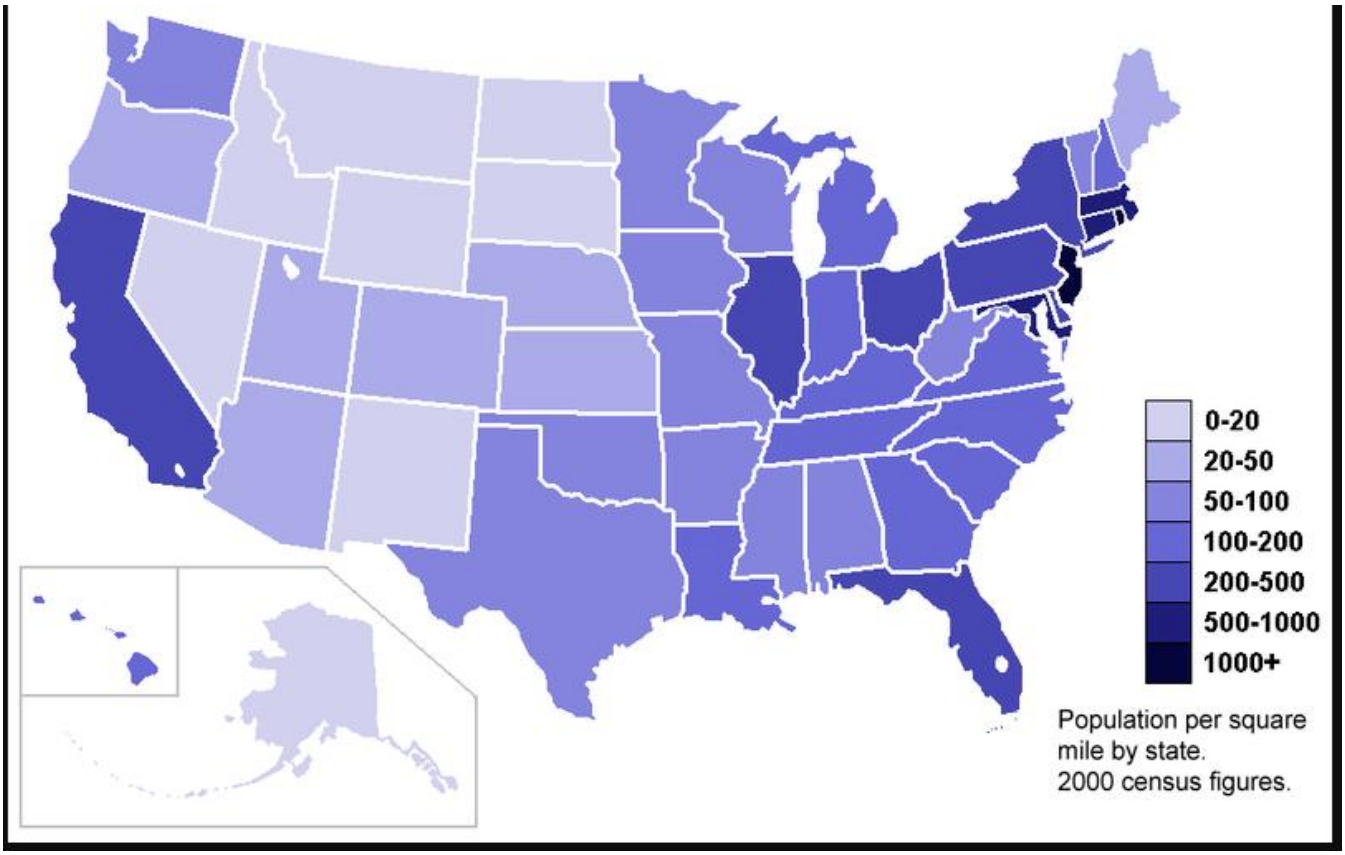
2. Which countries had the lowest (least desirable) ratings?

ACTIVITY 4:

Create a map using your, Where Would You Like to Live? worksheet ratings. You will be creating a **choropleth m**ap. A choropleth map is a representation of data, such as population, over a specific area using colors or patterns to represent types or intensity of data. The choropleth map below colors US states with high population density in darker colors, and states with lower population densities in lighter colors.

Where would you like to live in the World?

Choropleth Map:



Directions:

- You can either use the map of North and South America (on page 4) or you can create your map using this website: https://mapchart.net/americas.html
- Here is a tutorial. If you use this website, include your map below.

- FOR YOUR RATINGS (of desirable countries to live – from above):
- Create a color gradation. Choose a light color for the lowest rated countries and a dark color for the highest rated countries. Create a legend for your map.
- Color each country with the color that represents its ranking. Title your map "[Your Name]'s Country Preference Map."

ACTIVITY 5:

After you completed your creation of a Choropleth Map (on page 4), answer the following questions:

1. What patterns do you see on the map?

2. How can you explain those patterns? (ex. Countries I have already visited tend to be more desirable).

Where would you like to live in the World?