6th 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. These projects are standards-aligned and designed to meet the Remote Learning instructional minutes guidelines by grade band.

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

6th Grade Literacy Project: The Art of Letter Writing 1
6th Grade Math Project: Business Math 10
6th Grade Science Project: Why do chocolate and broccoli taste bitter to some people but not others? 16
6th Grade Social Science Project: Friendship through Adversity 25
### 6th Grade Literacy Project: The Art of Letter Writing

#### Estimated Time
180 minutes

#### Grade Level Standard(s)
- RI6.2 Determine a theme or central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.
- RI 6.6 Determine an author’s point of view or purpose in a text and explain how it is conveyed in the text.
- W6.4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose and audience
- L6.6: Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

#### Caregiver Support Option
Caregivers can read and discuss the letters and short story with their student.

#### Materials Needed
Paper and a writing utensil

#### Question to Explore
What are the benefits of using letters to communicate? How does a story change when the text is transformed into a letter?

#### Student Directions
In this project you will examine how letters convey a message and determine the tone and the central idea. Secondly, you will read a short story and turn the story into a letter. Finally, you will write a letter about a certain aspect of your life.

**Activity 1: What does a letter convey?**

A. Think about your answers to the following questions. If possible, discuss with a friend or family member. Write your answers on notebook paper.
   - a. What do you know about letters?
   - b. What purpose do they serve?
   - c. When are they used?

B. Now, answer the following question.
   - a. In a world of technology, why might someone write and mail a letter? In other words, besides as a form of communication, what other purposes do letters serve?

C. Read “Dear Mama: Letters From a Mill Girl.” As you read, think about who is writing the letter and the purpose of the letter. Then, answer the following questions on notebook paper.
   - a. What is the purpose of this letter?
   - b. What is the tone of the letter? Tone is an attitude of a writer toward a subject or an audience. Tone is generally conveyed through the choice of words, or the viewpoint of a writer on a particular subject.
   - c. What words and phrases in the letter stand out to you and demonstrate the tone?
   - d. How might the person receiving the letter respond if he/she were to answer?

D. After you have read the letter, pretend you are the recipient of this letter. Write a letter in
Lowell, Massachusetts - September 21, 1835

Dear Mama,

I arrived in Lowell at last. My, what a lot I have to tell you!

The journey here seemed mighty long. Bumping along in the wagon and then the train, I couldn't help but think how every mile was carrying me farther away from home.

Cousin Abigail met me at the depot. I knew her by her red hair—just like Papa's. She took me straight to her boardinghouse, so I only got a quick peek at the town. How I longed to stop and just stare at it all! The streets are lined with building after building, all crowded and close together. And so many people and horses and carriages hurrying here, there, and everywhere. It's so noisy and busy and bright.

Our boarding house is built of red brick. It is three stories tall, and our unit is joined to others on both sides. Thirty-six girls live here, four girls and two beds to a room. Abigail is in a room with older girls. I share a bed with a girl named Anne, who is fourteen—just my age! She is nice and quiet. A cheery, younger girl named Mary and a fourth girl, Susan, complete our room. I shouldn't say it, but Susan is a bit stuck-up. Anne whispered to me that it's because we're new girls and Susan has been here for five months. We are all crammed in like hens in the chicken coop. We have a single pitcher and basin for washing up.

Mrs. Chase keeps the house. There are such a lot of rules! We must be ever so quiet coming into the house and hang up our bonnets, shawls, and coats in the entry. We must never be rude or loud. And we must all be in bed by 10 o'clock.

I must say they feed us plenty. Yesterday's noon dinner was codfish hash and apple pie and warm biscuits and hot coffee.

One nice surprise is there are some books here we can borrow. I know Papa used to think me too bookish for a farm girl but, oh, Mama, I am so eager to read them.

Well, I had better stop. It's almost bedtime, and tomorrow I go to the mill to see about getting a position.

Your loving Grace

Source: Newsela.com
Activity 2: Explore Stories through Letters

Now that you have read a letter you know more about this genre. People often write letters to describe their lives, share their experiences, ask for help or advice, and make connections with people who they are not able to see every day.

A. You will read the short story below. Pay attention to the characters. Think about their perspectives and how they might use letters to communicate.

B. After you have read, write a letter from the narrator’s perspective. Consider:
   a. Who will you write the letter to?
   b. What moment or time from the story do you want to use as a focus?
   c. What will be the purpose of the letter?
   d. What will be the tone of the letter?

C. Check your letter for the following elements. Make any revisions you need to improve your letter.
   a. Date, greeting, body and closing
   b. At least two paragraphs
   c. Sentence variety
   d. Descriptive language
   e. Correct spelling, punctuation and capitalization

Sometimes a Dream Needs a Push

Walter Dean Myers

You might have heard of my dad, Jim Blair. He’s 6’5” and played a year of good basketball in the pros before tearing his knee up in his second year. The knee took forever to heal and was never quite the same again. Still, he played pro ball in Europe for five years before giving it up and becoming an executive with a high-tech company.

Dad loved basketball and hoped that one day I would play the game. He taught me a lot, and I was pretty good until the accident. It was raining and we were on the highway, approaching the turnoff toward our house in Hartsdale, when a truck skidded across the road and hit our rear bumper. Our little car spun off the road, squealing as Dad tried to bring it under control. But he couldn’t avoid the light pole. I remember seeing the broken windows, hearing Mom yelling, amazingly bright lights flashing crazily in front of me. Then everything was suddenly dark. The next thing I remember is waking up in the hospital. There were surgeries and weeks in the hospital, but the important thing was that I wasn’t going to be walking again.

I didn’t like the idea, but Mom and I learned to live with it. Dad took it hard, real hard. He was never much of a talker, Mom said, but he talked even less since I was hurt.

“Sometimes I think he blames himself,” Mom said. “Whenever he sees you in the wheelchair he wants to put it out of his mind.”
I hadn’t thought about that when Mr. Evans, an elder in our church, asked me if I wanted to join a wheelchair basketball team he was starting.

“We won’t have the experience of the other teams in the league,” he said. “But it’ll be fun.”

When I told Mom, she was all for it, but Dad just looked at me and mumbled something under his breath. He does that sometimes. Mom said that he’s chewing up his words to see how they taste before he lets them out.

Our van is equipped with safety harnesses for my chair, and we used it on the drive to see a game between Madison and Rosedale. It was awesome to see guys my age zipping around in their chairs playing ball. I liked the chairs, too. They were specially built with rear stabilizing wheels and side wheels that slanted in. Very cool. I couldn’t wait to start practicing. At the game, Mom sat next to me, but Dad went and sat next to the concession stand. I saw him reading a newspaper and only looking up at the game once in a while.

“Jim, have you actually seen wheelchair games before?” Mom asked on the way home.

Dad made a little motion with his head and said something that sounded like “Grumpa-grumpa” and then mentioned that he had to get up early in the morning. Mom looked at me, and her mouth tightened just a little.

That was okay with me because I didn’t want him to talk about the game if he didn’t like it. After washing and getting into my pj’s I wheeled into my room, transferred to the bed, and tried to make sense of the day. I didn’t know what to make of Dad’s reaction, but I knew I wanted to play.

The next day at school, tall Sarah told me there was a message for me on the bulletin board. Sarah is cool but the nosiest person in school.

“What did it say?” I asked.

“How would I know?” she answered. “I don’t read people’s messages.”

Probably nothing important,” I said, spinning my chair to head down the hall.

“Just something about you guys going to play Madison in a practice game and they haven’t lost all season,” Sarah said. “From Nicky G.”

“Oh.”

The school has a special bus for wheelchairs and the driver always takes the long way to my house, which is a little irritating when you’ve got a ton of homework that needs to get done, and I had a ton and a half. When I got home, Mom had the entire living room filled with purple lace and flower things she was putting together for a wedding and was lettering
nameplates for them. I threw her a quick “Hey” and headed for my room.

“Chris, your coach called,” Mom said.

“Mr. Evans?”

“Yes, he said your father had left a message for him,” Mom answered. She had a big piece of the purple stuff around her neck as she leaned against the doorjamb. “Anything up?”

“I don’t know,” I said with a shrug. My heart sank. I went into my room and started on my homework, trying not to think of why Dad would call Mr. Evans.

With all the wedding stuff in the living room and Mom looking so busy, I was hoping that we’d have pizza again. No such luck. Somewhere in the afternoon she had found time to bake a chicken. Dad didn’t get home until nearly 7:30, so we ate late.

While we ate Mom was talking about how some woman was trying to convince all her bridesmaids to put a pink streak in their hair for her wedding. She asked us what we thought of that. Dad grunted under his breath and went back to his chicken. He didn’t see the face that Mom made at him.

“By the way” — Mom gave me a quick look — “Mr. Evans called. He said he had missed your call earlier.”

“I spoke to him late this afternoon,” Dad said.

“Are the computers down at school?” Mom asked.

“No, I was just telling him that I didn’t think that the Madison team was all that good,” Dad said. “I heard the kids saying they were great. They’re okay, but they’re not great. I’m going to talk to him again at practice tomorrow.”

“Oh,” Mom said. I could see the surprise in her face and felt it in my stomach.

The next day zoomed by. It was like the bells to change classes were ringing every two minutes. I hadn’t told any of the kids about my father coming to practice. I wasn’t even sure he was going to show up. He had made promises before and then gotten called away to work. This time he had said he was coming to practice, which was at 2:30, in the middle of his day.

He was there. He sat in the stands and watched us go through our drills and a minigame. I was so nervous, I couldn’t do anything right. I couldn’t catch the ball at all, and the one shot I took was an air ball from just behind the foul line. We finished our regular practice, and Mr. Evans motioned for my father to come down to the court.
“Your dad’s a giant!” Kwame whispered as Dad came onto the court.

“That’s how big Chris is going to be,” Nicky G said.

I couldn’t imagine ever being as tall as my father.

“I was watching the teams play the other day.” Dad had both hands jammed into his pockets. “And I saw that neither of them were running baseline1 plays and almost all the shots were aimed for the rims. Shots off the backboards are going to go in a lot more than rim shots if you’re shooting from the floor.”

Dad picked up a basketball and threw it casually against the backboard. It rolled around the rim and fell through. He did it again. And again. He didn’t miss once.

“I happen to know that you played pro ball,” Mr. Evans said, “and you’re good. But I think shooting from a wheelchair is a bit harder.”

“You have another chair?” Dad asked.

Mr. Evans pointed to his regular chair sitting by the watercooler. Dad took four long steps over to it, sat down, and wheeled himself back onto the floor. He put his hands up and looked at me. I realized I was holding a ball and tossed it to him. He tried to turn his chair back toward the basket, and it spun all the way around. For a moment he looked absolutely lost, as if he didn’t know what had happened to him. He seemed a little embarrassed as he glanced toward me.

“That happens sometimes,” I said. “No problem.”

He nodded, exhaled slowly, then turned and shot a long, lazy arc that hit the backboard and fell through.

“The backboard takes the energy out of the ball,” he said. “So if it does hit the rim, it won’t be so quick to bounce off. Madison made about 20 percent of its shots the other day. That doesn’t win basketball games, no matter how good they look making them.”

There are six baskets in our gym, and we spread out and practiced shooting against the backboards. At first I wasn’t good at it. I was hitting the underside of the rim.

“That’s because you’re still thinking about the rim,” Dad said when he came over to me. “Start thinking about a spot on the backboard. When you find your spot, really own it, you’ll be knocking down your shots on a regular basis.”

Nicky G got it first, and then Kwame, and then Bobby. I was too nervous to even hit the backboard half the time, but Dad didn’t get mad or anything. He didn’t even mumble. He
just said it would come to me after a while.

Baseline plays were even harder. Dad wanted us to get guys wheeling for position under and slightly behind the basket.

"There are four feet of space behind the backboard," Dad said. "If you can use those four feet, you have an advantage."

We tried wheeling plays along the baseline but just kept getting in each other's way.

"That's the point," Dad said. "When you learn to move without running into each other you're going to have a big advantage over a team that's trying to keep up with you."

Okay, so most of the guys are pretty good wheeling their chairs up and down the court. But our baseline plays looked more like a collision derby. Dad shook his head and Mr. Evans laughed.

We practiced all week. Dad came again and said we were improving.

"I thought you were terrible at first," he said, smiling. I didn't believe he actually smiled. "Now you're just pretty bad. But I think you can play with that Madison team."

Madison had agreed to come to our school to play, and when they arrived they were wearing jackets with their school colors and CLIPPERS across the back.

We started the game and Madison got the tip-off. The guy I was holding blocked me off so their guard, once he got past Nicky G, had a clear path to the basket. The first score against us came with only 10 seconds off the clock.

I looked up in the stands to see where Mom was. I found her and saw Dad sitting next to her. I waved and she waved back, and Dad just sat there with his arms folded.

Madison stopped us cold on the next play, and when Bobby and Lou bumped their chairs at the top of the key, there was a man open. A quick pass inside and Madison was up by four.

We settled down a little, but nothing worked that well. We made a lot of wild passes for turnovers, and once, when I was actually leading a fast break, I got called for traveling when the ball got ahead of me, and I touched the wheels twice before dribbling. The guys from Madison were having a good time, and we were feeling miserable. At halftime, we rolled into the locker room feeling dejected.

"Our kids looked a little overmatched in the first half," Mr. Evans said.

"I think they played okay," Dad said. "just a little nervous. But look at the score. It's 22 to 14."
With all their shooting, Madison is just eight points ahead. We can catch up."

I looked at Dad to see if he was kidding. He wasn’t. He wasn’t kidding, and he had said “we.” I liked that.

We came out in the second half all fired up. We ran a few plays along the baseline, but it still seemed more like bumper cars than basketball with all the congestion. Madison took 23 shots in the second half and made eight of them plus three foul shots for a total score of 41 points. We took 17 shots and made 11 of them, all layups off the backboard, and two foul shots for a total of 38 points. We had lost the game, but everyone felt great about how we had played. We lined up our chairs, gave Madison high fives before they left, and waited until we got to the locker room to give ourselves high fives.

Afterward, the team voted, and the Hartsdale Posse all agreed that we wanted to play in the league. Dad had shown us that we could play, and even though we had lost we knew we would be ready for the next season.

Dad only comes to practice once in a while, but he comes to the games when they’re on the weekend. At practice he shows us fundamentals, stuff like how to line your wrist up for a shot, and how the ball should touch your hand when you’re ready to shoot. That made me feel good even if he would never talk about the games when he wasn’t in the gym. I didn’t want to push it too much because I liked him coming to practice. I didn’t want to push him, but Mom didn’t mind at all.

"Jim, if you were in a wheelchair," she asked, "do you think you could play as well as Chris?"

Dad was on his laptop and looked over the screen at Mom, then looked over at me. Then he looked back down at the screen and grumbled something. I figured he was saying that there was no way he could play as well as me in a chair, but I didn’t ask him to repeat it.

Text from commonlit.org

Activity 3: Express yourself
A. Pick one of the following and write a letter:
   a. A moment in your life where someone did something special for you
   b. An apology to someone you disappointed
   c. A wish or goal you have for yourself or someone you care about
   d. An exploration of your thoughts, feelings, and life right now
B. Check your letter for the following elements. Make any revisions you need to improve your
Activity 4: Reflection
A. Answer the following questions.
   a. What do you know about letters that you didn’t know before?
   b. In what ways are letters a unique genre?
   c. When and why might you use letters in your life?

Cross Content Connection:
Social Science: Write a letter to someone you know that lives in another place. Find that place on a map or talk with a friend/family member about that place. Compare and contrast it to where you live. Or, write a letter to your Congressperson about an issue that matters to you.

Visual Arts: Use materials available around your house (be creative!) to create images to accompany your letters. Bind them together to create a book.

Adapted from readwritethink.org

<table>
<thead>
<tr>
<th>6th Grade Math Project: Business Math</th>
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<tr>
<td>Estimated Time</td>
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<td><strong>Grade Level Standard(s)</strong></td>
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<tr>
<td>6.EE.B: Reason about and solve one-variable equations and inequalities.</td>
</tr>
<tr>
<td>6.EE.C: Represent and analyze quantitative relationships between dependent and independent variables.</td>
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Caregiver Support Option
Discuss how math is used in your workplace.

Materials Needed
Paper, pencil
If available, colored pencils.

Question to Explore
How can I represent the relationship between independent and dependent variables through equations, tables and graphs? What clues can I find in each?

Student Directions
Use your reasoning skills to fill out tables, deepen your understanding of independent and dependent variables, and match data sets shown in different representations!

Activity 1: The Gadget Factory* (35 minutes)
A. The Gadget Factory just obtained some magnets, binoculars and flash drives, but the company needs help in filling out the chart. Please help by completing the chart.

<table>
<thead>
<tr>
<th>Item</th>
<th>Number of Items per Box</th>
<th>Number of Boxes per Carton</th>
<th>Number of Items per Carton</th>
<th>Cost per Item</th>
<th>Cost per Box</th>
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<tbody>
<tr>
<td>Magnet</td>
<td>25</td>
<td></td>
<td>300</td>
<td>$66.25</td>
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<td>$449.70</td>
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</table>

B. Monty wrote and solved the equation below to find the cost per magnet. Is he correct? Explain below why/why not.

\[ 66.25w = 795 \]
\[ w = 12 \]

C. Ms. Washington owns a model train store. She uses magnets from The Gadget Factory for the train tracks.

The table shows the relationship between the number of train tracks (\( t \)), and the number of magnets needed, (\( m \)).

Describe in words the relationship between the number of tracks and the number of magnets needed.

<table>
<thead>
<tr>
<th>( t )</th>
<th>( m )</th>
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<tbody>
<tr>
<td>1</td>
<td>5</td>
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<td>2</td>
<td>8</td>
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Then, write an equation that shows this relationship.

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Relationship in words:

Equation:

D. Complete and label a graph to show the relationship between the number of magnets and the number of tracks.

E. Ms. Washington would like to increase the number of tracks to 6. Extend the graph. What ordered pair represents the number of magnets, \( m \), when there are 6 tracks? How many magnets will Ms. Washington need?

Activity 2: Matching Equations and Tables (35 minutes)
Match each equation with a table that represents the same relationship by writing the full equation next to the table number.**
\[ S - 2 = T \quad G = J + 13 \quad P = I - 47.50 \quad C + 273.15 = K \]
\[ e = 6s \quad m = 8.96V \quad y = \frac{1}{12}x \quad t = \frac{d}{2.5} \]
\[ g = 28.35z \]

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Activity 3: Focusing on One Equation (15 minutes)
$S - 2 = T$

S represents the number of sides of a polygon
T represents the number of triangles you can draw inside it (from one vertex to the others, without overlapping)

A. Using the correct table from the previous activity, add additional values to your table that match this equation (for example, if $S = 4$, then $T$ would equal 2).

B. Using the attached graph paper, create a graph based on your table. Don’t forget to label your axes!

Activity 4: Reflection (15 minutes)
Based on your work, write a reflection that demonstrates your knowledge of the relationship between equations, tables and graphs. Answer the following questions in your reflection.

- How do I start with an equation and then develop a table and graph?
- How do I start with a table and then develop an equation and graph?
- How do I start with a graph then develop an equation and a table?
- What clues do each of them give me so that I can match an equation with its correct table and graph?

Optional Extension (20 minutes)
On the second sheet of attached graph paper, design your own quilt using nothing but polygons. Make it colorful and remember that polygons must have straight lines as sides (no curves or circles!). Have fun!

* Courtesy of Savvas Publishing
** Courtesy of Illustrative Mathematics

Activity 3: Focusing on One Equation Graph
Optional Extension
# 6th Grade Science Project: Why do chocolate and broccoli taste bitter to some people but not others?

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<th>Estimated Time</th>
<th>120 - 130 minutes</th>
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**Grade Level Standard(s)**

- **MS-LS3-1**: Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.

- **MS-LS1-8**: Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. [Assessment Boundary: Assessment does not include mechanisms for the transmission of this information.]

**Caregiver Support Option**

Caregivers can assist by reading and discussing text and data with the student.

**Materials Needed**

Pen/pencil, paper

**Question to Explore**

Why can some people taste very bitter foods like dark chocolate and broccoli and others cannot?

**Student Directions**

Students will gather several different types of evidence from text, data, and models to determine how individuals can perceive taste differently. More detailed directions are given in the task. Please write **ALL** responses on a separate sheet of paper or in your notebook.

**Lesson Credits**

- Investigation 1 Image From: [https://learn.genetics.utah.edu/content/basics/ptc/](https://learn.genetics.utah.edu/content/basics/ptc/)
- Investigation 2 Text & Image Adapted From: [https://learn.genetics.utah.edu/content/basics/](https://learn.genetics.utah.edu/content/basics/) [https://kids.frontiersin.org/article/10.3389/frym.2017.00033](https://kids.frontiersin.org/article/10.3389/frym.2017.00033)
Mateo and Peyton were at lunch unpacking the food that their parents had packed for them. Mateo had a piece of pizza leftover from last night’s dinner, an apple, and some small milk chocolate bars. Peyton had a small piece of chicken, some broccoli, and some dark chocolate. By the time they had eaten the pizza and chicken, they were discussing the remaining foods.

“How funny of a coincidence, we both have chocolate today.” Peyton said. “Oh, but my milk chocolate is way better. That dark chocolate stuff tastes gross to me. It’s so bitter!” Mateo argued.

“Really?” inquired Peyton, “I don’t even taste any kind of bitter flavor. Just an intense chocolate flavor.” “Wait, what? You don’t taste that? Here, let me try a piece of yours to make sure I remember this right.” Peyton handed him a piece of dark chocolate, and he chewed it for a moment, then spit it out onto a napkin.

“Blah, gross, yep, that is soooo bitter,” Mateo said disgustedly. “Actually come to think of it, your broccoli there is really bitter tasting and gross to me too. But I’m not trying another bite…”

“Huh, this is really strange,” Peyton said. “I thought food tasted the same to everyone?” “Oh yeah, that is weird. It’s the same food, so shouldn’t it taste bitter to everyone?” Mateo wondered.

Peyton and Mateo were so puzzled by this situation that they are hoping you can help them figure out what is going on. They want to know, “Why do foods like dark chocolate and broccoli taste bitter to some people and not others?”

1. What experiences have you had with foods like dark chocolate or broccoli? Do you like them? Do you think they taste bitter? Record your response on a separate sheet of paper.
2. Right now, how would you explain the answer to Mateo and Peyton’s question, “Why do foods like dark chocolate and broccoli taste bitter to some people and not others?” Record your response on a separate sheet of paper.

Task Overview
To figure out why these foods taste bitter to some individuals and not to others, you will undergo two investigations and use evidence from these investigations to create a scientific explanation. On the following pages, you have guidance for each of the two investigations. For each investigation, complete the questions that you find. Afterwards, you will construct an argument as to which claim is most supported by the evidence.
Investigation 1: How does my tongue perceive taste?

In this investigation, you will read a text and try to find and summarize three main ideas that help you answer the question, “How does my tongue perceive taste?”

1. As you read the below text, annotate any information that you find that you think can be relevant to helping you answer the question, “How does my tongue perceive taste?”

In Disney’s Pixar acclaimed success *Ratatouille*, Chef Gusteau states: “Good food is like music you can taste, color you can smell, there is excellence all around you; You only need to be aware to stop and savour it!” Chef Gusteau’s extended metaphor clearly refers to the infinite combinations of flavors that delight our palate and make food intake a pleasurable experience. Flavor per se is the combined sensory impression of food, and it is determined by the five basic qualities of taste: sweet, salty, sour, bitter and umami (the “savory” taste associated with monosodium glutamate or MSG).

When it comes to eating food, it all starts in the tongue! The tongue acts as a “gatekeeper” by helping us tell the difference between good and harmful substances and consequently guiding our food choices. Although simple in appearance, the tongue is a complex organ with thousands of taste buds – small structures that mostly reside on papillae (or raised bumps) on the upper surface of the tongue and on the palate.
Each taste bud contains a set of 50 to 100 specialized cells known as gustatory cells responsible for sensing different tastes. Each of these gustatory cells is covered with taste receptor proteins. When you eat food, chewing and saliva break the food down into many different molecules that are responsible for different tastes. These molecules bind to the taste receptor proteins on your tongue. In much the same way a key fits into a lock, specific types of taste receptor proteins are responsible for sensing molecules responsible for specific tastes. Recognition of the taste molecule by its specific receptor triggers a signal that leads to the release of chemicals known as neurotransmitters that activate a specific region of the brain known as the gustatory cortex, where taste is perceived and processed.

Scientists have classified these cells into four subsets, called types I to IV. Type I cells, the most common taste cells in taste buds, are responsible for detecting molecules that give rise to a salt taste. Type II cells, the most extensively studied taste cells, have specific receptor proteins on their surfaces that allow each cell to sense molecules responsible for either sweet, bitter, or umami flavors. In particular, some of the taste receptor proteins involved in sensing molecules involved in bitter taste are called TAS2R proteins. Lastly, type III cells are responsible for detecting molecules associated with sour taste. The function of type IV cells is not well understood.

1. What do you think are three central ideas of the text above that will help us figure out the question: “How does my tongue perceive taste?” Copy the below table onto a sheet of paper and record your central ideas.
### Investigation 1: How the tongue perceives different tastes

<table>
<thead>
<tr>
<th>Topic</th>
<th>Summary of Central Idea I Found</th>
</tr>
</thead>
<tbody>
<tr>
<td>How the tongue is organized to perceive different tastes</td>
<td></td>
</tr>
<tr>
<td>What happens to food on the molecular level when it is eaten</td>
<td></td>
</tr>
<tr>
<td>How food molecules and taste receptors produce the sensation of taste.</td>
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</tr>
</tbody>
</table>

2. Looking at all of your central ideas from Investigation 1 together, what can you conclude about how your tongue perceives taste? Cite evidence to support your conclusions. Write your response on a separate sheet of paper.

### Investigation 2: How could two people taste something differently?

To help us figure out how one person would be able to taste bitter foods and another would not be able to, you’ll first read a short text on the role of genes in determining traits, then you will analyze a set of data on how genes influence traits in different individuals. To get started, you will first read a short text on the role of DNA in determining traits.

**DNA, Proteins, and Traits**

All living things have DNA. And whether it comes from you, a pea plant, or your pet rat, it’s all the same. Every living thing’s DNA is made up of different combinations of molecules called Adenine (A), Thymine (T), Guanine (G), and Cytosine (C). It’s the order of the letters that makes each organism different, which we refer to as the genetic code. In all humans, for example, more than 99.9% of the combinations of the As, Ts, Gs, and Cs of DNA are the same. But between two people, 1-3 of the many thousands of As, Ts, Gs, and Cs will differ from person to person.

These key differences in DNA give rise to different traits. This is because DNA is used to make proteins in the body. Proteins are the molecules that carry out functions in the body and give rise to traits. For example, the protein melanin plays a part in determining hair, skin, and eye color. The protein actin plays a role in moving your muscles. When the DNA between two individuals differs in their makeup of As, Ts, Gs, and Cs, it can change what function the protein has, which will then change the trait as well.
1. Based on the reading above, what important ideas do you think will help you determine how two different individuals can taste foods differently? Record your response on a separate sheet of paper.

The taste receptor protein responsible for tasting bitter substances is controlled mainly by one gene called TS2R. One short sequence of the DNA code in this gene, taken from two different individuals, is shown below.

<table>
<thead>
<tr>
<th>Individual</th>
<th>TS2R Genetic Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person 1</td>
<td>ATTCGCGGCCACAGT</td>
</tr>
<tr>
<td>Person 2</td>
<td>ATTCGCGGGCCACAGT</td>
</tr>
</tbody>
</table>

2. Annotate any differences you see in the gene sequence of these two individuals. What did you find? Record your response on a separate sheet of paper.

The below data are taken from 100 individuals. Scientists tested their DNA to determine if their TS2R genetic code contained a G or a C variant. Scientists also tested to what degree these individuals were able to taste bitter flavors. The data from this experiment is shown in the space below.

3. What patterns do you notice in this data? Describe what you see for both individuals. Write your response on a separate sheet of paper.
4. The model of how food molecules interact with taste receptors, as you viewed in Investigation 1, is again shown in the space below. Using what you know about how changes in DNA influence proteins, annotate the model to show how this model is changed in individuals who cannot taste bitter food.

**Individual Who Can Taste Bitter Food**  
(you can leave this model alone, for reference)

**Individual Who Cannot Taste Bitter Food**  
(you should modify this model as you think is appropriate).
Using Evidence to Construct a Final Explanation

After gathering evidence from the activities and investigations, you’ll now revise the explanation you made originally to help us answer Peyton and Mateo’s question, Why do foods like dark chocolate and broccoli taste bitter to some people and not others?"

On a separate piece of paper, record a scientific explanation that answers the above question. You can use the sentence starters below to help you with each part of your explanation.

<table>
<thead>
<tr>
<th>Claim</th>
<th>Answer the driving question in 1-2 short, concise sentences.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The differences in taste are due to...</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evidence</th>
<th>State at least 2 pieces of specific evidence that support the claim you are making. Be sure to pick one piece of evidence from Investigation 1 and one piece from Investigation 2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>My evidence is... (state specific data, quotes, or features of models).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reasoning</th>
<th>Explain the science ideas behind your claim and evidence. Sentence starters are shown below to help you. Be sure you discuss...</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• How the tongue interacts with food to produce the sense of taste.</td>
</tr>
<tr>
<td></td>
<td>• How changes in DNA between individuals can influence receptor proteins and taste.</td>
</tr>
</tbody>
</table>
____ happens because...

____ causes ______ to happen, which means...

The structure of ______ impacts its function because...
# 6th Grade Social Science Project: Friendship through Adversity

<table>
<thead>
<tr>
<th>Estimated Time</th>
<th>120-130 minutes</th>
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</table>
| **Grade Level Standard(s)** | ILSS 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** | Friendship assessment, audience for the final project |
| **Materials Needed** | Social Studies notebook, writing utensil |

## Question to Explore

1. **Essential Question:** How do friendships endure?
   a. What are the characteristics of a strong friendship?
   b. How do friendships change in the face of adversity?

## Student Directions

You will examine 6 sources that will help you identify characteristics of strong friendships, learn how friendships can change during challenging times, and reflect on your own friendships and struggles. As you analyze each source, consider the author’s perspective and purpose, evaluate the credibility of the source, and identify evidence to support your ideas.

### Activity 1: Unpacking the Essential Questions (25 minutes)

A. Write the Essential Question at the top of your notebook page (EQ: How do friendships endure?).
   a. What do you think this question is asking (in your own words)?
   b. Answer the Questions to Explore above with your best thinking right now.

B. Underline the key words in the question in your notebook and write their definitions below (from [www.learnersdictionary.com](http://www.learnersdictionary.com)):
   a. **friendship** - the relationship between friends
   b. **endure** - to continue to exist

C. Think about the friendships that you have. Create a list of 6-10 positive friendship characteristics (e.g. trust). Then, create a list of 6-10 negative friendship characteristics (e.g. sneaky).

D. Take the friendship self assessment on the next page. Be honest with yourself!

Modified from [https://www.uen.org/lessonplan/download/44665?lessonId=590&segmentTypeId=6](https://www.uen.org/lessonplan/download/44665?lessonId=590&segmentTypeId=6)
**Friendship Self Assessment**

Rate yourself on this scale:

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>I listen carefully when my friends talk to me.</td>
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<tr>
<td>I am modest about my own accomplishments.</td>
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<tr>
<td>I do not make fun of others.</td>
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<tr>
<td>I give credit to others for their successes.</td>
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<tr>
<td>I do what I promise; I am dependable.</td>
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<tr>
<td>I can control my temper.</td>
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<tr>
<td>I am interested in many different things.</td>
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<td>I am not rude.</td>
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<tr>
<td>I can laugh at myself.</td>
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<tr>
<td>I can admit when I am wrong.</td>
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<tr>
<td>I am honest regardless of the situation/consequences.</td>
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<td></td>
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<tr>
<td>I am happy for my friends when they win or excel.</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>I offer to help or share when needed.</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>I can keep secrets when asked.</td>
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<tr>
<td>I can share the spotlight easily.</td>
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<tr>
<td>I respect what belongs to others.</td>
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<tr>
<td>I am patient and kind when others make mistakes.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I seldom argue with others.</td>
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</tbody>
</table>

**Reflection:**

1. Look at the data above. Are you surprised by what you see? Do you fall more to the left, center, or right side of the chart? What does that mean?
2. If possible, ask a friend or family member to complete this survey about you. Does the data change?
3. What is the value in this assessment? Is it helpful to you and your friendships? Explain.
4. How does this list compare to the list you made in Activity 1, Part C above?
5. These questions were created by an Education Network for teachers. What questions would
Activity 2: Analyzing multiple sources to address the Essential Question (30 minutes)

A. Write today’s essential question in your Social Studies notebook (EQ: What are the characteristics of a strong friendship?).

B. As you read Sources A and B, annotate the text with questions and notes to help you answer today’s supporting question.

Source A: “I’ll Be There For You (Lyrics to the theme song from Friends)” by The Rembrandts (from: https://www.azlyrics.com/lyrics/rembrandts/illbethereforyouthemefromfriends.html)

So no one told you life was gonna be this way
Your job’s a joke, you’re broke, your love life’s D.O.A.
It’s like you’re always stuck in second gear
When it hasn’t been your day, your week, your month, or even your year, but
I’ll be there for you
(When the rain starts to pour)
I’ll be there for you
(Like I’ve been there before)
I’ll be there for you
(‘Cause you’re there for me too)
You’re still in bed at ten and work began at eight
You’ve burned your breakfast, so far things are going great
Your mother warned you there’d be days like these
But she didn’t tell you when the world has brought you down to your knees that
I’ll be there for you
(When the rain starts to pour)
I’ll be there for you
(Like I’ve been there before)
I’ll be there for you
(‘Cause you’re there for me too)

Source B: How to be a good friend (By WikiHow, adapted by Newsela staff Published:10/22/2019, from https://newsela.com/read/be-a-good-friend/id/40044/?collection_id=2000000156&search_id=b3838737-b4b8-46cd-a658-cd42d639c322)

Being a good friend isn’t always easy, but true friendships are more than worth the effort. They make us happier and stronger people.

Here are some key things that will help you be a good friend to others.

Being Trustworthy

1. **Keep your promises.** Try your best not to make a promise you can’t keep. If you say you’ll hang out with a friend or do a friend a favor, then try to stick to what you promised. It’s OK to back out of
things every once in a while — but don’t make it a regular thing. If it happens too often, you’ll start to seem untrustworthy.

2. **Apologize when you’ve made a mistake.** Don’t act as if you’re perfect. If you know you’ve made a mistake, admit it — and when you say sorry, you should mean it.

3. **Be honest about your feelings.** If something is upsetting you, don’t be afraid to talk about it, and be honest about how you feel.

4. **Be real.** Don’t try to act like someone you’re really not. If you’re just acting, your friendship won’t last.

5. **Don’t use people.** If you’re trying to be friends with someone just to become more popular, that’s not friendship – you’re just using them. **Eventually,** the fact that you’re not a real friend will become obvious.

6. **Be loyal.** If your friend tells you something and asks you to keep it a secret, don’t tell anyone else. Also, don’t talk about your friends behind their backs, and don’t spread **rumors.**

**Being Supportive**

1. **Be helpful.** Be ready to do a favor for your friend, and do it just to be nice, not because you want something in return. However, your friend should also sometimes do you favors. If you feel as if you’re always helping your friends and get nothing back, they could be taking advantage of you and you may have a problem.

2. **Be a good listener.** Don’t do all the talking, and take the time to truly listen to what your friends have to say. Don’t make them feel as if they can’t get a word in when they’re around you.

3. **Help your friend deal with their problems.** You need to watch out for your friend when they are having a tough time. If you see a problem, speak up, no matter how awkward you may feel. Let your friend know that you are there to help, or just to listen.

4. **Be there in a time of need.** If your friend has to go to the hospital, visit. If your friend’s dog runs away, help to find it. Let your friends see that they can count on you any time. If they’re true friends, you’ll be able to count on them, too.

5. **Give thoughtful advice.** If you give your friend advice, try to see things from your friend’s point of view. Don’t judge your friends and don’t insist they do whatever you say. Avoid giving advice when it hasn’t been asked for. Sometimes people just want to complain, and in those cases, you should just listen.

6. **Give your friend some space.** You should accept the fact that your friend won’t always want to spend time with you. Learn to step back and give your friend space if he or she wants to be alone. Don’t get jealous if your friend has many other friends. Every relationship is special and different, and if your friend has other friends it doesn’t mean he or she doesn’t appreciate you.

**Making Your Friendship Last**

1. **Learn to forgive.** If you want your friendship to last, then you should be able to forgive if your friend does something that hurts you. If your friend is sincerely sorry and didn’t do something too horrible, you should move past it. If you’re angry at your friend but haven’t told him or her why, the anger will build up. You need to be able to talk about what’s bothering you, or you’ll never be able to forgive.

2. **Accept your friends for who they are.** Don’t try to change your friends or make them see the world from your point of view. Instead, let them be who they are, and appreciate them for their
different way of seeing things.

3. Stay in touch. Sometimes friends move to different places and are only able to see each other every once in a while. If that happens, be sure to stay in touch. If you still care about your friend, speak up — your friend will be happy to hear from you!

Reflection:

Answer the questions below. Be sure to use your own words and make connections to your own experiences with friendships, both positive and negative.

1. What advice do these sources give about the qualities of a strong friendship?
2. How is the advice in these sources alike? How is it different?
3. What do you think is missing from these sources?
4. Think about social distancing and how to help our **friendships endure** during our time apart:
   a. Which lines from the song did you connect or identify with the most and why?
   b. From the list in source B, what key things do you think are the most important to focus on for your friendships at this time? Why?

Activity 3: Analyzing multiple sources to address the Essential Question (30 minutes)

C. Write today’s essential question in your Social Studies notebook (EQ: **How do friendships change in the face of adversity?**), then write the definition for this keyword:
   a. **adversity** - a difficult situation or condition

D. As you examine sources C, D, E, and F below, annotate the document with your questions and notes to help you answer today’s supporting question.
Hani tied up the laces on her high-tops. The girls’ basketball team at Hancock School had one more practice before the league tournament. For two hours, Hani and her teammates pounded the court. Dodging. Dribbling. Passing. Shooting. Akiko, the team captain, shouted the plays. Hani missed a layup. But five minutes later, her best friend Elly passed her the ball again. Swoosh! A perfect hoop. “Good job!” yelled Akiko. After practice, Coach Risa gave the girls a pep talk. “Remember, you’re part of a team. You have to go out there and help each other.” The girls gave each other high-fives and headed for the locker room. “Do you have a minute, Hani?” Hani wondered why Coach Risa wanted to talk to her. “No headwear is allowed in the tournament,” said Coach Risa. “I’m sorry. Those are the rules.”
Hani always wore a hijab outside her house. The headscarf was a symbol of respect and devotion for Muslim girls and women. In Egypt, where her grandmother Tetta lived, many girls wear hijab. On the basketball team, Hani was the only one. She also wore a long-sleeve top under her jersey and leggings under her basketball shorts to preserve her modesty.

Before she went to bed, Hani unfolded Tetta’s most recent letter.

“Your hijab makes you special on the inside and the outside,” Tetta had written.

Hani hardly slept all night.

The next morning, her parents drove her to the community center. Hani hadn’t told them about the rule.

Mom turned around to look at Hani. “You are very quiet today.”

“I always got the jitters before a game,” Dad said. He had played basketball in high school.

Hani looked silently out the window.

In the gym, Hani lined up with the team. But when the girls ran onto the court, Coach Risa stopped her. “You’ll have to sit on the bench, Hani,” she said.

Two girls were sick and there was no one to substitute for Hani. That meant the Hancock squad was one player short.

Maybe I should take it off just this once, Hani thought. She raised her hands, feeling the soft cloth. Then she remembered how beautiful Tetta looked in her blue-flowered hijab.

She put her hands down.

Akiko saw Hani and asked for a time-out. As the players gathered on the sideline, Coach Risa explained the no-headwear rule to the whole team.

The girls then gathered at the bench. “If you can’t play, I’m not going to either,” Elly told Hani.

Akiko hugged Hani. “You’re our best rebounder. It’s not fair.”

One by one, Hani’s teammates sat down on the bench, too.

As people sitting near the huddle picked up on what was happening, the news quickly spread throughout the stands. Everyone began talking at once. Some people agreed with the no-headwear rule for Hani. Others did not.

“The Hancock team should forfeit the game!” said one parent.

“The girl should be allowed to play!” said another.

The noise in the gym grew louder. Coach Risa talked with the tournament judges.

Hani’s cheeks burned.

The head judge walked over to Hani. “We’re willing to compromise,” he said. “You can wear the scarf at halftime.”

Hani thought again of Tetta’s words. Your hijab makes you special. Halftime wasn’t good enough.

“Can I wear it during the game if I tuck in the ends?” she asked.

The judge thought a minute.

“Agreed!” He shook Hani’s hand.

Hani’s team played hard.


Swoosh! A perfect three-pointer for Akiko.

After a long day, the Hancock team got the third-place trophy. The girls went out for pizza to celebrate. As they ate, they tried to pick the best moment of the game.

Was it Akiko’s three-point swoosh? Or Elly’s amazing pass?
“My best moment was when everyone sat with me on the bench,” said Hani.
“So was mine!”
“Mine too!”
“Same here!
That was it. Everyone agreed.

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How Is the Coronavirus Outbreak Affecting Your Life?

The coronavirus has changed how we work, play and learn: Schools are closing, sports leagues have been canceled, and many people have been asked to work from home.

We asked students how their lives have changed since the onset of this pandemic. They told us about all the things they miss, what it’s like to learn online, and how they’re dealing with the uncertainty. But, they also pointed out the things that have brought them joy and peace amid the chaos.

Finding new ways to socialize
Finding new ways to stay social has been essential, and recently, my friends and I all drove our cars to a large parking lot, parked more than 6 feet apart from each other, sat in our trunks, talked and enjoyed each other’s company for over an hour and a half. This was crucial in keeping our sanity. We missed each other and being in the presence of people other than our family; however, we were sure to maintain our distance and continue social distancing. We did not touch anything new and we stayed more than 6 feet apart from each other speaking about the adjustments we have been making and the ways we have been coping with all of the changes we are experiencing.
— Carly Rieger, New Rochelle High School

…[T]his “corona-cation” has given me a lot of time to reflect, and while I haven’t seen my friends in person for a week and half, I feel closer to them than ever. We’ve FaceTimed almost every day and we play some of our favorite group games; Psych and PhotoRoulette are two apps I highly recommend to have fun from the comfort of everyone’s homes.

Because my mom has a weak immune system, I’ve been quarantined since the moment my school closed, so social distancing has been a little more than 6 feet for me. However, my friends did make me a care package filled with my favorite candy and a puzzle which my family completed in a week.
— Jessica Griffin, Glenbard West HS Glen Ellyn, IL

Stay connected.
We could help one another just by the simple ways of: texting your friends every now and then and keep them in check and give them positive reinforcements; call your far away family and report to them on how you are doing and make sure that they are doing OK as well; help elders that are not safe to go out by running errands for them.
— Xammy Yang, California

It’s really important for everyone to stay in contact with others. Be open to talking to people you don’t necessarily talk to all the time just so you can fulfill your own social requirements. It’s also important to listen to others and take into account their feelings. We are all in a time of stress and anxiety about the unknown and we have to just go with the flow and wait it out. I’m stressed about possibly missing milestones in my life, like prom and graduation, but there are others suffering. We all just need to be prepared, stay healthy, and reach out to others.
— Elysia P., Glenbard West HS, Glen Ellyn, IL

### Source F: Survey result excerpts from a survey of 25 6th grade students at Chicago Public Schools

1) Are you able to stay connected with your close friends during this shelter-in-place period?

- **Yes** - 55.6%
- **No** - 11.1%
- **I’m trying, but it’s not always working** - 33.3%

2) Does your connection FEEL different? How?

“I miss hugs, but for now I’m saving lives.”

“I wouldn’t call it different because we still talk. We talk about secrets, but it’s not the same cuz since we are not in school there’s not much tea to talk about. I do really miss the hugs.”

“Yes, I’m feeling different with my connections because I’m so used to seeing my friends face to face.”

“Hecho de menos poder abrazar a mis amigos.”
Translation: “I miss being able to hug my friends.”

“Yes, because when we’re next to each other we can hug or laugh together. Now, it’s through the phone and we can’t have fun together”
“Tengo miedo, a ser sincero”
Translation: “I’m afraid, to be honest”

“Yes, I feel out of touch because you are always at home.”

“It does since I think we are all used to hugging, shaking hands, giving high fives! It’s just weird not communicating physically.”

Reflection:
To answer the questions below, examine your annotations about the supporting question (How do friendships change in the face of adversity?). Make connections to your own experiences.

1. How has your understanding of friendship changed?
2. How did the sources show that friendships can change during times of adversity? Use evidence from at least 3 sources in your response.
3. Which source did you connect or identify with the most and why?
4. What key idea(s) from Activity 2 do you think helped the friendships in these sources the most? Explain.

Activity 4: Communicating Conclusions (30 minutes)
A. Draw a comic strip or write a short story about a strong friendship going through adversity. You can tell a true story of your own, or create a fictional friendship. Be sure to:
   a. Review Sources A-F to help provide ideas for your comic or story.
   b. Introduce the characters.
   c. Describe the struggle or problem.
   d. Highlight the characteristics of a strong friendship that help with resolving the problem.
   e. Resolve the problem through friendship.
B. Share your comic or story with a friend and or family member. Be sure to follow social distancing rules.
C. If you have access to technology, share your comic or story with CPS! Email your teacher and/or post it to social media and tag/hashtag: @CPSCivicLife #EngageCPS.

Activity 5: Reflection (15 minutes)
A. Many people would call this shelter-in-place period a time of adversity. People have lost their jobs, their routines, and even their loved ones. Some are working through the crisis, risking their own lives in order to keep their communities running. Reflect in your Social Studies notebook about:
   a. The way you are or are not a strong friend (before the shelter-in-place order).
   b. The adversity you’re facing now.
   c. The way your friendships have changed and/or stayed strong during the shelter-in-place order.
   d. After this unit, are you planning to make any changes to maintain stronger friendships during adversity?
   e. What part of this project influenced you the most about maintaining stronger friendships
Look back at your answer for Activity 1, Question A - How has your understanding of friendship changed or been reinforced by this project?

**Cross Content Connection:**

A. Social Science & Literacy: While students are gathering evidence from various sources, they are considering the author’s perspective and purpose, evaluating the credibility of the source, and citing evidence to support a claim.