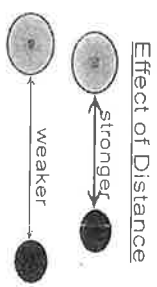
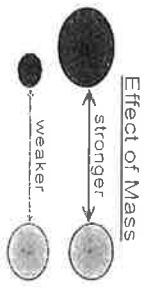


## Gravity (Lexile 800L)

1 There are four basic forces in nature. They are gravitational force, electromagnetic force, weak force, and strong nuclear force. Of these, the force of gravity was the first to be discovered. It is also the weakest force. Gravity does more than keep our feet on the ground. It may be weak, but gravity holds the whole universe together. However, many people do not really know what gravity is.



2 Many people define gravity as something that keeps you from floating off into space. That is true. But gravitational forces exist between all objects with mass. This happens everywhere in the universe. So what exactly is gravity? It is the force that pulls objects toward the center of the Earth. It is also the force that pulls an object toward any other object that has mass. When a force makes two objects pull together, we say they are attracted to each other. So on Earth, gravity is the force that pulls us to the center of the Earth. Now think about asteroids in space. Asteroids are clumps of rocks found in our solar system. Asteroids are attracted to the Earth just as the Earth is attracted to the Sun. When an asteroid comes close to Earth, gravity will pull it toward the Earth. It may be attracted so strongly that it even hits the Earth! Would you believe that the same asteroids actually pull Earth as well? They do! However, the Earth does not move very much. Since the Earth is so massive compared to the asteroid, the pull mainly affects the asteroid.

3 You may have heard the famous story of a scientist named Sir Isaac Newton. In this story, Newton was sitting under an apple tree when an apple fell on his head. Some versions of the story say that this is when Newton "discovered" gravity. This is not the whole truth. What did occur in that moment was a great leap in scientific thinking. Sir Isaac Newton realized that as the apple fell from the tree, it was gaining speed. An object that is gaining speed is accelerating. In order to be accelerating as it fell, there must be some kind of force "pulling" the apple towards the ground. He began to think how this force might act differently on different objects. He knew that a heavier apple would fall at the same rate. He knew that meant the new force must depend on the mass of the object. The force would have to "pull harder" on the heavier apple to get it moving. He wondered whether this force could also act on objects farther from Earth. Could it reach as far as the Moon? It started with an apple falling on Sir Isaac Newton's head. It became one of the most famous set of scientific questions of all time.

## Accelerate Learning™

4 In 1687, Sir Isaac Newton wrote one of the most important scientific papers ever written. It was called *Philosophiæ Naturalis Principia Mathematica*. In it, he included several equations describing the relationships that he discovered. One equation described the relationship between mass and acceleration. This is known as Newton's second law of motion. This equation describes  $F_{net}$ , the total force acting on an object.  $F_{net}$  is equal to the mass of the object ( $m$ ) times the acceleration of that object ( $a$ ). He wrote this when he realized that the apple's mass and acceleration depended on the total force acting on it. This equation looks like this:

$$F_{net} = m \times a$$

5 Realizing that gravity was a force was the first step. It helped Newton write a second equation. It was called the universal law of gravitation. This equation allows us to calculate the force of gravity between two objects. We must know the distance between the centers of those objects. The force depends on the product of the masses of two objects divided by the square of  $r$ . Just know that this means that gravity depends on two things. The force changes with the masses of the objects involved and the distance between them. This equation works for two objects on Earth. It works between an object and the Earth. It even works between the Earth and an object in space, such as the Moon. In fact, this equation works for anything with mass, anywhere!

6 Because gravity is so weak, measuring it is difficult. There was another famous scientist named Henry Cavendish. In 1798, he worked to measure gravitational force. Cavendish already knew that all masses were attracted to each other. He came up with an experiment. It would measure the pull between large and small objects. He built a device called a torsion balance. He put two small lead spheres on the end of a 2 foot long rod. He then hung the rod from a wire. He put two larger lead spheres near the smaller spheres of the hanging rod. He then measured how far the rod twisted in response. This experiment gave science the value of the gravitational constant, or  $G$ . It is a very, very small number because gravity is so weak. This is the reason why we really only see the effects of gravity with very large objects. We feel the pull of the Earth but not the pull of a rock. But thanks to scientists like Newton and Cavendish, we can accurately measure the force of gravity today. To make calculations easier, a single value for gravitational acceleration is used everywhere on Earth.

7 What do we know about gravity today? While gravity is a familiar force, it can be surprising. Gravity pulls all objects toward each other. Gravitational force acts on any object with mass. This force does not depend on what an object is made of. The more mass the objects have, the stronger the gravitational force between them. The force of gravity depends on the mass of objects. It also depends on the distance between them. The closer the objects are, the stronger the gravitational force between them. For example, the force of gravity is slightly different on a mountaintop than on the bottom of the ocean. The further away from the center of the Earth you are, the less gravitational force you feel. However, no matter how far apart two objects are, there is gravitational force between them. The force of gravity may be weak, but gravity is one of the most important forces. It holds the universe together.

## Accelerate Learning™



1 Which force was the first to be discovered?

- A Gravity
- B Weak nuclear force
- C Strong nuclear force
- D Electromagnetic force

2 What two qualities of objects does gravity depend on?

- A What each object is made up of and the distance between them.
- B What each object is made up of and what material is between them.
- C Each object's mass and its shape.
- D Each object's mass and the distance between them.

3 An asteroid flies close to the Earth. Gravity —

- A repels the asteroid away from the Earth.
- B attracts the asteroid and the Earth to each other.
- C makes the asteroid spin rapidly.
- D causes the asteroid to explode.

4 Which of the following statements is true about Sir Isaac Newton?

- A He discovered gravity when an apple fell on his head.
- B He found that gravity was the strongest force.
- C He made a connection between the mass of objects and distance between them.
- D He realized that the Moon orbits the Earth.

**Reading  
NTI Assignments**

Day 18:

Write an **objective summary** on the ***After Reading*** section from Day 12. To assist you in your writing, a resource will be attached to the back of your packet. You may also utilize Google Classroom.

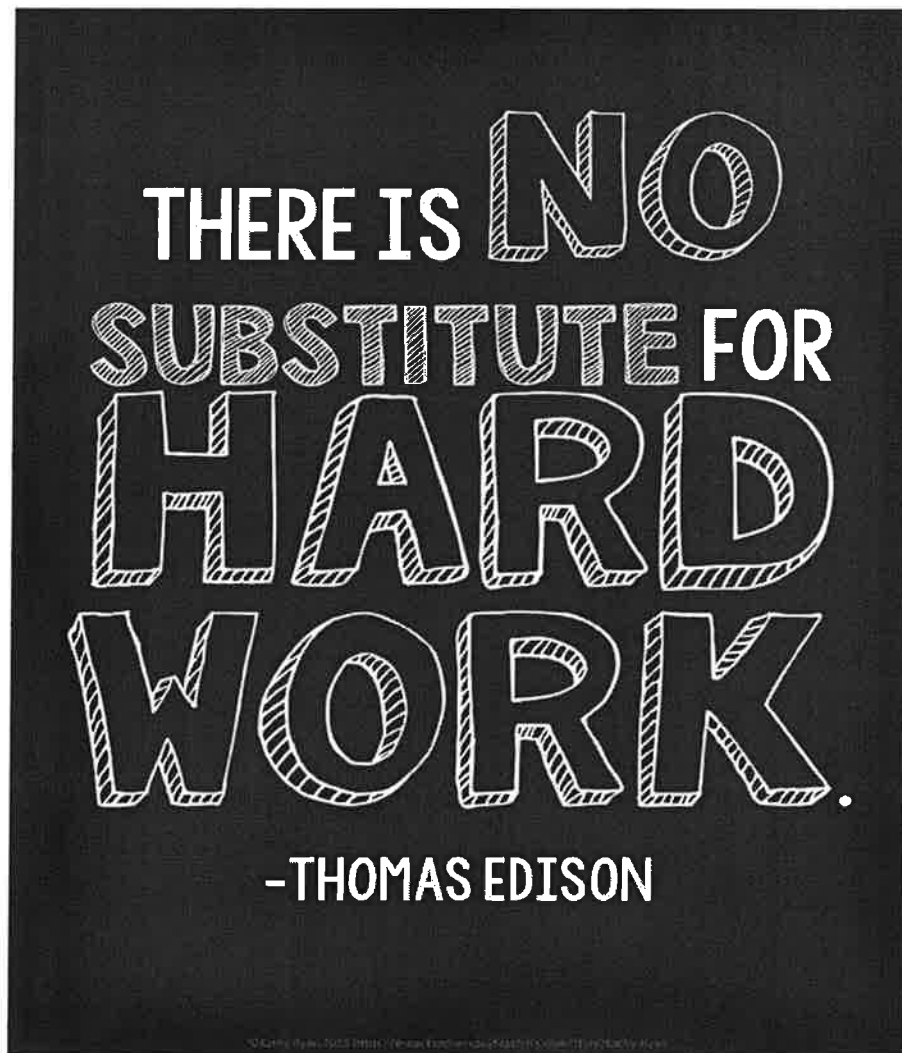
10-15 minutes of reading

Name (First & Last): \_\_\_\_\_

Team: MAROON OR GOLD

Homeroom Teacher: \_\_\_\_\_

# NTI #19



**Work hard. Be nice. Extend grace. Show mercy. Be humble.**

5 A satellite is traveling in an orbit around the Earth. What change would cause it to experience more gravitational force from the Earth?

- A Orbiting closer to the Earth's surface.
- B Removing some of its mass.
- C Making it orbit faster.
- D Making its surface reflect the Sun's rays.

6 Based on this reading, which statement below is FALSE?

- A Gravity acts on any object with mass.
- B The closer objects are, the stronger the gravitational force between them.
- C The farther you are from the center of the Earth, the less gravitational force you feel.
- D Gravitational force depends on what the object is made of.

Concept Attainment Quiz

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Group: \_\_\_\_\_

I. Vocabulary Matching

Match each term on the right to the correct definition.

- 1. \_\_\_\_\_ The push or pull between two objects
- 2. \_\_\_\_\_ The matter in an object that effects gravitational forces
- 3. \_\_\_\_\_ Objects being pulled together
- 4. \_\_\_\_\_ Objects have an effect on each other

- A. Gravitational Force
- B. Interactions
- C. Mass
- D. Attract

II. Identification

Use the clues provided to fill in the blanks.

Word Bank

strengthens	greater	distance	attractive	smaller
weakens	larger	repels	gravity	

- 1. Gravitational forces are always \_\_\_\_\_.
- 2. The \_\_\_\_\_ an object's mass, the greater its gravitational pull.
- 3. As \_\_\_\_\_ increases between two objects, the gravitational pull between them \_\_\_\_\_.
- 4. Given two objects, the object with the \_\_\_\_\_ mass will be pulled to the object with the \_\_\_\_\_ mass.

True



III. Open-Ended Response

Answer the questions below. Use additional paper if needed.

1. Why do the planets and other celestial objects in our solar system revolve around the Sun?

Blank lines for writing the answer to question 1.

2. Many planets in our solar system (Saturn, Uranus, Neptune) have rings. If these rings are made of chunks of debris, why do they form around the planet and not travel toward the Sun?

Blank lines for writing the answer to question 2.

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Group: \_\_\_\_\_

Gravity Activity Sheet

Please answer the following questions with complete sentences.

1. Order the objects in the model according to mass, from greatest to least:

Blank lines for writing the answer to question 1.

2. What happened when the tennis ball and the golf ball were placed on the sheet? How is this related to gravity?

Blank lines for writing the answer to question 2.

3. When the basketball and the tennis ball were in opposite corners of the sheet, and the golf ball was placed near the tennis ball, where did it roll? What caused the golf ball to move this way?

Blank lines for writing the answer to question 3.

4. What happened as you moved the basketball closer to the tennis and golf ball pair?

Blank lines for writing the answer to question 4.

5. How is this model related to what you learned about gravity and its effects on objects in our solar system?

Blank lines for writing the answer to question 5.

## Aztec Empire: Writing and Technology

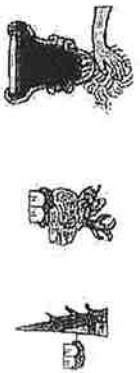
When the Spanish arrived in Mexico, the Aztecs had not yet developed iron or bronze metals. Their tools were made from bone, stone, and obsidian. They also did not use beasts of burden or the wheel. However, despite their lack of these basic technologies, the Aztecs had a fairly developed society. They also had some writing and technology of their own.

### Aztec Language

The Aztecs spoke the language Nahuatl. It is still used to today in some parts of Mexico. Some English words come from Nahuatl including coyote, avocado, chili, and chocolate.

### Aztec Writing

The Aztecs wrote using symbols called glyphs or pictographs. They didn't have an alphabet, but used pictures to represent events, items, or sounds. Only the priests knew how to read and write. They would write on long sheets made of animal skins or plant fibers. An Aztec book is called a codex. Most of the codices were burned or destroyed, but a few survived and archaeologists have been able to learn a lot about Aztec life from them.



Examples of some Aztec glyphs (artist Unknown)

### Aztec Calendar

One of the most famous aspects of Aztec technology was their use of calendars. The Aztecs used two calendars.

One calendar was used for tracking religious ceremonies and festivals. This calendar was called the tonalpohualli which means "day count". It was sacred to the Aztecs and was very important as it divided time equally among the various gods and kept the

universe in balance. The calendar had 260 days. Each day was represented by a combination of 21 day signs and thirteen day signs.

The other calendar was used to track time. This calendar was called the Xiuhpohualli or "solar year". It had 365 days divided up into 18 months of 20 days each. There were 5 days left over that were considered unlucky days.

Every 52 years the two calendars would start on the same day. The Aztecs were afraid that the world would end on this day. They performed the New Fire Ceremony on this day.



The Aztec calendar stone by Unknown

### Agriculture

The Aztecs used agriculture to grow food such as maize, beans, and squash. One innovative technique they used in swampy areas was called the chinampa. A chinampa was an artificial island that the Aztecs built up in the lake. They built many chinampas and used these manmade islands to plant crops. The chinampas worked well for crops because the soil was fertile and the crops had plenty of water to grow.

### Aqueducts

A major part of Aztec culture was bathing at least once per day. They needed fresh water in the city to do this. At the capital city of Tenochtitlan the Aztecs built two large aqueducts that carried fresh water from springs located over two and a half miles away.

### Medicine

The Aztecs believed that illness could come from natural causes as well as supernatural causes (the gods). They used a wide variety of herbs to cure sickness. One of the main cures doctors suggested was steam baths. They thought that by sweating, the poisons making the person sick would leave their body.

### Interesting Facts about Aztec Writing and Technology

- Aztec codices were made from one long sheet of paper that was folded like an accordion. Many of the codices were over 10 meters long.
- The chinampa farms were often called floating gardens as they appeared to float on top of the lake. They were built in rectangles and the farmers would travel between the fields in canoes.
- The Aztecs used canoes for transport and carrying goods around the waterways of the Valley of Mexico.
- Aztec doctors would use splints to help support broken bones while they healed.
- The Aztecs introduced the world to two of our favorite foods: popcorn and chocolate!
- One of the innovations the Aztecs had before much of the rest of the world was mandatory education for all. Everyone, boys and girls, rich and poor, were required by law to attend school.

## Aztec Empire - Writing and Technology

Please circle the best answer for each question based on the article, "Aztec Empire- Writing and Technology".

1. Which of the following did the Aztecs develop before the Spanish arrived?
  - a. Iron
  - b. Bronze
  - c. The wheel
  - d. Beasts of burden
  - e. None of the above
2. What were the tools used by the Aztecs made out of?
  - a. Iron
  - b. Bronze
  - c. Steel
  - d. Stones and bone
  - e. None of the above
3. What is Nahuatl?
  - a. A type of food eaten by the Aztecs
  - b. The language spoken by the Aztecs
  - c. The calendar of the Aztecs
  - d. The Aztec god of science and technology
  - e. An Aztec priest who specialized in medicine
4. Who were the only people in the Aztec Empire who knew how to read and write?
  - a. Farmers
  - b. Soldiers
  - c. Priests
  - d. Artisans
  - e. Royal family



5. True or False: The Aztecs developed an advanced alphabet with 29 letters similar to the Spanish alphabet.
- a. TRUE
  - b. FALSE
6. How often did the two calendars of the Aztecs start on the same day?
- a. Every 2 years
  - b. Every 10 years
  - c. Every 21 years
  - d. Every 52 years
  - e. Every 100 years
7. What were the Aztecs afraid would happen on the day when the two calendars began at the same time?
- a. The world would come to an end
  - b. The crops would die
  - c. They would lose in battle to their enemies
  - d. The dead would come back to life
  - e. The emperor would die
8. What was a chinampa?
- a. A type of food made with maize and beans
  - b. An artificial island used to plant crops
  - c. A way to bring fresh water into the city
  - d. A religious calendar
  - e. A Aztec god that played tricks on people
9. True or False: All Aztec children, rich or poor, were required to attend school.
- a. TRUE
  - b. FALSE

10. What did the Aztecs build in order to carry fresh water into the city for bathing?
- a. Water trucks
  - b. Underground plumbing
  - c. Chinampas
  - d. Aqueducts
  - e. The Aztecs refused to bath

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# Math

## DAYS 19 -20

CHOOSE ONLY ONE OPTION BELOW. YOU WILL HAVE TWO DAYS TO COMPLETE THIS.

Option 1 - Create a crossword puzzle (on the graph paper provided) choosing at least 10 vocabulary words using the definition as the clues.

Include an answer key.

\*May want to do 1st draft on regular paper before using the graph paper.

Option 2 - Create a word search using at least 10 vocabulary words (on the graph paper included).

Include an answer key.

\*May want to do 1st draft on regular paper before using the graph paper.

Option 3- Create an informational poster on a regular  $8\frac{1}{2}$  by 11 sheet of paper comparing ONE of the following:

Theoretical vs Experimental Probability

Independent vs Dependent Events

Tree Diagrams vs Fundamental Counting Principle

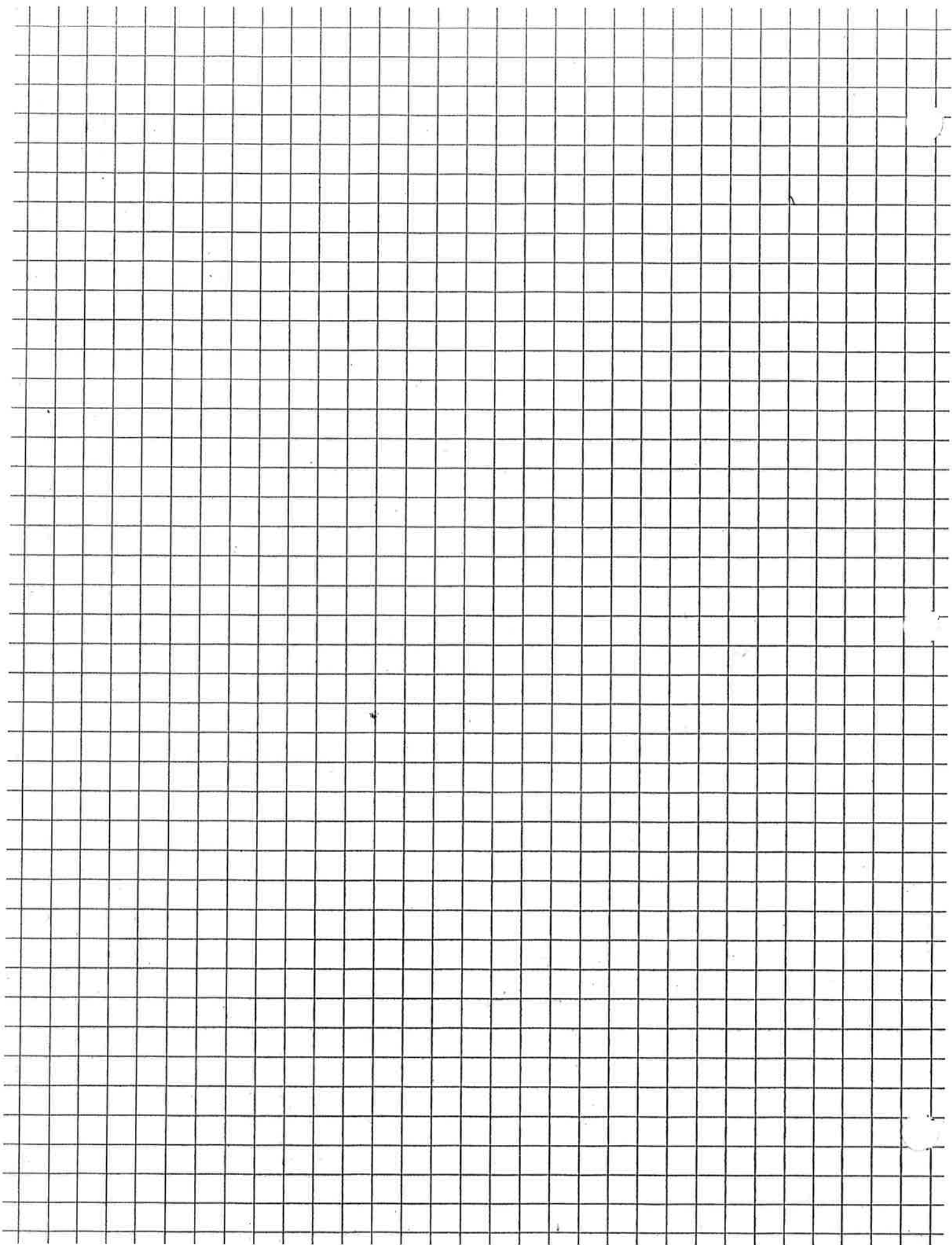
Option 4 - Create a rap, song, or poem highlighting the concepts of probability that you learned. Submit by a video, audio or written.

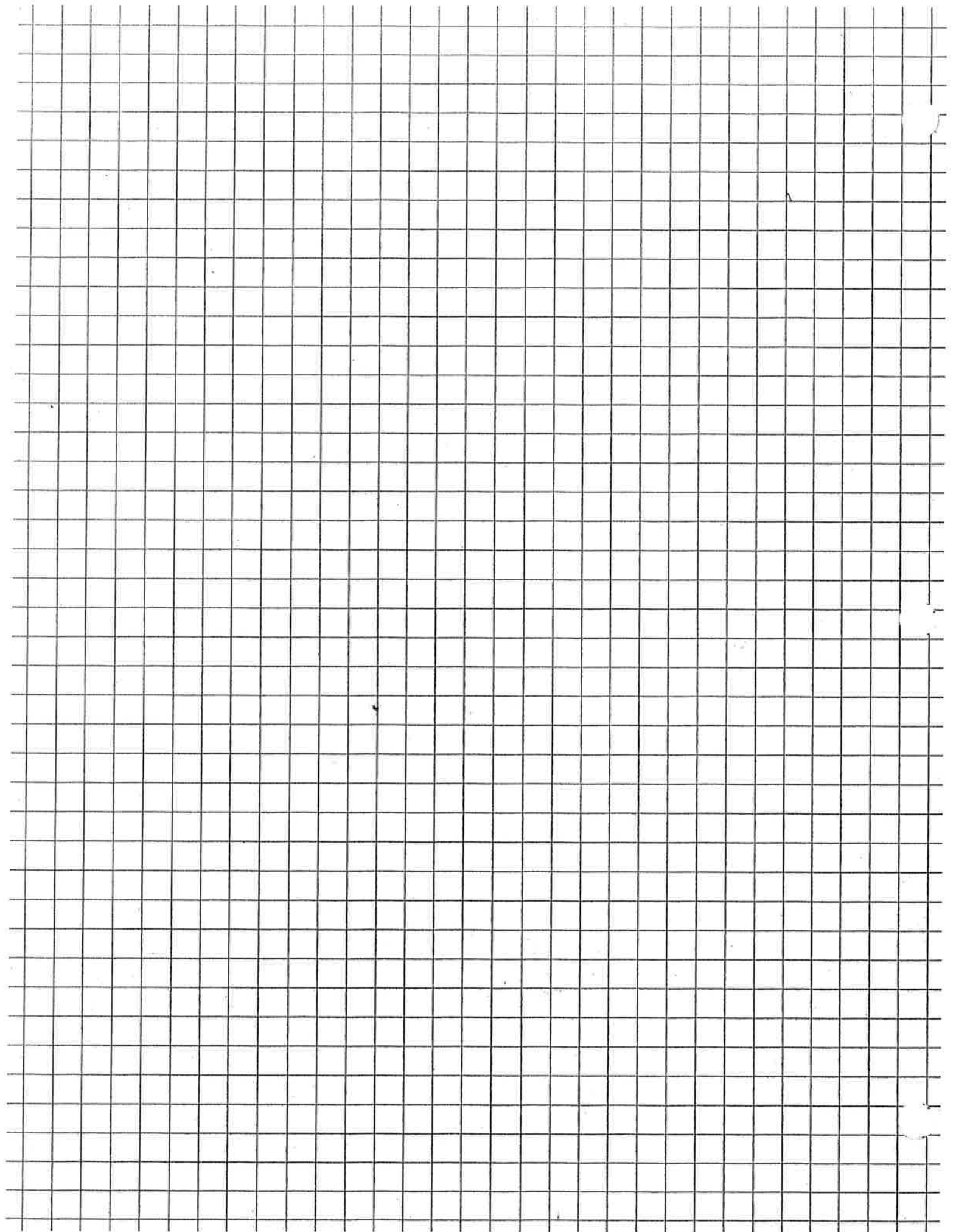
Option 5 - Take these two quiz assignments. Use these codes and you must USE YOUR FIRST AND LAST NAME.

Probability 1 - Code **510093**

Probability 2 - Code **965479**







**Reading**  
**NTI Assignments**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Day 19:  
Complete the **Key Ideas** and **Exploring Text Features** portions of your packet. Read the passage as needed.

10-15 minutes of reading

# Key Ideas: The Children of the Kindertransport

**Directions:** Fill in the chart below with information from "The Children Who Escaped the Nazis" to identify some of the challenges faced by the children of the Kindertransport. We filled in some information for you.

Challenge	Text evidence showing challenge
Children of the Kindertransport had very little time to say goodbye to their families.	<ul style="list-style-type: none"> <li>• "Only a few days earlier, Lore's parents had said they were sending her away." (p. 5)</li> <li>• "Lore would have only four days to get ready to leave." (p. 7)</li> </ul>
Children of the Kindertransport had to move to a foreign country where they did not know anyone, speak the language, or understand the customs.	<ul style="list-style-type: none"> <li>• "Others were put to work as domestic servants or sent to work on farms." (caption, p. 7)</li> </ul>
Many of the Kindertransport children felt responsibility to try to save the families they left behind, but it was hard to help those people.	<ul style="list-style-type: none"> <li>• "Like many Kindertransport children, Lore felt it was her responsibility to try to get her loved ones out of Germany." (p. 6)</li> </ul>

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Exploring Text Features

Authors use text features to bring attention to important details. In a nonfiction article, text features include titles, subheadings, photos, captions, charts, and maps.

**Directions:** Answer the questions below to help you explore the text features in "The Children Who Escaped the Nazis."

1. Read the headline and subheading—that is, the line of text underneath the headline. What do these features tell you about what the story is going to be about?

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2. Study the photograph and read the caption on pages 6-7. What mood do these features create?

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3. How does the map on page 7 contribute to the article?

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4. Study the photograph on pages 8-9. From this photo, what can you infer about what the experience of the Kindertransport was like for young children?

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5. Read the section titles. Describe how the tone of the section titles changes throughout the article.

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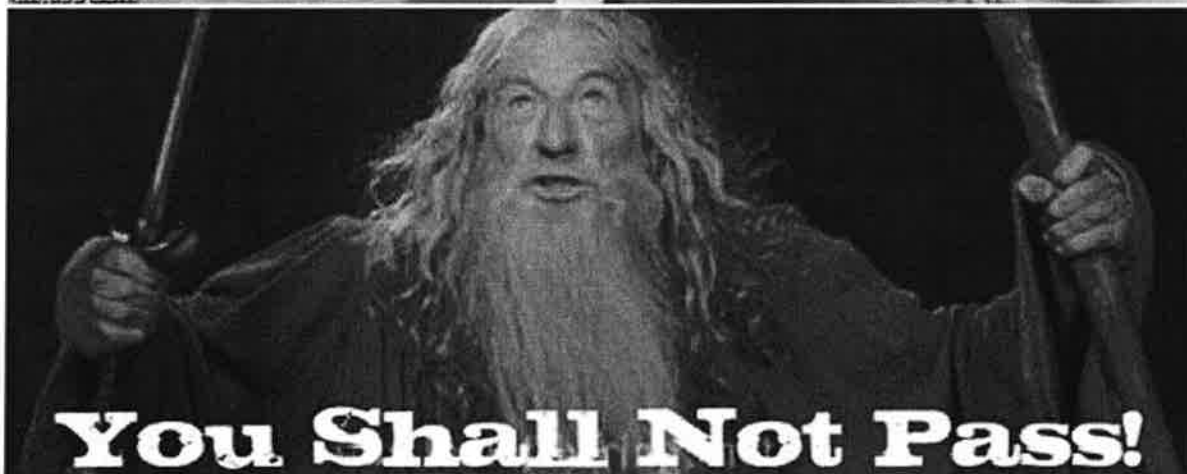
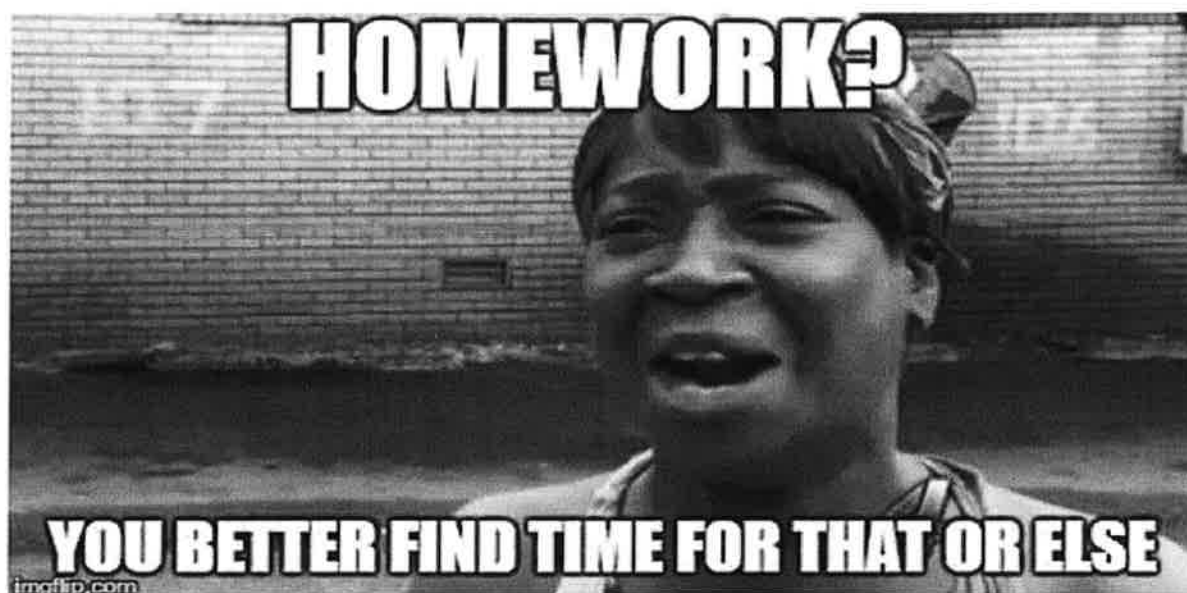
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Name (First & Last): \_\_\_\_\_

Team: MAROON OR GOLD

Homeroom Teacher: \_\_\_\_\_

# NTI #20

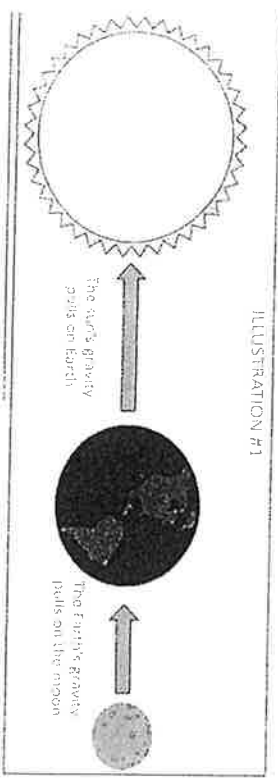


**Work hard. Be nice. Extend grace. Show mercy. Be humble.**

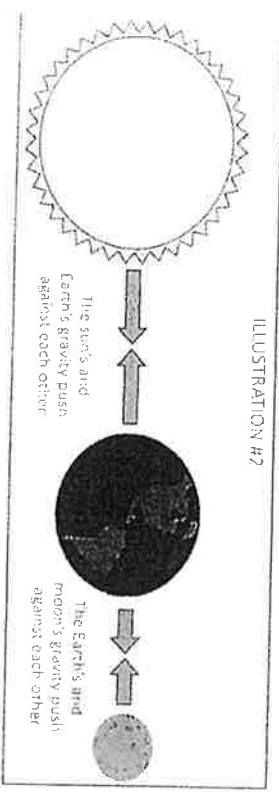


# Gravity C.E.R.

**Scenario:** Mrs. Caudwell asked two groups of students to make a gravitational attraction diagram that involved the Sun, Earth, and Moon. She asked them to also include an explanation under their diagram.



**Explanation:** The sun is the largest mass in the universe. Every planet and object is gravitationally attracted to the sun so it must rotate around the sun. The sun is pulling the earth and the moon towards it because of its large mass. Without the sun, the earth would be pulled to another large mass and rotated around.



**Explanation:** Everything that has mass has gravity. The Sun, Earth, and Moon have a great mass so they will have a gravitational attraction pull on each other. The Moon is smaller than the Earth so the gravitational pull will pull against it, but the Moon is smaller so it will rotate around the Earth. The Earth is smaller than the Sun so the gravitational pull will pull against it, but the Sun is so much larger that the Earth will rotate around the Sun. The rotation is caused by the gravitational pull.

**QUESTION - Which Group is correct based on their illustration and explanation?**

## Science HOUSE Brainstorm

<p><b>Introduction/Claim:</b>                  Restate the claim and give an overview (1 complete sentence)</p>		
<p><b>EVIDENCE #1</b>                  State the evidence and EXPLAIN EVIDENCE (4 Sentences)</p> <p>start the sentence like:                  One piece of evidence is.....</p>	<p><b>EVIDENCE #2</b>                  State the evidence and EXPLAIN EVIDENCE (4 Sentences)</p> <p>start the sentence like:                  One piece of evidence is.....</p>	<p><b>EVIDENCE #3</b>                  State the evidence and EXPLAIN EVIDENCE (4 Sentences)</p> <p>start the sentence like:                  One piece of evidence is.....</p>
<p><b>REASONING/CONCLUSION:</b> Restate the CLAIM. Your explanation of how the evidence supports the claim. Uses knowledge you already know about the subject and the evidence. Restate the Evidence (4-5 Sentences)</p> <p>Start the paragraph like:                  Based on this evidence, we must conclude.....</p>		

For Evidence:  
 Use support from the reading, graph, specific quantitative data, knowledge of subject. BE SPECIFIC!

# K-PREP Extended-Response Space

Do not write on this area.

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# SOCIAL STUDIES OPEN-RESPONSE QUESTION


Read all parts of each open-response question before you begin. Write your answers to the open-response questions in the space provided in this test booklet.

Write your answer to the question in the space provided on the next page.

## *Impact of the Maya, Inca, Aztec*

Choose one of the ancient civilizations, Maya, Inca, or Aztec.

- A. Explain how geography influenced the way of life of the civilization you chose.
- B. Using sources from this unit, identify two achievements of the civilization you chose and explain their lasting impact on the world today.

Do not write on this page. Please write your answer to this open-response question on the next page. 

PLEASE GO ON TO THE NEXT PAGE →



**Reading**  
**NTI Assignments**

Day 20:

Complete the **“The Children Who Escaped the Nazis” Quiz**. Use the R.A.C.E. method to complete both constructed-response questions in the space beside the multiple choice questions.

10-15 minutes of reading

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## "The Children Who Escaped the Nazis" Quiz

Directions: Read "The Children Who Escaped the Nazis." Then answer the questions below.

- The section "A Storm of Hatred" contributes to the article by explaining
  - why Germany lost World War I.
  - that during the 1930s, Germany became a dangerous and difficult place for Jewish people to live.
  - the plan that was put in place to help Jewish children escape Nazi-occupied regions.
  - how Lore felt when she arrived in London.
- "A Storm of Hatred" suggests that Germany's loss in World War I
  - left Germans feeling discouraged, angry, and eager to believe Hitler's promises.
  - made Germans doubtful that Hitler could make Germany strong again.
  - had little effect on the German people.
  - made Germans fearful of Hitler.
- On page 5, the author writes that Hitler "fanned the flames" of centuries-old prejudice against Jewish people. To "fan the flames" is to
  - fight a battle you have no hope of winning.
  - make a joke out of something.
  - make something weaker or less dangerous.
  - make something more intense or stir something up.
- Kristallnacht was important because it
  - was the first act of anti-Semitism in Germany.
  - showed that Hitler was losing power.
  - shone a spotlight on the horrors being carried out by the Nazis.
  - helped Jewish children escape the Nazis.
- According to the article, in England Lore
  - was treated with kindness but still felt like an outsider.
  - had no trouble fitting in but missed her parents.
  - was treated cruelly by her foster family.
  - was angry about having been separated from her parents.
- Which best describes the authors' main purpose for writing "The Children Who Escaped the Nazis"?
  - to inform readers about the Kindertransport, including why it was created and how it affected those who were rescued through it
  - to give a detailed analysis of the causes of World War II
  - to help readers understand what it was like to be the foster parent of a child brought to Britain on the Kindertransport
  - to honor the Germans who resisted the Nazis

### Constructed-Response Questions

- Directions: Write your answers to the questions below on the back of this paper or type them up on a computer.
- On page 8, the authors write that Lore's father urged her to stay strong. Give three details from the text that show that Lore did stay strong. Explain how these details show that Lore stayed strong.
  - How does the photograph on pages 6-7 help you understand that Hitler and the Nazis were powerful? Explain.