

The Simple Physics of Soccer



Everyone knows that kicking a soccer ball causes it to roll across the grass. But what makes this happen? What is required to make the ball move faster? What's the difference, in other words, between passing the soccer ball to a teammate and shooting for the goal?

Kicking a ball may seem simple, but physicists spent years trying to figure out why objects move the way they do. What they discovered is that kicking a soccer ball requires applying force to the surface of the ball. The greater the force, the faster the ball will go, and the further it will travel. How much force you apply to the ball, that is, will often determine whether you score a goal or not.

The combination of force and distance equals what is called "work." In this case, we don't mean the noun form of work, like a job. We are talking about work as a verb, as a form of action. Work can be taking out the trash or cleaning dishes in your house. Furniture movers work by carrying chairs and tables out of one apartment and into another. If the first apartment is on the second floor and the second apartment is on the fourth floor, carrying the furniture into the second apartment will require about twice as much work as the first.

Keep in mind that force and work are not the same things as energy. Energy comes in several forms. But the best way to understand it is as something that creates the ability to do work. When someone says, "I don't have any energy," what do they usually mean? Often, they mean they don't have the strength or motivation to work.

Without energy, it is hard to play soccer or lift furniture. In fact, it may even be difficult to get out of bed. Energy is what allows us to do work. The more energy we have, the more work we can do.

Mathematicians use the following simple equation to define the meaning of work: $\text{force} \times \text{distance} = \text{work}$. The heavier an object is, in other words, the more force it exerts in the form of gravity. Picking an anvil up off the ground requires more energy than picking up a feather. If you're interested in building muscles, though, keep in mind that lifting heavier things will make you stronger over time. And the stronger you are, the more likely you are to win at soccer.

Name: _____ Date: _____

1. Which sport does the passage use to examine physics?
 - A baseball
 - B football
 - C hockey
 - D soccer

2. What does the author describe in the passage?
 - A how to score a goal in soccer
 - B the relationship between work, force, and distance
 - C physics experiments that led to important discoveries
 - D different types of energy

3. A soccer ball will travel a greater distance the harder it is kicked. What evidence from the text best supports this statement?
 - A Physicists spent years trying to figure out why objects move the way they do.
 - B Kicking a soccer ball requires applying force to the surface of the ball.
 - C The greater the force, the faster the ball will go, and the further it will travel.
 - D How much force you apply to the ball will often determine whether you score a goal or not.

4. What is the difference between passing the ball to a teammate and shooting a goal?
 - A the amount of force applied to the ball
 - B the way that the ball rolls
 - C the distance the ball has to travel
 - D it is more difficult to pass the ball

5. What is this passage mostly about?

- A geometry
- B biology
- C physics
- D chemistry

6. Read the following sentences: "Everyone knows that kicking a soccer ball causes it to roll across the grass. But what makes this happen? What is **required** to make the ball move faster?"

What does "**required**" mean?

- A allowed
- B needed
- C ordered
- D stopped

7. Choose the answer that best completes the sentence below.

The tired soccer player does not have any energy left; _____, he is unable to do any more work.

- A however
- B finally
- C specifically
- D therefore

8. Define "work."

9. Why does carrying furniture up four flights of stairs require twice as much work as carrying furniture up two flights of stairs?

10. Imagine three different soccer players are shooting at the goal. Player A has a lightweight ball and is close to the goal, Player B has a heavy ball and is close to the goal, and Player C has a heavy ball and is far from the goal. Which player will need the most energy to score a goal, and which player will need the least energy? Support your answer using the text.

Character Traits

DIRECTIONS: Read about each interaction. Identify a character trait in each one, and write it on the line. Explain your answer by referring to the text.



1. During gym class, Aaron pretends that he is Superman. He isn't jumping hurdles, he is leaping tall buildings. He isn't racing a classmate; he's racing a train!

Character Trait: _____ Explanation: _____

2. Ms. Jenkins has a lot of credit card debt from recreational shopping. She feels overwhelmed by it, and there is no way that she can pay it off working only her day job. Rather than getting a second job, she decides to declare bankruptcy.

Character Trait: _____ Explanation: _____

3. Phoebe wants a new bicycle, but her parents can't afford it. She gets permission to get a part-time job after school. She saves the money that she earns, and buys herself a bicycle.

Character Trait: _____ Explanation: _____

4. On her way home from school, Tina finds a baby bird that has fallen out of its nest. She picks it up and carries it carefully home, where she makes it a bed out of an old shoebox. She feeds the baby bird by hand until it is strong enough to fly.

Character Trait: _____ Explanation: _____

5. Karen can't afford a new dress, so she refuses to go to the school dance.

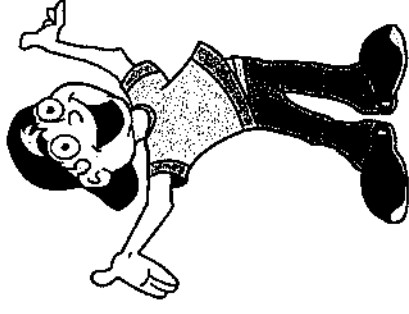
Character Trait: _____ Explanation: _____

Name _____ Character Traits

What's the Character Trait?

DIRECTIONS: Match each sentence to the character trait it represents.

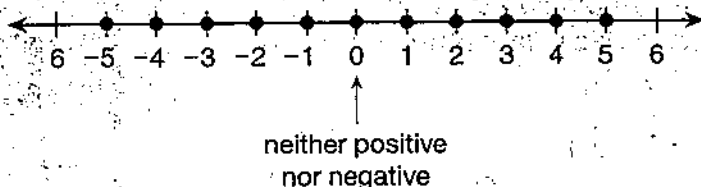
- A. creative B. assertive C. loving D. optimistic
E. wise F. stable G. zealous H. spiritual



- _____ 1. Marcia has tons of ideas and energy for this project, and she shows up early.
- _____ 2. Mr. Miller has had the same job and lived in the same house for 32 years.
- _____ 3. Jen isn't afraid to speak up if someone tries to take her turn.
- _____ 4. Hank always uses his experience and good judgement when dealing with people.
- _____ 5. Mary made a clubhouse out of glass and plastic soda bottles
- _____ 6. My mother tucks me in every night and kisses me on the forehead.
- _____ 7. No matter what happens, Jim always expects things to get better.
- _____ 8. Penny keeps a gratitude journal and never steps on insects.

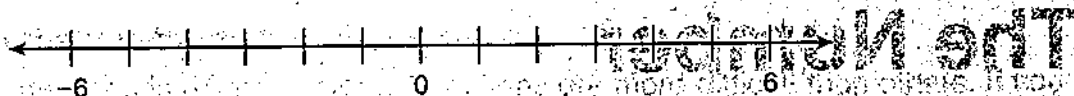
Lesson 1: Integers

Integers are whole numbers and their opposites (positive numbers and negative numbers) and zero. **Negative numbers** are the numbers less than zero. All of these types of numbers can be shown on a number line.



▶ Example

Write the numbers 2, 5, -4, and -1 in their correct place on the number line.



Determine what each mark on the number line represents. On the number line above, each mark represents 1 unit.

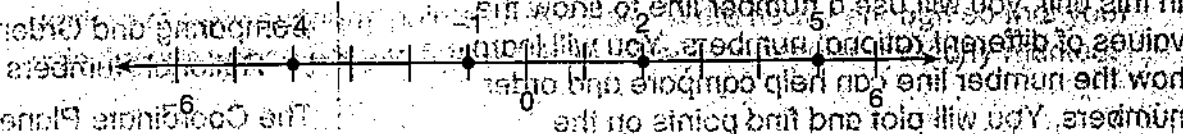
The number 2 is a positive integer. It is located 2 units to the right of zero.

The number 5 is a positive integer. It is located 5 units to the right of zero.

The number -4 is a negative integer. It is located 4 units to the left of zero.

The number -1 is a negative integer. It is located 1 unit to the left of zero.

Locate the numbers on the number line.



The **opposite** of a number is the number that is the same distance from 0 on a number line, but on the opposite side of 0. The opposite of a positive number is a negative number, and the opposite of a negative number is a positive number. For example, 4 and -4 are opposites.

TIP: Zero is its own opposite.

Integers can be used to represent real-world situations. Some keywords that indicate positive integers are *gained*, *increased*, *rose*, *above*, *more*, and *up*. Some keywords that indicate negative integers are *lost*, *decreased*, *dropped*, *below*, *less*, and *down*.

▶ Example

What integer is represented by the **bold words** in the following sentence?

The lowest temperature ever recorded in the United States was **80 degrees Fahrenheit below 0**.

The integer that represents **80 degrees Fahrenheit below 0** is -80 .

▶ Example

A baby boy typically experiences a **growth of 10 inches** during his first year of life. Explain what the **0** means in the situation.

The integer that represents a **growth of 10 inches** is 10 . In this situation, the **0** represents the height of the baby boy at birth.

▶ Example

What integer is represented by the **bold words** in the following sentence? Explain what the **0** means in the situation.

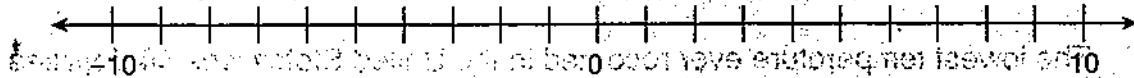
A scuba diver dives **30 meters below the ocean's surface**.

The integer that represents **30 meters below the ocean's surface** is -30 . In this situation, the **0** represents the surface of the ocean.

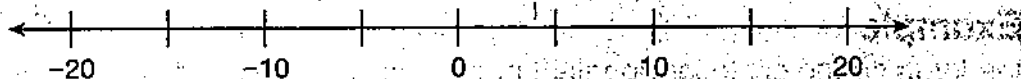
Practice

Directions: For questions 1 and 2, write the numbers in their correct place on the number line.

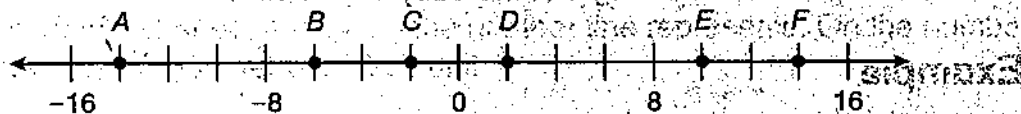
1. 7, -6, -9, 3



2. -12, 3, 18, -19, -3



Directions: For questions 3 through 8, use the number line below. Write the integer that belongs at each point.



3. A _____

4. B _____

5. C _____

6. _____

7. E _____

8. F _____

Directions: For questions 9 through 16, write the opposite of the number.

9. -6 _____

10. 11 _____

11. 15 _____

12. 77 _____

13. -80 _____

14. -12 _____

15. 1202 _____

16. -508 _____

Directions: For questions 17 through 21, write the integer that is represented by the bold words in each sentence.

17. Owen's kitten weighs **4 ounces more** this month than it did last month. _____

18. The height of the skyscraper **increased 25 feet** during construction last week.

19. The amount in Beth's bank account **increased 195 dollars**. _____

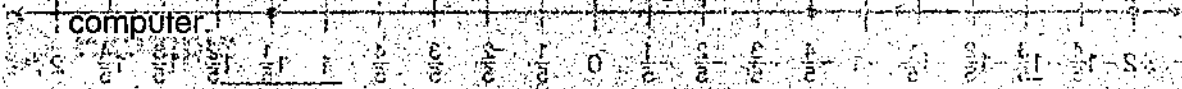
20. A submarine is **400 feet below** the surface of the water. _____

21. Antoine hit **8 fewer home runs** than he did last year. _____

Directions: For questions 22 through 25, write the integer that is represented by the bold words in each sentence. Then, interpret what the 0 means in the situation.

22. Holly earned **\$800 more** than she did last year. _____

23. A desktop computer has a mass of **2 kilograms more** than a notebook

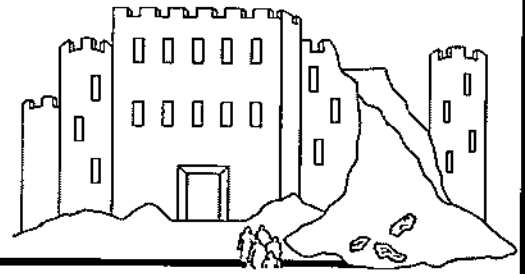


24. The temperature of a patient **decreased by 2 degrees Celsius**. _____

25. Isabella is **7 centimeters shorter** than her brother Lorenzo. _____

Explain how you know whether this integer is negative or positive.

THE HISTORY OF ANCIENT ISRAEL



Most of what scholars know about the history of Ancient Israel is found in the Bible. The story of the Israelites, or the Hebrews, is a long, interesting story full of surprising twists and turns. The basic storyline is of a group of people who descended from a man named Abraham. After being enslaved in Egypt for many years, the Israelites finally made it to Canaan in around 1200 BC. Canaan, is modern day Israel. There, the Israelites established their nation.

Prior to coming to Canaan, the Hebrew people had been nomads. This means they moved from place to place, without having a permanent home. However, the Israelite's God, known as Yahweh, had promised them a beautiful land of milk and honey in which they could settle.

The Israelites were one of the first groups of people to practice monotheism. This means they believed in only one God. Other civilizations that existed around the time of Ancient Israel were polytheists, and believed in many gods. This religion was the beginnings of Judaism, which would grow to become one of the world's major religions. Judaism has also influenced Christianity and Islam greatly.

David was the great king of Ancient Israel, following Saul's short reign. The first king of Ancient Israel, Saul, was anointed by Samuel, one of the great prophets. In Judaism and for the Ancient Israelites, prophets were important leaders who were inspired directly by God.

David became king around 1000 BC. He was an important warrior, poet and leader. As king, he conquered Jerusalem, which he made the capital of his kingdom. In addition, he annexed other areas to increase the size of his empire. Also, he fathered Solomon, who would succeed him as king.

King Solomon is well known in Christianity and Judaism for his wisdom. Under his reign, the first temple in Jerusalem was built. However, Solomon also is said to have favored the southern tribe of Judah. Following his death, his son, Rehoboam, treated the northern tribes with hostility. As a result, these tribes seceded from the nation, breaking the Israel into two kingdoms: one in the north and one in the south. The northern kingdom was known as Israel and the southern as Judah.

WHILE YOU'RE READING...

MARK WITH SYMBOLS

! when you find something interesting.

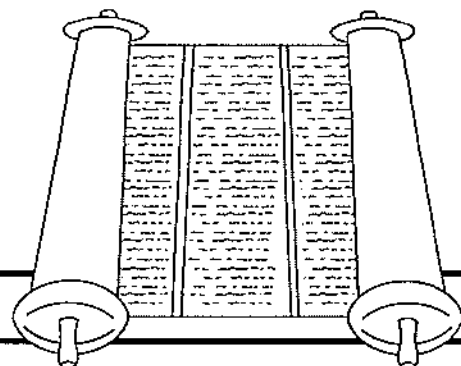
? when you are unsure or confused by something.

***** when you find something important.

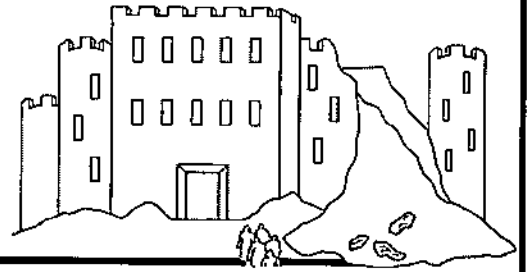
HIGHLIGHT WITH COLORS

yellow power words or key terms

green key phrases and definitions



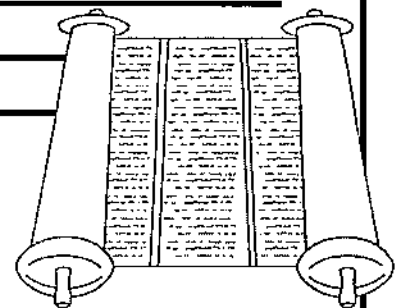
THE HISTORY OF ANCIENT ISRAEL



Question 1: Who were the people of Ancient Israel?

Question 2: Who was David?

Question 3: What happened after King Solomon died?



Name _____

Date _____

Figurative Language - idiom, simile, metaphor

Idiom - a common expression which means something different than what the words literally mean. Ex: once in a blue moon

Simile - compares two unlike items using like or as. Ex: white as snow

Metaphor - compares without using like or as. Ex: heart of stone

Directions: Determine if the underlined phrase is an idiom, simile, or metaphor.

1. I wish I had remembered my umbrella. It has rained cats and dogs all day.

idiom

simile

metaphor

2. When I went outside this morning, the front yard was beautiful. The dew drops were sparkling like diamonds in the early morning sun.

idiom

simile

metaphor

3. When Betty learned that she had won the grand prize, she was on cloud nine.

idiom

simile

metaphor

4. That assignment was a breeze. I finished it in less than an hour.

idiom

simile

metaphor

5. You know my hands are tied, making it impossible for me to tell you what was said.

idiom

simile

metaphor

6. Larry was such a hog last night at supper. It's no wonder he had a stomach ache.

idiom

simile

metaphor

7. You need to think before you speak. Every time you are around her, you put your foot in your mouth.

idiom

simile

metaphor

8. The fluffy pillows that mom bought were as soft as a cloud.

idiom

simile

metaphor

Name _____

Date _____

Identifying Figurative Language

Directions: Label: simile, metaphor, hyperbole, or personification. Explain.

Example: The wind howled through the trees, making us tremble.

Personification

Human qualities were given to the wind.

1. I was full after eating the mile high ice cream cone.

2. You must eat like a bird to be as small as you are.

3. The fire swallowed the house before the firefighters arrived.

4. We'll never make it in this dinosaur you call a car.

5. The stars winked at me as I searched for the constellations.

6. Her smile was a mile wide when she saw her new computer.

Figurative Language in Poetry

Read the poem. Then answer the questions by circling the answer.

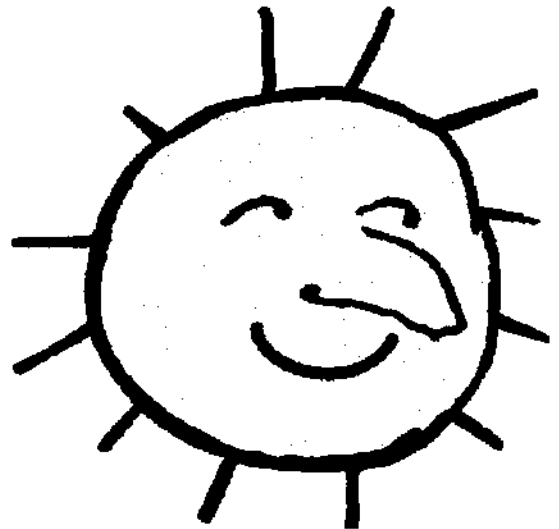
The Sun Rising

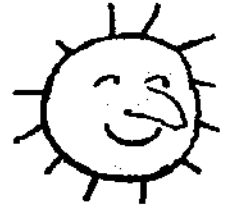
John Donne

Busy old fool, unruly sun,
Why dost thou thus,
Through windows, and through curtains call on us?
Must to thy motions lovers' seasons run?
Saucy pedantic wretch, go chide
Late school boys and sour prentices,
Go tell court huntsmen that the king will ride,
Call country ants to harvest offices,
Love, all alike, no season knows nor clime,
Nor hours, days, months, which are the rags of time.

Thy beams, so reverend and strong
Why shouldst thou think?
I could eclipse and cloud them with a wink,
But that I would not lose her sight so long;
If her eyes have not blinded thine,
Look, and tomorrow late, tell me,
Whether both th' Indias of spice and mine
Be where thou leftst them; or lie here with me.
Ask for those kings whom thou saw'st yesterday,
And thou shalt hear, All here in one bed lay.

She's all states, and all princes, I,
Nothing else is.
Princes do but play us; compared to this,
All honor's mimic, all wealth alchemy.
Thou, sun, art half as happy as we,
In that the world's contracted thus.
Thine age asks ease, and since thy duties be
To warm the world, that's done in warming us.
Shine here to us, and thou art everywhere;
This bed thy center is, these walls, thy sphere.





QUESTIONS

1. In the lines: "Busy old fool, unruly sun/Why dost thou thus/through windows, and through curtains call on us?" what kind of figurative language is being used?

metaphor *simile* *hyperbole* *personification*

2. In the lines: "Saucy pedantic wretch, go chide/Late school boys and sour prentices," what kind of figurative language is being used?

metaphor *simile* *hyperbole* *personification*

3. In the phrase: "the rags of time," what kind of figurative language is being used?

metaphor *simile* *hyperbole* *personification*

4. In the line: "I could eclipse and cloud them with a wink," what kind of figurative language is being used?

metaphor *simile* *hyperbole* *personification*

5. In the line: "She is all states, and all princes, I," what kind of figurative language is being used?

metaphor *simile* *hyperbole* *personification*

6. In the line: "Since thy duties be/To warm the world, that's done in warming us," what kind of figurative language is being used?

metaphor *simile* *hyperbole* *personification*

Lesson 6: Dividing Whole Numbers

When you divide, the number you are dividing is the **dividend**, the number you are using to divide is the **divisor**, and the answer is the **quotient**. Anything that is left over is the **remainder (R)**.

Example

Aubrey has 419 beads. She wants to divide the beads equally among 16 bracelets that she is making. How many beads will Aubrey use for each bracelet?

$\begin{array}{r} 26 \\ 16 \overline{)419} \\ \underline{-32} \\ 99 \\ \underline{-96} \\ 3 \end{array}$	<p>1. How many 16s are in 4? 0 Move to the next place value.</p> <p>2. How many 16s are in 41? 2</p> <p>3. Multiply 2 and 16; then subtract.</p> <p>4. Bring down the 9.</p> <p>5. How many 16s are in 99? 6</p> <p>6. Multiply 6 and 16; then subtract.</p> <p>7. Remainder (must be less than the divisor)</p>
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Aubrey will use 26 beads for each bracelet. There will be 3 beads left over. The quotient is therefore 26 R3.

Multiplication and division are inverse operations. To check a division problem, multiply the whole number portion of the quotient by the divisor, and then add the remainder. This should give you the dividend.

Example

Check the quotient and remainder of the previous example.

$\begin{array}{r} 26 \\ \times 16 \\ \hline 156 \\ + 260 \\ \hline 416 \\ + 3 \\ \hline 419 \end{array}$	<p>← Whole number portion of the quotient</p> <p>← Divisor</p> <p>← Add the remainder.</p>
--	--

The quotient of 26 R3 is correct.

TIP: To check a multiplication problem, divide the product by one of the factors. This should give you the other factor.

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Division can be represented using the division symbol \div . Always remember, that the dividend is the number before the symbol, and the divisor is the number after the symbol.

▶ Example

Find the quotient of $545 \div 23$.

1. How many 23s are in 5? 0. Move to the next place value.
 2. How many 23s are in 54? 2
 3. How many 23s are in 85? 3

23 $\overline{)545}$

-46

85

-69

16

← 3. Multiply 2 and 23; then subtract.
 ← 4. Bring down the 5.
 ← 6. Multiply 3 and 23; then subtract.
 ← 7. Remainder (must be less than the divisor)

The quotient of $545 \div 23$ is 23 R16

It's always a good idea to check the answer to a division problem using multiplication.

▶ Example

Check the quotient and remainder of the previous example

23 ← Whole number portion of the quotient
 $\times 23$ ← Divisor
 69
 $+ 460$
 529
 $+ 16$ ← Add the remainder.
 545

The quotient of 23 R16 is correct.

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Practice

Directions: For questions 1 through 8, divide. Write your answer with a remainder, if necessary.

1. A baker bakes 752 muffins in a weekend. She sells the muffins in packs of 12. How many packs of muffins did she sell, and how many did she have left over?

5. A book publisher prints 909 copies of a book. He packs the books into boxes with exactly 18 books in each box. How many boxes will he be able to fill, and how many books will be left over?

2. $414 \div 28 =$ _____

6. $41 \overline{)862}$

3. $13 \overline{)888}$

7. $15 \overline{)520}$

4. $703 \div 37 =$ _____

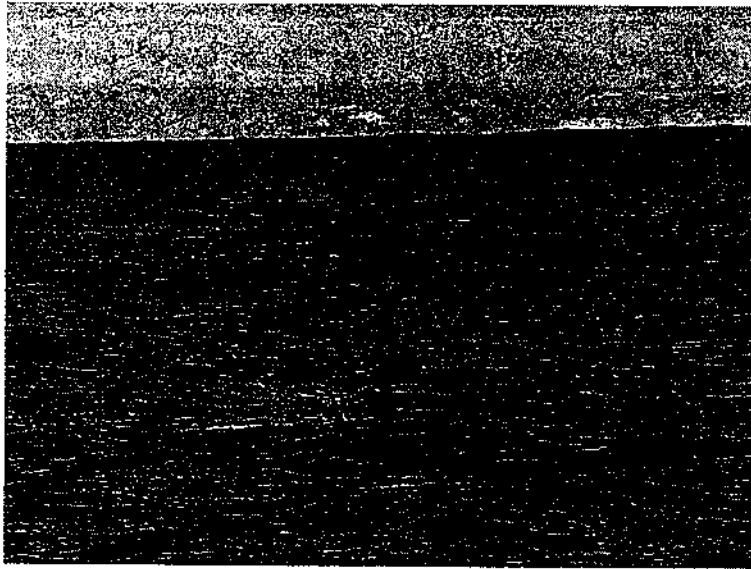
8. $992 \div 31 =$ _____

9. A teacher has a stack of 132 worksheets. She wants to give the same number of worksheets to each of her students. If there are 24 students in her class, how many worksheets will each student get? How many will be left over?

Explain how you found your answer.

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Talking Whales



Val Viers loves listening to killer whales talk. Viers, a retired professor, spends a lot of his time recording and listening to the sounds made by killer whales swimming in Puget Sound, the body of water that connects Seattle to the Pacific Ocean.

What Viers hears are complicated series of clicks, eerie howls, and cries like cats' meows. Orca whales make some of these noises to communicate with each other. They also use the high-pitched clicks like a modern ship uses its sonar, sending waves of energy through the water, looking for fish to eat. The sound bounces off the fish and returns to the whale, telling it where the fish is, how big it is, and how fast it's swimming. The whale uses this information to decide whether to attack or not, since the size and strength of the returning noise helps the whale figure out whether it's close to a little tasty snack or a scary shark.

"By listening to these a lot, you kind of develop a sense of the vocabulary of killer whales," Viers says of his audio recordings.

Viers is also listening to one of the purest examples of how vibrating things produce sound, and how sound can make things vibrate. Let's take the whale hunt we discussed above and slow it down. Whales make sounds by squeezing air between balloon-like sacs inside their heads. When the air passes by, it causes the sacs to squeeze together, or compress, causing vibrations. Those vibrating sacs then cause the air molecules to compress, starting a chain reaction that causes the water in front of the whale's head to compress, too. These chain reactions of compression are called sound waves.

When these waves of energy hit the belly of a salmon, the salmon vibrates, too. Those little jiggles send sound waves of their own, which travel back to the whale. The sound waves penetrate the whale's skin and cause long tunnels of fat inside its lower jawbone to vibrate. Those vibrations are transmitted to the whale's ear. That helps the whale decide whether to go and eat, or turn and swim away.

By listening in on this process thousands of times, Viers is hearing the complex interaction between matter and sound. The whale makes noise, and that same noise bounces back to the whale, causing a part of its head to vibrate.

Humans can do the same thing, though usually we don't have to. Whales spend most of their lives underwater, where light is limited, so they have little use for sight. Since people live in the sunlight of land, most of us use our eyes to determine where we are, how to get food, and where dangers lie.

Sometimes, though, we decide to close our eyes and use only sounds to navigate. As an experiment, find a room without windows. Walk inside, close the door, shut off the lights, and for extra measure close your eyes. (Before you do any of this, make sure there are no sharp objects inside!) Now walk around the room. You'll probably feel around you with your hands. But try making sounds, too. Clap your hands. Make a series of hoots, or one continuous loud noise. If you pay attention, you can figure out where you are in the room using just the sounds. If you're close to a wall, the noise will bounce back to you quickly. If you're in the center and the room is large enough, you may hear echoes.

Even though Orca whales are about 20 feet long, have up to 56 teeth and can hear sounds from several miles away, you're causing and receiving sounds waves just like they do.

Name: _____ Date: _____

1. What does Val Viers do?

- A catch fish
- B record music
- C record and listen to the sounds made by whales
- D teach classes about the ocean

2. What does the author describe in the passage?

- A how whales use sound to communicate and navigate
- B how boats navigate in the ocean
- C how humans use smell to navigate
- D the university that Val Viers used to teach at

3. In the passage, the author describes how humans can use sound to navigate like whales do. Based on this evidence, what conclusions can be made?

- A Humans navigate by asking other humans where to go.
- B Sound can be used to navigate different environments.
- C Sound can be used to navigate only one specific environment.
- D Whales are the only animals that navigate using this method.

4. Based on the passage, how do humans hear sound?

- A Humans hear sound by using nerves throughout their bodies to pick up vibrations.
- B Humans hear sound by picking up vibrations with their hands.
- C Humans hear sound by picking up vibrations with their ears.
- D Humans hear sound only when they are surrounded by other objects.

5. What is the main idea of this passage?

- A Whales can eat both small fish and large sharks.
- B Whales and humans are different because whales can navigate by sound while humans need vision.
- C Val Viers was an excellent professor.
- D Both whales and humans can navigate their surroundings by analyzing how sound bounces off nearby objects.

6. Read the following sentence: "The sound waves **penetrate** the whale's skin and cause long tunnels of fat inside its lower jawbone to vibrate."

As used in the passage, what does the word "**penetrate**" mean?

- A make their way through
- B bounce off of
- C go around
- D change the color of

7. Choose the answer that best completes the sentence below.

_____ humans have the ability to navigate by sound, they usually don't need to because of their strong vision.

- A However
- B First
- C Certainly
- D Although

8. What does the passage suggest that the reader try in order to see how to navigate using sound?

9. Describe how the sounds that the whale produces arrive back at its ears.

10. Explain whether sound waves work the same way underwater as they do out of water. Use information from the passage to support your answer.

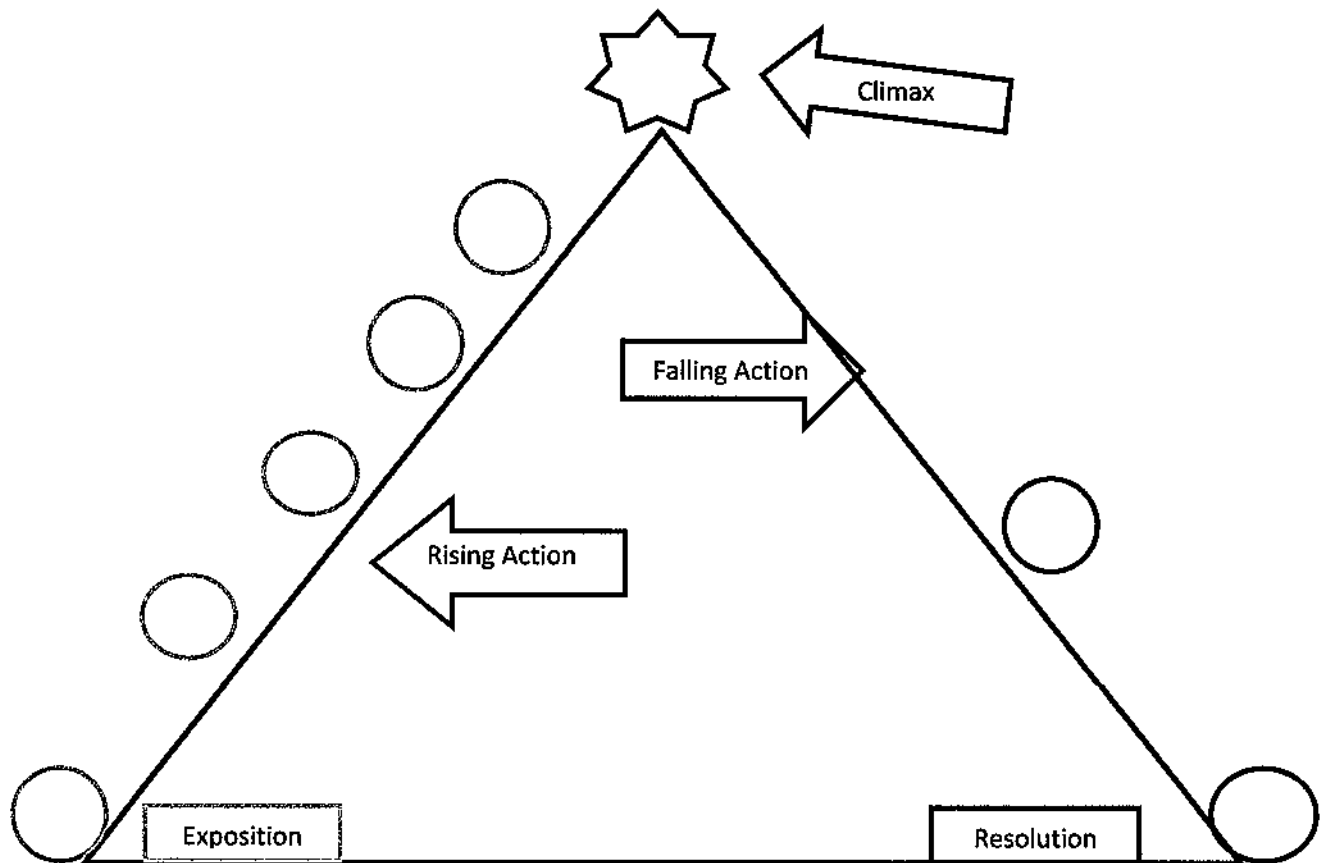
Name _____

Date _____

PLOT

Directions: Below are the main components of The Gingerbread Man. Place each component where it belongs on the Plot Diagram by placing its number in the circle.

1. The gingerbread man came to a river that he could not cross.
2. An old woman who lived in a cottage baked a gingerbread man.
3. The fox ate the gingerbread man.
4. The little old lady ran after him, but he ran away yelling, "You can't catch me; I'm the gingerbread man!"
5. The gingerbread man rode across the river on the fox.
6. When she opened the oven door, the gingerbread man jumped up and ran out the window, shouting, "Don't eat me!"
7. The gingerbread man ran past a pig, a cow, a farmer, and a horse who wanted to eat him.
8. He ran as everyone chased him, trying to catch him so that they can eat him.



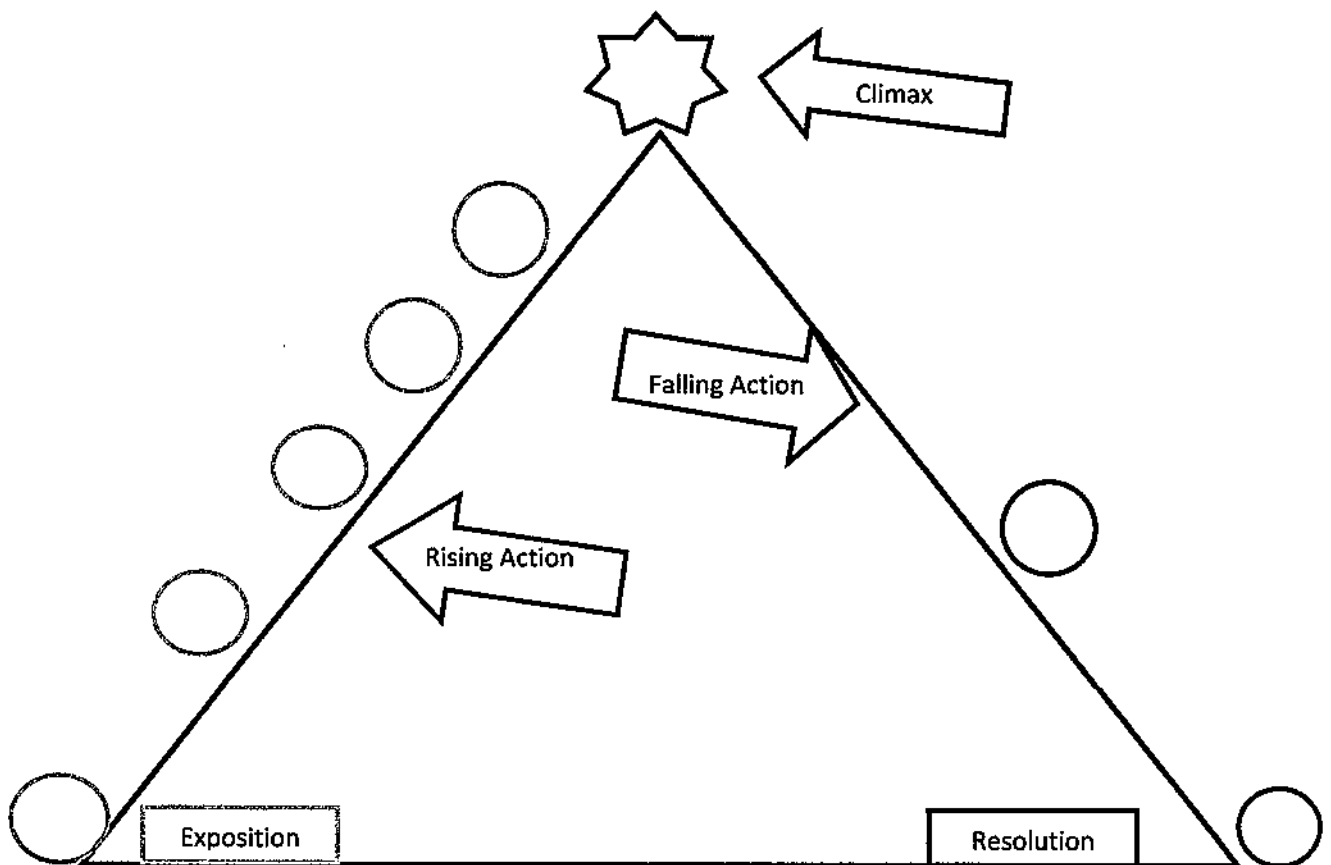
Name _____

Date _____

PLOT

Directions: Below are the main components of The Tortoise and the Hare. Place each component where it belongs on the Plot Diagram by placing its number in the circle.

1. The race started with the hare in the lead.
2. A tortoise took the challenge, making the hare laugh.
3. The hare awoke and saw the tortoise near the finish line.
4. The tortoise won the race.
5. A hare bragged that he was the fastest animal around and had never been beaten in a race, challenging anyone to race him.
6. The hare couldn't catch up in time to win the race.
7. The hare said he'd beat him, dancing around all the way, but the tortoise took the challenge.
8. The hare decided to take a nap, while the tortoise plodded on and on.



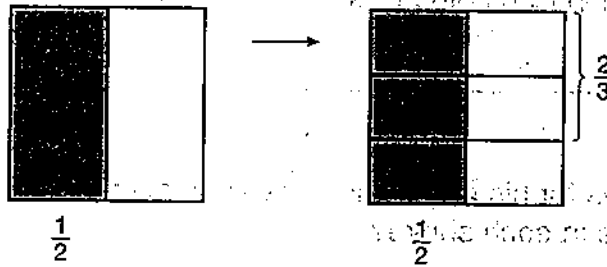
Lesson 10: Dividing Fractions

An area model can help show how to divide fractions less than 1.

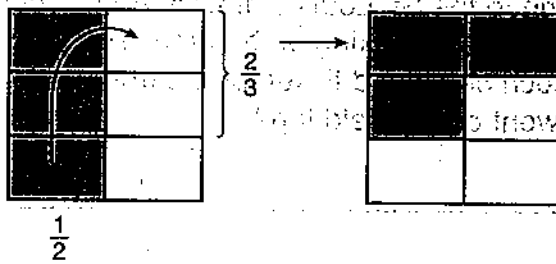
Example

A farmer plants cucumbers on $\frac{1}{2}$ acre of land. She would need $\frac{2}{3}$ acre to supply her entire town with cucumbers. How much of her town's demand for cucumbers can the farmer supply?

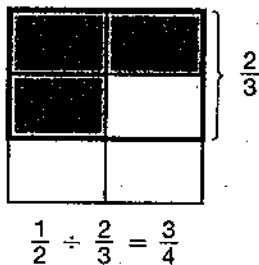
To solve this problem, create an area model to show $\frac{1}{2}$ of an acre. Then create rows to show the fraction of an acre the town needs, $\frac{2}{3}$.



The denominator of the quotient is the number of squares in the rows that show $\frac{2}{3}$. It may help to move any shaded squares into the rows for $\frac{2}{3}$.



There are 4 squares in the rows that show $\frac{2}{3}$. These squares represent the parts of an acre that should be planted with cucumbers to supply the town.



The farmer can supply $\frac{3}{4}$ of her town's demand for cucumbers.

You can also divide fractions by multiplying the dividend by the **reciprocal** of the divisor. To find the reciprocal of a fraction, switch its numerator and denominator. Then multiply the two fractions by multiplying the numerators and the denominators.

▶ Example

Divide: $\frac{5}{8} \div \frac{3}{4}$

Change the divisor to its reciprocal, and change the division symbol to a multiplication symbol.

$$\frac{5}{8} \div \frac{3}{4} \text{ becomes } \frac{5}{8} \times \frac{4}{3}$$

Multiply the numerators and denominators. Write the answer in simplest form.

$$\frac{5 \times 4}{8 \times 3} = \frac{20}{24} = \frac{5}{6}$$

Therefore, $\frac{5}{8} \div \frac{3}{4} = \frac{5}{6}$.

To divide mixed numbers, first change them into improper fractions. Then divide them as you would proper fractions.

▶ Example

Divide: $2\frac{1}{4} \div \frac{7}{9}$

Change the mixed number to an improper fraction.

$$2\frac{1}{4} = \frac{2 \times 4 + 1}{4} = \frac{9}{4}$$

Change the divisor to its reciprocal. Then change the division symbol to a multiplication symbol.

$$\frac{9}{4} \div \frac{7}{9} \text{ becomes } \frac{9}{4} \times \frac{9}{7}$$

Multiply the numerators and denominators. Write the answer in simplest form.

$$\frac{9 \times 9}{4 \times 7} = \frac{81}{28} = 2\frac{25}{28}$$

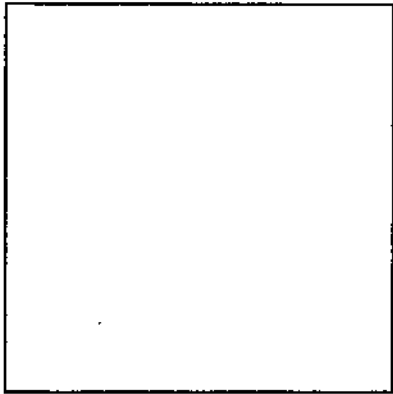
Therefore, $2\frac{1}{4} \div \frac{7}{9} = 2\frac{25}{28}$.

TIP: If you are dividing with a whole number, remember to change it to an improper fraction. For example, $5 = \frac{5}{1}$.

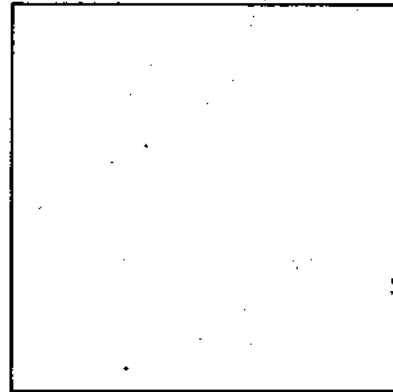
Practice

Directions: For questions 1 through 5, divide the fractions. Use the blank squares as area models.

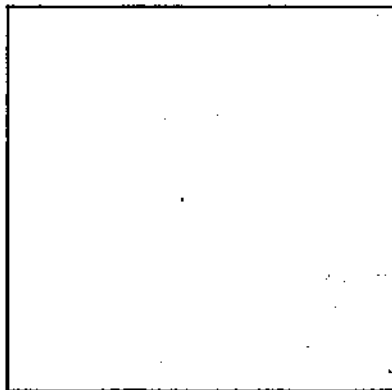
1. $\frac{1}{2} \div \frac{3}{4} =$ _____



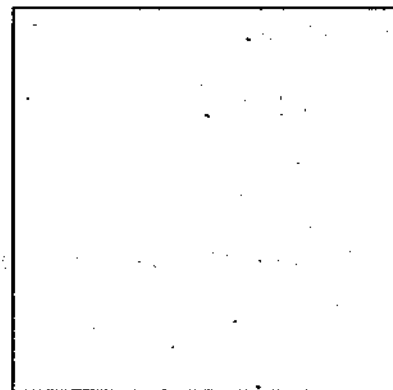
3. $\frac{1}{4} \div \frac{4}{5} =$ _____



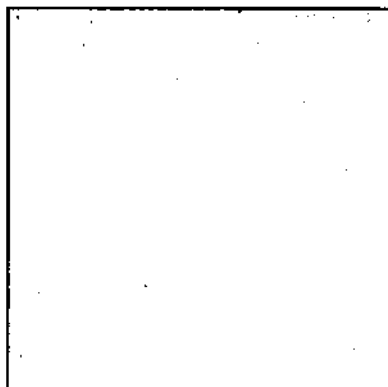
2. $\frac{2}{3} \div \frac{3}{4} =$ _____



4. $\frac{2}{5} \div \frac{1}{2} =$ _____



5. Michaela made $\frac{1}{3}$ pound of cookie batter. She needs $\frac{1}{2}$ pound to make a full batch of cookies. What fraction of a full batch of cookies can Michaela make?



Directions: For questions 6 through 13, divide the fractions. Leave your answers in simplest form.

6. $\frac{9}{10} \div \frac{2}{3} =$ _____

10. $\frac{7}{10} \div \frac{4}{9} =$ _____

7. $\frac{1}{8} \div \frac{3}{4} =$ _____

11. $\frac{1}{5} \div \frac{2}{15} =$ _____

8. $\frac{2}{5} \div \frac{3}{5} =$ _____

12. $\frac{7}{12} \div \frac{4}{5} =$ _____

9. $\frac{4}{7} \div \frac{1}{2} =$ _____

13. $\frac{7}{8} \div \frac{1}{3} =$ _____

Directions: For questions 14 through 23, divide the fractions and mixed numbers. Leave your answers in simplest form.

14. $1\frac{1}{2} \div \frac{2}{5} =$ _____

19. $2\frac{3}{8} \div \frac{3}{4} =$ _____

15. $\frac{1}{3} \div 1\frac{1}{3} =$ _____

20. $\frac{11}{12} \div 1\frac{1}{6} =$ _____

16. $2\frac{1}{5} \div 1\frac{1}{5} =$ _____

21. $1\frac{2}{3} \div \frac{1}{4} =$ _____

17. $3\frac{1}{4} \div \frac{3}{8} =$ _____

22. $3\frac{3}{4} \div 2\frac{1}{2} =$ _____

18. $1\frac{9}{10} \div \frac{2}{5} =$ _____

23. $\frac{1}{8} \div 1\frac{1}{4} =$ _____

24. Howard bought $\frac{3}{5}$ pound of granola. He divided the granola evenly among 4 friends. How much granola did each friend get?
-
25. Jasmine has $\frac{1}{4}$ of a pizza left. She is going to divide the leftovers into 6 equal pieces. What fraction of the whole pizza will each piece be?
-
26. Yolanda has $4\frac{1}{4}$ cups of flour. She needs $1\frac{2}{3}$ cups of flour to make a batch of cookies. How many batches of cookies can Yolanda make with the flour she has?
-
27. A businesswoman uses $\frac{1}{3}$ of the floor of an office building. She needs to use $\frac{5}{8}$ of the floor to expand her business. How much of the space that she needs does she currently use?
-
28. Maximilian had $\frac{4}{5}$ bag of trail mix. He divided the trail mix equally among 5 friends. What fraction of the full bag of trail mix did each friend receive?
-
29. Jeremiah bought a plank of wood $2\frac{2}{3}$ yards long. He divided the plank into 3 equal pieces. How long is each of Jeremiah's planks?
-

Explain how you found your answer.

Reading Comprehension: Compare (tell similarities) and Contrast (tell differences)

Two Great Teachers

Mrs. Weathers

Mrs. Weathers is one of the most loved teachers at our school. She has been a math teacher for over 25 years, and she still loves what she does. Many of the students think she is too strict and don't like the fact that she doesn't include technology or cooperative learning in her instruction. However, many parents prefer her to be their child's teacher because she makes sure that they know their multiplication facts and can do long division before they leave her class. She is a kind and caring teacher who enjoys seeing her students learn. She helps her students any way that she can to ensure that they leave her class with a clear understanding of the math skills that she teaches.

Mrs. Henry

Mrs. Henry is a new math teacher at our school. This is only her second year to teach math since graduating college. She loves teaching math and enjoys watching her students learn. She wants her students to understand the real world application of math; therefore, she has her students participate in many hands-on projects in her classroom. She also likes to include technology whenever she can. When teaching area and perimeter, she has her students design a room on the computer and then determine the area and perimeter of the room in order to determine the amount of carpet and baseboards that would need to be purchased for their room. Students enjoy her class, and most parents like the way that she helps their child love to learn.

1. Based on the two paragraphs, how are Mrs. Weathers and Mrs. Henry alike?
 - a. They both like to incorporate technology into their instruction.
 - b. They both still enjoy teaching after more than 25 years.
 - c. They are both thought of as strict by the students.
 - d. They both enjoy teaching math and enjoy watching their students learn.

2. Based on the two paragraphs, how are Mrs. Weathers and Mrs. Henry different?
 - a. Mrs. Weathers uses technology to teach math, but Mrs. Henry does not.
 - b. Mrs. Henry has been teaching for many years, but Mrs. Weathers is a new teacher.
 - c. Mrs. Henry uses technology and cooperative learning in her classroom, unlike Mrs. Weathers.
 - d. Mrs. Weathers provides real world learning experiences, unlike Mrs. Henry.

3. According to the second paragraph, what example is given to show how Mrs. Henry uses real-world situations to help students understand math.

4. Which teacher would you prefer? Explain why. _____

Reading Comprehension: Compare (tell similarities) and Contrast (tell differences)
Keeping in Touch

Greeting Cards

Do you ever miss the days when you looked forward to going to the mailbox to see what is there waiting for you? Some days, I do. The excitement of opening the mailbox and having a letter addressed to you from a friend or grandparent is an experience that many kids today have never had. Although many people don't still mail greeting cards, my grandmother still sends them and not only for birthdays and holidays. And if the truth be told, I enjoy getting them. Anytime I get a card from her, I know that she has been thinking about me. But that's not the only reason I like receiving them. Greeting cards can be quite funny and entertaining too. I like to hang them on my bulletin board and enjoy them for many days to come. I save every card that my grandmother gives me so that I will have something to remember her by when she is gone. I look forward to getting her cards in the mail, and I bet other kids would like receiving them too.

Emails and Electronic Cards

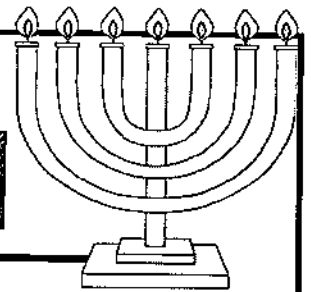
Many people today prefer to communicate through email and send their greeting cards electronically. Additionally, many people prefer to receive their communication from others via the computer in order to save the paper as well as the fuel needed to deliver the mail. Although some say that emails and electronic greeting cards aren't as personal, I don't agree. I love to open my inbox and see that a friend has been thinking of me and has taken the time to write an email or pick out and send an electronic card. I love the way that many of the cards entertain you with dancing dogs or firework displays, and I especially like the ones that are interactive. In addition, emails and electronic cards are much easier for me to respond to since I can do it without ever leaving my house.

1. Based on the two paragraphs, how are paper greeting cards and electronic cards alike?
 - a. Both types of cards are free to send.
 - b. Both types of cards let you know the other person is thinking about you.
 - c. Both types of cards can be displayed on your bulletin board.
 - d. Both types of cards come in beautiful envelopes.
2. Based on the two paragraphs, how are paper greeting cards and electronic card different?
 - a. Paper greeting cards sent through the mail are more meaningful then electronic cards.
 - b. You can save electronic greefing cards but you can't save paper greeting cards.
 - c. It is more exciting to get a card over the computer than it is to get one in your mailbox.
 - d. Electronic cards save paper and fuel since they are sent electronically.

3. Which kind of greeting card do you prefer? Why? _____

4. Why do some consider emails and electronic cards more eco-friendly? _____

THE HISTORY OF JUDAISM



Judaism is the first monotheistic religion in the world and is over 3500 years old. Today, there are more than 13 million Jewish people in the world. Jewish populations are concentrated in the USA and Israel, and fewer numbers in Europe and other countries around the world.

Judaism was founded by Moses, but can be traced back to Abraham. Christianity and Islam can also be traced back to Abraham. The Jewish people believe in one God. When Judaism was born, the Jews believed God chose Abraham to be the father of their people. The descendants of Abraham, the Israelites, were to be God's chosen people and serve as an example to the rest of the world.

During King Solomon's reign, the First Temple was built in Jerusalem. In this temple, the Ark of the Covenant was housed. This was an important part of the faith and certain rites and ceremonies could only be carried out there. The Ark of the Covenant represented the special agreement God had with his people. It was built during the exodus, when the Israelites were wandering around in the desert, seeking Canaan.

The exodus was an important time for the Israelites and in the history of Judaism because this was also the time when Moses received the ten commandments.

Much of the history of Judaism is written in the holy texts of the Jews, the Torah. These texts contains much of what is the old testament of the Bible, the holy book of Christians, but in a different order. The Torah can also refer to all Jewish holy texts and learning. Usually, the Torah is written and kept on a scroll, rather than a book.

Because Judaism shares much of the same history and holy texts with both Islam and Christianity, you could say that it has had a great influence on these religions. However, while Christians believe that Jesus is the Messiah, Jews still await the coming of the Messiah. Muslims, on the other hand, believe that Muhammed was the last prophet.

Judaism remains an important world religion today, coming in 11th place in terms of numbers of followers.

WHILE YOU'RE READING...

MARK WITH SYMBOLS

! when you find something interesting.

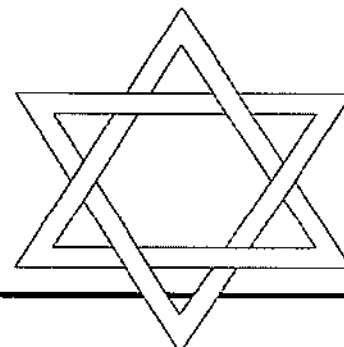
? when you are unsure or confused by something.

***** when you find something important.

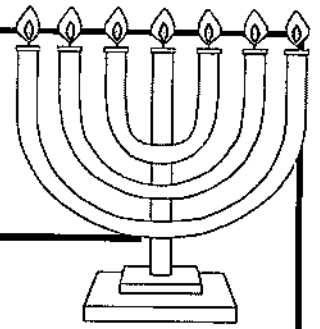
HIGHLIGHT WITH COLORS

yellow power words or key terms

green key phrases and definitions



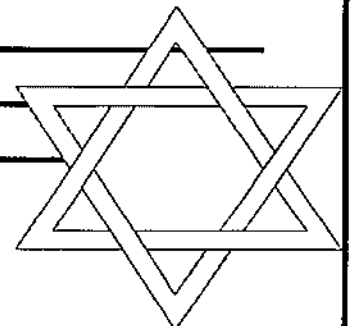
THE HISTORY OF JUDAISM



Question 1: When did Judaism begin?

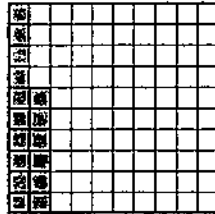
Question 2: Who built the First Temple?

Question 3: How does Judaism differ from Christianity and Islam?



Lesson 12: Percents

The word *percent* is made up of two parts, *per* meaning “out of”, and *cent* meaning “one hundred”. *Percent* literally means “out of each hundred.” A **percent** represents the parts of a whole that is divided into 100 equal parts. The following grid represents a whole unit, or 100%. The grid shows that 16 squares out of 100 are shaded. Therefore, 16% of the grid is shaded.



You can consider a percent as a ratio per 100. In the previous grid, there are 16 shaded squares. There are 100 total squares. The ratio of shaded squares to total squares is 16:100, or $\frac{16}{100}$. If the second part, or denominator, of a ratio is 100, then the first part, or numerator, is the percent.

▶ Example

The ratio of horses to all the animals on a farm is $\frac{11}{100}$. What percent of the animals on the farm are horses?

Because the denominator of the ratio is 100, the numerator must be the percent. Of all the animals on the farm, 11% are horses.

▶ Example

Luz got 88% of the questions right on her science quiz. What ratio represents the number of questions she got right to the total number of questions?

To convert the percent into a ratio, you can use the percent as the numerator and add a denominator of 100. The ratio of questions Luz got right to the total number of questions is, therefore, $\frac{88}{100}$, which can be simplified to $\frac{22}{25}$. The ratio can also be shown as 22:25 or 22 to 25.

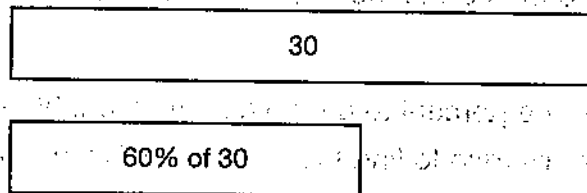
TIP: A ratio should be simplified using common factors. However, a percent should always be out of 100.

If you know a percent and the whole, you can find the part of the whole that the percent represents. You first need to convert the percent to a ratio as a fraction. Then multiply the whole by the fraction. The product will be that part of the whole.

▶ Example

What is 60% of 30?

A tape diagram can help show the relationship of the whole and the part.



The percent 60% is equal to the ratio $\frac{60}{100}$. Multiply the whole by this ratio. You will need to convert 30 to $\frac{30}{1}$.

$$\frac{30}{1} \times \frac{60}{100} = \frac{30 \times 60}{1 \times 100} = \frac{1800}{100} = 18$$

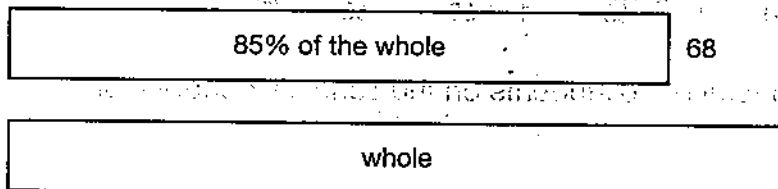
60% of 30 is 18.

If you know a percent and the part of the whole, you can find the total number of items in the whole. You first need to convert the percent to a ratio as a fraction. Then you can divide the part by the fraction. The quotient will be the total number.

▶ Example

85% of what number is equal to 68?

The tape diagram shows the relationship of the whole and the part.



The percent 85% is equal to the ratio $\frac{85}{100}$. Divide the part by this ratio.

$$\frac{68}{1} \div \frac{85}{100} = \frac{68}{1} \times \frac{100}{85} = \frac{68 \times 100}{1 \times 85} = \frac{6800}{85} = 80$$

85% of 80 is equal to 68.

You may need to solve for the part or the whole with a percent when working with real-world problems.

▶ Example

Kevin has 15 pairs of socks. Of his socks, 40% are black. How many pairs of black socks does Kevin have?

This problem provides the total number of pairs of socks and the percent that are black. You need to find the part of the total number. That part will be the number of black socks.

The first step is to convert the percent to a ratio as a fraction: $40\% = \frac{40}{100}$. Then multiply the total by this ratio to find the part. You will need to convert 15 to $\frac{15}{1}$.

$$\frac{15}{1} \times \frac{40}{100} = \frac{15 \times 40}{1 \times 100} = \frac{600}{100} = 6$$

Kevin has 6 pairs of black socks.

▶ Example

There are 13 girls on a school's debate team. If 65% of the team members are girls, how many students are on the debate team in total?

This problem provides the number of girls on a team and the percent that are girls. You need to find the total number. That number will represent the total number of students on the debate team.

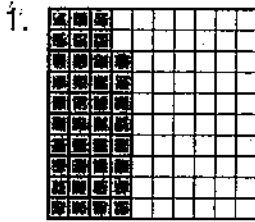
The first step is to convert the percent to a ratio as a fraction: $65\% = \frac{65}{100}$. Then divide the part by this ratio to find the whole. You will need to convert 13 to $\frac{13}{1}$.

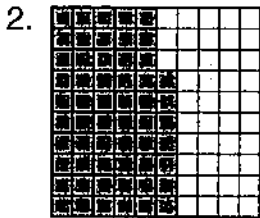
$$\frac{13}{1} \div \frac{65}{100} = \frac{13}{1} \times \frac{100}{65} = \frac{13 \times 100}{1 \times 65} = \frac{1300}{65} = 20$$

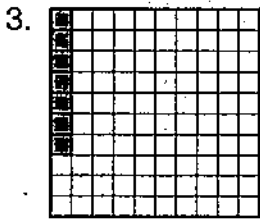
There are a total of 20 students on the school's debate team.

Practice

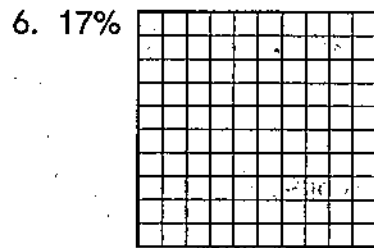
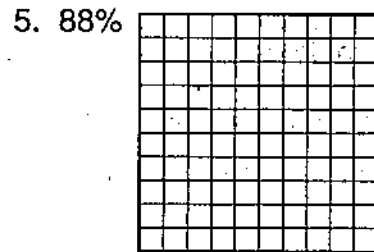
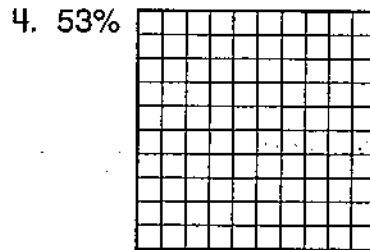
Directions: For questions 1 through 3, find the percent of the grid that is shaded.







Directions: For questions 4 through 6, shade in the given percent of each grid.



7. The ratio of teenagers to all the customers in a mall is $\frac{36}{100}$. What percent of the customers in a mall are teenagers?

8. Of all the students in Ms. Mack's class, 44% are girls. What ratio compares the number of girls in her class to the total number of students in her class?

Directions: For questions 9 through 22, find the part or the whole of a percent.

- | | |
|------------------------------|-------------------------------------|
| 9. What is 32% of 50? _____ | 16. 2% of what number is 1? _____ |
| 10. What is 15% of 60? _____ | 17. 30% of what number is 21? _____ |
| 11. What is 8% of 25? _____ | 18. 50% of what number is 29? _____ |
| 12. What is 75% of 92? _____ | 19. 75% of what number is 48? _____ |
| 13. What is 80% of 90? _____ | 20. 7% of what number is 7? _____ |
| 14. What is 25% of 88? _____ | 21. 25% of what number is 13? _____ |
| 15. What is 10% of 30? _____ | 22. 40% of what number is 26? _____ |

23. It rained during 40% of the days of Chrissy's vacation. If it rained on 2 days, how many days long was Chrissy's vacation?

24. Only 20% of the children at a party voted to have tacos for lunch. There were 20 children at the party. How many voted to have tacos?

25. Mr. Malkmus replaced 75% of the wooden boards on his deck. If he replaced 63 wooden boards, how many boards does his deck have in total?

26. Of the families in Mel's apartment building, 55% have at least one pet. There are 80 families in Mel's apartment building. How many have at least one pet?

27. Raymond answered 95% of the questions on his English quiz correctly. If he answered 19 questions correctly, how many questions were there on the quiz in total?

28. Gillian has completed 25% of a bicycle race. If the length of the race is 32 km, how many km has she traveled so far?

29. Alain has spent 40 minutes on his homework. If he is 40% done, how many minutes will he spend on his homework in total?

Explain your answer.

What's the Main Idea?

Kids love sports. There are age-appropriate programs for almost every sport, and playing sports is a way for kids to challenge themselves in a safe and encouraging environment. Sports are a natural place to learn important life lessons, and participating in sports can pave the way to unique opportunities that kids might not otherwise



have. Over time, as with many group activities, teammates and coaches become like family, so kids that are involved in sports have larger support systems. Sports are also a very viable way for athletically-inclined kids to be able to afford college. Many college and universities offer sports scholarships.

What is the main idea of the paragraph?

- A. Sports are a healthy way to spend your time.
- B. Sports scholarships are a good way to go to college.
- C. Kids benefit in many ways from being involved in sports.
- D. Every kid should be an athlete.

Write at least one supporting idea for the main idea.

Finding the Main Idea

In Montgomery, Alabama in 1955, an African American woman named Rosa Parks refused to give up her bus seat to a white man, a decision that brought about one of the defining moments of the U.S. Civil Rights movement. Her subsequent arrest sparked a reaction from the Montgomery Women's Political Council, and soon the whole Montgomery community got behind the effort. A one-day boycott of the Montgomery bus services was so successful that Dr. Martin Luther King, leader of the Montgomery Improvement Association, asked people to continue the boycott, which eventually lasted for 381 days. Not long afterwards, the United States Supreme Court ordered that the Montgomery segregation law was unconstitutional and that the buses were to be desegregated.



1. What is the main idea of the paragraph?

2. What evidence does the author present to support the main idea?

3. What would make a good title for this paragraph?

Name _____ Main Ideas

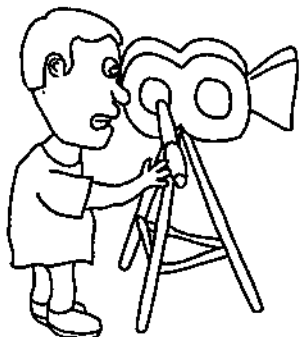
Defining Your Own Success

Tim Burton is living proof that it is possible to have a successful career if you choose to follow your passions. Hailed today as a creative and innovative film director, as a child, Burton was fascinated by classic horror films. He taught himself to draw, and eventually earned a degree in animation at the California Institute of the Arts. His first job after college was as an apprentice animator for Disney, but he left after only a year, preferring to pursue his own artistic vision. His first successful film was the award-winning short *Vincent*, which paid homage to his childhood hero, screen villain Vincent Price. Many commercially successful films followed, and after two decades, because of his unique vision - a quirky blend of fantasy and horror - Burton has something of a cult following. In addition to his films, over 700 of Burton's drawings, paintings, and other artwork have been exhibited at New York City's Museum of Modern Art.

MAIN IDEA

SUPPORTING IDEA

SUPPORTING IDEA



SUPPORTING IDEA

Lesson 20: Solving Inequalities

An **inequality** is a mathematical sentence comparing two expressions that are not equal. An inequality may use one of the following symbols: $<$ or $>$. The symbol $>$ means “is greater than.” The symbol $<$ means “is less than.”

To solve inequalities, follow the same rules as for solving equations. Use inverse operations to isolate the variable.

Example

Solve the following inequality for x .

$$5x < -35$$

Use inverse operations to solve for x .

$$5x < -35$$

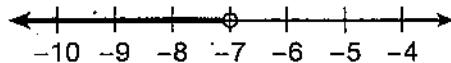
$$\frac{5x}{5} < -\frac{35}{5}$$

Divide both sides by 5.

$$x < -7$$

The solution set for the inequality is $x < -7$.

The graph of the solution set is shown below:



Notice that the dot on -7 is open. This means that -7 is not included as part of the solution set.

To check the answer, substitute any number less than -7 for x . Use $x = -8$.

$$5x < -35$$

$$5(-8) < -35$$

$$-40 < -35$$

 **Example**

Solve the following inequality for x .

$$8 + x \geq 5$$

Use inverse operations to solve for x .

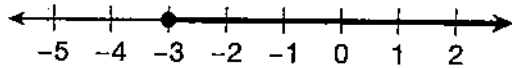
$$8 + x \geq 5$$

$$8 - 8 + x \geq 5 - 8 \quad \text{Subtract 8 from both sides.}$$

$$x \geq -3$$

The solution set for the inequality is $x \geq -3$.

The graph of the solution set is shown below.



Notice that the dot on -3 is filled in. This means that -3 is included in the solution set.

To check the answer, substitute any number greater than or equal to -3 for x . Use $x = 0$.

$$8 + x \geq 5$$

$$8 + (0) \geq 5$$

$$8 \geq 5$$

 **Practice**

Directions: For questions 1 through 10, solve the inequality.

1. $3m > 72$ _____

6. $n - 55 > 9$ _____

2. $\frac{1}{5}x > 30$ _____

7. $n + 90 < -101$ _____

3. $n - 4 \leq 8$ _____

8. $3y \leq 24$ _____

4. $2n < 5$ _____

9. $x - 49 < 7$ _____

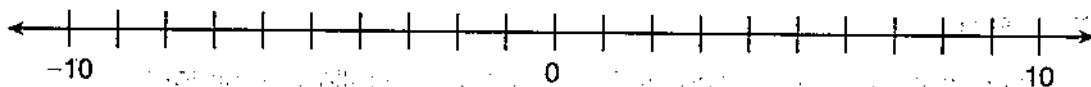
5. $34 + z \geq 14$ _____

10. $12x \leq 168$ _____

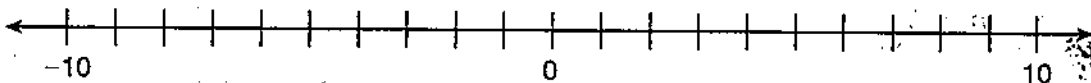
CCSS: 4-EE-5

Directions: For questions 11 through 17, solve the inequality for the given variable. Then graph the solution to the inequality on a number line.

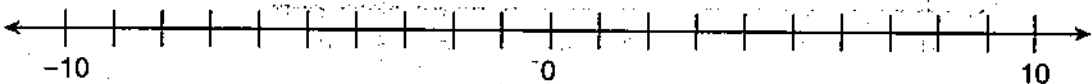
11. $3x < 27$



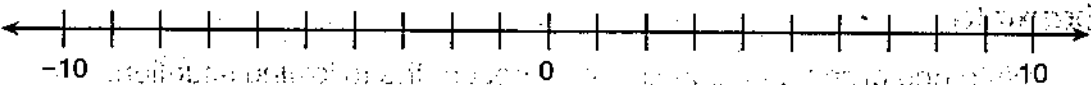
12. $y - 6 \geq 2$



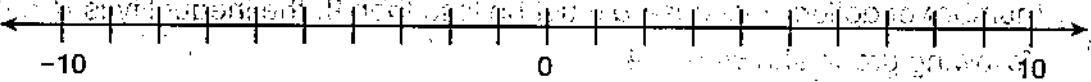
13. $4 + n > 9$



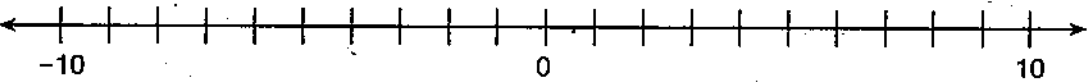
14. $12 \leq x + 5$



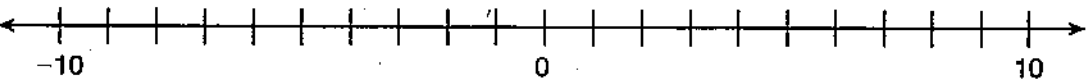
15. $x + 2 \leq -1$



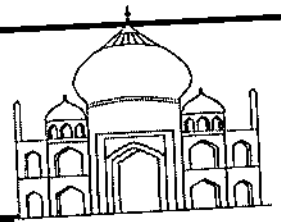
16. $8 > 4n$



17. $5x \geq -10$



THE INDUS VALLEY CIVILIZATION OF ANCIENT INDIA



The Indus Valley Civilization, also known as the Harappan civilization, first emerged in approximately 3000 BC, located around modern day Afghanistan and northwest India. The Indus Valley was a fertile flood plain that encouraged a thriving agricultural society. Over hundreds of years, the Indus Valley Civilization made many advanced technological contributions that changed the way people lived, including drainage systems, farming machinery, and measurement tools.

The Indus Valley Civilization depended on monsoons to aid their farming culture. These monsoons were seasonal winds that impacted the region, blowing warm and moist air from the southwest in the summer and cold air from the northeast in the winter. The people did not use irrigation systems and instead used these monsoons to water their crops. However, if the rains came too early, too heavy, or too late, the crops were destroyed.

The monsoons were a catalyst for a surge in development and technology for the people of the Indus Valley Civilization. One of their largest contributions to society was their elaborate underground drainage system. They used mud bricks to create the drainage system for waste. The waste would travel from a central well through clay brick pipes into a shared drain, and would then be disposed into a pit or used as fertilizer. Their civilization showed signs of being well-planned, complete with housing and even bathrooms.

Religion played a major role in the economy and daily life of the Indus Valley Civilization. As a result, religious buildings for worship, such as shrines and temples were designed. Many of them were built around the river valleys that provided resources for farming. Much like Mesopotamia's fertile crescent, the Indus Valley Civilization resided around a river valley. They built massive canals and participated in sea trade, building boats and using trade as a means to thrive as a society. Like the Mesopotamians, the Indus Valley Civilization depended on the fertile soil to grow their crops and support their farming lifestyle.

A decline soon began around 1500 BC. The monsoons continued to shift east, the water supply began to dry up, and residents began to migrate. Moreover, a new group of nomads from central Asia came into contact with the Indus Valley Civilization called the Aryans. The Aryans settled into the area and over several centuries, their language and religious practices slowly overtook the Indus Valley Civilization's language and religion.

The Aryans continued to advance the society by introducing iron, and therefore the iron plow, a mechanism used for ideal farming. Most importantly, the Aryans introduced the written language of Sanskrit around 1000 BC. Before, the written language of the Indus Valley Civilization was and still remains a mystery. The Aryans were able to write down their legends and religious chants, among other important information.

There is no agreement as to why the Indus Valley Civilization came to an end. Among the possible theories are climate change, migration, severe drought, decline in trade, and the arrival of the Aryans. However, the Indus Valley Civilization's contributions are still making an impact today.

WHILE YOU'RE READING...

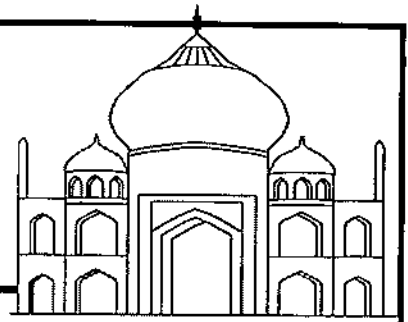
MARK WITH SYMBOLS

- ! when you find something interesting.
- ? when you are unsure or confused by something.
- * when you find something important.

HIGHLIGHT WITH COLORS

- yellow power words or key terms
- green key phrases and definitions

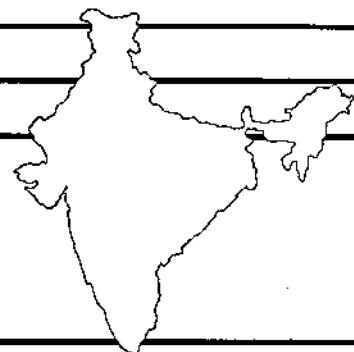
THE INDUS VALLEY CIVILIZATION OF ANCIENT INDIA



Question 1: What is a monsoon? How did they affect the lifestyle of the Indus Valley Civilization?

Question 2: Who were the Aryans? When did they arrive and what were the contributions to the civilization they joined?

Question 3: How was the Indus Valley Civilization similar to Mesopotamia?



Name _____ **Mood and Tone**

Mood and Tone Worksheet

Tone is the attitude that a writer takes towards what he or she is writing. It is expressed through the writer's choice of words, and it conveys information additional to the meaning of the words themselves. For example, tone can be formal, serious, angry, ironic, satirical, humorous, etc.

Mood is the atmosphere that exists within a written work. It is what is feels like to be in the world that the words create. Imagine watching a play. The setting, dialogue, and characters, etc., all combine to make you feel a certain way as you watch. For example, mood can be suspenseful, realistic, romantic, gloomy, dark, etc.



DIRECTIONS: For each passage below, write the tone and the mood of the passage. Then write down the context clues that convey them.

1. When the young man was summoned to the principal's office he just shrugged; but as he stood to leave the room, I thought I could detect the faintest quiver about his lips.

TONE: _____ MOOD: _____

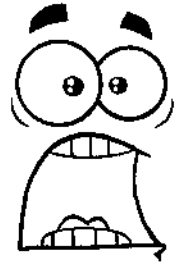
CONTEXT CLUES: _____

2. With gentle hands, she lifted the tiny kitten to her cheek and closed her eyes as she listened to its purring. In her palm she could feel its tiny heartbeat, steady and strong. Then she set it gently back down into its bed and went to prepare its next meal. With any luck, the poor little creature would make it to morning.

TONE: _____ MOOD: _____

CONTEXT CLUES: _____

Name _____ **Mood and Tone**



3. Henrietta watched, frowning as Kevin started to change the tire. He struggled with the lug wrench, and one time it flew out of his hands and he had to go hunting for it in a nearby ditch. Henrietta sighed, let her head drop backwards, and settled in for a long wait.

TONE: _____ MOOD: _____

CONTEXT CLUES: _____

4. Jane sat up in bed. Had that been a rustle? She was sure she had heard a rustling noise. She listened again. There was nothing—and then she heard a tapping at her window. Her heart leapt up into her throat and she was unable to call for help.

TONE: _____ MOOD: _____

CONTEXT CLUES: _____

5. "Who's ready to win?!" Kimberley called out as she bounced into the room, her pigtails flying. She crossed the gymnasium in three handsprings, and when she landed on her feet at the other end, the students in the bleachers leapt to their feet with a roar.

TONE: _____ MOOD: _____

CONTEXT CLUES: _____

6. "I'm not doing this again," Peter said grimly. Dan started to speak, but Peter cut him off. "No," he said. "I'm done. Never again." And that was that.

TONE: _____ MOOD: _____

CONTEXT CLUES: _____

Name _____ **Mood and Tone**

Identifying Mood and Tone

It was the best of times, it was the worst of times; it was the age of wisdom, it was the age of foolishness; it was the epoch of belief, it was the epoch of incredulity; it was the season of Light, it was the season of Darkness; it was the spring of hope, it was the winter of despair; we had everything before us, we had nothing before us; we were all going direct to Heaven, we were all going direct the other way—in short, the period was so far like the present period, that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree of comparison only.

There were a king with a large jaw and a queen with a plain face, on the throne of England; there were a king with a large jaw and a queen with a fair face, on the throne of France. In both countries it was clearer than crystal to the lords of the State preserves of loaves and fishes, that things in general were settled for ever.

From *A Tale of Two Cities* by Charles Dickens

1. The tone of the passage is:
 - a. nostalgic
 - b. philosophical
 - c. objective
 - d. ironic
2. The mood of the passage is:
 - a. humorous
 - b. cautionary
 - c. informative
 - d. mean-spirited
3. How does Dickens hook the reader in the opening paragraph?
 - a. with poetic language
 - b. with a series of paradoxes
 - c. with philosophical questions
 - d. with humor
4. When the author compares the kings and queens of the two countries who will soon be at war, what literary device is he using?
 - a. simile
 - b. irony
 - c. satire
 - d. symbolism

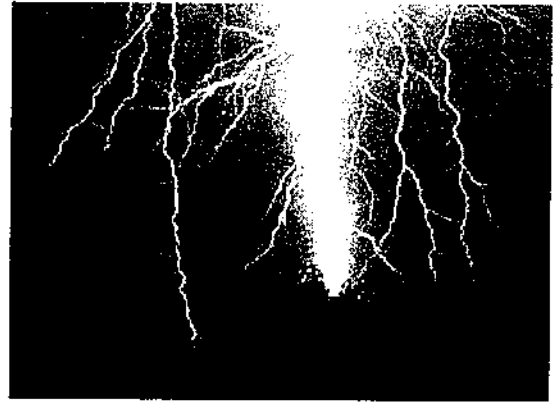


Name: _____

edHelper

Using Technology to Study Lightning

By the time you finish reading this sentence, lightning will have flashed more than five hundred times around the world. This common occurrence can have dangerous results. Each year in the United States alone, lightning kills almost one hundred people. It also causes several hundred million dollars in damage.



A bolt of lightning can travel at a speed of 136,000 miles per hour (220,000 km/h). It can reach temperatures of 54,000 degrees Fahrenheit (30,000 degrees Celsius), which is hot enough to melt sand into glass.

Lightning heats nearby air to about 18,000 degrees Fahrenheit (10,000 degrees Celsius) nearly instantly, which is almost twice the temperature of the sun's surface. The heating creates a shock wave that is heard as thunder.

Even though controlling this awesome outburst of Mother Nature may seem impossible, scientists around the world are searching for ways to do just that. Scientists have learned many things about lightning in the more than 250 years since Benjamin Franklin did his kite experiment. Natural lightning is very difficult to study. Scientists must know where it is going to strike and have their instruments at that point and ready ahead of time. So today when scientists want to study lightning, they stand in a carefully insulated trailer. Then they launch a rocket toward a thundercloud to create an artificial lightning bolt.

During a normal lightning strike, several things happen. First, electric charges build up at the bottom of a cloud. The cloud then emits a line of negatively charged air particles that zigzags toward the Earth. The attraction between these negatively charged air particles and positively charged particles from objects on the ground forms a plasma channel.

Remember that plasma is the fourth state of matter. It is a gas that has become ionized- its electrons are no longer bound to the atom. The free electrons make the gas highly conductive to electrical charges. This channel is the pathway for a lightning bolt. As soon as the plasma channel is complete- BAM!-between three and twenty lightning bolts separated by thousandths of a second travel along it.

Armed with this information, scientists are now trying to find ways to redirect these naturally occurring plasma channels. One idea is to use laser beams. A laser beam directed into a thundercloud can charge the air particles in its path, causing a plasma channel to develop and forcing lightning to strike.

By creating the plasma channels, scientists can catch a bolt of lightning before it strikes and direct it to a safe area of the ground. Scientists can simply use lasers to direct naturally occurring lightning to strike where they want it to.

Laser technology is not without its problems. The machines that generate laser beams are big and expensive. They

Name: _____

can be struck by misguided lightning bolts. And it is not yet clear that creating plasma channels will be enough to prevent the devastating effects of lightning.

Researchers from NASA have sent up test rockets with trailing copper wires. They are trying to determine the atmospheric conditions necessary for aircraft and rockets to trigger lightning strikes. Scientists have found that a rocket is more likely to trigger lightning when a thunderstorm is fairly inactive.

The Electric Power Research Institute uses small rockets to create and direct lightning strikes. They want to study the impact of lightning on electric utility equipment such as power lines and transformers. Laser-triggered lightning could be used to protect electric power stations, rocket launching pads, and other sensitive areas.

Using Technology to Study Lightning

Questions

- _____ 1. In the United States, about how many people are killed each year by lightning?
- A. one thousand
 - B. one hundred
 - C. five hundred
 - D. fifty

2. What causes thunder?
- _____
- _____

- _____ 3. Why do scientists who study lightning try to create artificial lightning?
- A. It is less dangerous than natural lightning.
 - B. Scientists must know where it is going to strike and have their instruments at that point and ready ahead of time.
 - C. Artificial lightning carries less heat and electricity.
 - D. all of the above

4. Put these events in order.
- _____

- A. A plasma channel is formed.
- B. Electric charges build up at the bottom of a cloud.
- C. Lightning bolts travel along the plasma channel.
- D. The cloud then emits a line of negatively charged air particles that zigzags toward the Earth.

Name: _____

- _____ 5. What is plasma?
- A. the fourth state of matter
 - B. a gas that has become ionized
 - C. a gas with free electrons no longer bound to the atom
 - D. all of the above
- _____ 6. What is one way scientists are trying to redirect plasma channels to control where lightning strikes?
- A. laser beams
 - B. electric utility equipment
 - C. rocket launching pads
 - D. all of the above

0 • 3 • 3 • x • = • x • 4 • 5 • 1 • 1 • 3 • 1 • 2 • 4 • ÷ • 4 • 3 • 1
 = • 4

A crossword puzzle grid with numbers and mathematical symbols placed in the cells. The grid is irregularly shaped. Numbers include 0, 3, 3, x, =, x, 4, 5, 1, 1, 3, 1, 2, 4, ÷, 4, 3, 1, =, 4. Symbols include ÷, x, =.

Rewrite these in increasing order of length:

852 km, 542 cm, 146 m, 8 dm, 698 mm

How many dimes make \$3.80?

Name: _____

How many of these can you write about? Think! Write! Check all the ones you answered.

- Why are NASA and the Electric Power Research Institute interested in trying to control where lightning strikes?
- Explain to a younger student or sibling what causes thunder and lightning. Write a paragraph using details from the reading passage.

Name: _____

$$\begin{array}{r} 886 \\ - 759 \\ \hline \end{array}$$

Can 966 be evenly divided by 6? Circle:

966 is NOT divisible by 6

966 is divisible by 6

$$\begin{array}{r} 79 \\ - 54 \\ \hline \end{array}$$

$6 \times 2 = \underline{\hspace{2cm}}$

Write the missing family fact.

$104 \div 13 = 8$

$13 \times 8 = 104$

$8 \times 13 = 104$

$$\begin{array}{r} 41 \\ + 43 \\ \hline \end{array}$$

$2,696 + 5,252 = \underline{\hspace{2cm}}$

$3 \times 8 = \underline{\hspace{2cm}}$

$32 \div 4 = \underline{\hspace{2cm}}$

Write this as a number in standard form. Use a comma in your number.

five hundred thirty-nine thousand eighty-seven

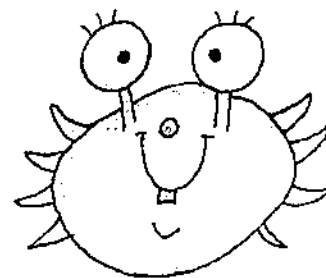
$15 \text{ km} = \underline{\hspace{2cm}} \text{ m}$

$$\begin{array}{r} 283 \\ + 293 \\ \hline \end{array}$$

You cannot decide what pizza store to go to. Emily's pizza cuts their pizza into 4 slices. Each slice costs \$5 each. Anne's pizza cuts their pizza into 7 slices. Each slice costs \$4 each. If you like each pizza the same, which pizza store has the better buy?

$21 \div 3 = \underline{\hspace{2cm}}$

$36 \div 12 = \underline{\hspace{2cm}}$



$1 \text{ kg} = 1,000 \text{ g}$

$29 \text{ kg} = \underline{\hspace{2cm}} \text{ g}$

For 93,195,968,544,725, write the digit that is in the hundred thousands place.

$77 \div 11 = \underline{\hspace{2cm}}$

Name: _____

Pick the correct answer using brain power. No writing.

0.3×0.3 is what? 0.0009 or 0.009 or 0.09

0.16×0.3 is what? 0.00048 or 0.048 or 0.0048

0.08×0.8 is what? 64 or 0.0064 or 0.064

7.12×0.7 is what? 4.984 or 0.04984 or 49.84

"Hey, Ted!" called out his friends. But Ted didn't reply. He was texting. They don't call him Texty Ted for nothing! Ted sends an average of 44 texts in only 3 minutes. At precisely 3:19 Ted finally sat down outside of school to play his phone. He played his phone until 3:52 when his phone ran out of power. How many texts do you think Texty Ted sent?

Name: _____

Write as a fraction in simplest form.

$$\frac{2}{3} + \frac{1}{6} + \frac{1}{10} =$$

$$\frac{1}{3} + \frac{5}{6} + \frac{2}{5} =$$

$$\frac{2}{3} + \frac{1}{5} + \frac{1}{15} =$$

In each group, use 4 of the numbers to make a proportion.

39 63 9 21 33 99

90 96 2 16 15 16

