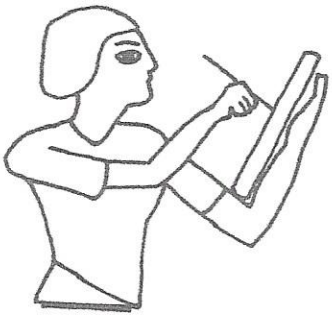
Summer Packet

ELA

Mr. Pawlowski

Resource Teacher

Mathematicians



Do you remember being so young that you did not know how to count? Although very young children don't know about numerals, they do understand the concept, or idea, of counting. The ideas of "one," "some," "all," and "none" are easy to understand. In fact, these concepts are how numerals and math were created.

Ancient people, such as Egyptians, had to express the idea of "how many" every day, for many reasons. For instance, suppose you live in ancient Egypt and are going fishing for your family's dinner. Your family consists of you, your mother, and your father. Before numbers were invented, you would not be able to think, "I need three fish, one for each of us." However, you would know what the idea of "three" meant, because you could catch a fish, then another, and then another, and match them in your mind to each person in your family. Now, suppose you want someone else to fish for you. How would you explain to them how many fish to catch? You might draw lines on a tablet: a line for your father, one for your mother, and one for you. The person fishing would match a fish to each line.

These lines, called hash marks, were people's first counting symbols. But when people needed to show "how many" of a lot of something, all those lines were a pain to draw and match to the objects they stood for. So people developed shortcuts: instead of drawing 10 lines, they would draw a symbol that everyone agreed stood for 10 lines. These were the first numerals. We use the numerals 1, 2, 3, 4, 5, 6, 7, 8, 9, and 0, but there are many other symbols used to show these amounts, or quantities. Have you ever seen book chapters with symbols like "I," "IV," and "XXVI"? These are Roman numerals—another set of symbols to communicate "how many."

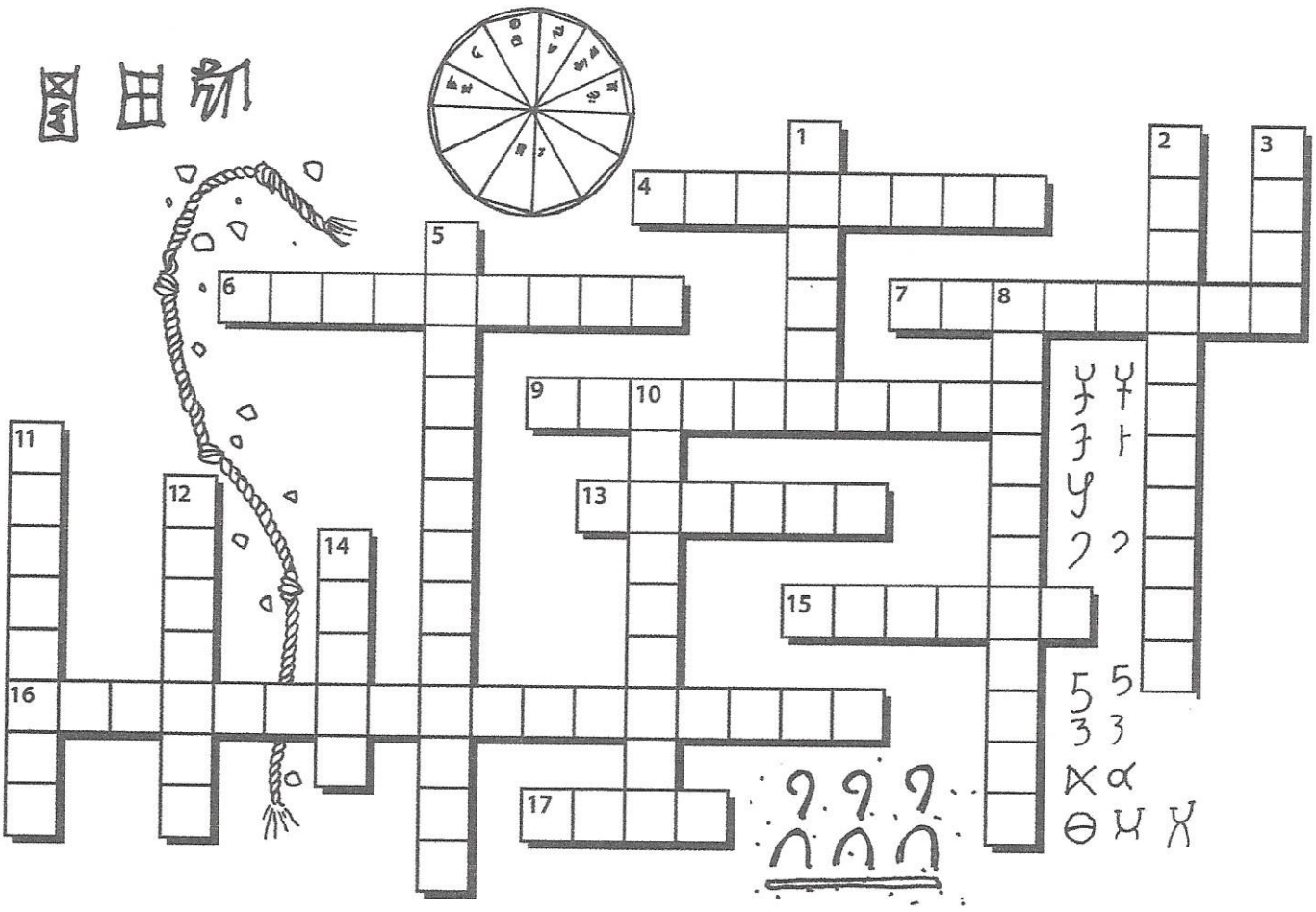
Once people agreed on what the symbols stood for, it was easy to show "how many"—and math operations such as addition, subtraction, multiplication, and division become possible. Just as a small child first learns about the simple concepts "take away" and "add more," so did early mathematicians. They agreed on symbols to show how quantities changed, and what the result equaled.

Once people understood how to write down and solve simple math problems, some individuals invented new ways to use numbers. For instance, symbols for fractions and decimals were decided on.

Then, mathematicians such as Rene Descartes began to use math to learn about shapes, lines, and angles—a discipline known as geometry. Other mathematicians created number puzzles, using numerals and other symbols. The numerals and symbols made up a code, and if you knew what they stood for, you could solve the puzzle. Today, these number puzzles are called algebraic equations.

All mathematicians have one thing in common: they study "how many." They do it in very different and sometimes very complicated ways. Each generation of mathematicians studies what others learned before them. Then, they use math to solve problems in many fields of study, including astronomy, engineering, medicine, and technology.

Mathematicians



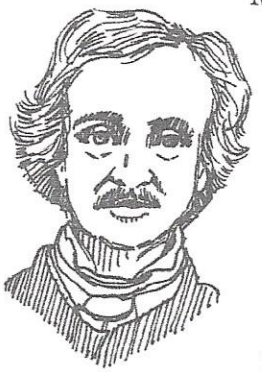
Across

4. A math discipline that deals with shapes, lines, and angles
6. Mathematician who studied geometry
7. A field of study that uses math
9. Addition, subtraction, and multiplication are examples of math _____.
13. A written mark that stands for something
15. Something that has to be solved, like an algebra equation
16. A number puzzle that uses numerals and symbols (two words)
17. A line mark used to keep track of "how many" is called a _____ mark.

Down

1. Another word for "quantity"
2. A field of study which uses math to solve problems
3. A simple mathematical concept is "_____ away."
5. Rene Descartes was a _____.
8. Geometry is one of the math _____.
10. Ancient people who used numbers
11. 1, 2, and 3, are examples of _____.
12. Another word for "idea"
14. A kind of numeral—IV, for example

Edgar Allan Poe



Murder, death, love, rejection, revenge, and gloom—these describe the works of Edgar Allan Poe. Poe was a well-known American poet, storywriter, and literary critic. His haunting poems and stories combined with his stormy personal life have made him one of the most famous figures in American literary history.

Edgar was born in Boston, Massachusetts, on January 19, 1809. He was the second of three children born to David and Elizabeth Poe, both actors. His father abandoned the family. In 1811, Elizabeth died, leaving the children orphans. The children were separated, and Edgar was taken in by John Allan, a wealthy Richmond merchant. Although he was never legally adopted, Edgar was renamed Edgar Allan. From the ages of six to eleven, Edgar moved with the Allans, first to Scotland and then to England. In 1826, he returned to Richmond, where he enrolled at the University of Virginia. It was here that Edgar began his drinking and gambling habits. John Allan, refusing to pay Edgar's debts, forced him to work as a clerk. Edgar quit and became estranged from Allan. He went back to Boston and published his first book, *Tamerlane and Other Poems*, in 1827. He enlisted in the U.S. army and served a two-year term. He made up with Allan, who then got him into the U.S. Military Academy. After a few months at the Academy, Poe was dismissed for neglect of duty, and Allan disowned Edgar permanently.

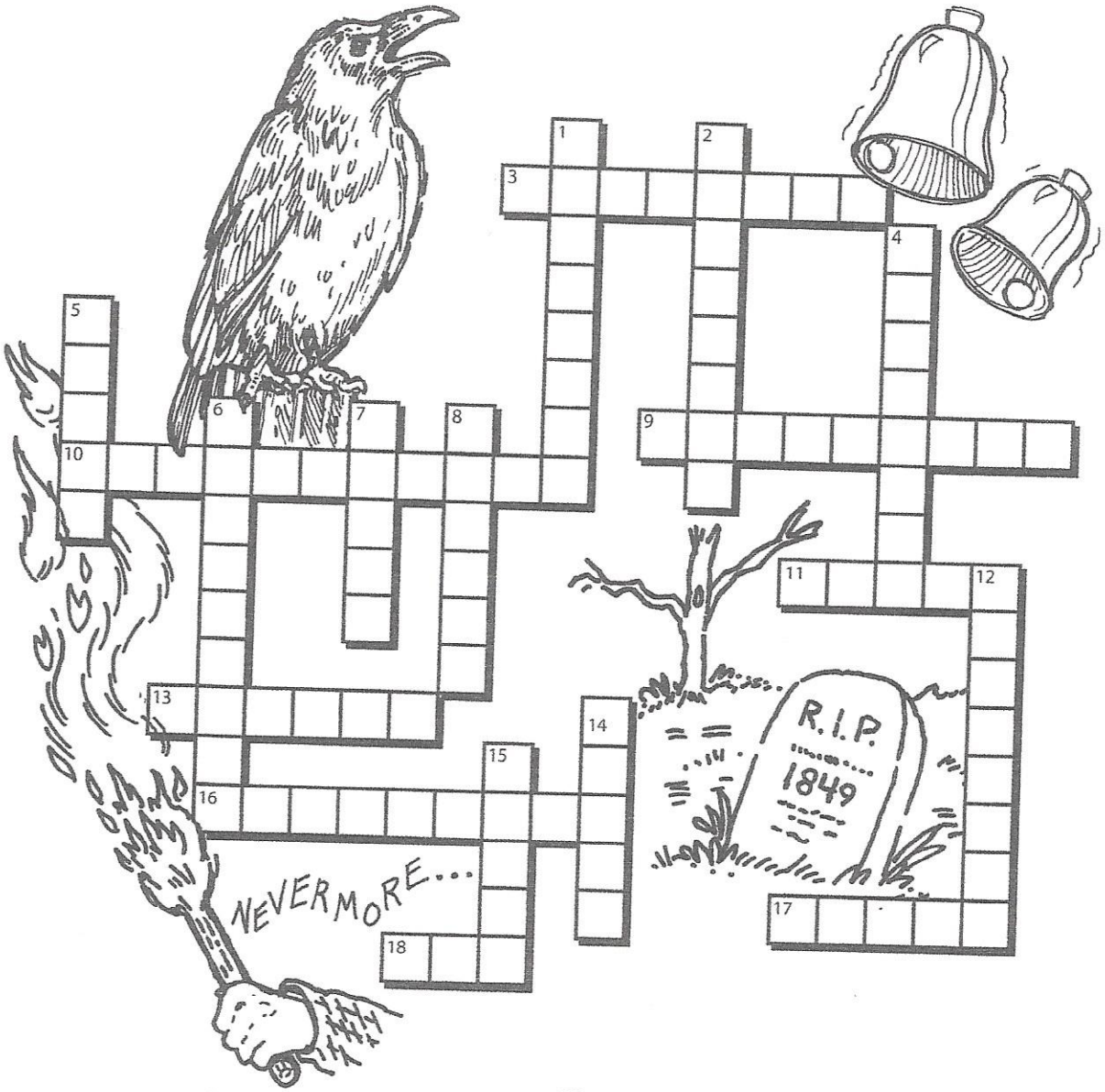
After publishing his third book, *Poems*, Poe moved to Baltimore, where he lived with his aunt, Maria Clemm, and her young daughter, Virginia. In 1836, he married Virginia, although she was not yet 14.

Poe wrote poetry because he liked to. To make extra money, however, he began writing short stories and reviewing other authors' works. He became known for his sarcasm and wit. One of his most famous short stories from this time period was "The Fall of the House of Usher." In 1841, Poe wrote "The Murders in the Rue Morgue." This work is considered to be the first modern detective story. Throughout the 1840s, Poe continued to write. His works were known for their perfect literary construction and their haunting themes. "The Raven," for example, has the narrator overwhelmed by depression and omens of death. "The Bells" is a poem that seems to echo with the chiming and repetitive sound of bells. "Annabel Lee" and "Lenore" are expressions of grief for the death of a beautiful young woman. His short stories also took on these sad tones. For example, "The Tell-Tale Heart" tells of a murderer who is haunted into confessing his guilt.

In 1847, Poe's beloved Virginia died after a long struggle with tuberculosis. Poe himself then sank into poor health, and his writing slowed. His peers said that he began to abuse drugs and alcohol. In 1849, Poe became engaged to marry the widowed Sarah Shelton, his childhood sweetheart. On his way to bring his aunt to the wedding, Poe stopped in Baltimore. He was later found outside a tavern, delirious and barely conscious. He died four days later.

Poe left his mark in the literary world and his works are highly respected. He approached his writing with the same eye for detail as a painter or architect. He talked about the importance of design in writing. He often used an incantatory, or hypnotic, quality of rhythm in his verses. His poetry and prose writing left its mark on the world.

Edgar Allan Poe



Across

3. First name of Poe's wife
9. Poe developed the first modern _____ story.
10. Another word for "hypnotic"
11. Poe's first name
13. City in which Poe was born
16. His mother's first name
17. His father's first name
18. Poe's literary reviews were known for their _____.

Down

1. In his writing, Poe achieved perfect _____ construction.
2. John Allan _____ Edgar, due to his behavior.
4. Poe's work is known for its _____ themes.
5. Aunt Clemm's first name
6. City in which Poe died
7. Poe was to marry _____ Shelton.
8. His favorite literary form
12. City in which John Allan lived
14. "The Fall of the House of _____"
15. "The Tell-Tale _____"

Antonio Vivaldi

Think of a famous composer, or music writer. You probably think of Johann Sebastian Bach, Ludwig van Beethoven, or George Frideric Handel. Antonio Vivaldi is not as widely known. However, he was one of the most influential and innovative Italian composers of his time. He changed the way future composers would write their music. Vivaldi was born on March 4, 1678, in Venice, Italy. This period was called the Baroque Era. The word "baroque" comes from "barroco," a Portuguese word meaning "misshapen pearl." It was used to describe the flamboyant, ornate style of art and music that was popular in Europe between 1600 and 1750. Baroque music has a strong harmonic base written for groups of instruments. It is supported by a keyboard, cello, or bass violin.

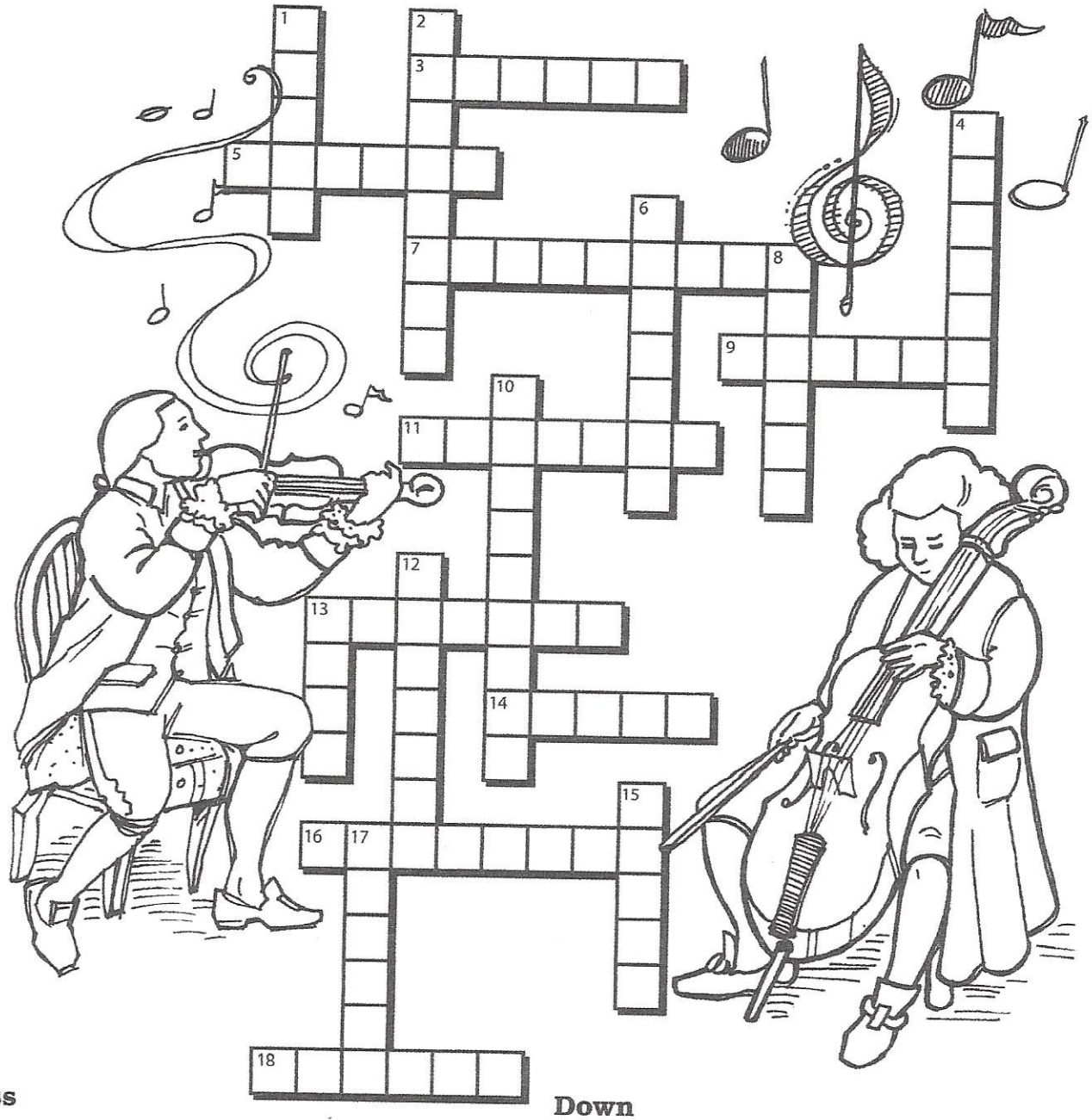
When Antonio was born, he was so frail and tiny that the midwife was afraid he would soon die. Despite her fears, he survived. He grew up learning and loving to play the violin. His father, a baker turned professional violinist, taught him while he lived at home. He and his father played at St. Mark's Basilica in Venice, a church known worldwide. In 1703, after training for the priesthood, Antonio was ordained. He had such bright red hair that he was instantly nicknamed "il prete rosso," or The Red Priest. Once ordained, he was given a teaching position at the Ospedale della Pietà. This Venetian orphanage housed and educated young girls. Music was very highly regarded there, and many leading performers took part in the weekly concerts. Vivaldi stayed there six years and began his composing career. The Sunday concerts, for which Vivaldi composed many orchestral and choral works, became famous. It was believed that no visit to Venice was complete without hearing a performance.

Vivaldi was famous for helping to develop the concerto, which is Italian for concert. He wrote over 500 in his lifetime. A concerto was written for an orchestra with one or more solo instruments. It usually had three movements. His most famous concerto was *The Four Seasons*, published in 1725. It was an important example of program music—music that tells a story or depicts a landscape. *The Four Seasons* expressed seasonal activities. The listener is treated to sounds of ice skating in the winter, hunting in autumn, and the singing of birds in spring.

During the Baroque Era, opera became very fashionable. Opera houses opened all over Europe. Due to this new demand, Vivaldi wrote 45 operas. Vivaldi was also the first composer that consistently used the ritornello form. Eventually it became standard for the fast movements of concertos. The ritornello was a section that recurred, or was played over and over again, by the full orchestra in different keys. It usually alternated with solo parts, called episodes. In Vivaldi's works, episodes were often virtuosic in character, meaning that they were played by a master musician.

After writing music for more than 30 years, Vivaldi died in July of 1741, in Venice, Italy. Some people did not like his personality or style. However, he was highly respected for his compositions. His work strongly influenced other composers such as Johann Sebastian Bach. Vivaldi changed classical music forever.

Antonio Vivaldi



Across

3. Vivaldi composed 45 of these
5. City in which he was born
7. Vivaldi's nickname (two words)
9. The instrument he played
11. The solo part of a concerto
13. Portuguese word meaning "misshapen pearl"
14. Country in which he was born
16. A person who writes music
18. Day of the week on which weekly concerts were held in Venice

Down

1. His father's first profession
2. Italian word for "concert"
4. *The Four* _____
6. Antonio _____
8. He wrote music for more than _____ years.
10. It means "played by a master."
12. Type of music that tells a story
13. Vivaldi strongly influenced this composer.
15. When Vivaldi was born, he was very _____.
17. Vivaldi taught young _____ girls at the Ospedale della Pietà.

Robert Oppenheimer

It was just before dawn on July 16, 1945, in an isolated desert in New Mexico. A voice stated, "Zero minus 25 seconds, zero minus 15 seconds, zero minus 10 seconds ...." The countdown had begun. A bright green flare was shot up in the sky. It warned the spectators not to look up without the special shaded glasses they had been given. The first atomic bomb was about to be tested. Robert Oppenheimer was the scientific director of the team that developed this bomb, which exploded at 5:24 a.m. Rocky Mountain Time. The nuclear age had begun.

Robert Oppenheimer was born in New York City on April 22, 1904. His father, Julius Oppenheimer, came to the United States from Germany in 1888. In 1903, he married Ella Friedman, an artist and teacher. Robert had a happy childhood with loving parents and many advantages. He visited Europe often to see his relatives. On one visit to his German grandfather when Robert was just five years old, he received a mineral collection. This sparked his lifelong interest in science.

Robert was a shy and physically frail boy. He was happy to study or pursue quiet hobbies. At age 12, he presented his first scientific paper to the New York Mineralogical Society. The members were so impressed with his writing that they invited him to present his paper to the members in person. Imagine their surprise to find out that Robert was not even in high school!

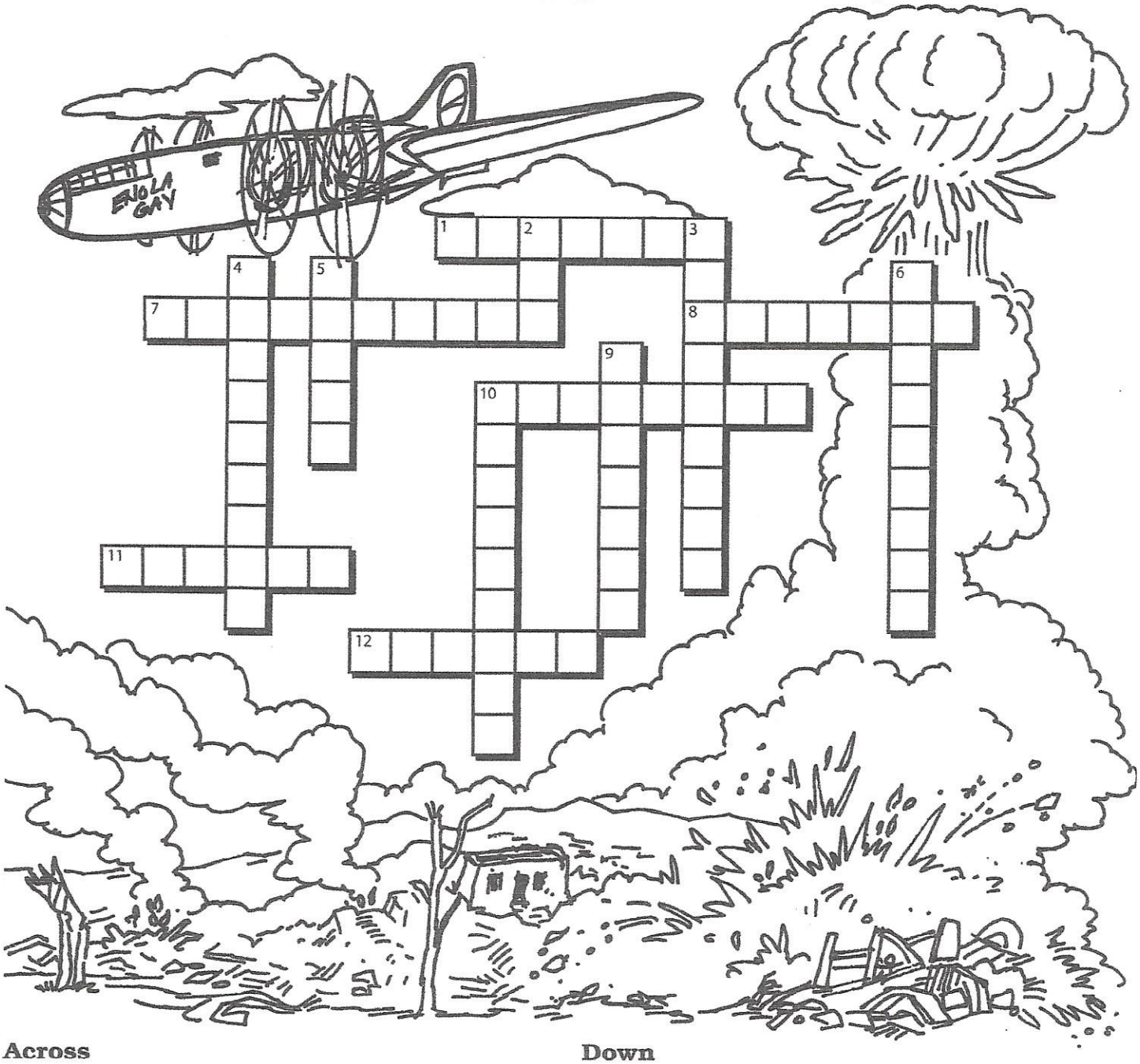
Robert graduated from Harvard University in 1925. He then went to England to do research at Cambridge University's Cavendish Laboratory. Oppenheimer excelled at scientific theory, but not at lab work. He hated the lab. From England he traveled to Germany and attended Göttingen University. There, he met prominent physicists such as Niels Bohr and Max Born. Born saw Oppenheimer as a philosopher who was trying to understand science. Oppenheimer spent the next 13 years studying quantum physics and the properties of atoms.

In 1940, Robert married Katherine Harrison. A year later they had a son named Peter. Around this time, Robert met with Arthur H. Compton to discuss military uses of atomic energy and the development of atomic weapons. Oppenheimer was asked to become the scientific director of atomic research for a project. This project later became known as the Manhattan Project. He enticed the best scientists in the world to the project. Soon there were more than 1,500 scientists in Los Alamos, New Mexico, where the project was coordinated.

The first nuclear bomb went off that July morning in 1945. People in three states saw the flash. It left a crater one-half mile (.8 km) wide and killed all animal life within a one-mile (1.6 km) radius. This sparked the beginning of atomic warfare.

Near the end of World War II, President Harry S. Truman asked the Japanese to surrender. They refused. On August 6, 1945, Truman ordered strong military action. A B-29 bomber called the *Enola Gay* dropped an atomic bomb on Hiroshima, Japan. The damage was incredible—80,000 people died immediately, and 40,000 were declared missing. Japan still did not surrender. Three days later, another bomb was dropped, this time on Nagasaki. More than 100,000 people were killed or injured. Japan formally ended the war on August 14, 1945. Robert was pensive about what the atomic bomb had done. His work had helped win the war, but it had also caused terrible damage and death. Yet, he was a hero in some people's eyes. In 1946, he was awarded the Presidential Medal of Merit for his leadership on the project. He later received the Enrico Fermi Award, which is the highest award given by the Atomic Energy Commission (AEC). Mr. Oppenheimer died in Princeton, New Jersey, on February 18, 1967.

Robert Oppenheimer



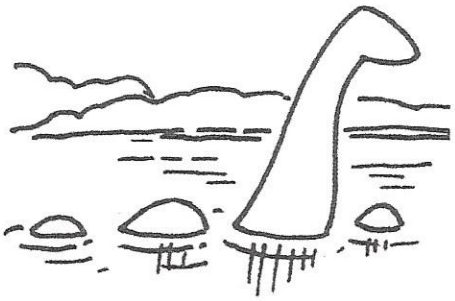
Across

1. Robert Oppenheimer studied _____ physics.
7. He served as _____ director at Los Alamos.
8. The creation of the atom bomb marked the start of the _____ age.
10. Japanese city where the second atomic bomb was dropped
11. U.S. president who ordered the dropping of the atomic bombs
12. Oppenheimer's father's first name

Down

2. Acronym for the Atomic Energy Commission
3. The _____ Project
4. Japanese city where the first atomic bomb was dropped
5. The airplane that carried the first atomic bomb was called the _____ *Gay*.
6. His wife's name
9. Graduated from here in 1925
10. The Manhattan Project was developed in Los Alamos, _____. (two words)

The Loch Ness Monster



People around the world have reported sightings of Bigfoot, UFOs, and other unexplained mysteries. Although many have tried, no one has been able to prove or disprove the truth of these sightings.

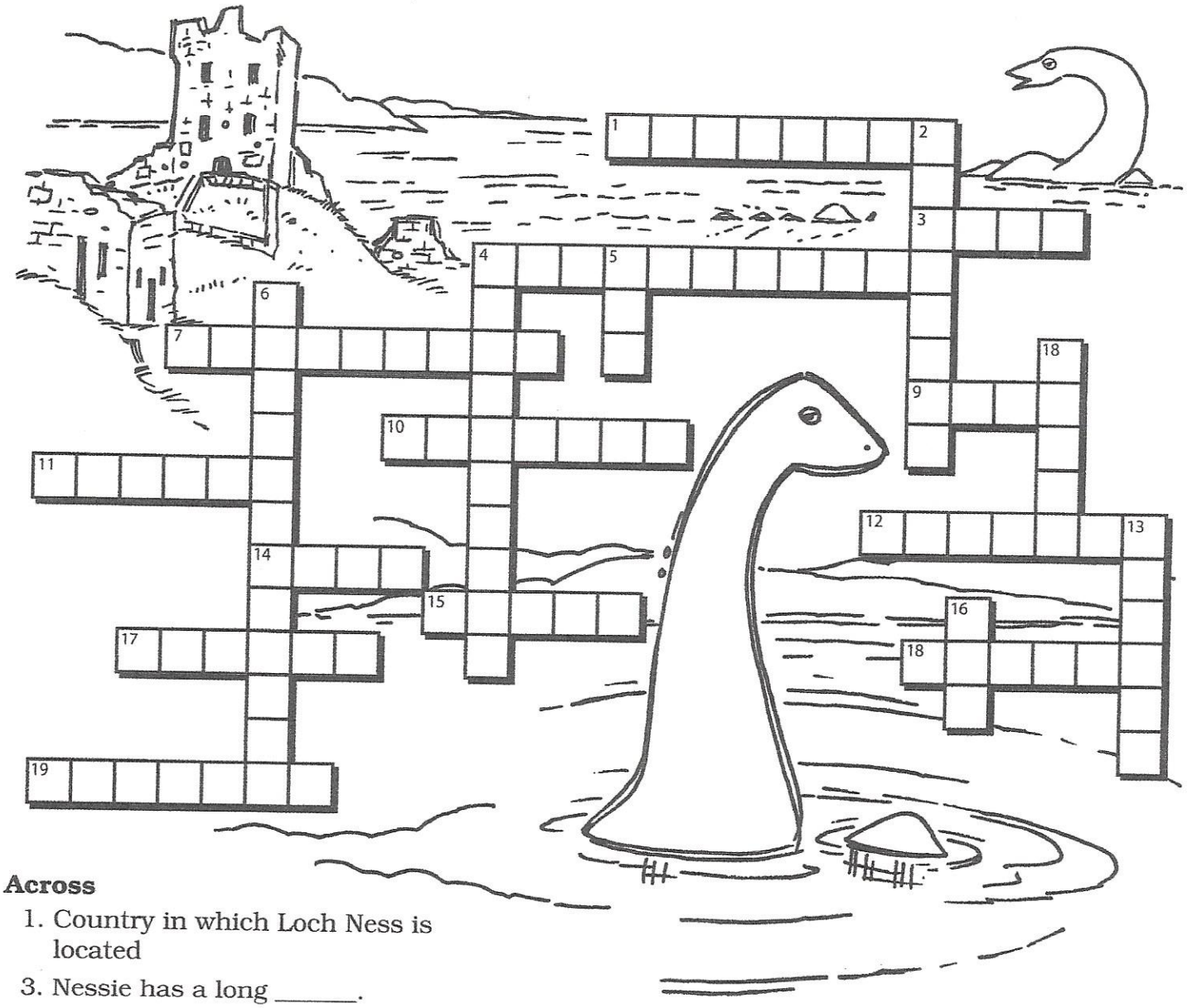
One such phenomenon is a sea serpent that some say resides in Loch Ness near Inverness, Scotland. In 1934, a London surgeon named R. Kenneth Wilson took a famous photograph. The picture showed a long-necked, dinosaur-like animal swimming in the loch (Scottish for "lake"). Although he took four photographs, only two survived. These photos caught the world's attention. Many people came forward claiming to have seen "Nessie," the name given to this monster. But other people were skeptical. In 1999, David Martin and Alastair Boyd published a book in which they denounced R.K. Wilson's photo as a hoax. They said the picture was created from a model. This cast doubt on Nessie's existence, but did not discourage true believers.

There have been many attempts to explain what kind of creature Nessie might be, and how she came to be in the loch. Commander Rupert T. Gould came up with the theory that this was a dinosaur, a plesiosaur, that had been stranded or trapped in the loch. In 1960, engineer Tim Dinsdale took what might have been the first unquestionably honest photo of the Loch Ness Monster. He filmed a sequence of an object swimming away from the camera. A military air unit analyzed the photo and authenticated the film. Dinsdale formed the Loch Ness Investigation Bureau (LNIB) in 1962. He also believed in the plesiosaur solution. Dr. Maurice Burton was also willing to consider the idea that Nessie might be a plesiosaur or a giant eel. At first, he really thought that the "misidentifications" were due to gas-bubbles, wind-formed waves, or floating vegetation. But after viewing many reports, he claimed there might be "a long-necked, otter-like animal." In 1972, Robert Rines from the Academy of Applied Sciences in Chicago photographed a flipper. In 1975, he took a photo of what appeared to be a head. Each of these sightings and investigations helped add to the controversy of Nessie's presence. A Visitor Center and Monster Exhibition was set up on the north shore of Loch Ness. It is filled with stories of sightings, photographs, research, and people's tales of the serpent.

What makes Nessie so difficult to prove or disprove? The first reason is due to the loch itself. It is two miles long and has some extremely deep chasms. Some believe that the monster disappears in these deep waters, which explains why there are months, even years, between sightings. Second, the water is very murky, or cloudy, and filled with moving sediment. Visibility is drastically reduced just inches under the surface—it's even difficult to see your own hand in front of your face. One group of scientists decided to settle the controversy, once and for all. They used sonar equipment set at regular intervals across the loch, and slowly scanned the entire lake. But this, too, was inconclusive. The sonar did pick up a large moving object, which pleased supporters, but the scientists disagreed that it was the sea creature.

In July, 1977, a photo was taken of a similar creature in Lake Champlain on the border of Vermont and New York. Sandra Mansi took the photograph of "Champ." There have also been sightings in Canada and Scandinavia of sea serpents. Could they be real? What do you think?

The Loch Ness Monster



Across

1. Country in which Loch Ness is located
3. Nessie has a long _____.
4. R. Kenneth Wilson took famous _____ of Nessie.
7. Martin and Boyd _____ Wilson's photos.
9. A word that means "lake" in Scottish
10. Robert Rines was from this city.
11. He said that Nessie might be a gas bubble.
12. Rines photographed a _____.
14. Acronym for the Loch Ness Investigation Bureau
15. A word that means "cloudy"
17. Took a famous photo of Nessie in 1934
18. The monster's nickname
19. Some people believe that a plesiosaur was _____ in the loch.

Down

2. Engineer who filmed a sequence of pictures of Nessie swimming
4. A type of dinosaur that Nessie resembles
5. Loch Ness is _____ miles long.
6. Investigations of the Loch Ness Monster have been _____, or not ending doubt.
8. A creature that has been sighted in Lake Champlain
13. Commander _____ Gould first decided Nessie was a sea serpent.
16. Some people think that Nessie is a giant _____.

The Great Depression

You may have great-grandparents or grandparents who tell stories about the Great Depression. Although this event happened more than 80 years ago, it left a mark on the people who lived through it. It caused the government to greatly expand its role in social and economic areas. How did it begin? Some blame the stock market crash. Others refer to the slowing economy, and still others say the drought in the West caused it. All three events played a role in causing the Great Depression.

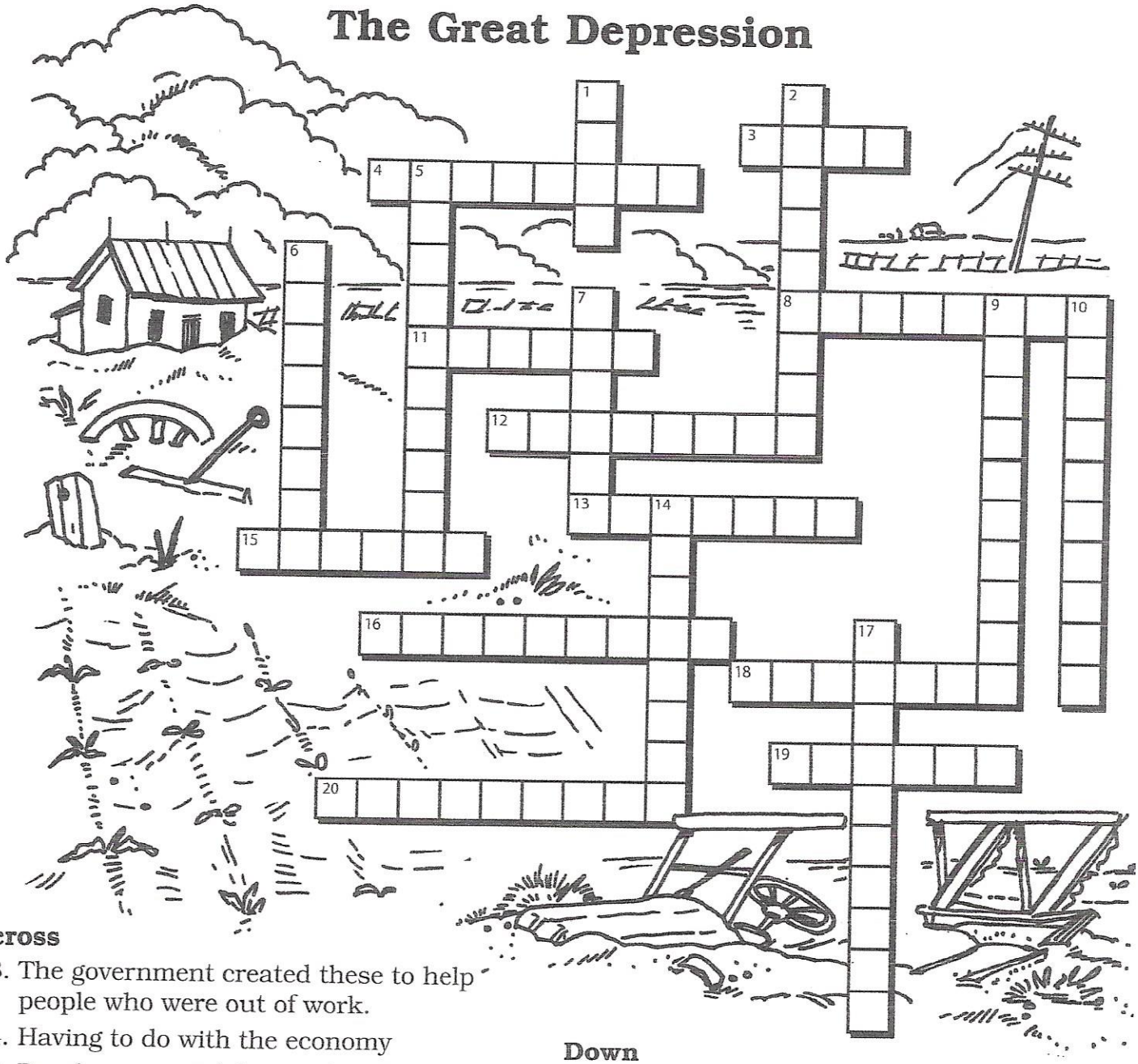
During the 1920s, many people in America prospered. The Industrial Age was in full swing with new factories for new inventions, such as cars, airplanes, and motorized machines. Another new phenomenon, called credit, became popular, and the "buy now, pay later" slogan was used in advertisements across the nation. The stock market was no exception. Investors bought millions of shares "on margin." This risky practice allowed them to pay a small part of the stock price and borrow the rest. They were gambling that they could sell the stock at a price high enough to repay the loan and make a profit. But in the fall of 1929, confidence in the market fell and so did the stock prices. On October 29, the stocks lost $10 to $15 billion in value. This day became know as "Black Tuesday." Thousands of people lost everything when the market collapsed.

The nation's economy had already been showing signs of faltering. With credit, millions of Americans had begun spending more money than they earned, believing that future good times could help pay their debts. The industrial boom also began to slow. Soon, the supply of goods exceeded the demand, and prices for goods plummeted. The economy spiraled downward over the next three to four years. As supplies increased, factories slowed production, laying off employees. Fewer workers bought fewer goods, and soon businesses and individuals could not pay back loans they had taken with the banks. By 1933, the banks virtually collapsed, causing millions of Americans to lose their savings.

Other forces affected the economy as well. Beginning in Arkansas in 1930, a severe drought spread across the Great Plains. The topsoil turned to dust, which was carried away by winds that sometimes reached 90 miles per hour. The area became known as the Dust Bowl. The drought destroyed most small farms. The storms choked people and suffocated animals. Entire farms were buried in the awful dust. Most farmers packed up their meager belongings and headed to California to look for work.

The results of the Great Depression were deep reaching. People became frugal. When the Depression was over, they collected possessions for fear of future lean times. Unemployment rose to almost 25 percent at one point and took a big toll on working men. They felt shame that they could no longer provide for their families. Many men had to beg for work or money. A popular song of the time was "Brother, Can You Spare a Dime?" People lacked adequate food, shelter, and clothing. Government programs were put into place and federal laws were created to protect and help banks, businesses, farmers, and the needy. The government helped create jobs by hiring workers to construct public buildings, hospitals, bridges, dams, power plants, and roads. Organized labor unions voiced their opinions about protecting the average worker from the wealthy business owners. The Great Depression finally ended with the arrival of World War II, when many workers were employed to support the war effort.

The Great Depression



Across

3. The government created these to help people who were out of work.
4. Having to do with the economy
8. People prospered during this decade.
11. People became _____, or careful about spending
12. The drought began in this state.
13. The stock market crashed on Black _____.
15. "Buy now, pay later" was a _____.
16. Cars and airplanes were made in these.
18. _____ laws were made to protect and help businesses and farmers.
19. To buy stocks on credit was to buy "on _____."
20. When stock prices suddenly fell, the stock market _____.

Down

1. "Brother, Can You Spare a _____?"
2. The government hired people to build _____.
5. Farmers moved to this state.
6. The drought-stricken Great Plains became known as the _____. (two words)w
7. Stocks are sold on the stock _____.
9. In the 1920s, the _____ Age was in full swing.
10. What the dust did to farm animals
14. The supply of goods _____ the demand.
17. Economic conditions of the 1920s and 1930s created the Great _____.

Child Labor

Imagine that instead of jumping on the bus to go to school, you spent your day working at a large factory machine. Your boss expected you to work for 16 hours with few breaks to go to the bathroom, let alone to eat. If you were a child living during the Industrial Revolution, you may have been forced to do this kind of work. Throughout the ages and in all cultures, children have worked, but generally to help out with the family business or on the family farm. This all changed and became a social problem with the introduction of the factory system.

What is child labor and how did it begin? Child labor is the employment of children as wage earners. Maybe you have been paid for working. Have you mowed lawns, shoveled sidewalks, babysat, or delivered newspapers for pay? You may be wondering how that is different from child labor. In Britain in the 1700s, the owners of cotton mills and other factories sought orphans and children of poor parents throughout the country. The children in these textile mills did the work of adults for much less than adults' wages. In some cases, children only five or six years old were forced to work from 13 to 16 hours a day. Employers liked that the children were smaller. They were able to fit in and around big machines. Children did not complain about the unhealthy conditions like adults did. Many children chose to work to support their unemployed parents. These practices occurred in the United States as well. Since the children were so busy working, they could not attend school. And because they were uneducated, they were only able to do this unskilled labor. They had very little chance to better themselves. Social reformers decided to fight for change for these children.

As early as 1802, the British Parliament passed the first law regulating child labor. The law prohibited the employment of pauper, or very poor, children under nine years of age. It also limited the work day of older children to 12 hours and said that children younger than 14 could not work at night. These restrictions were good, but there was no way to enforce the laws. Employers continued to keep their old ways.

As the mining and textile industries grew, so did the need for child workers. In 1832, about 40 percent of all factory workers in New England were between the ages of seven and 16. The most effective attack on the evils of child labor may have come from Charles Dickens's novel *Oliver Twist*. This book was widely read in both England and America, and it motivated social reformers to work harder to make and enforce new laws.

In 1938, the Fair Labor Standard Act helped promote child labor reform. The law included basic standards for the employment of minors, or children under 18. It limited the amount of hours a child could work per week, and stated that the work had to be voluntary and could only be done outside school hours. It also declared that children could not be employed in any industry considered hazardous. Every state now has child labor laws that are enforced. However, there are a few exceptions, such as children of migratory workers who move from harvest to harvest. Other exceptions are children employed as actors, performers in radio, television, and movies, and part-time workers in the home.

Child labor continues to be a serious problem in many parts of the world. Many of these children live in underdeveloped countries where living conditions are poor and their chances of education are small. The small wages they bring in, however, are necessary for the survival of their families. Let us hope that one day, these children too can benefit from laws to protect them.

Child Labor

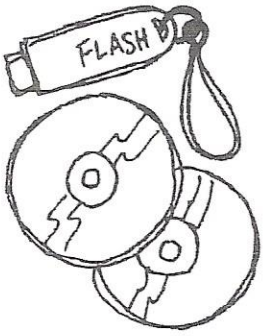
Across

3. Children cannot perform _____ jobs.
6. Social _____ fought for change.
8. *Oliver Twist* was written by Charles _____.
9. People hiring other people for work
12. Child labor became a problem in the eighteenth _____.
14. A famous book that discusses child labor is _____ *Twist.*
16. Owners of factories sought _____ and children of poor parents.
17. Uneducated people could only perform _____ labor.
18. Work
19. The British could not _____ early child labor laws.

Down

1. The British _____ passed the first child labor laws.
2. A fee paid for work
4. Children worked up to _____ hours a day.
5. In 1832, _____ percent of factory workers in New England were children.
7. _____ workers move from harvest to harvest.
10. A poor person
11. To forbid something
13. A _____ child is under legal age.
15. One industry that used many child workers

The History of Computers



What kind of computer do you use? Do you have a desktop computer or a laptop? Did you know that we can find many types of computers all around us? They are in our cars, telephones, medical machines, and calculators. Even some of the music that you listen to is made with the help of computers.

A computer is a programmable electronic device. It can store, retrieve, and process data, or information. Believe it or not, the idea of a computer began about 400 years ago. In 1642, Blaise Pascal, a French mathematician, scientist, and philosopher, invented the first automatic calculator. His invention could add and subtract by means of a set of wheels connected to each other by gears. The first wheel represented the ones place value. The second represented the tens. The third represented the hundreds, and so on. When the first wheel turned 10 notches, a gear moved the second wheel forward one notch. In the early 1670s, Gottfried Wilhelm von Leibniz, a German scientist, made improvements to Pascal's computer. His changes allowed it to multiply and divide. He also developed the binary, or two-number, system. This system uses only zeros and ones to represent all numbers and letters.

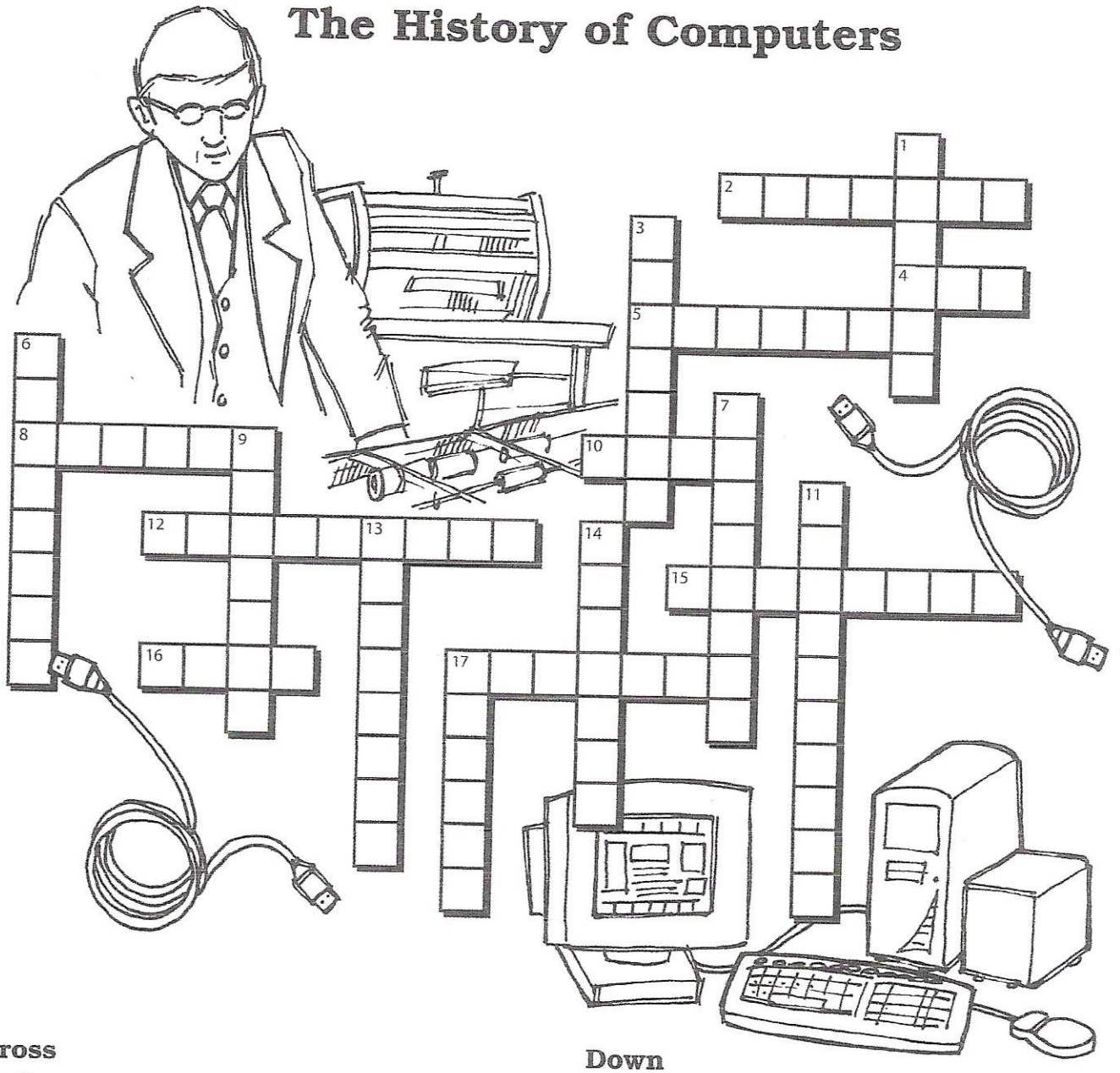
A French textile weaver named Joseph Marie Jacquard made the next advance in computer technology 130 years later. In 1801, he invented the Jacquard loom. In the weaving process, needles directed thread to produce patterns. Jacquard's loom used cards punched with patterns of holes. The cards were placed between the rising needles and thread. The presence or absence of holes told the machine where to place specific threads. The punched cards made it possible to "program" a loom to create complex woven patterns.

In the 1830s, English mathematician Charles Babbage developed the idea of a mechanical computer. He called his invention an analytical engine. It took more than 40 years to put his ideas together. The engine contained all the elements of a computer. It had storage, a working memory, a system for moving between the two, and an input device. He never made his engine because he could not make the precision parts he needed. Also, he did not understand how to use electricity to make his device run.

In 1888, an American inventor and businessman named Herman Hollerith made the first true computer. He combined the use of punched cards with devices that created and read the cards. He developed it to compute the results of the 1890 United States census. It counted the results three to four times faster than the time needed for hand counts. The machine was so successful that in 1896, he founded the Tabulating Machine Company. In 1911, he sold his company, and the name was changed to Computing Tabulating Recording Company. In 1924, this company changed its name to the International Business Machines Corporation, or IBM.

Over the next 35 years, many people added to and changed the computer. In the late 1960s, integrated circuits (tiny transistors and other electrical parts arranged on a chip of silicon) led to rapid progress in the creation of today's computers. The circuits replaced single transistors and made it possible for a computer to contain thousands of transistors. Smaller and cheaper computers were built. Today, computers are able to run programs and manage data in ways that were unimaginable 50 years ago. So when you use a computer, think about all the ways it impacts your life.

The History of Computers



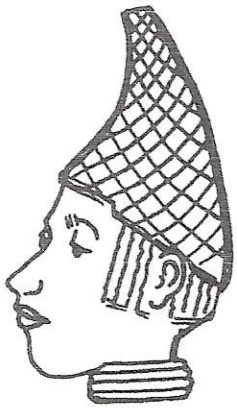
Across

2. Over time, computers became _____ in size.
4. Acronym for International Business Machines Corporation
5. The second wheel of Pascal's machine moved when the first wheel turned 10 _____.
8. Hollerith made a computer to compute the results of the U.S. _____.
10. One of the numbers in the binary system
12. American computer inventor Herman _____.
15. Pascal's invention could add and _____.
16. Jacquard invented a special _____.
17. He invented the analytical engine.

Down

1. _____ Pascal invented a calculator.
3. Jacquard's loom used _____ cards.
6. French textile weaver
7. A programmable electronic device
9. Tiny transistors are arranged on this chip.
11. Transistors arranged on a silicon chip make up an _____ circuit.
13. Computers can _____ stored information.
14. German scientist who made improvements to Pascal's calculator
17. A number system using two numbers

Sculpture



When someone mentions the word sculpture, what do you think of? Do you see a statue, a wooden carving, yard art, or the bust of someone famous? Believe it or not, all of these can be considered sculpture. Sculpture comes from the Latin word "sculpere," which means "to carve." Some of the first pieces of sculpture were carved pieces of stone or wood. Today, sculpture involves much more. Sculpture can be made from almost any substance. Some popular choices are stone, metal, clay, and wood. Traditional methods of creating sculpture are carving, modeling, and casting. In the twentieth century, welding, assemblage, and combining materials also became popular forms of sculpture.

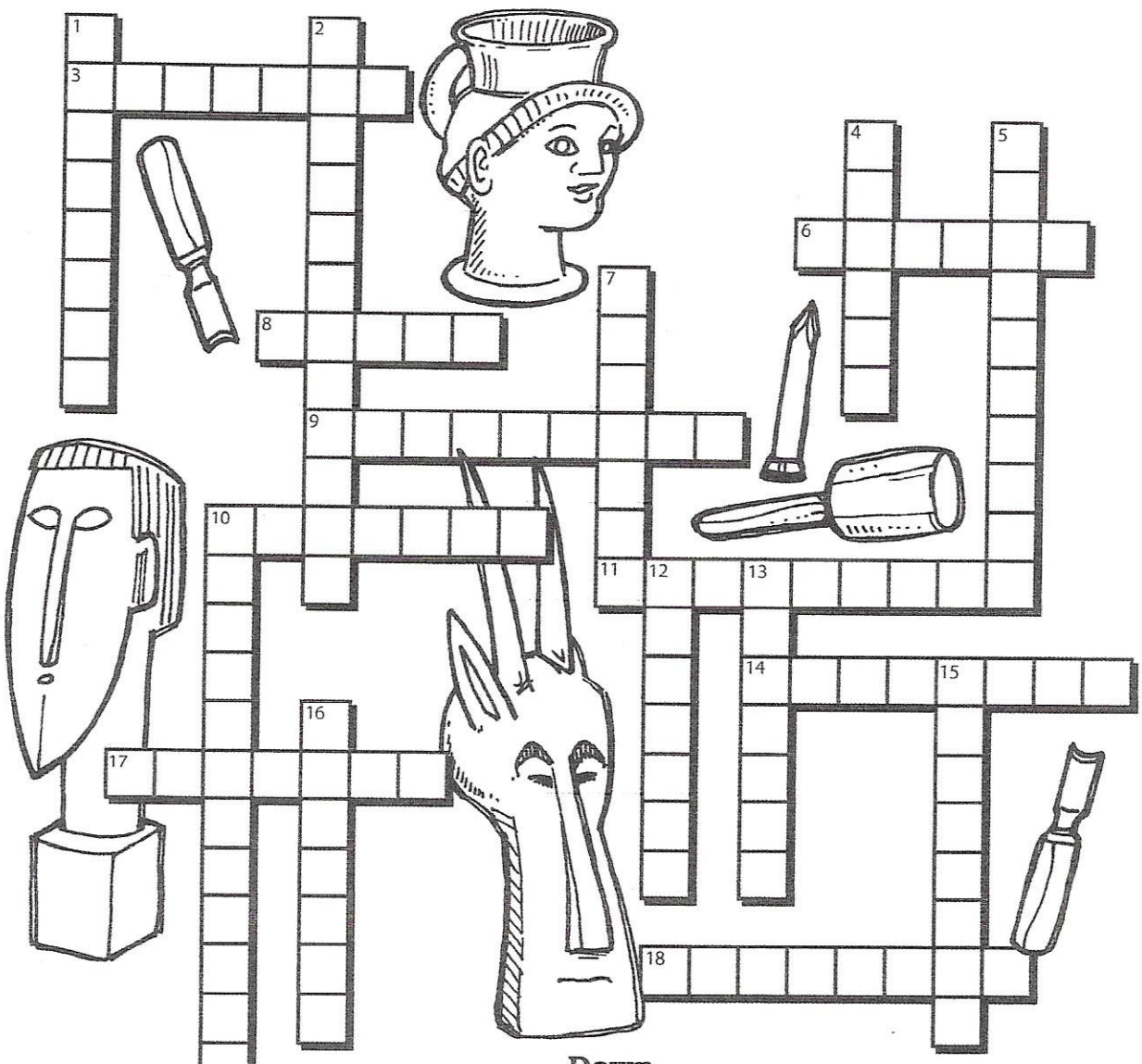
Carving is a procedure that dates back to prehistoric times. It is a time-consuming and painstaking process. The artist subtracts, or cuts away, some of the material he or she is using until the desired form is achieved. The material is usually hard and is often heavy and large. Michelangelo made many famous sculptures in stone and marble. Sculpture adds design to buildings and churches to make them unique and attractive. In the past, these sculptures sometimes served a function. Many European cathedrals are adorned with gargoyles that were thought to protect the inhabitants from evil. Since carving took a long time to do, it was often used as a pastime for people. Sailors carved designs into wood or whale teeth to fill the many hours spent at sea.

Modeling consists of adding to, or building up, a form. The forms are often organic shapes, similar to things found in nature. The materials, such as clay, are usually soft and yielding and can be easily manipulated. Once formed, the sculpture is often baked to achieve durability. Sculptures made by modeling have been around since ancient times. Amazing art exists in the form of beautiful bowls, vases, and statues. Since clay has always been widely available, every civilization and country has works of art using this modeling technique.

Casting reproduces a model in a more durable form, as metal is often used in the process. The two methods of casting are the "cire perdue," or lost-wax process, and sand-casting. The lost-wax process is the most widely used and involves two stages. First, an impression, or negative mold, is formed around the original. Then a positive cast, or reproduction, is made by filling the mold. This technique made it possible for an artist to make multiple copies of his work. Once the mold was made, the same sculpture could be made over and over again until the mold broke and a new one had to be made. The Liberty Bell is an example of a sculpture made using this casting process.

Although traditional techniques are still employed, many sculptures today are created by using construction and assemblage techniques. These methods have their origin in collage, a painting technique devised by Pablo Picasso, in which various materials are pasted to a picture surface. He also made three-dimensional objects, such as musical instruments, which were termed "constructions." One can find pieces of cars, machines, and even junkyard scraps welded together to create a sculpture. Some artists arrange unusual pieces together on a platform, board, or wall to portray their artistic message. Look around you, especially at older buildings, churches, and in museums. What forms of sculpture can you spot? Can you identify whether they were carved, molded, cast, or assembled?

Sculpture



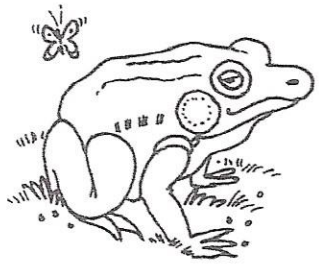
Across

3. Found in nature
6. One who creates art
8. Clay is _____ for durability.
9. Stone carvings sometimes found on cathedrals
10. Picasso began this art form.
11. Art form that can be created by carving, modeling, or casting
14. Latin word that means "to carve"
17. Cutting away material until desired form is achieved
18. In casting, an impression is a _____ mold.

Down

1. A type of sculpting using soft materials
2. A famous carver
4. Michelangelo used this material for some of his sculptures.
5. Type of sculpture in which things are assembled
7. _____ carved designs in whale teeth.
10. Form of sculpture in which things are built or put together
12. Form of sculpture in which molds are created
13. Most common method of casting (two words)
15. In casting, a reproduction is _____ cast.
16. The _____ Bell was made using the casting process.

Conservation: Problems and Solutions



What is conservation? It is the use of natural resources in a way that does not use them up. Plants, animals, mineral ores, water, air, coal, petroleum, and natural gas are all examples of natural resources. These resources are split into two groups, renewable and nonrenewable. A renewable resource is one that may be replaced over time by natural processes. Wind and solar energy are renewable resources. Nonrenewable resources are those that cannot be replaced or can only be replaced over very long periods of time. Nonrenewable resources include fossil fuels and mineral ores, such as gold. It is our duty to preserve natural resources so they will be available for generations to come.

One problem our Earth faces is the extinction of plant and animal species. As more and more people populate the world, they need space to live and work. Human population growth puts the natural habitats of many plants and animals at risk. As the amount of rain forest dwindles, the habitat of many exotic plants and animals is also disappearing. As a result, some of the plants and animals are becoming extinct. Poachers also pose a threat to wildlife. In some cultures, there is a demand for animal parts and skins. Poachers capture and kill animals to fulfill these demands.

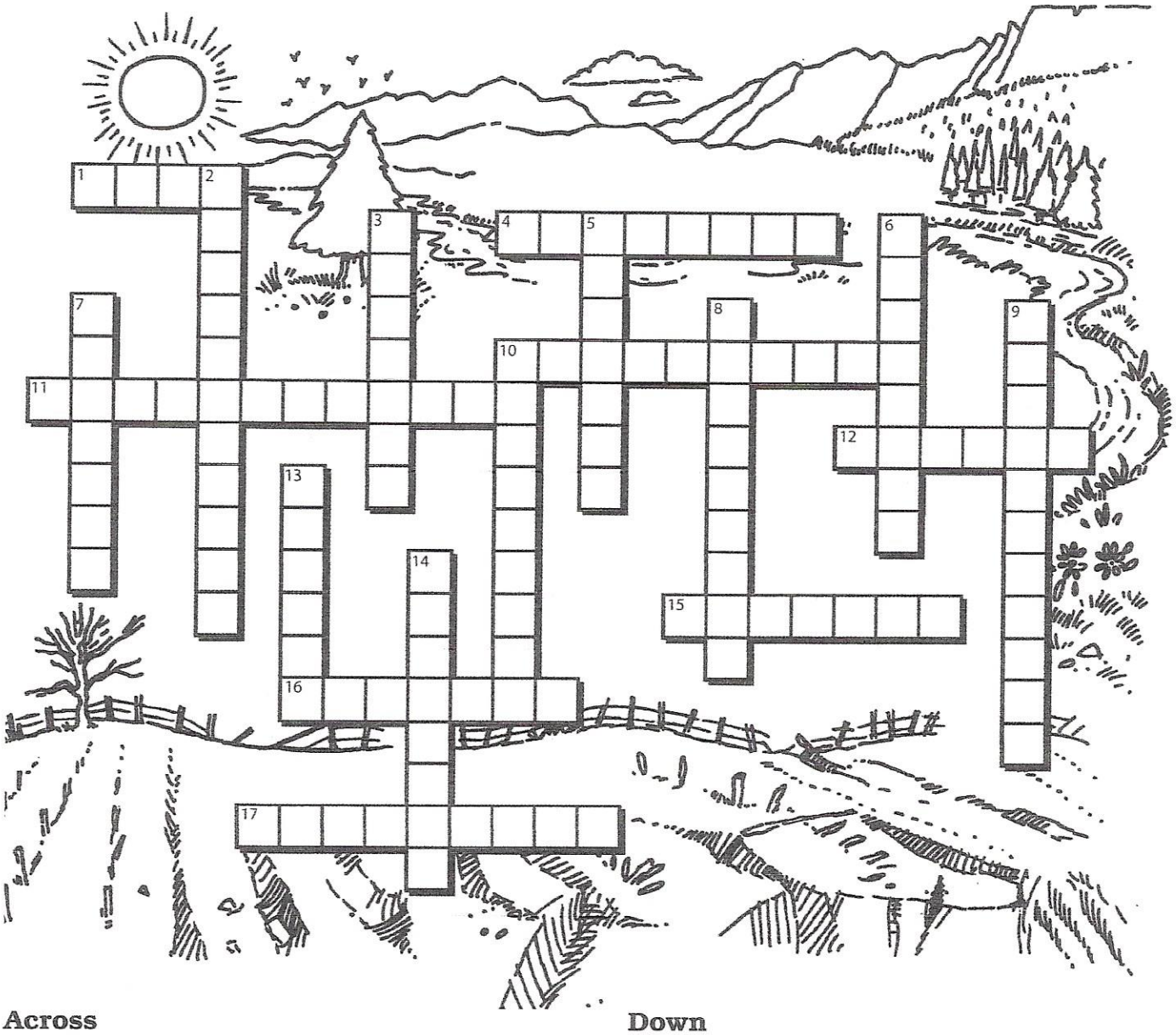
There are some solutions to solve this rapid loss of these natural resources. The incentives to preserve plants and animals need to be stronger than those to destroy them. Governments need to set up no-tolerance penalties for those who break the law. Also, we need to educate people about the benefits of preserving these species and habitats.

Pollution is another problem we face. It is not a new problem; Ancient civilizations tried to develop ways to get rid of animal and human refuse, often causing more pollution in their efforts to clean up. Water was used for drinking, bathing, and washing clothes. As more people used the water for these purposes, the water became contaminated. Cars contribute to our pollution problems today, but they were originally thought to help stop pollution from horse manure! As with conservation, one way to help stop pollution is to set up and enforce penalties for those who break the law. We can also teach people about recycling and the value of clean air, land, and water. Businesses need to be encouraged to utilize our natural resources in a cleaner and more efficient way.

Erosion is another threat to our planet. Erosion is a natural process that may take place over thousands of years. We can see its amazing effects in Grand Canyon and on sandy coastal beaches. However, some erosion is caused by humans and is drastically affecting our environment. Humans accelerate the erosion process by developing land and clearing away vegetation that holds water and soil in place. The ground then becomes fragile and is quickly washed away when exposed to heavy rains or wind. There are a few methods that effectively prevent erosion. Farmers should alternate strips of crop and uncultivated land to minimize erosion and water runoff. Crops should be planted along the contours of sloping lands to minimize runoff. Planting legumes, such as clover or soybeans, can help restore essential nitrogen in the soil. Minimizing plowing, or tillage, can also help reduce erosion.

There are many things we can do to preserve our planet. What can you do to help?

Conservation: Problems and Solutions



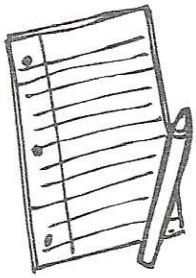
Across

1. People thought these would help end pollution of the streets.
4. There is a need to _____ species.
10. A natural habitat that is dwindling (two words)
11. Describes a resource that cannot be replaced
12. _____ are accelerating the erosion process.
15. A person who kills animals illegally
16. Soybeans and clover
17. Coal, _____, and natural gas are examples of natural resources.

Down

2. A renewable resource from the sun (two words)
3. Another word for plowing
5. Many species are becoming _____.
6. Crops should be planted along the _____ of sloping lands.
7. The wearing away of
8. Contaminates water, land, and air
9. An example of an area created by natural erosion (two words)
10. Describes a resource that may be replaced
13. _____ fuels are nonrenewable.
14. We need a _____ to the pollution problem.

Writing Realistic Stories



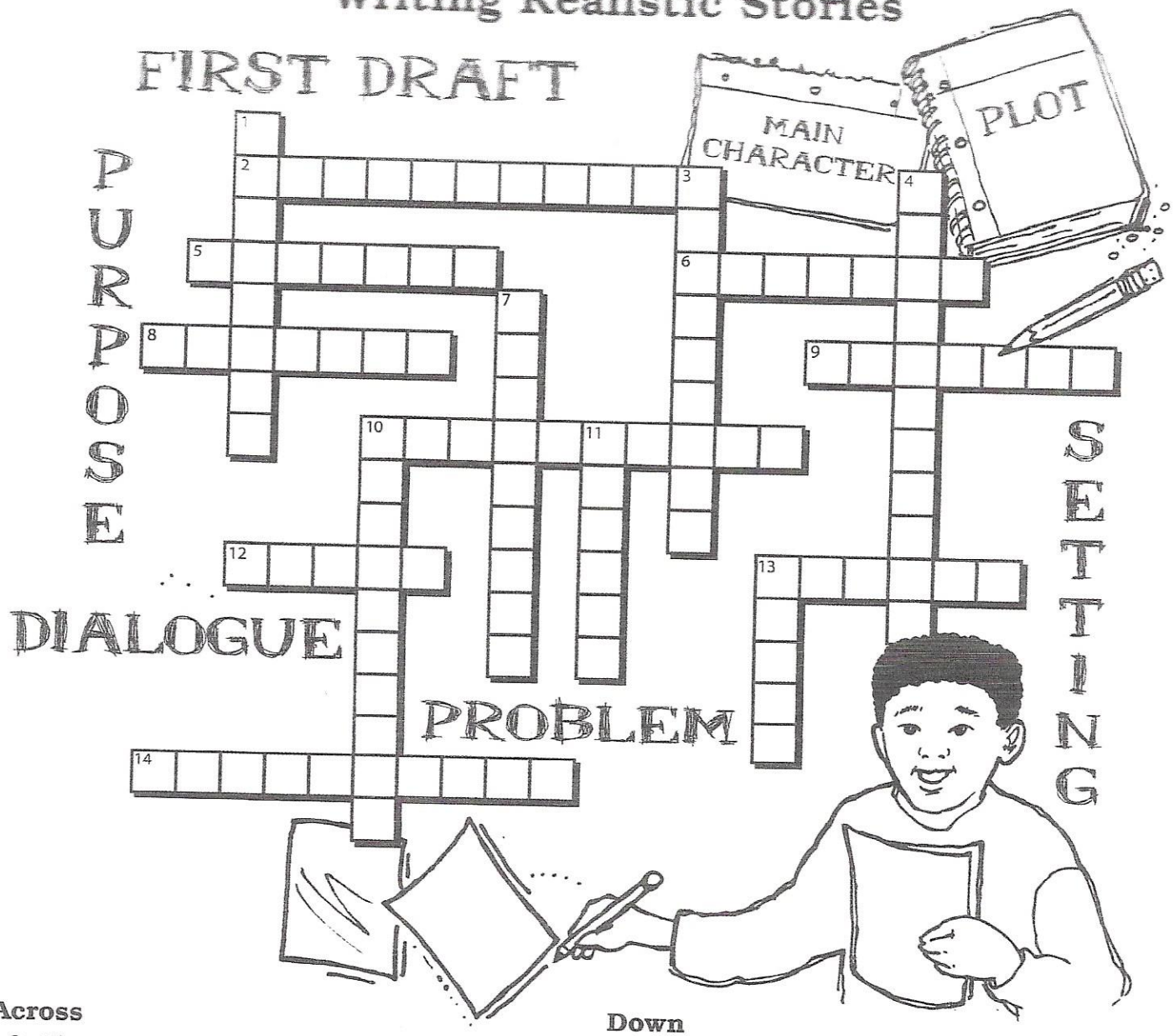
Your friends are arguing again. You wish they would stop. If they don't, they are going to ask you to side with one of them and you just can't do that. You sigh and think that their relationship would make a great story, but you would certainly come up with a different ending—one that actually solves the problem! This would be an example of a realistic story. A realistic story has genuine main characters that need to solve believable problems.

To begin your story, pick one or more characters that you will base your story upon. Then find a real problem. It could be a problem between the characters or one that the characters could solve together. One way to keep track of your ideas for the story is to create a "collection sheet." Write down the following categories: characters, setting, problem, story scenes, and purpose. The setting would be when and where you want the story to take place. The problem would be a list of possible situations that your characters need to solve, fix, or overcome. List some ways your characters might solve the problems for the story scenes, and then figure out the purpose of your story. Is it to entertain or to be informative?

Now you are ready to begin writing the first draft of your story. Many writers suggest that your story begin right in the middle of the action, but you can begin any way that you like. You may choose to begin with dialogue. "I asked you to keep your nose out of my business!" said Jeffrey. This introduction would bring your reader right into your story, making them want to know just what business the other character might be getting into. Or choose to start with a question: What do you do when your best friend is getting involved with bad kids? This will make the reader wonder about what your main character did to solve this problem. A description can be a good way to get started. Use very descriptive language, such as "I sat in the cold, dark room, waiting for him to come and tell me what happened." This kind of beginning lets your reader know where the story is taking place, and gives him or her a glimpse of what the problem may be. Sometimes it is good to start with some background information, such as "Amanda and I have been best friends since first grade, and we have never had a fight like this before." This fills your reader in on what has been happening with your main characters to help set up the current situation. And finally, a great beginning might have the main character introduce him or herself. "My name is Lynn; who ever heard of a boy named Lynn? To make matters worse, I am the tallest kid in sixth grade by about six inches ... my life is just about as horrible as it could be." Now your reader understands a little about the main character and is beginning to empathize with him or her right away.

Keep your story going, and your readers curious by including the who, what, where, when, why, and how so that your story is complete. Leaving any of these parts out may leave your reader wondering just what really happened and how the problem got solved. Most characters change in some way because of their problem, so keep that in mind as you are writing. Try to be as descriptive as possible to make the story more interesting. Are there any sights, sounds, smells, and feelings that you can add? Have you described the setting and characters the best you can? Dialogue helps to add action and excitement to the story as well. Wrap up your details and end your story. Remember that the story does not have to end on a happy note. Some problems just can't be solved easily or completely overcome. But the end should provide a logical conclusion to the story.

Writing Realistic Stories



Across

2. The purpose of a story is to entertain or be _____.
5. A descriptive beginning gives your reader a _____ of what the problem might be.
6. Is the _____ of your story to be informative or entertaining?
8. You might write a story about your friends _____, or disagreeing.
9. Keep readers _____ about your story.
10. Organize your ideas with a _____ sheet.
12. The setting tells _____ the action is.
13. Some problems can't be _____ easily.
14. You can start with _____ information about your main characters.

Down

1. Characters talking in a story
3. Readers can understand, or _____ with the main character.
4. Use _____ language to let readers know where the story takes place.
7. To seem true to life
10. The people in a story
11. Most characters _____ in some way because of their problems.
13. A realistic _____ has genuine characters with believable problems.

Summer Packet

Mathematics

Mr. Pawlowski

Resource Teacher

NAME _____

Check What You Know

Multiplying and Dividing Whole Numbers

Multiply.

	a	b	c	d
1.	49×35	380×22	816×32	276×80
2.	2714×52	5216×16	177×402	818×321
3.	445×176	3420×634	5867×382	6334×257

Divide.

	a	b	c	d
4.	$3\overline{)762}$	$7\overline{)423}$	$72\overline{)216}$	$33\overline{)594}$
5.	$24\overline{)671}$	$63\overline{)887}$	$45\overline{)6075}$	$89\overline{)3299}$
6.	$92\overline{)8147}$	$14\overline{)3315}$	$76\overline{)2647}$	$17\overline{)8451}$

NAME _____

Check What You Know

SHOW YOUR WORK

Multiplying and Dividing Whole Numbers

Solve each problem.

7. A video game company can fit 535 boxes of games into a truck. If the company has 47 full trucks, how many games does it have total?

   The company has _____ games total.

8. Sally bought 1,425 crayons that came in packs of 15. How many packs of crayons did Sally buy?

   Sally bought _____ packs.

9. Each day, 1,035 new apps are uploaded to a web server. After 28 days, how many apps would have been uploaded?

   _____ apps would have been uploaded.

10. An art museum has 1,042 pictures to split equally into 45 different exhibits. How many more pictures does the museum need to make sure each exhibit has the same amount?

    The museum needs _____ more pictures.

11. Robin is making bead necklaces. She wants to use 717 beads to make 57 necklaces. If she wants each necklace to have the same number of beads, how many beads will she have left over?

    She will have _____ beads left over.

12. Each day, the gum ball machine in the mall sells 919 gum balls. How many gum balls would it have sold after 160 days?

    It would have sold _____ gumballs.

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

NAME _____

Lesson 1.1 Multiplying 2 and 3 Digits by 2 Digits

Multiply right to left.

$$\begin{array}{r} {\scriptstyle 2} \\ 24 \\ \times\ 7 \\ \hline 168 \end{array}$$

If $24 \times 3 = 72$, then $24 \times 30 = 720$.

$$\begin{array}{r} 24 \\ \times\ 37 \\ \hline 168 \\ +720 \\ \hline 888 \end{array} \qquad \begin{array}{r} {\scriptstyle 1} \\ 24 \\ \times\ 30 \\ \hline 720 \end{array}$$

Multiply right to left.

$$\begin{array}{r} 427 \\ \times\ 1 \\ \hline 427 \end{array} \qquad \begin{array}{r} 427 \\ \times\ 61 \\ \hline 427 \\ +25620 \\ \hline 26{,}047 \end{array} \qquad \begin{array}{r} {\scriptstyle 1\ 4} \\ 427 \\ \times\ 60 \\ \hline 25620 \end{array}$$

Multiply.

	a	b	c	d	e	f
1.	$\begin{array}{r} 43 \\ \times\ 42 \end{array}$	$\begin{array}{r} 75 \\ \times\ 12 \end{array}$	$\begin{array}{r} 52 \\ \times\ 28 \end{array}$	$\begin{array}{r} 36 \\ \times\ 91 \end{array}$	$\begin{array}{r} 16 \\ \times\ 77 \end{array}$	$\begin{array}{r} 21 \\ \times\ 13 \end{array}$
2.	$\begin{array}{r} 24 \\ \times\ 87 \end{array}$	$\begin{array}{r} 62 \\ \times\ 54 \end{array}$	$\begin{array}{r} 96 \\ \times\ 32 \end{array}$	$\begin{array}{r} 18 \\ \times\ 47 \end{array}$	$\begin{array}{r} 33 \\ \times\ 79 \end{array}$	$\begin{array}{r} 45 \\ \times\ 63 \end{array}$
3.	$\begin{array}{r} 26 \\ \times\ 53 \end{array}$	$\begin{array}{r} 39 \\ \times\ 74 \end{array}$	$\begin{array}{r} 44 \\ \times\ 81 \end{array}$	$\begin{array}{r} 473 \\ \times\ 64 \end{array}$	$\begin{array}{r} 856 \\ \times\ 22 \end{array}$	$\begin{array}{r} 375 \\ \times\ 49 \end{array}$
4.	$\begin{array}{r} 838 \\ \times\ 58 \end{array}$	$\begin{array}{r} 266 \\ \times\ 93 \end{array}$	$\begin{array}{r} 372 \\ \times\ 46 \end{array}$	$\begin{array}{r} 659 \\ \times\ 78 \end{array}$	$\begin{array}{r} 428 \\ \times\ 37 \end{array}$	$\begin{array}{r} 235 \\ \times\ 86 \end{array}$
5.	$\begin{array}{r} 907 \\ \times\ 33 \end{array}$	$\begin{array}{r} 415 \\ \times\ 27 \end{array}$	$\begin{array}{r} 364 \\ \times\ 82 \end{array}$	$\begin{array}{r} 547 \\ \times\ 54 \end{array}$	$\begin{array}{r} 739 \\ \times\ 62 \end{array}$	$\begin{array}{r} 697 \\ \times\ 76 \end{array}$

NAME _____

Lesson 1.2 Multiplying 4 Digits by 1 and 2 Digits

Multiply from right to left.

$2 \times 7 = 14 + 2 = 16$
$3 \times 7 = 21 + 1 = 22$

$$\begin{array}{r} 3236 \\ \times \quad 7 \\ \hline 22{,}652 \end{array}$$

$6 \times 7 = 42$
$3 \times 7 = 21 + 4 = 25$

$$\begin{array}{r} 7198 \\ \times \quad 14 \\ \hline 28792 \\ +\ 71980 \\ \hline 100{,}772 \end{array}$$

$$\begin{array}{r} 7198 \\ \times \quad 4 \\ \hline 28792 \end{array}$$

$$\begin{array}{r} 7198 \\ \times \quad 10 \\ \hline 71980 \end{array}$$

If $7{,}198 \times 1 = 7{,}198$,
then
$7{,}198 \times 10 = 71{,}980$.

Multiply.

	a	b	c	d	e
1.	2763×5	6204×7	3221×4	8634×8	7253×6
2.	4728×4	3962×9	1854×2	5273×6	4456×3
3.	7526×3	9428×2	3725×28	6414×37	2889×41
4.	5297×64	4175×23	8052×46	2988×85	6364×92
5.	3562×27	7451×54	1920×83	9163×72	4276×56

NAME _____

Lesson 1.3 Dividing 3 Digits by 2 Digits

$71 \div 14 = 5$ remainder 1

$18 \div 14 = 1$ remainder 4

$$\begin{array}{r} 5 \\ 14\overline{)718} \\ -\,70 \\ \hline 18 \end{array}$$

$14 \times 5 = 70$

$$\begin{array}{r} 51 \\ 14\overline{)718} \\ -\,70 \\ \hline 18 \\ -\,14 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 51\ r4 \\ 14\overline{)718} \\ -\,70 \\ \hline 18 \\ -\,14 \\ \hline 4 \end{array}$$

The quotient is 51.
The remainder is 4.

Divide.

	a	b	c	d
1.	$23\overline{)264}$	$32\overline{)571}$	$81\overline{)724}$	$52\overline{)328}$
2.	$61\overline{)488}$	$35\overline{)175}$	$82\overline{)362}$	$47\overline{)719}$
3.	$97\overline{)891}$	$26\overline{)423}$	$43\overline{)916}$	$57\overline{)649}$

NAME _____

Lesson 1.4 Dividing 4 Digits by 2 Digits

$51 \div 23 = 2$ remainder 5

$$\begin{array}{r} 2 \\ 23\overline{)5173} \\ \underline{-\,46} \\ 5 \end{array}$$

$23 \times 2 = 46$

$57 \div 23 = 2$ remainder 11

$$\begin{array}{r} 22 \\ 23\overline{)5173} \\ \underline{-\,46} \\ 57 \\ \underline{-\,46} \\ 113 \end{array}$$

$23 \times 2 = 46$

$113 \div 23 = 4$ remainder 21

$$\begin{array}{r} 224 \\ 23\overline{)5173} \\ \underline{-\,46} \\ 57 \\ \underline{-46} \\ 113 \\ \underline{-\,92} \\ 21 \end{array}$$

$23 \times 4 = 92$

The quotient is 224.
The remainder is 21.

$$\begin{array}{r} 224\ r21 \\ 23\overline{)5173} \\ \underline{-\,46} \\ 57 \\ \underline{-46} \\ 113 \\ \underline{-\,92} \\ (21) \end{array}$$

Divide.

	a	b	c	d
1.	$43\overline{)6571}$	$22\overline{)8294}$	$62\overline{)3628}$	$88\overline{)4773}$
2.	$56\overline{)2829}$	$89\overline{)4340}$	$75\overline{)8195}$	$29\overline{)4872}$
3.	$63\overline{)1890}$	$31\overline{)6263}$	$96\overline{)5379}$	$48\overline{)7246}$

NAME _____

Lesson 1.5 Problem Solving

SHOW YOUR WORK

Solve each problem.

1. At the Bead Shop, there are 25 rows of beads. If there are 320 beads in each row, how many beads are in the shop?

   There are _____ beads in the shop.

2. The cafeteria planned to bake 3 cookies for every student in the school. If there are 715 students, how many cookies does the cafeteria need to bake?

   The cafeteria needs to bake _____ cookies.

3. A group of 123 students went on a field trip to collect seashells. If the students collected 15 shells each, how many shells did they collect?

   The students collected _____ shells.

4. A girls' club is trying to get into the record books for the most hair braids. There are 372 girls. If each girl braids her hair into 40 little braids, how many braids will they have?

   They will have _____ braids.

5. A school bought 831 boxes of computer paper for the computer lab. Each box had 59 sheets of paper inside it. How many sheets of paper were bought in total?

   The school bought _____ sheets of paper.

6. A vat of orange juice contains the juice from 231 oranges. If a company has 611 vats, how many oranges would it need to fill them all?

   The company would need _____ oranges.

1.

2.

3.

4.

5.

6.

NAME _____

Lesson 1.5 Problem Solving

SHOW YOUR WORK

Solve each problem.

1. The Pancake Restaurant served 348 pancakes. If 87 customers ate an equal number of pancakes, how many did each person eat?

   Each person ate _____ pancakes.

2. Gary opened a bag of candy containing 126 pieces. He wants to give each of his guests the same number of pieces. If he has 42 guests, how many pieces does each person get?

   Each guest gets _____ pieces.

3. At the local fair, 358 people waited in line for a boat ride. The boat can hold 8 people. How many trips will the boat have to take for everyone to get a ride?

   The boat will have to take _____ trips.

4. Cafeteria workers were putting milk cartons into crates. They had 1,052 cartons and 36 cartons in each crate. How many full crates did they end up with?

   They ended up with _____ full crates.

5. A machine in a candy company creates 9,328 pieces of candy each hour. If a box holds 98 pieces of candy, how many boxes can be filled in one hour?

   _____ boxes can be filled in one hour.

6. Oliver was trying to beat his old score of 1,842 points in a video game. If he scores exactly 85 points each round, how many rounds would he need to play to beat his old score?

   Oliver should play _____ rounds.

1.

2.

3.

4.

5.

6.

NAME _____

Check What You Learned

Multiplying and Dividing Whole Numbers

Multiply.

	a	b	c	d
1.	280 × 93	814 × 37	497 × 48	6492 × 82
2.	2158 × 32	8291 × 54	212 × 561	394 × 627
3.	4176 × 283	9192 × 562	7315 × 141	5639 × 374

Divide.

4.	$6\overline{)2142}$	$4\overline{)8676}$	$49\overline{)392}$	$34\overline{)2589}$
5.	$72\overline{)745}$	$45\overline{)213}$	$61\overline{)1708}$	$94\overline{)4649}$
6.	$52\overline{)9243}$	$68\overline{)3174}$	$16\overline{)4236}$	$81\overline{)2748}$

CHAPTER 1 POSTTEST

NAME _____

Check What You Learned

SHOW YOUR WORK

Multiplying and Dividing Whole Numbers

CHAPTER 1 POSTTEST

Solve each problem.

7. The park's sprinklers can spray 1,748 gallons of water on the grass in 38 minutes. How many gallons can they spray in one minute?

   They can spray _____ gallons per minute.

   7.

8. The auto factory will build 1,408 new trucks in the next 32 days. How many will it build in one day?

   It will build _____ trucks each day.

   8.

9. Pizza Depot will open 31 new restaurants next year. Each restaurant will need 27 employees. How many employees will Pizza Depot need to hire for the new restaurants?

   Pizza Depot will need to hire _____ employees.

   9.

10. The parking lot has 1,326 spaces to hold cars. The lot is divided into 26 equal rows. How many cars can be parked in each row?

    _____ cars can park in each row.

    10.

11. If a machine can make 761 pencils in a second, how many pencils can it make in 23 seconds?

    It can make _____ pencils.

    11.

12. In New York City, each mail truck has 1,023 pieces of junk mail. If there are 71 mail trucks, how much junk mail do they have total?

    They have _____ pieces of junk mail.

    12.

NAME _____

Check What You Know

Understanding Place Value

What is the value of the underlined digit?

	a	b
1.	4,<u>3</u>32	5<u>2</u>,321
	_____	_____

Write the digit that is in the given place value.

2.	30.146 – hundredth	1,325.12 – thousand
	_____	_____
3.	1.325 – tenth	731.045 – one
	_____	_____

Convert each power of ten to a standard number.

4.	10^4 _____	10^6 _____

Multiply or divide by the given power of ten.

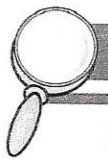
5.	8.75 × 1,000 _____	7,643 ÷ 100 _____
6.	45.67 × 1,000 _____	34,981 ÷ 1,000 _____

Write the numbers in expanded form.

7.	592,682	78.364
	_____	_____

CHAPTER 2 PRETEST

NAME _____



Check What You Know

Understanding Place Value

Compare each pair of decimals using <, >, or =.

	a	b	c
8.	6.203 _____ 6.214	2.4 _____ 2.400	48.28 _____ 46.281
9.	72.355 _____ 72.335	5.76 _____ 50.76	9.763 _____ 9.673

Order the decimals from least to greatest.

10. 72.5, 73.943, 72.1, 73.77

_____

11. 43.2, 43.219, 42.1, 42.59

_____

12. 38.507, 38.4, 38.23, 39.5

_____

13. 71.743, 71.3, 72.43, 72.5

_____

Round each number to the indicated place.

	a	b	c
14.	3.171 – tenths	2.253 – ones	5.126 – hundredths
	_____	_____	_____
15.	64.967 – ones	9.432 – tenths	1.225 – hundredths
	_____	_____	_____

NAME _____

Lesson 2.1 Understanding Place Value to Millions

Write the value of the underlined digit.
2,3<u>2</u>5,976

The value of the 2 is 2 ten thousands, or 20,000.

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
2	, 3	<u>2</u>	5	, 9	7	6

Write the numerical value of the digit in the place named.

	a	b	c	d
1.	5,363,246 millions 5,000,000	952,418 ten thousands	4,510,367 tens	8,123,405 ones
2.	9,867,823 hundred thousands	567,345 thousands	1,328,976 millions	5,004,002 thousands
3.	2,982,023 thousands	345,632 ten thousands	6,543,211 millions	2,566,900 hundred thousands

Name the place of the underlined digit.

	a	b
4.	2,<u>5</u>64,740	<u>3</u>,297,134
	___ is in the _____ place.	___ is in the _____ place.
5.	8,7<u>6</u>1,089	<u>9</u>,345,187
	___ is in the _____ place.	___ is in the _____ place.
6.	<u>8</u>59,632	<u>4</u>,689,322
	___ is in the _____ place.	___ is in the _____ place.

NAME _____

Lesson 2.2 Understanding Place Value with Decimals

In 1,324.973 what place value is the 9?

thousands	hundreds	tens	ones		tenths	hundredths	thousandths
1	3	2	4	.	9	7	3

The 9 can be named nine tenths, $\frac{9}{10}$, or 0.9.

Write the place value of the given number.

	a	b	c
1.	3 in \$10.03	7 in 7,000.2	5 in 13.5
	_____	_____	_____
2.	2 in \$25.75	4 in 5,238.004	8 in 11.8
	_____	_____	_____
3.	1 in \$561.07	3 in 0.037	6 in 0.136
	_____	_____	_____

Write the digit that is in the given place value.

	a	b	c	d
4.	432.14 hundreds	325.17 tenths	3,214.005 thousandths	25.132 tens
	_____	_____	_____	_____
5.	30.146 hundredths	25.523 thousandths	125.043 tenths	1,325 thousands
	_____	_____	_____	_____
6.	100.304 tenths	1.325 hundredths	1.005 thousandths	731.045 ones
	_____	_____	_____	_____

NAME _____

Lesson 2.3 Powers of Ten

An **exponent** is a number that shows how many times a base number is to be used in multiplication. A **power of ten** is an exponent where the base number is always 10.

$10^1 = 10 = 10$
$10^2 = 10 \times 10 = 100$
$10^3 = 10 \times 10 \times 10 = 1{,}000$
$10^4 = 10 \times 10 \times 10 \times 10 = 10{,}000$

Convert the values below to a power of ten.

	a	b	c
1.	100,000	1,000,000	10
	_____	_____	_____
2.	10,000,000	100	1,000,000,000
	_____	_____	_____

Convert these powers of ten to standard numbers.

	a	b	c
3.	10^7	10^5	10^3
	_____	_____	_____
4.	10^8	10^{12}	10^6
	_____	_____	_____

NAME _____

Lesson 2.4 Patterns of Zeros and Decimals in Products and Quotients

When a number is multiplied or divided by a multiple of 10, the number of zeros and decimals in the product or quotient will vary based on the value of the multiple of 10 that is used.

0.2658×1	=	0.2658
0.2658×10	=	2.658
0.2658×100	=	26.58
$0.2658 \times 1{,}000$	=	265.8
$0.2658 \times 10{,}000$	=	2,658.0
$0.2658 \times 100{,}000$	=	26,580.0
$0.2658 \times 1{,}000{,}000$	=	265,800.0

When a number is multiplied by a power of 10, the decimal in the product moves to the right and zeros are added to the left of the decimal when needed.

$265{,}800. \div 1$	=	265,800.0
$265{,}800. \div 10$	=	26,580.0
$265{,}800. \div 100$	=	2,658.0
$265{,}800. \div 1{,}000$	=	265.8
$265{,}800. \div 10{,}000$	=	26.58
$265{,}800. \div 100{,}000$	=	2.658
$265{,}800. \div 1{,}000{,}000$	=	0.2658

When a number is divided by a power of 10, the decimal in the product moves to the left and zeros are added to the right of the decimal when needed.

Multiply by the power of ten to find the product.

	a	b	c
1.	21.48×10	$6.07 \times 1{,}000$	7.58×100
	_____	_____	_____
2.	$7.434 \times 100{,}000$	$0.7 \times 1{,}000$	$0.502 \times 10{,}000$
	_____	_____	_____

Divide by the power of ten to find the quotient.

3.	$13.4 \div 10$	$27.65 \div 100$	$320.7 \div 10$
	_____	_____	_____
4.	$3.457 \div 100$	$82.93 \div 10$	$726.9 \div 1{,}000$
	_____	_____	_____

NAME _____

Lesson 2.5 Expanded Form with Whole Numbers

Expanded form is a way to write a number that shows the sum of values of each digit of a number. To use expanded form, a number has to be separated into each of its parts using place value.

$5{,}423 = 5{,}000 + 400 + 20 + 3$

$39{,}572 = 30{,}000 + 9{,}000 + 500 + 70 + 2$

Write each number in expanded form.

	a	b
1.	430	721
	_____	_____
2.	3,465	43,645
	_____	_____
3.	90,327	4,009
	_____	_____
4.	653,410	103,254
	_____	_____
5.	199,482	32,451
	_____	_____
6.	9,342,751	2,500,055
	_____	_____
7.	598,721	69,003
	_____	_____

NAME _____

Lesson 2.6 Expanded Form with Decimals

Expanded form can also be used with decimals. When a number contains decimal parts, they can be separated in the same way whole number parts can.

$396.636 = 300 + 90 + 6 + 0.6 + 0.03 + 0.006$

$94{,}524.51 = 90{,}000 + 4{,}000 + 500 + 20 + 4 + 0.5 + 0.01$

Write each number in expanded form.

	a	b
1.	268.849	657.254
	_____	_____
2.	182.19	9989.52
	_____	_____
3.	756.234	332.115
	_____	_____
4.	435.461	14.514
	_____	_____
5.	2,948.23	69.241
	_____	_____
6.	219.833	38,966.3
	_____	_____
7.	519.5	971.396
	_____	_____

NAME _____

Lesson 2.7 Comparing Decimals

Which is larger: 4.218 or 4.222?

4.2<u>1</u>8 4.2<u>2</u>2

The ones are the same.
The tenths are the same.
The hundredths are different.

4.218 < 4.222
4.218 is less than 4.222.

Compare each pair of decimals using <, >, or =.

	a	b	c
1.	5.213 ____ 5.312	3.1 ____ 3.10	28.35 ____ 28.251
2.	6.32 ____ 6.032	5.17 ____ 5.172	144.3 ____ 144
3.	7.325 ____ 6.425	3.14 ____ 2.99	48.28 ____ 48.280
4.	0.213 ____ 0.223	1.006 ____ 1.060	0.010 ____ 0.001
5.	0.674 ____ 0.644	3.122 ____ 3.220	43.01 ____ 43.100
6.	2.897 ____ 2.90	0.43 ____ 0.430	0.790 ____ 0.789
7.	0.571 ____ 0.58	10.462 ____ 100.46	9.36 ____ 9.306
8.	17.110 ____ 17.101	0.182 ____ 1.820	98.999 ____ 99.001
9.	1.090____ 1.009	25.224 ____ 25.242	63.12 ____ 63.2
10.	5.703 ____ 5.730	0.479 ____ 4.79	81.40 ____ 81.400

NAME _____

Lesson 2.8 Ordering Decimals

To order a group of decimals, line up the decimal points.

2.14, 2.08, 2.1, and 2.01

2.14
2.08
2.1
2.01

All the ones are the same. 2.14 and 2.1 have the same tenths digit, but 4 is greater than zero. In the other two numbers, 8 is greater than 1.

List from least to greatest:
2.01, 2.08, 2.1, 2.14

Order the decimals from least to greatest.

1. 7.52, 7.498, 7.521, 7.6

_____

2. 0.028, 0.080, 0.082, 0.008

_____

3. 12.193, 12.201, 12.191, 12.200

_____

4. 0.116, 0.108, 0.113, 0.117

_____

5. 22.5, 22.67, 23.8, 23.703

_____

6. 12.249, 12.13, 12.5, 12.2

_____

NAME _____

Lesson 2.9 Rounding to the Nearest Whole Number

Round 15.897 to the nearest whole number.

Look at the tenths digit. 15.<u>8</u>97

8 is greater than or equal to 5, so round 5 to 6 in the ones place.

16

Round 234.054 to the nearest whole number.

Look at the tenths digit. 234.<u>0</u>54

0 is less than 5, so keep the 4 in the ones place.

234

Round each to the nearest whole number.

	a	b	c	d
1.	6.421	5.882	19.235	2.371
2.	45.288	97.5	12.003	72.71
3.	13.936	8.42	1.100	65.39
4.	98.55	269.57	14.369	23.09
5.	95.645	8.67	99.198	51.70
6.	29.98	98.4	33.333	67.67

NAME _____

Lesson 2.10 Rounding Decimals

Round 2.137 to the nearest tenth.

Look at the hundredths digit. 2.1<u>3</u>7

3 is less than 5, so keep the 1 in the tenths place.

2.1

Round 8.447 to the nearest hundredth.

Look at the thousandths digit. 8.44<u>7</u>

7 is greater than or equal to 5, so round 4 to 5 in the hundredths place.

8.45

Round each number to the nearest tenth.

	a	b	c	d
1.	7.322	1.156	3.770	6.923
2.	7.953	4.438	5.299	8.171
3.	4.734	5.629	0.138	9.818

Round each number to the nearest hundredth.

4.	5.872	2.212	6.447	1.735
5.	4.397	4.442	9.161	3.476
6.	5.849	4.484	0.987	0.155

NAME _____

Check What You Learned

Understanding Place Value

What is the value of the underlined digit?

	a	b
1.	83,7<u>6</u>4 _____	328.36<u>7</u> _____

Write the digit that is in the given place value.

2.	32.376 – thousandths _____	3,693.34 – hundreds _____
3.	4.398 – hundredths _____	3,982.597 – tens _____

Convert these powers of ten to standard numbers.

4.	10^9 _____	10^5 _____

Multiply or divide by the given power of ten.

5.	532.4 × 100 _____	12.22 ÷ 10 _____
6.	4.412 × 1,000 _____	2,934.18 ÷ 100 _____

Write the numbers below in expanded form.

7.	43.436 _____	3,682.3 _____

NAME _____

Check What You Learned

Understanding Place Value

CHAPTER 2 POSTTEST

Compare each pair of decimals using <, >, or =.

	a	b	c
8.	5.113 ____ 5.112	42.882 ____ 43.88	4.6 ____ 4.600
9.	7.295 ____ 72.95	23.54 ____ 23.45	9.563 ____ 9.653

Order the numbers from least to greatest.

10. 5.6, 6.13, 5, 6.723

_____

11. 75.931, 75, 74.2, 74.61

_____

12. 21.1, 20.5, 21.967, 20.35

_____

13. 47.85, 46.793, 47.7, 47.5

_____

Round each number to the indicated place.

14.	7.559 – ones	2.165 – tenths	5.471 – hundredths
	_____	_____	_____
15.	3.337 – hundredths	66.34 – ones	9.245 – tenths
	_____	_____	_____

NAME _____

Check What You Know

Using Decimals

Add or subtract.

	a	b	c	d
1.	46.38 + 21.25	732.84 + 21.25	64.80 + 7.31	102.90 + 0.26
2.	78.62 − 38.89	8.86 − 5.29	9.40 − 3.62	75.1 − 23.2
3.	54.45 + 19.26	45.7 − 15.3	118.56 + 1.25	15.0 + 12.1

Multiply or divide.

	a	b	c	d
4.	1.3 × 4.8	2.07 × 3.4	5.74 × 0.44	3.01 × 2.9
5.	$3.8\overline{)15.96}$	$0.12\overline{)0.48}$	$1.75\overline{)67.55}$	$0.25\overline{)300}$

NAME _____

Check What You Know

SHOW YOUR WORK

Using Decimals

Solve each problem.

6. In a recent week, the rainfall was 0.2 inches for Monday, 0.7 inches for Tuesday, and 1.6 inches for Wednesday. What was the total amount of rainfall for those 3 days?

   The total amount of rainfall was _____ inches.

6.

7. Miranda wants to buy a tennis racket that costs $109.95. She has $68.50 saved from babysitting. How much more money does she need?

   Miranda needs _____.

7.

8. Julia went to the store and bought 3 items that cost $5.87, $21.62, and $11.48. What was the total cost of these items?

   The total cost of the items was _____.

8.

9. If a car averages 23.2 miles per gallon of gasoline, how far can it go on 15.25 gallons?

   The car can go _____ miles.

9.

10. Maria bought gifts for 7 of her friends. She spent $86.66. If she spent the same amount on each of her friends, how much did she spend on each?

    Maria spent _____ on each friend.

10.

11. A small tree was measured at 3.67 feet tall. It can grow to 25 times that height. What is the tallest height the tree can be expected to reach?

    The tree can reach _____ feet.

11.

NAME _____

Check What You Know

Understanding Fractions

Change each improper fraction to a mixed number.

	a	b	c	d	e
1.	$\frac{27}{5}$ _____	$\frac{35}{8}$ _____	$\frac{15}{7}$ _____	$\frac{25}{4}$ _____	$\frac{17}{3}$ _____

Change each mixed number to an improper fraction.

2.	$3\frac{5}{16}$ _____	$3\frac{3}{5}$ _____	$2\frac{3}{7}$ _____	$1\frac{3}{16}$ _____	$4\frac{1}{3}$ _____

Find the greatest common factor for each set of numbers.

3.	18 and 22 _____	25 and 50 _____	54 and 36 _____	40 and 8 _____	16 and 24 _____
4.	10 and 15 _____	24 and 30 _____	8 and 10 _____	5 and 24 _____	24 and 40 _____

Find the least common multiple for each set of numbers.

5.	8 and 12 _____	15 and 4 _____	20 and 4 _____	3 and 24 _____	12 and 4 _____
6.	15 and 2 _____	12 and 30 _____	4 and 30 _____	6 and 40 _____	10 and 2 _____

NAME _____

Check What You Know

Understanding Fractions

Write each fraction in simplest form.

	a	b	c	d
7.	$\frac{6}{9}$ _____	$\frac{12}{36}$ _____	$\frac{20}{32}$ _____	$\frac{21}{49}$ _____
8.	$\frac{15}{18}$ _____	$\frac{40}{45}$ _____	$\frac{12}{14}$ _____	$\frac{19}{38}$ _____

Find the equivalent fraction.

9.	$\frac{4}{6}=\frac{\quad}{12}$	$\frac{1}{9}=\frac{\quad}{18}$	$\frac{5}{6}=\frac{\quad}{12}$	$\frac{5}{12}=\frac{\quad}{60}$
10.	$\frac{2}{5}=\frac{\quad}{20}$	$7=\frac{\quad}{6}$	$6=\frac{\quad}{11}$	$4=\frac{\quad}{7}$

Compare each pair of fractions using <, >, or =.

11.	$\frac{8}{12}$ ___ $\frac{1}{12}$	$\frac{2}{3}$ ___ $\frac{1}{2}$	$\frac{6}{9}$ ___ $\frac{2}{5}$	$\frac{4}{6}$ ___ $\frac{5}{9}$
12.	$\frac{3}{6}$ ___ $\frac{7}{9}$	$\frac{2}{5}$ ___ $\frac{1}{4}$	$\frac{2}{7}$ ___ $\frac{2}{3}$	$\frac{6}{7}$ ___ $\frac{1}{5}$

Convert each fraction into a decimal. Convert each decimal into a fraction.

13.	$\frac{2}{5}$ _____	$\frac{3}{6}$ _____	$\frac{2}{8}$ _____	$\frac{7}{8}$ _____
14.	0.5 _____	0.6 _____	0.75 _____	0.625 _____

NAME _____

Lesson 4.2 Changing Improper Fractions to Mixed Numbers

$\frac{13}{6}$ means $13 \div 6$ or $6\overline{)13}$

$$\begin{array}{r} 2\ \frac{1}{6} \\ 6\overline{)13} \\ -\ 12 \\ \hline 1 \end{array}$$

$1 \rightarrow 1 \div 6 = \frac{1}{6}$

So, $\frac{13}{6} = 2\frac{1}{6}$

$\frac{13}{6}$ is an **improper fraction**, meaning the denominator divides the numerator at least one time. In other words, the numerator is greater than the denominator.

$2\frac{1}{6}$ is a **mixed number**. This is the simplest form of an improper fraction.

Write each improper fraction as a mixed number in simplest form.

	a	b	c
1.	$\frac{5}{3}$ _____	$\frac{7}{6}$ _____	$\frac{9}{5}$ _____
2.	$\frac{3}{2}$ _____	$\frac{4}{3}$ _____	$\frac{8}{5}$ _____
3.	$\frac{7}{5}$ _____	$\frac{9}{7}$ _____	$\frac{5}{4}$ _____
4.	$\frac{32}{6}$ _____	$\frac{51}{4}$ _____	$\frac{49}{9}$ _____
5.	$\frac{66}{5}$ _____	$\frac{83}{3}$ _____	$\frac{28}{5}$ _____
6.	$\frac{29}{3}$ _____	$\frac{28}{7}$ _____	$\frac{64}{6}$ _____

NAME _____

Lesson 4.3 Changing Mixed Numbers to Improper Fractions

To change a mixed number to a fraction, multiply the denominator by the whole number. Then, add the numerator to the product to get the new numerator. Keep the denominator the same.

$4\frac{3}{5} = \frac{(5 \times 4) + 3}{5} = \frac{20 + 3}{5} = \frac{23}{5}$

$2\frac{3}{4} = \frac{(4 \times 2) + 3}{4} = \frac{8 + 3}{4} = \frac{11}{4}$

Change each mixed number to an improper fraction.

	a	b	c	d
1.	$2\frac{5}{8}$ _____	$3\frac{1}{4}$ _____	$2\frac{3}{7}$ _____	$4\frac{1}{1}$ _____
2.	$3\frac{3}{4}$ _____	$2\frac{5}{12}$ _____	$4\frac{1}{6}$ _____	$5\frac{2}{3}$ _____
3.	$2\frac{7}{16}$ _____	$3\frac{1}{2}$ _____	$1\frac{7}{16}$ _____	$2\frac{5}{8}$ _____
4.	$3\frac{1}{3}$ _____	$4\frac{2}{5}$ _____	$3\frac{1}{8}$ _____	$7\frac{1}{3}$ _____
5.	$8\frac{2}{3}$ _____	$1\frac{2}{5}$ _____	$2\frac{3}{7}$ _____	$3\frac{8}{9}$ _____
6.	$4\frac{2}{5}$ _____	$3\frac{5}{6}$ _____	$2\frac{4}{9}$ _____	$4\frac{5}{12}$ _____