Name:_____ Date:_____

Things We Do for Beauty

By Monika Davies

People have done some pretty surprising things in the name of beauty. Glance through any style magazine, and you'll find no lack of creative beauty routines to try. In some places, beauty fanatics have smeared their faces with dehydrated bird droppings!

Beauty itself is a weird idea. The perception of beauty, of course, varies from person to person and culture to culture. Our idea of beauty reflects our lifestyle and values. Learning more about another culture's interpretation of what makes people beautiful gives meaningful insight into that culture's way of life.

Digging into Makeup Bags

Examining a makeup bag from another country is a fascinating glimpse into a lifestyle different from one's own. Let's take a look to see what people have tucked into their cosmetic totes in Korea.

Korea

Many Koreans take pride in having flawless complexions, a direct result of a 10-step (yes, 10!) skincare routine. The process begins with an oil-based cleanser, followed with a foaming cleanser. Koreans are gentle with their faces, using circular motions to cleanse a day's grime away.

Uniquely Korean, essence is a highly concentrated liquid. Full of beneficial properties, such as glycerin, essence hydrates your skin. A staple in the Asian beauty regimen, essence is said to promote a wrinkle free complexion.

While sheet masks can make you look like a mummy, Koreans swear by this unique skin-care solution. Sheet masks are treasure troves of skin-friendly vitamins. Letting the mask settle on your face allows the vitamins to absorb, ideally giving you the glow that's advertised!

The famous saying "you are what you eat" is also a part of Korean skin care. Kimchi is a beloved Korean superfood. This spicy fermented cabbage is loaded with antioxidants, which create a clear complexion.

Complex Beauty

Defining beauty is complex and will always be subject to scrutiny. Things that seem surprising to some people aren't strange to others or out of place within a given culture. Each culture defines "beautiful" differently. Every culture, country, and person has different approaches to demonstrating beauty. Undoubtedly, beauty is a concept with many definitions. Those definitions change over the years, with new trends setting in. In a world of selfies and social media, it's even more important to focus on what can't be seen. Make sure your concept of beauty encompasses your character, your passion, and your values. And keep in mind that every person's definition of what makes someone beautiful grows and evolves with time. In the end, the most meaningful perspective will always be the one we determine for ourselves.

Beauty Is Vain

by Christina Georgina Rossetti

While roses are so red,
        While lilies are so white,
Shall a woman exalt her face
        Because it gives delight?
She's not so sweet as a rose,
        A lily's straighter than she,
And if she were as red or white
        She'd be but one of three.

Whether she flush in love's summer
        Or in its winter grow pale,
Whether she flaunt her beauty
        Or hide it away in a veil,
Be she red or white,
        And stand she erect or bowed,
Time will win the race he runs with her
        And hide her away in a shroud.

About Mark Twain

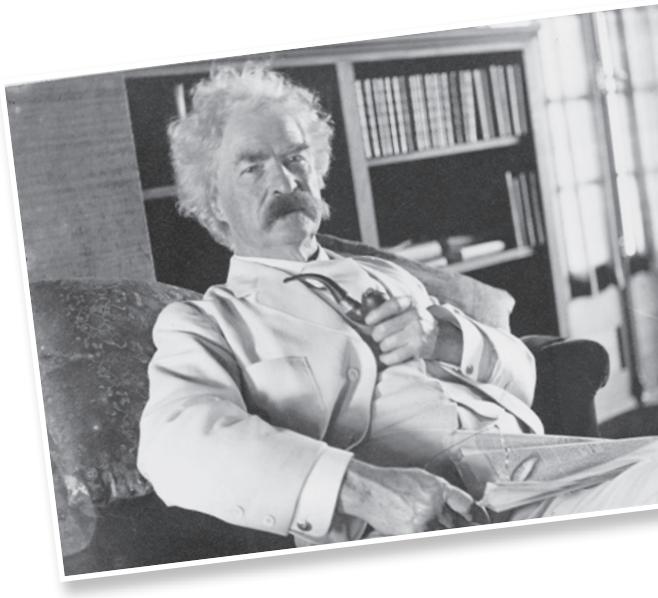
By Torrey Maloof

Mark Twain is one of America's favorite and most famous writers. In the 1840s, the young Twain caused mischief and mayhem on the banks of the Mississippi River. Much like his beloved characters Huckleberry Finn and Tom Sawyer, Twain's childhood was spent in a river city in Missouri. While much fun was had, Twain also witnessed slavery, racism, and violent crimes. His nineteenth century American upbringing shaped his literary career, while his wit, humor, and imagination made Mark Twain a household name. By stepping into his world, we can see how his surroundings and experiences influenced Twain's tales of life and adventure.

Halley's Comet appears about every 76 years. The bright streak of gas and dust was visible in the night sky the day Samuel Langhorne Clemens was born. That is Twain's real name. He came into the world two months early, on November 30, 1835, in the tiny town of Florida, Missouri. Twain's mother was worried that her premature baby wouldn't survive. Perhaps the comet brought him luck because Twain not only survived but lived a long, eventful life.

Twain was a spirited, rambunctious young boy. He moved with his family to Hannibal, Missouri, in 1839. Twain described Hannibal as a "boy's paradise" with caves, islands, and woods for exploring. As a young boy, he would regularly skip school to play and go on adventures with his friends. Sometimes, they would fish or swim in the Mississippi River. One of Twain's favorite things to do was watch steamboats work their way down the watery path. The three-story powerful boats with their mighty smokestacks and giant paddlewheels called to Twain. He knew that one day he would pilot one of those majestic vessels.

In the summer of 1874, Twain began work on *The Adventures of Tom Sawyer*. The book that introduced Tom and Huckleberry to the world would soon become one of the most popular stories in American history. Just like Twain's life, the story is packed full of adventure and witty characters. In 1884, Twain's masterpiece, *The Adventures of Huckleberry Finn*, was published. It, too, is full of adventure as Huck makes his way down the Mississippi River with a runaway slave named Jim. Despite harsh reviews upon its publication, the book later became an American classic.



Halley's Comet had ushered in one of America's most famous writers in 1835. Mark Twain passed away on April 21, 1910, the same year that Halley's comet returned to American skies. He left behind a compilation of witty works that tell the story of his life and times.

From running free on the banks of the Mississippi River to becoming a beloved author, Twain's life experiences are immortalized in the pages of his stories. His world is reflected in his works. Stepping into Twain's world is like stepping back in time to a young country. The United States struggled with growing pains as did Twain. Serious historical conflicts were knit with riotous occasions of fun. America and Twain grew up together, influencing each other along the way.

Name:_____ Date:_____

Excerpt from *The Adventures of Tom Sawyer*

by Mark Twain

The minister droned monotonously through a sermon so boring that many a head began to nod. Presently Tom remembered a treasure he had and got out a percussion-cap box. In it was an enormous black beetle with formidable jaw—"pinchbug." The beetle seized his finger; Tom shook his hand, and the beetle went floundering into the aisle and lit on its back, and the injured finger went into the boy's mouth. The beetle lay there working its legs helplessly, unable to turn over. Tom eyed it, and longed for it; but it was out of his reach. Other people uninterested in the sermon also eyed the pinchbug.

Presently a poodle came idling along and spied the beetle; his drooping tail lifted and wagged. He surveyed the prize; walked around it; smelled it from a safe distance; walked around it again; grew bolder, and took a closer smell; then lifted his lip and made a gingerly snatch at it, just missing it; made another, and another; laid down on his stomach with the beetle between his paws, and continued his experiments; grew weary at last, and then indifferent and absent-minded. His head nodded, and little by little his chin descended until it touched the enemy, who seized it. There was a sharp yelp, a jerk of the poodle's head, and the pinchbug fell a couple of yards away, on its back once more. Neighboring spectators shook with gentle inward laughter, several faces rapidly went behind fans and handkerchiefs, and Tom was entirely happy. The dog looked foolish, and probably felt so; but there was resentment in his heart, too, and a craving for revenge, so he went to the pinchbug and began a wary attack on it again; jumping at it from every angle, landing with his forepaws within an inch of the creature, making ever closer snatches at it with his teeth, and shaking his head until his ears flapped.

But the poodle grew tired after a while; tried to amuse himself with a fly but found no relief; followed an ant around with his nose close to the floor and quickly wearied of that; yawned, sighed, forgot the pinchbug entirely, and sat down on it. With wild yelps of agony, the poodle went sailing up the aisle; he crossed the church in front of the altar; he flew down the other aisle; he crossed before the doors. At last the frantic sufferer veered from its course and sprang into its master's lap. Embarrassed, he flung it out an open window, and its yelps of distress quickly thinned and died in the distance.

By this time the whole congregation was red-faced and suffocating with suppressed laughter, and the sermon had come to an absolute standstill. Although the minister valiantly tried to restart, his words were received with a smothered burst of unholy mirth. It was a genuine relief to everyone in the congregation when the final blessing was pronounced.

Tom Sawyer went home cheerful, thinking to himself that there was satisfaction about religious service when there was variety to it. He had but one negative thought: He was willing that the dog should play with his pinchbug, but he did not think it was fitting for him to carry it off.

Name:_____ Date:_____

Monster Movie History

By Timothy J. Bradley

The history of monster movies is a long and fascinating one. Many of us enjoy good, scary films. Monster movies have evolved since their beginnings. Improvements in filmmaking and technology have allowed for new creatures to exist and new stories to be told. So, grab that popcorn and a good friend to hide behind, and get ready to explore monster movies from the very beginning.

Frankenstein (1931)

A very popular book that was adapted into a monster movie is *Frankenstein*. It tells of a scientist who jolts a dead human body back to life. The story sparked many films. The most popular one stars Boris Karloff as Dr. Frankenstein's monster. Even though the creature dies at the end of the film, his popularity lives on. There have been many sequels and reboots.

Dracula (1931)

The film follows the bloodthirsty vampire from his castle in Transylvania to London. The film terrified audiences. In fact, newspapers reported that several audience members passed out from fear!

Creature from the Black Lagoon (1954)

Creature from the Black Lagoon features a humanoid monster mutant who can survive underwater. The film tells the story of an archaeological expedition into the jungle. It attracts a curious gill man. The gill man wants to watch the explorers. But the creature frightens the humans. So, the humans attack him, but the gill man fights back.

The Thing (1982)

When *The Thing* opened in theaters, the ultra-gory effects stunned audiences. *The Thing* is about a shape-shifting alien astronaut frozen in Arctic ice. The staff of a scientific outpost thaws the alien. Then, it starts to mimic and kill the men one by one.

I, Robot (2004)

The film *I, Robot* tells the story of a police officer in Chicago. The movie takes place in the future. The officer investigates a suicide that might be a murder... committed by a robot. It's hard to imagine where moviemakers might go in the future. The advances that have been made so far suggest that even more amazing things are to come.

Excerpt from *Frankenstein*

by Mary Shelley

It was on a dreary night of November that I beheld the accomplishment of my toils. With an anxiety that almost amounted to agony, I collected the instruments of life around me, that I might infuse a spark of being into the lifeless thing that lay at my feet. It was already one in the morning. The rain pattered dismally against the panes, and my candle was nearly burnt out, when, by the glimmer of the half-extinguished light, I saw the dull yellow eye of the creature open. It breathed hard, and a convulsive motion agitated its limbs.

How can I describe my emotions at this catastrophe, or how delineate the wretch whom with such infinite pains and care I had endeavored to form? His limbs were in proportion, and I had selected his features as beautiful. Beautiful! Great God! His yellow skin scarcely covered the work of muscles and arteries beneath. His hair was of a lustrous black, and owing; his teeth of a pearly whiteness; but these luxuriances only formed a more horrid contrast with his watery eyes, that seemed almost of the same color as the dun-white sockets in which they were set, his shriveled complexion and straight black lips.

His jaws opened, and he muttered some inarticulate sounds, while a grin wrinkled his cheeks. He might have spoken, but I did not hear. One hand was stretched out, seemingly to detain me, but I escaped and rushed downstairs. I took refuge in the courtyard belonging to the house which I inhabited, where I remained during the rest of the night, walking up and down in the greatest agitation, listening attentively, catching and fearing each sound as if it were to announce the approach of the demoniacal corpse to which I had so miserably given life.

Oh! No mortal could support the horror of that countenance. A mummy again endued with animation could not be so hideous as that wretch. I had gazed on him while unfinished; he was ugly then, but when those muscles and joints were rendered capable of motion, it became a thing such as even Dante could not have conceived.

I passed the night wretchedly. Sometimes my pulse beat so quickly and hardly that I felt the palpitation of every artery. At others, I nearly sank to the ground through languor and extreme weakness. Mingled with this horror, I felt the bitterness of disappointment. Dreams that had been my food and pleasant rest for so long a space were now become a hell to me; and the change was so rapid, the overthrow so complete!

Shapes in Geometry

Angles

All figures are made up of points. One example is a ray, which starts at a single point and then stretches forever in one direction. An angle is made up of two rays that intersect at a point, which is called the vertex.

Angles are critically important in the construction of roller coasters. Designers have to ensure that the angles are not too steep, because that might make the roller coaster too dangerous. However, the angles have to be steep enough to make for a thrilling ride.

Triangles

The world around us is made up of lines, angles, and shapes. Look around your classroom, how many triangles can you find? How many angles can you see on your desk? Try to count the lines that make up the front of the room. I bet there are almost too many to count!

A triangle is a closed shape. It is two-dimensional. It has three line segments for its sides. It is a three-sided polygon. The sides meet at three points. These points are called vertices. Each vertex forms an angle with two of the sides. The word *triangle* means "three angles." You can measure the three angles. You can add up the measures of those angles. They always add up to 180˚.

Triangles can be used to build things. They are strong shapes. Some rooftops are shaped like triangles. So are some parts of ceilings and bridges.

Lines

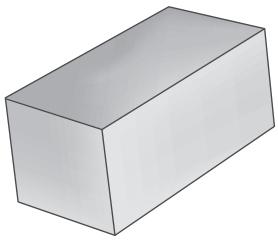
There are many kinds of lines. Parallel lines will never cross. They will always be the same distance apart. When lines cross, they intersect at one point.

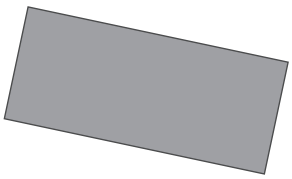
Lines, rays, and segments can intersect. When they do, angles are formed. You know that a right angle is 90˚. When right angles are formed, the lines, rays, or segments that formed those angles are perpendicular.

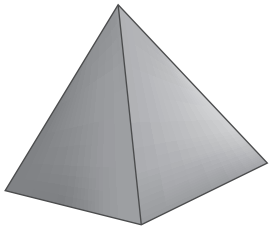
Look at the room shown. There are many examples of both types of lines. The pictures, table, chair, and drawers are only a few. If the handrail was not parallel with the base of the posts, it could cause problems. If the stair steps were not parallel with each other and with the ground, then anyone using the steps would likely fall!

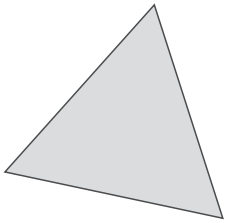
Name:_____ Date:_____

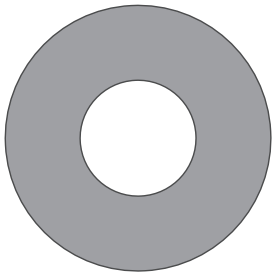
Excerpt from *Flatland*











By Edwin A. Abbott

This story is about two different worlds called Flatland and Space.

I call our world Flatland, not because we call it so, but to make its nature clearer to you, my happy readers, who are privileged to live in Space.

Imagine a vast sheet of paper on which straight Lines, Triangles, Squares, Pentagons, Hexagons, and other figures, instead of remaining fixed in their places, move freely about, on or in the surface, but without the power of rising above or sinking below it, very much like shadows—only hard with luminous edges—and you will then have a pretty correct notion of my country and countrymen. Alas, a few years ago, I should have said "my universe," but now my mind has been opened to higher views of things.

In such a country, you will perceive at once that it is impossible that there should be anything of what you call a "solid" kind, but I dare say you will suppose that we could at least distinguish by sight the Triangles, Squares, and other figures, moving about as I have described them. On the contrary, we could see nothing of the kind, not at least so as to distinguish one figure from another. Nothing is visible, nor could be visible, to us, except Straight Lines; and the necessity of this I will speedily demonstrate.

Place a penny on the middle of one of your tables in Space; and leaning over it, look down upon it. It will appear a circle.

But now, drawing back to the edge of the table, gradually lower your eye (thus bringing yourself more and more into the condition of the inhabitants of Flatland), and you will find the penny becoming more and more oval to your view, and at last when you have placed your eye exactly on the edge of the table (so that you are, as it were, actually a Flatlander), the penny will then have ceased to appear oval at all, and will have become, so far as you can see, a straight line.

Name:_____ Date:_____

Figuring Out Fractals

By Theo Buchanan

Nature's Geometry

Nature is mysterious. With the seasonal changes in scenery come changes in geometry that often seem unexplainable. Looking at this photo of a tree, you can probably imagine roots extending into the soil below what is pictured. But what if I told you that this isn't really a tree because it's just a branch someone stuck into the snow? Isn't it easy to see how it could be both? That is because the structure of a branch is similar to that of a tree.

Branches make up trees, but they also look like smaller versions of trees. We call this *self-similarity*. In a self-similar pattern, pieces of the pattern are miniature replicas of the whole. And that means that within those replicas, there will be even smaller replicas. This replication either stops at a certain scale or continues *ad infinitum* (to infinity). Take a look at a small tree branch coming out from a larger branch and notice, again, the tree-like structure. In a large tree, you can see dozens, sometimes even hundreds of mini trees! This is an example of a fractal.

What's the Definition?

Fractals come in a huge variety of forms, but they are generally defined as shapes that exhibit self-similarity and high complexity. As you will see, these shapes appear in many different forms throughout nature.

Fractals Everywhere!

"*Why is geometry often described as 'cold' and 'dry'? One reason lies in its inability to describe the shape of a cloud, a mountain, a coastline, or a tree. Clouds are not spheres, mountains are not cones, coastlines are not circles.*" —Mathematician and "fractalist" Benoit Mandelbrot

Fractal geometry is a mathematical infant. The term *fractal* has only existed since Mandelbrot, the "father of fractals," published his book, *The Fractal Geometry of Nature*, in 1982. This is amazing because for as long as humans have inhabited Earth, they have been surrounded by these patterns, and not in any small way either. As Mandelbrot points out, some of the largest features of our planet are fractals.

Fluffy Fractals!

A photo taken of a cloud formation up close will also show a remarkable level of scale invariance. This is because each individual "puff" is made up of smaller puffs. Clouds are good examples of why the term *fractal* doesn't need a strict definition. It's nearly always true that each puff has a somewhat unique shape, so clouds are really not *strictly* self-similar. But because all the shapes are so random, clouds are definitely scale invariant, making them fractals.

Figuring Out Fractals *(cont.)*

But Mom, I'm Drawing Fractals!

Benoit Mandelbrot himself said he made his famous discovery while having "mindless fun," and geometers around the world have enjoyed creating their own fractals from simple sets of rules. So get curious and get creative! Fractals are out in the world to be seen and are living in your mind, waiting to be created.

In comics, mountains are often shown as triangles. Even a photograph of a mountain will often appear to be roughly triangular, but this triangle is rough because it is made up of many smaller triangles. These smaller triangles are rough because they are also made up of smaller ones, and so on.

On Snow

By Jonathan Swift

A Riddle

From Heaven I fall, though from earth I begin.
No lady alive can show such a skin.
I'm bright as angel, and light as a feather,
But heavy and dark, when you squeeze me together.
Though candor and truth in my aspect I bear,
Yet many poor creatures I help to insnare.
Though so much of Heaven appears in my make,
The foulest impressions I easily take.
My parents and I produce one another,
The mother the daughter, the daughter the mother.

Mysterious Cryptography

By Rane Anderson

Imagine you're standing in an old, quiet graveyard in England. Every dreary headstone looks the same—except one. The headstone displays the usual name and date but also has several strange, unreadable symbols carved into the stone. What could they mean?

This true-life mystery from the nineteenth century stumped everyone who saw the odd progression of symbols. It caught the attention of reporters and authors, mystifying many. Some people said the symbols were Greek letters. Others thought they might be Hebrew letters. But the truth was that only a select group, the Freemasons, could understand the inscription.

In the eighteenth century, Freemasons used the same symbols to create cryptographs, or coded messages. Afraid of persecution for their beliefs, they disguised their potentially dangerous ideas and records in secret ciphers. By using numbers, letters, and symbols to make ciphers, they sent and received messages nobody else could understand.

Ciphers

Unlike codes, where each word or message is replaced with another word or symbol, mathematics and patterns play large roles in creating ciphers. In a cipher, every letter in a message is replaced. Cipher makers use special procedures to jumble up plaintext—the letters that make up a correspondence prior to encryption—with different letters, words, numbers, or symbols. These procedures vary in difficulty. Can you identify the procedure used to create this simple cipher?

rekaerbedoc emosewa na ma i

You might have figured out that the plaintext reads, *I am an awesome codebreaker*. The procedure for this cipher included only one step: to write the message backwards.

A two-step procedure might look a little different. Can you figure out the difference?

reka erbe docemo sew ana mai

In the second step of this cipher, the letters are separated at different intervals.

These are simple examples, but ciphers today rely on complex mathematics to decrypt and encrypt—to convert into a scrambled message.

Mysterious Cryptography (*cont.*)

Cipher Machines

Computers now help us create sophisticated ciphers, but long ago, people had to rely on their wits alone to devise new and clever methods of making cryptographs. Eventually, this led to the invention of simple devices that could generate complicated ciphers.

Into the Future

Cryptography is a mighty tool that can be used for good and for bad. The techniques to encode messages have evolved over time, but the goals remain the same. Cryptographers strive to protect top-secret information from interception. They also need to intercept messages to prevent tragedies, such as wars and terrorism.

For the average person, cryptography remains behind the scenes. It's intertwined in the everyday tasks people complete online, on cell phones, and on other devices. But it is always there, thanks to the scholars and codebreakers who worked through the centuries to turn cryptography into what it is today.

Name:_____ Date:_____

Excerpt from *The Riddle of the Sphinx*

By Elsie Finnimore Buckley

In The Riddle of the Sphinx, *Oedipus (a king in Greek mythology) faces the sphinx to answer a riddle. If he tries to avoid her, she will kill the villagers. If he answers incorrectly, he will die. If he answers correctly, the Sphinx will leave them alone forever.*

"Oh, lady, I am come to hear thy famous riddle and answer it or die."

"Foolhardy manling, a dainty morsel the gods have sent this day, with thy fair young face and fresh young limbs."

And she licked her cruel lips.

Then Oedipus felt his blood boil within him, and he wished to slay her then and there; for she who had been the fairest of women was now the foulest of beasts, and he saw that by her cruelty and lust she had killed the woman's soul within her, and the soul of a beast had taken its place.

"Come, tell me thy famous riddle, foul Fury that thou art, that I may answer it and rid the land of this curse."

"At dawn it creeps on four legs; at noon it strides on two; at sunset and evening it totters on three. What is this thing, never the same, yet not many, but one?"

So she chanted slowly, and her eyes gleamed cruel and cold.

Then thought Oedipus within himself,

"Now or never must my learning and wit stand me in good stead, or in vain have I talked with the wisest of men and learnt the secrets of Phoenicia and Egypt."

Excerpt from *The Riddle of the Sphinx* (cont.)

And the gods who had given him understanding sent light into his heart, and boldly he answered, "What can this creature be but man, O Sphinx? For, a helpless babe at the dawn of life, he crawls on his hands and feet; at noontide he walks erect in the strength of his manhood; and at evening he supports his tottering limbs with a staff, the prop and stay of old age. Have I not answered aright and guessed thy famous riddle?"

Then with a loud cry of despair, and answering him never a word, the great beast sprang up from her seat on the rock and hurled herself over the precipice into the yawning gulf beneath. Far away across the plain, the people heard her cry, and they saw the flash of the sun on her brazen wings like a gleam of lightning in the summer sky. Thereupon, they sent up a great shout of joy to heaven and poured out from every gate into the open plain, and some raised Oedipus upon their shoulders and, with shouts and songs of triumph, bore him to the city. Then and there, they made him king with one accord, for the old king had left no son behind him, and who more fitted to rule over them than the slayer of the Sphinx and the saviour of their city?

Name:_____ Date:_____

STEM Careers: Enhancing Engineering

By Wendy Conklin

Imagine you owned a robot that could sense a human's mood and emotions. What if someday you lived on the moon—or better yet, Mars? Or if your favorite pet dies, you have it cloned so that you can have another pet *exactly* like it. If any of this intrigues you, you might want to consider becoming an engineer.

Engineering is the field of technology where people come up with new ideas, build them, and then test their ideas. While an engineer is not strictly a scientist, engineering has a lot to do with science. A scientist observes things and has theoretical ideas. Engineers build machines, structures such as bridges or roads, and systems found in video games and smart phones. Engineering is applying science to solve problems in our everyday lives. It's *doing* science, but engineering also involves math, design, psychology, and creativity.

Engineers design and build things such as driveways, computer software, and flying suits. But, to say that someone is an engineer doesn't give us a clear idea of what he or she does beyond designing and building. The designing and building process involves steps and takes time.

Engineers affect our everyday lives. For example, think about the features on a smart phone and how these features improve our lives. Engineers came up with these ideas. They built prototypes based on their ideas, and then they tested these ideas to see if they worked. Many times, engineers have to "go back to the drawing board" by changing their ideas or completely starting over. It becomes a trial-and-error process.

Technology and Engineering Go Hand in Hand

Some engineers work on solutions for the future. They know that the technology does not exist yet, but that doesn't stop them from inventing new ideas for products.

Think about the popular store IKEA. The company wants to design a table for the future that can serve many functions. Using a camera mounted above the table, the table would be able to recognize the types of foods placed on its surface. The camera would then project onto the table various recipes and cooking tips for using that food. To ensure accurate measurements, the table could weigh each ingredient. It would know how to cook the food appropriately, such as boiling or frying, and could even keep a coffee cup warm. Cooks would be able to browse recipes and record their own cooking sessions at this table.

STEM Careers: Enhancing Engineering (*cont.*)

To create this table, engineers have to develop brand-new technologies that don't exist today. This new table will affect the way people live in the future. It will affect future kitchen designs, and it will impact the types of foods we cook. The engineers are not only designing something new and interesting, they are changing how we live.

Engineering the Future

So, does technology advance engineers? Or do engineers advance technology? Perhaps engineering and technology help to advance each other. It is difficult to separate the two. It takes engineering to develop technology. Technology has to be there for engineers to use. So, the next time you pick up a phone, ride in a car, or turn on the lights, stop to reflect. Think about the technology, and consider all the work engineers do to make these things possible.

Name:_____ Date: _____

STEM: The Battle Between 2-D and 3-D

By Georgia Beth

Posie pops her gum loudly. "Any idea what we're doing here?" she asks the gray-haired stranger standing next to her.

It has been a weird morning, but something tells her that the unexpected late-night message is just the beginning. Before Zak can answer, billionaire Vikram Patel appears at the gates. "Posie! Zak! Come in! Thank you for accepting my mysterious invitation."

"It's not every day that I get a personal summons from the owner of Phenomtech," Posie replies.

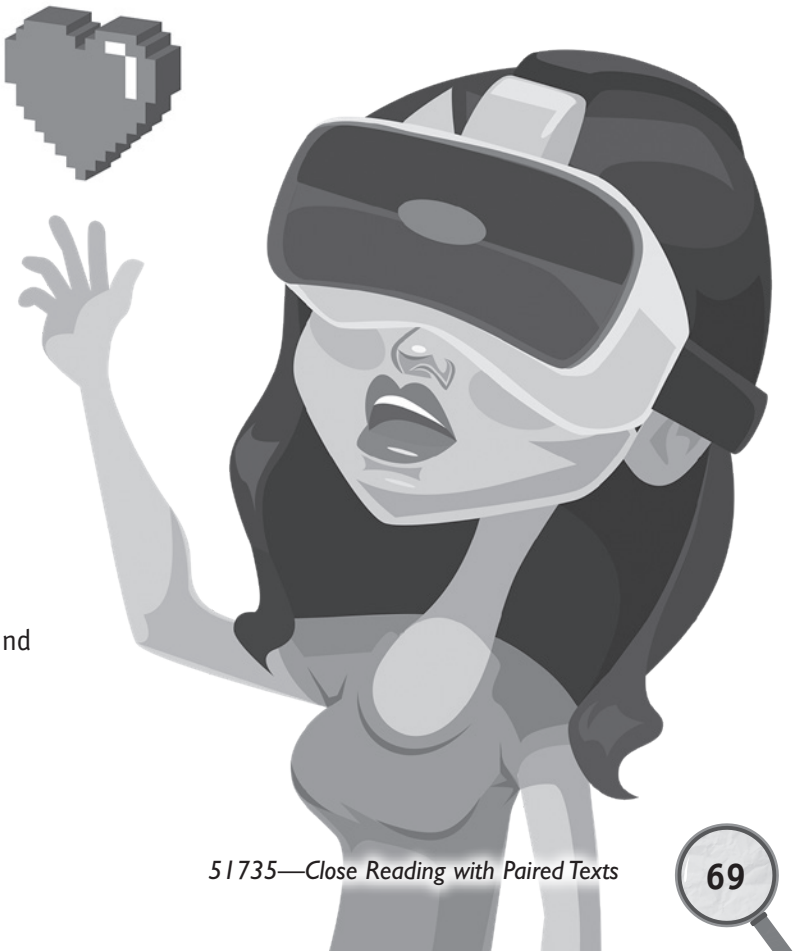
"I couldn't resist meeting the man who created *Org It*," Zak agrees.

Vikram waves the compliment away and ushers his guests into a large marble hallway. The space is elegant but sterile. "You may know me as the face of Phenomtech, but my passion is gaming."

He leads them deep into his mansion, revealing room after room filled with games. One room is dedicated to classic board games, and another room has arcade games from Tokyo. There are libraries of handheld games and other rooms with velvet-lined tables for playing. Posie nearly swallows her gum.

Vikram leads them down a long stairway to an underground amphitheater, where a small crowd of tech execs and gamers looks on. Zak and Posie take their places on the raised area at the center of the stage.

Then Vikram says, "Many of you know that I want to hire a new game designer—someone who can make Phenomtech the most popular gaming platform in the entire world. I think that this competition is the best way to interview Zak and Posie."



Interview? Posie's stomach starts doing flip-flops.

"Zak will create 2-D videogames, and Posie will work in 3-D virtual reality. There will be four rounds of competition, each focusing on a different shape. Whoever creates the best games will become the new Chief Designer at Phenomtech."

Visions of *Pacman* and *Sonic the Hedgehog* flash in Zak's head because his old favorites always come to mind whenever it is time to design a new game.

STEM: The Battle Between 2-D and 3-D *(cont.)*

Posie begins chewing her gum in slow motion, but her mind is moving at lightning speed. She silently vows to create something no one has ever imagined before.

"Do you accept this challenge?" Vikram asks Zak.

"I do."

"Do you accept this challenge?" Vikram asks Posie.

"I do."

"Then let the games begin!" he declares to the audience.

Marie Curie

By Elizabeth Cregan and Dona Herwick Rice

Marie Curie is one of the most brilliant, important, and revolutionary scientists the world has ever known. She transformed the way people look at the world of energy and the resources available to us. But in doing so, she paid the ultimate price. She worked daily with radioactive materials, long before anyone knew their dangers. She took detailed notes of her observations and experiments, as a good scientist does. Little did she know, her painstaking work was slowly killing her.

An Important Scientist

Curie spent her life studying energy called *radiation*. In fact, she invented the word *radioactive* to describe this energy. Her investigations and experiments helped other scientists understand how atoms work. Curie also learned many things that became instrumental in finding new ways to treat cancer.

Discovering Radium

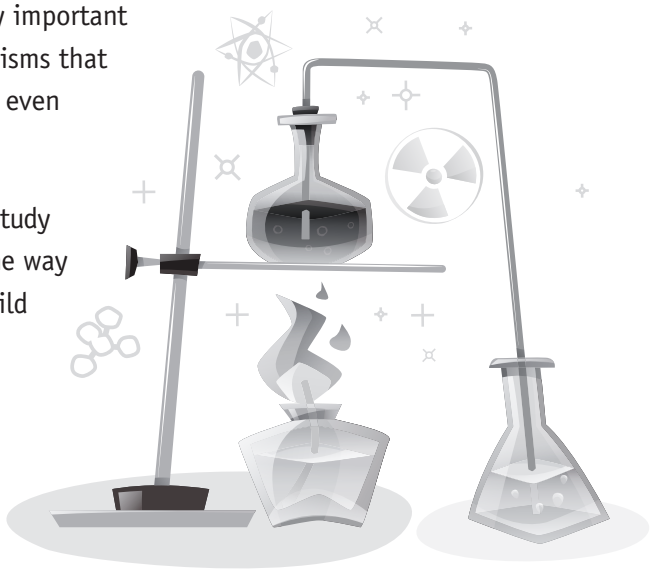
Curie suspected that the energy from uranium had to do with its atoms. Atoms are the basic building blocks that make up everything in the universe. Curie and her husband tested other elements to see if they generated radiation. This work led them to discover an element, which they named *radium*.

During this time, both scientists found themselves tired and losing weight. Their fingers were numb and burned. Perhaps they didn't realize that these symptoms were a result of handling radium. Some experts think the Curies knew radium would make them sick, but they ignored the dangers to continue their work.

The Final Years

Curie grew weaker and weaker from radiation sickness. Her eyesight was threatened, and finally, she became ill with cancer. In 1934, Curie died of the disease. The world mourned the loss of this great scientist.

But Curie had left a remarkable legacy. Her work led to many important findings, including the use of radiation to treat cancer, kill organisms that spoil food, find weaknesses in bridges, find smoke in homes, and even determine the age of dinosaur bones.



Because of Curie, there is also a new branch of science: the study of radioactivity. Her discovery of radium and its uses changed the way people think about matter and energy. Scientists continue to build on her work.

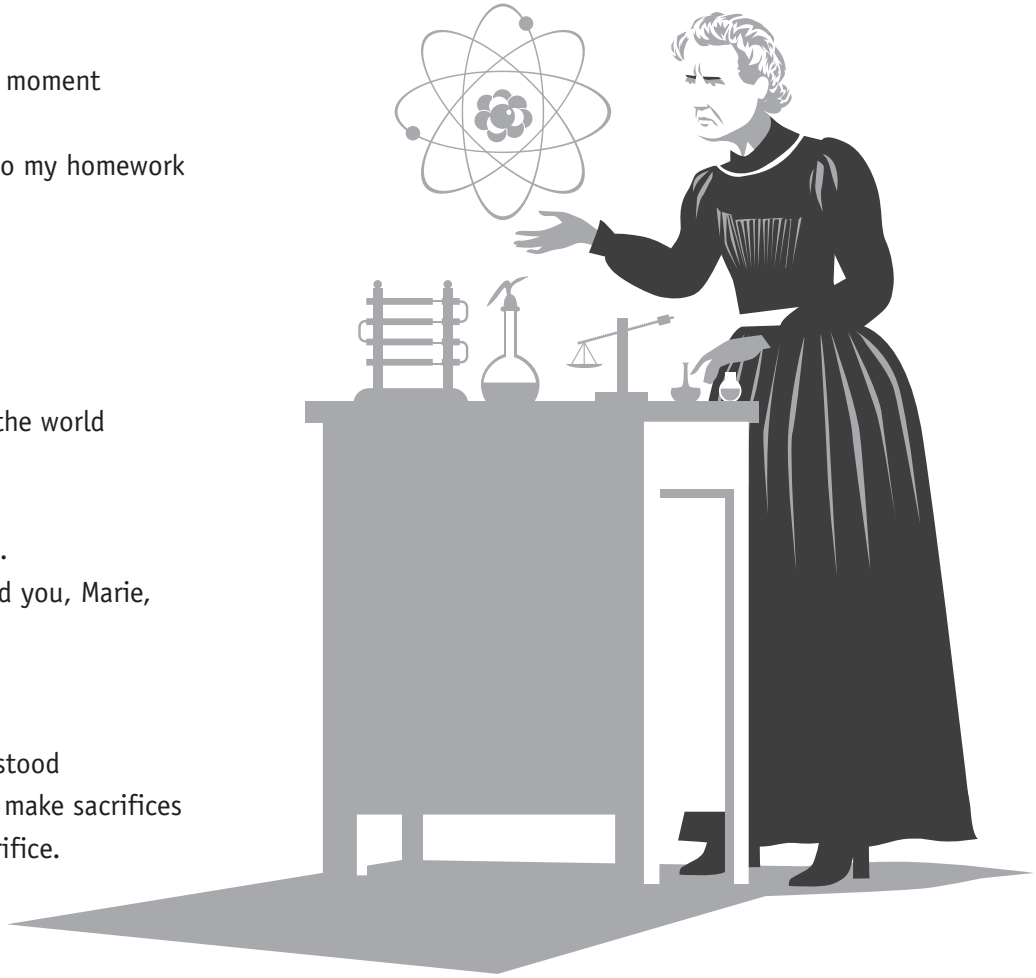
Curie was afraid her discoveries would be used to make weapons, and her fears were realized when the atomic bomb was made. But her work has also done great good in the world—and that's exactly what she hoped to do.

Name:_____ Date:_____

A Moment of Radiation

By Andrea Verde

I believe that it is plain to see
Upon this opinion, we can surely agree
Never before was there
or after will there ever be
A scientist as incredible as Marie Curie
What you did defies explanation
Entire life spent in radiation
At a time when working alone as a scientist
As a woman,
caused castigation
detestation
aggravation
But nevertheless, you showed determination.
I'll stop rhyming for a moment
In this moment
As I sit with my mother
Asleep, free from pain, for the moment
this moment
I have a moment to get back to my homework
Science
Radiation
You
I've been learning about you
The sacrifices you made
For science, for discovery, for the world
Right now,
in this moment
...for my mom.
The thing that eventually killed you, Marie,
has,
for the moment,
saved her life.
Radiation could only be understood
by someone willing to make sacrifices
In your case, the ultimate sacrifice.
Mom gets sick,
Well, more sick
A different sick,
From the treatments.
But she is getting better
because of radiation
because of discoveries you made
Your work as a scientist has helped so many people
But right now,
in this moment,
I only care about how
what you did
helped my mom.



Name:_____ Date:_____

The Power of Stress

By Wendy Conklin

You might hear your friends describe themselves as "stressed out," and you may sometimes feel that way, too. Stress is an unavoidable part of life, and it can come in many different forms. But have you ever thought of stress as a good thing? Think about it—everyone lives with low-level stress. You might have responsibilities such as mowing the lawn, finishing homework, or walking the dog. These small stressors of everyday life help you develop a sense of responsibility.

Stress can also set in because of deadlines—the nagging things that we have to complete by certain times. Deadlines help people get things done while also forcing people to solve problems and think creatively in a given amount of time. If we had all the time in the world, we might not get anything done, so sometimes stress is a good motivator. Remember that while some stress is normal, even helpful, it's important to ask for support if you are feeling overwhelmed.

Then, there's the stress that arises from a major life change. During these big life changes, such as changing schools or recovering from a serious illness, it's especially important to take care of yourself. You might also talk through your feelings with a trustworthy friend or adult.

Have you ever experienced an emergency that caused your heart to race and made you feel like you had superhuman strength? That was your adrenal gland producing a hormone called *adrenaline*. When you are under stress, your brain produces a variety of chemicals, including adrenaline, that go through the bloodstream to other parts of your body. Simultaneously, the adrenal glands also produce a hormone called *cortisol*. This gives your muscles and brain the energy to react as needed to the situation. When the stress ends, the cortisol travels back to the brain and tells it to stop producing the stress hormones. Then, your body is supposed to go back to normal.

For some people, however, this stress does not end. As a result, they experience health problems, such as panic attacks or trouble sleeping. It's important to learn to manage stress so that you don't experience the negative effects of it. Be sure to eat healthy foods, get enough sleep, exercise, and find healthy ways to relax, such as breathing techniques or meditation. If you still have trouble, be sure to talk to your doctor about your stress levels.

Good Morning

By Voiza Maxwell

Oh my gosh, what is that sound?
"Hey! Wake up! Come on down!"
Oh no! What time? What about my alarm!
"Power went out last night. What's that on your arm?"
Mom! Stop! I'm going to be late!
"Seriously, honey? It's not even eight."
But I have swim practice! This isn't right!
"Maybe you shouldn't have stayed up last night."
Ugh, Mom, leave me alone
"It's just that..."
Ack! Where is my phone?
"Sweetie, please, come have some eggs."
I'm not hungry
"What's that on your leg?"
It's nothing, Mom. I'm sorry, okay?
"They look like bruises..."
Mom, hey!
I don't feel great,
I can't find my phone,
I'm totally late,
The power went out,
No alarm went off,
I don't mean to shout!
Just please don't scoff,
I didn't get enough sleep,
My homework's not done,
My boyfriend's a creep,
I know I'm not the only one,
Who's ever overslept,
"But..."
Please, I'm not done,
I feel overwhelmed,
I might have to quit,
"You're not being yourself."
Now I have a new zit!
The bruises are from basketball,
With swimming and dancing, and one or two falls,
I'm doing a lot, and I know you're proud,
But most of the time,
I just feel stressed out.
"So...no eggs?"

March on Washington

By Torrey Maloof

Typically, the city streets are quiet in the early morning hours in Washington, DC, but that is not the case today, August 28, 1963. Buses are inundating the city at a feverish pace, and the smell of diesel exhaust is thick in the air as bus after bus heads to the heart of the nation's capital. These buses are carrying eager and committed citizens who want to do their part to make a difference. They don't want to witness history. They want to change history, and today they will.

African Americans aren't the only ones walking; there are white people, too. There are elderly people in wheelchairs and young children being pushed in strollers. People of all ages, ethnicities, and creeds have come together for this one extraordinary event. A sense of unity and excitement fills the air with each passing step.

Meeting at the Monument

Nearing the Washington Monument, it becomes virtually impossible to maneuver through the throng of people. Premade picket signs with writing demanding equal rights, decent housing, and more jobs are handed out among the crowd. An announcement is made stating that 90,000 people have arrived, and there are still more coming. Demonstrators roar with excitement, and the atmosphere becomes electric.

Time to March

The trek to the Lincoln Memorial is scheduled to begin at 11:30 a.m. and covers almost two miles. As they march, some groups sing hymns while others chant, "Freedom! Freedom!" Numerous civil rights leaders and activists take to the stage and orate on the importance of the fight for civil rights and equality.

Speaking for Change

To the side of the stage stands Dr. Martin Luther King Jr. Before he takes the podium, African American vocalist Mahalia Jackson sings. Her commanding voice carries an old slave spiritual to the masses. "I been 'buked and I been scorned / I'm gonna tell my Lord / When I get home / Just how long you've been treating me wrong." The wild cheering and chanting slowly die down as King begins to speak into the microphone.

At first when King speaks, he reads his words from a paper, but before long he discards his prepared words and speaks from his heart. His cadence grabs the crowd's full attention. He speaks for 17 minutes as he delivers his "I Have a Dream" speech.

The Washington Monument was completed in 1884.

March on Washington (cont.)

When we allow freedom to ring— when we let it ring from every city and every hamlet, from every state and every city, we will be able to speed up that day when all of God's children, black men and white men, Jews and Gentiles, Protestants and Catholics, will be able to join hands and sing in the words of the old Negro spiritual, "Free at last, Free at last, Great God a-mighty, We are free at last."

Reflection

The persuasive and powerful speeches given by the movement's greatest civil rights leaders have inspired and energized a nation to take action. Washington and the world at large will never be the same. The air is thick with hopes and dreams, and change is firmly planted on the horizon. The March on Washington for Jobs and Freedom has come to a triumphant culmination.

Name:_____ Date:_____

On Liberty and Slavery

by George Moses Horton

Alas! and am I born for this,
To wear this slavish chain?
Deprived of all created bliss,
Through hardship, toil, and pain!

How long have I in bondage lain,
And languished to be free!
Alas! and must I still complain—
Deprived of liberty.

Oh, Heaven! and is there no relief
This side the silent grave—
To soothe the pain--to quell the grief
And anguish of a slave?

Come, Liberty, thou cheerful sound,
Roll through my ravished ears!
Come, let my grief in joys be drowned,
And drive away my fears.

Say unto foul oppression, Cease:
Ye tyrants rage no more,
And let the joyful trump of peace,
Now bid the vassal soar.

Soar on the pinions of that dove
Which long has cooed for thee,
And breathed her notes from Afric's grove,
The sound of Liberty.

Oh, Liberty! thou golden prize,
So often sought by blood—
We crave thy sacred sun to rise,
The gift of nature's God!

Bid Slavery hide her haggard face,
And barbarism fly:
I scorn to see the sad disgrace
In which enslaved I lie.

Dear Liberty! upon thy breast,
I languish to respire;
And like the Swan upon her nest,
I'd to thy smiles retire.

Oh, blest asylum--heavenly balm!
Unto thy boughs I flee—
And in thy shades the storm shall calm,
With songs of Liberty!

Name:_____ Date:_____

Excerpt from *Address to Congress on Women's Suffrage*

By Carrie Chapman Catt

Do you realize that in no other country in the world with democratic tendencies is suffrage so completely denied as in a considerable number of our own states? There are thirteen black states where no suffrage for women exists, and fourteen others where suffrage for women is more limited than in many foreign countries.

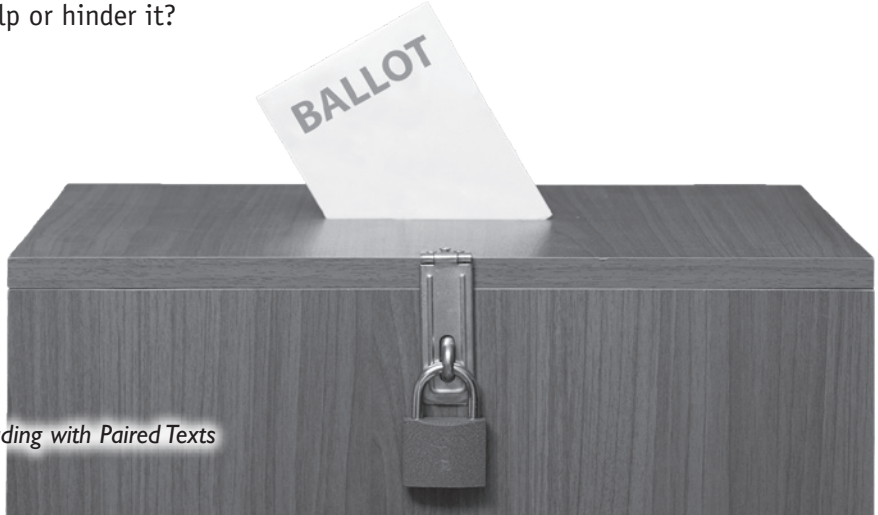
Do you realize that... you drive women of education, refinement, achievement, to beg men who cannot read for their political freedom? Do you realize that such anomalies as a college president asking her janitor to give her a vote are overstraining the patience and driving women to desperation? Do you realize that women in increasing numbers indignantly resent the long delay in their enfranchisement?

Your party platforms have pledged women suffrage. Then why not be honest, frank friends of our cause, adopt it in reality as your own, make it a party program, and "fight with us"? As a party measure, a measure of all parties, why not put the amendment through Congress and the legislatures? We shall all be better friends, we shall have a happier nation, we women will be free to support loyally the party of our choice, and we shall be far prouder of our history.

"There is one thing mightier than kings and armies"—aye, than Congresses and political parties—"the power of an idea when its time has come to move." The time for woman suffrage has come. The woman's hour has struck. If parties prefer to postpone action longer and thus do battle with this idea, they challenge the inevitable. The idea will not perish; the party which opposes it may. Every delay, every trick, every political dishonesty from now on will antagonize the women of the land more and more, and when the party or parties which have so delayed woman suffrage finally let it come, their sincerity will be doubted and their appeal to the new voters will be met with suspicion. This is the psychology of the situation. Can you afford the risk? Think it over.

Gentlemen, we hereby petition you, our only designated representatives, to redress our grievances by the immediate passage of the Federal Suffrage Amendment and to use your influence to secure its ratification in your own state, in order that the women of our nation may be endowed with political freedom before the next presidential election, and that our nation may resume its world leadership in democracy.

Woman suffrage is coming—you know it. Will you, Honorable Senators and Members of the House of Representatives, help or hinder it?



Introduction to *Are Women People?*

Are Women People? A Book of Rhymes for Suffrage Times

by Alice Duer Miller

Father, what is a Legislature?
A representative body elected by the people of the state.
Are women people?
No, my son, criminals, lunatics and women are not people.
Do legislators legislate for nothing?
Oh, no; they are paid a salary.
By whom?
By the people.
Are women people?
Of course, my son, just as much as men are.

Pearl Harbor

By Dona Herweck Rice

The sun rises over the calm and quiet United States Naval Base at Pearl Harbor on the island of O'ahu, Hawai'i. It is Sunday, and many of the military men and women are on leave for the weekend. Most offices and shops are closed. Still, the base hums as the military personnel stationed there go about their daily routines, whether servicing the vessels and planes that are critical to U.S. military strength or simply enjoying some much-deserved leisure.

The U.S. military is growing in strength, developing the means and training to protect and defend the nation it serves. Knowing that wars are being waged brutally in Europe and the Pacific, U.S. armed forces are prepared, despite the nation's desire to stay isolated from the wars that seemingly have little to do with its concerns. The military is ready to deploy if it needs to. But government leaders are clear: this is not America's war.

On this day, the necessary staff of sailors, soldiers, mechanics, nurses, and service people is at work bright and early, doing their duty for the country they serve. In the military, you can rely on people and systems operating as expected. It's fundamental and essential. The men and women at Pearl Harbor certainly know this to be true.

Except on this day—December 7, 1941—it isn't. An unexpected sound breaks through the familiar clangs and hums of the station. At 7:40 a.m., the swarm of bombers, torpedo planes, and fighter planes approach the island in the Pacific. The 183 aircrafts hide above a layer of clouds to approach O'ahu unseen. The massive, unexpected, and harrowing air strike begins.

The sky explodes! Bombs fall in a devastating firestorm. Just minutes later, the worst devastation comes not only in the destruction of aircraft and ships, but also in loss of life—loss in staggering numbers. A bomb designed to pierce armor is dropped from above and easily rips through the battleship *Arizona*. A massive amount of gunpowder ignites, shooting an explosive fireball through the ship and into the air. The United States ship (USS) *Arizona* is sunk within minutes, killing 1,177 sailors and marines. Many were trapped by both fire and sea. The devastation to the men and women of Pearl Harbor is severe. In all, more than 2,403 people die and more than 1,178 are wounded.

U.S.S. *Neosho* escapes Japanese attackers on December 7, 1941

In addition to the USS *Arizona*, the USS *Utah* and the USS *Oklahoma* were also destroyed. But every other struck vessel—even those that sunk—will eventually be lifted out of the water and repaired to sail again. In fact, many are instrumental in the eventual American defeat of the Japanese after many years of devastating war.

Name:_____ Date:_____

Pearl Harbor *(cont.)*

The United States was involved in the war until the very end. After atom bombs create unmatched devastation and loss of life in the Japanese cities of Hiroshima and Nagasaki in August 1945, the war comes to an end. The Japanese signed the surrender papers. The streets of the United States—and the base at Pearl Harbor—erupt in celebration.

It has been many years since the attack on Pearl Harbor. Millions of visitors pay tribute at the memorial each year, including countless Japanese tourists. In the end, the attack on Pearl Harbor proved devastating for all, Americans and Japanese alike. Peace between the nations has reigned since the last shots of the war were fired. Today, the nations are allies. But it is important that the lessons of Pearl Harbor and the war are never forgotten.

Name:_____ Date:_____

Excerpt from *The Guns of Bull Run*

by Joseph A. Altsheler

Harry did fall asleep after a while. He awoke before dawn. He found that there was already bustle and movement in the army about him. Fires were lighted farther back. An early but plentiful breakfast was cooked. All were up and ready. The sun rose over the Virginia fields.

"Another hot day," said Happy Tom. "The sun is as red as fire! And look how it burns on the water there."

"Hot it will be," Harry said to himself. They had eaten their breakfast. Now they lay once more among the trees. Harry searched with his eyes the bushes and thickets on the other side. He looked for their riflemen. Most of them were still invisible in the day. Then, the Southern brigades were ordered to lie down. They lay there some time. Then, Harry felt that the film of dust on the edge of the wind was growing stronger. They saw a great cloud of it rising above hills and trees. It was moving toward them.

"They are coming," said St. Clair. "In less than a half hour, they will be at the ford."

"But I doubt if they know what is waiting for them," said Harry.

The cloud of dust rapidly came nearer. Now they heard the beat of horses' feet. They heard the clank of artillery. Harry began to breathe hard. He and the other young officers walked up and down the lines of their company. All the Invincibles clearly saw that great plume of dust. They heard the ominous sounds that came with it. It was very near now. Suddenly, the fringe of forest on the far side of the river burst into flame. The hidden riflemen had opened fire. They were burning the front of the advancing army.

But the Northern men came steadily on. They were rousing the riflemen out of the bushes. Then, they appeared among the trees on the north side of Bull Run. It was a New York brigade led by Tyler. The moment their faces showed, there was a tremendous discharge from the Southern batteries masked in the wood. The crash was appalling. Harry shut his eyes for a moment. He did it to shut out the horror. He saw the entire front rank of the Northern force go down. Then, the Southern sharpshooters opened with their rifles. There were hundreds who lined the water's edge. A storm of lead crashed into the ranks of the hapless New Yorkers.

"Up, Invincibles!" cried Colonel Talbot. They began to fire. They loaded. They fired again into the attacking force. The force had walked into what was almost an ambush.

"They will never reach the ford!" shouted Happy Tom.

"Never!" Harry shouted back.