

ELA: Grade 5, Lesson 8, Electrifying Personalities: Thomas Edison

Lesson Focus: Thomas Edison’s contribution to the history of electricity; his life and inventions.

Practice Focus: Students will write plan for a presentation to demonstrate their knowledge of the history of the telephone.

Objective: Students will use *Electrifying Personalities: Thomas Edison* to learn about the history of electricity with a focus on the contributions of Thomas Edison, specifically, his invention of the lightbulb.

Academic Vocabulary:

- telegraph (reinforced from lesson 7)
- research laboratory
- phonograph
- filament
- generator

TN Standards: 5.RI.KID.1 / 5.RI.KID.2 / 5.RI.CS.4 / 5.RI.CS.5 / 5.W.TTP.3

Teacher Materials:

- Grade 5, Lesson 8 Teacher Packet
- Chart paper (or regular paper) for teacher graphic organizer
- Marker or highlighter

Student Materials:

- 2 pieces of paper
- pen or pencil
- marker or highlighter (if available)

Teacher Do	Students Do
<p><u>Opening</u> (1 min)</p> <p>Hello! Welcome to Tennessee’s At Home Learning Series for literacy! Today’s lesson is for all our 5th graders out there, though everyone is welcome to tune in. This lesson is the third in this series.</p> <p>My name is ____ and I’m a ____ grade teacher in Tennessee schools. I’m so excited to be your teacher for this lesson! Welcome to my virtual classroom!</p> <p>If you didn’t see our previous lessons, you can find them on www.tn.gov/education. You can still tune in to today’s lesson if you haven’t seen any of our others.</p> <p>Today we will be learning about someone that changed the history of human communication! But before we get started, and to participate fully in our lesson today, you will need:</p> <ul style="list-style-type: none">• 2 pieces of paper• something to write with and a flat surface to write on• a highlighter or marker if you have one around, if not, your pen or pencil will do just fine.	<p>Students gather materials for the lesson and prepare to engage with the lesson’s content.</p>

<p>I'll give you a few moments to get prepared for our time together! [slight pause].</p> <p>Ok, let's begin!</p>	
<p><u>Intro</u> (5 min.)</p> <p>I would LOVE to hear what you think of electricity now! Particularly since we've spent the last two lessons learning how totally <u>COOL</u> electricity is...and how our lives are impacted by it each and every day! Without it: no TV, no phones, no...well, think! NO to a lot! Remember our list from lesson 1, of all the things in our home that depend on electricity? I'm sure you remember how much I'd croak without my morning cup of coffee! What we've been finding out is that, thank heavens, there have been scientists and inventors in our past that have found electricity exciting enough to use it in ways that make our lives easier, quicker, better.</p> <p>Since that was a really fun way to get us started before, let's try something sort of like it again. But, this time, I want you to get your pen or pencil ready, hold it right over your paper so that you can mark on it easily. Now, get your pen or pencil <u>right</u> over your paper. Ready? [pause]. Okay, I want you to take a count of all the lightbulbs in your home – do this right there and just count in your head. Make a mark on your paper for each lightbulb you count. Keep moving in your head from room to room. Count lightbulbs in the ceiling and in every lamp. Oh, and don't forget the lightbulbs that light up your oven, your microwave, and your refrigerator! [pause and act like you are counting in your head too, make pretend marks on your paper]. Don't give up, you got this! [pause]. Alright, I think I'm about done, what about you? I can't think of any more, but will probably notice them later and need to add another mark to my list. So, total up your marks. [pause]. How many did you get? [pause]. Whoa! Can you believe there are <u>that</u> many lightbulbs in just one home? Imagine if I asked you to count all of the lightbulbs in your school, your neighborhood, your town, or even your state! I don't think you'd have enough paper...but, most importantly, I think your arm would wear out first!</p> <p>[The following section is intended to review the previous lesson: beginning with a check-in on the independent practice assignment, moving to key ideas and takeaways from the reading, and then connecting and transitioning to today's focus on Thomas Edison].</p>	<p>Students engage in an activity to create interest in today's focus on the invention of the lightbulb.</p> <p>Students recall learning from previous lessons and review the information from their lesson one graphic organizer.</p>

But, before we really dig into today's lesson, I want to check in on what we learned about in our last lesson, and I am especially excited to find out how your presentation for the *next generation phone* went? What did your boss and the development team think about your knowledge of Alexander Graham Bell and how his life experiences led him to invent the first telephone? What about all you knew about telephones since then? Did they like your new *improvement* ideas...how you're able to build upon others ideas? What about your prototype drawing! I Well, I'm sure they loved it and bet they already have plans in the works for it to be the hot new item on everyone's list! Let me know when it's available and I'll go check it out! ☺

So, speaking of telephones, in our last lesson we found out that the inventor himself, Mr. Alexander Graham Bell, was such an interesting human! He was born into a very talented family and grew up surrounded by people that encouraged him to learn and discover. Even at a young age, Bell found himself fascinated by the human voice and human communication, especially *speech*. Do you remember that word? What does *speech* mean? [pause]. Right! We said it was like the word *speak* and it means *the sounds we make when we communicate*. He had a dream to one day be able to connect his love for both speech AND electricity. And, he did, right? He invented one of the most famous devices of all time: the telephone!

So, let's not forget, this time period was called the, what? Yes, the Electrical Age, right around the late 1800s and early 1900s. Inventors were inventing like crazy and Bell was one of many. But, Bell was also one of just a few that made inventions that forever changed the way the world worked. Do you still have your organizer from our first lesson on electricity? The one that we wrote the word electricity really big, in the middle of our paper? I'll give you a moment to find yours while I find mine too. [pause]. Found it! Here is mine. Remember it now? [show your organizer from lesson 6]. Great! Now let's see, I remember we wrote down the names of three very important inventors from this time period, the Electrical Age, remember? And yes, we used this list to start a deep dive into the first inventor: Alexander Graham Bell. So...I'm thinking it makes sense to move on to the next inventor in line. Let's find out what's so cool about Thomas Edison. I see here that he invented the lightbulb [point to Thomas Edison, lightbulb on your organizer]. Awesome! Lightbulbs are pretty important if you ask me!

<p>So, I'm wondering:</p> <ul style="list-style-type: none"> • What drove Edison to invent something like the lightbulb? I mean, that's a really important invention. • What were his influences along the way? • Like Bell, how did he get from the simple electric circuit to a lightbulb...that lights up? • Were there other things that Edison invented? <p>Okay! So, now I'm really curious <i>and</i> ready to head into the text to find out. I'm going to read about this next important inventor, Thomas Edison, and I want you to listen closely as I read. I'm very interested to know, not just what led to his inventing the lightbulb, but also how his life and experiences mirror those of Alexander Graham Bell. Ready? Let's get going!</p>	
<p>Teacher Model/Read-Aloud (18 min.)</p> <p>Thomas Alva Edison 1847-1931</p> <ul style="list-style-type: none"> • That's interesting! In our last lesson, we learned that Alexander Graham Bell was also born in 1847, same year! It looks like Edison lived a bit longer though, to the age of 84. Wow - that's a long life full of inventing.! Here's a picture of Edison when he was a young man. [show image L8-A]. I wonder if he was inventing at this age? Hmm... [pause]. Let's read on to find out. <p>Thomas Alva Edison was born on February 11, 1847, in Milan, Ohio. He was the youngest of seven children, three of whom died when they were young. Because Edison was so much younger than his brother and sisters, he was sometimes lonely.</p> <ul style="list-style-type: none"> • This sparks something that I remember learning about Bell. Do you remember? [pause]. Yes, you're right! Bell also had siblings that died, two brothers. That would be so hard to lose a brother or a sister when you're a kid! <p>When he was seven, his family moved to Port Huron, Michigan. Edison caught a disease called Scarlet Fever, which destroyed most of his hearing.</p> <ul style="list-style-type: none"> • So, it's important for us to remember that Edison was living at a time, almost 150 years ago, when modern medicine wasn't what it is today. Many people died 	<p>Students will learn about the life and inventions of Thomas Edison and capture this information on a teacher-led graphic organizer.</p> <p>Throughout, students will:</p> <ul style="list-style-type: none"> • be probed to think about how his path was paved with influences and experiences that led to the invention of the lightbulb. • Consider how his life experiences and work experiences are similar to those of Alexander Graham Bell.

or were left with physical problems from illnesses that no one had found a cure for yet. Scarlet Fever was one of them. It caused people to have a really high fever that damaged their hearing. That's what happened to Thomas Edison. How do you think that might have changed his life? Remember, he was only seven years old. [pause]. Yes, I can imagine that he had to learn new ways to live with this new challenge.

- So, again, I'm connecting this new information with something we learned about Alexander Graham Bell's father, something he invented...do you remember? [pause]. Right! Bell's father invented a code called Visible Speech. Do you remember what it was used for? [pause]. You got it! It was used to help people that were deaf, or couldn't hear, learn how to speak. I wonder if losing most of his hearing at just seven years old changed the way Edison spoke? I believe this is something I'm going to want to research after today's lesson. What about you?
- Yes, you are right there with me! I can tell you are thinking that it's about time for us to start ourselves an organizer. You're right, we're already learning some important information about Edison and don't want to too far along and possibly forget it.
- So, grab a piece of clean paper. Let's give ourselves a header at the top: *Thomas Edison*. I'm going to write mine in all capital letters, like this. Feel free to use your marker or highlighter if you'd like it to stand out. [model starting your organizer with the header: *THOMAS EDISON*].
- Alright, let's dive back into the text!

Edison developed a keen interest in the world and a curiosity about everything around him. This curiosity sometimes got him into trouble at school. His teacher often grew angry with Edison's endless stream of questions. Edison's mother took him out of school and taught him at home. It was at this time that young Edison began to conduct simple scientific experiments—a habit that would last a lifetime.

- Yep, I can see what you're thinking! Who does this remind you of? [pause]. Right! Bell! So, let's think about this. We said that Bell also had trouble at school and his mother ended up teaching him at home. Hmm...that's very interesting! Why do you think that both Bell and Edison weren't very good students, but instead found themselves fascinated

with the world around them? [pause]. I agree. Let me reread this part: *"This curiosity sometimes got him into trouble at school. His teacher often grew angry with Edison's endless stream of questions."* What do you think when you hear this phrase: *endless stream of questions*? [pause]. I'm thinking that young Thomas Edison had tons and tons of questions. Like, Bell, I believe he probably had more questions than the teacher could answer. Can you imagine trying to teach someone that kept asking you questions?!

- Let's go ahead and add this to our organizer. I'm going to add that Edison got into trouble at school and ended up being home-schooled by his mother. I'm also going to add that he had lots of questions. Go ahead and add it to yours. [model adding to your organizer: *trouble in school, home-schooled by mom, and lots of QUESTIONS*].
- Now, back to our text!

When Edison was 12 years old, his father's business began to fail. To help his family, Edison sold newspapers and refreshments on a train that came through Port Huron. Whenever he could, he read books or conducted his own experiments.

- So, Edison was already working at 12! It seems like he had to, right? Because his father's business wasn't going well. What do you think he learned from having to work at this age? [pause]. I agree, he likely learned that it took much more to support a family than he realized. I'm guessing this also helped him to understand the value of hard work much more than he did before. Do you think working at such a young age might impact his life moving forward? How? [pause]. I'm thinking it just might, as well.
- This seems like something we'll want to remember later. Let's add it to our organizer, too. I'm going to add that Edison started work at the age of 12. [model adding to your organizer: *started work at age 12*].
- Okay...back in!

[Edison] had become interested in the telegraph and had built one of his own.

- Wait a minute, wait a minute! The telegraph? In our last lesson, we learned about the telegraph. We learned that Bell invented it. Do you remember what the telegraph did? [Pause]. Good job remembering!

The telegraph was the first machine that allowed people to send messages electrically over wires.

- So, let's think about this. We've been talking about how this was a time in history where inventors were experimenting and working hard for lots of reasons, and one reason was to invent the next, best thing before someone else did! Well, since we know that Bell was the one that invented the telegraph, what do you think it means that Edison "*became interested in it* and even *built one of his own*"? [pause]. Yes! We already know that Edison was a very curious human being, and this curiosity led him to want to know more about Bell's telegraph. Can't you see him...hunched over a telegraph investigating each piece and part! Of course, it wouldn't satisfy him to just understand how it worked, rather he felt compelled to make one of his own! Inventors...always making something!
- This is some cool stuff for our organizer! Let's add it. I'm going to write that Edison built his own telegraph, but he didn't invent it, right...that was Alexander Graham Bell. [model adding to your organizer: *built his own telegraph (AGB invented it)*].
- Before we move on, let's dive into this one sentence: "*[Edison] had become interested in the telegraph and had built one of his own.*" It tells us a lot about Edison, but we have to make some guesses here. What knowledge do you think Edison would have to have to be able to understand how a telegraph works and how to build one of his own? I'll give you a little help...go back and look over your organizers from our last two lessons. Take a moment and jot you're your answer. [pause as students write down answer]. Okay, first, I'm thinking that Edison would have to know a lot about electricity! The text doesn't tell us much about how he knew what he knew, but I'm pretty sure he would have to know how an electric circuit works, about transmitters and receivers, and how sound could travel along a wire through vibrations. I'm sure he'd have to know a lot more, too!

When the Civil War broke out, he had a chance to put his knowledge to work. In 1862, there was a battle in Shiloh, Tennessee, in which more than 20,000 men were killed or injured. Edison convinced the telegraph operator at the train station to send an advance message about the battle to all the stops along the train line.

- Remember, this is 1862 and the Civil War broke out right during the Electrical Age when Bell, Edison and others are inventing electrical devices.
- Why do you think the skills of people like Edison would be important during this time of war? [pause]. Sure! The skills of people who understood how electricity worked and the devices that used electricity to send signals, were very valuable. As we just learned about Edison, his knowledge of the how a telegraph worked changed the outcome of a battle...something as simple as sending an advance message!
- Yep, good info for our organizer, right under the information we just added about Edison building his own telegraph. Let's write that Edison helped during the Civil War. We need to say that it was an advanced message through telegraph. [model adding to your organizer: *helped during Civil War, advanced message through telegraph*]. We also need to be sure and remember what was so different here...Edison knew to send a telegraph message, but not just any message...an advanced message! One that got there before any bad stuff could happen. Let's underline the word *advanced*. [model underlining *advanced*].
- Cool! He really had to understand how telegraphs worked. Back in the text!

When Edison was 16, he became a "tramp telegrapher." He traveled throughout the country looking for the highest-paying telegraph work he could find. In 1868, he wound up in Boston, Massachusetts, working for the Western Union telegraph company. Throughout this period, he continued to do experiments and work on inventions.

- That's a cool term for someone that's looking for the highest-paying telegraph job.
- So, we see that Edison is now working, right. Holding down a job to pay the bills, like everyone else. But notice that the text said that "*he continued to do experiments and work on inventions.*" Why do you think so? [pause]. I agree! Experimenting and inventing were things that he loved to do. They probably didn't feel like work to him, so even though he might've been working long hours for the Western Union telegraph company, he still found time to do what he loved. What about you...is there something you love to do that doesn't feel like work? [pause].
- Let's keep reading!

“The Wizard of Menlo Park”

Young Edison moved to Newark, New Jersey, in 1870. There he started a company that made stock tickers.

- Ah...so, Edison decided to start his own company! But, a company that made, what? Stock tickers? What are stock tickers? I don't have a clue! Let's look at a picture of one. [show image: L8-B]. Wow! That's and interesting machine!
- Let's get back to reading so we can find out what it does.

These machines transmitted (or sent) the latest stock prices by telegraph and printed them on long strips of paper tape. Edison was paid a great deal of money to find a way to improve the machines.

- Well, I find it interesting that after all this time, Edison is still finding ways to make the telegraph, Bell's original invention, even better. Again, evidence that inventors build upon one another's ideas!
- Hmmm...we just learned that the stock ticker business made Edison lots of money. Think back to him as a 12-year-old boy. What was he doing then? [pause]. Right! He was working selling newspapers and refreshments on a train because his father's business was failing. How do you think Edison felt about his hard work being rewarded with all this money? [pause]. Sure! Remember, he values hard work and is probably happy to see it finally paying off in the form of his paycheck!
- I want this to go on our organizer! Let's add that Edison started his own business selling stock tickers, or a type of telegraph. Let's also add that it made him lots of money. [model adding to your organizer: *started his own business selling stock tickers (a type of telegraph)*].
- Whew! What else is this guy going to figure out he can do with a telegraph?

In 1874, Edison invented a telegraph that could send four messages at once.

- Whoa! I wasn't prepared for that. Were you? Four messages at once! Think about this just a minute. How is this different from what we know about previous telegraphs; like Bell's telegraph? [pause]. Hmmm...let's find out if you're right!

Up until then, telegraphs had been able to send only one message at a time.

- Right on - you got it! Previous versions of the telegraph only sent one message at a time. So, this was a big improvement.
- Absolutely! Let's put this on our organizer right now! Let's do this in a similar fashion to how we did it with Alexander Graham Bell. Let's create ourselves a sub-header called **INVENTIONS**. All in caps, like this.
[model adding sub-header to your organizer: *INVENTIONS*]. Now, let's add Edison's invention right underneath: **Telegraph that sent four messages at once**. [model adding to your organizer: *Telegraph that sent four messages at once*].

This machine, the telegraph the sent four messages at once, helped Edison establish a reputation as an important telegraphic inventor.

- What do you think it means to "*establish a reputation*"? [pause]. Yep, it just means that after this invention, people thought of him as someone that really knew his stuff when it came to telegraphs. He was the bomb and his hard work was paying off!

In 1876, Edison moved his company to Menlo Park, New Jersey, where he created a research laboratory.

- Wow, a real research laboratory! A place where scientists and inventors experiment. How cool. Do you want to see a picture of Edison's research laboratory at Menlo Park? Okay, look at this! [show image: L8-C]. Isn't this a totally neat place! Look at all the stuff! Look at how many bottles are in that place! Wonder what's in them? Hmmm...?
- I'm going to quickly add Menlo Park Research Laboratory to our organizer. You do it quickly too.
[model adding to your organizer: *Menlo Park Research Laboratory*].

There he found himself in a race with Alexander Graham Bell to perfect the "speaking telegraph," or telephone.

- Wait a minute now...a race? And with Alexander Graham Bell? I thought Edison was just a telegraph guy.
- And why a race? Does this mean that both of them are working on the same invention? I think this means that they are both trying to invent the "speaking telegraph:" the telephone?

- Hmmmm...? Well, if it's a race, then someone usually wins, right? Who do you think it will be? Let's find out!

Edison lost the race, with Bell's design becoming the standard. However, in 1877, Edison and his research staff made improvements on Bell's telephone. They invented a transmitter that made voices sent through wires louder and clearer.

- Ahhh, did you guess correctly? Edison lost the race to Bell. But, I noticed that it says that Bell's telephone became the *standard*. What do you think that means? [pause]. Yes, that Bell's phone became the one that most people used.
- However, Edison and his research crew weren't down for the count! They kept on pushing until, what? [pause]. Yes! They made improvements to Bell's telephone. What improvements did they make? [pause]. Right, they made the sounds that came through the transmitter louder and clearer. Isn't that cool that that they didn't feel the need to start over from scratch, but to take what Bell had already developed and just make it better. So cool!
- Let's hang here for just a second and see if we can remember what that word, *transmitter*, means. We learned about it in our last lesson when Bell and his assistant were working on the telegraph. Do you remember? [pause]. You got it! A transmitter is an electronic device that sends a signal. And likewise, a *receiver* is an electronic device that receives, or detects a signal. Good memory!
- This is some really interesting information! I'm with you and think we need to add it to our organizer. Ready? Alright, let's think. We definitely want to add that Bell and Edison raced to invent the telephone. [model adding to your organizer: *Bell and Edison race to invent telephone*]. And we don't want to leave out that Edison lost, but made improvements to make voices come through louder and clearer. [model adding to your organizer: improvements for louder and clearer voices].
- Great! Got to keep going!

Life at the lab moved at a fast pace. Edison worked hard and expected his employees to do the same. That hard work paid off. Edison and his team made the first recording of the human voice with a machine called a phonograph. His

inventions earned him the nickname “the Wizard of Menlo Park.”

- We’ve been learning that Edison really values hard work and this is just another example!
- So, what did we just learn that Edison and his team did that was so cool? [pause]. Yes! They made the very first recording of the human voice. Think about that a minute. Up until then, no human voice had ever been recorded, ever! This was amazing! Okay, so what did the text say they use to make this recording? [pause]. Exactly! They use a machine called a phonograph.
- You’re right, we need to add this to our organizer under INVENTIONS. I’m going to write the word *phonograph* and then *records human voice*. [model adding to your organizer: *phonograph: records human voice*].
- Of course, this must have seemed like magic to some people, don’t you think? To hear someone’s voice come out of a machine. We wouldn’t think anything of it today, but remember, this had never happened before! I think it’s safe to say that his nickname, *The Wizard of Menlo Park* was perfect because I’m sure to many, he seemed like a great sort of Wizard that could do magic with electricity! Let’s take a look at a picture of Thomas Edison, the Wizard of Menlo Park, and his prized invention, the phonograph. [show image L8-D].
- I’m not sure if he can top this invention, but let’s see!

A Bright Idea

Although gas lamps had been in use since the late 18th century, most of the world still shut down when darkness fell. In the 1840s, people began to experiment with electric light.

- Hmm...Why do you think people at this time in history felt the need to experiment with light? Why were they not happy with what they had, like candle light and gas-lamp light? [pause]. I’m guessing some people were content to keep using gas lamps and candles. But just knowing that electric light was a possibility would make anyone curious. Don’t you think? Just to see if electric light might be able to replace candles and gas lamps. Could it be easier, cheaper, more efficient? Who knows, but it might be worth trying.

- Do you have any clue where Edison might be headed with his inventions? [pause]. Let's keep reading to find out.

The idea was to have an electric current pass through a filament and heat it so that it gave off light.

- Whoa! What is this filament thing? Let's write it down on our organizer. [model adding to your organizer: filament]. Now, let's see if we can find out what a filament is.

Inventors tried filaments of paper and other substances. None of them lasted long, even in a glass bulb from which nearly all the air had been pumped out.

- How cool! Sound like anything you know of? Anything coming to mind? Hmmm...?

In 1879, Edison and his team began experimenting with filaments. In October 1879, they got a lightbulb to burn at the Menlo Park lab for an entire day. The next one glowed for 40 hours straight! Soon, Edison put bulbs all over the lab and his house. People came from all over to see this miracle of electricity.

- Okay, I think we got it! I'm going to give you a short definition for filament so we can talk about the other cool stuff we just read about. So quickly, beside the word filament, I want you to write: *something thin in a lightbulb that glows when electricity passes through it*. [model adding to your organizer: *something thin in a lightbulb that glows when electricity passes through it*]. Can you see that little thin wire in a light bulb? How interesting they tried to use paper once upon a time.
- So, it's 1879, Edison was 32 years old, and he did it! He and his team invented electric light contained in a glass bulb! How cool – can you imagine their excitement? On our organizer under INVENTIONS, for sure, I'm going to add lightbulb. [model adding to your organizer: lightbulb].
- Why do you think people from all over came to see Edison's lightbulb burn? [pause]. I agree! The Wizard was up to his magic again! ☺ This invention was unbelievable and people just had to see it for themselves.

Homes and businesses at that time did not have the electricity to power electric lights. Edison knew that his

lightbulb would never be more than a curiosity unless he figured out how to make electricity widely available.

- Let's think about that for a minute. Why do you think homes and businesses at that time didn't have the electricity to power, or run, electric lights? Why not? [pause]. Right! At this time, homes and businesses primarily used gas lamps for light. They were not wired for electrical lighting. There were no electrical wires coming to or even built within their walls. That really poses a problem if you're wanting lightbulbs!

Edison had an idea. He went to New York City to design an electric power station and his team worked out a way to supply electricity to a large area. They built an enormous generator, a device that made electricity.

- Let's quickly add *generator* to our organizer. [model adding to your organizer: generator: a device that makes electricity].

They ran cable into the city for the electricity to flow through. Then on September 4, 1882, power began to flow from the Edison Electrical Light Company to its first few customers. It worked! Lights went on as planned. A new electrical age had begun.

- So, cable, huh!? Think back to our little activity from the beginning of our lesson. Remember, I asked you to count all of the lightbulbs in your home. Now, think about how electricity gets to all of those lightbulbs in your house. What is outside of your home, down your street? [pause]. Right! Big, thick wires called cables. That's how you get electricity into your home, but way before now, Thomas Edison thought this might work. And, it did! Let's add the word cable to our organizer, like this. [model adding to your organizer: cable].
- Don't you think it's interesting that there were only just a few customers at first? [pause]. I'm guessing that not everyone could afford to have everything it took to have electric lights in their home or business. Not to mention, there were probably some people that still weren't impressed enough and were just happy to stick with their gas lamps.
- Why do you think the text says "new electrical age"? [pause]. This invention, similar to Bell's invention of the telephone, had changed everything!

It took some time before Edison's ideas really caught on. When they did, however, people began working, reading, and writing into the night under Edison's lights. Edison's invention of a long-lasting electric light was an amazing accomplishment. He had turned an idea into a valuable product.

- So, it looks like it caught on after all! Isn't it interesting to think of a time that people weren't sure if they wanted electric lights or not? That seems so strange to us now!
- What do you think it means by Edison had "*turned an idea into a valuable product*"? [pause]. Right, what was once just an idea in Edison's Menlo Park research laboratory actually ended up being something that people wanted and would gladly pay for. It had value! Look around you, everything you see was once just an idea until someone decided to try it out. And many people after that decided to try and make it better and better.
- Would you like to see a photo of Edison with one of his lightbulbs? Here you go! [show image L8-E]. Here, Edison is in his Menlo Park research laboratory. Can you see the bulb he's holding? And the one beside him on the table? Wow! They are so much bigger than the ones we have today.
- I'm curious to know what life was like for Edison after such an important invention. Let's read some more.

Despite his success and the fact that he was now deaf, Edison began working again on his phonograph. Although early phonographs did not require electricity to work, more modern and sophisticated versions did.

- Deaf? Oh, yes. Remember, most of Edison's hearing was destroyed when he was a child, from an illness called Scarlet Fever. I'm guessing that the older he got, the more of it he lost.
- I find it interesting that, after all this time, he went back to his phonograph. Maybe this was connected to his desire to hear since he was now deaf? Maybe going back to an old invention felt nice, like visiting an old friend. But this time, he wanted to see if he could make it run using electricity. I'm thinking this might be something else I'd like to research after today's lesson and I hope you do too! Let's look at a picture of Edison, later in life, with one of his phonographs. [show image L8-F].

<p>Edison's pace did not slow down as he grew older. Although he was now wealthy and famous, he continued to work and invent. He designed car batteries for the Ford Motor Company. He experimented with early movies. He was active right up to his death on October 18, 1931.</p> <ul style="list-style-type: none"> Remember, we wrote down that he was 84 when he passed away. That's a long life! <p>After he died, President Herbert Hoover requested that homes and businesses across the country dim their lights for one minute to honor Edison. Parts of the country were almost completely dark for that minute. Even the torch on the Statue of Liberty was dark in tribute to a man who had truly lit up the world.</p> <ul style="list-style-type: none"> What a fitting way to say good-bye to the man that invented the lightbulb! Do you recall that Alexander Graham Bell was honored in a very similar way? Telephone service all across Canada and the United States stopped for one minute. Why do you think the world felt the need to honor both Bell and Edison in such a big way? [pause]. Yes, I think so, too. Both of these men spent their lifetimes striving to invent things that would make the world a better, and brighter, place. Their inventions changed the course of science <u>and</u> history! 	
<p>Guided Practice (5 min.)</p> <p>Now, let's put our brains together and get you ready for your independent practice.</p> <p>Look over all of your notes on your organizer. [pause and begin looking over your organizer, then read the following script as you orally review your notes]</p> <ul style="list-style-type: none"> I see that Thomas Edison was born the same year as Alexander Graham Bell which means they both lived, worked, and invented during the Electrical Age. I also notice, like Bell, that Edison had three siblings die, and he even lost most of his hearing as a young boy when he battled an illness called Scarlet Fever. And, yes, just like Bell, Edison was not a good student and was known to ask so many questions of his teachers that his mother decided to school him at home. 	<p>Students will engage in a review of facts and information recorded on their organizer.</p>

- We found out that Edison had to start work at the age of 12 because his father's business wasn't doing well.
- But, this only made him stronger, for soon he was tinkering with Bell's invention, the telegraph, and even made his own.
- This telegraph thing followed him for quite a while and really give him the opportunity to show others how intelligent he was. For example, we wrote down that Edison even helped during the Civil War by showing a train conductor how to send advanced messages.
- Of course, we knew it wouldn't take long for Edison to start his own business: remember stock tickers? That was an interesting machine!
- He ended up creating an amazing research laboratory where he and his team worked to experiment and invent as much as possible. He was even nicknamed, The Wizard of Menlo Park.
- But most importantly, we discovered that Edison invented some cool stuff: a telegraph that could send four messages at once, the phonograph that was the first device to record the human voice, and of course, the lightbulb!

Like Alexander Graham Bell, Thomas Edison had an interesting life, full of challenges, lots of hard work, and some great accomplishments. He was a curious child that grew into a curious adult. He continued to think about ways that he could build upon the ideas of others, including his colleague, Bell! Let's take some time to think about the path that led Edison to his famous invention: the lightbulb.

Grab a piece of paper and jot down your thoughts as I ask you a few guiding questions.

- What do you think were Thomas Edison's earliest influences? In other words, what were the things in his life as a young boy that may have driven him to a life of experimentation and invention? [pause].
- What were some of the experiences that challenged him and made him want to work harder? [pause].
- What were some of the experiences he had along the way that kept him curious, wanting to know more? [pause].
- How does each of his inventions prove that he was driven to build upon the ideas of other inventors of his time? [pause].

Students will write short responses to the guiding questions to more deeply think about the path that led Thomas Edison to invent the lightbulb.

<p>I'll give you a few moments to go back and look over your answers before moving on. [pause].</p>	
<p><u>Independent Work</u> (3 min.)</p> <p>Now, I'd like for us to make sure that we have everything we need to do for our independent practice. [pause and begin looking over your organizer and pointing to what you see].</p> <ul style="list-style-type: none"> • We just completed a solid review of our organizer notes. Another great job capturing so much neat information about Thomas Edison! • We also just took some time to think deeply about how Edison's life led him to invent, among other things, the lightbulb. <p>I think you're ready!</p> <p>After our lesson is over for today, I want you to take some time to complete another cool activity.</p> <p>Take a look at this image of one of Edison's early, original lightbulbs. [show image: L8-G]. Now, imagine that you're living during the late 1800's, during the Electrical Age, when both Alexander Graham Bell <i>and</i> Thomas Edison lived. You are a reporter for a local newspaper and have been invited to Edison's research laboratory at Menlo Park. He has hand-picked a few people from the community to attend the reveal of his new invention: the lightbulb (just like the one in the picture). You are so excited to go!</p> <p>When you get there, Edison shares stories about all of the research and experimentation that he and his team did before they <i>finally</i> landed on a lightbulb design that actually worked...that lit up <i>and</i> stayed lit up for more than a day! He also shared his plans to make "electric light" widely available to everyone. He said that he had dreams that lightbulbs would one day replace the use of candle light and gas-lamp light. Before you leave, you make your way over to Edison himself in hopes that he will give you a few quotes to add to your story. Lucky for you, he does!</p> <p>After the event, you rush back to your office to begin writing your story to be published in tomorrow's paper. You can't wait to get this amazing experience all down on paper and share it with the world!</p> <ul style="list-style-type: none"> • Use a clean piece of paper to write your article. Be sure to reference your graphic organizer for facts and details to support your writing. 	<p>Students will prep for their independent practice.</p> <p>Students will write a narrative essay.</p>

<p>So again... [Repeat directions another time, show last slide with student independent practice assignment].</p> <p>I know you're going to do a fantastic job. Who knows, maybe, as I sip my coffee one morning soon, I'll find myself reading your exciting story about Edison and his fascinating lightbulb!</p>	
<p>Closing (1 min)</p> <p>I enjoyed learning with you today and am glad we know more about Thomas Edison and how important he was to the history of electricity! Who knew so much went into inventing such a simple thing as a lightbulb. Thank you for inviting me into your home. I look forward to seeing you in our next lesson in Tennessee's At Home Learning Series! Bye!</p>	



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