Title of Learning Unit: Inventions Throughout History

Subjects: Science, ELA, Social Studies

Grade Level/Range: first grade - second grade

Overarching Goal or Concept for the Learning Unit: The theme of this unit is to have students identify Americans in history who invented something which changed or altered the rest of history. The unit will also demonstrate chronological order and help students understand the purpose of timelines and how inventions have brought us to current-day. Social studies themes include Time, Continuity, and Change and Science, Technology, and Society.

Overview: Students will be learning about Americans who played a significant role in American History through their inventions. Students will be learning about the people as well as how their creations changed history. The students will be shown a simple timeline at the beginning of the unit to show how inventions fall in a chronological order. Students will be involved in a number of whole-group, small-group, partner and individualized activities. In addition to instruction, the students will be assessed on a continuum of complexity, using both formal and informal assessments.

Written By: Laken Kumer, Emily Wagner, and Jordyn Wyllie

Date: December 3, 2018

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Pre-instructional Assessment/Introduction: Students will be asked to look at a timeline of inventions by various inventors. The unit will be started by showing inventions in chronological order on a simple timeline. The inventions will be displayed on a PowerPoint. Students will examine the timeline as the teacher uses the presentation. The class will discuss each invention as well as a brief description of when it was invented and by whom. The students will then take a closer look at three of the inventions that heavily influence lives today.

Source of dates:

- 1800-1899: http://theinventors.org/library/weekly/aa111100b.htm
- 1900-1990: https://www.historylearningsite.co.uk/inventions-and-discoveries-of-the-twentieth-century/inventions-1900-to-1990/
- 2000-present: https://www.pastemagazine.com/blogs/lists/2009/11/the-20-best-gadgets-of-the-decade-2000-2009.html

Source of images:

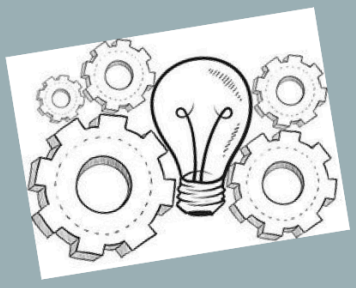
- iPad: https://en.wikipedia.org/wiki/IPad_(1st_generation)
- Omron: https://industrial.omron.us/en/products/robotics
- Hubble Telescope: https://www.nasa.gov/mission_pages/hubble/story/index.html
- Car Seats: http://www.thedetroitbureau.com/2012/11/seat-belt-use-reaches-all-time-high/
- Hair Dryer: https://www.timetoast.com/timelines/the-hair-dryer
- Airplane: http://www.wright-brothers.org/Information_Desk/Just_the_Facts/Airplanes/Flyer_I.htm
- Automobile: https://en.wikipedia.org/wiki/Benz_Patent-Motorwagen
- Telephone: https://www.antiquetelephonehistory.com/centennial.html
- Dish Washer: https://www.timetoast.com/timelines/dishwashers
- Steam Locomotive: https://www.alamy.com/stock-photo-stephensons-rocket-steam-locomotive-1829-engraving-1889-89006947.html
- Tin can: http://madeupinbritain.uk/Can

Clipart sources:

- http://www.clipartpanda.com/categories/imagination-clipart
- https://sciencestruck.com/invention-of-telephone

PowerPoint to go with Timeline:

INVENTIONS OVER TIME



1800-2018

WHAT IS AN INVENTION

The action of inventing something, typically a process or device.

WHO IS AN INVENTOR

A person who invented a particular process or device or who invents the things as an occupation.

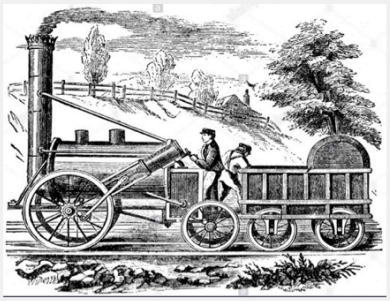
1810- TIN CAN

- Inventor- British Merchant, Peter Durand

- Brief Description- They were used to store food and other substances. They were so thick they had to be hammered open. As they became thinner, others invented can openers.

1829- STEAM LOCOMOTIVE

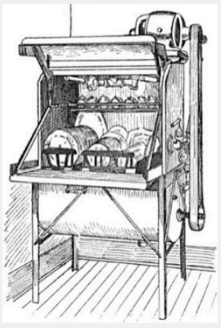
- Inventor- Richard Trevithick



- Brief Description- The first steam locomotive was first used to pump water from coal mines and flooded areas. It was later adapted for transportation.

1850- DISH WASHER

- Inventor- Joel Houghton



- Brief Description- The first one was made of wood and required the user to hand-turn a wheel that caused the water to splash on the dishes. It barely worked.

1876- TELEPHONE

- **Inventor-** Alexander Graham Bell

- **Brief Description-** Developed to send a message through a wire to someone else. The first word said over the phone was "Ahoy!"

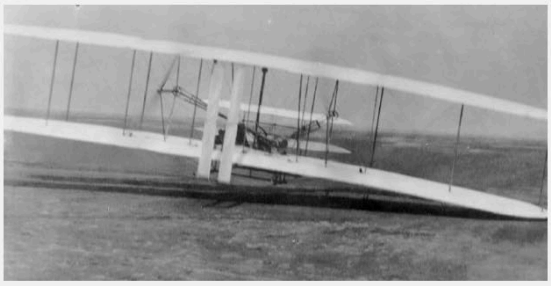
1885- AUTOMOBILE

- **Inventor-** Karl Benz

- **Brief Description-** The first model of automobile ran on gasoline. It only had three wheels.

1903- AIRPLANE

- **Inventor-** The Wright Brothers: Wilber and Orville



- **Brief Description-** The first plane was called a "glider." It made four short flights. The brothers share credit for the invention.

1920- HAIRDRYER

- **Inventor-** Esther F. Beau Godefroy

- **Brief Description-** This was invented to help women style their hair quickly. It was a lot heavier than modern hairdryers. It uses heat and airflow to dry their hair.

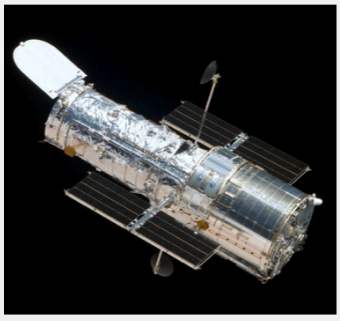
1959- CAR SEAT BELTS

- Inventor- George Cayley

- Brief Description- It was invented to keep pilots inside of their gliders initially. Then car manufacturers made them optional. Now it is against the law to drive without a seat belt on.

1990 HUBBLE TELESCOPE

- Inventor- NASA and European Space Industry
  - (Named after Edwin Hubble)



- Brief Description- Launched in 1990 and remains in operation. It is the largest space telescope. It is used as a research tool and a public relations connection for astronomy.

2001- IPOD

- **Inventor-** Company: Apple (Steve Jobs is CEO)
- **Brief Description-** The iPod completely changed the culture of listening to music. The small device can be carried in a pocket and is extremely user friendly.

2018- OMRON ROBOTS

- **Inventor-** Company called Omuro (CEO: Kazuma Tateishi)
- **Brief Description-** Created to replace a factory worker. It is currently too expensive for companies to purchase. They lift heavy objects and move at a quick pace. They navigate independently.

Title of Lesson/Activity #1: The telephone invention throughout history

Created By: Jordyn Wyllie

Overview of Lesson: Students will be engaging in a number of hands-on activities to learn about three different social studies standards. Students will participate in a science experiment, watch a video and read a story. They will participate in these activities in whole-group, small-group, partner, and individual settings. Additionally, there will be a number of informal assessments as well as two formal assessments.

PA Standards:

Standard - 8.3.1.A Identify Americans who played a significant role in American history.

Standard - 8.3.1.C Identify examples of change.

Standard- CC.1.4.1.I Support the opinion with reasons related to the opinion.

Investigative Question for this activity: How did the invention of the telephone by Alexander Graham Bell change history?

Objective(s):

After a whole-group discussion about inventions, students will engage in small-group activities regarding the telephone. They will see two primary source images and will complete an *Important Figures* (attached) handout providing at least one sentence for each reason.

Materials:

- Images of early telephones printed out
- Venn diagram handout
- Alexander Bell's importance handout
- Pencil
- iPads
- *Alexander Graham Bell National Geographic* By Barbra Kramer
- Headphones
- Cups
- String (3-9 meters long)
- Tape
- Scissors

Clipart/ Picture Sources:

- (Cups and string) https://www.scientificamerican.com/article/talk-through-a-string-telephone-bring-science-home/
- (Albert Einstein) https://www.pinterest.com/pin/566890671826602205/?lp=true
- (Lightbulb clipart) http://clipart-library.com/light-bulb-clipart.html

Print Sources:

1. Image of first telephone https://www.loc.gov/item/berlp0209/
2. Image of Bell using the telephone https://www.loc.gov/item/berlp0212/
3. Venn Diagram comparing above two images (self-made)
4. Why is Alexander Graham Bell Important handout (Self-made)

Online Collections/Exhibits/Websites:

https://jr.brainpop.com/socialstudies/biographies/alexandergrahambell/

Student Learning Process:

1. At their seats, students will be asked to look at some primary source images. First they will be shown an image of the original telephone and will be asked to talk with a partner about what they think it is, responses will be shared. **"What is this a picture of? Can you use any context clues to help you figure it out?"**

2. Students will be shown a second primary source image of Alexander Graham Bell using an improved telephone. They will take guesses as to what they think the image is and who they think is in the image. **"What is this a picture of, who do you think is the person holding it?" "Why are inventors important?" "Are inventors important Americans in our history? Why or why not?"**

3. Students will then be given a Venn Diagram with an image on either side.

4. Students will work in groups of three to write at least three points in each circle. Each student will contribute.

5. Following these activities, the students will have the National Geographic book read aloud to them.

6. Then, the students will listen and watch a video on *Brainpop Jr*. about Alexander Graham Bell to sum up everything they have learned. They will do this with headphones on individual iPads. The link will be put on the board.

7. Students will come up with two reasons / points as to why Bell was an important figure in American history. Students will use how Bell changed our world with his invention as one of their reasons.

Closure:

1. To end the lesson, students will engage in small group activities regarding a simple invention of the telephone. Essentially, they will become the inventor using paper cups and string. Questions like "**Why do you think you can hear using only string**?" will be asked**. "As the inventor, how did you feel when you first heard sound through your cup?" "Did creating this device make you want to improve it?" "How could you make it better?"**

Modifications/Accommodation Techniques for Students with Special Needs:

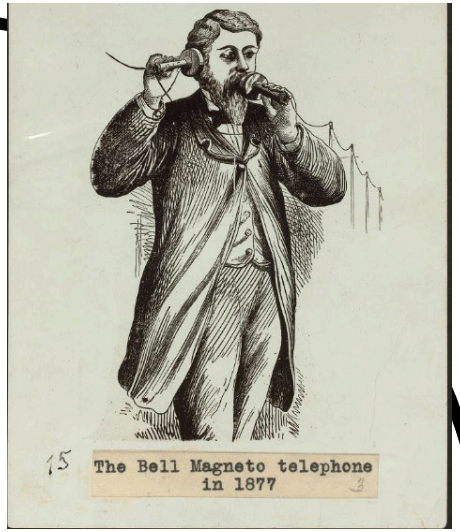
Students with varied learning abilities will be paired with students who are academically strong so that when they're discussing in partner groups, creating projects and learning new material, they will have peer assistance in addition to teacher assistance.

Informal Assessment- Teacher observation, Venn diagram completed in groups.

Formal Assessment- Students will be formally assessed through their completion of the *Important Figures in American History* handout. They will turn this in for the teacher to see if they have gained knowledge on the new content.

Compare Telephones in 1857 to 1877

Both



Why is Alexander Graham Bell Important?

Reason 1:

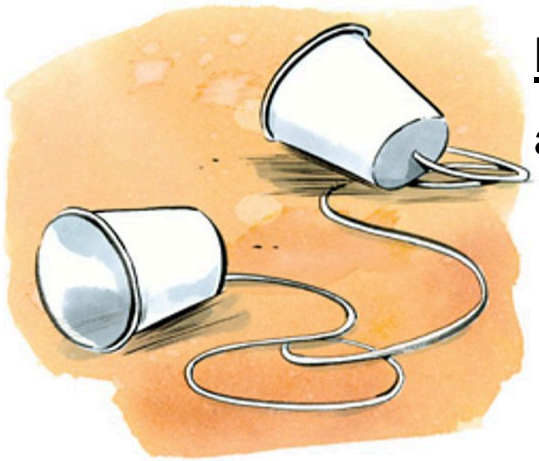
Reason 2:

I CAN INVENT A TELEPHONE TOO!

Directions:

Pick a partner in the room and work together to create a phone!

1. Poke a hole in the bottom of the cups.
2. Pull the string through the hole and tie a knot in both cups.
3. Tape the knot so it doesn't fall out.
4. Pull away from your partner until the string is tight and talk into your cup.



Materials: You will need to ask the teacher for…

- 2 cups
- A piece of string
- Scissors
- Tape

How could you improve your invention?

Created by: Laken Kumer, Emily Wagner, Jordyn Wyllie

Overview of Lesson:
In this center, students will watch a short clip of the evolution of telephones. They will then be given primary source images of telephones and telegraphs. Students will sequence the pictures in chronological order. In doing so, they will identify changes they notice in the telephones.
PA Standards:

- Standard - 8.3.1.C Identify examples of change.
- Standard - 8.1.1.A Demonstrate an understanding of chronology.
- Standard - CC.1.5.1.A Participate in collaborative conversations with peers and adults in small and larger groups.
- Standard - CC.1.5.1.G Demonstrate command of the conventions of standard English when speaking based on grade 1 level and content.

Investigative Question for this activity:

How has the evolution of telephones changed society?

Objective(s):

1. After watching a video on telephone evolution, students will work with a partner to recognize change in telephones and put six images in chronological order with no more than one error.

2. After small group discussions, students will individually demonstrate their ability to work with peers and adults using proper conventions of English when speaking by scoring a three or higher on the rubric guide.

Materials:

- Device to watch the clip on
- Images of telephones
- Telephone coil/wire
- Tape
- Invention of Telephone Handout
- Video source: https://www.youtube.com/watch?v=tHLPnOoeOeM
- Images of Telephone Sources:
    - https://www.loc.gov/item/berlp0209/
    - https://transom.org/2009/tools-recording-phone-calls/
    - https://www.knowlarity.com/blog/15-mind-blowing-facts-telephones/
    - https://www.amny.com/lifestyle/cell-phones-through-the-years-1.7585422
    - https://www.boostmobile.com/phones/apple-iphone-6.html
    - https://www.beepzoid.com/old-phones/
    - https://www.zdnet.com/article/ten-reasons-to-still-consider-a-basic-flip-phone-in-todays-smartphone-world/

Print Sources:

1. *The Telephone Over Time* Handout (Self-made)
2. Images of telephones from different time periods (downloaded from internet, source is in materials)
3. First telephone image (Primary Source) https://www.loc.gov/resource/berlp.12040301/

Student Learning Process:

1. Students will watch a short clip on how the telephone evolved throughout the course of history.
2. Students will talk with a partner about the clip and determine the different phones displayed.
3. Students will be given images of phones over time and will be asked to put them in chronological order.
4. Following this, students will glue images onto a phone wire and present their findings to the class.

Modifications/Accommodation Techniques for Students with Special Needs:

- Students that need the center modified will be given less images at a time to put in order. Working with half of the photographs will help them to narrow down which of the phones came first.
- If additional help is needed, the student can work one-on-one with individualized teacher instruction.

Formal Assessment:

- Students will be assessed using a rubric. They will be assessed on their chronological order, standard English grammar, and coming up with points while working with a peer.
- Their Invention Handout will also be used as a formal assessment.

Informal Assessment:

- Teacher Observation
- Student Participation
- Students will be assessed in how they are working with their peers

Student Name: _____ Date of Presentation: _____

Student attentively watches the video and is able to discuss many major points **4**	Student somewhat watches the video and is able to discuss a few major points **3**	Student hardly watches the video but is able to discuss a few minor points **2**	Student does not watch the video and is unable to discuss any points **1**
Partners come up with 3 comparisons between past and present telephones **4**	Partners come up with 2 comparisons between past and present telephones **3**	Partners come up with 1 comparison between past and present telephones **2**	Partners come up with 0 comparisons between past and present telephones **4**
Students speak loudly and talk clearly when presenting **4**	Students speak at a normal level and somewhat clearly **3**	Students speak quietly and mumble some of the words **2**	Students are quiet and speech is not decodable **1**
Students put all 7 images in the correct chronological order **4**	Students puts 5-6 images in the correct chronological order **3**	Students puts 3-4 images in the correct chronological order **2**	Students puts 1-2 images in the correct chronological order **1**
Total Points: _____	Total Points: _____	Total Points: _____	Total Points: _____

Total Points:

Inventions in History

How did the telephone change history?

_____

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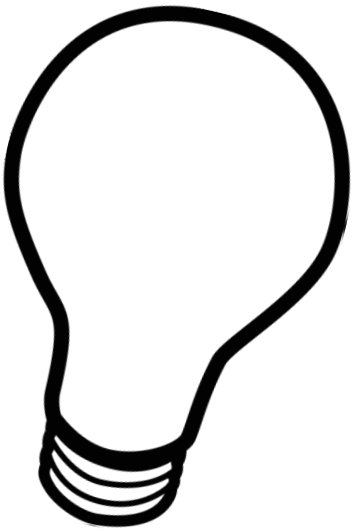


What if we didn't have telephones now? Illustrate what your life would look like.

Title of Lesson/Activity #3:

Created By: Laken Kumer

Overview of Lesson: Students will be comparing and contrasting primary source images of automobiles, when they were first invented and modern-day automobiles. Students will talk about how the invention of the automobile has affected people's lives. Students will also be creating their own automobiles using toilet paper rolls. Last, students will write about how the invention of the automobile has made it easier to travel, draw a picture to go with it, and then share it with the class.

PA Standards:

Standard - 8.3.1.C Identify examples of change.
Standard - CC.1.4.1.B Identify and write about one specific topic.
Standard - CC.1.5.1.A Participate in collaborative conversations with peers and adults in small and larger groups.

Investigative Question for this activity: How has the invention of the automobile affected the way people travel from one place to another?

Objective(s):
After group discussion and observation of the primary sources, students will understand and be able to state how the invention of the automobile has affected traveling.

Materials:

-Primary source image of an old automobile
-Primary source photo taken by me of a modern-day car
-Writing/drawing handout
-Toilet paper rolls
-Toothpicks
-Bottle caps
-Pencils
-Colored pencils
-Markers
-Crayons
-Glue sticks

Print Sources:

1. Picture of an old automobile- https://www.loc.gov/item/berlp0073/
2. Picture of modern day car- taken by the author of the lesson
3. Toilet paper automobile activity- https://www.pinterest.com/pin/327003622933670941/
4. Writing/picture handout (attached)

Student Learning Process:

1. The teacher will give the students a brief description of who invented the first true automobile which is credited to Karl Benz in 1885. The teacher will tell students that many people believe it was Henry Ford, but he invented first assembly line. The assembly line is used for creating things in mass productions or in large amounts.
2. The teacher will show students the image of what cars looked like when they were first invented and what modern day cars look like. In their group of tables students will compare and contrast the differences in the cars appearances. Students can also talk about how the invention of the automobile has affected the way people travel to places (it is faster, vehicles can hold more people, safer, etc.). After, students will share some of their responses with the class.
3. Students are then going to be creating their own toilet paper roll car. First, the teacher will show students one that was already made and have it on display.
4. The teacher will pass out a toilet paper roll to each student and have them color or decorate it how they please using crayons, markers, and colored pencils. The teacher will have already had the holes cut for the students.
5. Next, the teacher will pass out the toothpicks and show students how to stick them through the roll with one on each end.
6. The teacher will then pass out the bottle caps and model how to glue them on the ends of the toothpicks sticking out on the sides of the toilet paper roll.
7. To conclude the lesson on the invention of the automobile, the teacher will give students a writing and drawing assignment. In three to four sentences, students will write about how the invention of the automobile has made it easier to travel. Students will then draw a picture in the box at the top of the page to go along with their writing.

Closure: Students will share with the class their writing/drawings.

Modifications/Accommodation Techniques for Students with Special Needs:
Students with varied learning abilities will be working in groups with students with a higher academic level than them so they are able to help. Assistance will be provided by the teacher if needed when making the toilet paper roll automobiles. Lower level students with minimal writing abilities will not be required to write. They will instead have to draw two pictures about the prompt and be able to verbally explain them.

Formal Assessment:
The student writing/drawing assignment on how automobiles make it easier to travel as well as the sharing of the assignment is the formal assessment.

Informal Assessment: The teacher will observe student participation and listen to student answers of the comparisons of the images of the automobiles

Primary Source Images of the Automobile

Name: ________________________________

How has the invention of the automobile made traveling easier?

Title of Lesson/Activity #4: The Wright Brothers and Their First Flight

Created By: Emily Wagner

Overview of Lesson:

Students will be introduced to the Wright brothers by watching an educational video as a class. Throughout the lesson, students will participate in a variety of activities. They will be watching a video, having class discussions, creating a future airplane, and making an airplane out of straws and paper. They will be doing this in whole-group and independently.

PA Standards:

Standard - 8.3.1.A Identify Americans who played a significant role in American history.
Standard - 8.3.1.C Identify examples of change.
Standard - CC.1.4.1.B Identify and write about one specific topic.

Investigative Question for this activity:

How did the invention of the airplane change history and transportation?

Objective(s):

After whole-group discussion about the Wright Brother and their first flight, students will engage in independent activities regarding the airplane. They will be looking at one primary source image and will complete two handouts and a craft. The "Exploring the Future Handout" is required to have at least three sentences to describe and picture to match that has at least five colors. For the craft, they must follow the directions and use all of the materials. For the "How the Airplane Changed History" handout, students will be expected to write between two to three sentences to answer the question.

Materials:

- Image of the First Flight printed out
- "Exploring the Future" handout
- "How the Airplane Changed History" handout (self-made)
- Paper straws
- Colored card stock
- Pencils
- Scissors
- Crayons
- Markers
- Erasers
- IPads
- Smart board
- Clear tape
- Computer

Sources for Hands-on Activities:

https://www.diynetwork.com/how-to/make-and-decorate/crafts/how-to-make-straw-and-paper-airplanes

Print Sources:

1. "Exploring the Future "worksheet https://www.teacherspayteachers.com/Store/Sheila-Melton NOTE: This resource is available for purchase.
2. The First Flight image (Primary Source) https://www.loc.gov/resource/ppprs.00626
3. Airplane clipart image https://www.fg-a.com/stgifs9.htm

Online Collections/Exhibits/Websites:

1. The Wright Brother Video https://www.youtube.com/watch?v=YDlk4Ky_ahs
2. The First Flight Video https://www.youtube.com/watch?v=RriKI7u72Xs

Student Learning Process:

1. At their seats, students will be shown a video about the Wright Brothers. After watching the video, they will discuss what they have learned and any questions they might have.
2. Students will then be shown an image (primary source) of the first flight. The teacher will ask them: What do you notice about the image? What is different about the first airplane compared to today's airplanes? Have you ever flown on an airplane before? The teacher will then show the students the video of the first flight. The teacher will ask: What did you notice in the video? Was it a long flight? How big was the plane?
3. Students will be given the "Exploring the Future" handout. They will be asked to come up with what they think the airplane will be like in the future. They are to draw a picture and write about why their airplane is awesome.
4. Students will then, independently, make an airplane out of cardstock and straws.

Airplane directions:

- Start by cutting 5" x 1" strips of card stock. Each airplane will need three strips.
- Once the strips are cut, tape two of the strips together at the ends. There will be one 5-inch strip and one strip that is approximately 10 inches long.
- Tape the ends of each strip together to create a circle. Repeat this step on the other strip.
- Once both circles are made, use a piece of tape to secure the end of the straw inside the large circle.
- Repeat the step with the small circle, securing it to the opposite end of the straw.

5. Students will take turns testing the airplanes.

Closure:

- To end the lesson, students will participate in a wrap up writing activity. They will be expected to answer the question “What would the world be like today if we did not have the airplane?” on the “How the Airplane Changed History” handout.

Modifications/Accommodation Techniques for Students with Special Needs:

- Students with poor fine motor skills will be given a partner to work with and the materials ready and prepared ahead of time.

Formal Assessment

- **“**Exploring the Future” handout
- “How the Airplane Changed History” handout

Informal Assessment:

- Teacher observation

Name: _____ Date: _____

How the Airplane Changed History

What do you think the world would be like today if we did not have the airplane?

Respond with at least 2-3 sentences.

_____

_____

_____

_____

_____

_____

_____

_____

Post-instruction Assessment: The students will receive a prompt to improve or modify an invention that currently exists. They will be given three options as well as the opportunity to use an invention of their choice. The students will imagine what it will look like in 100 years and then draw it. Following their drawing, the students will complete their invention facts handout. They will list the invention name, the inventor, and the year it will be created. They will also write about what makes it different and how the invention works. Finally, the students will write one fun fact about the invention and inventor. This culminating assessment will provide feedback on whether or not the students have mastered the overarching goal. The assessment will evaluate if students can demonstrate that they understand change over time. They will also be able to identify themselves as important figures in American History because of their contribution to the future.

Name: _____

Think about how inventions have changed and improved over time. Choose a modern invention from the list below, or think of your own to improve. How might the invention change in 100 years? In the box, draw a picture to show what you think your invention will look like. Describe the size, shape, and color. Tell me what it will do that is different from what it can do now.

Invention options:

- Pencil
- Smart phone
- Laptop
- Your choice

My Invention Facts

Invention name:

_____

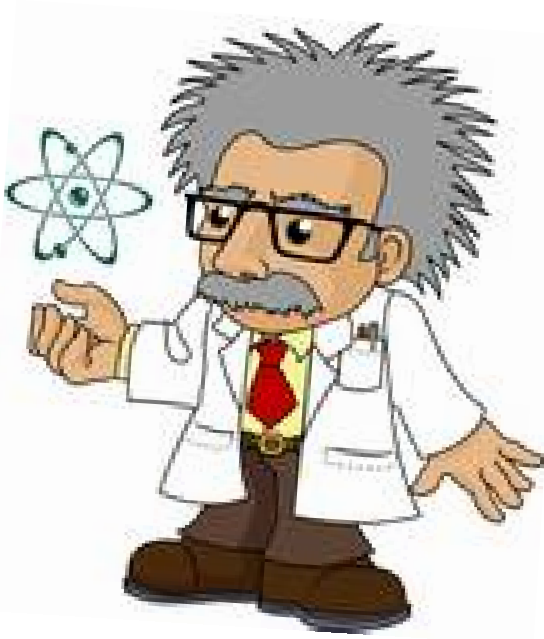
Invented by:

_____

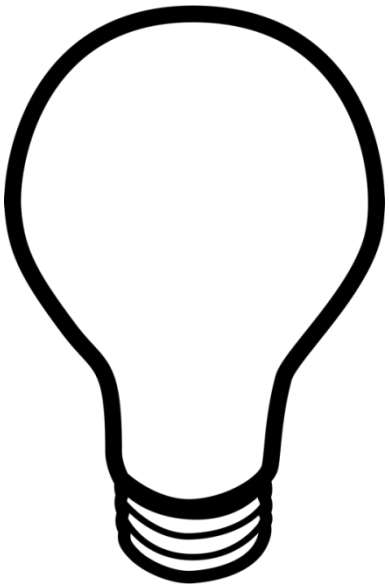
Year invented:

_____

What it does:



List one fun fact about the invention



List one fun fact about the inventor (you)