

Inventions from 1776- Early 1900s

Unit Lesson Plan Intended for Fifth Grade

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Introductory Sheet- Unit Lesson Plan

Grade Level and Typical Learner

My unit plan focuses on a fifth grade student in the second semester of school. These students are between the ages of ten and eleven. This age level is curious about places and problems in the news because they want to know what is happening in the world and where/why an event has occurred. They are able to apply their skills learned previously in other grades and use them for new situations. Physically, these students are growing in random spurts, which creates awkwardness with their bodies. They are unsure about themselves and the frequent changes cause frustration and anger. At this level these students are learning to read more for fun on their own and are becoming skillful writers by practicing more in the classroom. In all subjects, they learn to apply their skills and use them in real-world situations.

National Council for the Social Studies. (1988). Social studies for early childhood and elementary children: preparing for the 21st century. Retrieved from <http://www.socialstudies.org/positions/elementary>.
PBS Parents. (2011). Going to School: Grade-by-grade learning: 5th grade. Retrieved from http://www.pbs.org/parents/goingschool/what_5.html

Rationale

Fifth grade students should learn about engineering and technology for many reasons. Within this unit plan, students need to learn about major inventions and inventors. Indiana State Standards requires fifth grade students to know the “Major people, events and developments in the early history of the United States from 1776-1801,” in standard 5.1.17 (Indiana State Standards). This standard can include many different aspects of that time period. I decided to focus on inventions and incorporated primary and secondary sources in order to allow the students to fully grasp the importance of the inventions from that time period. For this portion of the unit plan, I used the standard “5.1.19 Using primary and secondary sources to examine an historical account about an issue of the time, reconstruct the literal meaning of the passages by identifying who was involved, what happened, where it happened, what events led to these developments and what consequences or outcomes followed,” (Indiana State Standards). These standards express the importance of knowing the early history of the United States and using primary and secondary sources to test and examine history. Fifth grade students should learn this material because they not only learn about historical events, but they can relate the important events from years ago to their lives today. Inventions like the assembly line and airplanes are essential to life today. The NCSS curriculum standards also apply to this unit plan. Time, continuity, and change is one theme because it follows the theme of time and change and comparing the development

over time. Another theme is people, places and environments. This theme is based on the specific inventors and where their inventions were popular, based on the location. The other theme that follows this unit plan is science, technology, and society. Technology has developed drastically over the years and this lesson teaches that because it focuses on the historical technology and how it has adapted over time. By using different teaching styles and methods, I will be able to implement this unit plan over engineering and technology to help students grasp the idea of major developments from 1776 to the early 1900s.

Goals:

- Students will be able to define primary and secondary sources
- Students will be knowledgeable about one specific inventor
- Students will learn the importance of inventions from 1776-early 1900s
- Students will be able to name and say the importance of the inventors discussed in class (ex: Wright brothers, Henry Ford, Samuel Morse, etc)
- Students will learn new skills to be applied with each invention (ex: sewing)

Standards and Objectives

Social Studies:

5.1.19 Social Studies: Using primary and secondary sources to examine an historical account about an issue of the time, reconstruct the literal meaning of the passages by identifying who was involved, what happened, where it happened, what events led to these developments and what consequences or outcomes followed (Core Standard)

Given an analysis tool sheet, the students will record their observations, reflections, and questions with a total of at least three in each section.

Given the Inventor Sheet, students with a partner will fill out all of the questions regarding their partner's inventor with 100% completion.

Given the answers from their partner's inventor, the students will present to the class the information they found by reading and hearing about the inventors.

5.4.4 Social Studies: Trace the development of technology and the impact of major inventions on business productivity during the early development of the United States (Core Standard)

The students will write a paragraph of five sentences about the major invention of the assembly line by using their own experience with the edible car.

Given the steam engine patterns, the students will create a steam engine with all materials that can be successfully moved.

Writing:

CC.5.W.7 (5.4.4, 5.5.3) Writing: Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic (Core Standard)

The students will create a research poster on their assigned inventor by using books and the Internet to find all of the required information according to the rubric.

CC.5.W.3 (5.4.2) Writing: Writing narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences (Core Standard)

The students will write a narrative given the parts of a narrative to describe the steam engine and assembly line to their parents in two pages.

Students will write a narrative based on the Gallery Walk by giving examples from their project and at least two other students' projects based on the given rubric.

CC.5.W.8 (5.4.5) Writing: Recall relevant information from experiences or gather relevant information from print and digital sources (Core Standard)

The students will write a one page reflection based on their results from their paper airplane experiment all required form of participation done in class.

CC.5.W.9 Writing: Draw evidence from literary or informational texts to support analysis, reflection and research (Core Standard)

The students will use the text *Something from Nothing* to draw evidence to develop a narrative letter with all the specified parts on the given rubric.

Science:

5.4.2 Science: Investigate the purpose of prototypes and models when designing a solution to a problem and how limitations in cost and design features might affect their construction (Core Standard)

Given specified materials, the students will create an edible car in the structure of an assembly line in the span of 10 minutes.

Math:

5.6.1 Math: Explain which types of displays are appropriate for various sets of data (Core Standard)

The students will list all electrical appliances used at home on their Electricity Log sheet with 100% accuracy.

The students will create the appropriate graph to display their data found from their Electricity Log sheet with full completeness.

Art:

5.7.4 Visual Art: Identify, control and use a balance of two-dimensional and three-dimensional media, techniques, and processes to effectively communicate ideas, themes experiences and stories (Core Standard)

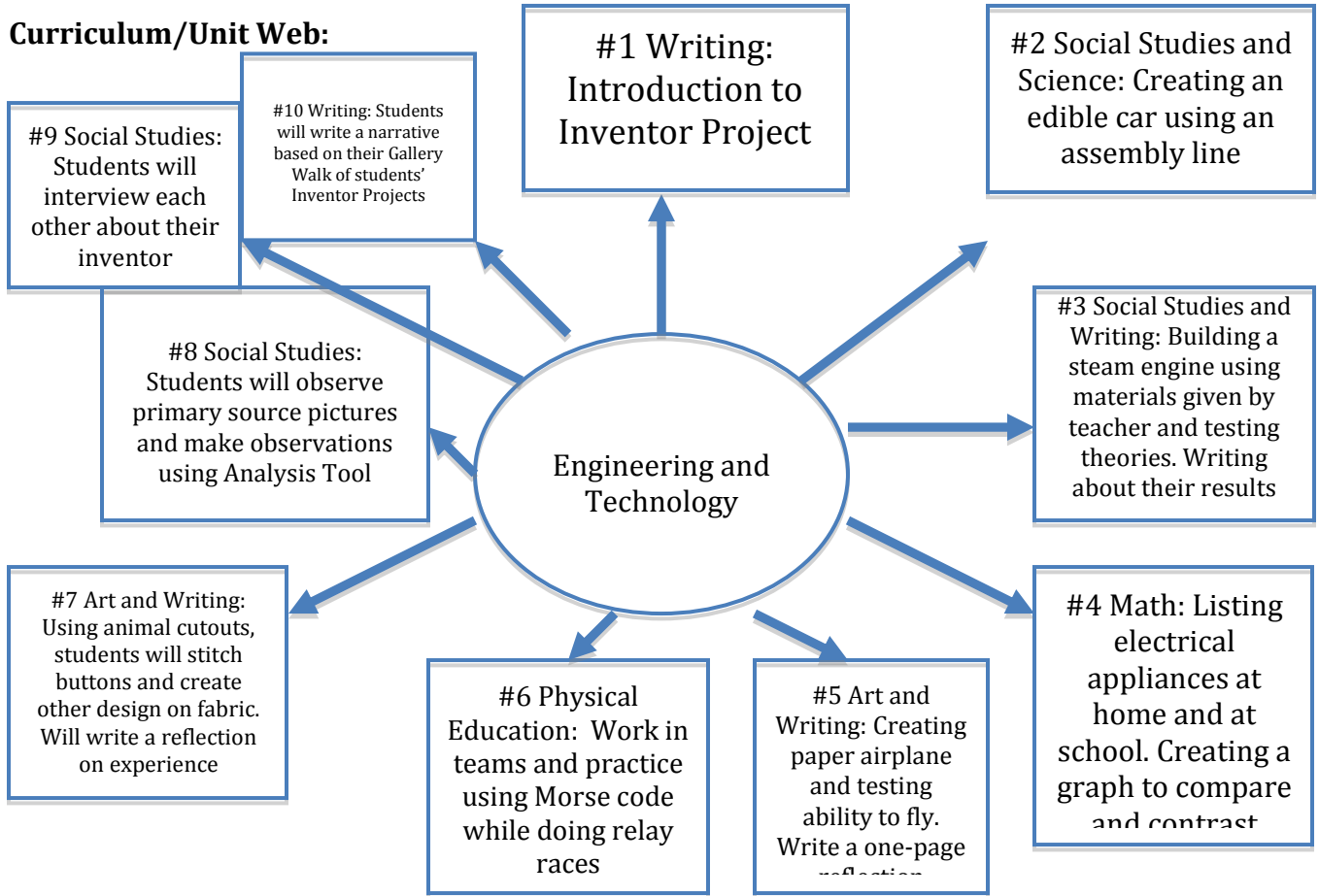
The students will create a two-dimensional paper airplane using the paper given by the teacher in order to follow all of the given instructions correctly.

The students will use fabric to stitch at least one cutout animal design correctly based on the instruction given by the teacher.

5.1.1 Physical Education: Demonstrate the ability to integrate locomotor and nonlocomotor movements in more complex skills (Core Standard)

The students will demonstrate their locomotor and nonlocomotor skills given an obstacle course by completing and answering all six stations' questions.

Curriculum/Unit Web:



Letter to Parents:

Dear Parent/Guardian:

Our class will be beginning a new unit based on Engineering and Technology. We will be focusing mainly in the inventions and inventors during the time period from 1776 to the early 1900s. The students will each be given an inventor who they will research and create a poster about to present to the class at the end of the two-week unit. They will be given class-time to work on these projects, but the main time to work on their poster will be at home. I encourage you to help the students in any way, but please DO NOT do it for them! ☺ I want to see their creativity side and their knowledge about their inventor.

During class, the students will be highlighting many of the major inventors of this time period. For example, the students will be creating their own assembly line in groups to help demonstrate the importance of Henry Ford's invention and the changes over the years. Another more physical lesson will include the students learning about Morse code leading into the telegraph being invented. The students will be given an answer sheet and as a group compete in relay races to decode messages. If the weather is nice, we will be outside, so I will send a note home the day before to remind students to dress appropriately!

I look forward to teaching the students about important inventions that made the United States what it is today and being able to see their progress within the two weeks. Let's start traveling back in time and seeing together how big of changes took place!

Sincerely,

Miss Faudree

Annotated List of Trade Books for Engineering/Technology

Eli Whitney and the Cotton Gin

This book is a novel that describes the invention of the cotton gin by Eli Whitney. In the beginning Whitney sees how ineffective picking cotton is, especially for the slaves who pick them. He wants to help change this method because he believes there is a faster way. After studying the type of cotton grown in the south, he invented a machine that quickly takes away the seeds. This invention changed the cotton industry with its effective method. The book ties into the theme for engineering and technology because it is geared toward a specific inventor. This inventor came up with a method built with the engineering and technology at the time.

Gunderson, J. (2007). *Eli Whitney and the Cotton Gin*. Capstone Press.

The Keeping Quilt

This book is about a Russian immigrant mother and family arrives in the United States. It was a difficult transition for the family, but more so the mother. The mother then stitches together old clothes on a quilt to help her remember Russia. She passes this quilt along to her daughter. This continues for four to six generations and is used as a Sabbath tablecloth, a wedding canopy, and a blanket for new members of the family. The story is based on the author's family history, showing a true connection with the text.

Polacco, P. (2001). *The Keeping Quilt*. Aladdin.

The Magic School Bus and the Electric Field Trip

This story is a continuation of the series with Ms. Frizzle and her class. In the book her class is learning about electricity and in order to do this they have to become small to travel through power lines. They learn how electric currents travel through their town. They get to go inside a toaster, a light bulb, and an electric motor. The class sees first hand how electricity works, which allows the class to learn authentically (even though it is fiction) on what an electric current looks like and does. This book ties into the theme because it goes into detail of the exact invention of a specific inventor. It provides an example of a fiction story of how a class learned about electricity. These types of books will help bring the topic to life and help make connections.

Cole, J. (1999). *The Magic School Bus and the Electric Field Trip*. Scholastic Paperbacks

My Brothers' Flying Machine: Wilbur, Orville and Me

This story is written in the perspective of Wilbur and Orville's sister, Katherine. It describes her point of view with her brother's invention. She describes her childhood with them but then discusses her point of view of when her brothers introduced their invention to the world. It is based on the true story of her point of view. To be the sibling of the famous brothers, was an important task so she shared her family's history and an insight about the beginning of the invention. This book ties into the theme because it is another perspective about an important invention during the 1776-early 1900s time period. Having the students read this book is important because it allows for another point of view within the family.

Yolen, J. (2003). *My Brothers' Flying Machine*. Brown Books for Young Readers.

Radio Rescue

This book focuses on the importance of Morse code. It is written after 1923 when wireless radio was invented. This invention allowed people to communicate over long distances. The boy in the story buys a secondhand receiver and earphones. He then studies Morse code so he can take a test to qualify as an amateur radio operator. His hope is that he will eventually own his own radio station. Eventually his skill is used to save a family in Florida who is stranded there from a flood. This book ties into the theme because it connects to using Morse code, which was started by Samuel Morse. Morse's inventions changed the way the world communicates with each other so students need to know the history behind when telegraphs and telephones began.

Barasch, L. *Radio Rescue*. (2000). Straus and Giroux.

Samuel Morse and the Telegraph

This story is about Samuel Morse and his invention of the telegraph. It depicts the life of how difficult it was without this invention. The book does this by including examples of how in war or in deathly situations it was detrimental to not have fast communication. Also, the book discusses the challenges Morse had to encounter during the time the telegraph was invented. The book ends by describing the switch from using Morse code to satellites and how it has affected society. This book ties into the theme of the unit plan because it allows for the description of the change within society with the specific invention mentioned. Technology has changed drastically because of this invention, which makes it essential for students to know this lesson and topic.

Seidman, D. (2007). *Samuel Morse and the Telegraph*. Capstone Press.

Steam Locomotives: Whistling, Chugging, Smoking Iron Horses of the Past

This story is based on a true story of a train authority and photographer who spreads his love for steam locomotives. He begins by describing George Stephenson's design of the steam engine and his importance to steam engines today. Next, how steam locomotives work and the history behind them are described. Then, he explains the system on how to categorize trains by counting the number of wheels on a train and the inside of the trains like the track gauges. The book also says how they are maintained and cared for by professionals. This book brings a personal account to the historical change of steam engines and how they came to be in the world. It also describes how trains are being used less and are slowly disappearing as a travel mechanism. This ties into the engineering/technology theme because it describes how steam locomotives work and then also focuses on how this invention changed the world.

Zimmerman, K. (2004). *Steam Locomotives: Whistling, Chugging, Smoking Iron Horses of the Past*. Boyd Mills Press.

Thomas Edison and the Light bulb

This novel focuses on the invention of the light bulb and the inventor behind it, Thomas Edison. The novel describes him as the "Wizard of Menlo Park" as he became known as after his invention. The book details the long process of how the light bulb was invented. It also discusses another invention by Edison, the electrical power system. This power system helped light all of New York City after it was invented. This invention is important to the theme of the unit plan because it is a

major invention that changed the world. Electricity is relied on by millions of people every day and students need to see what it was like when electricity was not used.

Welvaert, S. *Thomas Edison and the Light Bulb*. (2007). Capstone Press.

We'll Race you, Henry

This book is about the life of Henry Ford. It describes his background at home and most importantly, his schooling that led up to being interested into developing cars. He had an early interest in being creative and wanting to try new things. It also focuses on Henry Ford's strong desire to experiment, which helped create his version of cars and the assembly line. The Model T Ford is described, which eventually led him to use the first assembly line with conveyor belts. Models A and B created by Ford are described for readers to see the change within each. This book ties into the theme because it focuses on the specific example of an inventor during the time period who engineered an assembly line. This assembly line has been used for many years and without it, the United States would not have as many materials as it does.

Mitchell, B. (1986). *We'll Race you, Henry*. Carolrhoda Books

The Wright Brothers

This story describes the life of Orville and Wilbur Wright during their journey to discovering aviation. It begins by describing their first flight in Dayton, Ohio when their plane made a complete circle. Then, it goes back to describing their life before this event including their education and family life. It then leads up to the historical day when the brothers flew their first plane. The book also includes a description of how aviation works and includes pictures of the brothers and their

flights. This book ties into the engineering/technology theme because it describes a specific inventor and their invention. It also describes how the invention works and the engineering aspect of how aviation works.

Freedman, R. (1994). *The Wright Brothers: How They Invented the Airplane*. Holiday House, Inc

Guess the Inventor

Inventor

Person who invented a particular process or device

Created the assembly line

Has a car named after him

Henry Ford

Created the steam engine

Steam engine uses fluid to work

Thomas Savery

Most famous for inventing the light bulb
First invention was the phonograph

Thomas Edison

Invented airplanes

Born in Indiana
Wilbur and Orville Wright

Invented the telegraph

Originator of the Morse code
Samuel Morse

Invented the first sewing machine

Elias Howe

Description of Bulletin Board

This bulletin board will be posted on the first day of the unit plan. On the first day everything will be covered except for the definition of an inventor. After the students have learned about what an inventor is and are given their inventor to research, I will ask a student to come up and say what the word is and flip over the card. The next day I will uncover the first description of an inventor. By the end of the lesson, I will ask another student to tell the class which inventor answers the description and they will flip over the card. This will continue for each lesson. At the end of the unit, students will have a bulletin board with all of the inventors covered within the lessons. Even though the unit did not cover many of the inventors, by only discussing a few, it helped give students an idea of what to focus on in their research.

Guest Speaker

A guest speaker will visit (or virtually visit) our class after the day before the last lesson. We will be having Bill Gates join our class. Because we could not afford to have him come visit us in person (his agent said he costs too much to even visit her son's school!), we will have to have him join us on the computer. With my help, the students and I will come up with questions the day before that they would like to ask him. We will have at least ten questions about his life, his inventions, and what led him to begin inventing his specific inventions.

By the use of online sources, we will find these answers. Students will write these answers down on the question sheet I have created for them based on their questions. We will discuss as a class what we found out after all questions have been answered. Did Gates begin at an early age trying to invent new things? How does this tie into our inventors? In our research and lessons, did we hear about any inventor who began at an early age being a creative-thinker? We will discuss other similarities from our discussion with Bill Gates and our inventors.

Next, we will then discuss differences. What is different about Gates' inventions? How is his story different than the inventors we discussed? Does this have to do with the different time periods? Do you think he was influenced by any of the inventors we learned about?

The students will discuss these questions and answers in small groups first and then together as a class. After we have discussed our answers as a class, we will then discuss how Bill Gates' inventions have changed our society and how they will continue to do so. This will allow the students to generate the thinking needed to end the unit.

Technology and Literature

Technology and literature are both very important in a lesson and unit plan. In my unit plan both are used frequently for research and daily lessons. The students need to use computers and books to research their inventor project, given to them on the first lesson of the unit. This can be during class time or at home. After many lessons throughout the day, I will allow students, who have completed their work, to work on their projects by getting on the computers. The inventor projects require students to use the computer to not only research information, but to print out pictures and information that will be put on their posters. Students should use Microsoft Word or Microsoft PowerPoint to do this because their posters will look more professional by using a computer instead of hand-written. Within the lessons, technology will be incorporated because many of the lessons require students to write narratives. These narratives will be first hand-written but then after editing them, they will be typed on the computer. I will also bring in books for the students to search through to find information on their inventors. The lessons allow me to also read books to the students before giving them their assignment. This gives the students a chance to be introduced to the next invention will interacting with them.

Name_____

Date_____

Engineering/Technology Pre-Test

1. What is an invention?

2. What is an inventor?

3. Who invented the light bulb?
 - A. Thomas Edison
 - B. Elias Howe
 - C. Wilbur Wright
 - D. Orville Wright

4. Thomas Savery invented the
 - A. Airplane
 - B. Sewing Machine
 - C. Steam Engine
 - D. None of these

5. What are primary sources? Give an example.

Name_____

Date_____

Engineering/Technology Post-Test

1. What is an invention?

2. What is an inventor?

_____ 3. Orville and Wilbur Wright

A. Assembly line

_____ 4. Thomas Savery

B. Airplanes

_____ 5. Elias Howe

C. Light bulb

_____ 6. Henry Ford

D. Telegraph

_____ 7. Samuel Morse

E. Sewing Machine

_____ 8. Thomas Edison

F. Steam Engine

9. Name one example of a primary source you used in your Inventor Project. Explain why it is a primary source.

10. List at least three facts about your inventor.

Lesson Plan #1

Lesson: Introducing Inventors

Length: 30 minutes

Age or Grade Level Intended: 5th Grade

Academic Standard(s):

WRITING: CC.5.W.7 (5.4.4, 5.5.3) Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

Performance Objective(s):

The students will create a research poster on their assigned inventor by using books and the Internet to find all of the required information according to the rubric.

Assessment:

The students will be assessed on their completion of the poster. The rubric will include all required parts of the poster.

Advance Preparation by Teacher:

- Bring in books for students to look at of inventors
- Create assignment sheet and rubric for students to look at
- Have a sheet for students to pick out inventors from 1776 – early 1900s
- Make sure to have *The Wright Brothers* by Russell Freedman to read to class

Procedure:

Introduction/Motivation:

1. (Put on smart board) If you could invent a product, or something you need, what would it be? Give it a name. Write at least two sentences of what it does and then draw a picture of it. Allow students to work for 5-8 minutes. (Gardner: Visual-spatial)
2. Have students share invention with a partner and then select 2-3 students to share with the class. (Gardner: Interpersonal)

Step-by-Step Plan:

3. All of you just took on the role of creating an invention. What is a person called when they invent something? (They will answer with inventor). (Bloom: Knowledge)

4. We are starting a new unit with technology and invention. We are first beginning with the economic development of the time period from 1776 – early 1900s. Can anyone tell me some inventions during that time (electricity, steam engine, railroad, assembly line, automobile, airplanes) If students do not say airplanes, ask them, “What about an invention that allows people to travel in the sky that allows people to travel long distances?” (They answer with airplanes). Does anyone know who invented the airplane? (Wright brothers) (Bloom: Knowledge Gardner: Verbal/Linguistic)
5. In this book *The Wright Brothers* it details the life of Wilbur and Orville Wright. This means it is a biography. What is a biography? (An account of someone’s life written by another person). In a few days, we will be learning more about biographies and how important they are to learning about our inventors. I am going to read you the first chapter of the book to get an idea of what the life of an inventor is like. Before reading, note the left side of the book where it says, “The airplane has been called the first major invention to be fully documented by photography.” (Why do you think this was the first?) (Bloom: Analysis)
6. Read title of chapter one, “What Amos Root Saw.” Ask students what they think Amos Root sees. (They answer airplane) (Bloom: Knowledge)
7. Read first paragraph. Ask students what they would do if they had seen something flying in the sky like that (Bloom: Application)
8. Reread the last sentence of the chapter. Ask the students if they think the Wright brothers knew what big impact they would have on the lives of Americans? (Bloom: Application)
9. After Amos Root saw the Wright brothers flying the first plane, what did he do? Was he in shock of this new invention? (Bloom: Comprehension)
10. Now that we have not only become inventors but I have also showed you an example of important inventors throughout our history, I am going to give you the task of researching your own inventor. Your assignment is to research the inventor and create a poster on him/her. I am now handing out an assignment sheet for your directions on what needs to be included. This assignment sheet will tell you what my expectations are for the project. It will tell you what you will need to research and how I want it to be presented. I will also be passing around the list of famous inventors from the time period of 1776-early 1900s so everyone can pick an inventor and sign their name in the blank. Everyone should get a different inventor so everyone’s posters will be different.
11. As students are signing up for inventor, explain the directions to students.
12. You will be able to use the computers and the books I have brought with me to research your inventor. I suggest that you write down all of your facts and information on a separate sheet of paper before you put them onto the poster board.

Closure:

We will be working on this poster in class when there is free time, but this project is due a week from today so do not forget to work on it at home! After giving students a chance to work on it, bring class together again. Tomorrow we will continue our lesson about technology and inventions and go into more detail of the famous inventions. For some of you, these inventions will be ones that are about your inventors. This will help you and also help others to understand what points to stress in your project.

Adaptations/Enrichment:

Student with Learning disability in reading comprehension

Student will have first chance at the computers to research their inventor. If student still has difficulty, help student find website that has information that can be easily read. Teacher may have to sit with student to help read important facts about inventor.

Student with ADHD

The direction sheet should help this student stay on task because it will tell the student exactly what needs to be on the poster. If this does not work, create a checklist for the student to complete, which will help the student complete all parts of the project and keep themselves responsible for what is required for the assignment.

Student with Gifts and Talents in Creativity

The gifted students will create a brochure to “persuade” peers why their inventor’s invention is the best and the most useful. They will present these to the class at the same time when the other students present their poster boards.

Self-Reflection:

- Were the students engaged in the beginning activity?
- Did they think the book I read to them was beneficial to their project?
- Are they excited about this project?
- How can I make the project more interesting to the students?

Inventor Project

Directions: Students will create a poster board with information on their chosen inventor of the 1776-early 1900s time period. All posters need to be BIGGER than a regular sheet of paper. In order to complete the project correctly, you will need a poster board that will fit all of your information. On due date, students will present posters to class. Happy inventing 😊

Due Date: _____

Poster should include:

- Name of inventor
- Major invention/s
- Where and when born
- Family history
- Career
- What led them to create invention
- What happened after invention
- Any other important information
- Catchy color and decorations
- Sources
- BE CREATIVE!!

Famous Inventors Sign-up Sheet

1. Wilbur and Orville Wright _____
2. Henry Ford _____
3. George Stephenson _____
4. John Stevens _____
5. Thomas Edison _____
6. Benjamin Franklin _____
7. Eli Whitney _____
8. Humphry Davy _____
9. Joel Houghton _____
10. Elias Howe _____
11. Cyrus Hall McCormick _____
12. Samuel Morse _____
13. Alexander Bell _____
14. Lewis E. Waterman _____
15. Elisha Otis _____
16. James Finley _____
17. Elwood McGuire _____
18. Sylvanus Bowser _____
19. John Moses Browning _____
20. Willis Carrier _____

Poster Presentation

CATEGORY	4	3	2	1
Coverage of the Topic	Details on the poster capture the important information about the topic and increase the audience's understanding.	Details on the poster include important information but the audience may need more information to understand fully.	Details on the poster relate to the topic but are too general or incomplete. The audience needs more information to understand.	Details on the poster have little or nothing to do with main topic.
Use of Graphics	All graphics are related to the topic and make it easier to understand.	All graphics are related to the topic and most make it easier to understand.	All graphics relate to the topic.	Graphics do not relate to the topic.
Organization	Information is very organized with clear titles and subheadings.	Information is organized with titles and subheadings.	Information is organized, but titles and subheadings are missing or do not help the reader understand.	The information appears to be disorganized.
Layout and Design	All information on the poster is in focus and can be easily viewed and identified from 6 ft. away.	Most of the information on the poster is in focus and the content easily viewed and identified from 6 ft. away.	Most of the information on the poster is in focus and the content is easily viewed and identified from 4 ft. away.	Much of the information on the poster is unclear or too small.
Sources	All sources (information and graphics) are accurately documented.	All sources (information and graphics) are accurately documented, but there are a few errors in the format.	All sources (information and graphics) are documented, but information is incomplete or many are not in the desired format.	Some sources are not accurately documented.
Mechanics	No grammatical, spelling or punctuation errors.	Almost no grammatical, spelling or punctuation errors	A few grammatical, spelling, or punctuation errors.	Many grammatical, spelling, or punctuation errors.
Presentation	The presentation was the appropriate length. It did not seem hurried or too slow. The presenter spoke clearly and distinctly and established eye contact with the audience.	The presentation was the appropriate length but seemed slightly hurried or too slow. The presenter spoke clearly most of the time and established eye contact with the audience.	The presentation was the appropriate length but seemed very hurried or too slow. The presenter spoke clearly and distinctly only some of the time and/or established little eye contact with the audience.	The presentation was too long or too short. The presenter did not speak clearly most of the time and established little eye contact with the audience.

Lesson Plan #2

Lesson: Edible Car

Length: 30 minutes

Age or Grade Level Intended: 5th grade

Academic Standard(s):

SOCIAL STUDIES: 5.4.4 Trace the development of technology and the impact of major inventions on business productivity during the early development of the United States.

SCIENCE: 5.4.2 Investigate the purpose of prototypes and models when designing a solution to a problem and how limitations in cost and design features might affect their construction

Performance Objective(s):

Given specified materials, the students will create an edible car in the structure of an assembly line in the span of 10 minutes.

The students will write a paragraph of five sentences about the major invention of the assembly line by using their own experience with the edible car.

Assessment:

The students will be assessed on how well they participate with creating the edible car within the groups. They will also be assessed on the paragraph of their experience with the assembly line.

Advance Preparation by Teacher:

- Bring in *My Life and Work* by Henry Ford
- Bring in graham crackers, frosting, paper plates, M&Ms, and square candies

Procedure:

Introduction/Motivation:

Yesterday, we discussed what an inventor is. Can someone review and tell us what an inventor is? I gave you each an inventor from early America and you will be creating a poster to present to the class. Today, we are going to go into further detail of the specific inventions of these inventors. (Bloom: Knowledge)

Step-by-Step Plan:

1. Which one of you is creating a poster on Henry Ford? In your research from yesterday, what invention did he create? (Help student come up with an assembly line)
2. Does anyone know what an assembly line is? (Manufacturing process in which parts are added in a sequential order) (Bloom: Knowledge) This invention was first geared more towards cars because it allowed cars to be made faster.
3. Henry Ford created the assembly line. In his book *My Life and Work* he describes his explanation for the importance of this invention. Because he wrote the book, what does that mean this type of book is called? (Bloom: Comprehension Gardner: Verbal/Linguistic) It is an autobiography.
4. This specific type of autobiography is also a primary source. We have not learned about primary sources yet, but who would like to guess as to what it is? A primary source is an original source of information. We will learn about primary and secondary sources in the next few days.
5. We are now ready to read the book. Read the second paragraph on page 19 beginning with, "The essence of my idea..." and ending with "That is the only reason I have for talking about it."
6. Stop after the second sentence. What do you think Ford means by waste and greed? Allow students to get to the connection that an assembly line would take away waste and greed because the materials are already set. What if the government told you how much water you could use in the shower in order to cut down on waste and greed? (Bloom: Comprehension and Application)
7. Again, stop after "Greed is merely a species of nearsightedness." This text is difficult to read. What do you think Ford means by this? Help students come up with the thought that people are thinking only in a certain way for themselves.
8. Next, stop at, "In the process of manufacturing..." What Ford means by this statement is that he wants to make the most out of his products in the most efficient (or working in the fastest way) way.
9. At the end of this passage, he describes the benefits of his assembly line for the manager, worker and the one buying the products (consumer). Because this was years ago, do you think Ford knew the huge effect he would have on America? (Bloom: Evaluation)
10. Now, as a class you are going to get to experience what an assembly line is. I am going to put you in groups of five. (Put students in groups of five and have students sit next to each other). I will be passing out to each group your materials to create your own car. You each get a graham cracker, frosting, paper plates, M&Ms, and one square wrapped candy. The instructions sheet will be on the SMART board for all groups to look at. Each student will choose a number and their job will be what corresponding number they have. (Explain sheet for students)
11. Allow students to create their own "edible" car. Do this several times and challenge the students to get faster each time. (Bloom: Synthesis Gardner: Visual/Spatial, Interpersonal)

12. When the students have gotten a chance to improve, stop the assembly lines and have time for discussion. Tell the students that they can eat the food quietly while discussing. Did you notice how the assembly line became quicker once you knew what you were doing? What was different about the first time you created the car and the last? Do you think the use of an assembly line for cars works this way? (Talk about factories vs. humans) What do you think would have happened if Ford had not have created this? (Bloom: Evaluation)

Closure:

I want you to write about your experience today. What was difficult about this experience? What was easy? How did this help you understand what an assembly line is used for? (Gardner: Linguistic)

Adaptations/Enrichment:

Student with Learning disability in reading comprehension

The student should have a relatively easy time with this lesson because it is more group work. The teacher will help the student while reading the excerpt from Henry Ford's autobiography by asking comprehension questions to the class. The teacher can make sure that this student is answering these questions and paying attention.

Student with ADHD

This student will be able to focus more with the instructions on the board. The student may get involved in the food while creating the car, but in order to help this, the student will be given the last job of the assembly line to ensure that he keeps up and pays attention.

Student with Gifts and Talents in Creativity

The gifted student/s will work in a group where they will have to test the cars in a different way. They will add testing different forces like gravitational force or human-hand force. They will compare these.

Self-Reflection:

- Did the students enjoy this activity?
- Did this help the students understand an assembly line?
- Were the students able to see the importance of an assembly line in the early development of the US and now?

Resource:

http://www.proteacher.org/org/a/91896_Henry_Ford.html

Edible Car

Directions: Each group will be creating an edible car. Every group will be given graham crackers, frosting, paper plates, M&Ms, and square candies. Your task will be to create as many edible cars as possible in an assembly line. Each group member will be given a task. Choose wisely on which task you would like to do!

Person number one: Places the graham cracker on the paper plate.

Person number two: Puts the frosting on the cracker and spreads it around.

Person number three unwraps the square candy.

Person number four places the window on the crackers (square candy)

Person number five places the 2 round candies on the bottom of the cracker for wheels.



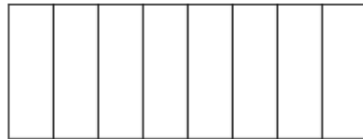
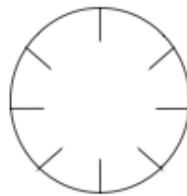
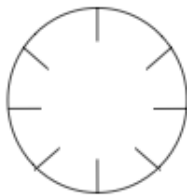
Patterns for steam turbine and paddle wheel

Please use cardstock to print these or glue pattern onto a manila folder before cutting out.

Cut out each disk below and carefully cut the slits shown on the disks.

Take a sharp pencil or compass point and make a small hole in the center of each disk. Do not make the hole very large as you want the wheel to fit snugly on the skewer.

Place one of the "paddles" in each slot of the wheels. It will be easier if you place a paddle so that it is about 1/6 of the way from the edge of the paddle and slide it into the slot on one wheel. Then do the same thing at the other end of the "paddle" with the second wheel. By adding the paddles to both wheels at once, you will save problems getting the second half of the paddle wheel built.



Paddles

When this portion of the paddle wheel is done set it aside for later use.

Cut the pattern below for the steam turbine. After cutting the slots in the wheel, carefully bend down the corner/side marked on the pattern to form a type of pinwheel. You will need to carefully insert the bamboo skewer through the center of this wheel so that the wheel is about 3 inches from the top (non pointed end of the skewer, and then tape or glue the wheel to the skewer to form a solid bond between the two pieces. When this is dry, place the skewer through the center of the bottom of the cup provided. Be sure that the wheel inside the cup is not touching the sides of the cup.

Now place the paddle wheel on the skewer that is extending from the bottom of the cup.



	Criteria				Points
	4	3	2	1	
Main/ Topic Sentence	Main/topic sentence is clear and clearly states what the paragraph will discuss	Main/topic sentence is either unclear or incorrect. Does not fully introduce paragraph	Main/topic sentence is unclear and incorrect. Only semi-introduces paragraph	Main/topic sentence is unclear and incorrect. Does not introduce paragraph at all	
Supporting Sentences	Paragraph has at least three or more supporting detail sentences that relate to the main idea	Paragraph has two supporting detail sentences that relate back to the main idea	Paragraph has one supporting detail sentence that relates back to the main idea	Paragraph has no supporting detail sentences that relate back to the main idea	
Legibility	Legible handwriting or typing	Marginally legible handwriting or typing	Writing is not legible in places	Writing is not legible	
Mechanics and Grammar	Paragraph has no errors in punctuation, capitalization, and spelling errors	Paragraph has one or two punctuation, capitalization, and spelling errors	Paragraph has three to five punctuation, capitalization, and spelling errors	Paragraph has six or more punctuation, capitalization, and spelling errors	
				Total ---→	

Lesson Plan #3

Lesson: Rollin' Steam Engine

Length: 30 minutes

Age or Grade Level Intended: 5th grade

Academic Standard(s):

SOCIAL STUDIES: 5.4.4 Trace the development of technology and the impact of major inventions on business productivity during the early development of the United States.

WRITING: CC.5.W.3 (5.4.2) Writing narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

Performance Objective(s):

Given the steam engine patterns, the students will create a steam engine with all materials that can be successfully blown.

The students will write a narrative given the parts of a narrative to describe the steam engine and assembly line to their parents in two pages.

Assessment:

The students' narratives will be assessed on how well they include all the parts that were instructed.

Advance Preparation by Teacher:

- Make copies of the patterns for students to cut out
- Make sure students have pencils, glue and tape
- Bring straws and cups

Procedure:

Introduction/Motivation:

We have already learned about one important invention of the United States. What was it? The second one we are going to discuss now is the steam engine.

Step-by-Step Plan:

13. What is a steam engine? Who invented it? (Engine that uses fluid to work and Thomas Savery) (Bloom: Knowledge, Gardner: Verbal/Linguistic)

14. How does the steam engine work? (The water boiled creates steam under pressure, which is vented onto a turbine. The turbine is attached through a series of gears to a drive mechanism. This is represented in the model by the skewer. I have provided a simple model schematic of this in the student materials, which you may wish to refer to as you are building their models.)
15. I am now going to let you each make your own steam engine. I am passing out the materials for you to start cutting out the patterns. If you follow the directions on the sheet, it will help you be able to make your steam engine.
16. Have each student cut out the turbine pattern and use the point of the skewer to pierce the center of the bottom of the cup. Remove the skewer and thread the turbine pattern onto the skewer until it is about halfway down the skewer. Tape the alternating corners of the turbine carefully to the skewer to form what looks like a stationary pinwheel. See diagram on student handouts.
17. Replace the skewer through the hole in the cup with the turbine set inside the cup. Place the lid on the cup. The skewer should stick out through the top. (You may have to use the sharp point of a pencil to make a small hole in the lid for the skewer to fit through. Do not tape the skewer to the cup of the lid. It must be able to turn freely. This is the combustion/steam generating area of your engine. The hot gas being created in the boiler will look for a way to get out of the cup and in doing so will spin the pinwheel. (Gardner: Logical/Mathematical)
18. Then have the students cut out and assemble the parts according to the directions on the handout.
19. Use the point of the skewer to pierce the center of the paddle wheel. Slide the paddle wheel part way up the skewer. Tape both the top and the bottom side of the paddlewheel to the skewer to hold it rigidly in position on the skewer. It should turn when the skewer turns.
20. Then, use a sharp pencil to make a small hole for the straw and an exhaust hole in the cup as shown on the diagram in the student handouts. Place the end of the straw in the first hole made in the cup for venting. This straw is going to be how the "steam" (hot air from the student) gets into the turbine chamber. You might wish to ask your students what part of the steam engine they are substituting for. (The boiler)
21. Then have students blow gently on the straw to see what happens to the paddleboat when steam is applied. Tell the students to then blow harder the second time on the paddleboat. Was there a difference? Why? (Bloom: Analysis)
22. After the students have been given enough time to experiment with their steam engines, bring the class back together to discuss. What was the most difficult part of creating the steam engines? Did this help you see how steam engines work? (Bloom: Evaluation)
23. Because we have done two different types of experiments, the next part of this lesson is to create a narrative to your parents on what you have learned from these two lessons. Hand out directions for this narrative.

24. Turn to the person sitting next to you and brainstorm what you would write about. (Gardner: Interpersonal)
25. The students will then work on their own to create their own narrative. Walk around helping guide students. Remind the students the parts of a narrative. (Gardner: Intrapersonal)

Closure:

We will continue working on these narratives in the next few days but I would like one student to read what they have so far. Allow one to two students (or more) to read aloud.

Adaptations/Enrichment:

Student with Learning disability in reading comprehension

The student who has difficulty reading may need more instruction verbally on the experiment so the teacher may need to repeat the instructions. The student can also have difficulty writing the narrative. The teacher needs to make sure that the student has help either from the teacher directly or an assistant who helps the student.

Student with ADHD

Directions need to be clear and concise and available for the student to stay on task. The placement of the student in the classroom is also important for creating the experiment and narrative. If the student is sitting around students who do not take the experiment seriously, they will be more likely to go along with them.

Student with Gifts and Talents in Creativity

The gifted students will create a narrative that will be a persuasive assignment to stress the importance of this type of lesson to the principal. It is to be used as a call to action as to why creating steam engines and assembly lines in class are beneficial for learning and their connection to science.

Self-Reflection:

- Did this lesson help the students better understand the business productivity of the early United States?
- How could I have made this lesson focus more on the specified standards?
- Did they enjoy creating their own steam engine?
- Were the directions too difficult? Too easy?
- Were the adaptations appropriate for students?

Resource:

http://www.thirteen.org/edonline/ntti/resources/lessons/hudson_river/b.html

Narrative Assignment

What is a narrative? Narratives provide human interest, spark our curiosity, and draw us close to the storyteller. You will write a narrative about steam engines and assembly lines. You are going to explain to a parent guardian what you learned. Explain the lesson and how we did it as a class. Then, explain the importance of these two inventions in American history. Write the narrative as though you were really having a conversation with your parents/guardian.

Parts of a narrative

- Make a point
- Convey action and details
- Present a conflict and create tension (Yours may not have a conflict)
- Sequence events
- Use dialogue (Don't forget " ")
- Told from a point of view

Your narrative should be two pages, grammar free, and in your best handwriting! These will be put up in the classroom.

Narrative Rubric

Stimulating Ideas	1	2	3	4	5
• Focuses on a specific event or experience • Presents an engaging picture of the action and people involved • Contains specific details and dialogue • Makes readers want to know what happens next					
Logical Organization	1	2	3	4	
5					
• Includes a clear beginning that pulls readers into the essay • Presents ideas in an organized manner • Uses transitions to link sentences and paragraphs • Flows smoothly from one idea to the next					
Engaging Voice	1	2	3	4	5
• Speaks knowledgably and/or enthusiastically • Shows that the writer is truly interested in the subject • Contains specific nouns, vivid verbs, and colorful modifiers					
Grammar/Conventions	1	2	3	4	5
• Sentence structure and variety • Spelling, punctuation, capitalization • Word choice and usage					
Attention to Directions	1	2	3	4	5
• 1 ½ - 2 pages in length • Typed (no exceptions) • 1 inch margins all around (top, bottom, left, and right) • Double spaced • Times New Roman 12 pt. font					

Lesson Plan #4

Academic Standard: MATH 5.6.1 Explain which types of displays are appropriate for various sets of data.

Performance Objectives: The students will list all electrical appliances used at home on their Electricity Log sheet with 100% accuracy. The students will create the appropriate graph to display their data found from their Electricity Log sheet with full completeness.

Advanced Preparation by Teacher: Create an Electricity Log sheet for students to record the amount of electricity they use at home. The other side of the sheet will contain questions for students to answer based on their data collected.

Lesson Plan:

- The teacher will discuss the importance of electricity. Students will be able to acknowledge the fact that Thomas Edison was the inventor. Teacher will explain that the class will continue to explore major inventions by focusing on electricity. Note- Thomas Edison also invented the phonograph (his first invention)
- After discussing electricity, the teacher hands out the Electrical Log Sheet. Explain to students that they will each be given an Electricity Log to fill out. They will fill out this log based on the amount of electricity used at home. They will also list the electrical appliances that are in their homes.
- Make sure students label the items on their list based on how much they use that item. For example, students can draw a blue star by the items that are used daily and a red square by the items that are only used several times a week. Then draw a green circle next to the items used only once a month and an orange triangle next to the items that are only used a few times a year.
- Students will then get into small groups and compare and contrast these lists. Ask students if they were to graph this information, what type of graph would they use? Students will then graph their information. After graphing, they will answer the questions on the other side of the Electrical Log sheet that ask students about their results. What did you see? Which type of electrical appliance was used the most? The least? Why?
- Students will then come together as a class and compare and contrast results.

Teacher will make a class graph of all electrical appliances used from students.

Assessment: The teacher will collect the students' Electrical Log sheet and their answers to the questions on the other side of the sheet. The teacher will check that students not only chose the correct graph to graph, but also that they answered the questions based on their information they collected.



Name _____

Electrical Log Sheet

Electrical item _____ Hours used _____

Electrical item _____ Hours used _____

Electrical item _____ Hours used _____

Electrical item _____ Hours used _____

Electrical item _____ Hours used _____

Electrical item _____ Hours used _____

Electrical item _____ Hours used _____

Electrical item _____ Hours used _____

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Electrical item _____ Hours used _____

Electrical item _____ Hours used _____

Electrical item _____ Hours used _____

Lesson Plan #5

Academic Standards: VISUAL ART: 5.7.4 Identify, control and use a balance of two-dimensional and three-dimensional media, techniques, and processes to effectively communicate ideas, themes experiences and stories.

WRITING: CC.5.W.8 (5.4.5) Recall relevant information from experiences or gather relevant information from print and digital sources.

Performance Objectives: The students will write a one page reflection based on their results from their paper airplane experiment all required form of participation done in class. The students will create a two-dimensional paper airplane using the paper given by the teacher in order to follow all of the given instructions correctly.

Advanced Preparation by Teacher: Pass out copies of the reading for the Wright Brothers. Print out copies of the instruction to create the paper airplane. Bring in blank sheets of paper to create the airplanes.

Lesson Plan:

- Teacher will begin lesson by passing out copies of the reading about the Wright brothers and ask them if they remember reading about the Wright brothers when we first introduced inventors. Explain that we will continue learning about specific inventors in order to understand the importance of early development inventions. Students will read about the Wright family and then discuss after. This will develop students' schema about the brothers into further detail.
- Teacher will then explain to students that they will be creating paper airplanes and then they will test their abilities to fly. This will give the students a chance to see what it takes (on a simpler scale) to make a plane fly.
- This website <http://www.proteacher.com/redirect.php?goto=1062> has the instructions for the teacher to print out for the students. Students will follow these instructions and if time, they can color and decorate their airplanes.
- Teacher will explain to students that they are going to test the ability of their airplanes to fly outside on a higher ground. Before going outside, students will discuss as a class what they predict will happen to their airplanes. Will all of their airplanes fly? Will some not work as well? Why or why not?
- Allow all students to test their airplanes outside. At first do test in any order, then ask the students if they put certain types of airplanes together, if that would change anything? Allow time to test this.
- Bring students back into the classroom and discuss with the students what conclusions they saw from this experiment.
- Teacher will then explain to the students that they will write a reflection paper based on their results from the experiment. Review the important parts of a reflection paper. Describe parts of a paper that are important. Put the rubric that will be used to assess students on the SMART board for them

to see. They will describe their own personal results and then the class's results. The paper will also include a comparison between their airplanes and the Wright brothers' first airplane.

Assessment: The students will be assessed by their reflection paper of their experiment.

Determining the Facts

Reading 3: From Bicycles to Airplanes

By the time Wilbur and Orville Wright opened their first bicycle shop in 1892 to repair and sell bicycles at 1005 West Third Street in Dayton, the nation was already in the midst of a cycle craze. In fact, so great was the appeal for the newly developed safety bicycle that it was extolled as the "greatest invention of the nineteenth century," and the decade of the 1890s was celebrated as the golden age of the bicycle.¹ The millions of bicycles that poured out of American factories during the decade of the 1890s set an entire nation on wheels. For both industry and society--the bicycle was a transitional technology, bridging the gap between the age of the horse and that of the automobile.

The bicycle enterprise provided a brisk business for Wilbur and Orville, and necessitated the relocation of their cycle shop at 1005 West Third Street to more spacious quarters. In early 1895, the Wrights once again made the decision to move their bicycle business to larger facilities this time to 22 South Williams Street. However, this time they chose to combine their bicycle and printing interests under the same roof. In addition to their repair business, the brothers stocked a line of parts and acquired the local distributorship for eight lines of new bicycles. Competition was still fierce, as there were 14 bicycle shops in Dayton by 1894-95, four of them within two blocks of the new Wright shop.

Late in 1895, the Wrights decided to expand their cycle business to manufacture their own brands of bikes. In a pamphlet printed early in 1896, the Wrights announced:

With the new year we begin our fourth season in the bicycle business, and we take this occasion to thank the public for its increasing favor. Each year we have more than doubled the business of the preceding one. For this reason we feel that we are justified in making special preparation for the accommodation of our customers in the coming year. Our salesroom at 22 South Williams Street is being nicely refitted, and a visit from you will be much appreciated. We are adding new machinery to our shop, and before the riding season opens we hope to have on the market a bicycle of our own make, which in commemoration of Dayton's Centennial Year and in honor of our own ancestor, we have decided to call it the "Van Cleve." . . . We shall also put out a cheaper bicycle which will be known as the "Wright Special." ²

In preparation to produce their own line of bicycles, the Wrights transformed the building into a well-equipped machine shop. Within no time, the back room of the bicycle shop was outfitted with a turret lathe (a turning lathe with a vertical cylindrical revolving head), drill press, brazier (a metal pan for holding burning coals or charcoal), tube cutting equipment, and an overhead line shaft. Likewise, the Wrights used many other tools such as files and wrenches, which would be necessary to manufacture bicycles. However, most important among the Wrights' inventions for the bicycle shop was an experimental gas engine. The one-cylinder

internal combustion engine was designed by Wilbur and Orville to power the bicycle machinery and was the first engine they ever built.

The first bicycle produced was the Van Cleve. Named for pioneer ancestors of the Wrights, it was always the top of the line of Wright bicycles and sold for \$65.00.³ The St. Clair (named in honor of Arthur St. Clair, first governor of the Northwest Territory), a lower priced model marketed towards school children, was also introduced in 1896. While most major bicycle manufacturers were mass-producing machines using techniques that helped set the stage for the assembly line, the Wright bicycles remained hand-crafted originals. Most of the Wright cycle frames were built from raw tubing, brazed (or soldered) with a machine the Wrights had developed themselves. The Wrights built their own wheels with either wooden or metal rims, according to individual customer orders. One particular element of their Van Cleve bicycles that they were proud of was their specially designed hub (the center of a wheel, from which the spokes radiate), which they announced, has "been a chief feature in making the Van Cleve reputation. We are certain that no hubs have been used in bicycles so satisfactory in all respects....they are absolutely dust proof, and oil retaining to a degree that one oiling in two years is all they require."⁴

Overall, between 1896 and 1907, when the Wrights discontinued their bicycle enterprise, the brothers manufactured and sold hundreds of several models and brands. But bicycles had given Wilbur and Orville more than just the wherewithal to build and test their experimental flying machines. Their experience in bicycle building had provided them with the wood- and metal-working tools and skills that would be required in the construction of an airplane. In fact, many early aviation enthusiasts predicted that the invention of a successful flying machine would be the work of bicycle makers.

The year 1896 at the bicycle shop was significant for other reasons as well. In August, after the line of Wright bicycles had been successfully introduced to the Dayton community, Orville contracted typhoid fever from a tainted well at the rear of the bicycle shop. While Orville remained bedridden until early October, Wilbur occupied his time contemplating the aeronautical problems of human flight. Around the time Orville became ill with the fever, Wilbur learned of another tragedy that would fuel the brothers' desire to conquer the air. On August 10, Otto Lilienthal, the German engineer and aeronautical pioneer who was the first man in the world to launch himself into the air and fly, died from injuries received in a glider accident. Lilienthal's death, which Wilbur learned of through a news service the brothers subscribed to for their printing firm, inspired the brothers' to work on overcoming the obstacles to human flight. As Wilbur remembered:

My own active interest in aeronautical problems dates back to the death of Lilienthal in 1896. The brief notice of his death which appeared in the telegraphic news at that time aroused a passive interest which had existed from my childhood...and as my brother soon became equally interested with myself, we soon

passed from the reading to the thinking, and finally to the working stage.⁵ From 1896 and on, the Wrights harbored a growing belief that man could fly, and they began to focus their attention on the problems of mechanical and human flight. Time and again the Wrights returned to the study of Lilienthal's crash and the reasons for it. After all, the German pioneer had constructed wings that could carry him aloft, but his primitive weight-shifting technique had been inadequate to provide sufficient control over his machine. Most would-be aviators had, in fact, moved in the same direction as Lilienthal, toward designing a machine that would be inherently stable, requiring the intervention of the pilot only when a change in direction or altitude was required. The insistence of the Wright brothers that the pilot be an integral part of the mechanical system, exercising complete and constant control over the balance and direction of the machine, was their first major step toward success.

Inside the building at 22 South Williams Street in Dayton, Ohio the Wright brothers began their incredible journey into aviation. The bicycle business not only provided the funds necessary to pursue their interests in aviation, but also allowed them time, as the business was seasonal in nature. Bicycle manufacturing was the ideal preparation for engineering the structure of an aircraft. Weight control is a primary concern of both bicycle and aircraft designers, though for very different reasons. In the key areas of balance and control, the bicycle had helped to shape the Wright brothers' approach to aircraft design. In the fall of 1897, the Wrights shifted their operations to 1127 West Third Street, the final location of their bicycle enterprise. It was in this building that the brothers constructed their experimental gliders and later machines, conducted much of their aeronautical research, and built the world's first airplane. They successfully flew that airplane on December 17, 1903 at Kitty Hawk, North Carolina.

After their success at Kitty Hawk, the Wright brothers proved that flight was possible. But they needed to prove that flight was practical. For aviation to take its next steps, they needed a convenient, private place--a flying field--closer to home. Their experiments continued--not at Kitty Hawk, but at a cow pasture eight miles east of Dayton, Ohio, known as Huffman Prairie. Even though their first experiments at Huffman Prairie in 1904 were filled with frustration, their experience as bicycle makers helped them master the mysteries of control and balance. Eventually, the brothers were able to stay in the air long enough to practice turns, circles, banking and stalling. It was here, at Huffman Prairie, that the brothers built the first practical airplane and learned to fly. They were no longer dependent on the wind; they could take off and land numerous times without injury and they could stay in the air longer than ever before. By the end of 1905, the Wright Flyer III could fly 20 miles or more at a time. The Wright brothers truly conquered the skies.

Reflection Paper Rubric

Category	Points				
	5	4	3	2	1
Organization	Information is very organized with well constructed paragraphs, use of subheadings, and information is factual and correct	Information is organized with well constructed paragraphs and information is factual and correct	Information is organized but paragraphs are not well constructed and information is factual	The information appears to disorganized information is suspect to being correct and factual	Information is not only disorganized but inaccurate
Quality of Information	Information clearly relates to the main topic. It includes several supporting details and/or examples	Information clearly relates to the main topic. It provides 1 – 2 supporting details and/or examples	Information clearly relates to the main topic. No details and/or examples or given	Information has little to do with the main topic	Information has nothing to do with the main topic
Mechanics	No grammatical, spelling or punctuation errors	Almost no grammatical, spelling, or punctuation errors	A few grammatical, spelling, or punctuation errors	Many grammatical, spelling, or punctuation errors	Way to many for a college student getting ready to enter the health education field

Reflective Tone	Information is presented in a reflective tone. Reflects on all parts of the experiment	Information is fairly in a reflective tone. Reflects on all parts of the experiment	Information is not as reflected as needed. Reflects on only two parts of the experiment	Information is not in a reflective manner. Reflects only on one part of the experiment	Information is not in a reflective manner and does not reflect on any specific part of the experiment
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Lesson Plan #6

Academic Standards: Physical Education: 5.1.1 Demonstrate the ability to integrate locomotor and nonlocomotor movements in more complex skills.

Performance Objectives: The students will demonstrate their locomotor and nonlocomotor skills given an obstacle course by completing and answering all six stations' questions.

Advanced Preparation by the Teacher: Print out copies of the Morse Code Alphabet Sheet on this website <http://www.scoutscan.com/cubs/morsecode.html> Set up the obstacle course outside in an area where the students will be able to run around.

Lesson Plan:

- Teacher will ask students what the lesson was about the day before. The teacher will then ask what theme they have been focusing on. Teacher will then explain that they will continue with the inventors and inventions theme with a new invention. The teacher will begin the lesson by asking students how many of them use a telephone or cell phone? Then the teacher will explain that the telegraph was the first form of this type of communication. The teacher will explain that Samuel Morse was the inventor of this invention.
- The teacher will then explain that in order to understand the telegraph, they will learn about the Morse code. The teacher will explain that during the Civil War, they used this as a means to communicate.
- Next, the students will work in pairs to decode a message from the teacher. After given enough time, the students will see if their decoding was correct by presenting it to the class.
- The students will then create their own Morse code message for their peers to decode.
- After all students have showed they understand the concept, the teacher will then explain that they will be doing an activity outside. The teacher will have already set up an obstacle course. This obstacle course will be the "battle scene" from the times of the Civil War. The students will be put into teams of five. Each student will have to do the specific obstacle at each station but they will have to decode the Morse code message at each station before they can go further. In order to win the obstacle course. The students have to complete all stations before any group and correctly decode all of the Morse code messages. All of the Morse code messages will combine to create a question. At the end, the students will need to answer this question as a group
- Have students come back inside after completing this activity and discuss what was most challenging and least challenging about this activity. Discuss if it was helpful to see Morse code being used by themselves, like it was in the Civil War.

Assessment: The students will be assessed by their participation in the small group work while practicing Morse code. They will also be assessed on how they participate in the obstacle course. Did all groups participate? Did they all help to answer the question?

Lesson Plan #7

Academic Standards:

VISUAL ART 5.7.4 Identify, control, and use a balance of two-dimensional and three-dimensional media, techniques and processes to effectively communicate ideas, themes, experiences and stories.

WRITING CC.5.W.9 Draw evidence from literary or informational texts to support analysis, reflection and research.

Performance Objectives: The students will use fabric to stitch at least one cutout animal design correctly based on the instruction given by the teacher. The students will use the text *Something from Nothing* to draw evidence to develop a narrative letter with all the specified parts on the given rubric.

Advanced Preparation by the Teacher: Bring fabric for students, felt, or any other easily sewn fabric. Prepare cutouts for students to trace and use to make animals out of. Bring a copy of *Something from Nothing* by Phoebe Gilman. Find a clip of an introduction to a sewing machine and how to use it. Bring in needles for students to use to sew. Thread and buttons. Create a rubric.

Lesson Plan:

- Review with students the inventors/inventions they have already learned. Tell students they will discuss a new inventor today. Teacher will first read *Something from Nothing* to the students. Teacher will ask the students about the book and how the blanket changed from a different item to the next. The students will then discuss how the blanket was sewn from a blanket to a jacket, etc.
- Teacher will then ask the students how clothes are sewn today. They will discuss sewing machines and the teacher will introduce the inventor Elias Howe.
- The students will then watch an introduction on how to use a sewing machine. Discuss how they are used. Because a sewing machine could not be brought into class, the students will be hand sewing for themselves.
- Teacher will describe and demonstrate how to use the needle and thread to sew a button or stitch onto the fabric given.
- Teacher will then explain that the students will pick out a design of an animal to cut out and then put buttons on their eyes using the method of sewing that was just shown. They will also need to put other designs on the animal using the stitches. They can be creative with the design, but it has to cover part of the design and show their knowledge of the skill.
- Before giving students time to work on their animals, allow students to practice first. Monitor student's work and make sure they are doing it correctly.
- Students may do as many animals as time permits.

- After students have made at least one animal, students will come back together as a class. They will discuss the challenges of having to hand sew their designs. Teacher will ask students what if Elias Howe had never created the sewing machine? How would this affect how clothes and other materials were made? Students will answer this question in a response letter to Elias Howe. They will write a letter thanking him for his invention. Review how to write a letter. Students should already know how to do this, but make sure that they understand the important parts of a letter. This letter will need to include references from the text read in class and how his invention has helped their lives, families, and community.
- Teacher will post these and their animal designs in the classroom

Assessment: The students will be assessed on their letter to Elias Howe based on a rubric. Their letter must include the given components and must be grammatically correct.

Letter Rubric

Student Name: _____

	4	3	2	1
Sentences	All sentences are complete, well-constructed (no ragments, run-ons) and of varied structure.	All sentences are complete and well-constructed (no fragments, no run-ons).	Most sentences are complete and well-constructed.	Many sentence fragments or run-on sentences.
Capitalization and Punctuation	Writer makes no errors in capitalization and punctuation.	Writer makes 1-2 errors in capitalization and punctuation.	Writer makes 3-4 errors in capitalization and punctuation.	Writer makes more than 4 errors in capitalization and punctuation.
Ideas	Ideas were expressed in a clear and organized fashion. It was easy to figure out what the letter was about.	Ideas were expressed in a pretty clear manner, but the organization could have been better.	Ideas were somewhat organized, but were not very clear. It took more than one reading to figure out what the letter was about.	The letter seemed to be a collection of unrelated sentences. It was very difficult to figure out what the letter was about.
Format	Complies with all the requirements for a friendly letter.	Complies with almost all the requirements for a friendly letter.	Complies with several of the requirements for a friendly letter.	Complies with less than 75% of the requirements for a friendly letter.
Salutation and Closing	Salutation and closing have no errors in capitalization and punctuation.	Salutation and closing have 1-2 errors in capitalization and punctuation.	Salutation and closing have 3 or more errors in capitalization and punctuation.	Salutation and/or closing Are missing.

CATEGORY

Final Grade: ____ / 20

Lesson Plan #8

Lesson: Exploring Primary Sources

Length: 30 minutes

Age or Grade Level Intended: 5th grade

Academic Standard(s):

SOCIAL STUDIES: 5.1.19 Using primary and secondary sources to examine an historical account about an issue of the time, reconstruct the literal meaning of the passages by identifying who was involved, what happened, where it happened, what events led to these developments and what consequences or outcomes followed.

Performance Objective(s):

Given an analysis tool sheet, the students will record their observations, reflections, and questions with a total of at least three in each section.

Assessment:

The students will be assessed on their Primary Source Analysis Tool Sheet and if they have completely filled out the sheet with all of the specific parts.

Advance Preparation by Teacher:

- Create a PowerPoint with pictures of primary sources and print off separately
- Create an analyzing tool worksheet
- Have a single picture by itself for students to look at as a class

Procedure:

Introduction/Motivation:

I mentioned a few days ago in our lesson that we talked about primary sources. Do you remember what that term was that I read in class to you? (Biography) This is an example of a primary source. What is a primary source? (An artifact, document, or other source of information that was created at the time under study) The book *My Life and Work* by Henry Ford is an example of a primary source. Can someone tell me why? (Bloom: Knowledge, Comprehension Gardner: Verbal/Linguistic) We already learned about Henry Ford. What did he invent? Why is he important to early American history?

Step-by-Step Plan:

1. What have we been focusing on the past few days? (Technology and Inventions) (Bloom: Knowledge)
2. We are going to combine our knowledge of primary sources and inventors/inventions.
3. On the board I have a picture that is a primary source. They will be up at the beginning of class for the students to see and ponder before class. As a class we are going to observe this picture. (Give time for students to look at the picture. The picture will be the Wright brother's plane) What is this a picture of? (A plane) Who did we discuss a few days ago that invented the plane? (Wright brothers) (Bloom: Knowledge)
4. When we look at this picture, we see a plane. Because we have already learned about The Wright brothers and their invention of airplanes, we can assume that this is a picture from one of the first planes they built because the picture shows a plane that is not as developed as planes today. What else can we observe? What time period was this? Do we know if the flight was successful? Why or why not? (Bloom: Analysis, Evaluation)
5. Allow students to discuss this as a class and provide input.
6. We can also do this with passages or quotes. Put Orville and Wilbur Wright's quotes on the SMART board. What do we see from these quotes? What do they mean? Let's look at a few of these together and try to figure out what the brothers meant by these quotes.
7. After they have discussed these quotes and figured out a guess on what they mean, hand out copies of the Primary Analysis Analyzing Tool Sheet.
8. I have around the room pictures that are primary sources about your inventors/inventions from the time period of 1776- early 1900s. You are going to go to each picture with a partner and fill in first your observations, which would be what you see in the picture. Describe the picture and all of the parts. Second, you need to reflect on what you see. What does it make you think of? Why? Third, I would like you to ask a few questions about the picture. What confuses you? What is still left to be answered within the picture? The last part will be further investigation where we will go through the pictures together as a class. (Bloom: Synthesis, Application)
9. Each pair will be given a number and they will start at the picture with the number given to them.
10. Give students enough time to work in pairs to observe the pictures around the room. They will each need to get out of their desks to find the pictures. Walk around and help students who are having difficulty observing the pictures. (Gardner: Interpersonal, Bodily/Kinesthetic, Visual/Spatial)
11. When students have completed all or the majority of the pictures, have students come together as a class.
12. Now, we will go through each picture and see if your observations were correct. Go through each picture and tell the students what the picture is and what inventor/invention it is connected with. While going through each picture, ask students before what they thought the picture was. Get a consensus for each picture. After revealing the picture's identity, explain to

students why their observations may have not been correct. Then, go through their reflections and questions.

13. Make sure that you teach students how to effectively observe primary sources, especially pictures in this lesson so the students will be able to properly observe them in the future.

Closure:

Make sure that your names are on your Primary Source Analyzing Tool worksheet and with your partner I want you both to write the real answers for each picture and what observations would lead you to these answers. Put this on the bottom of the sheet and then turn it in.

Adaptations/Enrichment:

Student with Learning disability in reading comprehension

This student will mainly have difficulty while writing their observations and recordings on the Analysis Sheet. The teacher may need to keep an eye on the student in order to keep the student on task. The student will be put into a group with students who are stronger readers that will be able to come up with inferences and observations that challenge the picture.

Student with ADHD

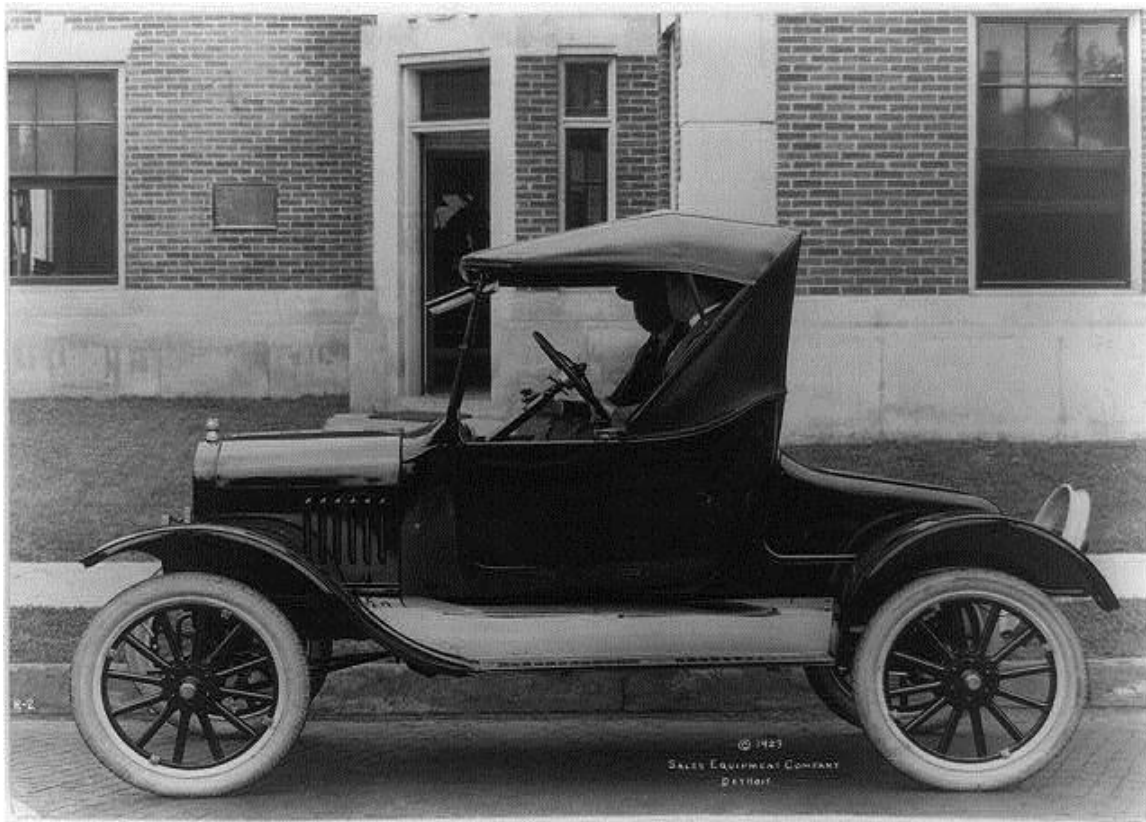
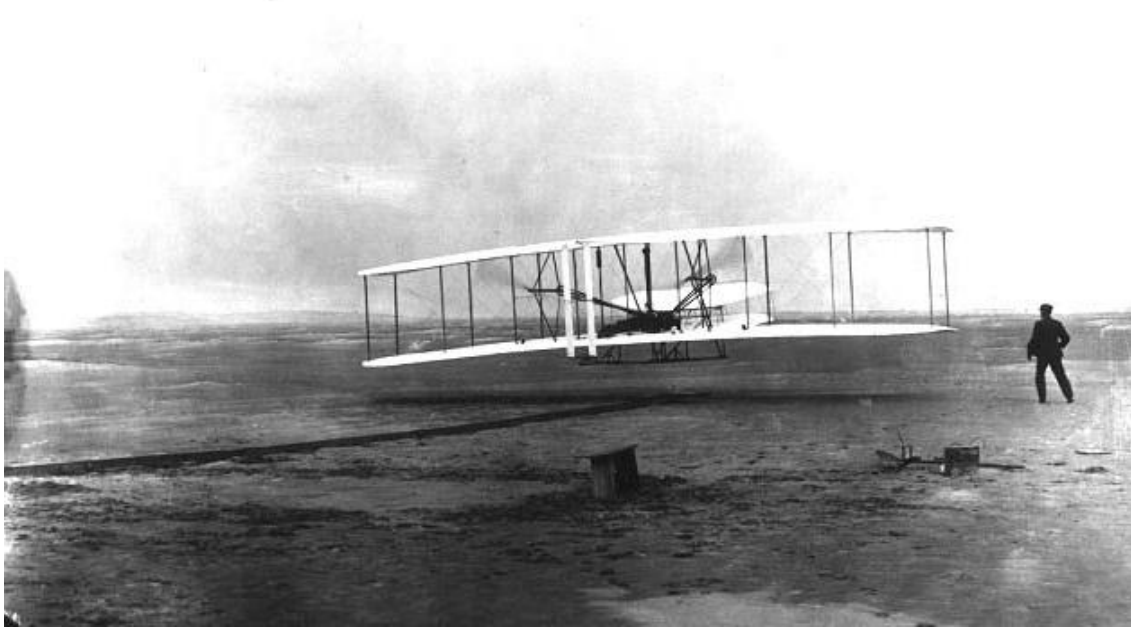
This student will need a to-do list to be put on the board so they can follow it. The student will still do the same material but by having a checklist to follow, they will feel accomplished when they are able to check off each picture.

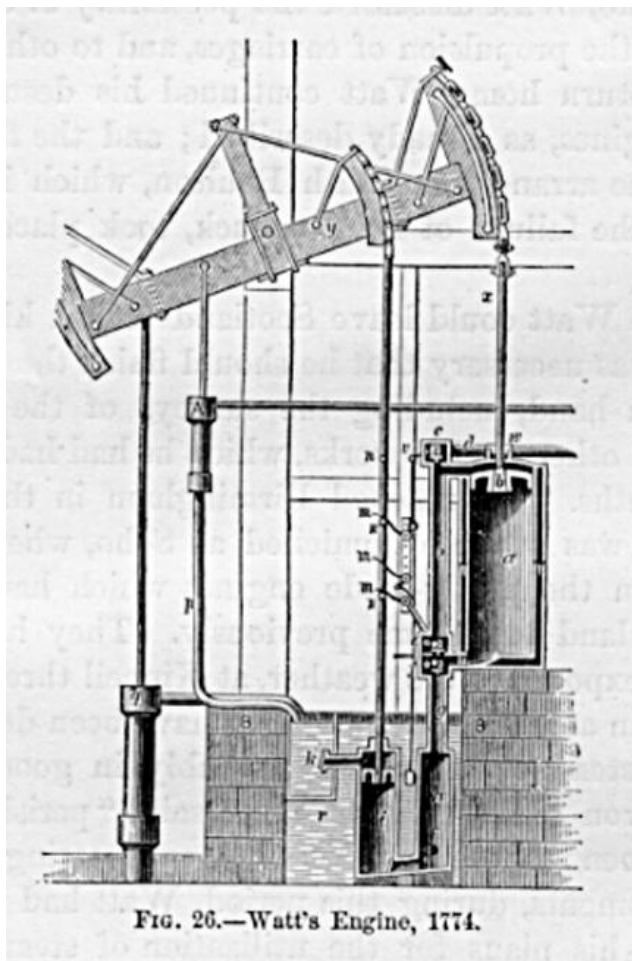
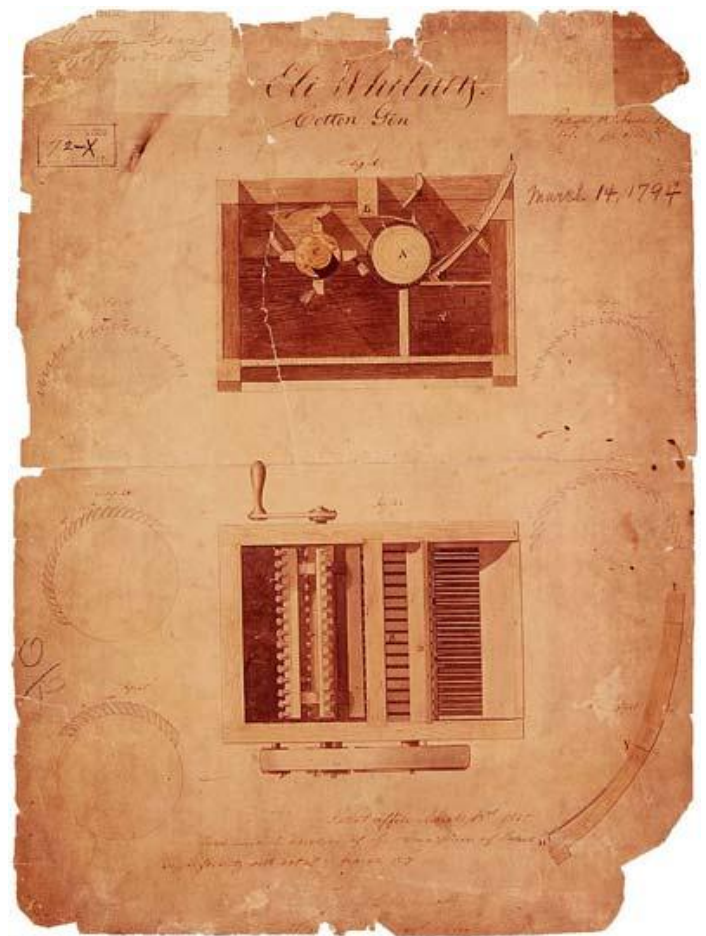
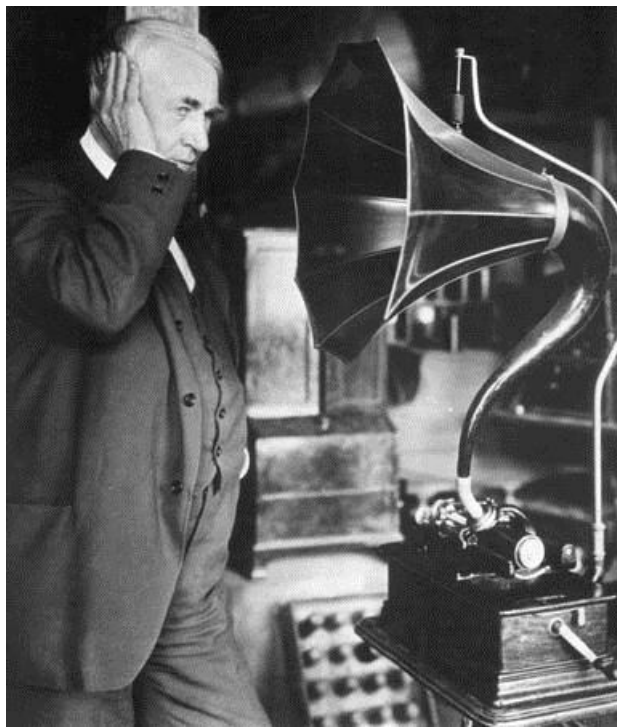
Student with Gifts and Talents in Creativity

These students will instead of observing pictures, will be given links of recordings of primary sources for many of the similar inventions. They will get on the computer and listen to the recordings but they will still fill out the Primary Source Analysis Sheet. When the rest of the class is discussing the pictures with the class, these students at the end will report what they heard and provide any feedback that may go along with the other students' activity.

Self-Reflection:

- Were the students able to figure out the picture?
- Were the pictures too difficult? Too easy?
- How could I have extended this lesson to make it more applicable?
- Did the students think this lesson would help them with their projects?





Orville and Wilbur Wright

Orville Wright:

"The desire to fly is an idea handed down to us by our ancestors who, in their grueling travels across trackless lands in prehistoric times, looked enviously on the birds soaring freely through space, at full speed, above all obstacles, on the infinite highway of the air."

"If we worked on the assumption that what is accepted as true really is true, then there would be little hope for advance"

"The airplane stays up because it doesn't have the time to fall."

"No flying machine will ever fly from New York to Paris ... [because] no known motor can run at the requisite speed for four days without stopping."

"Isn't it astonishing that all these secrets have been preserved for so many years just so we could discover them!"

""If birds can glide for long periods of time, then... why can't I ?"

"We were lucky enough to grow up in an environment where there was always much encouragement to children to pursue intellectual interests; to investigate what ever aroused curiosity."

Wilbur Wright:

"There is no sport equal to that which aviators enjoy while being carried through the air on great white wings."

"More than anything else the sensation is one of perfect peace mingled with an excitement that strains every nerve to the utmost, if you can conceive of such a combination."

Lesson Plan #9

Lesson: Being a Secondary Source

Length: 30 minutes

Age or Grade Level Intended: 5th grade

Academic Standard(s):

SOCIAL STUDIES: 5.1.19 Using primary and secondary sources to examine an historical account about an issue of the time, reconstruct the literal meaning of the passages by identifying who was involved, what happened, where it happened, what events led to these developments and what consequences or outcomes followed.

Performance Objective(s):

Given the Inventor Sheet, students with a partner will fill out all of the questions regarding their partner's inventor with 100% completion. Given the answers from their partner's inventor, the students will present to the class the information they found by reading and hearing about the inventors.

Assessment:

The students' assessment will be the Inventor Sheet and whether or not they filled it in correctly and participated in the discussion/sharing portion of the lesson.

Advance Preparation by Teacher:

- Create the Inventor Sheet
- Bring research books
- Have computers available for students

Procedure:

Introduction/Motivation:

1. Yesterday we learned about primary sources. Would someone please refresh my memory what a primary source is? (Bloom: Knowledge)
Students should mention that primary sources are documents, pictures or physical objects that were written during the time of study. They also need to mention that primary sources are original pieces of work. Now that we have reviewed primary sources, you are now ready to discuss secondary sources. Who can tell me what a secondary source is? (Secondary sources analyze primary sources. Examples are textbooks, magazines, encyclopedias) (Bloom: Knowledge Gardner: Verbal/Linguistic)

Step-by-Step Plan:

2. Your inventor project requires you to research information on your inventor. What types of sources are you using? (Say both) How can you tell which one is a primary source? How can you tell it is a secondary source? If you are getting your information from an encyclopedia or newspaper source online, then it is a secondary source. If you are getting it from an online source that says it is a direct quote or passage from a book written by the inventor, then it is a primary source. Allow for discussion on the differences between these. Put on the board their answers for the differences then the similarities into a Venn diagram. Use the smart board to draw the circles. Have students come up and put their answers on the diagram. The students will write aspects of primary and secondary sources that describe each. In the middle, students will find similarities about these sources. For example, they both give information about a topic. (Bloom: Analysis, Comprehension Gardner: Visual/Spatial)
3. You all should be working on your project at home and during extra class time. My hope today is that you will have already worked on your project enough to be able to share your information with a partner. You will take the role as a secondary source. You are going to tell your partner all of the information you know about your inventor and what they invented. If you have the books I gave you with you, you may show them any pictures. (Gardner: Interpersonal)
4. Each student will get a sheet that they will need to ask their partner to find information about their partner's inventor. You are going to play the role of a secondary source to your partner.
5. Hand out Inventor Sheet. There are ten parts of this to fill out. You and your partner will describe your inventor to each other in a way that will be conversation. Do not just ask each other what the answers are to the Inventor Sheet! You are playing the part of a secondary source. Can someone tell me how that is? You are getting the information from a primary source about an inventor and then writing it down. This is how historians learn about the past. Historical facts have been passed down from generation to generation, each beginning with a primary source. (Bloom: Application)
6. Give students time to fill out sheets. While they are working, walk around and observe students. Make sure students are answering questions in a conversational tone. Ask students what invention their partner's inventor created. What is important about their invention? Have you used it before today? (Bloom: Evaluation)
7. When students have completed this task, get together as a class. Was it helpful to discuss what other students have found out about their inventor? Did it make you think about your research for your own inventor? Before we get together as a class, discuss briefly the

similarities and differences (Bloom: Application Gardner: Intrapersonal)

Closure:

Every group will now present what they found out about their partner's inventor. Make sure your information is correct. I would like each of you to present at least three details about the inventor and one must include an important event in their life. (Gardner: Bodily/Kinesthetic)

Adaptations/Enrichment:

Student with Learning disability in reading comprehension

This student will have difficulty writing/reading the questions for the assignment with the partner. In order to help the student, the teacher will have instructions on a tape for the student to listen to on the computer before class starts so the student knows before hand what to do.

Student with ADHD

This student will have a checklist to follow with the instructions that they will be able to check off after completing. The teacher will put the instructions on the board.

Student with Gifts and Talents in Creativity

These students will prepare not only a presentation of their partner's inventor, but they will present it in a creative way. They will be the inventor and teach the class about the inventor's life.

Self-Reflection:

- Did the students like working together?
- Did they grasp the concept that they were the primary and secondary sources?
- Did I assess them in a way that connected to the standard?

Inventor Sheet

Name_____

Partner_____

1. Name of inventor_____
2. Major invention_____
3. Other inventions_____
4. Birth date/Birth place_____
5. Date of death (if applicable)_____
6. Name of parents_____
7. Number/names of siblings_____
8. Date of invention_____
9. Importance of invention_____

10. Name and describe three important events in their life

[illegible]

Lesson Plan #10

Academic Standards: Writing: CC.5.W.3 (5.4.2) Write narratives to develop real or imagined experiences or events using effective techniques, descriptive details, and clear event sequences.

Performance Objectives: Students will write a narrative based on the Gallery Walk by giving examples from their project and at least two other students' projects based on the given rubric.

Advanced Preparation by the Teacher: Teacher will need to tell students to bring in their completed Inventor project/poster. They will need to be ready to present their posters to the class. Create a rubric for the project to check while students are observing other projects.

Lesson Plan:

- Make sure that all students have brought their posters.
- Teacher will then discuss that all students will go through a Gallery Walk of everyone's posters. Describe a Gallery Walk.
- Students will need to pay close attention to their peers' posters because they will be writing about them after looking at everyone's.
- Allow enough time for students to do this. Teacher will need to also look at student's projects and grade them while students are observing. Use rubric and write comments so students understand what they did correctly/incorrectly
- After all students have looked at everyone's poster, bring class together to discuss. What were some similarities between the posters? Differences? Why do you think this?
- Explain to students that they will write a narrative about their experience during the Gallery Walk. Hand out the rubric and explain what they will be graded on. Briefly describe the parts of a narrative so students know the expectations. Also, describe that they will need to use specific example from not just their project, but also at least two other projects.
- Students will present these narratives to the class.

Assessment: The students will be assessed by their narratives. There will be a rubric the teacher will use to assess these narratives. They will also be assessed informally by their presentation of their narratives. This will also be a post-assessment for the unit by the Inventor posters the students have created. The teacher will be able to create a chart on what aspects the students were good at and which parts the students still need to work on.

Narrative Reflection Paper Rubric

Learning from Experience Personal Narrative Rubric Advanced	• Demonstrates a thorough understanding of the purpose, audience, and task. • Provides description and sensory details that are all relevant to the story. Uses a wide variety of specific, accurate, and relevant detail. • Demonstrates a cohesive and unified structure with an engaging introduction with a strong conclusion, effective use of paragraphing, and transitional devices throughout. • Provides precise descriptive language use, vivid figurative language, thoughtful word choice, and well-structured and varied sentence types. • Contains little or no errors in paragraphing, grammar, punctuation, spelling, etc.
Proficient	• Demonstrates a general understanding of the purpose, audience, and task. • Provides description and sensory details that are all relevant to the story. Uses sufficient specific, accurate, and relevant detail. • Demonstrates a mostly unified structure with a good introduction and conclusion, consistent use of paragraphing, and transitional devices. • Provides precise language use, appropriate word choice, an example of figurative language, and well-structured sentence with some variety. • Contains few errors in paragraphing, grammar, punctuation, spelling, etc.
Basic	• Demonstrates a basic understanding of the purpose, audience, and task. • Provides description and details that are relevant to the story. Uses some specific, accurate, and relevant details. • Demonstrates a generally unified structure with a noticeable introduction and conclusion. Inconsistent use of paragraphing and transitional devices. • Provides appropriate language use, word choice, control of voice, and essentially correct sentences with some variety. • Contains occasional errors in paragraphing, grammar and usage, punctuation, spelling, and mechanics, but the errors do not make comprehension difficult.
Below Basic	• Demonstrates a limited understanding of the purpose, audience, and task. • Provides description and details that may not be relevant to the story. Uses insufficient details. • Demonstrates evidence of structure with an uncertain introduction and conclusion; lacks paragraphing and some transitional devices. • Contains simple language use, word choice, and awareness of voice, relies on simple

	sentences. • Contains many errors in grammar, spelling, mechanics, etc. that make comprehension difficult.
Far Below Basic	Demonstrates a minimal understanding of the purpose, audience, and task. Provides very little or no description, or description and details that may stray from the point of the story. Demonstrates little evidence of structure with a poor introduction and conclusion. Little evidence of paragraphing and transitional devices. Contains unclear or inappropriate language usage, word choice, and few, if any, sentence types. Contains serious errors in paragraphing, grammar and usage, punctuation, spelling, and mechanics. Errors may make comprehension difficult or impossible