Ten-Day Unit Plan

Unit Topic: Inventors and Inventions

Unit Goal: The students will learn about inventors of the past and understand the importance of inventions to our daily lives.

Day 1

Subject: Language Arts

Standards:

- Language Standards Conventions of Standard English
 - ➤ **2.L.1** Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.
 - ➤ **2.L.2** Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.

Indicators:

- <u>**4**</u> 2.L.1
 - ➤ **f.** Produce, expand, and rearrange complete simple and compound sentences
- **♣** 2.L.2
 - ➤ **e.** Consult reference materials, including beginning dictionaries, as needed to check and correct spellings.

Topic: Introduction to Inventions

Objective: The students will practice writing sentences using inventions as words included in the sentence.

Resources:

- The How It Works Encyclopedia of Great Inventors & Discoveries. London: Marshall Cavendish, 1978. Print.
- Scrabble, Blond, Geri, and Doris Spivack
- Inventions & Extensions: High-interest, Creative-thinking Activities. Nashville, TN: Incentive Publications, 1991. Print.
- Agnes, Michael. *Webster's New World Children's Dictionary*. New York: Macmillan, 1999. Print.
- "Noah Webster House &." *Do you Know Noah?*. N.p., n.d. Web. 1 Apr. 2014. https://www.noahwebsterhouse.org/discover/kids-corner/know-noah.htm.

• "History of SCRABBLE." *History of SCRABBLE*. N.p., n.d. Web. 1 Apr. 2014. http://www.scrabble-assoc.com/info/history.html.

Materials:

- roll of tape
- light bulb
- pencil
- tennis ball
- comb
- small radio
- roll of film
- battery
- "Invention Alphabet" story
- smartboard

Lesson Summary: The teacher will set up a table with a roll of tape, light bulb, pencil, tennis ball, comb, small radio, roll of film, and battery and ask the students why the collection is there and what do all of the objects have in common, which is all of the objects are inventions. The teacher will then use Frayer's Model to discuss the meaning of the word invention. The students will give examples of things that are not inventions, such as water, fire, trees, etc., they will give characteristics by answering the questions of who can be an inventor and why do people invent things. The students will then take turns naming their favorite invention and each student should try to name a different invention. The students will then read along as the teacher reads the "Invention Alphabet" story, which is a few paragraphs of letters of the alphabet complaining about how their letter is usually remembered by using animals, such as "A is for anteater." The end of the story challenges students to think of a word that's an invention that starts with every letter of the alphabet. Students will use the dictionary for this activity for inventions that begin with difficult letters. The students will then learn a quick bio about Noah Webster, the man who invented the dictionary. After learning a little about the person who invented a book of words, students will then be asked about word games, such as Scrabble, and when they first began. The inventor of the game Scrabble, Alfred M. Butts, will then be discussed briefly with the students. The students will then play a "Board Relay" game on the whiteboard. The class will be split into two teams and one player from each time will write a word on the board that is an invention, and then the next player will go up and write another word, and this will keep going until one team writes a complete sentence with a minimum of seven words. After one team completes a sentence, as a class we will work to expand and rearrange the sentence to make it sound the best. The students will each independently write a paragraph about their favorite invention and explain why.

Day 2

Subject: Art, Science, and Math

Standards:

- \rm Art
 - ➤ Standard 1: Understand art in relation to history and past and contemporary culture Students discover connections between artwork and the cultures of origin, comparing subjects in artwork and its function in various cultures. They consider their own art experiences and explore art and related work of individuals in the community, museums, and galleries.
 - > Standard 7: Understand and apply elements and principles of design in personal works of art, utilizing a variety of media, tools, and processes Students apply the elements and principles and discriminate various lines, shapes, forms, textures, colors, and space. They identify two and three-dimensional works of art, visual characteristics of media, and utilize appropriate media and processes in artwork, demonstrating safe and proper use of materials.

Science

Standard 1: Physical Science - *Observe and describe the motion of an object and how it changes when a force is applied to it.*

Math

- > Standard 4: Geometry Students identify and describe the attributes of common shapes in the plane and of common objects in space.
- > Standard 5: Measurement Students understand how to measure length, temperature, capacity, weight, and time in standard units.

Indicator:

- **♣** Art
 - ➤ 2.2.1 Identify connections between works of art and artifacts and their culture of origin.
 - ➤ 2.7.4 Identify and use a balance of two-dimensional and three-dimensional media, techniques, and processes to effectively communicate ideas, experiences, and stories.

Science

➤ 2.1.6 Observe, demonstrate, sketch and compare how applied force (i.e., push or pull) changes the motion of objects.

Math

- ➤ 2.4.1 Construct squares, rectangles, triangles, cubes, and rectangular prisms.
- ➤ 2.5.1 Measure and estimate length to the nearest inch, foot, yard, centimeter, and meter.

Topic: Leonardo da Vinci's Flying Machine

Objective: The students will design and test the successfulness of their own symmetrical flying machine.

Resources:

• Edwards, Roberta, and True Kelley. *Who was Leonardo da Vinci?*. New York: Grosset & Dunlap, 2005. Print.

- Barretta, Gene. *Neo Leo: the ageless ideas of Leonardo da Vinci*. New York: Henry Holt, 2009. Print.
- "." . N.p., n.d. Web. 5 Apr. 2014. http://www.drawingsofleonardo.org/images/fly3.jpg.

Materials:

- paper straws
- · construction paper
- tape
- scissors
- measuring tape

Lesson Summary: This lesson will begin by students observing the original sketches of Leonardo da Vinci's flying machine and explaining and discussing what they see until understanding that it is a design of an airplane. Students will then learn about the artist and inventor, Leonardo da Vinci, and how his sketchbooks contained the first ideas for many inventions we use today, such as the parachute, airplane, helicopter, and army tank. Students will then learn about symmetry to create their own well-balanced design of a flying machine. After assembling all the parts to their flying machines, students will then test their machines by throwing them and seeing how far it goes before hitting the ground. Students will throw their finished products three at a time, and will be allowed two attempts to throw it so they can add more or less force when throwing it. After each attempt, students will measure and record how far their inventions went, and then explain why they think it might have gone farther the first or second time. Students will also write what improvements or changes they could make to their designs to make it better and will also be asked to explain what would happen if their design was not symmetrical. The students will turn in their observations and explanations to be assessed.

Day 3

Subject: Music, Social Studies

Standard:

- **4** Music
 - Standard 9: RESPONDING TO MUSIC: Understanding music in relation to history and culture Students identify music for special occasions and its role. They experience music and dances from various cultures and historical periods and explore roles of community musicians.
- Social Studies

Indicator:

Music

➤ 2.9.3 Perform and listen to music and learn folk dances from past and present cultures.

Topic: Early Musical Instruments

Objective: The students will compare and contrast their favorite song today to music from the past.

Resources:

- "History of Music for Kids." !. N.p., n.d. Web. 6 Apr. 2014. http://www.historyforkids.org/learn/arts/music/music.htm.
- Carlsen, Roger, and Dee Anna. Willis. *Society for Information Technology & Teacher Education International Conference Annual March 26-30, San Antonio, Texas, USA*. Chesapeake, Va: Association for the Advancement of Computing in Education, 2007. Print.
- "Making Multicultural Music." Making Multicultural Music. N.p., n.d. Web. 3
 Apr. 2014. http://makingmulticulturalmusic.wordpress.com/tag/ancient-egypt-instruments/>.
- "Music and creativity in Ancient Greece Tim Hansen." *YouTube*. YouTube, 3 Dec. 2013. Web. . https://www.youtube.com/watch?v=-1aAunaw1GA>.

Materials:

- metal rods
- sticks
- bells
- various recycled materials

Lesson Summary: The class will discuss what their current favorite songs and artists are. The students will learn then explore the earliest inventions of music and instruments and the origins of the different instruments, including Egypt, China, Jerusalem, Italy, and Greece and discuss how it is different compared to the music we listen to today. The students will then get to create their own instruments out of recycled materials modeled after an instrument from the past and write a description about the instrument comparing it to a common instrument used today. The students' comparisons will be turned in for a grade.

Day 4

Subject: Math

Standard: Standard 1 - Number Sense

Indicator: 2.1.12 Represent, compare, and interpret data using tables, tally charts, and bar graphs.

Example: Make a tally of your classmates' favorite colors and draw a bar graph. Name the color that is most popular and the color that is the favorite of the fewest people.

Topic: Invention of the Chocolate Chip

Objective: The students will rank what their favorite kind of cookie is, illustrate a bar graph representing their choices in cookies, and evaluate what the graph says about the most and least favorite kind of cookie.

Resources: "Ruth Wakefield." : Chocolate Chip Cookie Inventor. N.p., n.d. Web. 08 Apr. 2014.,

Materials:

- smart board
- crayons
- bar graph template

Lesson Summary: Students will learn about Ruth Wakefield and the history of cookies. Students will survey and tally their favorite kind of cookies and then draw a bar graph. They will then name the cookie that is the most popular and the cookie that is the favorite of the fewest people. The students will then invent a new cookie by drawing a picture of what they think would be the best cookie ever using any kind of ingredients they can imagine.

Day 5

Subject: Theatre

Standard: Standard 3 – Analysis and Response: Students understand and analyze the dramatic structure of plays and performances.

Indicator: 2.3.2 Identify and describe the character, plot, and setting in classroom dramatizations and/or formal productions.

Topic: Benjamin Franklin 's *Poor Richard Almanac*

Objective: Students will make up short plays using a moral from Poor Richard's Almanac as a theme, and establish plot, characters, and setting.

Resources:

- Franklin, Benjamin, J. A. Leo Lemay, Benjamin Franklin, and Benjamin Franklin. *Writings*. New York, NY: Literary Classics of the United States, 1987. Print.
- Scarf, Maggie, and Harry Beckhoff. *Meet Benjamin Franklin*. New York: Random House, 1968. Print.
- Barretta, Gene. *Now & Ben: The Modern Inventions of Benjamin Franklin*. New York: Henry Holt, 2006. Print.

Materials:

- Kite template
- List of Benjamin Franklin's morals

Lesson Summary: The teacher will read books about Benjamin Franklin to the students and discuss all his inventions and occupations. The class will then use a kite graphic organizer that is split into 4 sections, in the middle they will write Benjamin Franklin and then in separate sections they will write his inventions, occupations, places they see him today (money and stamps), and lastly some of his wise sayings. The students will then use a moral from one of Ben's sayings to use as a theme in a made up short play. The students will be assessed on what actions they acted out to convey the meaning of the moral.

Day 6

Subject: Science **Standard:**

Science

Standard 3: Life Science - Observe, ask questions about and describe how organisms change their forms and behaviors during their life cycles.

Indicator:

Science

➤ 2.3.1 Observe closely over a period of time and then record in pictures and words the changes in plants and animals throughout their life cycles-including details of their body plan, structure and timing of growth, reproduction and death.

Topic: George Washington Carver

Objective: The students will illustrate the parts of peanuts and the stages of how peanuts grow.

Resources:

- "George Washington Carver for Kids." *YouTube.* YouTube, 14 Oct. 2012. Web. . https://www.youtube.com/watch/?v=ggUl20GR7Fw.
- "National Peanut Board." *National Peanut Board How Peanuts Grow Comments*. N.p., n.d. Web. . http://nationalpeanutboard.org/the-facts/how-peanuts-grow/.
- "George Washington Carver Biography for Kids." MrNussbaumcom FREE Math Games Spelling Games Teacher Tools Printables and Much more George Washington Carver Biography for Kids Comments. N.p., n.d. Web. . http://mrnussbaum.com/african-americans/george_washington_carver/>.

Materials:

- peanut diagram
- crayons
- lap book book

Lesson Summary: The students will learn about George Washington Carver and his many inventions including peanut butter. Students will then explore the life cycle of a peanut by looking at picture diagrams, books, and videos. The students will write and illustrate a fantasy story about a character that is a peanut and his or her life from birth to adulthood. Students will have to include all the stages and identify the stages and different parts throughout the story.

Day 7

Subject: Language Arts and Social Studies **Standard:**

Language Arts

➤ Reading Standards for Informational Text: Key Ideas and Details - The following standards offer a focus for instruction each year and help ensure that students gain adequate exposure to a range of texts and tasks. Rigor is also infused through the requirement that students read increasingly complex texts through the grades.

Social Studies

Standard 1: History - Students will differentiate between events that happened in the past and recently, recognize examples of continuity and change in local and regional communities, and consider ways that people and events of the past and present influence their lives.

Indicator:

- Language Arts
 - ➤ 2.RI.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
- Social Studies
 - ➤ 2.1.2 Explain changes in daily life in the community over time.
 - ➤ 2.1.5 Develop a simple timeline of important events.

Topic: Alexander Graham Bell

Objective: The students will read an informational piece about Alexander Graham Bell, create a timeline of telephones from the first telephone to cell phones used today, and invent what phones in the future will be like.

Resources:

- "Animated Hero Classics: Alexander Graham Bell on DVD." *YouTube*. YouTube, 7 Sept. 2007. Web. .
 - https://www.youtube.com/watch?v=2BCvXH5M9n0>.
- "Alexander Graham Bell Facts for Kids Telephone, Inventions, Quotes." Alexander Graham Bell Facts for Kids - Telephone, Inventions, Quotes. N.p., n.d. Web. .

http://www.sciencekids.co.nz/sciencefacts/scientists/alexandergrahambell.html.

Materials:

- Timeline
- Paper
- Crayons

Lesson Summary: The students will learn about Alexander Graham Bell and all his inventions. The teacher will then display pictures of phones from past to present and students will predict what order of events the phones go in. The teacher will then tell them if they were correct or incorrect and fix any incorrect placements. The students will then individually draw a timeline of telephones throughout history and also adding their own invention of a phone in the future at the end of the timeline. The students will also write a paragraph about what they would say to Alexander Graham Bell if they could call him on their invented phone about the similarities and differences of their telephone and his telephone. Students should identify specific details about the past telephone and be creative with their future telephone.

Day 8

Subject: Social Studies and Language Arts

Standard:

- Social Studies
 - ➤ Standard 1 History
- Language Arts
 - Writing Standards Text Types and Purposes

Indicator:

- Social Studies
 - ➤ 2.1.2 Explain changes in daily life in the community over time using maps, photographs, news stories, web sites, or video images.
- Language Arts
 - 2.W.3 Write narratives in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts, and feelings

Topic: Thomas Alva Edison

Objective: Students will compare and contrast life before and after the invention of Thomas Edison's light bulb by creating a newspaper article.

Resources:

- Barretta, Gene (2012). *Timeless Thomas: How Thomas Edison Changed Our Lives.* Henry Hold and Company: New York.
- Daily NewsPaper (i.e. South Bend Tribune from April 12, 1999)

Materials:

- chart paper
- newspaper article graphic organizer

Lesson Summary: After discussing prior knowledge about Thomas Edison, the students will listen as the teacher reads aloud the story, *Timeless Thomas: How Thomas Edison Changed Our Lives.* The students will then talk about the invention of the light bulb and brainstorm a list of the effects of the invention of the light bulb. The students will then write a list of what life would be life if we did not have a light bulb today and how the light bulb has improved our lives and made living a lot easier compared to the ways people had to have light in the past. The students will then write a news article in the time period of Thomas Edison's era about his invention of the light bulb. Students will include how life was before the light bulb and how life is going to be better now that the light bulb has been invented.

Day 9

Subject: Physical Education and Language Arts **Standard:**

- Physical Education
 - ➤ Standard 2 Movement Concepts: Students demonstrate an understanding of movement concepts, principles, strategies, and tactics as they apply to the learning and performance of physical activities students learn to utilize cognitive information to achieve mature (proficient) fundamental motor skills. Knowledge and application of movement concepts (body, spatial, directional, and

temporal awareness), relationships, and strategies enhance independent learning and effective participation in physical activity.

Language Arts

➤ Writing Standards: Text Types and Purposes - The following standards offer a focus for instruction to help ensure that students gain adequate mastery of a range of skills and applications. Each year in their writing, students should demonstrate increasing sophistication in all aspects of language use, from vocabulary and syntax to the development and organization of ideas, and they should address increasingly demanding content and sources.

Indicator:

Physical Education

➤ 2.2.3 Identify and apply the basic elements for efficient locomotor, nonlocomotor, stability, and manipulative skills.

Language Arts

➤ 2.W.3 Write narratives in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts, and feelings, use temporal words to signal event order, and provide a sense of closure.

Topic: Louis Braille

Objective: The students will perform various physical activities, write about their experiences, and make a list of fun activities for a peer with vision impairment to play.

Resources:

- "Help Others Learn About Blindness Through Fun Activities." *BrailleSC*. N.p., n.d. Web. . http://www.braillesc.org/blog/2011/02/04/help-others-learn-about-blindness-through-fun-activities/.
- "Bringing Sight to the Sightless." *Teaching Tolerance*. N.p., n.d. Web. . http://www.tolerance.org/activity/bringing-sight-sightless.
- Adler, David A., and John Wallner. *A picture book of Louis Braille*. New York: Holiday House, 1997. Print.
- Litchfield, Ada Bassett. *A cane in her hand*. [Braille ed. Livonia, MI (PO Bx 2395, Livonia 48151-0395): Seedlings, 1985. Print. (A nonfiction story written with braille)

Materials:

- blindfolds
- canes
- cones
- KWL chart
- Writing paper
- Vision impairment goggles

Lesson Summary: The students will learn about Louis Braille and his invention of the Braille Printing press. Afterwards, the students will discuss the topic of blindness and what they know about people who are unable to see and what they want to know about the topic on a KWL chart. The students will then get the

opportunity to participate in several physical activities (galloping, cartwheel, throwing a ball at a target, and jumping rope) first with their vision, second with vision impairment goggles, and a third time completely blindfolded. After completing all the activities three times for each vision level, students will then travel through an obstacle course of cones while blindfolded and using a cane to guide them. After completing all the activities students will write about each experience and how they felt during each activity. Lastly, students will complete the "L" section of the KWL chart, and then brainstorm to develop a list of fun activities for one of their peers to participate in if he or she had vision impairment. The students will be assessed on their KWL charts and whether they made a contribution in the brainstorming of activities.

Day 10

Subject: Social Studies, Language Arts, and Science **Standard:**

Social Studies

Standard 2: Civics and Government - Students will explain why communities have government and laws, demonstrate that people in the United States have both rights and responsibilities, and identify individual actions that contribute to the good of the community and nation.

Science

Standard 4: Science, Engineering and Technology - Describe how technologies have been developed to meet human needs.

Indicator:

Social Studies

➤ 2.2.4 Describe how people of different ages, cultural backgrounds and traditions contribute to the community and how all citizens can respect these differences. (Individuals, Society and Culture)

Science

➤ 2.4.3 Identify a need and design a simple tool to meet that need.

Topic: Inventions for Helping People

Objective: The students will invent something to make the life easier for a person with a physical handicap.

Resources:

- Thomas, Pat, and Lesley Harker. *Don't call me special: a first look at disability*. New York: Barron's, 2002. Print.
- *How difficult can this be?*. Dir. Peter Rosen. Artwork PBS, 2004.

Materials:

- Drawing paper
- Crayons
- Writing paper

Lesson Summary: The students will Think/Pair/Share the word "special" and what it means. The teacher will then read the story <u>Don't Call Me Special</u>, <u>A First Look at Disability</u>, by Pat Thomas. Afterwards, the class will discuss different disabilities people may have, and people who have accomplished their goals despite having a disability. The class will then discuss how many inventions have been made to help people who have disabilities. Examples include the wheelchair, artificial limbs, ramps in buildings, specially equipped cars, glass, hearing aids, and many more. Students will then think about a person with a physical handicap they may know or have seen, and will design an invention to make this person's life better. On their designs they will need to include a reason for what is something the world is missing, or something that could be improved to make life easier for physically handicapped people, and explain how their invention will improve the quality of life in the future.