Project Bright IDEA 2: Interest Development Early Abilities

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Concept: Change

Topic: How do Inventions Contribute to Change?

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Grade Level: 4

The North Carolina Department of Public Instruction
Exceptional Children Division
Academically or Intellectually Gifted Program

The American Association For Gifted Children at Duke University

Big Ideas Manifested

Topic – How do inventions contribute to change?
Text – *Now and Ben*
Author – Gene Barretta
Publisher/Date

Concepts	Themes
Future **Progress** **Change**	**Change is inevitable** **Necessity is the mother of invention.** **Inventions influence change** **Inventions** **Technology** **Necessity**
Issues or Debates	**Problems or Challenges**
Change vs. Status Quo **Why do we change?** **Change: positive or negative?** **Preservation vs. Growth**	**Risk taking** **Openness to change** **Making connections to change** **Courage to change** **Cost effectiveness** **Acceptance of change**
Processes	**Theories**
Analysis **Research** **Making Connections** **Problem solving** **Decision Making** **Analysis**	**Change is necessary for growth** **Change generates additional change** **Changes can be political, economic, or social**
Paradoxes	**Assumptions or Perspectives**
All inventions have already been invented. **We have all that we need.** **Change is the only constant.**	"When you're finished changing, you're finished." Ben Franklin Change has widespread effects. Change can be intentional and unintentional. Change takes time.

Concept: Change
Topic: How do inventions contribute to change?

Suggested Text Selection(s): *Now and Ben* by Gene Barretta

Look, Listen and Identify:

Intelligent Behaviors

Story Focus: Persisting; thinking flexibly; striving for accuracy and precision; questioning and problem posing; applying past knowledge to new situations; gather data through all senses; creating, imagining and innovating; responding with wonderment and awe; taking responsible risks; remaining open to continuous learning, thinking about your thinking.

Student Activities: Persisting; thinking flexibly; thinking about your thinking; striving for accuracy and precision; questioning and problem posing; applying past knowledge to new situations; thinking and communicating with clarity and precision; creating, imagining and innovating; taking responsible risks; thinking interdependently.

NC Standards:

Social Studies

3.01 Assess changes in ways of living over time and determine whether the changes are primarily political, economic, or social.
7.02 Analyze the effects of technology on N.C. citizens, past and present.
7.04 Analyze the effects of technology on N.C. citizens today.
7.05 Identify the advantages and disadvantages of technology in the lives of North Carolinians.

Science

3.02 Describe and demonstrate how magnetism can be used to generate electricity.
3.03 Design and test an electric circuit as a closed pathway including an energy source, energy conductor, and an energy receiver.
3.04 Explain how magnetism is related to electricity.
3.09 Recognize lightning as an electrical discharge and show proper safety behavior when lightning occurs.

Language Arts

3.05 Analyze and integrate information from one or more sources to expand understanding of text including graphs, charts, and/or maps.
3.06 Conduct research for assigned projects or self-selected projects (with assistance) from a variety of sources through the use of technological and informal tools.
4.02 Use oral and written language to present information and ideas in a clear, concise manner, discuss, interview, solve problems, make decisions.
4.03 Make oral and written presentations using visual aids with an awareness of purpose and audience.
4.05 Use planning strategies to generate topics and organize ideas.
4.06 Compose a draft that conveys major ideas and maintains focus on the topic with specific, relevant, supporting details by using preliminary plans.
4.07 Compose fiction, nonfiction, poetry, and drama using self-selected and assigned topics and forms.

4.09 Produce work that follows the conventions of particular genres.
4.10 Use technology as a tool to gather, organize, and present information.
Math
3.02 Solve problems involving perimeter of plane figures and areas of rectangles.
4.01 Collect, organize, analyze, and display data (including line graphs and bar graphs) to solve problems.
4.02 Describe the distribution of data using median, range and mode.
5.01 Identify, describe, and generalize relationships in which: quantities change proportionally and change in one quantity relates to change in a second quantity.

Local Pacing Guide Timeline:

Thinking Skills Focus:

Topic Focus: How do inventions contribute to change?

Concept Focus: Change

Overarching Generalizations:
Change is inevitable.
Need drives change.
Change is necessary for growth

More Complex Generalizations (Two or more concepts):

Change can be positive or negative.
Change generates additional change.
Change can be motivated by a variety of factors.
Change can be intentional or unintentional.

Change can positively or negatively influence how a society and its individuals grow and progress within their political, economic, and social development.

Political, economic, and social change results from a variety of both intentional and

unintentional factors, which affects individuals and society.

Directions for Teachers:

Display sentence strips with the generalizations. Discuss topics and vocabulary words needed to gain a deeper understanding of the conceptual lessons.

Suggested Topics for Discussion:

- How inventions have impacted the course of our lives.
- Changes due to technology
- Changes in North Carolina over time
- Inventions and inventors
- Ben Franklin
- North Carolina inventors
- Life in North Carolina
- Technology – past and present
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Suggested Vocabulary Words for Discussion:

- Change
- Technology
- Technological advances
- Invention
- Inspiration
- Motivation
- Necessity
- Flexibility
- Creativity
- Community
- Political/ politician
- Economic/ economist
- Social/ sociologist
- Effect
- History
- Perspective
- Geography
- Debate
- Futurist
- Dialogue
- Implication
- Classification
- Time Capsules
- Environmentalist
- Textile
- Timber

A Six-Step Process for Teaching Academic Vocabulary Terms:

1. Provide a description, explanation or example of the new vocabulary term.
2. Ask students to restate the description, explanation or example in their own words using complete sentences.

3. Ask students to construct a picture, symbol or graphic representing the term or phrase.
4. Engage the students periodically in activities that help them add to their knowledge of the terms in a booklet that they have created (Keep it simple.)
5. Periodically ask students to discuss the terms with one another (**Think** of your favorite vocabulary words from the unit; **pair** with a vocabulary buddy, **share** by discussing the vocabulary terms with your vocabulary buddy.) Teacher should model process each time before students do the Think, Pair, Share with Vocabulary Buddy.
6. Construct games to periodically involve students and allow them to play with the terms.

Robert Marzano

Vocabulary Extension:

- Spider strategy
- Vocabulary whirl
- Three way tie
- Group think
- Metaphoric thinking

Select a generalization(s) and essential questions. Introduce one or more of the following topics:

Six Facets of Understanding

Facet 1 – EXPLANATION

How effective are inventions/technology in causing change?

Choose an invention. Create a timeline showing the changes caused by that invention. Include both how the invention has changed and/or how everyday life has changed due to the invention.

What is change?

Using picture cards of inventions/technologies, show the progression, relationships, and diversity from an original invention.

What do you predict will be invented in your life time? What effects do you predict these inventions will have on our environment and/or life style? Draw a picture of this invention and on the reverse side list reasons for the need for the invention.

Facet 2 – INTERPRETATION

What are the implications of change with the use of inventions/technology?

Choose one of Ben Franklin's inventions and one invention created by a North Carolinian. Compare and contrast the effects of those inventions on the citizens of North Carolina today.

Why does change matter?

Predict what human life would be like without electricity, modern transportation, or modern communication?

What implications do you speculate would happen if Americans stopped inventing? What country do you believe will become a leader in developing new inventions? Research this country for important inventions in the past 10 years.

Facet 3 – APPLICATION

What motivates us to invent?

Think of in invention or technology. Why do you think that invention was created?

How might motivation help us to change?

Think of in invention or technology. Why do you think that invention was created?

How would we make changes/adaptations to insure that we remain a leader in technology and innovations for the future? Utilize "Collaborative Summarizing" activity to formulate your class idea.

Facet 4 – PERSPECTIVE

What are the positive and negative effects of inventions and technology?

In your opinion identify the invention/technology that has had the most positive impact on North Carolinians in the past 15 years. What has had the most negative effects?

What are the possible reactions to change?

Research inventions and/or technologies used in NC and debate which one has had the biggest influence, intentional or unintentional, on NC.

How would you compare/contrast a day in your life with a day in Ben Franklin's life? Create two dioramas depicting the compare/contrast.

Facet 5 – EMPATHY

How might we reach an understanding about a culture based on their use of technology?

Think of a fairly recent invention that people of a previous generation may not be comfortable with. Create a help tip sheet that would allow them to incorporate this new technology into their everyday life.

How do changes in technology affect people's livelihoods?

Students role play as if they are the employees of a technology company. The company needs to convince the Governor of N.C. to allow them to build a new facility here which will create positive changes, including political, economic and social changes for NC citizens. Students should predict possible concerns by the Governor of N.C., the teacher, in order to address them with confidence.

Imagine you are Ben Franklin's assistant for a day. How does it feel to work with such a famous person? Create a postcard illustrating and describing your feelings about working with a famous inventor.

Facet 6 – SELF-KNOWLEDGE

How do I handle change?

Predict how changes in technology will affect you. What are the positives and negatives of these changes? Create a product that expresses your perception of change.

What changes can I expect in my life?

Predict how changes in technology will affect you. What are the positives and negatives of these changes? Create a product that expresses your perception of change.

What is something you became aware of after reading *Ben and Me?* What would you like to learn more about? As a class design a questioning map using sticky notes with student generated "I wonder…" questions Teacher will demonstrate how to research and answer one question per day. The question map will remain posted for new questions to be added and answered throughout the unit of study.

Read:

Language Arts: Task Rotation Learning Activities

4th Grade

All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.

Mastery Learner (A) **Sensing- Thinking** Choose an invention. Create a timeline showing the changes caused by that invention. Include both how the invention has changed and/or how everyday life has changed due to the invention. (Factual) **V*_L*_S__M__B__P__I__N__**	**Interpersonal Learner (B)** **Sensing-Thinking** Work with a friend to prioritize Ben Franklin's inventions. Which have changed our lives the most? The least? Other than electricity, which of Ben Franklin's ideas have had the biggest impact on your community today? Create a product that explains your thinking. OR If you could only choose 3 of Ben Franklin's inventions to exist today, what would you choose to keep? Have a discussion within your group. Provide evidence for your opinions. You must come to a consensus. After you have agreed, work with the other groups in the class to come up with a final list. (Provocative & Perspective) **V__L_*_S__M__B__P__I_*_N__**
Understanding Learner (C) **Intuitive-Thinking** Choose two inventions to compare and contrast. Include how each has contributed to change in our world. Argue which invention would be most helpful if you were lost in a deserted area. How would your situation change because of this invention? Create an article for a magazine describing your experience and how you used the invention to solve your problem. (Conceptual) **V_*_L_*_S__M__B__P__I__N__**	**Self-Expressive Learner (D)** **Intuitive-Feeling** Create the front page of a newspaper (or another news source) that will appear 100 years from now. Incorporate articles and information how Ben Franklin's contributions have helped to shape the future. Be creative! (Perspective & Conceptual) **V_*_L_*_S__M__B__P_*_I__N__**

Real World Connections With Products:

Organizing, evaluating, analyzing, comparing, contrasting, problem solving, predicting

Real World Applications:
Scientist, historian, nature guide, teacher, inventor, city planner, reporter, futurist

Real World Terms:

Timeline, article, argument

Connect all products in the unit to real world applications reflecting the concept, generalizations and topic. The above is an example of how this might be accomplished.

Mastery Learner (A) **Sensing- Thinking** Create a display that shows the inter-relationships between 5 of the inventions Ben Franklin created. (Conceptual) **V__L* S*_M__B__P__I__N__**	**Interpersonal Learner (B)** **Sensing-Thinking** Identify the personality characteristics of Ben Franklin. What do you think motivated Ben Franklin to invent? What do you admire most about him? Which characteristics do you think made him a great inventor? Write a letter to Ben Franklin complimenting his accomplishments. (Provocative) V_*_L__S__M__B__P__I_*N__
Understanding Learner (C) **Intuitive-Thinking** Research changes that occurred as a result of Ben Franklin's inventions. Based on what you learned, identify the most important invention Ben Franklin invented. Defend your choice in a debate, a pamphlet, editorial or commercial. (Conceptual) **V_*_L__S__M__B_*_P_*_I_ *N__**	**Self-Expressive Learner (D)** **Intuitive-Feeling** Predict what the world would be like without electricity. OR If you could change one of Ben Franklin's inventions, which one would it be and how would you change it? What the effects be of your decision? Create an illustration. (Conceptual & Perspective) **V__L_*_S_*_M__B *__P__I__N__**

Real World Connections With Products:
Analyze, evaluate, identify, examine, decision-making, researching, predicting, classifying, synthesizing, interpretation,

Real World Applications:
Inventor, scientist, historian, anthropologist, electrician

Real World Terms:
Graphic Organizer, letter, illustration, editorial, debate, commercial, pamphlet

Connect all products in the unit to real world applications reflecting the concept, generalizations and topic. The above is an example of how this might be accomplished.

Concept Focus:

- Change

Overarching Generalizations:
Change is inevitable.
Need drives change.
Change is necessary for growth

More Complex Generalizations (Two or more concepts):

Change can be positive or negative.
Change generates additional change.
Change can be motivated by a variety of factors.
Change can be intentional or unintentional.

Change can positively or negatively influence how a society and its individuals grow and progress within their political, economic, and social development.

Political, economic, and social change results from a variety of both intentional and unintentional factors, which affects individuals and society.

Essential Question

How may change be positive or negative within relationships?

Materials Needed for Task Rotation and/or Task Rotation Menu

Sources for researching, magazines for references, paper, pencil, resources about inventions, note cards, research outline, computer access, various product materials

Materials Needed for Task Rotation and/or Task Rotation Menu

- Chart Paper
- Markers, pencils, colored pencils, and crayons
- *Now and Ben*
- Drawing and typing paper
- Scissors
- Glue

MetaCognitive Discussion (Essential Questions):

(Whole Group)

Conceptual Perspectives:

Intelligent Behaviors:

1. What intelligent behaviors are characteristic of inventors?

2. Which intelligent behaviors does Ben Franklin demonstrate?
3. How did Ben Franklin demonstrate taking responsible risks in developing his inventions? Which invention do you think represents this habit of mind the best?
4. When you are designing something, which intelligent behaviors do you think you use the most?
5. How can metacognition help you when you are designing something new?
6. What intelligent behaviors do people have to demonstrate when adapting to new inventions and the changes in their everyday life?

Literary Perspectives:

Student/Teacher Reflections

Math Task Rotation Learning Activities

4th Grade
All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.

Mastery Learner (A) **Sensing- Thinking** Make a prediction about which area of the school uses the most items that contain a circuit. Explain your reasoning. Create a frequency distribution to collect your data. ?? **V*_L*_S__M__B__P__I__N__**	**Interpersonal Learner (B)** **Sensing-Thinking** Create a survey and poll people on what they think is the most important invention created. Make a graph to illustrate your data. Identify the median, mode and range. Which would be the best indicator of the central tendency? **(Perspective)** **V_*_L_*_S__M__B_*_P__I_*_N__**
Understanding Learner (C) **Intuitive-Thinking** Think about the relationship between range, mean, median, and mode. Explain how range and the measures of central tendency are similar and different. What kinds of data would change each? (Factual) **V_*_L_*_S__M__B__P__I__N__**	**Self-Expressive Learner (D)** **Intuitive-Feeling** Collect data and manipulate the values on your graphs to illustrate how different points of view can be supported by the same data. How is this used in the real world and why? (Perceptive) **V_*_L_*_S__M__B__P__I__N__**

Real World Connections With Products:
Organizing, evaluating, analyzing, identifying, comparing, contrasting, problem solving, predicting, examining, decision making

Real World Applications:
Scientist, marketing analyst, statistician, researcher, pollster, stock broker

Real World Terms:

Graph, survey, Explanation

Math Task Rotation Learning Activities

4th Grade
All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.

Mastery Learner (A) **Sensing- Thinking** Predict how many inventions you can use in a day. Then keep a tally of your use of inventions and list them. Classify the inventions into 4/5 groups and calculate the percentage of each group compares to your total use of inventions. **V*_L*_S__M__B__P__I__N__**	**Interpersonal Learner (B)** **Sensing-Thinking** In pairs, create equations for your partner to solve. Include the use of parentheses and explain how this can change the solutions. **V_*_L_*_S__M__B_*_P__I_*_N__**
Understanding Learner (C) **Intuitive-Thinking** Discuss how changing one side of an equation affects the other side. Demonstrate examples of this. **V_*_L_*_S__M__B__P__I__N__**	**Self-Expressive Learner (D)** **Intuitive-Feeling** Use a piece of paper to demonstrate how various polygons can be formed by folding the paper in various ways. Identify and define each polygon. Find the area and perimeter of each. **V_*_L_*_S__M__B__P__I__N__**

Real World Connections With Products:
Evaluating, identifying, problem solving, predicting, examining, classifying, explaining, discussing, demonstrating, examining, identifying, defining, creating

Real World Applications:
Inventor, mathematician, consumer Marketing specialist, architect, researcher, teacher, graphic designer, artist

Real World Terms:

Graph, talley, problems, equations, polygons

Connect all products in the unit to real world applications reflecting the concept, generalizations and topic. The above is an example of how this might be accomplished.

Concept Focus:

- Change

Overarching Generalizations:
Change is inevitable.
Need drives change.
Change is necessary for growth

More Complex Generalizations (Two or more concepts):

Change can be positive or negative.
Change generates additional change.
Change can be motivated by a variety of factors.
Change can be intentional or unintentional.

Change can positively or negatively influence how a society and its individuals grow and

progress within their political, economic, and social development.

Political, economic, and social change results from a variety of both intentional and unintentional factors, which affects individuals and society.

Essential Question

How may change be positive or negative within relationships?

Materials Needed for Task Rotation and/or Task Rotation Menu

Access to different areas of the school, graphing materials, paper, pencil, computer access

MetaCognitive Discussion (Essential Questions):

(Whole Group)

Conceptual Perspectives:

Intelligent Behaviors:

1. What intelligent behaviors are required in graphing?
2. Which intelligent behaviors help you decide which graphing strategies to use?
3. What intelligent behaviors are characteristic of mathematicians?

4. When you are collecting data, which intelligent behaviors do you think you use the most?
5. How can the use of metacognition help you when you are designing a data collection experiment?

Literary Perspectives:

Student/Teacher Reflections

Social Studies Task Rotation Learning Activities

4th Grade
All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.

Mastery Learner (A) **Sensing- Thinking** Create a timeline of inventions that have been invented by N.C. inventors. Develop a code to show the effect the inventions have had on North Carolina. (Factual & Perspective) **V_*_L_*_S_*_M__B__P__I__N__**	**Interpersonal Learner (B)** **Sensing-Thinking** In a group, discuss 15 ways life in North Carolina has changed over time. How have inventions played a part in these changes? Evaluate whether the changes are political, economic, or social changes. (Perceptive & Conceptual) **V_*_L__S__M__B__P_*_I__N__**
Understanding Learner (C) **Intuitive-Thinking** Choose one of Ben Franklin's inventions and one invention created by a North Carolinian. Compare and contrast the effects of those inventions on the citizens of North Carolina today. (Perceptive & Conceptual) **V_*_L_*_S__M__B__P__I__N__**	**Self-Expressive Learner (D)** **Intuitive-Feeling** Choose one of the regions of N.C. Predict what new technologies will affect that region. You should consider the 5 themes of geography. Create a visual display to show your thinking. (Perceptive & Conceptual & Factual) **V_*_L__S*__M__B__P__I_*_N__**

Real World Connections With Products:

Organizing, evaluating, analyzing, synthesizing, researching, discussing, comparing, contrasting, predicting

Real World Applications:

Inventor, politician, economist, sociologist, historian

Real World Terms:

Discussion, time line, compare/contrast graphic organizer, visual display

Social Studies Task Rotation Learning Activities
4th Grade
All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.

Mastery Learner (A) **Sensing- Thinking**	**Interpersonal Learner (B)** **Sensing-Thinking**
Create a product that shows a collection of inventions/technology that are used in NC. Identify which ones are now used in a way that is different from their inventor's intention. (Perspective) **V_*_L_*_S__M__B__P__I__N__**	With a partner, discuss how inventions/technology have affected your life. Videotape your discussion and analyze it for your partner's key points. (Perspective) **V_*_L__S__M__B__P_*_I_*_N__**

Understanding Learner (C) Intuitive-Thinking	Self-Expressive Learner (D) Intuitive-Feeling
Research inventions and/or technologies used in NC and debate which one has had the biggest influence, intentional or unintentional, on NC. (Perspective & Provocative) **V_*_L_*_S__M__B__P_*_I__N__**	Predict how changes in technology will affect you. What are the positives and negatives of these changes? Create a product that expresses your perception of change. (Perspective & Provocative) **V__L_*_S__M__B__P__I_*_N__**

Real World Connections With Products:
Analyze, evaluate, identify, examine, problem-solving, decision-making, researching and predicting

Real World Applications:
Inventor, computer analyst, chemist, researcher, biologist

Real World Terms:
Video, debate

Connect all products in the unit to real world applications reflecting the concept, generalizations and topic. The above is an example of how this might be accomplished.

Concept Focus:

- Change

Overarching Generalizations:
Change is inevitable.
Need drives change.
Change is necessary for growth

More Complex Generalizations (Two or more concepts):

Change can be positive or negative.
Change generates additional change.
Change can be motivated by a variety of factors.

Change can be intentional or unintentional.

Change can positively or negatively influence how a society and its individuals grow and progress within their political, economic, and social development.

Political, economic, and social change results from a variety of both intentional and unintentional factors, which affects individuals and society.

Essential Question(s):

How may change be positive or negative within relationships?

Materials Needed for Task Rotation and/or Task Rotation Menu

Sources for researching, paper, pencil, resources about Ben Franklin and N.C. inventors, sample time lines, have for reference the 5 themes of social studies, computer access, various product materials

MetaCognitive Discussion (Essential Questions):

(Whole Group)

Conceptual Perspectives:

Intelligent Behaviors:

1. What intelligent behaviors are characteristic of inventors?
2. Which intelligent behaviors does Ben Franklin demonstrate?
3. How did Ben Franklin demonstrate taking responsible risks in developing his inventions? Which invention do you think represents this habit of mind the best?
4. When you are designing something, which intelligent behaviors do you think you use the most?
5. How can metacognition help you when you are designing something new?
6. What intelligent behaviors might people demonstrate when adapting to new inventions and the changes in their everyday life?
7. Which intelligent behaviors does a person use when considering the impact of inventions on the future?

Literary Perspective:

Student/Teacher Reflections

Concept:

Topic:

Generalization(s):

Essential Question(s):

Task Rotation Menu

Level	Mastery	Understanding	Self-Expressive	Interpersonal
1	Explain how electricity is related to magnetism.	Compare and contrast electricity and magnetism.	Dramatically act out the parts of an electrical circuit. You may work in small groups.	Create and prioritize a list of safety behaviors when lighting occurs.
2	Draw and label a diagram demonstrating how electricity is related to magnetism.	Create a flow chart describing how magnetism can be used to generate electricity.	Create 5 metaphors or analogies that explain the relationship between electricity and magnetism OR an electric circuit.	Personify lightning, magnetism or electricity in a story.
3	Create a product that demonstrates how electricity is related to magnetism.	Research to find inventions which rely on electricity and magnetism.	Create an invention that includes an electrical circuit.	Write an editorial about which is more important: magnetism or electricity.

Real World Connections With Products:

Real World Applications:

Real World Terms:

Connect all products in the unit to real world applications reflecting the concept, generalizations and topic. The above is an example of how this might be accomplished.

Concept Focus:

Overarching Generalizations:

More Complex Generalizations (Two or more concepts):

Essential Question:
(Include concept and intelligent behavior that leads to deeper understanding of the concept through exploration of the generalization)

Materials Needed for Task Rotation and/or Task Rotation Menu

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MetaCognitive Discussion (Essential Questions):

(Whole Group)

Conceptual Perspectives:

Intelligent Behaviors:

1. Which intelligent behaviors does Ben Franklin demonstrate?
2. How did Ben Franklin demonstrate taking responsible risks in developing his inventions?
3. Which invention do you think represents this habit of mind the best?
4. When you are designing something, which intelligent behaviors do you think you use the most?
5. How can metacognition help you when you are designing something new?
6. What intelligent behaviors might people demonstrate when adapting to new inventions and the changes in their everyday life?
7. Which intelligent behaviors does a person use when considering the impact of inventions on the future?
8. What intelligent behaviors are characteristic of inventors?

Literary Perspective:

Student/Teacher Reflections:

Student Reflections and Assessments
Task Rotation Learning Experience
4th Grade Social Studies
All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.

Mastery Learner (A) **Sensing- Thinking** Compile a list of 5 technological advances which have affected North Carolina, past and present. List at least 5 advantages and disadvantages of each and determine whether the changes were primarily political, economic or social. **V_*_L_*_S__M__B__P__I__N__**	**Interpersonal Learner (B)** **Sensing-Thinking** Students role play as if they are the employees of a technology company. The company needs to convince the Governor of N.C. to allow them to build a new facility here which will create positive changes, including political, economic and social changes for NC citizens. Students should predict possible concerns by the Governor of N.C., the teacher, in order to address them with confidence. **V_*_L__S__M__B__P_*_I__N__**
Understanding Learner (C) **Intuitive-Thinking**	**Self-Expressive Learner (D)** **Intuitive-Feeling**

You own a hog farm. A salesman comes to you with a new technological advance allowing you to double the number of hogs you sell. Analyze the positive and negatives of this technological advance in relation to the social, political, economic and ecological implications of using this new technology. What decision would you make on purchasing this new technology? Write a letter to the salesman's company explaining your position. **V_*_L__S__M__B__P__I__N__**	For 3 technological advances in N.C. history, create 3 dialogues with a script focused on a discussion of the positive and negative changes, in regards to their political, economic and social classifications that each of these technological advances created. **V_*_L__S__M__B__P__I_*_N__**

Real World Connections With Products:

Analyzing, persuading, researching, predicting, evaluating, decision making, synthesizing

Real World Applications:

Governor, C.E.O of a company, county commissioner, hog farmer, salesman, playwright

Real World Terms:

Letter, list, role play, play/script

Social Studies Student Reflections and Assessments
Task Rotation Learning Experience
4th Grade
All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.

Mastery Learner (A) **Sensing- Thinking**	**Interpersonal Learner (B)** **Sensing-Thinking**
Create a product that documents the changes that 5 technological advances have created in N.C. The product must address the advantages and disadvantages of each change. **(Conceptual)** **V_*_L_*_S__M__B__P__I__N__**	Pretend you are immortal and live in N.C. Write a journal documenting the effects, positive and negative, that technological advances have had on your life throughout the last 100 years. **(Factual)** **V_*_L*__S__M__B__P_*_I_*_N__**

Understanding Learner (C) **Intuitive-Thinking** You own a timber farm. A salesman comes to you with a new technological advance allowing you to double the amount of trees you cut. Analyze the positive and negatives implications of using this new technology. Summarize your findings on a plus/delta chart. What decision would you make on purchasing this new technology? (Provocative) **V_*_L_*_S__M__B__P__I *__N_*_**	**Self-Expressive Learner (D)** **Intuitive-Feeling** Create a time capsule for people showing (through pictures, objects, newspapers articles, etc.) the technological changes in the textile industry in North Carolina. The capsule won't be opened for 100 years. Include the positive and negative changes to life in N.C. Predict what effects there will be in the next 100 years. Imagine how the people in the future will react to your predictions. Generate a list of tips for these people in order to prepare for future technological advances and the changes they create. (Factual, Perspective) **V_*_L_*_S_*_M__B_*_P__I_*_N_*_**

Real World Connections With Products:
creating, organizing, predicting, drawing conclusions, decision making, identifying, observing, applying, analyzing, comparing and contrasting.

Real World Applications:
computer analyst, journalist, lumberjack, farmer, salesman, banker, environmentalist, historian, textile worker

Real World Terms:
journaling, charting, labeling, create

Connect all products in the unit to real world applications reflecting the concept, generalizations and topic. The above is an example of how this might be accomplished.

Concept Focus:

- Change

Overarching Generalizations:
Change is inevitable.
Need drives change.
Change is necessary for growth

More Complex Generalizations (Two or more concepts):

Change can be positive or negative.
Change generates additional change.
Change can be motivated by a variety of factors.
Change can be intentional or unintentional.

Change can positively or negatively influence how a society and its individuals grow and progress within their political, economic, and social development.

Political, economic, and social change results from a variety of both intentional and unintentional factors, which affects individuals and society.

Essential Question:

How may change be positive or negative within relationships?

Materials Needed for Task Rotation and/or Task Rotation Menu

Sources for researching, paper, pencil, resources about inventions, samples of technology company information, resources about hog farming, sample scripts, computer access, various product materials

Materials Needed for Task Rotation and/or Task Rotation Menu

- Chart Paper
- Markers, pencils, colored pencils, and crayons
- Drawing and typing paper
- Scissors
- Glue and tape
- Computers
- Various product materials (i.e. Pringles can for the time capsule)

MetaCognitive Discussion (Essential Questions):

(Whole Group):

Conceptual Perspectives:

Intelligent Behaviors:

1. What intelligent behaviors are characteristic of inventors?
2. Which intelligent behaviors does Ben Franklin demonstrate?
3. How did Ben Franklin demonstrate taking responsible risks in developing his inventions? Which invention do you think represents this habit of mind the best?
4. When you are designing something, which intelligent behaviors do you think you use the most?
5. How can metacognition help you when you are designing something new?
6. What intelligent behaviors might people demonstrate when adapting to new inventions and the changes in their everyday life?
7. Which intelligent behaviors does a person use when considering the impact of inventions on the future?

Literary Perspective:

Student/Teacher Reflections

4th Grade
All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.

Mastery Learner (A) **Sensing- Thinking** Demonstrate how magnetism can be used to generate electricity. Create a working display of your process. **V_*_L__S__M__B_*_P__I__N__**	**Interpersonal Learner (B)** **Sensing-Thinking** With a friend, plan a Public Safety Announcement of what to do when lightning occurs. Include an explanation of what lightning is and why people need to be careful. How should their behavior change during a storm or other electrical event? **V_*_L__S__M__B_*_P_*_I__N_*_**
Understanding Learner (C) **Intuitive-Thinking** Research the connection between magnetism and electricity. Compare and contrast the two concepts. You may include sources, causes, uses, etc. Include an argument for which concept you think has caused more change in North Carolina. **V*_L*_S__M__B__P__I__N__**	**Self-Expressive Learner (D)** **Intuitive-Feeling** Create an artistic design that incorporates electricity in a closed pathway. Your design should reflect how electricity has changed your life. **V__L__S_*_M__B_*_P__I_*_N__**

Real World Connections With Products:

Demonstrating, creating, researching, comparing, contrasting, justifying, decision making, drawing conclusions

Real World Applications:

Electrician, artist, electrical engineer, public safety officer, scientist, teacher

Real World Terms:

Display, performance, comparison, art design

Science Task Rotation Learning Activities
Task Rotation Learning Experience
4th Grade Science
All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.

Mastery Learner (A) **Sensing- Thinking** Choose and build one type of circuit. Draw a set of diagrammed directions explaining how to build your circuit. Include directions for how to change your type of circuit to another type. How can this be done using the fewest number of steps? (Factual & Conceptual) **V_*_L_*_S_*_M__B_*_P__I__N__**	**Interpersonal Learner (B)** **Sensing-Thinking** Role play with a friend the appropriate safety precautions to follow in the event of lightening in various situations. Document what changes in behavior are needed for each circumstance. **(Factual & Conceptual)** **V_*_L__S__M__B_*_P_*_I__N_*_**
Understanding Learner (C) **Intuitive-Thinking** Using what you know about how electric circuits operate, test and classify various materials to determine whether they are a conductor, non-conductor, a receiver or an energy source. Document the changes you observe and come to a conclusion about which materials would be the most efficient circuit materials and explain your reasoning. (Factual & Conceptual)	**Self-Expressive Learner (D)** **Intuitive-Feeling** Imagine you are in a deserted area with magnetic materials. Create a plan and demonstrate how you could use these materials to generate electricity. How would having electricity change your situation. (Perspective & Conceptual)

V_*_L_*_S__M__B_*_P__I__N__	**V__L__S__M__B_*_P__I_*_N_*_**

Real World Connections With Products:
creating, organizing, drawing conclusions, decision making, observing, applying, analyzing, building, explaining, drawing, problem-solving, evaluating, classifying

Real World Applications:
Electrical engineer, scientist, electrician, meteorologist

Real World Terms:
Illustrate, classify, display, explain, discuss, role-play, demonstrate, problem-solve

Connect all products in the unit to real world applications reflecting the concept, generalizations and topic. The above is an example of how this might be accomplished.

Concept Focus:

- Change

Overarching Generalizations:
Change is inevitable.
Need drives change.
Change is necessary for growth

More Complex Generalizations (Two or more concepts):

Change can be positive or negative.
Change generates additional change.
Change can be motivated by a variety of factors.
Change can be intentional or unintentional.

Change can positively or negatively influence how a society and its individuals grow and progress within their political, economic, and social development.

Political, economic, and social change results from a variety of both intentional and unintentional factors, which affects individuals and society.

Essential Question:

How may change be positive or negative within relationships?

Materials Needed for Task Rotation and/or Task Rotation Menu

Science kit materials for electricity unit, video equipment, computers, paper, pencil, art materials, resource materials on magnetism and electricity, compare/contrast graphic organizers

Materials Needed for Task Rotation and/or Task Rotation Menu

- Science kit materials
- Paper/pencil/
- Art materials
- Chart paper
- Research materials including computers

MetaCognitive Discussion (Essential Questions):

(Whole Group)

Conceptual Perspectives:

Intelligent Behaviors:

1. What intelligent behaviors are characteristic of inventors?
2. Which intelligent behaviors does Ben Franklin demonstrate?
3. How did Ben Franklin demonstrate taking responsible risks in developing his inventions? Which invention do you think represents this habit of mind the best?
4. When you are designing something, which intelligent behaviors do you think you use the most?
5. How can metacognition help you when you are designing something new?
6. What intelligent behaviors might people demonstrate when adapting to new inventions and the changes in their everyday life?
7. Which intelligent behaviors does a person use when considering the impact of inventions on the future?

Literary Perspective:

Student/Teacher Reflections:

Student Reflections and Assessments

Task Rotation Learning Experience
4th Grade Science
All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.

***NOTE: Students need to choose one activity from each vertical column.

Mastery Learner (A) **Sensing- Thinking** Write a set of directions for another student that would allow them to create a circuit based on magnetism. Include a supply list and the step-by-step process. **V_*_L_*_S__M__B__P__I__N__**	**Interpersonal Learner (B)** **Sensing-Thinking** Develop and present a guide about electricity for 3rd graders. Include the "dos and don'ts" of magnetism and lightning safety. Make sure to explain how magnetism and electricity are related. Note: We would like help making the mastery and interpersonal activity more rigorous. **V_*_L__S__M__B__P_*_I__N__**
Understanding Learner (C) **Intuitive-Thinking** Create an electric circuit as part of an improvement to an existing object. You must include magnetism as part of your process. Explain how the improvement changes the invention. What effects might this have? **V_*_L__S_*_M__B__P__I__N__**	**Self-Expressive Learner (D)** **Intuitive-Feeling** Create a presentation that shows: • how magnetism is related to electricity. • the relationship between lightning and electricity. • lightning safety Be creative! Can you include dancing or singing? **V_*_L__S__M_*_B_*_P__I_*_N__**

Real World Connections With Products:

Creating, presenting, explaining, building

Real World Applications:
Electrical engineer, scientist, teacher, electrician, meteorologist

Real World Terms:
Directions, guide, invention, performance

Science Student Reflections and Assessments
4th Grade
All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.

*****Note: Students need to choose one activity from each horizontal row.**

Mastery Learner (A) **Sensing- Thinking** Write a set of directions for another student that would allow them to create a circuit based on magnetism. Include a supply list and the step-by-step process. (Factual) **V_*_L_*_S__M__B__P__I__N__**	**Interpersonal Learner (B)** **Sensing-Thinking** Develop and present a guide about electricity for 3rd graders. Include the "dos and don'ts" of magnetism and lightning safety. Explain how magnetism and electricity are related. (Conceptual) **V_*_L__S__M__B__P_*_I__N__**
Understanding Learner (C) **Intuitive-Thinking** Create an electric circuit as part of an improvement to an existing object. You must include magnetism as part of your process. Explain how the improvement changes the invention. What effects will these changes cause? (Conceptual) **V_*_L__S_*_M__B__P__I__N__**	**Self-Expressive Learner (D)** **Intuitive-Feeling** Create a presentation that shows: • how magnetism is related to electricity. • the relationship between lightning and electricity • lightning safety Be creative! Can you include dancing or singing? (Factual & Conceptual) **V_*_L_S__M_*_B*_P__I_*_N__**

Real World Connections With Products:
Creating, presenting, explaining, building

Real World Applications:
Electrical engineer, scientist, electrician, meteorologist, teacher

Real World Terms:
Directions, guide invention, performance

Connect all products in the unit to real world applications reflecting the concept, generalizations and topic. The above is an example of how this might be accomplished.

Concept Focus:

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Essential Question:

How may change be positive or negative within relationships?

Materials Needed for Task Rotation and/or Task Rotation Menu

Science kit materials, paper/pencil, art materials, chart paper, research materials including computers

Materials Needed for Task Rotation and/or Task Rotation Menu

- Science kit materials
- Paper/pencil/
- Art materials
- Chart paper
- Research materials including computers

MetaCognitive Discussion (Essential Questions):

(Whole Group):

Conceptual Perspectives:

Intelligent Behaviors:

1. What intelligent behaviors are characteristic of inventors?
2. Which intelligent behaviors does Ben Franklin demonstrate?
3. How did Ben Franklin demonstrate taking responsible risks in developing his inventions? Which invention do you think represents this habit of mind the best?
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5. How can metacognition help you when you are designing something new?
6. What intelligent behaviors might people demonstrate when adapting to new inventions and the changes in their everyday life?
7. Which intelligent behaviors does a person use when considering the impact of inventions on the future?

Literary Perspective:

Student/Teacher Reflections

Additional Support Materials:

Favorite Read-Alouds:

Finger Plays, Nursery Rhymes and Songs:

Video Clips:

Paintings & Prints:

Teacher Reflections

Literary Selection

Date **School** **Grade**

1. What were the strengths of the task rotations and/or other activities?

2. How did the task rotations and/or activities reveal students' Intelligent Behaviors? Please discuss how each Intelligent Behavior manifested it self.

3. What would you change or add the next time you taught this lesson?

4. What opportunities for growth does the resource unit have?

5. What were "ah ha's?" for the students? For teachers?

“Additional Comments

APPENDIX

A

Additional Instructional Concept-Based Activities