Objectives:
• Students will apply their knowledge of locally-grown apples and their knowledge of eating healthy to write a persuasive essay. The students will convince their audience that eating apples will contribute to a healthy lifestyle.

Essential Questions:
• Why is it important to eat healthy?
• Why are apples a healthy part of your daily diet?
• If I eat an apple each day, will it improve my eating habits?
• Can apples prevent certain diseases?

Vocabulary:
• health
• My Plate
• orchards
• health benefits
• healthy lifestyle
• habits
• vitamins
• apple varieties
• disease
• cholesterol
• heart disease
• antioxidants
• idiom
• minerals

Duration:
• Five 45-minute class periods
• The writing piece should proceed through the writing process: prewriting, drafting, revising, editing, and publishing.

Materials:
• projector
• teacher’s computer or student computers
• writing paper for draft
• Apple Stationary
• Graphic Organizer – Ideas
• Graphic Organizer – Persuasion Map
• Graphic Organizer – Persuasive Writing and New Vocabulary
• vocabulary list  
• Pennsylvania Apples Variety Chart  
• large chart paper  
• laptop or tablet with projection system

Anticipatory Set:
• Connect a laptop or tablet to the projection system and project the website http://www.choosemyplate.gov so students can see how a healthy plate should look.
• Tell the students, “Today we will be learning about healthy eating and what a healthy plate looks like.”
• Discuss the components of a healthy plate and ask students to name their favorite group on the plate, focusing on the fruit section. Which fruit most supports healthy eating? Guide students to talk about apples.
• Remind students of the idiom “An apple a day, keeps the doctor away.”
• Discuss this concept to see if the idiom may have some truth behind it.
• Another option is for teachers to share a video from the BrainPOP website. This is optional but can lend additional information to students. Link is listed below in Related Materials and Resources section.

Introduction:
1. Explain to the students that they will be writing a persuasive essay to convince their audience that eating an apple a day really does keep the doctor away.
2. The students will decide to which audience they will write (parents, the community, peers). Do they feel that most people should eat healthier or is there a specific person that would benefit from eating an apple a day?

Modeling:
• Share a sample persuasive essay where the author’s purpose of writing is to persuade their readers that eating an apple a day really does keep the doctor away.
• Emphasize to the students the purpose of the essay, the format of the writing (length and number of paragraphs), and that this piece will be completed through the writing process.

Procedure:
• Students will work together in discussion and use the apple website to develop a list of persuasive reasons for eating apples. Use the computer(s) to take students to the website and the page on nutrition. The link is listed below: http://www.pennsylvianaapples.org/AllAboutApples/AppleFacts.aspx#nutrition
• Explore each reason and discuss them with the class. Distribute Graphic Organizer – Persuasion Map or Graphic Organizer –Persuasive Writing and New Vocabulary for students to take notes and write their thoughts under each health benefit. The notes will assist the students in the writing process.
• Brainstorm with the students a list of vocabulary words that they might need as they write their essays (see vocabulary list).
• If the teacher has gathered resource materials, give students time to look through the books and gather words that they think might be useful. These may be added to the list after students have had time to share out.
• Post the chart paper with the vocabulary words. The students should refer to the chart for
vocabulary words when writing their essays.

- Post the evidence that students found in their research encouraging the concept of eating an apple or apple products per day.
- A persuasive essay must state a reason with elaboration for each reason to help their audience understand the importance of eating apples.
- To begin writing, the teacher will elicit ideas from the students.
- When the final group essay is composed, the teacher will display it in the classroom or make copies for students to refer to as they write their own essay.

**Independent Practice:**
- With parental guidance and access to the Pennsylvania Apples website: [www.pennsylvaniaapples.org](http://www.pennsylvaniaapples.org) students will share the assignment with their parents and discuss the reasons for eating an apple or apple product each day.
- Once students have selected their reasons, they should begin composing their own essay.
- Students will revise and edit their essay with the teacher.
- After editing, students will rewrite their essays to final copy.
- Students will have the opportunity to share their writing in class.

**Closure:**
- Student will share his or her essay with their peers.
- Students will take their essays home to share with a parent. Parent will sign that they have seen the essay and send it back to school.

**Assessment:**

**Formative:** Your Ticket Out The Door: Students should write at least three reasons how eating apples keeps them healthy and aids in building a healthy lifestyle.

**Summative:** Each student will have successfully completed a persuasive essay stating reasons with elaborations as to the importance of adding an apple a day or an apple product to his or her diet. Students’ final edited drafts may be used for the summative assessment.

**Related Materials and Resources:**
- [http://www.agriculture.state.pa.us/portal/server.pt/gateway/PTARGS_0_2_24476_10297_0_43/AgWebsite/Page.aspx?name=About-PDA&navid=30&parentnavid=0&pageid=9&](http://www.agriculture.state.pa.us/portal/server.pt/gateway/PTARGS_0_2_24476_10297_0_43/AgWebsite/Page.aspx?name=About-PDA&navid=30&parentnavid=0&pageid=9&)
- [http://www.portal.state.pa.us/portal/server.pt/community/pennsylvania's_agricultural_history/2584](http://www.portal.state.pa.us/portal/server.pt/community/pennsylvania's_agricultural_history/2584)
- [http://www.pennsylvaniaapples.org/AllAboutApples/PAAppleVarieties.aspx](http://www.pennsylvaniaapples.org/AllAboutApples/PAAppleVarieties.aspx)
- [http://www.pennsylvaniaapples.org/AllAboutApples/AppleFacts.aspx#nutrition](http://www.pennsylvaniaapples.org/AllAboutApples/AppleFacts.aspx#nutrition)
- [http://www.choosemyplate.gov](http://www.choosemyplate.gov)
- [http://www.brainpop.com/health/nutrition/nutrition](http://www.brainpop.com/health/nutrition/nutrition) - optional

**Accommodations and Adaptations:**
- Computers will be made available at school if a student has no access at home.
- A copy of products and a graphic organizer for persuasive writing will be provided if needed.
- An adaptation of the writing process may be to provide a partially written essay.
- Assistance may also be given throughout the writing process with buddy writing or one-on-
one writing assistance.

- Provide a personal word bank for thoughts and correct spelling.

**Grades 3-5**

**Common Core Standards:**
CC.1.4.3.H – Introduce the topic and state an opinion on the topic.
CC. 1.4.3.I – Support an opinion with reasons.
CC.1.4.3.D – Create an organizational structure that includes information grouped and connected logically with a concluding statement or section.
CC.1.4.3.E -- Choose words and phrases for effect.
CC.1.4.3.F -- Demonstrate a grade appropriate command of the conventions of Standard English grammar, usage, capitalization, punctuation, and spelling.

**Pennsylvania State Standards for Environment and Ecology:**
4.4.3.A – Identify Pennsylvania crops that provide food for the table and fiber for textiles.
4.4.3.B – Explain how agriculture meets the basic needs of humans.
IMPORTANT SAFETY NOTE: This lesson involves tasting apples. Some students may be allergic to apples or apple skins. Before beginning the lesson, check your records and ask the school nurse if there are any food allergies in your classroom. Additionally, it is important to thoroughly wash all apples before tasting.

Objectives:
• Students will use their observation skills to find the apple they like best.
• Students will describe the flavor of each apple using **adjectives** and **adjectival phrases**.

Essential Questions:
• What flavors do I prefer (**bitter, sweet, tart**)?
• Is there one type of apple **taste** that is more appealing than another?
• How would the description of an apple differ from another?
• Do you think that different **tastes** would lend themselves to different purposes (eating, cooking, baking)?
• Can you describe your apple’s **texture**?

Vocabulary:
• observe
• property
• texture
• taste
• bitter
• sweet
• sour
• tart
• adjective
• adjectival phrase
• description

Duration:
• One 45-minute class period
• Optional: expand if teaching scientific process

Materials:
• pencils
• Graphic Organizer – Tasting an Applicious Treat
• Apple Stationary
• Pennsylvania apples cut into wedges for tasting
• hand lens
• glasses of water
**Anticipatory Set:**
1. Explain that the students will *taste* different types of Pennsylvania apples. First, ask students to think about something everyone has *tasted*.
2. Tell the students to think about chocolate. Ask, “What kinds of chocolate do you like best?” Make a chart on the board with the following headings: white chocolate, milk chocolate, and dark chocolate.
3. Explain that those are three of the most common types of chocolate. Ask the students which is their favorite. Why is it their favorite? Encourage students to discuss *taste*.
4. Ask the students how they would describe the *taste* of their favorite chocolate and record their answers in the appropriate place on the chart.

**Introduction:**
1. Prior to beginning the lesson, review adjectives by using the following link: [http://www.brainpop.com/english/grammar/adjectives/](http://www.brainpop.com/english/grammar/adjectives/). Spend a few minutes brainstorming adjectives with the class and listing the adjectives on the whiteboard.
2. Place all the apples on a table in the front of the classroom with a sign in front of each type of apple.
3. Ask the students to take a slice of the first type and look at the whole apple.
4. After they bring the apple back to their desk, instruct the students to examine and *observe* their slice. Ask a series of questions:
   - What color is the skin?
   - What color is the flesh? Use the hand lens to take a closer look.
   - What did the whole apple look like on the table?
   - How do they think it will *taste*?
5. Distribute Graphic Organizer – Tasting an Applicious Treat so the students can record their observations.
6. They should then take a bite of their apple slice and pay close attention to the *taste*. The students should record the *taste* on their organizer. Also, the students should pay close attention to the *texture*. Is it mushy (mealy), firm, soft, or crunchy?
7. The students should sip water between slices.

**Guided Practice:**
- Prior to this lesson, the teacher could provide a type of food like chocolate so the students could practice the procedure.
- If the activity includes writing a *description* of the *taste* of the apples, this should also be modeled for the students.

**Independent Practice:**
- Have the students repeat the procedure above using the different types of apples.
- Guide them on procedure.
Closure:
- At the close of this lesson, discuss with students which apple they thought tasted the best.
- Ask the students a series of questions:
  - How did they decide?
  - Did their apple have to be the sweetest?
  - Did they not like the sweetest apple?
  - Why do you think some students liked different apples than you did?
  - Why do you think some students liked the same kind of apple that you chose?
  - Did you prefer a crisper bite?
  - What did you learn from doing this?

Assessment:
**Formative:** Students will write the name of their favorite type of apple and what it tasted like. Students should also explain why this apple had the best *taste*.

**Summative:** Students should turn in their final written description of the different types of apples and how they *tasted*. This piece of writing would be comparing and contrasting the *tastes* of the different types of apples. The final copy of the writing should be completed on the Apple Stationary. Students should also find a way to rank their apples as a guide for the reader. A student might choose to rank them by *taste, sweetness, or preference*.

Related Materials and Resources:
- [www.pennsylvaniaapples.org](http://www.pennsylvaniaapples.org)
- BrainPOP and/or BrainPOP Jr.
  - [http://www.brainpopjr.com/readingandwriting/word/adjectivesandadverbs/preview.weml](http://www.brainpopjr.com/readingandwriting/word/adjectivesandadverbs/preview.weml)

Accommodations and Adaptations:
- Younger students can use smile or frown faces to describe how they liked the apples if they are unable to use accurate descriptive *adjectives*.
- If students have difficulty coming up with *adjectives*, the class could complete this activity with a partner and put their heads together to assist each other.
- Students could also be given a list of *adjectives*.
- Younger students would be able to write simple sentence descriptors underneath a picture they draw of themselves tasting each apple.
- The complexity of the activity would depend on the grade level and the teacher’s discretion.

**Grades 1-5**
Common Core Standards:

Science Standards:
3.1.3.A – Describe the characteristics of living things that help identify them.
3.2.3.A – Process, procedures, and tools of investigations
S3.A.2.2.1 – Identify appropriate tools or instruments for specific tasks, and describe the information they provide (i.e., measuring [length—ruler; mass—balance scale] and making observations [hand lenses—very small objects]).

English Language Arts:
1.6.3.A – Listen critically and respond to others in small and large group situations. Respond with grade level appropriate questions, ideas, information, or opinions.
CC.1.5.3.A
Engage effectively in a range of collaborative discussions on grade level topics and texts, building on others’ ideas and expressing their own clearly.
CC.1.4.3.A
Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
CC.1.4.3.B
Identify and introduce the topic.
CC.1.4.3.C
Develop the topic with facts, definitions, details, and illustrations, as appropriate.
CC.1.4.3.D
Create an organizational structure that includes information grouped and connected logically with a concluding statement or section.
CC.1.4.3.F
Demonstrate a grade-appropriate command of the conventions of Standard English grammar, usage, capitalization, punctuation, and spelling.
Objectives:
• Students will collaborate to discover and name types/varieties of apples.
• Students will strengthen their communication skills by working in groups.
• Students will understand that apples are part of a healthy diet.

Essential Questions:
• How many varieties of Pennsylvania apples are there?
• How many varieties can be named by working together in pairs, in groups of four, in groups of eight, and in groups of sixteen?
• Is working together helpful?
• How well did the group communicate?
• What are the health benefits of eating apples?

Vocabulary:
• collaboration
• varieties
• apple products
• health benefits

Duration:
One 45-minute class period

Materials:
• pencils
• paper for each group
• computers (optional)
• List Your Apple Varieties worksheet
• Health Benefits worksheet
• Pennsylvania Apples Variety Chart

Anticipatory Set:
• Explain to students that they are going to work together to brainstorm things that belong in a group. For example, ask them to brainstorm and name kinds of pies.
• As the students name the pies, write them on the board.
• Once you have a list of pies, explain that the class will work in pairs to brainstorm varieties of apples.
Procedure:
1. Ask the students to define *variety*. Ensure that the students understand it refers to a type of apple.
2. Explain that the students will work together to name as many types of apples as they can.
3. Divide the students into pairs. Ask them to “put their heads together” to come up with a list of apples.
4. Give the students five minutes to develop the list.
5. Ask the students to join with another group to compare their lists. The groups should share their lists and arrive at a final list.
6. Once the group of four has had time to compare their lists, ask them to join another group of four. The students should repeat the process of comparing lists and adding the names of apples from the other group. Every group member should have the same list.
7. If there are not enough students to make a group of eight, the students should return to their seats.
8. Compile all of the lists, writing the varieties on the whiteboard. Ask the students how working together helped them to complete the task. Ask a series of questions such as:
   • How many apples did you name when you worked with a partner?
   • What happened each time you joined with another group?
   • What did you learn by working together?
9. When the class finishes this discussion, ask, “What do you think are the *health benefits* of eating apples?” Elicit responses from the students and write them on the board.

Guided Practice:
• Instruct the students to repeat the procedure, this time with *apple products*.
• The students will work together to learn about and name *apple products* that are sold in stores, farmer’s markets, and orchards.
• The students will make lists of *apple products* while working together in their different-sized groups.

Closure:
• Explain to the students that the purpose of this activity is two-fold:
  • The first objective is to understand that apples exist in numerous *varieties*.
  • The second objective is to understand that working together helps to generate more ideas.
• Watch Penn State’s video, which explains that there are more than 10,000 *varieties* of apples in the world (See link in Related Materials and Resources section).
• Remind the students that apples are part of a healthy diet. Explain that this is an introductory lesson on apples, providing background information for the activities to follow.

Assessment:
**Formative:** Students will name *varieties* of apples that they learned from their brainstorming.

**Summative:** The students will be able to name at least five *varieties* of apples grown in Pennsylvania and five *apple products* made in Pennsylvania.
Related Materials and Resources:
- Websites on Apple Varieties: [http://www.pennsylvaniaapples.org/AllAboutApples/PAAppleVarieties.aspx](http://www.pennsylvaniaapples.org/AllAboutApples/PAAppleVarieties.aspx)
- Penn State on Apple Varieties: [https://www.youtube.com/watch?v=zSWq8qI_cN0](https://www.youtube.com/watch?v=zSWq8qI_cN0)

Accommodations and Adaptations:

Grades 3-5

Common Core Standards:

**English Language Arts:**
CC.1.5.3.A – Engage effectively in a range of collaborative discussions on grade level topics and texts, building on others’ ideas and expressing their own clearly.
1.6.3.A – Listen critically and respond to others in small and large group situations. Respond with grade level appropriate questions, ideas, information, or opinions.

**Health Standards:**
10.1.3.C – Explain the role of the food guide pyramid in helping people eat a healthy diet.
Objectives:
- Students will become familiar with the 13 varieties of Pennsylvania apples.
- Students will be able to name apples that are tart or sweet.
- Students will learn and record apple tidbits.
- Students will be able to alphabetize the 13 varieties.
- Students will understand vocabulary related to the Pennsylvania Apples Variety Chart.

Essential Questions:
- How many apple varieties can you name?
- Can you distinguish between tart and sweet flavors?
- Can you name some apple tidbits?
- What are the health benefits of eating apples?
- Can you put them in alphabetical order?

Vocabulary:
- Alphabetize
- Categorize
- Flavors
- Varieties
- Dense
- Texture
- Mellow
- Tart
- Sweet
- Crisp
- Digestion
- Fresh
- Disease
- Cholesterol
- Antioxidants

Duration:
Two 45-minute class periods

Materials:
- Whiteboard
- Marker
- Pencils
- Pennsylvania Apples Variety Chart
- Health Benefits worksheet
• Your Ticket out the Door
• Alphabetize Your Apple Varieties

Introduction:
1. Present the students with a series of questions:
   • What varieties of apples have you heard of?
   • What varieties of apples have you eaten in the past?
2. Write the names of the apples on the SMART Board or whiteboard.
3. Direct the students to the Pennsylvania Apples Variety Chart.
4. Review both sides of the chart.
5. Name and point to the 13 varieties of apples. Ask the students to repeat each name.

Guided Practice:
*Note: This lesson contains several activities. Teacher may choose which activities are appropriate.*

Activity #1: Tart vs. Sweet
1. Ask, “What do apples taste like?” Call on six students as the class listens to their answers.
2. Discuss the terms tart and sweet.
3. Present the students with a series of questions:
   • How many of you have tasted something tart?
   • How many of you have tasted something sweet?
4. Refer to the Pennsylvania Apples Variety Chart and group apples by flavor.
5. Write the words “tart” and “sweet” on a SMART Board or whiteboard.
6. Ask the students to name varieties that fit under the categories.

Activity #2: Apple Tidbits
1. Review the Pennsylvania Apples Variety Chart – “Get to Know Pennsylvania Apples” or Health Benefits worksheet.
2. Call on students to read the apple bullets aloud, one by one.
3. Review appropriate vocabulary.
4. An optional enhancement of this lesson would be to create a matching game with apple varieties and their attributes. This will allow students to match the variety to the attribute.
5. Distribute Your Ticket Out The Door. Each student should list three facts about apples as a closure to the lesson.

Activity #3: Alphabetizing Apples
1. Pose the question, “What is alphabetizing?” It involves looking for words to categorize by letter order.
2. Refer to the 13 varieties on the chart. Ask, “How would we alphabetize these names?”
3. The students will complete Alphabetize Your Apple Varieties worksheet. They may work individually or in groups, per teacher’s discretion.

Independent Practice:
• The teacher will instruct the students to work independently or in groups.

Closure:
• The teacher may review the answers to worksheets with the class.
Assessment:
  Formative: Observe the students as they complete the worksheets.
  
  Summative: Students will complete and turn in Your Ticket Out The Door and/or List Your Apple Varieties.

Related Materials and Resources:
  • http://www.pennsylvaniaapples.org/

Accommodations and Adaptations:
  • The students will have the opportunity to review and correct their alphabetized list.
  • The students may work with a partner to alphabetize if needed.
  • The teacher can assist younger students to define challenging vocabulary.
  • To expand this lesson, refer to the lesson: Tasting an Applicious Treat for taste testing options.

Grades 1-3

Common Core Standards:
RFS.1.3 – Know and apply grade-level phonics and word analysis skills in decoding words.
RFS.2.3 – Know and apply grade-level phonics and word analysis skills in decoding words.
RF.3.3 – Know and apply grade-level phonics and word analysis skills in decoding words.
CC.1.2.3.J
Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases, including those that signal spatial and temporal relationships.
CC.1.2.3.K
Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade-level reading and content, choosing flexibly from a range of strategies and tools
CC.1.2.3.L
Read and comprehend literary nonfiction and informational text on grade level, reading independently and proficiently.
CC.1.4.3.W
Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.
CC.1.5.3.E
Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.
Objectives:
• Students will follow the scientific method to determine if the number of seeds correlates with the size of the apple.

Essential Questions:
• Does the size of the apple affect the number of seeds in the apple?

Vocabulary:
• circumference
• correlate
• affect
• poles
• equator
• hypothesis
• scientific method
• carpel
• prediction
• substance
• nectar

Duration:
Two 45-minute class periods

Materials (Per Group):
• apples of different varieties (four per group)
• plastic knife
• measuring tape
• paper plates
• More Seeds = Bigger Apples worksheet?

Anticipatory Set:
• If necessary, review the scientific method.
• The students will learn about the basic structure of the apple. They should know that an apple has five carpels, where the seeds are formed.
• Check BrainPOP for a video.

Procedure:
1. Distribute the More Seeds = Bigger Apples worksheet.
2. The students will develop hypotheses that predict if the number of seeds in an apple has a direct correlation to its size.
3. Distribute four apples to each group.
4. The students will measure the circumference of each apple at its equator and poles. They will record the measurements on More Seeds = Bigger Apples worksheet.
5. The students will use plastic knives to remove the seeds from the apples.
6. The students will count and record the number of seeds.
7. The students will write a conclusion on the worksheet that answers if the number of seeds in an apple has a direct correlation to its size.

Introduction:

1. Review the scientific method.
2. Remind the students that they will make predictions, or hypotheses, and then gather data to determine if their hypotheses are correct.

Modeling:

- Review the parts of an apple, emphasizing the five carpels that contain the seeds.
- Discuss the various factors that impact fruit development:
  - “If you look at a well-developed apple and cut it cross-section, you would see that the ovary has five compartments, called ‘carpels.’ Each carpel should contain two seeds, for a total of 10 seeds.
  - The number of seeds inside each apple is related to the health of the tree. Healthier trees produce better fruit with more and larger seeds.
  - The apple blossoms (flowers) need to be pollinated in order to grow large fruit that have most or all of their seeds. Pollen is a substance produced by apple trees as well as many other plants, and is necessary for reproduction. Pollen stimulates the development of the seed, which in turn stimulates other parts of the fruit to develop. In late spring, white blossoms appear on apple trees for about nine days. These blossoms produce a lot of pollen and a sweet nutrient-rich substance called nectar. Honeybees are attracted to the blossoms in order to obtain the nectar, and as they move from tree to tree collecting nectar, they also transfer pollen from blossom to blossom. Pollinated blossoms grow into ripened fruit in about four and a half to five and a half months.
  - Apple trees begin to bear fruit in [two to three] years. They are capable of producing fruit for as long as 100 years, but most commercially grown apple trees are replaced every 12-20 years.
  - If an apple tree has a particularly good growing year and produces an abundance of fruit, this may cause it to become temporarily low on stored energy. It may produce apples with a small number of fruit and seeds the following year” (Willett Garden of Learning). Growers use a pruning and thinning technique to prevent this.

Guided Practice:

- Demonstrate how to measure the circumference of the apple.
- Demonstrate how to remove the seeds using a plastic knife.
Independent Practice:
• The students will write their own hypotheses.
• The students will work as a group to complete the experiment.
• The students will measure the circumference of the apples and record the results.
• The students will remove the seeds from the apples and record the results.
• The students will write their own conclusions.

Closure:
• Compare the class’ data orally or using a line plot.

Assessment:
  Formative: Teacher will observe and note if the students are able to formulate hypotheses and follow the scientific method in conducting this experiment.

  Summative: Students should be able to draw conclusions from their experimental data and complete More Seeds = Bigger Apples?

Related Materials and Resources:
• Pennsylvania Apple Varieties: http://www.pennsylvaniaapples.org/AllAboutApples/PAAppleVarieties.aspx
• Google topics for discussion: “The Production and Structure of Apples” and “Fruit Development”

Accommodations and Adaptations:
• Teacher may provide a sentence frame for formulating a hypothesis, i.e. “If _______, then ______.”

Grades 3-5

Common Core Standards:

Science:
S3.A.2.1.1 – Generate questions about objects, organisms, or events that can be answered through scientific investigations.
S3.A.2.1.2 – Make predictions based on observations.
S3.A.2.1.3 – Identify the variables in a simple investigation.
CC.1.2.4.J – Acquire and use accurately grade-appropriate conversational, general academic, and domain specific words and phrases, including those that signal precise actions, emotions, and states of being that are basic to a particular topic.
CC.1.4.5.1 – Provide reasons that are supported by facts and details; draw from credible sources.
Objectives:
- Students will be able to name and describe the life cycle stages of an apple.
- Students will be able to recreate a model of the life cycle.

Essential Questions:
- What are the stages in the life cycle of an apple?
- Which insect is needed to complete the life cycle?
- Name and define the apple vocabulary.

Vocabulary:
- life cycle
- rootstock
- buds
- apple blossoms
- pollinate
- honeybees
- seedling
- sepals
- calyx
- nectar
- pollen

Duration:
Two 45-minute class periods

Materials:
- two brown lunch bags per student
- colored pencils
- scissors
- staplers
- glue sticks
- The Life Cycle of an Apple
- Your Ticket Out The Door
- The Life Cycle of an Apple: Answer Key

Anticipatory Set:
- Begin by explaining that students will learn about the life cycle of an apple.
- Ask the students, “What is a life cycle?” Ensure that the students understand it is the stages an apple goes through from rootstock to apple.
Procedure:
1. Review the definition of a *life cycle* with the students. A *life cycle* is the series of stages that an organism goes through during its lifetime. Instruct the students to record the definition in their science notebooks.
2. Remind the students that they are going to focus on the *life cycle* of an apple. Point out the distinction between the *life cycle* stages of an apple and those of other organisms. An apple comes from an adult plant, which only needs to go through winter to produce new *buds* and grow fruit. It is different from a pumpkin, for example, which grows a new plant each time it needs to produce fruit.
3. After clarifying this distinction, use one or more of the reference books to explain the *life cycle* of an apple.
4. Ask the students to fill in the stages on The Life Cycle of an Apple (worksheet).

Modeling:
1. Draw and label the stages of the *life cycle* of an apple. The students should be able to replicate the drawings in their notebooks.
2. Draw a picture of *apple rootstocks*. The *rootstocks* restart the *life cycle* by growing into apple trees.
3. Draw a picture of a *tree*. This is where the *buds* will grow.
4. Draw a picture of a *bud* on a branch. The *bud* contains the leaves and the flowers that grow into the fruit.
5. Draw a picture of an *apple blossom*. The blossom falls off the tree, and then fruit forms in its place on the branch.
6. Draw a picture of an *apple*. The apple grows out of the *apple blossom*.

Independent Practice - Following Class Period:
1. At the beginning of the next class, ask the students to recall the *life cycle* of an apple.
2. The students will make a paper bag book depicting the *life cycle*.
3. Distribute two brown lunch bags to each student.
4. Instruct the students to fold both bags in half.
5. The students (or teacher) should staple the two bags along the folds to make the spine of the book.
6. Once the book is stapled, the students should write the title, “The Life Cycle of an Apple,” on the front cover.
7. Glue down the extra flaps.
8. Each page should contain one stage in the *life cycle*.
9. *Optional*: Snip along the right-side edge of the front cover to make a pouch for pictures, etc. The students can use the pockets created by the opening of the paper bags to hide interesting facts that they have learned about apples.

Closure:
* Encourage the students to share their books with a partner. This allows the students to use their speaking skills to explain the information learned from the text and instruction.
Assessment:

**Formative:** Students should review the apple *life cycle* with a partner. Ask the students to list the stages (rootstock, tree, bud, flower, and apple) on the exit ticket entitled Your Ticket Out The Door. The students could complete Life Cycle of an Apple (worksheet).

**Summative:** Students will turn in their apple books for a grade. Teachers may create their own rubric for grading purposes.

Related Materials and Resources:


Accommodations and Adaptations:

- This lesson could easily be simplified to use with younger ages.
- Pictures could be used for the *life cycle* rather than having the students draw their own.
- Any students who have difficulty with fine motor skills could be given a drawing of the *life cycle* instead of drawing their own.
- The teacher could staple the paper bag books for younger students.

Grades 2-5

**Common Core Standards:**

- **CCSS.ELA-Literacy.SL.3.1.c** Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.
- **CCSS.ELA-Literacy.SL.3.1.d** Explain their own ideas and understanding in light of the discussion.
- **CCSS.ELA-Literacy.SL.3.2** Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- **CCSS.ELA-Literacy.SL.3.3** Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
- **CCSS.ELA-Literacy.SL.3.4** Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

**Pennsylvania Core Science & Technology:**

- **3.3.4.D** – Identify changes in living things over time.
Objectives:
- Students will write a paragraph or series of sentences supporting a main idea.
- Students will be able to identify evidence from the text that support main ideas.

Essential Questions:
- How does an author use details to support main ideas?

Vocabulary:
- main idea
- details
- evidence
- peacemaker
- environmentalist
- pioneer
- orchard
- eccentric
- frontier
- nurseryman

Duration:
- Three to five 30-minute class periods

Materials:
- one or more books about Johnny Appleseed (see list below)
- Graphic Organizer – Johnny Appleseed
- Johnny Appleseed – Anticipatory Guide
- Johnny Appleseed: Main Ideas/Key Details
- Apple Stationary

Anticipatory Set:
- Complete Johnny Appleseed – Anticipatory Guide.
- Teacher can show a short YouTube video on the background of Johnny Appleseed.

Procedure:
2. Teacher will read aloud a book of choice about Johnny Appleseed guiding students through discussion to find evidence in the text that support key characteristics of Johnny Appleseed.
Introduction:
1. After completing anticipatory guide/discussion about Johnny Appleseed, turn and talk to your partner.
2. What do you know about Johnny Appleseed? Share details with the class.
3. Teacher will introduce key ideas about Johnny Appleseed (see attached Johnny Appleseed: Main Ideas/Key Details). For example, he was a peacemaker, an environmentalist, and a storyteller and a pioneer.

Modeling:
• During read aloud, use think-aloud procedure to identify evidence from the text that support these key ideas about Johnny Appleseed.

Guided Practice:
• During read aloud, stop at various points and ask students to turn and talk to their partner or small group to determine what evidence from the text supports listed characteristics, i.e., peacemaker, environmentalist, storyteller, pioneer.

Independent Practice (Optional):
• Give students books (to work independently) appropriate to their level to complete the graphic organizer.

Closure:
• Discuss completed graphic organizer.
• Students will write paragraph about Johnny Appleseed (option – use Apple Stationary).

Assessment:
  Formative: Observation throughout read aloud. Can students ask/answer questions, can they identify evidence from the text to support main ideas?
  Summative: Completed writing or graphic organizer.

Related Materials and Resources:
• Teacher-created PowerPoint or YouTube video on Johnny Appleseed
• Johnny Appleseed - Anticipatory Guide

Books:
The Story of Johnny Appleseed by Aliki
Johnny Appleseed: My Story as told by David L. Harrison
Johnny Appleseed: The Story of a Legend by Will Moses
Seed by Seed: The Legend and Legacy of John “Appleseed” Chapman by Esme Rji Codell
Johnny Appleseed by Jane Yolen
Johnny Appleseed: A Tall Tale retold and illustrated by Steven Kellogg
Who Was Johnny Appleseed? By Joan Holub

Accommodations and Adaptations:
• Provide students with individual graphic organizers to complete independently.
• Choose book appropriate to listening/reading level.
• Sentence stems for discussion:
  The author says __________.
  I think Johnny Appleseed is __________ because __________.
• Extension: After completing the graphic organizer, write a response to this statement using evidence from the text: Johnny Appleseed was/was not an American hero.

Grades K-2, 3-5

Common Core Standards:

Nonfiction:
CC.1.2.K.A, CC.1.2.1.A, CC.1.2.2.A (Key Ideas and Details – Main Idea)
CC.1.2.K.B, CC.1.2.1.B, CC.1.2.2.B (Key Ideas and Details – Text Analysis)
CC.1.2.K.F, CC.1.2.1.F, CC.1.2.2.F (Craft and Structure – Vocabulary)
CC.1.2.K.H, CC.1.2.1.H, CC.1.2.2.H (Integration of Knowledge and Ideas - Evaluating Arguments)
CC.1.2.K.J, CC.1.2.1.J, CC.1.2.2.J (Vocabulary Acquisition and Knowledge)

Fiction:
CC.1.3.K.A, CC.1.3.1.A, CC.1.3.2.A (Key Ideas and Details – Theme)
CC.1.3.K.B, CC.1.3.1.B, CC.1.3.2.B (Key Ideas and Details – Text Analysis)
CC.1.3.K.J, CC.1.3.1.J, CC.1.3.2.J (Vocabulary Acquisition and Use)

Speaking and Listening:
CC.1.5.K.A, CC.1.5.1.A, CC.1.5.2.A (Comprehension and Collaboration – Collaborative Discussion)
CC.1.5.K.B, CC.1.5.1.B, CC.1.5.2.B (Comprehension and Collaboration – Critical Listening)
Objectives:

- Students will follow the scientific method to estimate the number of seeds in an apple.

Essential Questions:

- What is the importance of the stages in the life cycle of an edible plant?
- Does every apple have the same number of seeds?

Vocabulary:

- skin
- flesh
- core
- carpels
- seeds
- hypothesis

Duration

One 45-minute class period

Materials (Per Group):

- four types of apples, sliced and placed in cups labeled “Apple #1, #2, #3, #4”
- plastic knife or metal spoon
- paper plates
- How Many Seeds in an Apple (worksheet)?
- Apple Parts worksheet

Anticipatory Set:

- Dissect an apple and discuss its parts.
- Distribute Apple Parts worksheet. The students will fill in the worksheet. Note: This chart may be used on a SMART Board as a “drag and drop” activity.
- Check BrainPOP for a video.

Procedure:

1. Divide the class into groups.
2. Distribute the worksheet.
3. The students will develop hypotheses that predict if every apple has the same number of seeds. They will write their hypotheses on the worksheet.
4. Distribute the cups of sliced apples to each group.
5. The students will use plastic knives to remove seeds.
6. The students will count and record the number of seeds in each apple.
7. The students will write a conclusion on the worksheet that answers if every apple has the same number of seeds.
Introduction:
1. Review the scientific method.
2. Remind the students that they will make predictions, or hypotheses, and then gather data to determine if their hypotheses are correct.

Modeling:
• Review the parts of an apple.
• Display and discuss the types of Pennsylvania apples.
• Ask the students, “Do you think that all types of apples have the same number of seeds?”

Guided Practice:
• Demonstrate how to remove the seeds from an apple using a plastic knife or metal spoon.

Independent Practice:
• The students will write their own hypotheses.
• The students will work as a group to complete the experiment.
• The students will remove the seeds from the four apples and record the results.
• The students will write their own conclusions.

Closure:
• Compare the class’ data orally or using a line plot.

Assessment:
Formative: Teacher will observe and note if the students are able to formulate hypotheses and follow the scientific method in conducting this experiment.

Summative: Students should be able to draw conclusions from their experimental data and complete How Many Seeds in an Apple (worksheet)?

Related Materials and Resources:
• Pennsylvania Apples Variety Chart and website: http://www.pennsylvaniaapples.org/AllAboutApples/PAAppleVarieties.aspx

Accommodations and Adaptations:
• Teacher may provide a sentence frame for formulating a hypothesis, i.e. “If ________, then ________.”

Grades K-2
Common Core Standards:

Science:
3.1.K.A3 – Observe, compare, and describe stages of life cycles for plants and/or animals.
3.1.K.A9 – Ask questions about objects, organisms, and events. Understand that all scientific investigations involve asking and answering questions and comparing the answer with what is already known. Plan and conduct a simple investigation and understand that different questions require different kinds of investigations. Use simple equipment (tools and other technologies) to gather data and understand that this allows scientists to collect more information than relying only on their senses to gather information. Use data/evidence to construct explanations and understand that scientists develop explanations based on their evidence and compare them with their current scientific knowledge.
CC.1.2.4.J – Acquire and use accurately grade-appropriate conversational, general academic, and domain specific words and phrases, including those that signal precise actions, emotions, and states of being that are basic to a particular topic.
CC.1.4.5.I – Provide reasons that are supported by facts and details; draw from credible sources.
How Many Apples Will I Eat in My Lifetime?

Objectives:
• Students will solve an open-ended question that encourages them to think critically and to communicate their thinking.

Essential Questions:
• How can I use estimation to make predictions?

Vocabulary:
• lifetime
• consumer
• estimate
• consumption
• prediction
• apple products
• fresh market apples

Duration:
One 45-minute class period

Materials:
• How Many Apples Will I Eat (worksheet)?

Anticipatory Set:
• Share an apple fact with the students: “The average United States consumer eats about 16.9 pounds or 45 fresh market apples each year” (U.S. Apple Association).
• Aid the students in developing a list of apple products and approximate how many apples are in each product.
• Remind the students to factor the other apple products into their predictions.

Procedure:
• The students will take the information from the apple fact and estimate how many pounds of apples they would consume in a lifetime.

Introduction:
1. Read the problem to the students.
2. Discuss key terms like lifetime and fresh market apples.
3. Explain that there is no right or wrong answer. Since the question is open-ended, the most important part of this activity is the process the students use to reach their final answer.
Modeling:
• Pose these questions:
  • What is a lifetime?
  • Does every American consume 16.9 pounds or 45 apples per year? Do some consume more or less?
  • What about the first few years of your life? Do you think you ate 16.9 pounds of apples then? Did you eat baby food or drink apple juice?
  • What are some things people do with fresh apples besides eating them whole?
  • How do you figure out how many fresh apples are in other apple products i.e., how many apples go into a jar of applesauce?

Guided Practice:
• Some students will begin solving the problem immediately.
• Other students may struggle in the beginning. Offer guided instruction to these students.

Independent Practice:
• The students will solve this problem.

Closure:
• Ask the students with varied answers and strategies to share their solutions.

Assessment:
  Formative: The students will calculate how many apples they have eaten this year. They could also calculate how many apples they have eaten in five years.

  Summative: Evaluate the students’ results with the attached rubric.

Related Materials and Resources:
• Puddle Questions: Assessing Mathematical Thinking by McGraw Hill Education

Accommodations and Adaptations:
• Brainstorm strategies with the students.
• Model strategies for the students.

Grades 3-5

Common Core Standards:
CC.2.4.3.A.1: Solve problems involving measurement and estimation of temperature, liquid volume, mass, or length.
CC.1.2.4.J Acquire and use accurately grade-appropriate conversational, general academic, and domain specific words and phrases, including those that signal precise actions, emotions, and states of being that are basic to a particular topic.
CC.1.4.5.I: Provide reasons that are supported by facts and details; draw from credible sources.
### How Many Apples Will I Eat in My Lifetime?

#### Rubric

<table>
<thead>
<tr>
<th>Reasonableness of Final Answer</th>
<th>EXCELLENT</th>
<th>COMPETENT</th>
<th>NEEDS IMPROVEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reasonably correct, given the constraints of the question.</td>
<td>Somewhat reasonable, given the constraints of the question.</td>
<td>Not reasonable, given the constraints of the question.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Logical Reasoning</th>
<th>EXCELLENT</th>
<th>COMPETENT</th>
<th>NEEDS IMPROVEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exceptional logical reasoning used to come up with a final answer. Strategies may compensate for variances in calculations. Multiple steps are involved in solving the problem.</td>
<td>Logical reasoning is used to come up with final answer, although there may be some flaws in the reasoning.</td>
<td>The solution is based on a guess, without thoughtful reasoning.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Use of Diagrams or Illustrations</th>
<th>EXCELLENT</th>
<th>COMPETENT</th>
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<tr>
<td></td>
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<tr>
<th>Communication of Ideas</th>
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<tr>
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<td>The explanation demonstrates a depth of understanding by using relevant and accurate detail. The explanation of how the student calculated his/her final answer and his/her thought process is extremely clear.</td>
<td>The explanation is clear.</td>
<td>The explanation is limited or nonexistent.</td>
</tr>
</tbody>
</table>
Objectives:
- Students will solve an open-ended question that encourages them to think critically and to communicate their thinking.

Essential Questions:
- How can I measure an object in non-standard units?
- Besides height, what are other ways to determine an object’s size?

Vocabulary:
- measure
- height
- characteristics
- varieties
- circumference

Duration:
One 45-minute class period

Materials:
- How Many Apples Big Am I (worksheet)?
- Pennsylvania Apples Variety Chart
- tape measure
- yarn or string
- ruler

Anticipatory Set:
- Explain to the students that apples come in different shapes and sizes.
- Review the varieties and characteristics of Pennsylvania apples.

Procedure:
1. The students will work with a partner or in a group.
2. The students will measure the height of an apple and use these measurements to determine how many apples big they are.

Introduction:
1. Read the problem to the students.
2. Ask the students, “Besides height, how else do we talk about ‘how big’ something is?”
3. Remind the students that there are different apples to choose from.
4. Explain that there is no right or wrong answer. Since the question is open-ended, the most important part of this activity is the process the students use to reach their final answer.
Modeling:
- Pose these questions:
  - What does “how big” mean?
  - What are different ways you can measure yourself and your apple?

Guided Practice:
- Some students will begin solving the problem immediately.
- Other students may struggle in the beginning. Offer guided instruction to these students.

Independent Practice:
- The students will solve this problem.

Closure:
- Ask the students with varied answers and strategies to share their solutions.

Assessment:
  Formative: The students will share with the class their methods of measurement.
  Summative: Evaluate the students’ results with the attached rubric.

Related Materials and Resources:
- Puddle Questions: Assessing Mathematical Thinking by McGraw Hill Education

Accommodations and Adaptations:
- Brainstorm strategies with the students.
- Model strategies for the students.

Grades K-2

Common Core Standards:
CC.2.4.K.A.1 – Describe and compare attributes of length, area, weight, and capacity of everyday objects.
CC.1.2.4.J – Acquire and use accurately grade-appropriate conversational, general academic, and domain specific words and phrases, including those that signal precise actions, emotions, and states of being that are basic to a particular topic.
CC.1.4.5.I – Provide reasons that are supported by facts and details; draw from credible sources.
### How Many Apples Big Am I?

**Rubric**

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</tr>
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Objectives:
- Compare and contrast which apples are better for baking and preparing various apple products.
- Discuss with the students how different varieties of apples are used to make different apple products.
- Students will present an informational presentation on how a specific Pennsylvania apple product is made.

Essential Questions:
- Is it wise to choose any apple type when preparing a given apple product?
- Would certain varieties of apples be better in certain products? Why?

Vocabulary: (with synonyms)
- sweet
- tart
- apple product
- baking
- cooking

Duration:
Two 45-minute class periods

Materials:
- projector
- activotes (optional)
- student computers
- Apple or Apple Product Worksheet
- Pennsylvania Apple Variety Chart - Get to Know Pennsylvania Apples
- Storyboard Apple Product Planning Worksheet
- Teacher-Created Presentation Rubric

Instructional Procedure:

Anticipatory Set:
1. View the chart “Apple or Apple Product Worksheet”
2. Students will determine the difference between fresh fruit or an apple product.
3. The class will develop definitions for:
   - fresh fruit
   - apple product
4. The students will view the Pennsylvania Apple Variety Chart - Get to Know Pennsylvania Apples (PennsylvaniaApples.org) and focus on how the apples are arranged from sweetest to
most tart in addition to the icon denoting best for snacking, baking or cooking.

5. Optional: Teacher will use Activotes and have the students answer the following questions:
   - How many students like apples?
   - How many students had an apple or apple product this morning?
   - How many students buy apple products when you go shopping?
   - How many students have an apple or apple product for snack today?
   - How many students are likely to eat an apple or apple product later?
   - How many students would eat an apple or apple product right now?

Modeling:
   1. Students should watch a video about how applesauce is made and focus on what varieties of apples are used for applesauce recipes.
   2. Students will then locate an apple variety for making applesauce on the Pennsylvania Apple Variety Chart or research the variety on PennsylvaniaApples.org or usapple.org.

Guided Practice:
   1. Teacher will project the Storyboard Apple Product Planning Worksheet.
   2. Each student will receive a copy of the Pennsylvania Apple Variety Chart.
   3. Together they will complete the Storyboard using the example of apple sauce and an apple variety they selected.

Independent Practice:
   1. Teacher will either assign or students will select one of the apples on the chart and use the apple descriptions and icons (snacking, baking, or cooking) to determine what type of apple product is best produced using this specific apple.
   2. Students will select their apple product and locate a recipe or video that describes how to make the apple product.
   3. Students will begin filling in their Storyboard Apple Product Planning Worksheet.
   4. Teacher will approve Storyboard Apple Product Planning Worksheet prior to the creation of their presentation.

Closure: The students will present their findings as an informational presentation.

Assessment:
   1. Formative/ Independent Practice – Teacher will approve the Storyboard Apple Product Planning Worksheet.
   2. Summative: Rubric Assessment on Presentation

Related Materials and Resources:
   1. http://www.pennsylvaniaapples.org/
      All about Apples/Apple Facts.

Accommodations and Adaptations:
   1. Students may worked together for research help.
   2. Students may work together on the presentation.
   3. Presentations may be in the form of PowerPoints, demonstrations, plays, or songs.
Grades 3-5

Common Core Standards:

Language Arts:
1.2.3.E. – Read, understand, and respond to essential content of text in all academic areas.
1.5.3.A. – Write with a focus, with an understanding of topic, task, and audience.
1.5.3.B.2. – Write a series of related sentences or paragraphs with one central idea.
1.2.4.E. – Read, understand, and respond to essential content of text in all academic areas.
1.5.4.C.2. – Use appropriate transitions within sentences and between paragraphs.
1.1.5.C. – Use meaning and knowledge of words (e.g., homophones, homographs, root words) across content areas to increase reading vocabulary.
1.2.5.E. – Read, understand, and respond to essential content of text and documents in all academic areas.
1.4.5.C.2. – Include supporting details, citing sources when needed.
1.5.5.B.2. – Write paragraphs that have a topic sentence and supporting details.
1.5.5.C.1. – Use appropriate transitions within sentences and between paragraphs.
1.5.5.D.1. – Include specific details that convey meaning and set a tone.
Objectives:
• Students will be able to graph the results of an apple comparison.

Essential Questions:
• What is a pictograph?
• How can you use a pictograph to compare results?
• Based on the results of the pictographs, which apple did the class like the most?

Vocabulary:
• pictograph
• interior
• exterior
• appearance
• texture
• variety

Duration:
One 45-minute class period

Materials:
• Three varieties of Pennsylvania apples
  Suggestion: Use apples with varying tastes and textures - Red Delicious, Granny Smith, and Pink Lady
• knife
• paper towels or cutting board
• Two pictographs, which can be replicated on poster board or chart paper
  • appearance
  • taste and texture
• two apple stickers per student and one set for teacher demonstration
• plain paper or index card
• Exit Ticket: Your Ticket Out The Door

Anticipatory Set:
• As a class, discuss what you look at when you pick out an apple at the grocery store. Ask, “What is important when finding the perfect apple?”

Introduction:
• Ask, “What is a pictograph?” If the students are not sure, define pictograph and explain how it is used to compare information. If available, show a sample.
Modeling:
- Draw a *pictograph* on chart paper or the whiteboard.
- Place a sticker in the row for the apple of your choice. This shows students how they will place their stickers to represent their selections. Explain that the class will be able to determine which apple was the favorite at the end of this activity.

Procedure:
1. Draw two *pictographs*, one representing “appearance” and the other representing “taste and texture.”
2. Distribute stickers to the students.
3. Ask the students to examine the three apples before they are sliced.
4. Instruct the students to place a sticker in the row of their favorite apple on the “appearance” graph, based on the exterior of the apple.
5. Slice the three apples. Give every student one slice of each variety. Ask the students to taste each apple. While they are eating, remind them to think about the flavor and the texture (soft vs. crisp).
6. Based on these *interior* qualities, the students should indicate their favorite by placing a sticker in the corresponding row on the “taste and texture” graph.

Independent Practice:
- The students should write down three facts about the data on the graphs.

Closure:
- As a class, discuss the facts that the students wrote down.

Assessment:
  Formative: Discuss these questions with the class:
  - Which apple did the class think had the best *exterior appearance*? Taste? Texture?
  - How many people liked each *variety*?

  Summative: Students will answer the following questions on Your Ticket Out The Door:
  - On the *appearance* graph, which apple was most visually appealing? Which apple was least visually appealing?
  - On the taste and *texture* graph, which apple was most popular? Which apple was least popular?
  - Which apple was the least favorite of the class? Why do you think that it is the least favorite?

Related Materials and Resources:
- Pennsylvania Apples Variety Chart
- [http://www.pennsylvaniapples.org/AllAboutApples/PAAAppleVarieties.aspx](http://www.pennsylvaniapples.org/AllAboutApples/PAAAppleVarieties.aspx)

Accommodations and Adaptations:
- The teacher can use two varieties of apples to simplify the lesson.
• The teacher can use four varieties of apples to make the lesson more complex.
• The class can focus on one quality of the apple (e.g., taste).

**Grades 3-5**

**Common Core Standards:**
CCSS.MATHCONTENT.3.MD.B.
Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs.
CC.1.2.4.J – Acquire and use accurately grade-appropriate conversational, general academic, and domain specific words and phrases, including those that signal precise actions, emotions, and states of being that are basic to a particular topic.

**Example Pictographs:**

<table>
<thead>
<tr>
<th>Appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Delicious</td>
</tr>
<tr>
<td>Granny Smith</td>
</tr>
<tr>
<td>Pink Lady</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Taste and Texture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Delicious</td>
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Objectives:
• Students will utilize Google Earth to analyze local apple orchards and the apple products they manufacture.

Essential Questions:
• Where do the apples I eat come from?
• What apple orchards are located close to where I live?
• What types of products can be purchased from local apple orchards?
• Why do different orchards offer different products?
• What are the benefits of buying products from local apple orchards?

Vocabulary:
• orchard

Duration:
Three to four 45-minute class periods, depending on use of extension activities

Materials:
• computers or iPads with internet access to Google Earth
• list of apple suppliers: http://www.pennsylvaniaapples.org/AllAboutApples/PAAppleWholesaleSuppliers.aspx
• list of Pennsylvania growers who manufacture apple products: http://www.pennsylvaniaapples.org/AllAboutApples/ProcessedAppleProducts.aspx
• lined paper
• Apple Stationary
• Venn Diagram

Anticipatory Set:
• Begin by asking the students to brainstorm a list of foods made with apples. Allow for maximum student participation.
• Collect a list of sources on the whiteboard, overhead, or chart paper (where it can be referenced later). Before the discussion, the teacher may ask the students to think about this question individually, or discuss it with a neighbor/small group.
• Ask the students, “Where do you think the apples to make these products come from?” If students do not trace food back to farms or orchards, ask these questions to guide them:
  • Where does the food in the grocery store come from?
  • Why can you only get specific foods at certain times of the year?
This discussion will allow the teacher to assess how much the students know about where apples are grown and direct student focus on apple orchards.
Procedure:

Introduction:
1. The goal of this section of the lesson is to introduce the students to Google Earth. It may be modified if the students are already familiar with the program.
2. Open Google Earth on your computer or through the iPad application. Project it so that the students can see and follow along.
3. Direct the students to the Search bar in the upper left hand corner.

Modeling:
• Instruct the students to type “Pennsylvania” in the Search bar. The program will zoom into Pennsylvania.
• Give them time to learn how to navigate the images and directionality of the program.
• Give the students specific tasks:
  • Find the location of the school.
  • Find the location of the closest hospital.
  • Find other landmarks close to your location.
• Brief discussion and opportunity for Formative Assessment:
  • What can you see using Google Earth?
  • What do the pictures show?
  • How far can you zoom in?
  • What does the land look like?
  • What does it NOT show you?
  • Did you find any tools or tricks?
• At this point, the teacher should be able to determine if students are focusing on the appearance of the land. This will be important when students are asked to compare the geography surrounding apple orchards.

Guided Practice:
• Divide the students into pairs or small groups.
• Provide each group of students with a list of Pennsylvania growers who manufacture apple products (found on the Pennsylvania Apples website).
• The students will explore the various orchards across the state of Pennsylvania.

Independent Practice:
• Using Google Earth, the students will find and pin tree local apple orchards in close proximity to their home or school.
  • In Google Earth, select the “Find Businesses” tab.
  • Type in “Orchard” and “Pennsylvania.” The students could also use the list of apple orchards on PennsylvaniaApples.org.
  • To pin two orchards, place the mouse over the letter of the orchard, right-hand click, and then select “Save to My Places.” Google Earth will save this orchard for you to use later.
• The student will begin to take notes on Apple Stationary or lined paper. The notes should include:
  • the orchard’s geographic characteristics (county, landforms, water forms, proximity to homes, surrounding businesses, etc.)
  • products the orchard provides
  • size of the orchard
  • any other information students feel should be included in analysis

Closure:
• Pin various orchards chosen by the students and discuss similarities and differences.
• Select two orchards and complete a Venn diagram as a class.

Assessment:
  Formative: Students will pin two local apple orchards using Google Earth.

  Summative: Students will use their notes to create a Venn diagram, comparing and contrasting two local apple orchards.

Extensions:
• PA and World Connections:
  • At this point, the teacher may decide to elaborate on the lesson by asking groups of students to investigate different regions and/or counties of Pennsylvania.
  • Ask the groups to describe the types of products they find at the different orchards. Do these products differ from those found at orchards near them?

• Buy Local:
  • Ask the students to work in groups (or individually) to analyze their findings and answer the following questions:
    • What products did you find at the orchard that you also buy from a store?
    • What products did you find at the orchard that you have never seen at a regular grocery store?
    • What are the benefits of buying these things directly from the orchard?
  • Ask the students to pick a product they found on the list, e.g. apple butter. They should think about purchasing this product for their family’s consumption. Have the students write a brief opinion piece (about five sentences in length) about where they would buy this food in the future. This informal writing should serve as a reflection on the lesson. The students should be able to reach a logical conclusion using their notes from the investigation. They should consider these top reasons for buying local products:
    • **Tastes great:** local fruits and vegetables taste great because they’re fresh from nearby farms.
    • **Good for you:** local food is fresher and has more vitamins.
    • **Good for Pennsylvania:** when your family buys products grown or made in our state, it helps local farmers, food processors and businesses. The money you spend on local products helps create jobs and strengthens our economy.
    • **Helps protect the environment:** it takes less fuel to get local products to you. This means less pollution, which helps the environment.
    • **Keeps Pennsylvania Growing:** Pennsylvania has some of the richest farmland in the country, and produces some of the best food and agricultural products in the world.
By supporting local farmers and businesses today, you help Pennsylvania remain strong for future generations.

Related Materials and Resources:
- Resources on landforms, water forms, and other geographic features

Accommodations and Adaptations:
- Time adaptations can be made, and the number of activities completed can be adjusted
- Students can be placed into groups, work individually, or with a specific student according to the best learning environment for each student.
- Students with vision problems should have access to magnified computer images.
- For higher level students, use the triple Venn diagram to compare and contrast three orchards.

Grades 2-3, 4-5

Common Core Standards:
4.1.4 – Environment and Ecology: Analyzing models to determine the reliance of humans on the environment at different levels (individual, community, etc.)
CC1.4.4.C
Develop topic with facts, definitions, concrete details, and examples related to the topic.
E04C1.1 – Write an opinion piece on a topic that supports a point of view with reasons and information.
Essential Questions:
• How do we use place value to write numbers?

Student Objectives:
• Students will be able to count using place value (ones, tens, hundreds).
• Students will be able to compare numbers.

Vocabulary:
• fewer
• more
• place value
• ones
• tens
• hundreds
• manipulatives

Duration:
One class period depending on the activities used

Materials:
• flipchart
• counting manipulatives
• individual whiteboards or plastic plates
• dry erase markers

Introduction:
• Explain to students that today they will be counting apples. To ensure all student participation, teacher can provide students with manipulatives for counting.

Anticipatory Set:
• Teacher will review counting appropriate to grade level, for example, kindergarten counting single objects or first and second grade using 10 and 100 block manipulatives.

Procedure:
1. Counting by ones:
   • Teacher will provide students with number and they count out that many apples.
   • On flipchart, one student reads number, counts and drags appropriate number of apples into bag and writes the number on the bag.
   • Other students count out manipulatives at their seat and write the number on their white board or plastic plate.
2. Counting by tens and hundreds:
   • On flipchart, student counts how many apples are in the bag(s) and on the tree altogether.
   • On flipchart, student writes how many apples.
   • Students at their seat may use manipulatives and individual whiteboards or plastic plates to count.

3. Comparing numbers:
   • Students count and write how many apples in the bag and on the tree altogether and drag symbol to compare.
   • Students at their seats compare numbers using comparison symbols.

Modeling:
   • Student participation on smart board would model activity for other students.

Independent Practice – Following Class Period:
   • Students can continue counting activities with manipulatives.

Closure:
   • Review counting procedure that the student participated in (ones, tens, hundreds) and how to write corresponding numbers.

Assessment:
   Formative: Observation of student counting and comparing numbers.

   Summative: Using manipulatives, teacher says a number and student counts the objects and write the number.

Accommodations and Adaptations:
   • Provide all students with whiteboard or plastic plate and dry erase marker.
   • Provide students with manipulatives to count (apples, bags, boxes).
   • Provide students with sentences frames for comparing numbers. For example, _____ is greater than _______.

Grades K-2

Common Core Standards:

Counting by ones, tens and hundreds

CC.2.1.K.A.2 - Apply one to one correspondence to count the number of objects.
CC.2.1.K.A.3 - Apply the concept of magnitude to compare number and quantities.
C.2.1.K.B.1 – Use place value to compose and decompose numbers within 19.
CC.2.1.2.B.1 – Use place value concepts to represent amounts of tens and ones and to compare three digit numbers.
CC.2.1.1.B.2 – Use place value concepts to represent amounts of tens and ones and to compare two digit numbers.

Comparing numbers
CC.2.1.K.A.2 - Apply one to one correspondence to count the number of objects.
CC.2.1.K.A.3 - Apply the concept of magnitude to compare number and quantities.
CC.2.1.K.B.1 - Use place value to compose and decompose numbers within 19.
CC.2.1.2.B.1 – Use place value concepts to represent amounts of tens and ones and to compare three digit numbers.
CC.2.1.1.B.2 – Use place value concepts to represent amounts of tens and ones and to compare two digit numbers.
# Apple Counting Manipulatives

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Objectives:
- Students will be able to identify essential information from the text.
- Students will compare and contrast important ideas about Johnny Appleseed and Rachel Carson.
- Students will write sentences or a paragraph comparing and contrasting Rachel Carson and Johnny Appleseed.

Essential Questions:
- What are the similarities and differences between Johnny Appleseed and Rachel Carson?

Vocabulary:
- compare
- contrast
- evidence
- biography
- environment
- environmentalist
- environmental movement
- legacy
- chronological

Duration:
Five 45 minutes class periods

Materials:
- Biography Organizer
- Johnny Appleseed: Main Ideas/Key Details
- Venn diagram
- Graphic Organizer - Sentence Frames
- Apples Stationary

Anticipatory Set:
- Discuss elements of a biography. Make sure students understand that a biography focuses on the life of a person, important events and contributions. A biography is generally written in chronological order.
- Turn and talk to a partner to discuss what you know about Johnny Appleseed. Discuss ideas with class.
- Introduce Rachel Carson, a writer and scientist who studied the natural world and wrote the book Silent Spring, which people credit as being the beginning of the environmental movement.
• Briefly explain that although these two people seem very different, they both made important contributions that impacted our environment.
• Explain that students will be identifying important events in each person’s life and then comparing and contrasting these life events and their contributions.

Procedure:
1. Read aloud or direct students to read a book about Johnny Appleseed and a book about Rachel Carson.
2. While reading, list details from the book about each person and their work.
3. After reading, guide the students to complete a Venn diagram or comparison chart to compare/contrast each person’s life events, beliefs and contributions.
4. Students can use that information to write sentences or a paragraph.

Modeling/Guided Practice:
• Use think-aloud process after listening to or reading the text on how to identify important information.
• During read aloud, stop at various points and ask the students to turn and talk to their partner or small group to determine what evidence from the text completes the Biography Organizer (worksheet).
• Record information.
• Use think-aloud process to identify how Johnny Appleseed and Rachel Carson are similar and/or different.
• Record information in Venn diagram or comparison chart.

Independent Practice:
• Prior to writing, students can use their Venn diagram or chart to share in small groups or with partners the similarities and differences that were identified. (Note: some students may benefit from the Graphic Organizer: Sentence Frames (worksheet) to help them discuss ideas in complete sentences.)
• Write sentences or a paragraph to compare/contrast Rachel Carson and Johnny Appleseed.

Closure:
• Students can share writing or illustrate writing and discuss what they learned about Johnny Appleseed and Rachel Carson.

Assessment:
Formative: Observation throughout read aloud from student discussion and participation. Can students ask and answer questions? Can they identify important information from the text? Can students ask and answer questions to discuss similarities and differences? Can students identify evidence from the text to show differences and similarities?

Summative: Student writing can be graded based on teacher created rubric or checklist.

Materials and Resources:
• **Johnny Appleseed: The Story of a Legend** by Will Moses
• **Rachel: The Story of Rachel Carson** by Amy Ehrlich
• Book review for Silent Spring
  [http://www.nytimes.com/books/97/10/05/reviews/carson-spring.html](http://www.nytimes.com/books/97/10/05/reviews/carson-spring.html)
• Excerpts from Silent Spring
  [http://faculty.uml.edu/sgallagher/silentspring.pdf](http://faculty.uml.edu/sgallagher/silentspring.pdf)
• Article about Johnny Appleseed from Harper’s New Monthly Magazine, November 1871
  [https://archive.org/details/johnnyappleseedp00hale](https://archive.org/details/johnnyappleseedp00hale)
• **Who Was Johnny Appleseed** by Joan Holub
• **Who Was Rachel Carson** by Sarah Fabing (due out October 2014)

**Accommodations and Adaptations:**
• Choose book appropriate to listening and reading level.
• Higher-level students could examine how Appleseed’s and Carson’s work and their legacy impacted our country.
• Model sentences to compare and contrast using and/but/however.

**Grades 2-5**

**Common Core Standards:**
CC.1.2.3.A  
Determine main idea of a text, recount key details and explain how they support the main idea.
CC.1.2.3.B  
Ask and answer questions about the text and make inferences from the text; refer to text to support responses.
CC.1.2.3.I  
Compare and contrast the most important points and key details presented in two texts on the same topic.
CC.1.4.3.A  
Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
CC.1.4.3.B  
Identify and introduce the topic.
CC.1.4.3.C  
Develop the topic with facts, definitions, details and illustrations, as appropriate.
CC.1.4.3.D  
Create an organizational structure that includes information grouped and connected logically with a concluding statement or section.

*Note: Some suggested compare and contrast ideas may include respect for nature, love of animals, environmental impact of work, storytelling, vision, family background, and desire to leave home.*
Objectives:
• Students will use their observational skills to write descriptive phrases about an apple.
• Students will be able to distinguish their apple from the others in the class.
• Students will be able to use descriptive phrases to write a paragraph about their apple.

Essential Questions:
• How detailed does my description need to be in order for me to find it in the mix-up?
• Which descriptions are the most helpful?
• How many attributes do I need to describe my apple so I can recognize it?
• How sharp are my observational skills?

Vocabulary:
• observe
• property
• texture
• shape
• color
• density
• size
• description
• adjective
• adjectival phrase

Duration:
• Two 45-minute class periods
• Optional: expand if teaching scientific process

Materials:
• pencils
• Graphic Organizer – Ideas
• Graphic Organizer – My Apple
• Your Ticket Out The Door
• Apple Stationary
• hand lenses
• paper bag with a common object in it
• one paper bag per student
• one apple per student

Anticipatory Set:
• Hold up a paper bag that contains a common object, e.g. baseball or pencil.
• Ask one student to put his/her hand inside the bag. He/she should describe the object without looking at it. The class should be able to guess the object.
• Ask the students to define property. If this term has never been used before, take time to explain it. The property of an object is a quality like size, texture, color, shape, or density.
• Ask, “What types of words usually describe an object?” The answer is adjectives. Explain that more than one adjective makes an adjectival phrase.

Introduction:
1. Prior to beginning the lesson, review adjectives by using the BrainPOP website: http://www.brainpop.com/english/grammar/adjectives/. BrainPOP is designed for students in fourth through sixth grades. BrainPOP Jr. for students in grades kindergarten through third.
2. Spend a few minutes brainstorming adjectives and listing them on the whiteboard.
3. Distribute a paper bag to each student.
4. Optional homework assignment: ask the students to bring an object from home in the bag. They should write adjectives and/or adjectival phrases to describe their object. If you use this homework assignment, the first lesson would end here. Before the apple mix-up the following day, the students could work in pairs to guess each other’s objects. If you do not use the homework assignment, the class would move on to the procedure.

Procedure:
1. Place the apples on a table in the front of the classroom.
2. Ask the students to choose an apple from the table, and then return to their desks.
3. Ask the students to examine their apples. They should use a hand lens for a closer look.
4. Remind the students to pay special attention to the features that distinguish their apple from the others.
5. In addition to looking for features that will help them recognize their apples, the students should describe their properties: color, shape, size, texture, and density.
6. The students should record their observations on Graphic Organizer – My Apple.
7. When they are finished, the students should return their apples to the table and stand around it.
8. The teacher should mix up the apples while the students close their eyes.
9. Once the apples are mixed-up, ask the students to try to find their apples.

Guided Practice:
• Model the procedure before doing the activity with the students.
• Pick an apple and elicit responses that describe the apple.
• If the lesson includes writing a description of the apple, arrange their adjectives and adjectival phrases into a paragraph.

Independent Practice:
• The students should repeat the procedure with their own apple. The process should follow the teacher’s discretion.

Closure:
• Discuss the outcome of the lesson with the students.
• Ask a series of questions:
• Did you find your apple?
• If you did, how do you know the apple is yours?
• If you did not, how do you know it is not yours?

Assessment:
Formative: Students will turn in Your Ticket Out The Door and answer these questions on the ticket:
• What did you learn about your observational skills?
• What properties did your apple have?
• What adjectives describe your apple?

Summative: Students will turn in their final paragraph about their apples. The final copy of the writing should be completed on the Apple Stationary.

Related Materials and Resources:
• BrainPOP and BrainPOP Jr:
  http://www.brainpop.com/english/grammar/adjectives
  http://www.brainpopjr.com/readingandwriting/word/adjectivesandadverbs/preview.weml

Accommodations and Adaptations:
• The complexity of the activity depends on the grade level of the students and the teacher’s discretion.
• Younger students could draw their apple.
• Younger students could write simple sentences underneath their drawings.
• If the students have difficulty coming up with adjectives, they could complete this activity with a partner.
• The students could choose from a list of adjectives as they examine their apples.

Grades 1-5

Common Core Standards:

Science Standards:
3.1.3.A – Describe the characteristics of living things that help identify them.
3.2.3.A – Process, procedures, and tools of investigations.
S3.A.2.2.1 – Identify appropriate tools or instruments for specific tasks, and describe the information they provide (i.e., measuring [length—ruler; mass—balance scale] and making observations [hand lenses—very small objects]).

English Language Arts
1.6.3.A – Listen critically and respond to others in small and large group situations. Respond with grade level appropriate questions, ideas, information, or opinions.
CC.1.5.3.A
Engage effectively in a range of collaborative discussions on grade level topics and texts, building on others’ ideas and expressing their own clearly.

CC.1.4.3.A
Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

CC.1.4.3.B
Identify and introduce the topic.

CC.1.4.3.C
Develop the topic with facts, definitions, details, and illustrations, as appropriate.

CC.1.4.3.D
Create an organizational structure that includes information grouped and connected logically with a concluding statement or section.

CC.1.4.3.F
Demonstrate a grade-appropriate command of the conventions of standard English grammar, usage, capitalization, punctuation, and spelling.