



Going Green

Grade Levels 3-5

Unit Overview

Materials

- Poem by Shel Silverstein—*Sarah Cynthia Sylvia Stout Would Not Take the Garbage Out*
- Brown paper bags or construction paper
- Line paper
- Crayons/markers/colored pencils
- Magazines
- Rulers/scissors
- Computers/projector/internet
- People and the Environment (video)
- Index cards
- Construction paper or unlined paper
- White board/chart paper
- Rubber gloves
- Thermometer
- Three plastic grocery bags
- Clear plastic cups
- Clear glass bowls
- Thermometers
- Water
- Go Green notebook and a pencil
- Going Green journal
- 4 maps of the school and grounds
- Trash bags for litter collection
- Energy Savers Activity Sheet
- Egg cartons
- Solar Car kit—includes solar battery, Kinex with assembly instructions
- Laptops/internet
- Heavy cardboard
- Corks
- Tape
- Straight pins
- Metal pan
- *The Giving Tree*, by Shel Silverstein
- Nature trail (area with trees on school property)

Standards

Unit Content Standards	Unit Youth Development Standards
<ul style="list-style-type: none"> • HE.5.P.2.1: Persuade others to make positive health choices. • LA.3.1.6.2: The student will listen to, read, and discuss familiar and challenging text. • LA.3.5.2.1: The student will recall, interpret, and summarize information presented orally. • LA.4.2.1.7: Identify and explain the author’s use of descriptive and figurative language (poetry), and examine how it describes people, feelings, and objects. • LA.5.1.6.5: The student will relate new vocabulary to familiar words. • MA.3.A.6.2: Solve problems by making a table, chart or list. • MA.3.S.7.1: Construct and analyze bar graphs, pictographs, and line plots from data collected through observations and surveys. • MA.5.G.5.3: Solve problems requiring attention to approximation, selection of appropriate measuring tools, and precision of measurement. • SC.3.E.5.2: Identify the sun as a star that emits energy; some of it in the form of light. • SC.3.L.17.2: Recognize that plants use energy from the sun, air and water to make their own food. • SC.3.N.1.1: Raise questions about the natural world, investigate through free exploration and systematic investigations. • SC.3.N.3.2: Recognize that scientists use models to help understand and explain how things work. • SC.3.P.8.1: Measure and compare temperatures of various samples of solids and liquids. • SC.4.C.2.2: Identify ways citizens work together to solve state and community problems. • SC.4.E.6.6: Identify resources available in Florida (sun, water, solar energy). • SC.4.L.17.3: Trace the flow of energy from the sun as it is transferred along the food chain from producer to consumer. 	<p>External:</p> <ul style="list-style-type: none"> • 2 – positive family communication • 3 – other adult relationships • 5 – caring school climate • 8 – youth as resources • 9 – service to others • 10 – safety • 12 – school boundaries • 16 – high expectations • 17 – creative activities <p>Internal:</p> <ul style="list-style-type: none"> • 21 – motivation • 22 – school engagement • 24 – bonding to school • 25 – reading for pleasure • 26 – caring • 28 – integrity • 29 – honesty • 32 – decision making • 33 – interpersonal competence • 36 – peaceful • 37 – personal power • 38 – self-esteem • 39 – sense of purpose

<ul style="list-style-type: none"> • SC.4.L.17.4: Recognize ways plants and animals, including humans, can impact the environment. • SC.4.N.1.2: Compare observations made by different groups and seek reasons to explain the differences. • SC.4.N.1.5: Compare the methods and results of investigations done by other classmates. • SC.4.P.10.1: Observe and describe some basic forms of energy, including heat, light, sound, electrical. • SC.5.L.15.1: Describe how, when the environment changes, differences between individuals allow some plants and animals to live, while others die out. • SC.5.L.17.1: Compare and contrast adaptations displayed by plants and animals that enable them to survive in different environments. • SC.5.N.1.1: Define a problem to carry out a plan such as: collecting and organizing data, interpreting data in a graph and analyzing information. • SC.5.P.10.3: Investigate and explain that energy has the ability to cause motion or create change. • SS.3.A.1.2: Utilize technology resources to gather information from primary and secondary sources. 	
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Pre/Post Assessment

Student will have brief pre/post assessments in every lesson. The use of The Going Green Journal will be used to monitor comprehension of vocabulary and the ongoing formative assessments will play a major role in the success of this unit. The pre-assessment takes place in the first procedure of each lesson and the post-assessment is the final procedure/activity in each lesson. Some of the assessments include: journal writing, science experiments, discussion, observation, presentations, brochures, student created charts and graphs.

Adaptation for Grade Band:

Content standards used are the New Sunshine State Standards accessed at <http://www.floridastandards.org/index.aspx>.

The first letters listed is the subject (SC=science, MA=math, LA=language arts, etc.) and the first number given is the grade level. If it reads MA.4 that means it's a 4th grade math FCAT tested benchmark! Sixth grade was not included in this band but can be very easily adapted. As with each grade level, the amount of vocabulary and information given depends on the individual child. All of the lessons in this unit can be performed with very little modification needed.

Technology:

Computers will be needed in almost every lesson, so arrangements need to be made in advance. The laptop carts at my school are used for the after-school programs and they are available every day.

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Lesson 1: Take The Garbage Out!

Essential Question:

How do humans impact the Earth in a positive and negative way?

Content Standards:

- LA.4.2.1.7: Identify and explain the author’s use of descriptive and figurative language (poetry), and examine how it describes people, feelings, and objects.
- MA.5.G.5.3: Solve problems requiring attention to approximation, selection of appropriate measuring tools, and precision of measurement.
- SC.3.N.1.1: Raise questions about the natural world, investigate through free exploration and systematic investigations.

Youth Development Standards:

- 5 – caring school climate
- 8 – youth as resources
- 25 – reading for pleasure
- 38 – self-esteem

Vocabulary

- Waste
- Conservation
- Landfills
- Reuse
- Recycle
- Reduce
- Environment

Teacher Background Knowledge:

The reading of the poem by Shel Silverstein must be prepared in advance. Stores will provide the brown paper bags or construction paper could be substituted. Knowledge and understanding of the key vocabulary and of the Harcourt Science website is needed to deliver the lesson.

Materials:

Poem by Shel Silverstein—*Sarah Cynthia Sylvia Stout Would Not Take the Garbage Out*, brown paper bags or construction paper, line paper, crayons/markers/colored pencils, magazines, rulers, scissors, computers, projector, internet

Procedure:

1. Read the poem, *Sarah Cynthia Sylvia Stout Would Not Take the Garbage Out*, by Shel Silverstein (if you don’t have the book, the poem can be found online, just search Shel Silverstein). Discuss the poem, the mounting garbage, and its implications towards the environment. Students should start to wonder about where all of the garbage in the world is going?

2. Pass out the materials for creating the *Going Green* journal (brown paper bags or construction paper, rulers, magazines, glue, stickers, lined paper—whatever you can find to decorate the journal). Explain to the class that this journal will be used throughout the unit to define vocabulary words with pictures, diagrams and scenes, record facts and information about the environment, create graphs, etc. *The *Going Green* journal will be used in each lesson of the thematic unit (this is a vital formative assessment to track student understanding of content being taught).
3. Students should cut the brown bags into 9.5 x 14 inch sections. Use the rulers to measure the dimensions. Model how to measure the length and width. Each student should cut out a total of 6 sections, and fold to create a book. They should have 11 total sections not including the front cover and the back page. Each section consists of 2 pages, one for an illustration and the other for text, graphs, charts, and tables about the environment.
4. Allow the students to personalize the journals with vocabulary words, stickers and pictures. Remember the theme is *Going Green* and saving the Earth should be our focus; their journal cover and back should reflect this. Five sheets of lined paper should be glued into the journal for use during experiments, reflections, and vocabulary.
5. The final 10 minutes of class should be spent using the following website, accessed through our district students' online site: <http://www.harcourtschool.com/activity/waste/index.html>. Students should continue working on their journals if they are not finished. Project the Harcourt Science interactive website called *Waste Not*, onto the white board and read the text to the students. They will be exposed to the key vocabulary for this unit, and there are several video clips the students will see about landfills and waste. They will tour the Solid Waste Authority of Palm Beach County, Florida, discover how waste is turned into energy, and begin to build awareness for the amount of trash in the world, and the urgent need to recycle. By the end of the lesson the students should understand that *Going Green* means we are becoming responsible users and protectors of our environment, which will result in a more positive future for Earth.

Formative Assessment:

- Observation and discussion during read aloud and Harcourt website presentation
- Creation of *Going Green* journal (did they create the journal accurately using the guidelines given?).

Lesson 2: We Did that to Earth!

Essential Question:

How do humans impact the Earth in a positive and negative way?

Content Standards:

- HE.5.P.2.1: Persuade others to make positive health choices.
- SC.4.L.17.4: Recognize ways plants and animals, including humans, can impact the environment.
- SS.3.A.1.2: Utilize technology resources to gather information from primary and secondary sources.

Youth Development Standards:

- 2 – positive family communication
- 17 – creative activities
- 26 – caring
- 39 – sense of purpose

Vocabulary

- Ecosystems
- Population
- Habitat
- Conservation
- Hazardous waste
- Natural resources

Teacher Background Knowledge:

The teacher should know if they have a subscription to UnitedStreaming.com (I have a subscription). If not, a video about how people effect the environment must be located. A variety of magazines must be gathered before the lesson. Each student should have at least one magazine to go through.

Materials:

People and the Environment (video), computer/projector, magazines, index cards, crayons/markers/colored pencils, construction paper or unlined paper, white board/chart paper

Procedure:

1. Ask the students to help make a list of activities people do that seem harmful to the native plants and animals of the environment. Show the TLC Elementary School video, *People and the Environment*. As responses are given, stop the video and record them on the board or chart paper for the whole class to view. The key vocabulary is addressed in the video; stop periodically to review these words. This video is located on UnitedStreaming.com; if your school does not subscribe to United Streaming, any video about the effects humans have on the environment will work.

2. Students will cut out photos from magazines and/or draw pictures on index cards to illustrate the stated harmful behaviors visually. Each group's pictures will be collected and redistributed so that each group gets another group's pictures.
3. Ask the groups to analyze each of the cards they've received, having them to discuss such things as: "What is happening? Does it harm wildlife? How? Does it seem to be appropriate or inappropriate behavior? Why? Is the person doing it having fun? What are alternative forms of the same behavior that would be less harmful to the environment?"
4. Each group will report to the rest of the class, displaying the picture card and discussing their feeling concerning the harmful activity, and their possible recommendation(s) for less harmful behaviors.
5. After seeing the multiple ways in which humans are harmful to the environment, students will create handbooks/brochures illustrating the harmful behavior and outline alternative ways that would be less harmful to their environment. Each student should make their own handbook to take home and share with their family. *To adapt this lesson for the upper grades, they can be asked, based on harmful behaviors they are now aware of, create a personal code of environmental ethics incorporating all of the behaviors discussed in class.

Formative Assessment:

- Discussions about the environment; students should use key vocabulary during discussion
- Observations when students are cutting out pictures that show a negative impact on the environment
- Brochures/handbooks created by students

Lesson 3: Energy Savers

Essential Question:

How do humans impact the Earth in a positive and negative way?

Content Standards:

- MA.5.G.5.3: Solve problems using appropriate measuring tools and precision of measurement.
- SC.3.P.8.1: Measure and compare temperatures of various samples of solids and liquids.
- SC.4.N.1.5: Compare the methods and results of investigations done by other classmates.

Youth Development Standards:

- 5 – caring school climate
- 17 – creative activities
- 22 – school engagement
- 37 – personal power

Vocabulary

- Atmosphere
- Greenhouse gases
- Pollution
- Temperature
- Thermometer
- Global warming

Teacher Background Knowledge:

The following information must be understood by the teacher before this lesson can be effective: greenhouse gases have massively traumatized the earth's atmosphere. Our atmosphere is under increasing pressure from greenhouse gases which changes the climate and puts holes in the ozone layer. Chloro-fluorocarbons (CFC) from our refrigerators and fire extinguishers destroy and damage the ozone layer. The earth is acidified by sulfur and nitrogen oxides from our cars and factories. The life expectancy of our Earth is lowering everyday and we must do something about this.

Materials:

Experiment One – Rubber gloves, thermometer, three plastic grocery bags

Experiment Two – Clear plastic cups, clear glass bowls, thermometers, water, Go Green notebook, pencil

Procedure:

Explain to the students this lesson consists of 2 experiments to be done in groups of 3-4. Enough materials must be provided for each group member to participate in the experiments. A short discussion over our key vocabulary should open the lesson along with a brief synopsis of the effects greenhouse gases have on our atmosphere (see teacher background for support).

Experiment #1

- Students will take the temperature of the room and record its temperature in their *Going Green* journal.
- Distribute 3 plastic bags, 1 pair of rubber gloves and 1 thermometer to each student. They should put on the rubber gloves.
- Students will wrap one hand with the 3 plastic bags, leaving the other hand in the rubber glove.
- Students will slide the thermometer between the glove and the plastic bags and record the temperature in their journals.
- Students will compare their data with one another and discuss their findings.
Note: Gloved hand represents the EARTH. The gloved hand wrapped in plastic bags represents the toxins emitted in the atmosphere.

Experiment #2

- Fill each cup $\frac{3}{4}$ full of water. Before placing the bowl over the glass of water, students record the temperature in journals.
- Put a glass bowl upside down over one of the cups and leave the cups in the sun for about an hour before temperature is taken.
- Observe the glass bowl and note the changes if any. Record data in journals.
- Remove the bowl; take the temperature of the container of water, and record.
- Take the temperature of the container of water that was not covered, and record. Compare temperatures to find the difference.
- Through discovery student should be able to note the differences in temperatures.

Formative Assessment:

- Ability to execute experiments successfully
- Through discussions, observations, and *Going Green* notebook
- Written explanations of the causes and effects of Global Warming

Lesson 4: Where Did They All Go?

Essential Question:

How do humans impact the Earth in a positive and negative way?

Content Standards:

- LA.3.1.6.2: The student will listen to, read, and discuss familiar and challenging text.
- SC.4.L.17.4: Recognize ways plants, animals and humans can impact the environment.
- SC.5.L.15.1: Describe how, when the environment changes, differences between individuals allow some plants and animals to live, while others die out.

Youth Development Standards:

- 5 – caring school climate
- 16 – high expectations
- 29 – honesty
- 36 – peaceful

Teacher Background Knowledge:

Teacher must know how to use the website for the slide show (see procedure 1) and have an understanding of the key vocabulary.

Materials:

Computer/projector, internet, laptops, crayons/colored pencils/markers, Going Green journal, pencils

Procedure:

1. The students will begin the lesson on endangered species by viewing an internet slide show shown at the following site: <http://training.fws.gov/deo/endang/INDEX.html>. This slide show will introduce the children to many definitions, and many different kinds of animals considered endangered. It will give the children a sense of why the problem exists and how it can be eliminated. This slide show will take about 25 minutes to do and should be narrated by the teacher. Once the slide show is over the children will write a brief reflection in their *Going Green* journal. It should include answers to questions like: What does endangered mean? What are some examples of endangered species? How did they become endangered? What is the main reason most species become endangered?

Vocabulary

- Endangered species
- Extinction
- Habitat
- Predator
- Prey
- Characteristics

2. The students will work with partners on the laptops. They will find one endangered animal and draw it in their journal. They should label their drawing and include characteristics like, how many remain, who is their predator, and why are they becoming extinct? Grolier online is a great website to use (CCPS district pays for this research site and can be accessed through students' online-research tab). World Book Encyclopedia is also available under the same research tab.
3. The class will spend the last 10 minutes discussing their endangered species, using their journals as a guide in the discussion. They should know why their animal is becoming extinct and suggestions for how we can help this animal survive.

Formative Assessment:

- Going Green notebook with endangered species drawing and characteristics
- Discussion and observation during slide presentation
- Brief presentation of endangered species with suggestions of how to help this animal survive

Lesson 5: The Litter Detectives

Essential Question:

How do humans impact the Earth in a positive and negative way?

Content Standards:

- MA.3.S.7.1: Construct and analyze bar graphs, pictographs, and line plots from data collected through observations and surveys.
- SC.4.C.2.2: Identify ways citizens work together to solve state and community problems.
- SC.5.N.1.1: Define a problem to carry out a plan such as: collecting and organizing data, interpreting data in a graph and analyzing information.

Youth Development Standards:

- 8 – youth as resources
- 10 – safety
- 28 – integrity
- 39 – sense of purpose

Vocabulary

- Litter
- Recycle
- Graphs (bar, line, picture)

Teacher Background Knowledge:

The teacher should know if the school has a recycling plan. It is also important to know where the most amount of trash is around the school.

Materials:

4 maps of the school and grounds, chart paper, trash bags for litter collection, white board

Procedure:

1. Have the class complete a brief oral survey about littering. It could include questions like: Have you littered? What have you seen littered? Do you know any areas in or around the school where litter can be found? (the questions vary depending on grade level).
2. Divide the class into small groups. Using student suggestions, select a destination for each group to search for litter. The locations can be indoors or outdoors and must be as specific as possible. Identify the locations on the map. The goal of the exercise is to collect and analyze all litter located within the selected area. Allow 15 - 30 minutes for the litter collection.
3. After the litter collection, have each group examine the collected litter materials. Each group should categorize the litter and determine the most frequent litter components. Record the data on chart paper. Each group should identify its litter search area on the map.

4. After the group presentations, students will record the following in their *Going Green* journal: Create 1 simple graph (bar, line, or picto) that categorizes the trash and amount found. Also answer the following questions: Can any of the littered items be recycled or used in some other way? By examining the types of litter, can it be determined which age group is most responsible for the problem? How is litter managed at our school? Does the school provide recycling containers near the litter locations? How can the amount of littering be reduced?

Formative Assessment:

- Going Green notebook with graphs and responses
- Observation of teamwork organizing a recycling plan, reading a map, and collecting litter

Lesson 6: Solar Cars

Essential Question:

How do humans impact the Earth in a positive and negative way?

Content Standards:

- SC3.E.5.2: Identify the sun as a star that emits energy; some of it in the form of light.
- SC.4.E.6.6: Identify resources available in Florida (sun, water, solar energy).
- SC.5.P.10.3: Investigate and explain that energy has the ability to cause motion or create change.

Youth Development Standards:

- 5 – caring school climate
- 16 – high expectations
- 32 – decision making
- 33 – interpersonal competence

Vocabulary

- Solar energy
- Forms of energy (heat, light)
- Mechanical energy
- Hybrid car

Teacher Background Knowledge:

Must have an understanding of how the STEM lab equipment works. If this lesson does not take place in the STEM lab, the kit must be checked out in advance. The solar cars the students will be creating should be practiced ahead of time by the teacher (the construction involves connecting Kinex).

Materials:

Solar Car kit-includes solar battery, Kinex with assembly instructions, laptops, internet, Going Green notebook, pencils

Procedure:

1. Students will review vocabulary and be introduced to new concepts about the science on the laptops. They will visit Harcourt online (CCPS students, online grade 3-5). In the Harcourt site section they will find facts and information about hybrid cars and the sun. A short 5 minute video clip about the sun is also an option on this site. Students should record and draw information about hybrid cars and the sun in their Going Green notebook (give the students 10 minutes to explore).
2. Pass out Kinex and solar kit materials (this can be done with partners or groups; there are plenty of materials for either).
3. Students will create their solar cars following the directions in the kit (this should take about 25 minutes).

4. Take class outside to race solar cars (it doesn't have to be a sunny day, but it helps).
5. A class discussion about the benefits of the sun's energy should conclude this lesson.

*This lesson can be adopted for different grades; the STEM lab kit has activities for all grade levels in this band using the solar kit.

Formative Assessment:

- Proper assembly of solar cars and if they run in the light
- Through discussions, observations, and Going Green notebook
- Written explanations and pictures that show different uses of the sun's energy

Lesson 7: Creating Energy from Water

Essential Question:

How do humans impact the Earth in a positive and negative way?

Content Standards:

- SC.3.N.3.2: Recognize that scientists use models to help understand and explain how things work.
- SC.4.E.6.6: Identify resources available in Florida (sun, water, solar energy).
- SC.5.P.10.3: Investigate and explain that energy has the ability to cause motion or create change.

Youth Development Standards:

- 5 – caring school climate
- 10 – safety
- 33 – interpersonal competence
- 37 – personal power

Vocabulary

- Hydroelectricity
- Energy
- Turbine
- Generator
- Transformers
- Natural resources

Teacher Background Knowledge:

The teacher must be familiar with the website being used in this lesson. This site will walk the students through a hydroelectric project. The presentation starts at the beginning with the Penstock (collects the water from a lake, reservoir, or river) and ends at the transmission lines as it carries energy into a building. The ability to create a water turbine is also needed (a website is provided in the procedures to help create this).

Materials:

Heavy cardboard, corks, tape, straight pins, laptops, internet, Going Green notebook, pencils, metal pan, water

Procedure:

1. Introduce students to hydroelectricity using the following website:
<http://www.fwee.org/walk.html>. Students should be recording the parts of the station and the vocabulary in their Going Green notebook. Their tour goes through 10 different locations and gives a description and picture of each.
2. Students will now begin to create their own water turbines (this can be done with partners or in groups of 3-4; it depends on the class/teacher). Pass out the cardboard, corks, and tape (an adult should hold onto the pins). The following website should be projected on the board:

<http://www.energyquest.ca.gov/projects/waterenergy.html>. This site shows how to make the water turbine and a picture of what it should look like.

3. Tape strips of cardboard to the cork. Pins are attached to each end of the cork acting as axles. A U-shaped holder should be made out of the heavy cardboard and the pins attached into each end. When turbines are finished, place in the pan under running water. The cork should turn like the turbine the students visited earlier. *Follow the directions from the website.
4. A section of the students Going Green book should have a detailed sketch of a hydroelectric plant. Five or more parts (this should be adjusted for grade level bands) should be included with a brief description of what it does. Their sketch should end with electric lines and something using electricity (for example a house).

Formative Assessment:

- Going Green notebook and the detailed sketch of the hydroelectric plant
- Completed turbine that water can flow through and turn to produce energy
- Observation and discussion of natural resources

Lesson 8: Energy Savers

Essential Question:

How do humans impact the Earth in a positive and negative way?

Content Standards:

- LA.5.1.6.5: The student will relate new vocabulary to familiar words.
- MA.3.A.6.2: Solve problems by making a table, chart or list.
- SC.4.P.10.1: Observe and describe some basic forms of energy, including heat, light, sound, electrical.

Youth Development Standards:

- 5 – caring school climate
- 10 – safety
- 21 – motivation
- 29 – honesty

Vocabulary

- Energy
- Efficiency
- Electricity

Teacher Background Knowledge:

The teacher should know what rooms in the school waste the most amount of energy. Speak with the head custodian about what areas of the schools use the most amount of energy. Tour the rooms that will be used for the observation to find ways to save energy.

Materials:

Energy Savers Activity Sheet, poster board, markers, crayons, whiteboard, chart paper, egg cartons

Procedure:

1. Write the phrase "energy efficient" on the board. Ask students: *What does it mean to be **energy efficient**?* (finding ways to do things while using less energy). Then ask students to name different ways that they can be more energy efficient. Write the students' ideas on the board.
2. Distribute the Energy Savers activity sheet (I have this activity sheet saved as an Adobe document). Cut out and place into *Going Green* notebook. Explain that, during their investigation, they will explore the school's energy use, think up ideas for reducing it, and put the ideas into action.
3. Separate students into groups of three. Instruct each group to choose a room and complete the "Investigate" section. Provide at least 10 minutes to complete the investigation (one 3rd-5th grade classroom, cafeteria and the office).
4. Return to the classroom. Answer this question with the class: *What did you discover?* Review what students observed.

5. Create a list on chart paper of the things that our class, other students, and our school could do to use less energy in the room.
6. Each group will create a poster with a chart, table, or graph that encourages students to save energy at school. The ideas for the posters should come from the list we generated. Poster board, egg cartons, and other crafts can be used.

Formative Assessment:

- Chart paper with list of energy wasters and savers
- Poster with information on how we waste energy and suggestions for saving energy at school and at home
- Going Green notebook
- Observation—Do the students act on their own suggestions? Are they making an attempt to save energy?

Lesson 9: The Food Chain Gang

Essential Question:

How do humans impact the Earth in a positive and negative way?

Content Standards:

- SC.3.L.17.2: Recognize that plants use energy from the sun, air, and water to make their own food.
- SC.4.L.17.3: Trace the flow of energy from the sun as it is transferred along the food chain from producer to consumer.
- SC.5.L.15.1: Describe how, when the environment changes, differences allow some plants to reproduce and others to die out.

Youth Development Standards:

- 5 – caring school climate
- 12 – school boundaries
- 21 – achievement motivation
- 26 – caring sense of purpose

Teacher Background Knowledge:

A picture of a food chain should be saved before the lesson. Go to Google-images-search-food chain, or choose your own image search engine and save. The food chain cards can be made by cutting out pictures of animals, plants, the sun, or it can just have the word written on an index card (mushroom, deer, lion, etc.). This is done in advance of the lesson by the teacher. Teachers should know how a food chain works and interacts with the environment. The purpose of this lesson in environmental education is necessary to show children the interdependence of plant and animal life with humans and the environment.

Materials:

Food chain example (projected from computer), sets of food chain cards (I have these already made), Going Green journal, paper, pencil, crayons, markers, colored pencils, computers, projector, laptops, internet, poster board or chart paper

Vocabulary

- Food chain
- Producer
- Consumer
- Decomposer
- Predator
- Prey

Procedure:

1. Write the words: sun, green grass, rabbit, and fox on the board. Ask students why they think these four words would be placed together? What do they have in common? They are all in a food chain.
2. Next, project an example of the food chain and ask the students if they recognize what it is. What is a primary producer? An herbivore? A primary carnivore? What animals are in each of the categories? What happens if man hunts all of the carnivores in a habitat, does the food chain still work? What do you think? Have students record these answers and vocabulary words in their journals.
3. Students should work in groups of 3-4. Give each group a set of 15 note cards with various living things on them (each group must have the sun, some plants, and animals). These are made in advance. The students will have about 15 minutes to put the cards in the proper order, according to the food chain. After the groups have finished, have each group tape the cards on a piece of poster board or chart paper and share their results with the class. Does everyone agree that is where the panther should go? Is a fern a producer?
4. Pass out laptops (or use students computer station) and have students go on the following website hosted by BBC U.K. Schools:
http://www.bbc.co.uk/schools/ks2bitesize/science/living_things.shtml. The students will be in a section called, Science and Living Things. Click on Food Chain activities. They explore different habitats and must complete a series of activities on food chains. They will take the 10 question quiz after completing the exercises. Feedback is instant and it converts that grade into a percentage for each student. There is also a vocabulary section called *revision bites*. Students should review this section before taking the quiz. Also have each group revisit the food chain they put on the poster board in step 3. Make corrections if necessary.
5. The lesson will conclude after the students draw a food chain in their Going Green journal. It should contain producers, consumers, prey, and predators.

**5th graders should design a more detailed food chain that is labeled with the following terms: herbivore, carnivore, omnivore, and decomposer. Upper grades could also create a food web.*

Formative Assessment:

- Scores from the 10 question quiz hosted by BBC U.K. Schools
- Going Green journal

Lesson 10: Adopt a Tree

Essential Question:

How do humans impact the Earth in a positive and negative way?

Content Standards:

LA.3.5.2.1: The student will recall, interpret, and summarize information presented orally.

SC.4.N.1.2: Compare observations made by different groups and seek reasons to explain the differences.

SC.5.L.17.1: Compare and contrast adaptations displayed by plants and animals that enable them to survive in different environments.

Youth Development Standards:

- 3 – other adult relationships
- 9 – service to others
- 24 – bonding to school
- 39 – sense of purpose

Teacher Background Knowledge:

The teacher should do a practice nature walk before going out with the students. It should be known in advance where the read aloud is going to take place (make sure the area is free of ants). It must have plenty of tree, plant and animal life. This project should also be cleared with the principal and plant operator; they need to know the students will be picking up trash and maintaining an area of the school.

Materials:

The Giving Tree, by Shel Silverstein, nature trail (area with trees on school property), Going Green journal, paper, pencil, crayons, markers, colored pencils, computers, laptops

Procedure:

1. Have the students draw a picture of a tree on a piece of paper (not in their Going Green journal). Don't ask for a particular type of tree or size, etc. Give them about 5 minutes to draw. They can keep the paper.
2. Take the students on a nature walk. Walk around and observe the trees in the area surrounding the school (at my school our campus is surrounded by forests and there is plenty of nature to view). Ask the students to describe the trees and surrounding area to you. Ask them to be specific about what they see. Notice differences and similarities.

Vocabulary

- Environment
- Coniferous
- Deciduous
- Tree parts
 - Leaves
 - Stems
 - Roots
 - Veins

3. Find a quiet, shady spot outside and read the book *The Giving Tree*, by Shel Silverstein, to the students. Discuss some of the specifics about the trees and their environment.
4. The students will now be told they are going to adopt a tree somewhere around the school. They will not only be adopting a tree, but also the area surrounding their tree. They will be responsible for cleaning and maintaining the tree's environment for the school year. I will monitor maintenance of their areas and periodically give them time to clean. The students will take a bark rubbing and a leaf from their tree (it may be taped in the journal).
5. Return to the classroom and have students get out their Going Green journal. Tell the students to create a detailed drawing of their tree and its surrounding environment. It should include the animals and plants that call this place home. Give them a good amount of time if it is needed. Have the students compare the two sets of drawings and discuss what they see. The second drawings should be more detailed. Were they more aware of the shape of the trees, the surroundings, etc.?
6. On the laptops, have the students try and identify their tree (use Student's Online, research tab that includes ask.com, Grolier, Worldbook Encyclopedia, Fact Monster, etc). Record any additional information about their tree in the journal.

*Step 6 is added only for 5th graders, if time permits, and can always be carried into another lesson on the environment.

Formative Assessment:

- Observation and discussions during nature walk and while the students draw their trees
- Going Green journal and the information collected from the research about their tree
- Drawing of a detailed environment

Appendix