STEWARDS of the FORESTS and Our FUTURE

Target: Gr. 5

Overview
The following lessons are intended to cultivate in young learners, a genuine interest in being good stewards of our world. As we consider the use of our forests as a resource to reduce or replace fossil fuels, we also seek to become better caretakers of our planet. With skill, knowledge and action, we can productively meet our needs and sustain our resources.

Our school’s grade five language arts curriculum SRA Open Court, has a unit titled Cooperation and Competition. This unit includes the story Founders of the Children’s Rain Forest from It’s Our World Too! by Phillip Hoose. This nonfiction story is about what first and second grade students did to help save the rain forest. We will use this real world example as motivation to learn more about forests in our state, and the human impact on these forest environments. These lessons will follow the thorough reading and discussion of the story. We will identify the location of forests where we live, and the living things that depend upon the trees that grow there. We will research the human impact on forests and how we can ensure their sustainability while meeting future energy needs. (5 Lessons, 50 minutes each).

Michigan Grade Level Content Expectations

S.IA.05.15 - Students will use multiple sources to evaluate the need to invest in biofuel process development.
S.RS.05.17 – Students will use technology to educate the public about biofuels
R.CM.05.04 – Students will demonstrate comprehension of literature from grade 5 science and social studies.
W.GN.05.03 – write poetry based on reading a wide variety of grade appropriate poetry
5 – P4.2.2 – Participate in projects to help or inform others

References

Lesson 1

Objective: Students will identify areas of Michigan with the least and greatest forest cover.

Materials:
- Blank maps of Michigan
- Computers with internet access to www.michigan.gov
- Projector to display web pages of “Overview of Forested Areas” or create overhead of text and maps for whole class discussion of data.
- Color pencils
- Journal

Procedure:
After reading and discussing the story, Founders of the Children’s Rain Forest, instruct students to use the internet to research forest cover in Michigan and identify forested areas using a map of Percentage Forest Cover in Michigan. Students can shade their maps to indicate coverage and create map keys for identification. Remind students to include the map title.

Discussion Questions:

1. Is there much forested land in Michigan?
2. In which parts of the state is there the greatest forest coverage? Least coverage?
3. What does this website tell us about the areas of least coverage? (Forest lands in the southern lower Peninsula were cleared mostly for agricultural purposes)

Journal: Students will answer the following in their journals: What happened to the Michigan forests in the areas of the least forest coverage? How do you think most of that land is being used today?
Lesson 2

Objective: In this lesson, students will work in groups of 3-4 to identify animals that depend on forests to survive. Each group will create a book that describes three or four of these forest animals. (2-50 min. class periods)

Materials:
- Field guides for plants and animals of the Michigan forests
- Reference books about forest plants and animals of Michigan
- Index cards
- Construction paper
- Poster board
- Tree identification key
- Markers, crayons, color pencils
- Computers with internet access
- Fasteners and yarn
- Hole punch
- Journal

Procedure:
Take the class on a nature walk in a nearby forest while leaves are still on the deciduous trees (in Detroit that might be the Belle Isle Nature Center; this walk will probably require more than one class period). Using the field guides, ask students to record the plants and animals they see.

After returning to the classroom; in their groups, ask each student to select a plant or animal observed in the forest, write its name and forest resources it uses to survive on an index card. Using the field guides, reference books and internet, each student will create a forest food web that includes at least one of the plants or animals on the cards. Webs may include animals from the forest that are not on the cards. Book pages will then be made on construction paper; students may bind the book by using the hole punch to make three holes along one edge and securing the pages with fasteners or tying the pages with colorful yarn. Each student will now be able to create a page in the group book that shows their food web and explains what would happen to the web if the selected animal disappeared from the forest. On the back of the page, each student will write and illustrate a Haiku poem. Haiku is a form of Japanese poetry. A Haiku poem will have three lines. The first line contains exactly 5 syllables, The second line exactly 7 syllables, and the third line exactly 5 syllables again.

Sample Haiku poem:

A Tree
It keeps the air clean
Yet we wonder what it’s worth
By now, we should know.

Journal: How would you feel if your favorite food disappeared, and was no longer available for you to eat?
Lesson 3

Now let’s consider man’s need for sustainable energy and how forests might be impacted. In this lesson, students will learn that scientists are searching for ways to economically produce biofuels (ethanol) from renewable forests. These fuels from sustainable resources could replace fossil fuels. Students will make comments on the science class blog for or against the use of forests for the production of ethanol.

ENERGY KID’S PAGE –
http://www.eia.doe.gov/kids/energyfacts/sources/renewable/biomass.html

"Biofuels" are transportation fuels like ethanol and biodiesel that are made from biomass materials. These fuels are usually blended with the petroleum fuels - gasoline and diesel fuel, but they can also be used on their own. Using ethanol or biodiesel means we don’t burn quite as much fossil fuel. Ethanol and biodiesel are usually more expensive than the fossil fuels that they replace but they are also cleaner burning fuels, producing fewer air pollutants.

Ethanol is an alcohol fuel made from the sugars found in grains, such as corn, sorghum, and wheat, as well as potato skins, rice, sugar cane, sugar beets, and yard clippings. Scientists are working on cheaper ways to make ethanol by using all parts of plants and trees. Farmers are experimenting with "woody crops", mostly small poplar trees and switchgrass, to see if they can grow them cheaply and abundantly. Most of the ethanol used in the United States today is distilled from corn. About 99 percent of the ethanol produced in the United States is used to make "E10" or "gasohol" a mixture of 10 percent ethanol and 90 percent gasoline. Any gasoline powered engine can use E10 but only specially made vehicles can run on E85, a fuel that is 85 percent ethanol and 15 percent gasoline.

Materials:
- Carbon cycle diagram
  http://www.eia.doe.gov/kids/energyfacts/sources/renewable/biomass.html
- Articles defining the terms fossil fuels, ethanol and biomass
• Articles discussing the environmental impact of fossil fuels and biofuels
• Chart paper and markers
• Computers with internet access
• Teacher sponsored science blog
• Journals

Procedure: The whole class will review the importance of forests in an ecosystem by asking:

1. What living organisms depend on forests for their survival?
2. What do you think might happen if half the forests in Michigan disappeared?

Record responses on chart paper.

Review the carbon cycle diagram, explaining the process emphasizing the roles of CO2 and plants. Students should clearly understand that the plants reabsorb CO2. Have students work in groups of 4-5 to discuss articles on environmental impact of fossil fuels and biofuels. Groups should be able to identify positive and negative impacts.

Over the next 3 days, students without computer access outside of the classroom will be given 10 minutes at the computer to blog in response to the question: Will harvesting trees for biofuels help or harm our state forests?

Journal: What kind of alternative energy options (non fossil fuel) are available for use in automobiles today?
Lesson 4:


Objectives: Students will analyze forest uses around the world for the benefits and positive and negative impact.

Materials: Student pages – articles and questions

Procedure: Students will review one article that describes the use of forest resources in different communities around the world. Student will respond in writing to questions to check for understanding.

Lesson 5:

Objectives: Students will work in cooperative groups to create a 45-second audio PSA. They will use literacy and technology skills to create audio “Public Service Announcements” (PSA) that promote the students’ choice of the best alternative energy solutions for fossil fuels. The PSA’s will be broadcast during morning announcements to increase awareness of the environmental issues associated with the need to eliminate our dependency on fossil fuels.

Materials:

- At least 3 Audio players/recorders
- Audio tapes/cds
- Computers with word processors or pencil and paper
- Sample PSAs
- Chart paper and markers
- Previously recorded sample PSA’s

Procedure:
To introduce this activity, ask students which issues we’ve been considering in this unit seem to be the most important, forests, animals in the forests, biofuels from forests, laws to protect forests, etc. List student responses on chart paper. The topics we’ve considered will help us evaluate the need to use our planet’s forest resources to produce biofuels. Tell students they are going to record a 45-second commercial or public service announcement. These 45 seconds should be used to inform others about the value of our forest lands and their future. Explain that PSA’s are short but strong messages on a topic of social interest. Play sample PSAs for the class. Assign students to work together in groups of 2-3. Direct each group to take five minutes to discuss and decide on one issue to present in their PSA. Students should then write a script and rehearse the announcement. Allow groups to practice. Have each group record their announcement is a quiet area.
Assessment: “If You Could Talk to the Animals”

You, like Dr. Doolittle have been given the power to talk to the animals. A group of engineers have informed you that they have discovered how to produce biofuels from trees. They will be using biomass from the forests in your community. You must go to the animals of the forest and explain to them what will be happening to their forest and let them whether or not they you think it’s a good idea to allow the forest to be used for biofuels and why. Using what we have learned in this unit, write the speech you will give to the animals (9 points).

**Scoring Rubric**

_____ Speech reflects an understanding of the interdependence of the forest ecosystem.

_____ The need to use forest biomass for energy is clearly stated.

_____ The sustainability of the forest is addressed.

**Rubric Score**

| 3 | 2 | 1 | 0 |