

Saturday Science- Week 1 January 31, 2009

Objective-

- To understand importance of energy.
- How we as a human beings consume energy in our daily lives.

Materials- Cardboard, aluminum foil, glue, plastic wrap, stick, black construction paper, scissors, nametags, journals, poster (energy), food, lamp

STAGE/TIME	PROCEDURE
OPENING	Introduce program-Our impact on the earth's systems Say something about themselves (Favorite food, favorite movie, favorite thing to do outside)

<p>ENGAGE</p>	<p><i>“What do you think the biggest problem with our environment is today?”</i> <i>“What do you think our planet will be like in 100 years? Why?”</i> Have them sketch/write this in the journal. Discuss answers as a class Ask one side of the room to run in place for about a minute. <i>“How do you feel?”</i> (Ask each side of the room) <i>“Why do you think you feel that way?”</i> <i>“What do you think your body is using to make it work”</i> (When you know you have a soccer game...) Discuss energy. <i>What is energy? How do you use energy? What else do you know about energy?</i> <i>Energy is the ability to move or make change.</i> <i>Can we see energy? You cannot see energy.</i> <i>How do we know energy is there?</i> <i>Whenever you detect motion, heat, light, or sounds, energy is at work.</i></p> <p>Explain potential and kinetic energy. Go over examples. <i>Potential energy is stored energy</i> <i>Kinetic energy is energy possessed by a moving object.</i></p>
<p>EXPLORE (60 min)</p>	<p>Quick Journal/Discussion on how they used energy yesterday or at home. (Ideas include getting ready in the morning, things done for learning like reading, getting around, doing stuff for fun).</p> <p>Discuss as a class.</p> <p>(Heat for food. What energy is used to heat food? Is there another way we can cook without a microwave/oven? Why may solar ovens be more environmentally friendly?)</p> <p>Build Solar oven (observe material under lamps. What do you notice?)</p>
<p>Explain</p>	<p>Connect different types of energy discussion with solar energy. Why and how building solar ovens was important. Discuss different parts of solar oven.</p>
<p>EXPLORE</p>	<p>1. Look at poster and list energy sources. Use worksheet for this. Discuss this as a</p>

Poster- 10 Discuss- 5	<p>class. What sources or signs of energy are not shown on the poster? What pictures should be added to the poster to represent the missing sources?</p> <p>2. Introduce different sources. Find different sources of energy (assign challenge groups sun, wind, thermal etc.) <i>"Can you think of any others?"</i> <i>(sun, wind, water, biomass, coal, geothermal, natural gas)</i></p> <p><i>Explain difference between nonrenewable and renewable sources</i> <i>Nonrenewable-exist in finite or limited amounts.</i> <i>Renewable- sources that can be replenished through natural and/or human processes.</i></p>
Research- 15-20 Presentation- 10	Groups research their energy sources Present findings.
ELABORATE	Choose electric meter from the building and ask them to take reading. Also, tell them to take meter reading at home and why and how energy is consumed and how it could be reduced.
	Plant plants (For next week)
Evaluate (15 min)	Journal- What is energy? Why is it important? How do we use it? What have you learned and what questions do you still have about energy and the environment? Check solar ovens
Other possibilities	Skit about potential/kinetic energy? Another experiment

Saturday Science- Week 2-February 7, 2009

Objective-

- How food gives us energy.
- How does food consumption affect us and our environment?
- Our role in the reducing negative impact on the environment.

Materials- Pencils, paper, worksheets, cheetos, burners, buckets, cups, eco-cards, computers, journals, solar oven, masking tape?

STAGE/TIME	PROCEDURE
Before:	Write formulas on board for calculating calories?
OPENING	Myth or Fact Activity Brief Discussion
ENGAGE	Burn one cheeto under burner and try to see how much longer it burns. Try to use this heat for raising temperature of water and show kids how much energy we consume by eating cheetos. Discss about different percentage of fats, carbohydrates, proteins from the food.
EXPLORE OUTSIDE	Bring Solar Ovens out and keep food for cooking. Let them make observations. Holes in Buckets. Students will work in the team. One team will be vegetarian team and one will be non-vegetarian. Each person from the food chain will pass the bucket with the hole and collect water at the end. The group collecting more water will be

	<p>winner.</p> <p>Cards on the forehead activity</p> <p>Students will get different cards from the food chain, but they can't see their own card. They need to see each other's card and arrange themselves in the food and predict their role.</p> <p>Remove the person (animal) from the food chain and discuss the effect of it.</p>
EXPLAIN	<p>Foodchain Activity- overfishing, overbuilding, clearing forests, carbon (tell group that an animal is gone. Ask group what are some reasons why this animal is gone. Write paragraph, draw picture and present ideas) <i>regenerate food chain for each group and take out an animal for each group</i></p> <p>Carbon Footprint with food (3 stations- calculate CO2 footprint –nature.org-, CO2 footprint for various popular foods, How much energy we have consumed with pretzels using formula)</p>
ELABORATE 11:30-11:45	<p>Have class discussion with the hypothetical situation of missing some animals from the earth and see its effect.</p> <p>Also, connect discussion to different food habits and how we can save energy by choosing certain food habits.</p>
Evaluate (15) 11:45-12	<p>What did you learn? 3 Questions? Journals entries.</p>
Other (If time)	<p>Draw windmill designs if time?</p>

Saturday Science- Week 3

Objective-

- Water as energy source.
- How do we use water?
- How our usage of water affects the environment.

Materials- plastic wrap, scissors, nametags, journals, posters, 7 dice

STAGE/TIME	PROCEDURE
Before:	
OPENING	Put up picture to review from last week http://www.epa.gov/owow/nps/kids/whatwrng.html What are different things happening in the picture, which are affecting our environment and could be avoided.
ENGAGE	Book- Lorax or book dive Hands on experiment- greenhouse (look up) Apply enviro to ecosystems (find drama pics) scenarios (groups and poster)
EXPLORE	Water cycle activity. Build different stations having water cycle components. Let students go around the room to different stations and complete the water cycle.
Explain	Talk about function of different components of water cycle. How human beings impact the water. Discuss about amount of consumable water and how we can preserve it for future generation.
Elaborate	Ask students how we affect different components of water cycle and how it affects our nature. Also discuss with students different ways to control some of our daily waster usage habits to control water wastage and help environment.
Other possibilities	Check up on plants- Journal observations/discuss observations (why did that happen)

Fifty Simple Things Kids Can Do to Save the Earth

Earthworks Group, John Javna

ISBN: 0836223012 Explains how specific things in a child's environment, like a light switch or a toilet, are connected to the rest of the world; how using them affects the planet; and how the individual can develop habits and projects, like energy conservation and recycling, that are environmentally sound.

Going Green: A Kid's Handbook to Saving the Planet

John Elkington, Julia Hailes, Douglas Hill and Joel Makower

Tony Ross (Illustrator)

ASIN: 0140345973

This comprehensive guide introduces young readers to the major concepts of ecology and provides them with ways in which they can make a contribution to saving the planet. Includes explanations of ecological issues and projects, and an alphabet of thoroughly practical things - feeding the birds, closing the refrigerator door - that young people can do to help.

My First Green Book

Angela Wilkes

ISBN: 0-679-81780-8

Features environmental activities and projects in such areas as water pollution, recycling, acid rain and wildlife gardens all in an oversized-book format and with beautiful full color photos.

Worms Eat Our Garbage: Classroom Activities for a Better Environment

Mary Appelhof, Mary Frances Fenton, Barbara Loss Harris, Daniel L. Dindal

ISBN: 0942256050

Saturday Science- Week 4

Objective-

- Students understand types of energy resources. (Renewable and non renewable resources.)
- Students understand how we can help preserve non renewable energy resources.
- Students build variety of process skills.

STAGE/TIME	PROCEDURE
Before:	
ENGAGE 9:50-10:30	Outdoor Games http://www.eia.doe.gov/kids/classactivities/ActiveEnergy_PrimElem.pdf To engage students in the types of energy resources, play the game. Student will perform the actions as mentioned and follow the rules. Ask them how they feel after playing the game. Have they consumed energy? How do they feel about it?
EXPLORE 10:30-10:50	Stations- Website and Experiments http://www.eia.doe.gov/kids/classactivities/EIA%20Scavenger%20Hunt%20color.pdf Students will go on the site and will choose one of the renewable or non renewable energy resources and find information about it. Cookie- http://www.eia.doe.gov/kids/classactivities/CookieMining_PriElem.pdf Give students cookie and toothpick. Each cookie represents the earth surface and chocolate chip into it is coal. Ask them to compete with each other to gather maximum coal. The cookie will break for the students who have dug deeper. Sustainability report IU http://www.greenreportcard.org/report-card-2009/schools/indiana-university-bloomington Go around building and think of ways that you can help with your impact Recommendations

Explain	Students will record their understanding about different energy resources in the journal. Also each group present a 3 to 4 minute presentation of a poster made on either renewable or non renewable energy source. By taking example of coal mining build discussion about importance of non renewable sources and how we can help environment to preserve them.
Elaborate	Check up on plants (Students are watering different plants from different pots with normal and polluted water) - Journal observations/discuss observations (why did that happen)
Other possibilities	http://www.eia.doe.gov/kids/classactivities/wind_elemrev.pdf

Saturday Science- Week 5

Objective-

- Students understand what green house effect is.
- Students understand how our activities produce green house gases.
- Student apply their knowledge of factors affecting environment and suggest control majors for that through building model.

STAGE/TIME	PROCEDURE
Before:	
ENGAGE	Students will be shown a documentary called Inconvenient truth by Al Gore
EXPLORE	Greenhouse Effect experiment Students are given thermometer, lamp and zip lock bag. One thermometer is kept

	<p>inside the zip lock bag and one outside. Students note down temperature of each thermometer by the interval of 7 minutes and will draw graph.</p> <p>Students work on their letter to present to IU. They go in the library, school hallways, and cafeteria and try to find out ways and means by which energy is wasted. They note down their observations in the journal. They also make observations of recyclable and non recyclable material in the school</p> <p>Students choose their group members for final week to build their project. They spend some time in brain storming and make outline of their model.</p>
Explain	<p>Explain students the zip lock bag represents the greenhouse gases and ask them to interpret their graphs. Discuss about resources of greenhouse effect gases.</p> <p>Discuss appealing things from inconvenient truth documentary</p>

Saturday Science- Week 6

Building a sustainability village and present it to class and parents.

In the last or sixth week students transfer all their learned ideas in their model building. Students work in group with recyclable materials and generate sustainability villages. Students build models of small solar oven, wind mills in their villages. They try to find different resources of pollution and try to build things which will make less negative impact on the environment.