

Environmental Awareness

CIK 2017

OVERVIEW:

Each and every one of us plays an important role in the long-term health and survival of our race and planet. This class will give students a clear understanding of our environment, the challenges we face, and what we can do about it. Conservation is cool...

OBJECTIVES:

Students will be able to:

-) Identify a diversity of renewable and nonrenewable resources.
-) Identify the natural origins of common objects.
-) Determine energy sources.
-) Summarize the interrelationship between natural resources and our communities.
-) Understand environmentally responsible choices related to conservation and natural resource utilization.

VOCABULARY:

4 Rs (reduce, reuse, repair, recycle)

Atmosphere

Greenhouse Effect

Ozone Layer

Smog

Acid Rain

Conservation

Natural Origin

Pollution

Alternative Energy Source

Fossil Fuel

Nonrenewable Resource

Renewable Resource

NEXT GENERATION SCIENCE STANDARDS:

-) Human activities in agriculture, industry and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1)
-) Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success of how well each takes the constraints into account. (ETS1.A)
-) Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks and meet societal demands. (3-5-ETS-2)
-) Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3)

MATERIALS:

Clean Trash

Resource Cards

Alternative Energy Cards

The Wump World book

Poker Chips

PROCEDURES:

1. Introductory Activity: Trash Toss (found in activity glossary)
 - A. Make sure students retrieve all trash when activity is over. Make it fun!
 - B. Debrief: What happened to the trash in this activity? Did either side get rid of their trash completely? Where does trash go when you throw it "away"? What are you really throwing away when you get rid of trash? Use items to introduce natural origin.
2. Resources Discussion

- A. Using the trash from Trash Toss, begin discussion by asking students to hypothesize where the trash came from. Probe them into a discussion of where did the products really come from, the **natural origin** of the products: (once students catch on to these patterns, ask them if they can identify any more)

Aluminum – metals – ore – rocks – Earth

Paper – wood – tree – soil – Earth

Glass – sand – pebbles – rocks – Earth

Plastics – petroleum – dead plant and animal matter – Earth

Food wastes – animal and plants – Earth

- B. Define **renewable** and **non-renewable**.

- i. Renewable-the earth can replenish the resources used to make an item in 100 years or less (animal/plant-based products)
- ii. Non-Renewable-the earth cannot replenish the resources used to make an item in 100 years or less (mineral & petroleum-based products)

- C. Activity: Resource Relay (found in activity glossary)

- i. Debrief: Instructor asks teams about item placement. Have teams justify why they chose their item placement. Were there any items in which you didn't know the origin? Some items may have multiple origins. Were there items that could have fit into both categories? This is a good activity to show how many products like plastic and nylon come from non-renewable resources.
- ii. Challenge students to consider the resources it took to provide their lunch today. Beyond the food itself and the means required to get the food to them, what else was needed? With that in mind, segue into discussion on **4Rs**.

3. 4Rs Discussion

- A. Have students hypothesize, "If the products we use take so many resources to make, what can we do with them when we are finished?" Use resource cards or trash as references in discussion.

- B. Clearly discuss each of the 4Rs:

- i. **Reduce**-This is where we need to begin. **Conservation** always starts with reduction!
- ii. **Reuse**-What are some common items we "throw away" every day that could be reused usefully?
- iii. **Repair**-It's nice to have something brand new, but what have you gotten rid of lately that could have been repaired?
- iv. **Recycle**-If you cannot do the other three, determine if the item can be recycled instead of being put in a landfill.

4. Energy Discussion

- A. Ask students how they got to camp. *By bus*. What was the bus burning in order to drive to the mountains? *Gas and oil*. Explain the term **fossil fuel** and the importance of them in our society. Oil drilling provides jobs for many Californians and that oil fuels much of our energy.

- B. Show "the big picture" on a white board. Start with the earth. Explain the **atmosphere** and **ozone layer**. Put a few cars (SUVs) on the earth. Explain **smog**, **pollution**, and **acid rain**. Link this discussion to the **greenhouse effect**. This effect can be seen in the changing climate through the prolonged drought in Southern California.

- C. How can we minimize the use of non-renewable resources when our society is so dependent on them? Introduce the term **alternative energy source**. Inform students that many people, businesses, and even cities are working towards more renewable sources of energy. Briefly describe solar energy, wind energy, geothermal energy, biomass conversion, and hydroelectricity.

- D. Inform students that energy sources other than fossil fuels also have consequences. Describe nuclear energy and include its potential problems.

5. Experiment: How Will I Get My Electricity?

- A. Conduct experiment.

- B. Debrief: Theorize why everyone doesn't drive hybrid cars right now even though they are better for the environment. (They are new, expensive, and a lot of steps to make). Theorize why people still burn fossil fuels like coal and oil for electricity (it's still cheaper and easier to get and use). Have students discuss with each other positive changes they personally can make to help the environment.

6. Wrap Up

- A. [*What?*] Concisely review the major points of the lesson, all the way back from the introductory activity.

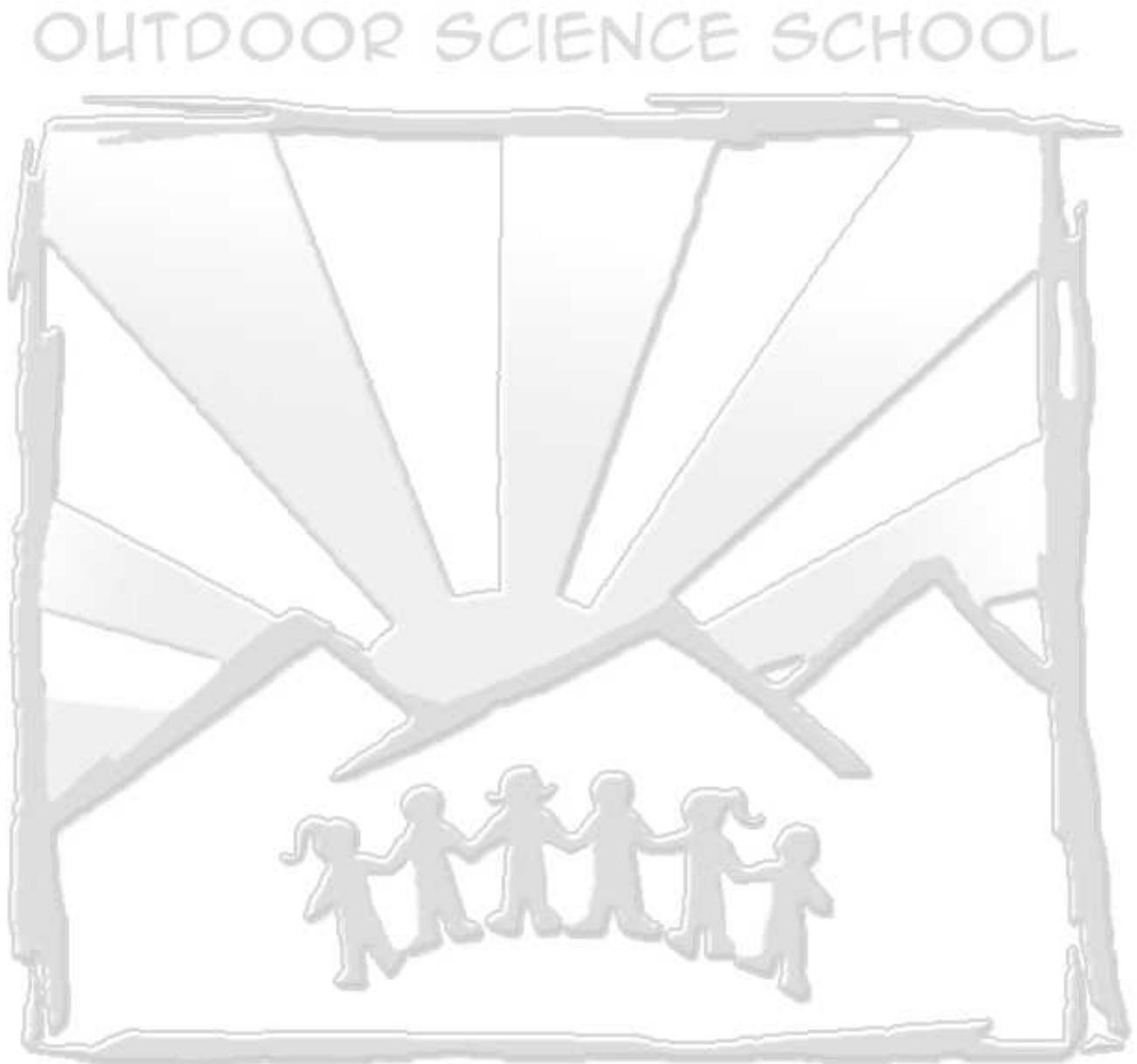
- B. [So what?] What was important for you to discover from the lesson? Why was it important for all of us to take this class?
- C. [Now what?] What can you now do with this information? What changes can you make in your life? What can you teach to others? Who will you tell? What will you say?
- D. Pass out beads after all students have contributed.

THINGS TO THINK ABOUT:

Special Needs: When reading a story, instructor must act out or embellish to keep students' attention.

Time Fillers: If extra time at the end of class, read The Wump World (see activity glossary).

Weather: You can read the story indoors if inclement weather exists.



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