

**ecoMentors Lesson Plan Template: Helping kids explore the planet! www.ecomentors.ca**

**Title: Energy from wind and water**

**Grade Level(s): 2**

**Time/Date:**

**School:**

**Teacher:**

**Directions to school, class:**

**Contact Info:**

**Curriculum Link: Energy and Control - Energy from Wind and Moving Water**

Required Reading

Vocabulary: Words & Concepts your class may be learning, look these up yourself too!

**Energy** – the ability to make something happen

**Electricity** – The energy we need to make equipment work

**Environment** - All the things around us that help us live

**Fossil Fuels** – Coal and oil, originated from fossil plants

Materials and Equipment: List these before and while you plan and revise so you're prepared.

Paper and pencil

What is your class accomplishing?: Learning & Activity Goals, Objectives

- **Understand and name the ways in which air and water can provide us with energy**
- **Understand that wind and water always can be renewed and understand the advantages over fossil fuels**
- **Understand that it is the *movement* of air and water that contains energy**
- **Name activities that are affected by moving water or air**
- **Identify devices that use moving air and moving water as energy sources**

**PROCEDURE**

The Spark: Introductions, Demonstrations, Show and Tell, Topic Intro (Break the ice!) ~5-10min

Introduce yourself. Let the students introduce themselves along with an electrical appliance they use and how often they use it (i.e. watching TV). Or you can ask them how many times and for how long they watch TV.

Brainstorming, Getting ideas, Connecting ideas (assess their knowledge!) ~10-20min

*What is the 'Environment'?* The things around us that we need to live: air, water, earth, trees, rivers, fish, lakes, beaches, gardens, farms. Write down all the things that students say is the environment on the board. You can stop at ~25. *What do you think are two of the most important aspects of our environment?* Air and water. *Why?* Every living thing needs air and water to survive. *Why is it so important to protect air and water?* Clean air and clean (drinkable) water are getting scarce, without it, plants animals and humans can not survive. *What can water give us?* Drinks, the possibility to grow food (plants need water!), fish, transportation, energy, ...

*What can air give us?* The possibility to breathe, wind (climate), transportation, energy, ...

*So wind and water can give us energy. That is what we are going to talk about today. What do we mean with energy?* to make something happen/move. *What is electricity?* The energy we use to make appliances work. *How do we make electricity for our houses?* Wind, water, solar, fossil fuels, ...

Activity, Game, Exercise, Debate, Puzzles, Problem Solving, Role Play ~10-30mins

**Fossil fuels**

Ask the students if they know what fossil fuels are, and how fossil fuels are created. If they know; use the information the class gives you to summarize the process of forming coal on the black board. Start with a picture of the sun, shining on plants. Arrow to dying plants, arrow to plants covered under the soil, arrow to plant material deep under the soil, being compressed, arrow to coal under the soil and simple mining. Arrow to factory that burns the coal, heating water, producing steam to make blades go round (don't forget the smoke produced by the factory!). Arrow to electricity in our homes.

*Do you know other examples of fossil fuels?* Oil and gas. Explain shortly how these are formed.

If they don't know much about fossil fuels, tell the students a story about the sun:

*Millions of years ago the sun shone on the plants that grew on our planet. The plants used the solar energy to grow big. The solar energy was stored inside the plants. Plants don't live forever and when they died they were slowly buried under the earth or under the ocean. The plant matter and the solar energy stored inside became a part of the earth. Earth and water is heavy, and the immense pressure slowly compressed the plant matter into coal and*

oil. The coal and oil contain the solar energy that was first stored inside the plants. In our time, the coal and oil is mined, and burned to produce energy. So what we use to make electricity today, were plants millions of years ago! Coal and oil are called fossil fuels, because they were formed by fossil plants.

Again; illustrate with the pictures described above!

Ask the students; *How does energy from burned coal and oil affect the environment around us?* Smoke, pollution : acid rains

*What if we run out of coal and oil? Can we ever run out of wind or water?*

Activity, Game, Exercise, Debate, Puzzles, Problem Solving, Role Play(Pt. II or Cont...) ~10-30mins

Let the students come up with 2 lists of things that use wind or water to move: a list with **activities** that are affected by moving wind or water (fishing, sailing, flying a plane) and a list with **devices** that use moving wind or water as energy source (wind mill, water wheels).

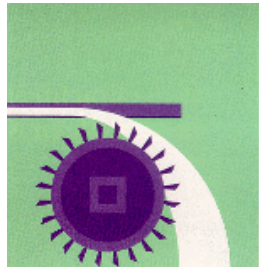
Start with asking the class to name activities that are affected by moving wind or water. Point out that these activities need moving air or water, otherwise they wouldn't work.

Then go to the devices; ask the class if they can think of any devices that use this movement to make energy. List these on the board.

Then make them sit together in groups (4-6) and let them discuss among themselves how they could use water or wind (half of the groups should take water, and half the groups wind) to make electricity. If they find it too difficult; hint at the example of using a giant fan, but instead of using energy to make the blades go round and produce wind, let them turn it around. Use wind or water to make the blades turn and make energy!

Every group should draw a (schematic) picture of how they think it would work and share this with the class.

Discuss the results with the class and summarize on the board: for water energy draw a picture like this:



Explain how the water makes the wheel turn, which produces energy.

Make a similar picture for wind energy!

Activity, Game, Exercise, Debate, Puzzles, Problem Solving, Role Play(Pt. III or Cont...) ~10-30mins

Reduce energy:

*Most energy we use is made from fossil fuels. We know now that fossil fuels are bad for the environment. What could we do to protect our environment?* Write all suggestions of the students on the blackboard. Discuss which options are most reasonable (reduce electricity and create more wind and air energy). *In what way could we reduce the amount of electricity we use?* Make a list of all options, and discuss again what is reasonable to do at home/school.

*Why do people not use more wind and water energy?* Make a list on the black board. Behind it, make a column with **solutions**. *What could we do to solve this?*

Activity, Game, Exercise, Debate, Puzzles, Problem Solving, Role Play(Pt. IV or Cont...) ~10-30mins

Acting Out:

Whisper an electrical appliance in the student's ear. Let the student act out the use of that appliance. Let the other students guess which appliance it is. The one who has it right is next to act one out.

Presentation of Findings ~5-15mins

Review, Conclusion and steps towards continued action ~5-10mins

Let the class summarize the findings on the back board from the last activity: *How do we reduce the amount of electricity? What are better ways to produce electricity than fossil fuels and why is it better to use those instead of fossil fuels?*

References

<http://www.aecl.ca/kidszone/atomicenergy/energy/index.asp>

Great work ecoMentor! After use of Lesson Plan, revise, add ideas and repeat!