

Energy Around Us

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ENERGY AROUND US

UNIT OVERVIEW

Although not blessed with an exciting title, "Energy Around Us", is a powerful unit. Students examine the very nature of energy, its many forms and the changes it can undergo. In general, students learn basic concepts and information as they go through a series of student notes. The notes are followed by meaningful activities associated with the theme of each lesson. To further captivate student interest, many of these activities have been designed around the "Science Challenge Format" in which small groups of students work cooperatively to solve various problems. Learning, integrated with fun, is the order of the day and your science class may never be as energetic.

STUDENT ASSIGNMENTS AND ACTIVITIES

- | | | |
|---|---|--|
| 1. Energy, Kinetic Energy, Light | - | Illustrated Energy Alphabet |
| 2. Heat Energy | - | Ice Cube Meltdown (Science Challenge #1) |
| 3. Electricity | - | How To Open A Jar Lid...(Worksheet) |
| 4. Chemical Energy | - | Calorie Counter (Worksheet) |
| 5. Elastic/Spring Potential Energy | - | Paddlewheeler (Science Challenge #2) |
| 6. Gravity Potential Energy | - | Popcorn Launcher (Science Challenge #3) |
| 7. Law of Conservation of Energy | - | Energetic Cartoons (Worksheet) |
| 8. Renewable Energy (Solar, Wind, Hydro) | - | Windmill Penny Lifter (Science Challenge #4) |
| 9. Non-renewable Energy (Fossil Fuels, Nuclear) | - | Energy Pictograms (Science Challenge #5) |
| 10. Review | - | A review is included. |

OPTIONAL ACTIVITIES

1. Energy Wordsearch
2. Energy Crossword (Enrichment)
3. How a Microwave Oven Works (Reading Activity - Worksheet)
4. Milkfat and Food Colouring
5. I Scream For Ice Cream
6. Making Sandpaper
7. Energy Conservation/Project Suggestions

SCIENCE CHALLENGE ACTIVITIES

Many of the lessons in this unit use science challenge activities to help students apply what they have learned from the notes. The goals of science challenge are:

- 1) to help students learn to solve "real" science problems
- 2) to help students work cooperatively within groups.

The activities are usually somewhat competitive in nature and small prizes such as bite-sized chocolate bars can help make the activity more interesting. However, it is important that students do not get too carried away and learn to work cooperatively. An evaluation sheet has been included on the next page to easily monitor student cooperative work skills. Each student begins with twenty out of twenty or 100%. If a student fails to work cooperatively in one of the categories (Which should be explained in advance) a mark is taken off. Students quickly become aware of what acceptable behaviour is and strive to keep their 100%.

COOPERATIVE WORK SKILLS EVALUATION

[illegible]

LESSON #1 - ENERGY, KINETIC ENERGY, LIGHT ENERGY

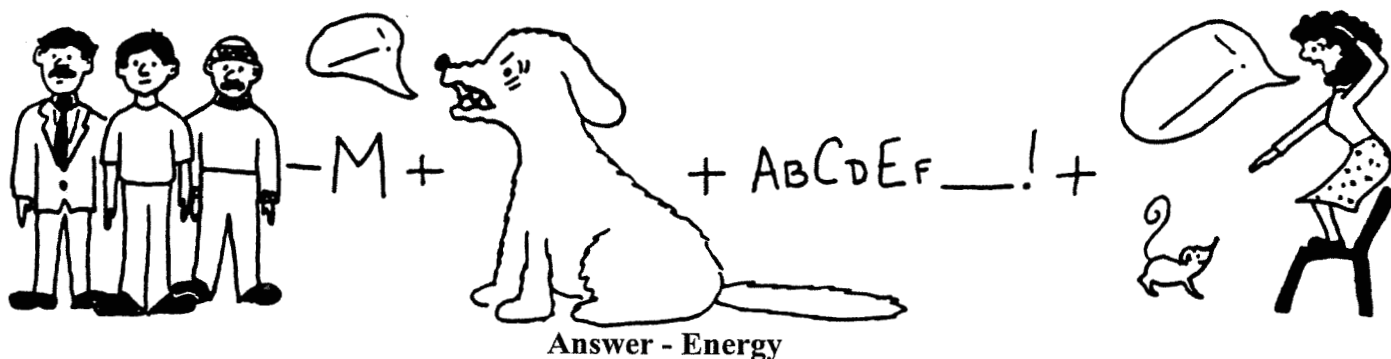
Student Objectives and Activities

- Students learn about energy as well as two different types of energy - kinetic energy and light energy.
- Students complete an "Illustrated Energy Alphabet" as an introductory activity.

Suggested Teaching Strategies

- Announce the new topic in science by drawing the following picture on the board and ask students to decipher it.

pictogram- the silent letter in (a picture of a knight) + ndog going "rrr"
rrr" + comes before "H"



- Begin the notes by stressing that energy is invisible and a person can only see what energy does. This makes energy an extremely difficult concept to understand since it is not concrete in nature.
- One attention-grabbing method of demonstrating kinetic energy (movement energy) is to spin around and throw a piece of chalk against the back wall of the class.

*** Note ***

Be sure not to hit a student - unless of course you are about to be declared redundant or plan to retire in the immediate future.

- Next, explain that the class is going to make an "Illustrated Energy Alphabet" for a room display, with a picture relating to the central topic of energy being drawn for each letter.
- Put the letters of the alphabet in a hat and have students randomly select a letter.
- It is a good idea for the teacher to have drawn some of the tougher letters such as Z, J, and Q beforehand to use as examples.
- Students can work on this project individually or in pairs. (If students work in small groups it is easier to give an extra letter to a particular group so all the letters are covered)

- If students are unable to come up with an energy related word suitable for their drawing, a suggested list is given below.
- A - airplane
 - B - battery, burning, barbecue
 - C - coal, car, chemical energy, conduction, convection
 - D - diesel, dynamite, drums
 - E - electricity, elastic energy, earthquake
 - F - fossil fuels, friction, fire
 - G - gravity potential energy, gasoline, geothermal energy
 - H - heat, hydroelectric energy, hamster power
 - I - insulator, ice
 - J - jumping
 - K - kinetic energy
 - L - light, laser energy, lightning, lightbulb
 - M - microwaves, music, mechanical energy
 - N - nuclear energy, natural gas
 - O - oven, oil
 - P - plug-in, potential energy, propane, pollution
 - Q - quasar
 - R - radio waves, resistors, radiant energy, river
 - S - solar energy, sound, spectrum, spring energy, sun
 - T - television, thermal energy, tuba
 - U - uranium
 - V - volcano, violence, violin
 - W - wind energy, wave energy, work, wood energy
 - X - X-ray, xylophone
 - Z - zzzap
- As a variation, teachers may choose to brainstorm the energy-related words as a class or let students choose letters instead of randomly assigning them.

Student Example

