

Dear Parent,

Your child is beginning a unit developed by the Battle Creek Area Mathematics and Science Center. This unit was designed to promote science and engineering literacy and integrate reading and writing skills into high-interest science content. During the next twelve weeks, your child will be actively involved with the *Energy and Waves* unit. This unit is geared for fourth-grade students and focuses on the big ideas of obtaining information to determine how energy moves from place to place, the relationship between energy and forces, and the properties of waves and how waves are used in technology. Students will:

1. Obtain information through investigations and discussions to construct an explanation relating the speed of an object to the energy of that object.
2. Obtain information through investigations to provide evidence that energy can be transferred from place to place.
3. Plan and conduct investigations to predict the outcomes about the changes in energy when objects collide.
4. Design, test, and refine a device that serves a purpose where energy transfers from place to place.

Fourth-grade students are also encouraged to think and act like scientists and engineers and begin to develop observation and communication skills in science.

1. Ask questions that can be investigated and use evidence to predict outcomes based on patterns.
2. Make observations to produce data.
3. Plan and conduct simple investigations.
4. Use evidence to construct explanations.
5. Obtain and combine information from resources to explain phenomena.
6. Develop a model using an analogy, example, or abstract representation to describe a scientific principle.
7. Use patterns in data and cause-and-effect relationships to explain change.
8. Use relevant scientific concepts and research findings to solve an engineering problem.

In this unit the activities are geared to build on students' inherent knowledge and provide experiences in which they can use and apply their knowledge in a wider range of tasks. Students will be given the opportunity to examine, measure, reflect upon, describe, and discuss how energy moves from place to place and is evident in motion, light, sound, heat, and magnetism and electricity. Suggestions for activities to do at home are included with this letter. These activities will reinforce the concepts taught during this unit instruction.

May you enjoy quality time with your child while discussing the concepts involved with the *Energy and Waves* unit. Let us know if we may be of assistance.

The Outreach Staff

Battle Creek Area Mathematics and Science Center

(269) 213-3904 or (269) 213-3905

ACTIVITIES TO DO AT HOME

Activities To Do At Home

1. Make a solar cooker and enjoy experimenting with cooking foods using energy from the sun. Try making s'mores, hot dogs, or other favorite foods.

Making a Solar Cooker

Materials needed:

large oatmeal container aluminum foil
wire or wood skewer masking tape
scissors plastic wrap

Directions:

- a. Tape the lid to an empty oatmeal container.
 - b. Cut the box lengthwise in half.
 - c. Cover the inside completely with aluminum foil, shiny side up.
 - d. Push the skewer through the middle of one end of the box.
 - e. Put the hot dog, marshmallow, or other food on the skewer.
 - f. Push the skewer through the other end of the box.
 - g. Cover the solar cooker with plastic wrap and tape closed.
 - h. Place it in the sun. The hot dog will be done in about three hours. Other food items may take more or less time.
2. Collect a variety of different sizes of balls and have your student investigate the collision between balls and make connections to the transfer of energy and the changes in motion of the balls.
 3. Use a variety of common household materials to make different kinds of musical instruments. Challenge your student to muffle the sound and amplify the sound using different materials.
 4. Do a household inventory of different items that use magnets. Discuss how engineers used the properties associated with magnets to design a device or solve a problem.
 5. Conduct an investigation to find the warmest and coolest places in the yard or house. Discuss the transfer of heat energy differs with different materials (i.e., lawn, deck, and driveway).