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ONTARIO SCIENCE CENTRE



Exhibit Inquiry

Energy!

Grade SK - 3

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Exhibit Inquiry

Energy!

Have students look for the following exhibits related to energy during their visit to the Ontario Science Centre:

Water Table

Where to go:

KidSpark (Level 4)
Water Table



What it's about:

Water is a source of energy that pushes, pulls and makes things move. It is the movement of water that produces energy. The movement of the water at the water table is powered by different sources. The energy produced by the moving water causes other devices to move.

What to say and do:

- What causes the movement of the water in the water table? (*Downhill movement, water pushing out of the jets in the side*) What kind of energy is created by the water? (*Kinetic/movement*)
- How can you create movement of water in the water table? (*Rotating the screw to move water uphill, pushing or pulling hands through water*) What causes water movement in real life? (*Tides, paddles in water, gravity*)
- What does the energy from the water allow you to do at the water table? (*Move a boat, rotate the water wheel*) What would happen to these devices if the water was not moving?
- What other devices can you think of that use energy from moving water? (*Raft*) What does the energy allow them to do? What happens to these devices when the water is still?

Rhoads Sculpture

Where to go:

KidSpark Entrance (Level 4)
Keep the Ball Rolling
(*The Rhoads Sculpture*)



What it's about:

This is a great place to talk to students about energy input and output. Without energy input from the visitors, not much would happen in the Rhoads Sculpture. Only two parts of this exhibit have electrical motors that use electric energy to lift the balls higher.

What to say and do:

- What kind of input energy is used by this sculpture? Where do the balls get their energy to move? (*Visitors supply the energy by lifting the balls up.*)
- Are there any parts of the sculpture that move without input from visitors? What kind of energy are these parts using? (*Electrical energy from the motors*) What is the output energy for these parts? (*Kinetic/movement energy when balls fall, sound energy*)
- Lift a ball to the top of any of the tracks. What kind of energy does the ball have before you let it go? (*Potential/stored*)
- Let the ball go and observe what happens. What kind of energy does the ball have now? (*Kinetic/movement*) What other type of energy is released from the ball when you let it go? (*Sound energy*)

Energy!

Build Your Own Roller Coaster

Where to go:

KidSpark (Level 4)
Build Your Own Coaster



What it's about:

Roller coasters are an example of stored up potential energy – and a fun demonstration of kinetic energy when it is released! Once the “coaster” is lifted to the starting point of the ride, no other energy is put into the system - potential and kinetic energy take care of the rest.

What to say and do:

- Build a roller coaster track and start a ball rolling from one end of it. Watch and remember how far it travels. Then, try starting the ball at different points on the track – where do you have to place it to make it go the farthest? Why does it sometimes travel farther? (*It travels farther when it starts at higher points on the track.*)
- Where does the ball have the most potential energy? (*At the highest point.*)
- Can you re-design and re-build the track so that the ball will travel even farther? What elements do you need to change?
- If you start two balls at either end of the track, where do you predict they will meet? Try it and see. Can you find where you need to start the two balls so that they meet in the middle of the track?

Pedal Power

Where to go:

Science Arcade (Level 6)
Bicycle Generators



What it's about:

The bicycle generators use human energy to create enough electricity to run a radio set or light up a light bulb or lightbulbs.

What to say and do:

- Ask students to think about activities for which they need a lot of energy. (*Running, cycling*) Do they think they could use their energy to run a television set or light up a bank of lights?
- Have students pedal the bike and observe the results. Ask students to explain how they were able to light up the light or run the television. Where did they get their energy to pedal the bike? (*Food provides energy to the body.*) What type of energy is this? (*Movement/kinetic*)
- What type of energy usually runs a radio or a set of lights? (*Electrical energy*)

Ask students to explain the energy transformation that takes place to run the television or the lights using the bicycle generator. (*Movement/kinetic energy from the body is converted to electrical energy through the generator.*)

Exhibit Inquiry

Energy!

Vocabulary

Elasticity	Property of a material that allows it to return to its original shape after the material has been stretched or distorted; when a material can store and release energy.
Food	A substance that is a source of energy for humans and animals. The energy is stored in chemical form.
Force	A push or a pull by one body on another; a force can change the speed or direction of an object.
Heat	A form of energy that is transferred by a difference in temperature.
Input	Energy that is put into a system to allow it to do something. Sources of input include people, materials and energy.
Kinetic energy	Movement energy. Energy possessed by an object or person due to its motion.
Light	Energy in the form of electromagnetic radiation.
Output	The actual result obtained from a system (e.g., the light that comes on when the light switch on an electrical system is pressed).
Potential energy	Stored energy. The kinds of stored energy are gravitational, elastic, chemical, static electricity, magnetic.
Pressure	The force acting perpendicular to a unit area.
Sound	Energy in the form of vibrations travelling through a medium.
Sun	The principal source of energy (light and heat) for the planets in a solar system.

Internet Links

Energy Quest
<http://www.energyquest.ca.gov/index.html>

The Franklin Institute Online – Wind
<http://www.fi.edu/learn/hotlists/wind.php>

Books

Franklin, Sharon. *Power Up! 20 Thematic Science Experiments for Home and School*. California: GoodYear Publishing, 1995.

Ward, Alan. *Experimenting with Energy*. New York: Chelsea House, 1991.

Taylor, Beverly. *Exploring Energy With Toys - Complete Lessons for Grades 4-8*. Toronto: Terrific Science Press / McGraw-Hill, 1998.

PLEASE NOTE: Programs and exhibits are subject to change without notice.