Welcome to the Energy and Electrical Safety school case!

This object-centred, hands-on school case is designed to support the Science and Technology guidelines of the Ontario Curriculum. It is aimed primarily at Grade 5 and 6 students, but is easily adaptable for younger or older students. There are three layers of information presented:

* Activity Centre booklets provide basic information and are written in plain language using simple terms.
* Activity sheets illustrate and support the booklets, as well as provide further details for curious or older students.
* Teacher's Notes booklet adds more sophisticated information and follow-up activities for you to use as required.

Most activities are designed for small groups with a maximum of five students. This group size encourages interaction and idea-sharing while maintaining a casual atmosphere that supports participation. Many of the benefits of co-operative learning can be gained from such groups. Group structure can be loose or rigid – you may prefer to assign roles (such as Reader, Visual Recorder, Transcriber, Presenter) or leave students free to create their own structure.

Ideally, you will want to set up all six activity centres on tabletops throughout your classroom. Each activity center includes activity centre booklet, activity sheets, and objects. Students can rotate through the centres. If space is limited, you may choose to set up one or a few centres at a time. Activity Centre 1 is designed to involve the whole class.

Take time to introduce the school case and point out its theme – **Energy: What Can We Do With It**. Students can brainstorm all the different things we can do with energy as a pre-activity. This can be as brief or in-depth an activity as you choose.

We strongly urge you to set up an Energy Resource Centre in your classroom or library for the duration of this unit. This can include books, newspaper articles (have students scan newspapers for several months prior to the unit and create a scrapbook), videos, and access to the Internet. See the Resources listed toward the end of this booklet for suggestions.

We hope this school case will engage your students and deepen their learning experience. We welcome your feedback at any time and encourage you to contact us with questions or comments at any time.

CENTRE 1 ENERGY: WHAT CAN WE DO WITH IT?

Activity 1 – Which forms of energy do you use?
Divide the class into small groups (maximum five students). Assign each group one of the nine kinds of energy listed in the chart Forms of Energy: chemical, nuclear, stored mechanical, gravitational, radiant, thermal, electrical, sound and motion. You may want to photocopy this chart (in the activity centre booklet) as a handout for each student to use as a reference.
Questions 1 through 5 – Answers will vary.

Activity 2 – Where does energy come from?
Hand out the puzzle pieces in ENVELOPE 1, one per student. There are 27 pieces – hold on to any extras and students can come to you to complete a puzzle. Give the students 5 – 10 minutes to complete the puzzles and settle down with their group.
Question 1 – Answers will vary.
Question 2 – All of the energy sources come from the Sun except moving water and nuclear energy. (There is nuclear energy in the Sun; however, the kind we generate in power stations comes from uranium atoms.)
Question 3 Answers will vary.
NOTE: Two other energy sources not included in the puzzles are garbage (burned in waste-to-energy facilities – as it burns it heats up water to make steam which turns turbines on electrical generators) and geothermal energy (warm water from under the Earth's surface is pumped up to heat blocks of apartments – used most widely in Iceland). See the Resources listed toward the end of this booklet for more information.

Activity 3 – Visit a mini-museum! (Objects 1–8)
Ask students to match objects 1–8 with their object labels (in ENVELOPE 2). Make a photocopy of SHEET 1 for the students. (You will find activity sheets 1–7 at the end of this booklet.) Have fun with this activity and set up a real mini-museum in your classroom! Students can help plan displays, backdrops, and lighting. Encourage the students to handle the objects with care. This activity can be done individually or in small groups.

Follow-up Activity – Future energy
Having looked at and discussed energy use in the past and present, invite students to imagine energy use in the future. What new energy sources could be developed? Will we use current sources in different ways? Ask them to draw a machine or device of the future.