Canadian Centre for Energy Information

PETROLEUM magic

Petroleum Magic is part of an integrated education program distributed nationally by the Canadian Centre for Energy Information (Centre for Energy). The purpose of this series of current and practical petroleum industry learning resources is to increase students', teachers' and parents' understanding of petroleum and its relevance to all Canadians.

Petroleum Magic is a fun learning resource that connects students to petroleum by talking about products they recognize and use every day. In addition, the resource ties in the environmental messages of the 3Rs – Reduce, Reuse and Recycle – whenever possible, to encourage students and their families to conserve our valuable petroleum resources.

April 2006 **LEARNING RESOURCE SERIES**

Canadian Centre
for Energy Information

Your Resource Source

The Canadian Centre for Energy Information (Centre for Energy) is a non-profit organization created in 2002 to meet a growing demand for balanced, credible information about the Canadian energy sector. On January 1, 2003, the Petroleum Communication Foundation (PCF) became part of the Centre for Energy. Our educational materials will build on the excellent resources published by the PCF and, over time, cover all parts of the Canadian energy sector from oil, natural gas, coal, thermal and hydropower to nuclear, solar, wind, fuel cell and other alternative sources of energy.

The Centre for Energy does not take positions on issues. The Learning Resource Series was developed using a multi-stakeholder review process with the aim of creating fact-based, balanced documents. Educators helped ensure that the educational materials are interesting and applicable to students in schools across Canada.

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To find out more about the Canadian Centre for Energy Information or to find up-to-date information on petroleum issues, statistics or Centre for Energy education resources, please visit the Centre for Energy's portal at: **www.centreforenergy.com.**

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Background Information

There are literally thousands of products made with petroleum. Teachers are encouraged to read the Centre for Energy background information on petroleum products and recycling prior to introducing these activities. All Centre for Energy classroom materials are available free to Canadian teachers (some restrictions apply) and can be reviewed and downloaded at **www.centreforenergy.com.** To order, call the Centre for Energy toll-free order line at 1-877-606-4636.

Some of the more common petroleum products can be found listed in the following Centre for Energy publications:

- *Petroleum – The Source of So Much* discovery booklet, included with this resource package
- *Our Petroleum Challenge, 7th edition* This book provides a general introduction to Canada's crude oil and natural gas industry. Section 1 presents an overview of the nation's crude oil and natural gas resources and the role they play in modern society. Section 2 describes in more detail the steps involved in finding, producing, processing, transporting, refining, selling and using petroleum products. Section 3 discusses the challenges and opportunities facing the industry in the 21st century.

Additional resources can be found online:

- Student activities and games on recycling plastics from the Canadian Plastics Industry Association: **www.cpia.ca/teachers/**
- Centre for Energy energy education resources: **www.centreforenergy.com**
- Interactive student activities from the Alberta Energy & Utilities Board Kidzone: **www.kidzone.ercb.ca**
- Interactive games from the UK Institute of Petroleum: **http://resources.schoolscience.co.uk/exxonmobil/index.html**

The following books may be used as an introduction to the activities:

- *Art from Packaging*
  Gillian Chapman (1996)
- *Plastics*
  Wayne Jackman (1991)
- *Petroleum Play*
  Alberta Energy & Utilities Board (2002)

TEACHING TIPS

The activities in *Petroleum Magic* can be completed in school or at home, or a combination of the two. However, it is suggested that teachers introduce the concept of petroleum-based products using one or more of the activities provided in this teacher's guide, before assigning any of the activities in the booklet.

Curriculum Links

The activities in *Petroleum Magic* span a number of grade 1 and 2 curriculum areas, including:

- *ENGLISH LANGUAGE ARTS:* Skills of listening, speaking, reading and writing while exploring thoughts, ideas, feelings and experiences.
- *SOCIAL STUDIES:* Concepts of my family, my school and my community.

Pan-Canadian Science Links

The activities are also designed to fit within the following grades 1 to 3 general learning outcomes from the Pan-Canadian Common Framework of Science Learning Outcomes, in which students will:

- #100: Investigate objects and events in their immediate environment, and use appropriate language to develop understanding and to communicate results.
- #103: Undertake personal actions to care for the immediate environment and contribute to responsible group decisions.
- #200: Ask questions about objects and events in their immediate environment and develop ideas about how those questions might be answered.
- #400: Recognize the role and contribution of science in their understanding of the world.

This resource can act as an introduction to the science topic "Rocks and Minerals", and to the social studies topic "Canada" covered in future grades.

Introductory Activities

- Bring into the classroom as many of the following items as you can (and any others from the list of petroleum-based products found in *Petroleum – The Source of So Much* discovery booklet):

  - bandage
  - bubble gum
  - comb
  - crayon
  - elastic band
  - glue
  - golf ball
  - lipstick
  - nail polish
  - panty hose
  - plastic bag
  - plastic container or bottle
  - toothbrush and toothpaste
  - tube of hand cream
  - wax paper

Show all the products to the class and explain that they are all made from one similar ingredient – petroleum.

- Discuss together how you can tell if something is made with petroleum. Some possible descriptors include: feels oily; can be bent; usually doesn't break if you drop it; can be hard or soft; can be waterproof; doesn't rust; usually lightweight; lasts a long time; is recyclable or is made from recycled material; can be colourful or clear; can melt. Of course these don't apply to every petroleum-based product but by joining in this simple discussion, students will develop the necessary knowledge to work through the activity booklet.

- Tell students that one of the most common petroleum products is gasoline that goes into a car to make it run. Ask students to suggest other vehicles that also use a type of petroleum product to run, e.g. truck, van, sport utility vehicle, boat, airplane, jet, motorcycle, etc. Write or draw these on a large poster.

- Create a class graph titled "How I get to school". Give each student a sticker. Have students glue their sticker in a bar over the transportation method they use most days: drive, walk, ride a bike, etc. Which students relied on petroleum to get to school? (Answer: They all did! The ones who were driven used the most petroleum – gasoline, motor oil, plastic car parts, artificial rubber tires, vinyl upholstery, carpeting, dashboard, etc. The ones who rode bikes needed petroleum for their tires, seats, pedals and handlebar grips. And those who walked probably wore runners or rubber boots!)

- Show the students a sponge, pointing out the holes in it. Get the sponge wet and then squeeze the water out to show the class how water gets trapped inside the spaces in the sponge. Explain that petroleum comes from underground rocks that hold oil like a sponge holds water. The word petroleum comes from two Greek words that mean "rock oil". Help the students understand the word petroleum by dividing it in two. Write on the board: petro = rock + oleum = oil.

Petroleum Magic Activity Booklet – Answers and Ideas

Page 2 – Magical Petroleum

The products made from petroleum shown on this page are:

- Toothpaste
- Runners
- Glue
- Bubble Gum
- Toothbrush
- Computer (hardware, CDs, disks and cords)
- Bike tires (and seat, handlebar grips and pedals)
- Crayons
- Candles

The petroleum-based products that can be recycled are:

- Milk jugs
- Tires
- Pop bottles
- Motor oil (and its container)

Page 3 – From Earth to Us

The resources and products connect as follows:

- Bread = wheat field
- Toilet paper = trees
- Pie = berry bush
- House paint and brush = pumpjack
- Plastic shower curtain = pumpjack
- Fish for dinner = ocean or lake or river
- Drinking water from tap = river or lake
- Stone fence = mountains and rocks

Extension

For a greater challenge, students could make small drawings of additional products made from these resources and glue them on their booklet illustration. For example, students might draw a hamburger bun (wheat field), jar of raspberry jam (berry bush), storybook (trees) or basketball (pumpjack).

Pages 4 - 5 Products from Petroleum

Remind students that sometimes a product can be made from a mix of petroleum and other materials (such as a stereo with plastic and metal components). There are 20 petroleum products pictured here. The only items not made with petroleum are:

- $1 coin
- Bike chain and lock
- Light bulb
- Tree house
- Book

Remind students that petroleum-based products can last a very long time.

That's why we should reuse and recycle them whenever we can. The reusable petroleum products on these pages are:

- Camera
- CD
- Dentures
- Fleece vest
- Football
- Garden hose and sprinkler
- Hair brush
- Helmet
- In-line skates
- Portable CD player
- Rubber boots
- Sunglasses
- Telephone
- Parachute

The recyclable petroleum products shown on these pages are:

- Pop bottle
- Vitamin bottle
- Fleece vest
- Dishwashing liquid bottle

Pages 6 - 7 Who am I?

1. Button
2. Garbage bag
3. Balloon or beach ball
4. Toothpaste
5. Sunglasses
6. Telephone
7. Tires
8. Bubble gum
9. Rubber boots
10. Pop bottle

Extension

For a greater challenge, students could write their own "Who Am I?" questions for different petroleum-based products, like some of the ones shown elsewhere in the booklet. When there are enough clues written, each student could read out a clue and ask the rest of the class to guess the product.

Pages 8 - 9 A Day Without Petroleum

Suggested responses:

1. I wouldn't be able to: go anywhere in a car, sit on plastic lawn furniture, play with Lego®* or Barbie®**, wax the floor, take photos, chew gum, brush my teeth with toothpaste, watch TV, blow dry my hair or glue anything.

2. I wouldn't be able to wear: a fleece vest, runners, rubber boots, helmet, in-line skates or anything made from nylon or polyester.

Did you know?

Much of the synthetic fleece clothing on the market today is made from recycled pop bottles, which are made from natural gas.

3. I wouldn't be able to drink anything in a plastic bottle or plastic cup, or anything from a straw. I wouldn't be able to eat anything in a plastic container, or anything in wax paper or plastic wrap.

4. I wouldn't be able to play: basketball, golf, hockey, tennis, volleyball or a guitar.

5. I wouldn't be able to go: skiing, bike riding, skateboarding, boating, fishing or running.

6. I wouldn't be able to listen to a CD, MP3 player, computer or headphones.

* Registered trademark of the LEGO Group.
** Registered trademark of Mattel, Inc.

Page 10 – Old into New

The recycling activities on pages 10 and 11 will be more challenging for the students. The teacher and/or a classroom helper should lead the students through the activities by asking key questions that will stimulate discussion about recycling and recycled products.

The old and new products connect as follows:

- Milk jug = Plastic garbage can and plastic bench
- Plastic grocery bag = Large plastic garbage bag
- Tire = Playground swing made from a tire
- Pop bottle = Fleece vest
- Used motor oil = New motor oil

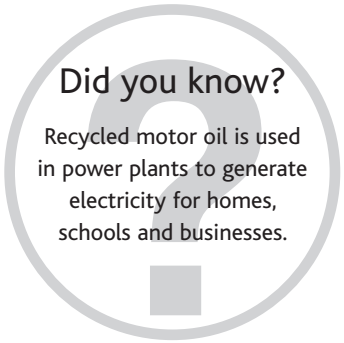
Page 11 – Life of a Milk Jug

The simplified order of events in the life of a milk jug are:

1. Pumpjack brings petroleum to surface
2. Oil goes into processing plant that makes milk jugs
3. Full milk jug lands on kitchen table
4. Empty milk jug goes into recycling bin
5. Milk jugs are turned into garbage can and plastic lumber for park bench

Extension

For a greater challenge, students could draw the life story of another petroleum-based (and recyclable) product like a tire, pop bottle or grocery bag.



Page 12 – Take Home Activity

Because so many petroleum-based products are found in the home, we have added a take-home component to the Petroleum Magic activity booklet. To complete the activity, students work with their families to identify six petroleum-based products at home. They write those products on the list provided on the back page of the booklet. Then they think of one way to help conserve petroleum, by reducing their use of a petroleum product, reusing a petroleum product many times over, or recycling a product so it can be made into something else. They add their conservation idea to the bottom of the list, and have their at-home helper sign the form.

When students have completed this short at-home activity, they bring their list back to school and share it with their classmates.

Teachers may wish to photocopy the back of a booklet to have spare take-home activity sheets on hand in case students lose them or forget them at home. If students are having difficulty completing the project at home, a few minutes could be devoted to the activity in school. Students might enjoy working with an older student who could help them identify petroleum-based products at school, and who could sign their form when it is completed.