



# Geoscape Ottawa-Gatineau

Grade 7 Lesson Plans to accompany the Geoscape Ottawa-Gatineau poster and website  
F. Fiset and J. Aylsworth

## Theme Five: Wealth from the Land

List of Expectations		
Grade	Strand and Topic	Expectations
7	Science: Earth and Space Systems The Earth's Crust	<ul style="list-style-type: none"> <li>investigate some of the ways in which humans have altered the landscape to meet their needs and assess the environmental and economic consequences;</li> <li>identify earth resources used by humans to manufacture products</li> </ul>
7	Geography: Natural Resources	<ul style="list-style-type: none"> <li>demonstrate an understanding of the concept of sustainable development and its implications for the environment</li> </ul>

### Overview

The Geoscape "Wealth from the Land" theme presents the natural resources, past and present, in the Ottawa-Gatineau area and will encourage students to be aware of the importance and implications of mining natural resources.

At the end of these lessons, students will be able to:

- recognize the natural resources in the Ottawa-Gatineau area
- appreciate the impact of mining resources on society, economy and the environment

Suggested Lessons	Brief Description
Students Take Notes	Overhead: Wealth from the Land
Key Word Game	Word Search
Lesson 1	Mine it or Grow it
Lesson 2	Mining Chocolate Chips
List of related web sites and resources	<p>Information on how cement and concrete are made, including what basic rock types are used.  <a href="http://matse1.mse.uiuc.edu/~tw/concrete/prin.html">http://matse1.mse.uiuc.edu/~tw/concrete/prin.html</a></p> <p>History of concrete  <a href="http://matse1.mse.uiuc.edu/~tw/concrete/hist.html">http://matse1.mse.uiuc.edu/~tw/concrete/hist.html</a></p> <p>Frequently asked questions about concrete and cement  <a href="http://www.kuhlman-corp.com/FAQ.html">http://www.kuhlman-corp.com/FAQ.html</a></p> <p>Lesson plans on the subject of peat moss (produced by <i>Canadian Sphagnum Peat Moss Association</i>)  <a href="http://www.peatmoss.com/hortprog1.html">http://www.peatmoss.com/hortprog1.html</a></p> <p>Lesson plans on the use of mineral resources (Mineral Information Institute, USA)  <a href="http://www.mii.org/">http://www.mii.org/</a></p>

Students take notes: **Wealth From the Land**

## Mining Today for Aggregates and Peat

Type	Name of resource	Description	Uses
Mineral	Crushed Stone* Sand and Gravel*	Coarse grained	Construction materials to make concrete and build roads
		Fine grained	Plastics, glass, paint, wallboard and roofing tiles
Organic	Peat Moss**	Decomposed plant material	Horticultural industry

\*Excavation of pits and quarries may conflict with urban lifestyle (noise, dust, rehabilitation issues)

\*\*Mining of peat moss is controversial as its removal destroys the bog, thus changing wetland recharge areas for groundwater and destroying bog habitat for wildlife.

Students take notes: Wealth From the Land

## Past Mines

Many minerals used to be mined in the Ottawa-Gatineau area between the mid 1800's and the mid 1900's.

Metals	Industrial Minerals	Newly Discovered Minerals*
Lead Iron Molybdenum Zinc Silver	Feldspar Apatite Mica Graphite Brucite	Bytownite Wakefieldite Carletonite Weloganite, named after Sir W.E. Logan, founder of the GSC Sabinaite, named after Ann Sabina, mineralogist at the GSC and author of popular mineral guidebooks.

*\* named in honour of local mineralogists, collectors, localities, and institutions*

Quarries	Type of Stones	Example of use
East of Kanata	Sandstone	Parliament Buildings Museum of Nature
Hwy 417 at Stittsville	Limestone	Crushed stone
Carlington Hill and Gatineau Casino area	Limestone	Production of cement



Aggregate  
Apatite  
Bog  
Brucite  
Cement

Concrete  
Feldspar  
Graphite  
Horticultural  
Iron

Lead  
Limestone  
Mica  
Molybdenum  
Peat

Quarry  
Sandstone  
Silver  
Wetlands  
Zinc

## 5.1 Lesson 1: MINE IT OR GROW IT

### **Brief Description**

A teacher-led class discussion to discover the importance of mining to our everyday life

### **Suggested Materials**

blackboard

**Duration** 20 minutes

### **Lesson Instructions**

1. Teacher explains that everything we use comes from the land. The original material must be grown (organic) or mined (inorganic) before they are processed.
2. Teacher puts 2 headings on the blackboard, Mine and Grow.
3. Students name things that they have touched since awakening this morning and class decides whether it is mined or grown. Form lists on blackboard.

Examples of “mined” products include:

Light switch (and electric wires)  
Alarm clock  
Light bulb and lamp  
Toothbrush and comb  
(all plastic things)  
Toothpaste, soap  
Clothing of man-made fibres  
Shoes (non-leather)  
Jewellery, eyeglasses  
Taps, sink, toilet, countertops  
China plates, glasses  
Fridge, stove, toaster  
Plaster, paint  
Brick/concrete walls/floors

Roof shingles (non-cedar)  
Linoleum or tile floor  
Carpets of man-made fibres  
Gasoline, oil  
Bus, car  
Road, sidewalk  
Parking metres  
Blackboard  
Chalk  
Pens and pencils  
CDs, DVDs, and players  
TV, radio  
Electronic games  
Computers

## 5.2 Lesson 2: Mining Chocolate Chips

### **Brief Description**

A hands-on activity that gives students an opportunity to appreciate the factors involved in mining natural resources. Students will extract chocolate chips from cookies using simple “tools” while showing concern for the impact on the surrounding areas.

### **Suggested Materials**

Chocolate Chip Cookies (one per group)  
Toothpick (at least one per group)  
Popsicle stick (at least one per group)  
Copies of student worksheet and landscape diagram

**Duration** 40 minutes

### **Lesson Instructions**

1. Start the activity by preparing the students with an explanation of why we need to extract natural resources. When we do it, we need to be aware of the following:

- Is it cost effective? Compare the value of the resource to the cost of extracting it (exploration, equipment, workers, transportation)
- Will this resource benefit society? (employment, profits, better lifestyle)
- How will the extraction process impact the environment? (lakes and rivers surrounding the mining area, groundwater quality, humans and wildlife, etc.)

2. Explain the “Mining Chocolate Chips” activity:

“You have just discovered a precious mineral in the Ottawa area. The only problem is that this mineral is present in very small amounts and the host (surrounding) rock contains elements that are harmful to the environment, particularly when dissolved in water. A rare bird species nests near the outcrop.

The model you will be using is a chocolate chip cookie. The chocolate chips represent the precious mineral and the rest of the cookie represents the host rock.”

3. Students place their cookie on the landscape diagram as indicated. Using a toothpick and/or a Popsicle stick, they try to remove as many chocolate chips as possible. They then complete the worksheet.

*Student Worksheet:*        Mining Chocolate Chips

1. Was it difficult to remove the chocolate chips with the tools provided? What other tools would be more appropriate? Would it be worth going out to buy new tools?
2. Did the chocolate chips come out in one piece or did most of them break?
3. What happened to all the cookie crumbs as the chocolate chips were being extracted?
4. How will the crumbs that reach the river affect the water? How will this affect humans, animals and vegetation in the area?
5. What can you do to minimize the affect on the surrounding area?
6. When you have finished extracting the chocolate chips, where can you go to get more?
7. What does the cookie look like when you're finished?
8. What would you do to improve the environment of your landscape during and after the mining the chips?
9. In reality, when planning to extract minerals from the ground, how do mining companies decide whether or not it is worth doing? Will they make money?
10. Do you think that mining minerals affects the environment? Explain.
11. Transportation is also a big issue when mining. How would you deal with transporting equipment and workers to the site if there were no roads? How would you transport the "minerals" from the site?

Mining Chocolate Chips

