# Canadians and the Weather

## Lesson Overview (4 periods)

Students will design and conduct an experiment to test and compare different house building materials from the 1700s, 1800s and 1900s used by Canada’s founding peoples. They will investigate how well people were protected from the weather and consider benefits of reusing traditional building concepts in a modern setting.

## Connections to Environmental Education

Students will learn about the resources of the Earth, particularly soil and minerals, their characteristics, and their role in supporting living organisms as they investigate different historic building materials and their effectiveness against Canadian weather. This activity should enable students to recognize the need to incorporate an environmental perspective in decision making models as they consider the benefits of using traditional building concepts in modern times to achieve sustainable progress.

## GRADE 7 SCIENCE AND TECHNOLOGY, HISTORY

## Curriculum Expectations

Science and Technology (2007) – Understanding Earth and Space Systems: Heat in the Environment
2. Investigate ways in which heat changes substances and describe how heat is transferred.
2.4 Use Scientific inquiry/experimentation skills to investigate heat transfer through conduction, convection, and radiation.

History and Geography (2004) – New France

Use a variety of resources and tools to gather, process, and communicate information about how settlers in New France met the physical, social, and economic challenges of the new land.

Use a variety of primary and secondary sources to locate relevant information about how early settlers met the challenges of the new land.

## Learning Goals

At the end of this lesson, students will understand that certain historic building materials are more effective than others at protecting people against Canadian weather because of heat transfer properties and that historic materials and procedures can be modified to achieve sustainable progress.

## INSTRUCTIONAL COMPONENTS AND READINESS

## Readiness

Knowledge of the types of homes built by Aboriginal Peoples and the building materials used.
Knowledge of how heat is transmitted through conduction.
Understand that only one variable can be changed in a fair test.

## Terminology

Aboriginal Peoples, climate, conduction, conductor, culture, experiment, fair test, First Nation(s), heat transfer, material, natural resource, resources, sustainability, sustainable development, temperature, weather.

## Materials

**Canadians and the Weather Lesson Plan** (Print the lesson plan you are viewing)

**BLM1 – Homes and Building Materials Graphic Organizer**
**BLM 2 – Investigating the Effect of Weather on House Building Materials**

**BLM 3 – Investigating the Effect of Weather on House Building Materials – Teacher’s Guide and Answer Key
BLM 4 – Green Roof Posters – Assessment**
**”First Nations and Inuit - Shelter”** webpage <http://www.ecokids.ca/pub/eco_info/topics/first_nations_inuit/shelter.cfm>
**“First Nations in Canada”** webpage section on **“Homes”** <http://www.aadnc-aandc.gc.ca/eng/1307460755710/1307460872523>
“**Aboriginal Pit House”** video <http://www.youtube.com/watch?v=k1WrOc9vRR8>
**“Pit House (Istken) – Squamish Lil’wat Cultural Centre”** video <http://www.youtube.com/watch?v=Z4Kf382lpA0&feature=related>
**“Earth Sheltered Homes”** webpage <http://earthshelters.com/>
“**10 Amazing Underground Homes”** webpage <http://www.oddee.com/item_98085.aspx>
**“Green Roofs for Healthy Cities”** video <http://www.youtube.com/watch?v=7UA1rjnPZtU>
**“City Hall’s Podium Green Roof”** webpage <http://www.toronto.ca/nps/revitalization/greenpodiumroof/index.htm>
1 roll of sod
4 15cm square pieces of animal fur
4 15cm square pieces of suede
4 15cm square pieces of birch bark
4 15cm square pieces of elm bark
4 15cm square pieces of cedar bark
1 bucket soil
8-10 small spruce boughs

4 15cm square pieces of cedar plank
4 15cm square pieces of other wood plank
4 15cm diameter stones
4 bricks
8 wood shingles

8 slate shingles

4 15cm square pieces of metal or baking sheets
6 ice blocks

6 desk lamps with incandescent bulbs, or spot light, retort stand and clamp
15 thermometers
6 spray bottles
water
paper towels
rags for clean up

## MINDS ON

Whole class and individual. Shared reading and graphic organizer. Identify home-building materials of Aboriginal Peoples and settlers.

Use a data projector or overhead projector to display **”First Nations and Inuit - Shelter”** webpage <http://www.ecokids.ca/pub/eco_info/topics/first_nations_inuit/shelter.cfm>. Conduct a shared reading of the material. Students use the spider map **BLM1 – Homes and Building Materials Graphic Organizer** to record information from the reading. An alternate website is the **”First Nations in Canada”** webpage section on **“Homes”** <http://www.aadnc-aandc.gc.ca/eng/1307460755710/1307460872523>.

Explain to the students that many of the first settlers would have adopted local Aboriginal Peoples practices for building homes. As well, early Canadians built homes of wood, stone and eventually brick. Early roofing materials included wood shingles, slate shingles, zinc, lead, and tern (copper bearing steel coated with an alloy of 80% lead and 20% tin). Students should add this information to their spider map.

### Minds On: Assessment

Assessment for learning.
Circulate in the classroom as students are filling in their graphic organizers. Guide students to gather required information and organize it on the spider map.

### Minds on: Differentiated Instruction

Provide paper copies of **”First Nations and Inuit - Shelter”** webpage <http://www.ecokids.ca/pub/eco_info/topics/first_nations_inuit/shelter.cfm> and highlighters. Guide students to highlight required information in the text and transfer it to the graphic organizer.

Provide access to **“First Nations in Canada”** webpage section on **“Homes”** <http://www.aadnc-aandc.gc.ca/eng/1307460755710/1307460872523> for additional information.

## ACTION!

Groups of 4. Lab investigation.

Students use **BLM 2 – Investigating the Effect of Weather on House Building Materials** to assess the relative effectiveness of different building materials to protect against rain, cold and heat. They design their experiment to test the effectiveness of two or more materials under conditions of rain, and heat or cold. They make conclusions based on the results of the experiment. Teachers use **BLM 3 – Investigating the Effect of Weather on House Building Materials – Teacher’s Guide and Answer Key** to plan and prepare for the lab investigation.

### Action: Assessment

Assessment of learning. Marking scheme.

Use **BLM 3 – Investigating the Effect of Weather on House Building Materials – Teacher’s Guide and Answer Key** to assess students’ work.

### Action: Differentiated Instruction

Students choose the number of materials that they will investigate.

## CONSOLIDATION

Whole class and individual. View videos and webpages and create a poster.

Show students the “**Aboriginal Pit House”** video <http://www.youtube.com/watch?v=k1WrOc9vRR8> or the **“Pit House (Istken) – Squamish Lil’wat Cultural Centre”** video <http://www.youtube.com/watch?v=Z4Kf382lpA0&feature=related>. Show students **“Earth Sheltered Homes”** webpage <http://earthshelters.com/> pointing out the environmental benefits of earth sheltered homes. Discuss similarities and differences between First Nations pit houses and earth sheltered homes. Show students webpage “**10 Amazing Underground Homes”** webpage <http://www.oddee.com/item_98085.aspx> pointing out vegetation growing on the roofs of houses 2-9. Show students **“Green Roofs for Healthy Cities”** video <http://www.youtube.com/watch?v=7UA1rjnPZtU>. Show students **“City Hall’s Podium Green Roof”** webpage <http://www.toronto.ca/nps/revitalization/greenpodiumroof/index.htm> (scroll over the photo, click on the full screen icon, and view the slideshow of seven photos). Discuss benefits of green roofs.

Students create a poster demonstrating the benefits of green roofs or subterranean homes. Students should include at least three benefits in their poster.

### Consolidation: Assessment

Assessment as learning.

In groups of 4, students present their posters to each other with an opportunity to ask questions and give feedback. Students then use **BLM 4 – Green Roof / Subterranean Homes Posters – Assessment** to peer assess other posters in the group and to reflect on the peer assessments of their own posters.

### Consolidation: Differentiated Instruction

Students could prepare a television or radio advertisement explaining the benefits of green roofs or subterranean homes.