Origin of Canada’s Physiographic Regions

Lesson Overview
This lesson examines the nature of Canada’s physiographic regions and their geological origin. This is an introductory lesson that could be further developed into a more in-depth understanding of rock structures and mineral resources or link to a closer understanding of Canada’s early settlement pattern.

Grade Level
Grades 9-12 (secondary)

Time Required
Approximate time required: 60-80 minutes

Curriculum Connection (Province and course)
British Columbia. Social Studies 10: Environment - Canada from 1815 to 1914
- E1: describe the physiographic regions of Canada and the geological processes that formed these regions

Link to Canadian National Geography Standards
Essential Element #1 (Grade 9-12) - The World in Spatial Terms
- Map, globe, and atlas use (e.g. observing and analyzing relationships)

Essential Element #2 (Grade 9-12) - Places and Regions
- Physical and human processes shape places and regions
- Changes in places and regions over time

Essential Element #3 (Grade 9-12) - Physical Systems
- Components of Earth’s physical system (atmosphere, lithosphere, biosphere, and hydrosphere)
- Plate tectonics / continental drift

Essential Element #5 (Grade 9-12) - Environment and Society
- World patterns of resource distribution and utilization

Essential Element #6 (Grade 9-12) - The Uses of Geography
- Influence of geographical features on the evolution of significant historic events and movements

Principle Resource
This lesson is based on content found in the “Explore by Theme” section of The Atlas of Canada Online website at www.canadiangeographic.ca/atlas/.
Additional Resources, Materials and Equipment Required

- This lesson includes one student activity sheet. Canada outline maps are available at http://atlas.nrcan.gc.ca/site/english/maps/reference/outlinecanada

Main Objective

The primary goal of this lesson is to establish an understanding of the origin of physiographic regions as a result of geological processes.

Learning Outcomes

By the end of the lesson, students will be able to:

1. Describe Canada’s physiographic regions;
2. Match data from Canada’s physiographic regions with geologic origin;
3. Provide a simplified hypothesis about the origin of the Canadian Shield and its border regions.

- LO (1) Students will examine and extract information from reading selections and complete several tables.
- LO (2) Students will answer questions based on the table and the map data.
- LO (2) Students will practice their reading skills and make inferences from the text.
- LO (3) Students will examine the maps showing Canada’s landform regions and, together with their table data, draw conclusions about the formation and shaping of Canada’s regions.
- LO (4) Students will illustrate their conclusions in diagram form.

Lesson

<table>
<thead>
<tr>
<th>TEACHER ACTIVITY</th>
<th>STUDENT ACTIVITY</th>
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</table>
| Introduction     | • Introduce students to the idea of an online atlas and that it can be used to collect data on Canada’s physiographic regions in order to understand how they formed.  
                   • Introduce the idea of locating important resources and making decisions about human settlement based on the region.  
                   • Hand out a copy of the student activity sheet and a copy of an outline map of Canada available at http://atlas.nrcan.gc.ca/site/english/maps/reference/outlinecanada | • Students pair up in front of one computer or work individually depending on the set-up to complete the Student Activity Sheet. |

Lesson (cont’d)

<table>
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<tr>
<th><strong>TEACHER ACTIVITY</strong></th>
<th><strong>STUDENT ACTIVITY</strong></th>
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| **Lesson Development** | • Teacher helps individual groups locate materials and helps them complete the tables and the questions.  
• Teacher solicits answers to ensure all students are involved with the task and gets feedback to see if they are on the right track.  
• Before students tackle question #4, the teacher may wish to clarify the difference between forming a landscape and shaping a landscape. | • Students continue to work to complete the activity sheet.  
• Students take the True/False test and reflect on the answers as they are discussed in class.  
• Students move on to the second link and follow the instructions. |
| **Conclusion** | • Students are encouraged to think in simple terms when it comes to landform formation and shaping processes.  
• They will have to be told what a profile is and how a simple profile can easily be used to illustrate key concepts to understand landscape formation and subsequent remodelling.  
• Students are encouraged to apply their newly learned navigation and reading skills in a possible extension or homework activity to explore the economic importance of Canadian regions. | • Students sketch out how they believe the Canadian Shield used to look and how it changed over time. Their results can be summarized by the class and analyzed. |

Assessment of Student Learning

Student assessment rests on their completion of the student activity sheet and their conclusions with respect to the formation of Canada’s physiographic regions.

Teachers could also use the images in the regions sections to create a power point presentation or let the students create a power point presentation in which they describe the connection between geology and physiography.

Further Reading

• Further reading would involve a follow-up lesson that would centre on the potential uses of different physiographic regions in economic terms.

• An extension activity is being offered to provide a rationale for the study of physiographic and geological regions in terms of their economic utility. Additional reading material that complements the atlas materials is available at [http://www.geo.msu.edu/geo333/Precambrian.html](http://www.geo.msu.edu/geo333/Precambrian.html)
Student Worksheet:
Canada’s Physiological Regions and Their Geological Origin

This activity is based on connecting ideas from two different areas. First, you will examine a series of maps that describe Canada’s physiographic regions. These readings can be found by using Link #1 shown below and by following the navigation buttons. You will then link this knowledge to geologic origin information. Simply follow the instructions


Sidebar Navigation: Explore by Themes > The Land > Canada’s Many Faces

1. From the reading selection, identify Canada’s major landform regions and list them in the table below.

<table>
<thead>
<tr>
<th>LAND FORM REGION</th>
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</tbody>
</table>

2. Based on your reading, what can you say about how these regions are determined?

   ____________________________________________________________

   ____________________________________________________________

   ____________________________________________________________

3. Based on your reading, what forces formed and shaped these regions?

   ____________________________________________________________

   ____________________________________________________________

   ____________________________________________________________
4. Examine each region in more detail. Choose Landforms in the drop-down navigation bar and go to each region to learn about its characteristics. Use the information to complete the table below.

<table>
<thead>
<tr>
<th>Landform</th>
<th>Approximate Age</th>
<th>Forces of Formation(^1)</th>
<th>Shaping Forces(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cordillera</td>
<td></td>
<td></td>
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<tr>
<td>Interior Plains</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Arctic Lands</td>
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<td></td>
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<tr>
<td>Canadian Shield</td>
<td></td>
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<tr>
<td>Great Lakes-St. Lawrence Lowlands</td>
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<tr>
<td>Appalachian</td>
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</tbody>
</table>

Notes: \(^1\) Formation = creating and building. Agents of formation: large-scale tectonic forces, collision of plates, volcanism, folding. \(^2\) Shaping = eroding, changing, wearing down. Agents of shaping: wind, water, glaciers.
Student Worksheet: Page 3

5. Based on your reading, decide if the following statements are true (T) or false (F).

   __ The Canadian Shield provides rock materials for the surrounding landforms.
   __ Most of the surface materials from the Canadian Shield were pushed to adjacent regions as a result of glacial action.
   __ The Interior Plains are solely the result of sedimentation from large inland seas.
   __ The formation of the Cordillera region is not related to sedimentation.
   __ The Great Lakes-St. Lawrence region is evidence of inland sea sedimentation with consequent shaping from glacial action.

Now that you have learned something about Canada’s physiographic, or landform regions, you are ready to link this knowledge to Canada’s geology. You will do this by using Link #2 shown below and by navigating the links. Simply follow the instructions.

Link #2:  http://www.canadiangeographic.ca/atlas/themes.aspx?id=manyfaces&sub=manyfaces_basics_geology&lang=En

1. Upon close inspection of the geologic timeline,
   a. Identify the oldest time period: ________________________________________________
   b. Review your notes and tables on the Canadian landscape and indicate which region is likely the oldest. ________________________________________________

2. Click on the Timeline Buttons in order to reveal the regions formed in each era. Do this by completing the table below. Colour these regions on your outline map and neatly label them.

<table>
<thead>
<tr>
<th>Era</th>
<th>Time</th>
<th>Region</th>
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<tbody>
<tr>
<td></td>
<td>65 million to present day</td>
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<tr>
<td></td>
<td>600 – 250 million years</td>
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</table>
Student Worksheet: Page 4

4. Which Canadian physiographic region formed first, and how did it form?

__________________________________________________________________________

__________________________________________________________________________

3. Which landform-shaping agents acted on this landform and led to the formation of adjacent landforms?

__________________________________________________________________________

__________________________________________________________________________

If you are unsure, you may refer to the short film by following this link:
http://www.canadiangeographic.ca/atlas/themes.aspx?id=waterrich&sub=waterrich_basics_glaciers&lang=En

4. Now draw a sketch to represent the shield when it first formed. Then sketch the same shape but include the effects of erosion that would have worn it down to its current profile. Indicate the location of the materials that have been eroded on your second sketch.
Student Worksheet: **Extension: Economic Importance of Canada’s Geological Regions**

Based on your reading of the information on this website, complete the following table.


<table>
<thead>
<tr>
<th>Physiographic Region</th>
<th>Economic Use</th>
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