

# Physical Geography 12

## Brookmere Secondary - Coquitlam College

### Course Overview

#### Big Ideas: What students will UNDERSTAND

- Incorporating data from a variety of sources allows us to better understand our globally connected world.
- Natural processes have an impact on the landscape and human settlement.
- Interactions between human activities and the atmosphere affect local and global weather and climate.

#### Curricular Competencies:

Curricular Competencies Content Students are expected to be able to do the following:	Students are expected to know the following:
<ul style="list-style-type: none"> <li>• Use geographic inquiry processes and geographic literacy skills to ask questions; gather, interpret, and analyze data and ideas from a variety of sources and spatial/temporal scales; and communicate findings and decisions (evidence and interpretation)</li> <li>• Assess the significance of places by identifying the physical and/or human features that characterize them (sense of place)</li> <li>• Assess the interpretations of geographic evidence after investigating points of contention, reliability of sources, and adequacy of evidence (evidence and interpretation)</li> <li>• Draw conclusions about the variation and distribution of geographic phenomena over time and space (patterns and trends)</li> <li>• Evaluate how particular geographic actions or events affect human practices or outcomes (geographical</li> </ul>	<ul style="list-style-type: none"> <li>• structure of, feedback within, and equilibrium of natural systems</li> <li>• distinguishing features of the atmosphere, hydrosphere, cryosphere, lithosphere, biosphere, and anthroposphere</li> <li>• connections and interactions between the spheres</li> <li>• features and processes of plate tectonics and their effects on human and natural systems</li> <li>• features and processes of gradation and their effects on human and natural systems</li> <li>• natural disasters and their effects on human and natural systems</li> <li>• features and processes of Sun–Earth interactions and resulting patterns of climate, landscapes, and ecosystems</li> <li>• climate, weather, and interactions between humans and the atmosphere</li> <li>• characteristics of global biomes, including climate, soil, and vegetation</li> </ul>

<p>value judgments)</p> <ul style="list-style-type: none"> <li>• Evaluate features or aspects of geographic phenomena or locations to explain what makes them worthy of attention or recognition (geographical importance) Identify and assess how human and environmental factors and events influence each other (interactions and associations)</li> <li>• Make reasoned ethical judgments about controversial actions in the past and/or present, and determine whether we have a responsibility to respond (geographical value judgments)</li> </ul>	<ul style="list-style-type: none"> <li>• features and processes of the anthroposphere and their effects on natural systems.</li> <li>• natural resources and sustainability</li> </ul>
---	--

### **Assessment:**

Your marks will reflect how well you are able to demonstrate improved skill in the **core competencies** of critical thinking, effective communication, and social responsibility.

Your learning will be evaluated through various methods.

- Daily participation in oral and written work
- Teacher observation
- Worksheets exercises
- Student self-assessment
- Quizzes and unit review tests
- Projects and presentations
- Oral and written reports/essays/labs
- Midterm and final examinations

### **Evaluation:**

Marks:	Tests (6 at 8% each)	48%
Homework	(6 units at 2% per unit)	12%
Assignment	(2 at 5%)	10%
Mid-Term	(15%) + Final Exam (15%)	30%

Mid-Term + Final Exam will be written by all students.

Your success in this course depends on your willingness to apply yourself and work hard.

## **Principles of Learning generally reflect First Peoples pedagogy**

Because these principles of learning represent an attempt to identify common elements in the varied teaching and learning approaches that prevail within particular First Peoples societies, it must be recognized that they do not capture the full reality of the approach used in any single First Peoples society.

- Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors.
- Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).
- Learning involves recognizing the consequences of one's actions.
- Learning involves generational roles and responsibilities.
- Learning recognizes the role of indigenous knowledge. Learning is embedded in memory, history, and story.
- Learning involves patience and time.
- Learning requires exploration of one's identity.

Learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain situations.

# **Unit Overview**

## **Unit 1: Earth Surface (Week 1)**

**Curricular Competency:** Use geographic inquiry processes and geographic literacy skills to ask questions; gather, interpret, and analyze data and ideas from a variety of sources and spatial/temporal scales; and communicate findings and decisions (evidence and interpretation)

**Curricular Competency:** Assess the significance of places by identifying the physical and/or human features that characterize them (sense of place)

### **Assignments:**

- Students will complete activity sheets which summarize key geographic facts. Students will be assessed through quizzes, and homework completion.
- Students are introduced to ESRI ArcGIS Online to create Story-Maps, and other presentation formats which act to introduce new geographical software as learning evaluative tool.
- ESRI Six by Six – Activity (Pt.1)

### **Key Questions:**

- How does tectonic setting affect the perspectives and experiences of a local community?
- What are the differences between various types of rocks, minerals, and earth materials?
- How does the rock cycle change rocks and minerals?
- What evidence suggests that a supercontinent will form again?
- What is the significance of the global distribution of volcanoes, mountain ranges, and earthquake epicentres?

### **First Peoples Learning embedded within unit:**

- Learning involves patience and time
- Learning is embedded in memory, history, and story

### **Unit Assessment:**

- Students reflect on learning at end of unit
- Content is not assessed except for completion; the writing is intended to provide students a chance to internalize the material by finding personal emotional connections to the material
- Students research and present using Story Maps their home with and vacation locations, which introduce this technology and reflect on past memorable geographic locations
- Unit quiz

### **Resources:**

<https://www.arcgis.com/index.html>

Studies in Physical Geography - ISBN 978-0-9735999-8-5  
Geography 12 Student Textbook/Workbook/Study Guide  
<https://www.esri.com/en-us/arcgis/products/arcgis-storymaps/resources>  
<https://opentextbc.ca/geology/>

## **Unit 2: Gradational Processes (Week 2-3)**

- **Curricular Competency:** Assess the interpretations of geographic evidence after investigating points of contention, reliability of sources, and adequacy of evidence (evidence and interpretation)
- **Curricular Competency:** Evaluate how particular geographic actions or events affect human practices or outcomes (geographical value judgments)

### **Assignments:**

- ESRI Six by Six – Activity (Pt.2)
- Quizzes
- Workbook Activities

### **Key Questions:**

- How have wind, water, ice, and mass movements shaped our landscape over time?
- What are the causes and effects of Earth's glaciation events?
- What impacts do human activities have on local and global groundwater resources?
- How could current use of groundwater affect future land uses?
- Explore local coastlines, parks, watersheds, lakes, and other areas to collect evidence of weathering and erosion.
- How does tectonic setting affect the perspectives and experiences of a local community?

### **First Peoples Learning embedded within unit:**

- Learning involves patience and time
- Learning is holistic, reflective, experimental and relational (focus on connectedness, on reciprocal relationships, and a sense of place)
- Learning recognizes the role of indigenous knowledge

### **Unit Assessment:**

- Students reflect on learning at end of unit
- Content is not assessed except for completion; the writing is intended to provide students a chance to internalize the material by finding personal emotional connections to the material
- Students inform and discuss in class gradational process they have seen in their home areas like the processes described within this unit
- Unit quiz

### **Resources:**

<https://www.arcgis.com/index.html>  
Studies in Physical Geography - ISBN 978-0-9735999-8-5



### **Unit 3: Weather & Climate (Week 4-6)**

**Curricular Competency:** Draw conclusions about the variation and distribution of geographic phenomena over time and space (patterns and trends)

**Curricular Competency:** Evaluate features or aspects of geographic phenomena or locations to explain what makes them worthy of attention or recognition (geographical importance)

### **Assignments:**

- Quizzes
- Workbook Activities
- Predict Weather with Real-Time Data - Explore real-time weather data, make predictions, and interpolate surfaces – Arc GIS Online Lesson, Activity & Formative Learning (Classwork/Homework)

### **Key Questions:**

- What types of information do geoscientists use to reconstruct past landscapes, environments, and geological conditions?
- Collect data to establish where most earthquakes tend to occur.
- Are their climate patterns which are dependent on location?
- How can we predict weather and climate? Is it accurate?
- How much responsibility do we have for the environment?
- Should people sacrifice some of their standard of living to halt global climate change?

### **First Peoples Learning embedded within unit:**

- Learning involves patience and time
- Learning is embedded in memory, history, and story
- Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits and the ancestors

### **Unit Assessment:**

- Students reflect on learning at end of unit
- Content is not assessed except for completion; the writing is intended to provide students a chance to internalize the material by finding personal emotional connections to the material
- Sketch and label air mass interactions and compose brief summaries of associated weather phenomena
- Unit quiz

### **Resources:**

<https://www.arcgis.com/index.html>  
Studies in Physical Geography - ISBN 978-0-9735999-8-5  
Geography 12 Student Textbook/Workbook/Study Guide  
<https://learn.arcgis.com/en/projects/predict-weather-with-real-time-data/>  
<https://learn.arcgis.com/en/projects/get-started-with-arcgis-online/>

## **Unit 4: Biosphere (Week 7-8)**

- **Curricular Competency:** Identify and assess how human and environmental factors and events influence each other (interactions and associations)
- **Curricular Competency:** Make reasoned ethical judgments about controversial actions in the past and/or present, and determine whether we have a responsibility to respond (geographical value judgments)
- **Curricular Competency:** Assess the interpretations of geographic evidence after investigating points of contention, reliability of sources, and adequacy of evidence (evidence and interpretation)

## **Assignments:**

- Quizzes
- Workbook Activities
- Soil Survey

[https://www.glbrc.org/sites/default/files/document/Teacher%20Guide\\_0.pdf](https://www.glbrc.org/sites/default/files/document/Teacher%20Guide_0.pdf)  
Measuring Soil Microbial Activity

## **Key Questions:**

- Are soil sample databases useful and practical for Gr. 12 students?
- How do Canadian scientists classify soils within Canada?
- How does soil relate to water cycle, and/or carbon cycle?

## **First Peoples Learning embedded within unit:**

- Learning involves patience and time
- Learning is holistic, reflective, experimental and relational (focus on connectedness, on reciprocal relationships, and a sense of place)
- Learning is embedded in memory, history, and story

## **Unit Assessment:**

- Students reflect on learning at end of unit
- Content is not assessed except for completion; the writing is intended to provide students a chance to internalize the material by finding personal emotional connections to the material
- Map local soils near home in Greater Vancouver area and hometown and present finding using clear map representation
- Unit quiz

## **Resources:**

Studies in Physical Geography - ISBN 978-0-9735999-8-5

Geography 12 Student Textbook/Workbook/Study Guide

<https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>

Soils - <http://www.arcgis.com/home/item.html?id=204d94c9b1374de9a21574c9efa31164>

- <https://www.glbrc.org/outreach/educational-materials/measuring-soil-microbial-activity>

## **Unit 5: Topographic Mapping & Nautical Charts (Week 9-11)**

- **Curricular Competency:** Assess the significance of places by identifying the physical and/or human features that characterize them (sense of place)
- **Curricular Competency:** Evaluate features or aspects of geographic phenomena or locations to explain what makes them worthy of attention or recognition (geographical importance)

## **Assignments**

- Quizzes
- Workbook Activities
- Constructing a 3D Topographic Map ([https://www.usgs.gov/science-support/osqi/yes/resources-teachers/constructing-a-3d-topographic-map?qt-science\\_support\\_page\\_related\\_con=1#qt-science\\_support\\_page\\_related\\_con](https://www.usgs.gov/science-support/osqi/yes/resources-teachers/constructing-a-3d-topographic-map?qt-science_support_page_related_con=1#qt-science_support_page_related_con))
- How do I construct a topographic profile? (<https://serc.carleton.edu/mathyouneed/slope/topoprofile.html>)
- Plot Your Course Assignment ([https://oceanservice.noaa.gov/education/lessons/plot\\_course.html](https://oceanservice.noaa.gov/education/lessons/plot_course.html))

## **Key Questions:**

- How are geologic maps and 3D block models used by different interest groups?
- How are 2D and 3D topographic maps created?
- Do mariners still use paper charts (maps)? When are these charts important?

## **First Peoples Learning embedded within unit:**

- Learning involves patience and time
- Learning is embedded in memory, history, and story

## **Unit Assessment:**

- Students reflect on learning at end of unit
- Content is not assessed except for completion; the writing is intended to provide students a chance to internalize the material by finding personal emotional connections to the material
- Unit quiz

## **Resources:**

Studies in Physical Geography - ISBN 978-0-9735999-8-5

Geography 12 Student Textbook/Workbook/Study Guide

[https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/topo101/pdf/mapping\\_basics\\_e.pdf](https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/topo101/pdf/mapping_basics_e.pdf)



## **Unit 6: ESRI Arc GIS Online (Week 12)**

- **Curricular Competency:** Use geographic inquiry processes and geographic literacy skills to ask questions; gather, interpret, and analyze data and ideas from a variety of sources and spatial/temporal scales; and communicate findings and decisions (evidence and interpretation)
- **Curricular Competency:** Evaluate how particular geographic actions or events affect human practices or outcomes (geographical value judgments)
- **Curricular Competency:** Make reasoned ethical judgments about controversial actions in the past and/or present, and determine whether we have a responsibility to respond (geographical value judgments)

## **Assignments**

- Quizzes
- Workbook Activities
- Creating a swipe story map (<https://www.esri.com/content/dam/esrisites/en-us/media/pdf/teach-with-gis/creating-a-swipe-story-map.pdf>)
- View depth of earthquake and aftershocks in 3D (<https://www.esri.com/content/dam/esrisites/en-us/media/pdf/teach-with-gis/responding-to-an-earthquake-off-the-western-coast-of-mexico.pdf>)
- Understanding the Global Ecosystems Map (<http://downloads.esri.com/learnarcgis/educators/global-ecosystems-map.pdf>)

## **Key Questions:**

What careers exist in Geographical Information Systems (GIS)? What education options are available for this career?

What industries use GIS?

Can the oceans survive human impacts?

## **First Peoples Learning embedded within unit:**

- Learning involves patience and time
- Learning is embedded in memory, history, and story

## **Unit Assessment:**

- Students reflect on learning at end of unit
- Content is not assessed except for completion; the writing is intended to provide students a chance to internalize the material by finding personal emotional connections to the material
- Unit quiz

**Resources:**

Studies in Physical Geography - ISBN 978-0-9735999-8-5

Geography 12 Student Textbook/Workbook/Study Guide

Teach with GIS (<https://learn.arcgis.com/en/educators/#/library>)