



Introduction

THE SPANISH INFLUENZA OF 1918 resulted in the deaths of at least 50 million people worldwide, and is considered one of the most devastating pandemics in recorded world history. Ultimately killing more people than the First World War, the Spanish Flu circled the globe, travelling with its human carriers and claiming victims at an alarming rate. Although the outbreak of the flu had a devastating effect on the world, it was not the first pandemic nor the last to challenge the health and well-being of humans across the globe.

This Giant Floor Map is Canadian Geographic Education's first global projection and focuses on medical geography or, more specifically, how geography plays a role in the spread, outbreak and eradication of deadly viruses and diseases. This Giant Floor Map and the 12 accompanying activities provide students in grades 7 to 12 with the opportunity to learn more about the geographic side of pandemics and epidemics such as the Spanish Flu, the plague, cholera and more. It also helps students learn about the importance of preparedness and how to research ways in which Canada is preparing both at home and abroad for future pandemics.

Can Geo Education acknowledges that there are countless activity ideas with this Giant Floor Map for all grade levels and that there are many other diseases and pandemics not mentioned in this learning guide. We encourage teachers to share their activity ideas with us at info@cangeoeducation.ca.



About This Resource

IN THIS GUIDE, you will find 12 learning activities linked to the Canadian National Standards for Geography, designed for students in grades 7 to 12.

1. Introduction to Global Geography

This activity introduces students to global geography and encourages them to think about how interconnected they are in the world.

2. Spanish Flu

This activity will trace the path of the Spanish Flu and help students become aware of the factors that led to the spread of such a virulent virus.

3. Malaria

In this activity, students will explore the regions where malaria is endemic and discover where isolated cases pop up.

4. Smallpox

Students will discover which countries have had smallpox outbreaks and will learn how international cooperation regarding vaccination can lead to the eradication of infectious diseases.

5. Cholera

In this activity, students will become familiar with mapping skills and use critical thinking to discover the conditions which allow cholera to continue to exist.

6. Polio

Students will discover which countries still have cases of polio and what barriers may exist to effective vaccination and eradication of the disease.

7. SARS

Students will trace the path of the SARS outbreak and learn how rapidly an infectious disease can spread from hospitals to the larger community.

8. Plague

Students will learn about a number of plague outbreaks throughout history and will connect the plagues to trade routes, urban expansion and political power.

9. Lyme Disease

Students will locate countries with endemic Lyme disease using mapping skills and examine the spread of Lyme disease in Canada.

10. Ebola

Students will understand the difficulties in containing virulent diseases and the challenges that arise from providing medical assistance.

11. Zika

In this activity, students will understand how geography can dictate the regions in which a disease can become endemic, such as with the Zika virus.

12. Safe Travels!

Students will learn about the importance of researching and improving their knowledge about a country before they visit for leisure or work.

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INTRODUCTION TO GLOBAL GEOGRAPHY



Overview

There are countless activities that can be done with a Giant Floor Map of the world. This activity is designed to introduce students to global geography and to help them explore how interconnected they are with the world. Students will examine the Giant Floor Map and use it to discuss global citizenship, landforms, climate, population distribution and current issues. They will be introduced to the subject of medical geography and how health and disease are connected to the global systems and geography of the world.

Objectives

- ▷ Students will explore the Giant Floor Map and review their knowledge of global geography.
- ▷ Using mapping skills, students will connect population distribution trends with location.
- ▷ Students will analyze patterns and trends of landform regions and population.
- ▷ Students will discover and discuss the term “global citizen.”
- ▷ Students will define and discuss the term “medical geography.”

Materials

- ▷ Chains (16)
- ▷ Pylons (20)
- ▷ Handheld device

Activity

Students will complete several small activities to learn more about how to read the Giant Floor Map and examine patterns and trends with landform regions and population. They will learn how to read latitude and longitude coordinates as well as define and understand “medical geography.”

- **How to read the map:** Ask students to stand along the map’s border and identify the five main elements of a map (title, border, compass rose, legend and scale). Bring attention to the map’s legend and ask students to locate various features on the map such as country borders, capital cities, oceans, forests and mountains.
- **Landform regions:** Ask students if they can name any of the major landforms labelled on the map. Have students place a chain along the equator and discuss how climate and landforms are connected. Finally, divide students into small groups and give each group a different natural disaster to research and present on where these events happen in the world. Examples could include: volcanic eruptions, tornadoes, cyclones, forest fires, earthquakes, floods, etc.
- **Population Geography:** Ask students to locate the five most populated countries (China, India, United States, Indonesia and Brazil) and where these countries are in relation to Canada. Discuss how the Earth’s population has surpassed seven billion and ask students what challenges the world may face in the future. How are population and landforms connected? Where are the major cities and what commonalities do they have (e.g., if they are all close or next to water)?
- **Latitude and Longitude:** Use coloured chains to locate the equator, Tropic of Capricorn and Tropic of Cancer. Use a different colour to locate the international date line and the prime meridian. Introduce lines of longitude by asking three volunteers to stand at the North Pole and follow the white lines (lines of longitude) to the South Pole. Ask students to stand on a line that is parallel to the equator and walk from west to east (along the lines of latitude). Ask all students to stand on a different city and determine the exact location of that city.



1

INTRODUCTION TO GLOBAL GEOGRAPHY



- **Medical geography:** Ask students which topics, themes and ideas fall under the umbrella of medical geography. Have students think about a time they felt sick, how they may have gotten sick and what happened. How were they treated? What did they do? How did they feel? Next, ask students to connect what they know about population distribution, climate and landforms to health and disease. Divide students into six groups, each representing a different continent (excluding Antarctica). Have students use their handheld device in groups to research and learn about common diseases that exist as well as where and how population distribution and landforms play a role in disease outbreak, spread and access to health care. Allow time for students to share what they learned.

Discussion

Use the following guiding questions to have a class discussion to learn more about how Canada is connected to the rest of the world.

- **What does Canada** import? Where do these imports come from? What about exports?
- **Which countries** are in the G7? Why is this important?
- **What does** it mean to be a global citizen?
- **What is Canada** a leader in? How can Canada help other countries in need?
- **How does** the population distribution of Canada connect to global shipping and travel patterns?

Extend your geographical thinking

This teacher's guide focuses on medical geography, but there are other lesson and activity ideas teachers can use with this map, including: climate change, historic trade and shipping routes, migration patterns in people and animals, water, pollution, resources, tourism, wind and ocean currents, time zones, culture, economics, sustainability, technology, food and crops — the possibilities are endless. Share your lesson ideas with us at info@cangeoeducation.ca or on social media [@CanGeoEdu](https://twitter.com/CanGeoEdu).

Links to the Canadian National Standards for Geography

Essential Element 1: The World in Spatial Terms

- ▷ Distribution of major human and physical features at country and global scales
- ▷ Major countries of the world

Essential Element 2: Places and Regions

- ▷ Physical and human characteristics of places and regions in Canada and the world
- ▷ How culture affects places and regions
- ▷ World political regions
- ▷ World cultural regions

2

THE SPANISH INFLUENZA

Overview

Students will trace the path of the Spanish Flu and become aware of the factors that led to the spread of such a virulent virus. They will learn which countries were affected, how troop movements helped spread contagion and how local and national government actions helped spread or stop the flu. Students will then learn about how the Spanish Flu affected Canada.

Please note: the majority of historians and virologists do not yet agree on how the Spanish Flu started or where it originated. There are several theories, the most common of which is that it originated from an American military camp in France, however no concrete answers exist because the flu spread so quickly and we lack documentation from its inception.

Objectives

- ▷ Using latitude and longitude, students will locate countries affected by the Spanish Flu.
- ▷ Students will understand how context and existing world conditions can cause contagion to spread at different rates.
- ▷ Students will dive deeper into the impact that the Spanish Flu has had on Canadian culture, specifically Indigenous Peoples in Canada.

Materials

- ▷ Spanish Flu fact card (1)
- ▷ Identity cards (29)
- ▷ Master list card (1)

Activity

Students will learn about how the Spanish Flu spread across the globe to Europe and beyond in 1918. The following activity is based on real people and real events.

- **Once students have** explored the map independently, gather around the map's border. Distribute Identity cards to all students except one. Ask students to locate their country on the map and then sit down on it.
- **Locate Kansas, United States**, on the map and ask the student without a card to stand there. Inform the group that this student is patient zero, also known as Private Albert Martin Gitchell, the first documented case of the Spanish Flu.
- **Ask the patient zero student** to select one American soldier and two American nurses from the group of students standing in the United States and shake their hands.
- **Next, inform the class** that it is 1918 and the world is at war (ask students what they know about the First World War and discuss if needed). Inform students that each of them is involved in the war in some way. Have all students read and follow the instructions on their cards. Once everyone has travelled to their final location, have students shake the hands of each student in their country or around where they are standing.
- **Finally, inform the class** that the war is now over and soldiers and nurses are allowed to travel back to their home countries. Before students depart however, notify students that there are rumours of an illness spreading around Europe. Using the Master list card, read out which students have been infected and ask them to sit down. Inform them that they caught this illness and passed away. Those that are left standing have survived and can now travel back to their home country.
- **This illness was known** as the Spanish Flu. For those students who have returned home to their countries, inform them that because of the war, there was a shortage of doctors and hospital supplies. As a result, members in your local community (and later your country at large) were infected.
- **Ask students:** Who is left alive? What do all the survivors have in common? Direct the survivors to look at their age on their identification cards. Most survivors are over 35 years of age.



2

THE SPANISH INFLUENZA

Discussion

Begin a class discussion and learn more about the Spanish Flu pandemic, asking students the following questions below. Use the Spanish Flu fact card for additional information.

- **Gather students** around Canada and inform the class that the Spanish Flu killed approximately 55,000 people in Canada, most of whom were young and in the prime of their lives. The disease arrived in port cities (Quebec, Halifax, Montreal) and spread westward across the country. With the casualties from the First World War and the Spanish Flu, the number of healthy workers declined rapidly, causing the Canadian economy to become paralyzed.
- **Ask students** about the possible origins sources of the Spanish Flu (e.g., military camps). Why are these places considered potential sources for the Spanish Flu (e.g., sick and malnourished soldiers in close quarters help spread disease)?
- **Ask students** where Canadian health care professionals may have focused their attention with the treatment of the Spanish Flu. Discuss how Canada's Indigenous Peoples may have suffered from this disease and how their communities may have been affected. If the source of the disease was known, could the spread have been prevented?
- **What method of transportation** would the soldiers and nurses have used to return home at the end of the war? Would this have affected the way the disease spread?
- **How do people** travel today? Would current modes of travel change the impact of a virus like the Spanish Flu?
- **How did technology** in 1918 influence the spread of the virus or, alternatively, contribute to its suppression?
- **How did** the Spanish Flu impact society at that time?
- **Can countries** work together to control the spread of the flu in our time? Describe some measures that can be taken.
- **Where do researchers** have to look for the viruses that cause the flu? What parts of the world should be investigated?
- **What could happen** in the next pandemic?

Extend your geographical thinking

The World Health Organization provides influenza updates every two weeks. Have students research the weekly influenza updates (who.int) and use the world Giant Floor Map to identify current-day transmission zones (geographical groups of countries, areas or territories with similar influenza transmission patterns). Have students determine a way to identify each zone and then analyze their findings by discussing any patterns and trends they see. Ask students how scientists are preparing for the next pandemic and how growing populations can be prepared.

Links to the Canadian National Standards for Geography

Essential Element 2: Places and Regions

- ▷ Changes in places and regions over time
- ▷ Critical issues and problems of places and regions

Essential Element 6: The Uses of Geography

- ▷ Effects of physical and human geographic factors on major historic events
- ▷ Role of multiple points of view in contemporary geographic policies and issues

3

MALARIA



Overview

Students will explore the regions where malaria is endemic, discover where isolated cases pop up and discuss where malaria may spread to in the future.

Objectives

- ▷ Using mapping skills, students will learn which countries have endemic malaria.
- ▷ Students will determine the factors that allow malaria to occur in some parts of the world and not others.
- ▷ Students will discuss and explore questions related to malaria and climate change: how can malaria be controlled? What measures can the general population take to prevent the spread of malaria?

Materials

- ▷ Chains (16)
- ▷ Malaria fact card (1)
- ▷ Endemicity cards (88)

Activity

Students will locate malaria-endemic countries and explore reasons why they think malaria is occurring in these regions.

- **Once students have** explored the map independently, have them locate the equator and stand on it. Ask students what they know about malaria. Do they know how someone gets infected? Do they know where cases are most popular? Allow time for students to share what they know about malaria and what they would like to know. Using the Malaria fact card provided, share additional information with the class.
- **Distribute the** Endemicity cards to students and allow time for them to locate and place the cards on the appropriate country.
- **Once all cards** have been placed on the map, gather students around the map's border. Ask students what patterns and trends they observe with the location of these cards. Which continent has the most malaria-endemic countries? Why is this the case?
- **Using coloured chains**, select a few students to place one colour of chain horizontally along the northernmost line of latitude where mosquitos cards are placed. Select a different chain colour and a few more students to make connections along the southernmost line of latitude.
- **Have students observe** the pattern created by the cards and comment on the locations in relation to major lines of latitude (most of the cards will be placed on tropical or subtropical countries, between the Tropic of Cancer and Tropic of Capricorn.)



3

MALARIA



Discussion

Students will brainstorm what these locations have in common regarding climate, population and geography. They will use discussion questions to dive deeper and talk about future global disease trends and how to protect themselves.

- **Connect the locations** of malaria to global population trends. Where are the most populous countries located? Ask students to discuss any patterns or trends they see.
- **Have students** search for a connection between climate and malaria. What is the climate like in many of the countries that have malaria? As the global climate continues to change and warm, how do you think the pattern of malaria distribution could change? Where could malaria appear in the future?
- **Additional** discussion questions:
 - ▷ Do you think malaria could spread outside these countries?
 - ▷ Are there any outlying areas north or south of the tropics?
 - ▷ What common features do these countries have that would explain the presence of malaria?
 - ▷ Is it possible that malaria could establish itself in Canada? How could this happen? Has there ever been a case of malaria in North America?
- **Conclude** the lesson by discussing what can be done globally. Do you think governments should test their citizens for infections when they return home after having visited countries where malaria is endemic? What is the future of malaria? Are there new cures being developed? How can countries without malaria help those with it? How can we control the spread? Is the spread of malaria inevitable with climate change?

Extend your geographical thinking

Using the Endemicity cards, have students research what their country and other countries on their continent are doing to prevent malaria. Allow time for each group to design their own icon card to represent this action. When students are ready, allow them back onto the Giant Floor Map and this time have them place their icons on the appropriate countries. Ask each group to share what they learned.

Links to the Canadian National Standards for Geography

Essential Element 1: The World in Spatial Terms

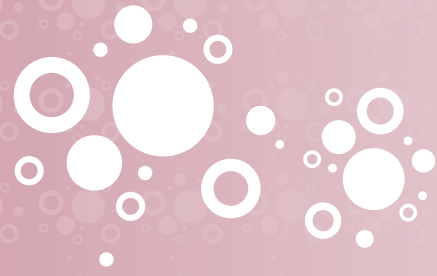
- ▷ Distribution of major human and physical features at country and global scales
- ▷ Location/allocation situations

Essential Element 2: Places and Regions

- ▷ Factors that influence people's perception of places and regions
- ▷ Critical issues and problems of places and regions

4

SMALLPOX



Overview

Students will discover which countries have had smallpox outbreaks and will learn how international cooperation regarding vaccination can lead to eradication of infectious illnesses.

Objectives

- ▷ At the end of the activity, students will be able to locate various countries on all continents using latitude, longitude and cardinal directions.
- ▷ Students will be familiar with how the smallpox disease spreads.
- ▷ Students will understand how international efforts and cooperation can lead to positive changes worldwide.

Materials

- ▷ Smallpox fact card (1)
- ▷ Smallpox country cards (30)
- ▷ Contagion cards (10)
- ▷ Vaccine cards (10)
- ▷ Dice (1)

Activity

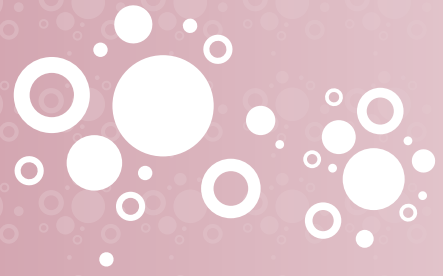
Students will locate countries that have had outbreaks of smallpox and learn about how infectious diseases can spread quickly. Students will partake in an activity where one student will discover that they are the “host” of smallpox.

- **Allow students** to freely explore the map. Encourage them to locate places they have visited, places they want to go or places they have heard about in the news.
- **Ask students** if they have heard of smallpox before and to share what they have learned. Using the Smallpox fact card, share additional information with students.
- **Randomly distribute** a Smallpox country card to each student. Explain to students that each of these countries experienced a smallpox outbreak at some point. On the front of their card will be a number. On the back of their card, students will find two pieces of information: latitude and longitude coordinates and a date (which will be used later in the lesson). Have students use the coordinates to locate their country and stand on it (note to teachers: countries have been strategically located so that smallpox appears in each continent except Antarctica and can act as a pandemic disease).
- **Explain to students** that they are going to demonstrate how easily a disease like smallpox can spread globally. Call out any number between 1 and 30 and ask the student with that number on their card to identify themselves and their country. Inform this student that they now have smallpox and that this student is now patient zero. This student can sit down.
- **Next, inform** the class that every student within arm’s reach of patient zero receives a Contagion card from the teacher. They are also infected and can sit down.
- **Offer the** “infected” students a chance to roll the dice. If they roll an even number, they can receive a Vaccine card and can stand up to join the class. If they roll an odd number, however, they will not receive a vaccination and remain seated. Explain to students that the purpose of rolling the dice is to demonstrate the factors that play a role in a country receiving aid (e.g., political turmoil, economy and availability of supplies).
- **Continue to** show how easily the disease can spread by distributing Contagion cards to those students who are standing next to the previously infected students. Again, offer the dice to all infected students and allow them an opportunity to get vaccinated. Continue doing this a few more times or until students have an understanding of how easily this disease can spread.





SMALLPOX



Discussion

Students will further discuss how a country can get vaccinated and how geography can play a part in delaying a country from eradicating a disease.

- **Bring students' attention** to the dates on their Smallpox country cards. Have the class read out the dates in order, from most recent to oldest. Explain that these are the dates of eradication of smallpox in that country. What pattern do you see in the dates of smallpox eradication? Ask students what they can determine from this information. Why do you think Iceland became the first country to eradicate smallpox?
- **Discuss how** a country can become vaccinated. Ask the class: What will happen to patients who are infected and denied vaccines (similar to those students who were denied vaccines in the activity earlier)? What will happen to people in close proximity to these students? What will happen to their families, friends, communities and countries?

Extend your geographical thinking

Ask students to consider the spread of smallpox through various geographical lenses: What environmental (human and physical geography) factors could affect the spread of a disease or access to prevention/treatment of an outbreak? What can the global community do to stop the spread of infectious diseases such as smallpox? Ask the class what strategies we can use to solve this problem. Have students research and share what has been done to date. What role do you think social media could play in spreading accurate public health information? What negative roles could social media play?

Links to the Canadian National Standards for Geography

Essential Element 4: Human Systems

- ▷ Population density, distribution and growth rates
- ▷ Regional development in Canada and the world

Essential Element 6: The Uses of Geography

- ▷ Effects of physical and human geographic factors on major historic events
- ▷ Role of multiple points of view in contemporary geographic policies and issues

5

CHOLERA



Overview

Despite best efforts, cholera outbreaks continue to occur in places where people live in unsanitary conditions or don't have access to purified water. In this activity, students will use mapping skills and critical thinking to discover the conditions in which cholera continues to exist. Students will also examine how unpredictable events such as natural disasters can cause cholera outbreaks.

Objectives

- ▷ Students will use mapping skills to learn more about cholera and where it exists in the world today.
- ▷ Students will examine how natural disasters can cause cholera outbreaks.
- ▷ Students will look for patterns and trends between cholera, population and poverty.
- ▷ Students will use their critical thinking skills to discuss how they can make a difference.

Materials

- ▷ Cholera fact card (1)
- ▷ Cholera map cards (4)
- ▷ Cholera case study cards (4)
- ▷ Coloured blocks (100)

Activity

Students will use their mapping skills to learn where cholera exists and how natural disasters play a role in cholera outbreaks.

- **Ask students** if they have heard of cholera. What is it? Is it a common disease that is often heard of in Canada? Why do they think that is? Use the Cholera fact card to provide students with more information about the disease.
- **Now that students** know a bit more about the disease, ask them to stand on a place where they think cholera exists today. Allow time for students to share why they think cholera exists in that location. Using the coloured chains, place one colour along the equator and another colour along the prime meridian. Having divided the Giant Floor Map into quadrants, place students into four groups to represent each section.
- **Give each group** a Cholera map card and a handful of coloured blocks. Ask each group to place a block on a country that is highlighted in their section of the Earth.
- **Ask students** to stand along the border of the map and ask about the location where cholera outbreaks exist. Where is cholera most prevalent? What do these regions have in common? What conditions may lead to cholera? Are there any patterns and trends they can identify? Are there any countries that surprise them? Why?
- **Using the** same groups, give each group a Cholera case study card. Each card outlines a case study of a cholera pandemic in their section of the world. Allow time for each group to locate their country, review the information, use coloured pylons or chains to identify the country, and learn about the outbreak of cholera in their country.
- **Have each group** share what they have learned with the rest of the class followed by a discussion on things that are similar in each case study, and things that are different.





CHOLERA



Discussion

Students will make connections between cholera outbreaks and living conditions, and discuss how Canada can help aid countries in need and to eradicate the disease.

- **What simple steps** could most people in the world take to limit the spread of cholera?
- **Is there** a relationship between per capita income, life expectancy, and outbreaks of cholera?
- **Could cholera** outbreaks spread if the climate continues to change? Which countries do you think might soon be at risk?
- **What would be** some of the best ways to prevent cholera? Why do you think these methods are not being implemented in many countries?
- **What methods** of prevention are being used to stop the spread of cholera? What role does access to clean drinking water play in the prevention of cholera? What would you do if you lived in a region where clean water was scarce or inaccessible?

Extend your geographical thinking

John Snow is a famous physician often considered one of the fathers of epidemiology and was a leader in medical hygiene in 19th-century England. Have students research how John Snow was able to use geography to map out the 1854 cholera outbreak in London.

Links to the Canadian National Standards for Geography

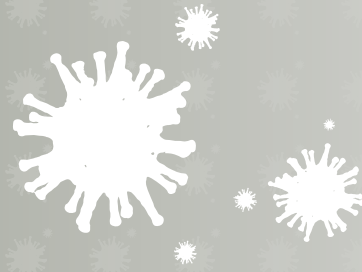
Essential Element 2: Places and Regions

- ▷ Physical and human characteristics of places and regions in Canada and the world
- ▷ Factors that influence people's perceptions of places and regions
- ▷ Changes in places and regions over time

Essential Element 5: Environment and Society

- ▷ Effects of human modification on the physical environment
- ▷ Limits and opportunities of the physical environment for human activities

6 POLIO



Overview

Despite international efforts to completely eradicate the disease through mass vaccination, polio is still prevalent in remote locations and places of conflict. Students will discover which countries still have cases of polio and what barriers may exist to effective vaccination and eradication of the disease.

Objectives

- ▷ Students will learn about the history of polio, including how the disease spread and how the vaccine has been implemented.
- ▷ Students will be able to identify patterns of physical and human geography that may impact the availability of a polio vaccine.
- ▷ Students will suggest strategies that may enhance the availability of a polio vaccine in the affected countries.

Materials

- ▷ Polio fact card (1)
- ▷ Timeline cards (20)

Activity

Students will explore the map and learn about the history of polio. Students will use Timeline cards to understand how polio spread, as well as how a vaccine was created and implemented on a global scale.

- **Once students** have explored the map independently, gather students into a group and ask them to share what they know about polio. What is it? How can you contract it? Is there a cure? Using the Polio information card, share additional information about polio with your students.
- **Explain to students** that polio has an interesting history, one that involves numerous countries from all continents except Antarctica. Additionally, the pursuit to eradicate it has taken a global effort involving just about every country in the world.
- **Distribute** a different Timeline card to each student and allow time for students to read the information on their card and locate the country mentioned. Next, have students share their information in chronological order. Begin with the student that has the 1840 card.
- **Once students** have shared the history of polio and the global effort to eradicate it, dive into deeper discussions about the efforts made by different countries and the links between countries. Use the chains and pylons provided for visualization purposes. For example, some countries have greater access than other to natural resources and funding - link these countries together by using matching pylons or chains.



6 POLIO



Discussion

Students will suggest strategies that could enhance the availability of a polio vaccine and how to move toward a polio-free world.

- **Explain to students** that there are many factors that can play a part in the resurfacing of polio and/or the inability to adopt a vaccine for it. Ask students why certain countries still have polio cases. What do they notice about levels of conflict, wealth and transportation/communication access in these nations?
- **As a class**, develop a list of possible factors that can interfere with the effectiveness of the vaccine. Are there some common factors? What can be done to solve these problems? If the global goal is to completely eradicate the polio virus, what steps need to be taken concerning vaccination numbers?

Extend your geographical thinking

Tackling the last one percent of polio cases has proved to be difficult. Conflict, political instability, hard-to-reach populations and poor infrastructure continue to pose challenges to eradicating the disease. Each country offers a unique set of challenges which require local solutions. In 2013, the Global Polio Eradication Initiative launched its most comprehensive and ambitious plan for completely eradicating polio. Have students research what is being done and what Canada is doing to support the goal of creating a polio-free world.

Links to the Canadian National Standards for Geography

Essential Element 2: Places and Regions

- ▷ Changes in places and regions over time
- ▷ Concepts of formal, functional and perceptual regions

Essential Element 4: Human Systems

- ▷ Regional development in Canada and the world
- ▷ Transportation and communication networks in Canada and the world

7 SARS



Overview

Students will trace the path of the 2002-2004 SARS outbreak and learn how rapidly an infectious disease can spread from hospitals to the larger community.

Objectives

- ▷ Students will use mapping skills to plot the course of the SARS outbreak from Guangdong Province in China to Toronto, Canada.
- ▷ Students will learn how fast an infectious disease can spread from one person, through hospitals to the larger community.
- ▷ Students will learn about the consequences of an infectious disease outbreak in one specific city (Toronto).

Materials

- ▷ SARS fact card (1)
- ▷ Chains (16)
- ▷ SARS country cards (11)
- ▷ Blocks (100)

Activity

Students will explore the explosion of SARS from index patient A in Hong Kong to the outbreaks in Toronto.

- **Allow students to explore** the map freely, find locations they've travelled to, or where their families may originate from.
- **Ask students** what they know about the SARS disease. Use the SARS fact card to provide more information about SARS, how you can contract it and what happens when you have it.
- **Introduce the** activity by informing students that the class is going to explore the global spread of the SARS virus by thinking like detectives to figure out how it started and why it spread where it did.
- **Select one** student and hand them the Guangdong Province card from the SARS country cards and a bag with blocks in it. Ask the student to find **Guangdong Province** using latitude and longitude, place their card in this location and stand there.
- **Next, select** three more students and give each of them a SARS country card for the following countries: **Singapore, Vietnam** and **Taiwan**. Have students use the latitude and longitude information on the card to find those locations and stand on their country. Ask students to locate the capital city of their country and place their card on that city with the airplane facing up (alternate side of the country card).
- **Select another** five students and hand them a coloured chain and a **Hong Kong** card and ask them to find Hong Kong and create a "hotel" by making a circle with the chain. Have students stand in the circle. (Note: Hong Kong isn't large, so it's OK if the circle goes outside the actual country.)
- **For each** of the five students standing inside the Hong Kong hotel circle, distribute a different country card: **Canada, Singapore, Taiwan, Vietnam** and **Mainland China**.
- **All remaining** students will receive one **Ontario, Canada** card as a group. Have this group move to Canada and stand in the country. Have one student place their card airplane side up on Toronto, Ont., representing Pearson International Airport.
- **Next, ask** the student standing in Guangdong Province to travel to Hong Kong. Instruct them to give two blocks to each of the students with the Singapore, Taiwan, Vietnam, and Mainland China cards staying in the hotel. Have the student representing the Guangdong Province give all remaining blocks to the student representing Canada.



7 SARS



- **Have all students** not standing in their original country head back to their home countries. Upon arrival, ask all returning travellers to give out blocks to the students that are standing in their country. (Note: A few Canadians may not receive a block if it's a large class. That's OK!)
- **Once everyone** has travelled home and given out at least one of their blocks, inform the students that anyone holding a block is now infected with SARS.

Discussion

Students will partake in a class discussion connecting their experience on the map with the real-life scenario of how SARS spread. They will discuss how Canada was affected and how Canada can prepare for any new outbreaks in the future.

- **How did Canada** respond to the outbreak of SARS? Do you agree or disagree with the steps and safety measures that were taken? How could the response be improved in preparation for the next outbreak?
- **What do each** of the countries with cases of SARS have in common? What about them is different? Do they have similar climates? Why do you think the disease spread the way it did? What could have happened differently to cause it to spread to different countries?
- **Ask students** if they have any ideas as to why so many Canadians were affected. The outbreak in the Toronto area was hospital-based; can a hospital be imagined as a small nation? If not, why not? Are there “borders” in hospitals?
- **If you were** part of the World Health Organization and another new virus began spreading around the world, what steps would you take to contain it?
- **What role** should governments take in terms of spending on outbreaks? Should more money be put into research efforts worldwide or locally? Should money be invested in research and preparation before the next big outbreak or should money be released during the outbreak?
- **Do you think** there should be an international agreement regarding notifications of new viral outbreaks?

Extend Your Geographical Thinking

While there have long been natural borders such as mountains, seas and rivers between countries, the age of air travel has “shrunk” the world. It's been said that the next epidemic is a plane ride away. Have students consider this statement and ask them if they agree or disagree. How could language and media contribute to a more rapid spread of an outbreak? Have students select a different disease from the World Health Organization website (who.it) and investigate how a social media or media campaign can help people across the world become more aware.

Links to the Canadian National Standards for Geography

Essential Element 1: The World in Spatial Terms

- ▷ Location/allocation situations
- ▷ Major countries of the world

Essential Element 6: The Uses of Geography

- ▷ Influence of geographical features on the evolution of significant historic events and movements
- ▷ Local, regional and world policies and problems with spatial dimensions

8

PLAGUES



Overview

Students will learn about a number of plague outbreaks throughout history and will connect the plagues to trade routes, urban expansion and political power. Students will look for patterns between each of the plagues and compare and contrast.

Objectives

- ▷ Students will use mapping skills to locate countries that experienced outbreaks of plague throughout various times in history.
- ▷ Students will compare and contrast the various plagues and look for patterns and trends of outbreaks and how societies dealt with them.

Materials

- ▷ Plague fact card (1)
- ▷ Plague outbreak cards (6)
- ▷ Chains (16)
- ▷ Pylons (20)

Activity

Students will delve deeper into specific examples of plague that occurred throughout history.

- **Once students** have explored the map independently, gather students around the map's border and ask them to share what they know about diseases or plagues. Talk about specific diseases and plagues as well. Where did plagues occur? What caused it? What impact did it have? Using the plague information card, share additional information about plagues. Explain that the word "plague" does not refer to just one event in history, but refers to a type of contagious disease caused by a bacteria. The first recorded pandemic, the Justinian Plague, began in AD 541.
- **Divide students** into seven groups and inform them that each group will learn more information about a specific plague that took place in history. Give each group a different plague outbreak card and ask students to read the information on the card, locate where the plague took place, and map out the general outbreak area using the chains or pylons.



8 PLAGUES



Discussion

Students will share information about their plague outbreak and discuss patterns and trends on how each plague spread.

- **Once students** have mapped out their plague, have students sit in their area on the map and ask the class the following questions about their plague outbreak: Where did it come from? How did it spread? Why do you think there were animals with the traders? What could have been on or in the trade goods? How could the plague have been stopped?
- **Bring students** back to the present day and ask students their thoughts on what governments can do to help control the spread of bacterial infections today. What can we do as travellers to stay safe? Do you think different countries should spend money on medical research and disease tracking to prevent the worldwide spread of contagious diseases?

Extend your geographical thinking

Plague spread through trade (flea-carrying rats that hid with goods that were moved from port to port), travellers carrying germs, poor hygiene, and a lack of knowledge about disease transmission. Do you think analyzing and monitoring travel and trade routes are still important ideas for governments or is the world now “safe”? Have students look at how trade and advancements in transportation have evolved and how this has impacted the spread of diseases.

Links to the Canadian National Standards for Geography

Essential Element 4: Human Systems

- ▷ Changes in human settlement patterns over time
- ▷ Human migration patterns
- ▷ Types of human settlement patterns

Essential Element 6: The Uses of Geography

- ▷ Effects of physical and human geographic factors on major historical events
- ▷ Influence of geographical features in the evolution of significant historical events and movements

9 LYME DISEASE



Overview

Using mapping skills, students will locate countries where Lyme disease is endemic. Students will examine the spread of Lyme disease in Canada and how to protect themselves when exploring their own communities.

Objectives

- ▷ Students will use mapping skills to locate the countries with cases of Lyme disease.
- ▷ Students will use inquiry and analysis techniques to formulate ideas about why Lyme disease is contracted in certain areas.
- ▷ Students will brainstorm ideas to stop the spread of Lyme disease based on its locations around the world.

Materials

- ▷ Lyme disease fact card (1)
- ▷ Lyme disease country cards (38)
- ▷ Canadian Lyme disease map (1)
- ▷ Pylons (20)

Activity

Students will find countries with Lyme disease using latitude and longitude coordinates and then formulate hypotheses by answering leading questions.

- **Once students** have explored the map independently, gather them around the map's border. Ask students what they know about Lyme disease. What is it? How can you contract it? In which countries can you contract it? Can you get it in Canada? Use the Lyme disease fact card to share additional information with students.
- **Explain to students** that Lyme disease has been reported in all 50 states in the United States and more than 80 countries worldwide. Distribute a different Lyme disease country card to each student and have students locate their countries and place their card there.
- **Gather students** back along the map's border and ask students about patterns and trends they see regarding the location of these countries. Ask students to consider the climate in the countries where Lyme disease is present. What latitude or longitude do most countries with Lyme disease lie between?



9 LYME DISEASE



Discussion

Students will examine Lyme disease in Canada and discuss what they can do to be safe and avoid contracting it. Students will brainstorm what the future of Lyme disease may look like in Canada.

- **Gather students** around Canada on the map to discuss the presence of Lyme disease within the country. Show students the Canadian Lyme disease map card and have students place pylons in these areas or map it using chains.
- **Ask students** if they have visited any areas where Lyme disease is present, or if they live in one of these highlighted places. Ask students what they do when they go outside and partake in outdoor activities. What do you think you will do differently when you spend time outdoors? If there was a Lyme disease vaccine, who would get it? Do you think schools should have Lyme disease posters and information bulletin boards? Who can help get the message about tick/Lyme disease safety out to students and families?
- **Inform students** that scientists are concerned that ticks with Lyme disease will continue to spread with climate change. As a class, brainstorm ideas on where tick habitats may spread in Canada. Could tracking ticks on maps help doctors diagnose Lyme disease more easily? How else could using maps help public health departments and medical professionals deal with Lyme disease?

Extend your geographical thinking

Have each student select a different country where Lyme disease is endemic (or using the same country card they were given in the activity) and research more into where these cases have been reported, what the climate is like in their countries and how many cases of Lyme disease have been reported. Create a collaborative map displaying everyone's information using a print-out map or an electronic mapping tool like Google My Maps or ArcGIS online.

Links to the Canadian National Standards for Geography

Essential Element 5: Environment and Society

- ▷ Environmental issues
- ▷ Perceptions of and reactions to extreme natural events

Essential Element 6: The Uses of Geography

- ▷ Role of multiple points of view in contemporary geographic policies and issues
- ▷ Local, regional and world policies and problems with spatial dimensions

10 EBOLA



Overview

Responses to disease outbreaks, especially deadly diseases such as Ebola, can be global in nature. In this activity, students will examine the ways in which people can transmit a disease in ways they may not have anticipated.

Objectives

- ▷ Using latitude and longitude coordinates, students will locate countries that were involved in the 2014 Ebola outbreak.
- ▷ Students will understand the global nature of emergency response programs, which are necessary to stop the spread of communicable diseases.
- ▷ Students will explore how human geography and cultural barriers can affect international aid work.

Materials

- ▷ Chains
- ▷ Dice
- ▷ Ebola fact card (1)
- ▷ Newspaper headline cards (6)
- ▷ Aid and supplies cards (26)
- ▷ Thank you cards (26)
- ▷ National identity cards (32)

Activity

Students will participate in a mock outbreak scenario and will learn that despite good intentions and best efforts to cooperatively contain a virus, the disease can still spread.

- **Ask students** to share what they know about the Ebola virus. Do they know what an outbreak is? Is Ebola common or rare? Are they more likely to get Ebola or the flu in their home country? What about abroad? Is the Ebola virus still an issue or is it a problem of the past? Use the Ebola fact sheet to learn more about this disease as a class.
- **Ask students** to stand around the map. Ask for six volunteers and hand out six National identity cards: Liberia, Congo, Guinea, Sierra Leone, Nigeria, and Mali. Ask the volunteers to stand on the country shown on their card.
- **Hand out** the rest of the National identity cards, and the Aid and supplies cards to the remaining students and ask them to stand on the country shown on their cards.
- **Alert the students** in the West African countries that an Ebola outbreak has occurred and hand each of them a chain, a Newspaper headline card, and a Thank you card.
- **Ask the students** in the West African countries to create quarantine zones in their countries using their chains and to stand inside of them (this represents efforts within the country to contain the virus and prevent further illness).
- **Next**, have the students read their newspaper headlines out loud. Ask the students representing aid organizations from other countries to respond by bringing the specific aid and supplies requested by the students in the West African countries, and to remain standing in those countries.
- **Once they receive** the aid, the students who are originally from the West African countries will each roll the dice to determine if the aid is actually effective (meaning that perhaps the aid was stolen, could not be transported or shipped, or the villagers refused what was offered because it did not take into account local culture/traditions/beliefs). Odd numbers mean the aid is effective, even numbers mean the aid is not effective.
- **Ask students** who roll even numbers to sit down (this represents that they have died from Ebola). Ask the aid workers to return to their home countries.
- **Ask students** who rolled odd numbers to give their Thank you cards to all the students who delivered the Aid and supplies cards to their countries. These aid workers then return to their home countries with their Thank you cards.



10 EBOLA



- **Ask the aid workers** to look at their Thank you cards. Green circles symbolize that the aid worker did not get Ebola. Red circles symbolize that the aid worker contracted Ebola and may die. Students with red circles with black Xs on their Thank you cards will sit down to represent that they didn't survive Ebola.
- **Finally**, assess how many students are alive out of the whole class and how many perished due to a lack of aid or an infection. Discuss the element of chance represented by the dice and the random distribution of the Aid and supplies cards and Thank you cards. Discuss the transmission of the disease despite the presence of quarantines. Ask the students to share any questions they may have.

Discussion

This activity demonstrated that a virus that was previously thought to be easily contained due to outbreaks in very remote locations can spread throughout the world in the age of land, sea and air travel. Even though the countries in West Africa affected by the Ebola outbreak placed a quarantine around their nations, Ebola still managed to spread.

- **Ask students** why they think this happened.
- **What measures** could be put in place to help contain outbreaks that spread through international travel?
- **What are** the positive and negative implications of travel bans and restrictions?
- **If there was** an Ebola outbreak, would there be cause for concern even if the outbreak was thousands of kilometres away?
- **Some health care workers** passed away from Ebola when they returned home. What are the implications of this since these countries should realistically have the best medical resources?
- **Why was** there an international response to the 2015 Ebola outbreak?
- **What happens** if international aid is not provided after an Ebola outbreak?
- **What factors** may affect research about the Ebola virus? Should international organizations be allowed to do research in developing nations?

Extend your geographical thinking

Some response methods and strategies are more effective than others. Have students research more about the 2014 international Ebola response and how response methods have changed since. Websites like the [Global Ebola Response](#), the [World Health Organization](#), and the [Centers for Disease Control and Prevention](#) are a good starting place. [Interactive maps](#) are also a useful reference.

Links to the Canadian National Standards for Geography

Essential Element 1: The World in Spatial Terms

- ▷ Map, globe and atlas use
- ▷ Location/allocation situations

Essential Element 2: Places and Regions

- ▷ Critical issues and problems of places and regions
- ▷ Regional analysis of geographic issues and questions

Essential Element 6: The Uses of Geography

- ▷ Effects of physical and human geographic factors on major historic events

11 ZIKA



Overview

Using latitude and longitude coordinates, students will explore areas around the world that are at risk for Zika transmission. Zika transmission does not usually occur beyond 2,000 metres above sea level, thus students will also discover which travel destinations pose less of a threat to travellers

Objectives

- ▷ Using mapping skills, students will locate different travel destinations around the world and discover that Zika is found in a mid-latitude “band” around the world.
- ▷ Students will understand that preparedness can help travellers avoid exposure to and transmission of mosquito-borne viruses.
- ▷ Students will think critically about travel safety risks and the consequences of being unprepared.
- ▷ Students will discover that many areas with Zika are popular holiday destinations with Canadians seeking to escape winter.

Materials

- ▷ Chains
- ▷ Zika fact card (1)
- ▷ Countries with Zika card (1)
- ▷ PSA storyboard template (1)
- ▷ Traveller identity cards (30)

Activity

Students will receive traveller identity cards with itineraries, and will travel to different destinations. They will be recalled to North America and will assess their risk of exposure to Zika.

- **Once students** have explored the map independently, have students stand around the map and observe the lines of latitude (parallels) and longitude (meridians that run from the north pole to the south pole). Ask them to locate the equator, as well as the tropical, subtropical, temperate, and polar zones. Ask them to identify zones of high and low elevation. Do they know why these zones exist and what differentiates them? Ask students if they have travelled to destinations in one or more of these zones. In which zone do they permanently reside? Conclude your discussion by asking your students what they know about Zika, and give them time to share what they know or have read in the news with the group.
- **Ask students** to stand anywhere in North America. Distribute the Traveller identity cards to students and allow time for them to locate and stand on their destination. Ask students to identify if they are in a tropical, subtropical or temperate zone based on the latitude of their location. The subtropics are located between the tropics (which end at about 23.5 degrees) and the temperate zones (which begin at about 35 degrees) north and south of the equator. Next, ask students to identify the elevation of their location using their itinerary.
- **Create four** large zones over North America using the different coloured chains (a green zone representing travellers at low risk of being infected due to the elevation of their location, a yellow zone representing travellers at low risk of being infected due to the geography and climate of their location, a red zone representing travellers at high risk of being infected, and a blue zone representing travellers at high risk of being infected and most likely to transmit the disease to another person or an unborn child).
- **Have every student** who is at a location above 2,000 metres return to North America and move to the green zone.
- **Have every student** located in Canada and Australia move to the green zone in North America (since no local mosquito-borne Zika virus transmissions have been reported in these regions).
- **Have every remaining student** who is at a location below 2,000 metres return to North America and stand in the yellow zone.
- **Using the** Countries with Zika card, read out loud the countries with cases of Zika transmission. If a student standing in the yellow zone hears the name of the country they visited, they move to the red zone.



11 ZIKA



- **Have every student** standing in the red zone with an identity card age between 15 and 49 (i.e., reproductive age) move to the blue zone.
- **As a class**, discuss how many individuals are located in each zone. Using the Zika fact sheet provided, and the World Map of Areas with Risk of Zika, share additional information with the class about Zika. Review why there are four zones and what each zone represents. Have students discuss their identities and see if there are any commonalities between those who got infected and those who didn't.

Discussion

Students will have a discussion about the geography of the Zika virus, the risks, safety precautions, and public health concerns. Students will discuss their travels and identities with other students in the same zone and make hypotheses about why they ended up in their zone.

- **Make links** between the locations of countries with cases of Zika transmission and geography, climate, topography and population characteristics. Ask students to identify trends that stand out to them and any questions that arose during the activity.
- **Have students** consider the characteristics of mosquitoes that make them prolific vectors of this disease below elevations of 2,000 meters. What do mosquitoes require to survive? Why are female mosquitoes vectors but not males? How do mosquitoes travel and how far? Is there a link between mosquito population size and water? Is there an correlation between Zika incidence rates and climate change or seasonality?
- **Have students** consider how clothing preference and accommodation choices may affect the risk of infection.
- **Additional** discussion questions:
 - ▷ **What regions** would you consider as safe travel zones?
 - ▷ **Could new areas** of the world host Zika infected mosquitoes in the future?
 - ▷ **What precautions** do airlines need to take to avoid the spread of Zika infected mosquitoes?
 - ▷ **What precautions** do travellers need to take to avoid spreading Zika?
 - ▷ **Why do you think** elevation plays a role in the presence of Zika?
 - ▷ **Would you reconsider** travel destinations with known Zika transmission if you were planning a trip for yourself/friends/family?
 - ▷ **What precautions** would you be willing to take if you're travelling to an area of high risk?
 - ▷ **Why should we care** about Zika as Canadians?
 - ▷ **The vacation locations** represent final destinations. Is it possible some students could have become infected on their way into our out of their final destination?

Links to the Canadian National Standards for Geography

Essential Element 1: The World in Spatial Terms

- ▷ Map, globe and atlas use
- ▷ Location/allocation situations

Essential Element 2: Places and Regions

- ▷ Critical issues and problems of places and regions
- ▷ Regional analysis of geographic issues and questions

Essential Element 6: The Uses of Geography

- ▷ Effects of physical and human geographic factors on major historic events





ZIKA



Extend your geographical thinking

Place students in groups and have them design a 30-second public service announcement (PSA) that raises awareness about the Zika virus and aims to change traveller behaviour before, during and after visiting high-risk areas, targeting a demographic of their choosing. Students can research effective PSA strategies on the Web and by viewing examples such as the [TRUTH anti-smoking commercial](#) and the [Listen Carefully video winners](#), and can browse the Centers for Disease Control and Prevention's [posters and infographics](#). Have students use the PSA storyboard template to plan their video on paper and, if possible, allow students to film their PSA and share it with the class. Students should focus on identifying the most important information about the disease that should be included in the PSA as well as strategies to get viewers to remember and abide by the suggestions in the PSA.



ZIKA



12

SAFE TRAVELS!



Overview

Students will learn about the importance of researching and improving their knowledge about the countries they may visit for leisure or work. Students will learn how important it is to be prepared before leaving their home country so that they remain healthy while travelling.

Objectives

- ▷ Students will learn how to research vaccinations, including how and where to get properly vaccinated when planning a trip to another country.
- ▷ Students will understand how easily diseases can spread and how difficult it may be to stop the spread of microbes before a pandemic ensues.

Materials

- ▷ Trip planning template (1)
- ▷ Computers or handheld devices with internet access

Activity

Students will use the Giant Floor Map to plan a trip around the world. Students will follow guidelines and use a template to gather information from the map and then use a computer or their handheld device to research the vaccinations needed to visit those countries.

- **As students** are exploring the map, have them share places they have visited and places they wish to visit. Ask students about what draws someone to visit a country and have students share why they want to visit these places.
- **Brainstorm ideas** about the kind of preparation someone must do before visiting a country. What do you need to do in order to feel safe?
- **Ask students** to imagine what they would do if they won the lottery and gave them plan their dream trip around the world. Distribute a Trip planning template to each student and go over the requirements for their trip. Students must select six countries on three different continents, calculate the distance travelled, and indicate why they want to visit this place (what is their reason for visiting?).
- **Once students have** planned their trip, allow time for students to research the types of vaccines they need to visit these countries.



12 SAFE TRAVELS!



Discussion

Students will share their research while planning for their voyage and discuss what the future of travel may look like.

- **Invite students** back on the map and ask for volunteers to share their dream trip with the rest of the class.
- **Have a class discussion** about what students learned while researching the types of vaccines needed to visit their countries. Which diseases are most common? Which diseases appear to be clustered; where and why is this happening? What do these locations have in common? Was there a price associated with getting the vaccine? With climate change, do you think that the countries that currently don't require vaccines for travellers may require them in the future? Which countries could these be? What graphic and interactive tools can you think of that would be easy to use to help travellers prepare to stay healthy before travelling? How can we raise awareness about travel safety and health for people planning trips?
- **After doing this** activity, how important do you think it is for all travellers to receive vaccinations before travel? Should governments enforce vaccinations for travellers? Why or why not?
- **How can Canadians** like yourself help prevent the spread of diseases and infections, at home and abroad?
- **Remind students** that the Health Canada website offers extensive information about vaccines needed before travel. It's also important to consult with a family physician months before departure to receive vaccines in time for them to be effective. Some vaccines require multiple doses and can't be done the "week before." A family physician may recommend other medications to take during travel (such as antimalarial medications) in addition to vaccines, so make sure you're covered! Students should also be aware that mosquitoes and ticks may prove to be a hazard and to pack and use insect repellent and appropriate clothing when travelling.

Extend your geographical thinking

What about travelling within Canada? Have students investigate the types of diseases in Canada, where they can be found, and possible causes. For example, tuberculosis is affecting Inuit communities in Canada and they are 290 times more likely to contract the disease than non-Indigenous people. Using a class map of Canada, locate these communities on the map and create an information card displaying facts students find. This can be done using a large class map and a bulletin board or online using mapping tools like Google Maps or ArcGIS Online.

Links to the Canadian National Standards for Geography

Essential Element 1: The World in Spatial Terms

- ▷ Major countries in the world
- ▷ Major cities in Canada and the world

Essential Element 2: Places and Regions

- ▷ Factors that influence people's perceptions of places and regions
- ▷ How culture affects places and regions
- ▷ Regional analysis of geographic issues and questions