ONTARIO ELEMENTARY SOCIAL STUDIES TEACHERS ASSOCIATION

SPATIAL SKILLS/ACTIVITIES
GRADE 7: GEOGRAPHY – NATURAL RESOURCES AROUND
THE WORLD: USE AND SUSTAINABILITY

ABSTRACT:

Students will analyse a variety of different maps expressing the spatial distribution of global deforestation and reforestation efforts. Students can reflect on global stewardship and citizenship while considering the direct and indirect consequences of forest loss.

SOCIAL STUDIES STRAND / RELEVANT GUIDING QUESTION(S):

- How does the demand for lumber affect forests?
- How can resources be used in a sustainable manner?
- Is the loss of forests a global issue?
- What other environmental issues are associated with deforestation?
- What can you do to help be part of the resource preservation movement?

LEARNING GOALS

- We are learning to understand the interrelationship between the human systems and natural systems in terms of resource use and extraction
- We are learning to recognize consistent patterns over time and determine trends based on data
- We are learning to identify spatial characteristics on a map
- We are learning to understand the patterns that exist in the natural environment and how they impact social and economic factors on a global scale for different regions of the world
- We are learning to understand that we can become a global citizen and contribute to forest restoration initiatives at a local level

Spatial skills focus

- Students will analyse a series of digital maps depicting the spatial distribution of forests on a global scale. Students will also create maps and bar graphs depicting how forest areas have changed between 1990 and 2010 on a global scale using the continents as a geographical base

Have students get familiar with different parts of the world by playing a Geo Game which helps students determine how much they know about the "where" for different countries and cities: http://www.minijuegosgratis.com/juegos/hwdykyworld/hwdykyworld.html (geo. game)

Have students identify all the products associated with this resource which they use at home, in school and within their community

Have students discuss the global economic benefits of a strong workforce associated with the resource and the associated consequences if the resource is depleted (economic and environmental). Teacher can share the attached article on logging and the global economy and a website devoted to the associated benefits of the forestry industry on a global basis: http://www.greenfacts.org/en/forests/l-2/8-economic-social-benefits.htm http://www.thestar.com/news/insight/2013/12/14/ bc_indian_band_breaking_all_stereotypes.html#

Share with students what some forestry companies are doing to ensure that they are practicing sustainable logging methods. The following website outlines the sustainable operation of a forestry company: http://northlandforestproducts.com/environmental-stewardship/industrygroupsandprograms/

Students will need to identify types of natural resources (renewable, non-renewable and flow) and how they are used and how extraction varies with these resources

Students need to identify different logging methods. Teacher can show some images of clear cutting, selective logging and row logging and allow students to determine which is more sustainable, which is more profitable and which method leads to deforestation: http://www.livescience.com/27692-deforestation.html *(clear cutting image and article)* Students can use the interactive website showing maps and graphs displaying information about deforestation: http://eschooltoday.com/forests/what-is-deforestation.html

Students will need to understand that increasing populations are putting greater stress on the environment and demand for natural resources is increasing on a global scale, more specifically lumber. Show a series of short videos showing issues related to deforestation and how mapping and spatial analysis is helping to solve the problem: http://www.youtube.com/watch?v=XFIieYbNl6Y   (trading bows and arrows for laptops) http://www.youtube.com/watch?v=sqiyP5Xv_PM   (mapping deforestation using Google Earth) http://www.youtube.com/watch?v=5XFS_oCETaw   (when tress fall Landsat Maps them)

Show the film *The Lorax* (1970 or 2011 version) in order for students to gain the perspective of two groups involved with resources use and management and understand why deforestation is a difficult sustainability issue

Detailed Spatial Skill Activities

Can the spatial distribution of global deforestation continue and how can you become a global citizen and help with restoration efforts?

Students will work with different digital maps showing the spatial distribution for the demand of lumber and the pressures these demands have and are placing on global forests. By analysing different patterns associated with the specific resource depletion, students will have the opportunity to see where the greatest impact exists and what is being done to help manage the forest industry on a global scale. Students will create a thematic map expressing how forest areas have changed over two time periods on a continental basis. Students will also explore how they can become a global citizen and help with forest management at a local level.

1. Students are to analyse the digital map outlining the state of the world forests. This is an interactive map and students can focus on different regions of the world. By using the legend provided, the students can determine the spatial distribution representing deforestation throughout the world. The students can also explore a second map representing net-forest loss by country. The teacher should focus on spatial analysis for this section. As students explore the work they can generate questions. Also, consider the following questions:

- Where is the greatest amount of deforestation?
- Is there a pattern emerging for specific countries, regions or areas of the world? What is the pattern if any? Why do you think this pattern exists?
-Do the countries with the highest deforestation share commonalities?

Have the students type in the name of a location into the search tab located on the map from the link below. Using the provided map legend, the students can now identify what is the state of surrounding forests within their community or region of choice.
What parts of the world have the greatest amount of forest loss?
What parts of the world are experiencing forest gain?
http://earthenginepartners.appspot.com/science-2013-global-forest (Interactive map of global forest loss)
http://www.fao.org/forestry/41775/en/   (forest loss by country)

2. Students are to use the following website to witness the deforestation of the Amazon region in Brazil. This is a time-lapsed map which depicts the change. Consider asking students what may be causing this change and can or will this stop? Have the students consider "where" this happening. In many cases, countries are interested in immediate gains and have little foresight of the consequences associated with poor resource management skills. Consider asking who benefits and who loses. Ask students the following question: Why do developing nations have weaker resource management strategies?
https://earthengine.google.org/#intro1.

3. Have students read the article from the link below and view the map displaying current reforestation efforts globally. View the graph outlining the distribution of tree planting by continent. Through the creation of journal, students will communicate the main idea of the article and explain how a map can help understand where global reforestation efforts are occurring.
http://www.wri.org/blog/new-hope-restoring-forest-landscapes   (forest restoration article)
http://www.fao.org/forestry/41775/en/   (tree planting graph)

4. Students will create a thematic map displaying the continents of the world represented as different colours.

5. Students will combine a bar graph and map for the purpose of showing change over time for forest change. Students will fill in the provided student chart (Appendix 2) which depicts the change in land area of forests by continent using bar graphs from 1990 to 2010. The bar graphs will be cut out and data placed on the associated continent.

6. Students will construct a bar graph representing the 1990 forest area values and another bar graph representing the 2010 forest area values. They will use the provided chart (Appendix 2) to determine bar height and place them on top of the correct continent. The 1990 and 2010 bars must be different colours and must start from the same baseline in order to show how forest areas have changed overtime by continents

7. Students will add all the necessary mapping conventions to the constructed map. The teacher will need to review the necessary mapping conventions found on all maps in the form of a checklist. This will includes title, legend, border, scale, publisher, and north arrow (see Appendix 3).

8. Students respond to the story of all three maps (global deforestation, global forest restoration, forest change by continent in terms of what they are expressing, how can these maps help solve the deforestation crisis , and what can an individual do to help with this environmental dilemma?

9. Students can now attempt to become global citizens and come up with a plan to help with the indirect effects of deforestation within their own community. Introduce students to The Billion Tree Campaign and review information about getting involved and the successes of the program on a global basis:
http://www.plant-for-the-planet-billiontreecampaign.org/   (U.N The Billion Tree Campaign)
http://www.unep.org/Documents.Multilingual/Default.asp?
DocumentID=589&ArticleID=6200&l=en&t=long (Global Tree Planting Article)

ASSESSMENT

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Can students determine what regions of the world are under threat of resource depletion based on the spatial distribution of forest loss and why this may be occurring in these parts of the world?

Have students communicate what has been learned through an exit ticket submitted at the end of class.

Circulate and observe that students have made connections between resource management and quality of life.

Monitor the terminology/vocabulary that students use to identify spatial characteristics on a map.

Circulate and scan students' work as they prepare bar graphs and give verbal feedback.

OVERALL EXPECTATIONS
B1 Application: Analyze aspects of the extraction/harvesting and use of natural resources in different regions of the world, assess ways of preserving these resources (FOCUS ON: *Spatial Significance; Interrelationships*)

SPECIFIC EXPECTATIONS
B1.4 create a personal plan of action outlining how they can contribute to more sustainable natural resource extraction/harvesting and/or use

B2.1 formulate questions to guide investigations into issues related to the impact of the extraction/ harvesting and/or use of natural resources around the world from a geographic perspective

B2.2 gather and organize data and information from a variety of sources on the impact of resource extraction/harvesting and/or use, ensuring that their sources reflect more than one perspective

B2.3 analyse and construct maps as part of their investigations, with a particular focus on exploring the spatial boundaries of and, where applicable, patterns relating to their topics

B2.4 interpret and analyze data and information relevant to their investigations, using various tools and spatial technologies

B3.4 describe the perspectives of different groups *(e.g., a traditional indigenous community, an environmental organization, a multinational mining or company, the residents of a resource town)* regarding the use of the natural environment to meet human needs solve problems involving the calculation of unit rates.

OTHER RESOURCES

The Great Kapok Tree by Lynne Cherry

Appendix 1: Teacher Chart

Total Forested Area by Continent (1990- 2010)

Continent	Total Forest Area 1990 (sq km)	Bar Height (cm)	Total Forest Area 2010 (sq km)	Bar Height (cm)
Africa	7 492 380	7.4	6 744 190	6.7
Asia	5 761 100	5.7	5 925 120	5.9
Europe	9 894 710	9.8	10 050 001	10.0
North America	7 083 830	7.0	7 053 930	7.0
South America	9 464 540	9.4	8 643 510	8.6
Oceania	1 987 440	1.9	1 913 304	1.9

Source: Country Stat 2010

Calculating Bar Height

In order for the bars to drawn on the map using an appropriate size, we must assume that every 2cm of height will be equal to 1 000 000 square kilometres of forest area. Feel free to adjust the scale value of 1 000 000 to any other value in order for the bars to fit the map which the data will be placed on. Use the following example to determine bar heights for your map.

Example:
Total Forest Area / 1 000 000 = bar height in cm
7 492 380 / 1 000 000 = 7.492380 cm or 7.4 cm

Appendix 3

Mapping Checklist

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Use the following checklist to check if the completed map has all the required information before submitting.

Criteria	Strong	Moderate	Needs Attention
Title: - what the map is about - what time period - what location			
Border: - visible - drawn with a straight edge - even spacing			
Scale: - appropriate in size - correct unit			
Direction: - large enough to see - properly placed on the map			
Publisher/Date/Source: - publisher name/date/source in bottom right hand corner			
Legend: - has a full frame - information in legend makes sense for the audience - no duplication between map and legend			

Comapring Forest Area Change By Continent 1990 to 2010

1990   2010

North America

Europe

Asia

South America

Africa

Australia and Oceania

Antarctica

1:162,936,587

0   5,500   11,000 Km

Bar Size is Representative of
1 000 000 sq km of Forest Area

Source: Country Stat
Publisher: John Smith 2013