



<p>Ministry Licensed Resource Title:</p>	<p>ArcGIS</p>
<p>Description of resource</p>	<p><b>ArcGIS</b> is a desktop/cloud-based Geographic Information System (GIS) with powerful tools for mapping and data analysis. Students can create, customize and manipulate maps from templates as well as integrate information found online and other digital resources. This software offers students opportunities to engage and manipulate different types of maps and discover, share and use geographic data in ways that “traditional” maps, globes and other geography teaching tools may not allow. The ability to “layer” or superimpose visually represented data on top of a basemap gives students the capability to seamlessly transition between and simultaneously analyse different types of information.</p> <p>With the use of ArcGIS, students can transcend geographical-based maps to study and create issue-based maps that allow them to explore links between issues related to global development and quality of life.</p>
<p>Curriculum Connections</p>	<p>This exemplar is specific to <b>Grade 8 Geography, Global Inequalities: Economic Development and Quality of Life</b>, specifically in the area of Inquiry within a geographic perspective. However, ArcGIS could be used in any area in which geographical, economic, geo-political interrelationships, or a host of other issues or set of data needs to be studied and/or communicated.</p> <p>B2.2 gather and organize data and information from a variety of sources and using various technologies to investigate issues related to global development and quality of life from a geographic perspective;</p> <p>B2.3 analyse and construct digital and print maps as part of their investigations into issues related to global development and quality of life;</p> <p>B2.4 interpret and analyse data and information relevant to their investigations, using various tools and spatial technologies;</p> <p>B2.5 evaluate evidence and draw conclusions about issues related to global development and quality of life;</p>

	B2.6 communicate the results of their inquiries using appropriate vocabulary;
The “traditional” classroom practice and approach to the learning goals	<p>In small groups, students examine different thematic maps using either their textbooks, atlases, and other sources in order to understand the relationships between national education rates (or literacy rates) and the global economic standing of a particular country through GDP/GNP.</p> <p>Students then compare two countries, one developing and one developed, and draw conclusions about the correlation between education/literacy rates and wealth/poverty.</p> <p>Students convey this information to the rest of the class by creating visual displays, including student-created thematic maps, that demonstrate the information they’ve discovered and conclusions they’ve drawn. These visual displays are displayed in the classroom and become part of a Gallery Walk.</p>
<u>SAMR</u> : Substitution	Students use ArcGIS to look up thematic maps that depict the literacy rates/education rates of a given country and that country’s GDP/GNP and other economic markers. These maps would come from either the ArcGIS library or online sources. Students could print their maps and use them in their visual displays.
<u>SAMR</u> : Augmentation	Students use ArcGIS to look up thematic maps that depict the literacy rates/education rates of a given country and that country’s GDP/GNP and other economic markers. These maps would come from either the ArcGIS library or online sources. Student can use the “layering” function to compare the relationship between education/literacy rates and wealth/poverty of different countries. Students could then print their maps and use them in their visual displays.
<u>SAMR</u> : Modification	Students use ArcGIS to look up thematic maps that depict the literacy rates/education rates of a given country and that country’s GDP/GNP and other economic markers. These maps would come from either the ArcGIS library or online sources. Instead of printing these maps out, student will use the “layering” function to compare and show the relationship between education/literacy rates and wealth/poverty of different countries. Students would then move away from creating static displays and instead create virtual or digital displays where ArcGIS could be used to explain conclusions (e.g., using screen capture, video tools, and/or presentation software). Sharing

	would occur through a Gallery Walk where those who created the displays would be on hand to “walk” the audience through their findings and answer questions (i.e., Science Fair style).
SAMR: Redefinition	Students use ArcGIS to look up thematic maps that depict the literacy rates/education rates of a given country and that country’s GDP/GNP and other economic markers. These maps would come from either the ArcGIS library or online sources. Instead of printing these maps out, student will use the “layering” function to compare and show the relationship between education/literacy rates and wealth/poverty of different countries. To share information and conclusions, students would modify or augment their maps using ArcGIS tools to point out certain findings or important information, thus creating interactive maps which would be shared with other students. Sharing would occur through a “virtual” Gallery Walk, as students would be responsible for downloading and examining at least 3 maps from other groups.
Considerations for Digital Citizenship:	<p>Search and Evaluation: students have the opportunity to learn the idea of searching through and evaluating sources created by different organizations and the reasons for these resources were created (i.e., the idea of motive and bias)</p> <p>Rights and Responsibilities/Copyright: students will learn about using copyrighted material and how to properly cite and provide acknowledgments to the creators/sponsors of the maps and information being used</p> <p>Digital Literacy/Digital Access: embedded in the assignment itself, a discussion about access to digital resources as part of education and (digital) literacy and the relationship of these to wealth/poverty</p>

Reflections from the author...

**What impact did using this digital approach have on your instructional practice?**

The SAMR model has provided me with opportunities for reflection and often challenges me to find ways to integrate technology in a more seamless or invisible way. Using the SAMR model when planning a lesson or task allows me to see where I am entering with the the use of technology as a teaching/learning tool and then pushes me to find new ways to progress even further along the SAMR continuum. The SAMR model has encouraged me to ask not how can technology change my lessons, per se, but how can the skill, strategy or information I am working on with the students can be amplified by

the available tech tools. In other words, I focus not on the technology itself, but the desired outcomes.

While the SAMR model is often thought of as a progression of teaching and learning with technology, with its ultimate goal to using technology to incorporate rich learning tasks that are not possible without technology, it should be noted that there are times when each stage of SAMR can be used to great success. To that end, using the SAMR approach to planning lessons allows a teachers multiple entry points into the use of technology. No matter what the teaching-with-tech comfort level is or where along the continuum we are in our teaching practice, integrating technology has profound and direct impact on student learning.

**How did you know the approach had impact?**

I know the SAMR approach has had an impact on both my teaching practice and student learning because students have become more independent and resourceful. As I push myself to use technology to redefine my approach to teaching and learning, I have come to the realization that by integrating technology into the everyday experience of students, and doing so in such a way that using such tools becomes as commonplace as using pen and paper or manipulatives in math, students almost always take an active role in their learning and become much more engaged.

Additional Resources:

List of Geospatial Resources and Datasets  
That Can Be Used with the ArcGIS Software

Title	Description	Location
Geogratis	This site contains data and map resources collected and created by Natural Resources Canada. The resources are specifically Canadian.	<a href="http://www.geogratis.gc.ca/geogratis/Home?lang=en">http://www.geogratis.gc.ca/geogratis/Home?lang=en</a>
Canadian GIS and Geomatics: Geographic Information and Resources	This site lists several organizations/websites to get free information. It is one of the best sites as it compiles lists of various types of international resources.	<a href="http://canadiangis.com/data.php">http://canadiangis.com/data.php</a>
Land Information Ontario	This Ontario Ministry of Natural Resources site provides access to data and imagery, as well as the opportunity to create and share maps. The material available focuses on Ontario.	<a href="http://www.mnr.gov.on.ca/en/Business/LIO/index.html">http://www.mnr.gov.on.ca/en/Business/LIO/index.html</a>
Libre Map Project	The Libre Map Project was put together to collect and share digital maps and GIS data for free. The resources available are American.	<a href="http://libremap.org">http://libremap.org</a>
DIVA-GIS	DIVA-GIS provide free spatial data and maps.	<a href="http://www.diva-gis.org">http://www.diva-gis.org</a>
GIS Data Depot	This is a paid site, but does allow a free trial. You can have access to world-wide data and maps.	<a href="http://data.geocomm.com">http://data.geocomm.com</a>
Natural Earth	Natural Earth is a free public site where volunteer contributors collaborate and add content. It is supported by the North American Cartographic Information Society.	<a href="http://www.naturalearthdata.com">http://www.naturalearthdata.com</a>
Global Map	Is a collection of maps and data compiled by the International Steering Committee for Global Mapping (ISCGM) and is updated every 5	<a href="http://www.iscgm.org/cgi-bin/fswiki/wiki.cgi">http://www.iscgm.org/cgi-bin/fswiki/wiki.cgi</a>

	<p>years. The thematic data sets contain the following layers: elevation, vegetation, land cover, land use, transportation, drainage systems, boundaries and population centres.</p>	
<p>The Biodiversity Hotspots</p>	<p>This site contains data from Conservation International and is concerned with different aspects of climate, bio-diversity, water quality, food supplies and many other issues pertaining to conservation.</p>	<p><a href="http://www.conservation.org/how/pages/hotspots.aspx">http://www.conservation.org/how/pages/hotspots.aspx</a></p>

