

Water in the Americas

<b>Lesson Author(s)</b>	Joyce Sevast
<b>Lesson Title</b>	Water in the Americas
<b>Lesson Source</b>	
<b>Technology Needs (if any)</b>	Internet access with <a href="http://arcgis.com/explorer">arcgis.com/explorer</a> capabilities.
<b>Date/Time Lesson to be Taught</b>	Fall Semester. 2 days. Approximately 100 minutes of “tuned in” time.
<b>School</b>	
<b>Supervising Teacher</b>	
<b>Math or Science?</b>	Science
<b>Lesson Concepts</b>	How does the lack or abundance of fresh water impact location of human populations?
<b>Objectives</b>	<ul style="list-style-type: none"> <li>• Students will be able to discuss the availability and use of fresh water in the Western Hemisphere – its source, diversion, and use.</li> <li>• Students will be able to generalize the importance of fresh water to all people in the world.</li> <li>• Students will be able to locate places on the earth’s surface that, due to topography and prevailing weather systems, would have a generally promising availability of water.</li> </ul>
<b>CO State Standards</b>	CCSS Science Earth Science 2a (3.2.a) Gather and analyze data from a variety of print (electronic?) resources and investigations to account for local and world-wide water circulation and distribution patterns
<b>Materials List and Advanced Preparation</b>	World Atlases, World Almanacs Outline maps of N. and S. American countries. Computers (with internet access)
<b>Safety</b>	N/A
<b>Accommodations for Learners with Special Needs</b>	Focus on one key question.

**5Es**

<b>1. ENGAGEMENT</b>		<b>Time: 10 Minutes</b>
<b>What the Teacher Will Do</b>	<b>Probing/Eliciting Questions</b>	<b>Student Responses and Misconceptions</b>
Given a blank topo map with no human elements on it, choose which of 3 locations would be the best choice for a city, why?	What makes a place a good settlement spot? (Remember Jamestown?) What should you consider on your map? (vegetation, water, overall topography)	High on a hill – for protection and a view (water doesn't flow here). Ideal Answer – near a fresh water source in a protected topographic area.
<b>Evaluation/Decision Point Assessment</b>		<b>Student Outcomes</b>
Informal assessment of student learning through sharing of class locations with the group.		Students will choose the city nearest to a fresh water source or in a protected location.

<b>2. EXPLORATION</b>		<b>Time: 20 Minutes</b>
<b>What the Teacher Will Do</b>	<b>Probing/Eliciting Questions</b>	<b>Student Responses and Misconceptions</b>
<ul style="list-style-type: none"> <li>• Each pair of students will be given an outline map of a nation located in the Americas.</li> <li>• On the map, each pair will locate the ten largest cities in that nation.</li> <li>• Once located, students should also map natural features surrounding the cities (mountains, rivers, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Why are the cities located where they are?</li> </ul>	<ul style="list-style-type: none"> <li>• Transfer of information from a resource to their own map.</li> <li>• Lack of knowledge of physical map interpretation.</li> </ul>
<b>Evaluation/Decision Point Assessment</b>		<b>Student Outcomes</b>
Accuracy of student maps will be used to evaluate student progress.		Students are able to map major cities and locate dominant land features of the assigned country outline.

<b>3. EXPLANATION</b>		<b>Time: 30 Minutes</b>
<b>What the Teacher Will Do</b>	<b>Probing/Eliciting Questions</b>	<b>Student Responses and Misconceptions</b>
<p>Lead a discussion about the key elements for the location of a city.</p> <ul style="list-style-type: none"> <li>• Fresh Water Source</li> <li>• Protection</li> <li>• Climate</li> <li>• Elevation</li> <li>• Natural Vegetation</li> </ul> <ol style="list-style-type: none"> <li>1. Have the students look critically at the location of each city on the map. Are there any common features that are part of each city’s location?</li> <li>2. Have the students work in small groups (with several different maps) to generate a list of elements that should be considered to locate cities.</li> <li>3. Discuss findings with the group.</li> <li>4. As a large group, generate a list of “must haves” for a large population to exist in certain areas.</li> <li>5. Using <a href="http://ArcGIS.com/explorer">ArcGIS.com/explorer</a> the students will create maps with a topography base and world watershed information as an overlay.</li> <li>6. With this map the students will confirm or deny that each city has each element within a reasonable distance to the city center.</li> </ol>	<ul style="list-style-type: none"> <li>• What specific elements make each location a good place for a city?</li> <li>• What features do you see in or near most cities?</li> <li>• Which element is missing most often in your country? Why?</li> <li>• What does the place lack that may prevent its development?</li> </ul>	<ul style="list-style-type: none"> <li>• Mistaking swamp, oceans, etc. as fresh water sources.</li> <li>• Discounting cities in high elevation simply because of the high elevation.</li> <li>• Lack of knowledge of the use of different types of natural vegetation.</li> <li>• Misunderstanding about climate types.</li> </ul>
<b>Evaluation/Decision Point Assessment</b>		<b>Student Outcomes</b>
<p>Students are able to generate a list of common elements needed for a city to function with a great number of people in one area. Students will offer explanation for the location of cities that seem “misplaced” (i.e. piped in water from nearby rivers, climate regulation due to technological advances, etc.).</p>		<p>Students will draw reasonable conclusions about the best placement of cities based on the class generated list of “must haves” for city living.</p>

4. ELABORATION		Time: 20 Minutes
What the Teacher Will Do	Probing/Eliciting Questions	Student Responses and Misconceptions
<ol style="list-style-type: none"> <li>1. Pose the question, do you think animals create homes for the same reasons?</li> <li>2. Allow students to investigate animal homes via online resources to answer this question.</li> <li>3. Pose the question, how would this relate to our study of Mars colonization?</li> </ol>	This is the elaboration.	<ul style="list-style-type: none"> <li>• Animals live near those resources it needs to survive, or it would not survive. Survival of the fittest is not lost in animal populations.</li> <li>• Mars colonization will require looking closely at the topography to determine the best colonization space.</li> </ul>
Evaluation/Decision Point Assessment		Student Outcomes
Are student answers logical based on class discussion?		Students will understand that population centers of both humans and animals are not coincidental. Populations grow based on the available resources and their accessibility. Students will also recognize that technology has enhanced man’s ability to live in extreme environments and in places in which resources are not as plentiful.

5. EVALUATION		Time: 20 Minutes
What the Teacher Will Do	Probing/Eliciting Questions	Student Responses and Misconceptions
Once again, the students will be faced with a blank topo map – this time with no choices for city locations. The students will then choose a location for settlement and write a brief narrative explaining their city’s location which demonstrates understanding of the key elements that should be considered when choosing a city location.		
Differentiation		Time: N/A
Students who are behind or need support	For advanced or gifted students	
The final locations may be more varied for this subgroup of children. These kids will work with a group through the whole process.	The final location should be the best possible location on the topo map and explanations should be precise. These students should lead and offer unique perspectives to the discussion.	