Water Crossings

Grade Level:
Upper Elementary, Middle School and High School

Subject Areas:
Geography, History, and Language arts

Setting:
Classroom

Skills:
Recall, Observation, Analyzing, Applying, and Evaluating

Prior Preparation:
Make copies of *The River of the West* excerpt for each student. Make a list of materials that each small group is responsible for bringing to class for the activity. Some materials are provided in this kit.

Read aloud excerpts from the book *River Roads West: America's First Highways* and view excerpts from the DVD "Historic Columbia River Films".

Vocabulary:
water crossing

Post Activities:
Play the game Terra Nova or New World.

Objective: Students participate in a water-crossing contest in which they must move their possessions (a hard-boiled egg, tennis ball or rock) across a span of water (cake pan).

Materials:
Copies of *The River of the West*
Map of the United States or local map
State road map
Hard-boiled eggs, rocks, or tennis balls
Student collected natural materials (twigs, dried grass, reeds, bark, cork, etc.)
String or twine
Waterproof glue
Cake pan, bucket, or dish pan

Background:
Water crossings and the technology involved in bridging rivers have had a major impact on exploration and settlement patterns throughout history. Student understanding of the challenges posed by water crossings, and of the various historic methods used to overcome these obstacles, leads to a greater appreciation of the efforts of early explorers and pioneers.

Pioneers crossing North America faced many challenges. While today there are interstates and highways, back then the land was untamed and relatively unchanged by people's influence. The cross-country trip would have taken many months on roads that often were no better than trails. People traveled by steamboat and railroad, on horseback, in wagons pulled by horses or oxen, and on foot.

River crossing were common challenges. Consider crossing the Mississippi or Ohio Rivers today at a spot where no bridge exists. Consider, too, the dilemma facing a family encumbered by a wagon filled with all of their possessions, as they overlooked the Colorado River in 1890.

Rivers without crossings have a natural damming effect on travelers. A safe and efficient crossing acts like a funnel, drawing people from far and wide. Towns and cities all across the nation were established at river crossings. River boats and ferries added prosperity to local economies.

Successfully crossing waterways demanded innovation, hard work, group coordination, and luck. Sometimes a section of river could be found that was shallow enough to allow a ford. In other cases, ferries or cable and pulley systems were rigged to transport people and materials. During winter, people could cross on the ice, once it had reached sufficient thickness. If a river's course ran in generally the same direction as a party's travel route, boats or rafts could be made and the river used as a roadway. Once a sufficient level of population and resources had amassed at a crossing site, a bridge could be built to span the water. Even after a bridge was built, its life expectancy was jeopardized by spring floods and floating ice.

Procedure:

- Ask students if any of them have taken lengthy trips across the country. Compare their experiences to travel during the pioneer days. Have them identify the hazards pioneers faced during their journeys. If students have been exposed to early American history, review Native Americans' need to cross rivers, early European explorations, and historical routes.

- Give each student the copy of the excerpt from Frances Fuller Victor's book, The River of the West. The author describes a crossing of the Yellowstone River by a group of trappers and traders led by Jedediah Smith in 1829. Some of the words in the excerpt may be unfamiliar to students (see bold type). Have students guess the meaning from the context of the sentence and story. Compare students' and author's meanings.

- Ask if any students have had to cross bodies of water where no bridges existed. What were their feelings/ How did they solve the problem? What factors had to be taken into account (safety, time of year, building materials, alternative routes, etc.)?

- Have students study a map of the United States or the local map and identify several major cities located at river crossings. Why are river crossings often associated with towns? List the positive and negative impacts of a crossing site on the development of a region.

- Using the map, have students select a river or stream and count the number of bridges/crossings. What factors are likely to influence their number and location?

- Have students write a short fictional story about approaching a river and needing to get to the other side. Encourage them to use their imagination when describing the river. They should explain the character's feelings and indicate how they would cross the river.

- Tell students they are about to gain insight into some of the challenges pioneers faced when they arrived at a river; they are going to participate in a water crossing contest! The goal of the contest is for small groups of students to plan, design, and construct a means of carrying a load across a body of water. The competition should encourage a variety of interesting approaches.

- Divide the class into small groups. Each team will build a water crossing conveyance from natural materials collected from front yards, city parks, and school grounds. Since each team gets only one chance to succeed, encourage groups to discuss their options (making a ferry, raft, wherry [a light, swift boat built for one person], etc.) before beginning construction.

- Inform students that the load to be transported is a hard-boiled egg (or rock or tennis ball). Once each team has built its conveyance, the "load" is place on the center and the whole floated in a

bucket or dish pan. The conveyance must support the load for 2 minutes, while not touching the sides or the bottom of the bucket. If the structure does not crack, capsize, or fall apart within 2 minutes, the team has succeeded in crossing the barrier. To increase the challenge and simulate treacherous crossing conditions, rock the pan, sprinkle water, or create wind with a fan.

- Have students vote on the most successful strategy and brainstorm improvements in conveyance designs for another contest. Students can also vote on the most aesthetic, innovative, or unique design. Try to make every team a winner.

Extensions:

- Look at the routes of historical trails and recognize the effects of water obstacles on their course. Have students map a pioneer trail across America, minimizing water obstacles. Compare historical trails to the modern highway system and discuss the differences and similarities regarding rivers and lakes. Are modern bridges located at some of the same places as the historical crossings?

- Conduct a bridge-building contest. Invite a structural civil engineer to visit your class and have him/her hold a bridge building day with your students.

Note: This is a Project WET activity. For further activities, refer to the Project WET Curriculum and Activity Guide.

Excerpt from Frances Fuller Victor's book, **The River of the West**

Arrived at the Yellowstone with his company, Smith found it necessary, on account of the high water, to construct Bull-boats for the crossing. These are made by stitching together buffalo hides, stretching them over light frames, and ***paying*** *the seams with elk tallow and ashes. In these light* ***wherries*** *the goods and people were ferried over, while the horses and mules were crossed by swimming.*

The mode usually adopted in crossing large rivers was to spread the ***lodges*** *on the ground, throwing on them the light articles, saddles, etc. A rope was then run through the* ***pin-holes*** *around the edge of each, when it could be drawn up like* ***reticules****. It was then filled with the heavier camp goods, and being tightly drawn up, formed a perfect ball. A rope being tied to it, it was launched on the water, the children of the camp on top, and the women swimming after and clinging to it, while a man, who had the rope in his hand, swam ahead holding on to his horse's mane. In this way, dancing like a cork on the waves, the lodge was piloted across; and passengers as well as freight* ***consigned****, undamaged, to the opposite shore. A large camp of three hundred men, and one hundred women and children were frequently thus crossed in one hour's time.*