



wildsight

TEACH THE COLUMBIA

River ecology: How do natural river ecosystems work?

Guiding questions

What is a river? How do rivers change over time? What is the “job” of a river on the landscape? What makes a river healthy or unhealthy? What do rivers do for nature? For people?

Learning goals

Students can describe what a river is and how rivers may connect with other features of a landscape (e.g. lakes, wetlands, glaciers, ocean, etc.)

Students gain an understanding of what factors make a river healthy or unhealthy

Students understand both the value of healthy rivers for nature and the kinds of “ecosystem services” that healthy rivers provide for humans

Materials

- USGS - **Rivers, Streams and Creeks**
- National Geographic- **River and Understanding Rivers**
- **River Ecology with Annette Luttermann** interview video

Preparation

1. Have **River Ecology interview** video ready
2. Provide large chart paper or whiteboards for group mind maps
3. Print off USGS and Nat Geo resources or have links and devices available for students

Instructions

Total time: **90 minutes**

1. Begin with students in small groups, to discuss their ideas in response to these questions: What is a river? How do we define what a river is and what it does? Create a group mind map or other graphic to show the group’s evolving definition. **10 mins**

2. Provide students with the links to USGS and National Geographic resources to read and add to their definitions. **30 mins**
3. Group Discussion: Collect student ideas on the following questions: What is the “job” of the river on the landscape? How can we determine the “health” of a river as an ecosystem? How does the hydrosphere interact with the biosphere, geosphere, and atmosphere through rivers? **10 mins**
4. Watch **River Ecology** video. **15 mins**
5. In small groups, discuss video and add their thoughts to the original mind maps. Add thoughts related to the values of intact, healthy rivers with regard to nature and to humans. What kinds of “services” do free-flowing rivers provide? **10 mins**
6. Report back to the whole group in whatever creative way each group chooses, referring to the lesson’s guiding questions. **15 mins**

Extensions

- Experiential Activity: ‘Build a River’ — observe behaviour of water moving downhill by experimenting with different shapes, substrates, angles and flows. (See River-building activity resources in the Appendix)
- Create a class collage of favourite local river photos with labels and notes
- Make slideshows or videos to describe river features and processes

Curriculum links

Science 9
Social studies 11
Earth Science 11
Environmental Science 11
Physical Geography 12

Appendix

Some Definitions for “River”:

- “A river is a large, natural stream of flowing water” - **Nat Geo**
- “A river forms from water moving from a higher elevation to a lower elevation, all due to gravity” - **USGS**
- “A river is a natural flowing watercourse, usually freshwater, flowing towards an ocean, sea, lake or another river. In some cases, a river flows into the ground and becomes dry at the end of its course without reaching another body of water. Small rivers can be referred to using names such as stream, creek, brook, rivulet, and rill.” - **Wikipedia**

Additional resources

- **Geology-River Systems and Fluvial landforms US**
National Parks Service
- **How a river flows** — Cristi Cave, University of Washington, School of Fisheries student
- **Introduction to Rivers and Streams** — Let’s Talk Science
- **Streams and Rivers** — Basic Lesson Plans
- **River-building activity:**
 - **Stream Table Lab**
 - **Work of Water lesson** from Glacier National Park
 - **Stream Table lab**
 - **River Sediment Processes**