

Hydropower Resources by Grade Level

Grade Level	Lesson Title/Link	Short Description
K-12	Northwest Resources for Educators	Educators Toolbox includes K-12 classroom curriculum, renewable energy videos and information, hydroelectric project walkthrough, "A Day in Hydro STEM Path" Career video, and links to games, worksheets, and more.
K-12	Map of Water Power Site Tours	The map shows locations of hydropower power generation and research sites that offer museums, educational facilities, and/or site tours. Click on a pin to learn more about a site. Narrow your search by selecting a site category.
K-12	Map of Virtual Site Tours	The map shows hydropower power generation and research sites that offer virtual site tours.
K-12	Energy Resources in Spanish	The Department of Energy has translated some of its most popular resources from English to Spanish, including videos, activities, and guides for energy consumers and educators. A great resource to make available to teachers and parents.
K-12	PowerWheel Lessons and Examples	The PowerWheel is a micro hydro generator - an amazing tool for teaching lessons about energy, hydro-power, and other renewable sources of energy. Now you can charge cell phones or power laptops all from the power from your faucet. The PowerWheel can be used to enhance lessons for students from kindergarten through 12th grade.
K-12	NEED's Curriculum Library and Hydropower Resources	NEED (National Energy Education Development) provides PowerPoints, handouts, maps, data, lessons, and teacher lesson plans for different grade levels in their comprehensive library of resources.
K-12	BPA's Hydropower Resources	The Bonneville Power Administration provides K-12 materials which focus on renewable energy sources, including hydropower; climate change; environment fish and wildlife, and energy efficiency.
K-2	Hydropower Flows Here Coloring Sheet	This coloring sheet asks students to identify how many things in the picture are using hydropower.
3-4	Busy As a Beaver Dam Activity	The purpose of this activity is to introduce students to some of the issues engineers face in building dams: they must be both waterproof and strong enough to withstand the pressure of water.

3-5	NEED's Interactive Hydropower Poster	Students interact with a graphic depicting various components of hydropower system and can check their answers for "correctness"
3-5	Video Resource: Bonneville Dam Salmon Lifecycle	Salmon go to extraordinary lengths to lay their eggs. Join a park ranger to learn how these incredible fish complete their journey from stream to ocean, and back again!
3-5	Hydropower and the Force of Water	Students will identify how hydroelectric facilities use water pressure to work. They will make a makeshift dam using common household materials to help them understand how the water pressure is harnessed to turn a turbine. They will discuss how water pressure, the flow of the water, and distance using gravitational force creates electricity
3-5	Video Resource: Bonneville Dam Hydropower Basics	Electrons, magnets, millions of gallons of water, and giant turbines! Take a tour of Bonneville's second powerhouse with a park ranger! In this video, learn about how hydropower is produced, where all that electricity goes, and how it gets used.
3-5	Video Resource: Bonneville Dam Navigation on the Columbia River	Have you ever seen a barge on the river and wondered what it was doing, where it was going or what it was carrying? In this video, learn about how ships get past dams, what they're carrying, and why it's important!
4	Falling Water	Students drop water from different heights to demonstrate the conversion of water's potential energy to kinetic energy. They see how varying the height from which water is dropped affects the splash size. They follow good experiment protocol, take measurements, calculate averages and graph results. In seeing how falling water can be used to do work, they also learn how this energy transformation figures into the engineering design and construction of hydroelectric power plants, dams and reservoirs.
4	Waterwheel Work: Energy Transformations and Rotational Rates	Students learn the history of the waterwheel and common uses for water turbines today. They explore kinetic energy by creating their own experimental waterwheel from a two-liter plastic bottle. They investigate the transformations of energy involved in turning the blades of a hydro-turbine into work, and experiment with how weight affects the rotational rate of the waterwheel. Students also discuss and explore the characteristics of hydroelectric plants.
4-5	Hydroelectric Dam Game and Worksheet	This resource allows students to play a simple online game and complete a worksheet that includes the parts of a hydroelectric dam that could be part of an introductory activity
5	Clean Energy:	Using the associated activities, Hydropower generation is

	Hydropower	introduced to students as a common purpose and benefit of constructing dams. Through an introduction to kinetic and potential energy, students come to understand how a dam creates electricity. They also learn the difference between renewable and non-renewable energy.
5-8	Hydropower Turbine Engineering Challenge	Use household items to design and engineer your own hydropower turbine at home. This video shows a variety of methods designs to inspire students to make a turbine and measure the number of spins in 10 seconds. Students are encouraged to use whatever materials they have on hand and get creative!
5-8	Woods Creek Hydro Project Virtual Tour and Teacher Guide	Virtual Tour Video and guide with discussion questions, suitable for upper elementary and middle school.
5-8	Teacher's Guide to Bonneville Dam	This is a comprehensive guide for upper elementary and middle school teachers that will build understanding of the U.S. Army Corps of Engineers and its mission, specifically hydropower, navigation, natural resource management (including salmon), and recreation.
5-8	Harnessing Hydropower: A Kids Hydropower Information Booklet	This 20 page PDF with graphics and grade-level appropriate language serves as an introduction and overview of hydropower
7	Do As The Romans Do: Conduct An Aqueduct	Students work with specified materials to create aqueduct components that can transport two liters of water across a short distance in the classroom. The design challenge is to create an aqueduct that can supply Aqueductis, a (hypothetical) Roman city, with clean water for private homes, public baths and fountains as well as crop irrigation.
5-12	Video Resource Library: Career Pathways	This database of day-in-the-life professional profiles and case studies is available to help educators learn and teach about hydropower. We want to make it easy for educators at all levels to quickly find these materials that will help energize students around a hydro-powered future and related concepts. Careers highlighted include: Operation and Maintenance Manager, Compliance Specialist, Hydropower Biologist, Lineworker Apprentice, Cable Splicer, Construction Crew Chief, Grounds Maintenance Crew, Engineer, and many more
5-12	Northwest River Partners Hydropower Resources	Northwest River Partners offers an up-to-date and thorough library of links to fact sheets, files, and websites that offer great information on the hydropower system and salmon.

7-9	Make Your Own Hydropower (Kit and Activity Guide)	Make Your Own Hydropower provides students with a hands-on exploration of generating electricity with water power. By constructing the model successfully, students will learn and demonstrate the principles of generating electricity. As they explore the role of hydropower, the source for over 60% of electrical generation in the Northwest and 10% nationally, students can also consider other sources of electrical generation.
9	Power Your House With Water	Students learn how engineers design devices that use water to generate electricity by building model water turbines and measuring the resulting current produced in a motor. Student teams work through the engineering design process to build the turbines, analyze the performance of their turbines and make calculations to determine the most suitable locations to build dams.
9-12	Hydropower Lesson Plan	How do we use hydropower without causing further damage to natural ecosystems? What is hydropower and how does it work? How do dams impact fish populations? What concerns need to be taken into account when building new dams?
9-12	Video Resource: Bonneville Dam History	Take a step back in time to learn about the construction of Bonneville Dam! Find out what President Franklin Roosevelt had to do with Bonneville's beginnings, and how the dam impacted the region and our nation.