

How Energy Moves from Nature to Your Home

VIDEO GUIDE & LESSON PLAN » » »

ELEMENTARY AND MIDDLE SCHOOL



Bonneville
POWER ADMINISTRATION



**HYDRO
POWER
FLOWS HERE**

TOPICS:

Energy, Electricity Production,
Energy Sources, Clean Energy,
Renewable Energy, Hydropower,
Water Cycle, Solar Power,
Wind Power, Power Grid,
Power Lines, Power Line Safety

Video summary

Students use electricity every day and often don't stop to think about where the electricity comes from, how it's made, how it gets to their homes and schools, or what impact it might have on the environment. This educational video explains the difference between renewable and non-renewable energy sources. It then follows the journey of hydropower from a water drop falling as snow in the mountains to an energy watt traveling on an electricity superhighway to homes and schools.

Students will learn about the important role hydropower plays in supporting other renewables such as wind and solar. The first version of the video also includes a segment on the region's largest provider of hydropower, Bonneville Power Administration (BPA), and the variety of career opportunities available there.

Videos

Version 1: [How energy moves from nature to your home](#) – 14:01 minutes
(includes segment on BPA and careers)

Version 2: [How energy moves from nature to your home](#) – 11:18 minutes

Video Sections

1. Everyday electricity
2. Non-renewable vs. renewable resources
3. The cleanest energy in the nation
4. Hydropower: The water cycle
5. Hydropower: How electricity is made
6. Hydropower: Flexible, reliable and a great team player
7. Getting electricity to your house
8. Electricity safety
9. BPA: The people behind the power (version 1)

Poster

A corresponding classroom poster reflects the journey of hydropower and is available in English and Spanish.

- [How electricity moves from nature to your home](#)
- [Cómo se mueve la electricidad de lanaturaleza a tu casa](#)

Video discussion prompts

These questions can be asked in advance of the video viewing, or it can be paused at these timestamps to engage students as you view the video together.

- 0:36** – Where do you think the power comes from when you flip on a light switch? Why should we care about where our electricity comes from?
- 1:04** – What would life be like without electricity? What things do you enjoy doing today that you could no longer do?
- 2:14** – What is the difference between non-renewable and renewable energy? Have you ever noticed energy being made in your community or maybe on a road trip?
- 2:59** – What energy source do you think is the reason the Northwest has the cleanest energy in the nation?
- 5:05** – Have you ever seen a hydropower dam before? Where do you think the water for hydropower comes from?
- 6:56** – What do waterfalls and hydropower dams have in common?
- 7:46** – Changes in weather can change the way we use electricity. Can you think of examples?
- 8:37** – Look out the window. What types of renewable energy might be making electricity right now? Why aren't wind and solar energy available all the time?
- 9:14** – Where have you seen tall transmission towers before? Why do you think the towers are located there?
- 9:38** – Have you ever driven or walked by a substation? Before today what did you think happened there?
- 10:02** – Think about your neighborhood. Are the power lines near your house above ground or below ground?

Worksheet answer keys

Elementary School: 1.C; 2.A; 3.B; 4.A; 5.A; 6.C; 7.A; 8.N/A; 9.N/A

Middle School: 1.B; 2.A; 3.Gravity; 4.A; 5.A; 6. Non-renewable, Renewable, Non-renewable, Renewable, Non-renewable, Non-renewable, Renewable; 7.E; 8.N/A; 9.N/A; Bonus. N/A

Glossary of terms

Distribution lines – Wires typically supported by wooden poles that carry electricity to homes and buildings.

Hydroelectric dam – A structure on a river that converts falling water into electricity.

Hydropower – Energy that has been converted from moving water into electricity.

Intermittent energy – Energy that is not always available because it cannot be controlled.

Non-renewable energy – Energy made by burning or changing the energy source.

Non-renewable resources – Energy sources that are burned or changed when used and can't be used again.

Powerhouse – The part of the hydroelectric dam that houses the generators and turbines used to make hydropower.

Renewable energy – Energy made without burning or changing the energy source.

Renewable resources – Energy sources that can be used again and again without being burned or changed.

Reservoir – A body of water stored behind a hydroelectric dam that can later be turned into electricity.

Solar power – Energy that has been converted from the sun's rays into electricity.

Substation – Equipment that converts electricity into different voltages.

Transmission lines – Wires usually supported by tall metal towers that carry high-voltage electricity over long distances.

Turbine – A wheel with blades turned by flowing air, water or steam that produces electricity.

Water cycle – The Earth's process of recycling water through evaporation and condensation over and over again.

Wind power – Energy that has been converted from the wind into electricity.

WORKSHEET

How Energy Moves from Nature to Your Home

ELEMENTARY SCHOOL

1. Which of the following is a large source of our electricity?
 - a. Lightning bolts from Thor
 - b. Hamster wheels
 - c. Water
-

2. Which of the following is a renewable source of electricity?
 - a. Water
 - b. Coal
 - c. Gasoline
-

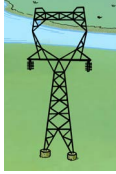
3. When water falls, it is powerful. That means water plus _____ equals hydropower.
 - a. Wind
 - b. Gravity
 - c. Boats
-

4. Where does the water for hydropower come from?
 - a. Snow
 - b. Trees
 - c. Boats
-

5. Renewable resources can be used over and over again without being destroyed.
 - a. True
 - b. False

6. What are big lakes behind dams that store water for the future?
- a. Swimming pools
 - b. Oceans
 - c. Reservoirs
-

7. What is this?



- a. Transmission tower for moving electricity
 - b. Rocket launching platform
 - c. Metal trees
-

8. Fill in the blank with your own example.

I used electricity today to _____.

9. Draw a picture of three things in nature that can make electricity:

Energy Resource 1
Hint: It's good for swimming.

Energy Resource 2
Hint: It blows things around.

Energy Resource 3
Hint: It lights up the sky.

WORKSHEET

How Energy Moves from Nature to Your Home

MIDDLE SCHOOL

1. Which renewable resource is the most dependable?
 - a. Wind
 - b. Water
 - c. Sun
-

2. What do transmission lines do?
 - a. Carry electricity long distances
 - b. Move cell phone signals
 - c. Transmit Wi-Fi across the country
-

3. Fill in the blank. Water plus _____ equals hydropower.
-

4. What does a substation do?
 - a. Converts one voltage electricity into a different voltage electricity
 - b. Holds water for later
 - c. Generates hydropower
-

5. Renewable resources can be used over and over again without being destroyed.
 - a. True
 - b. False

6. Categorize the following types of energy sources as renewable or non-renewable.

ENERGY TYPE	RENEWABLE	NON-RENEWABLE
Coal		
Solar		
Natural Gas		
Hydropower		
Petroleum/Oil		
Nuclear		
Wind		

7. What is a benefit of dams besides producing electricity?
- a. Lakes for boating, swimming and fishing
 - b. Flood protection
 - c. Water for farms
 - d. Easier travel for boats on the river
 - e. All of the above

8. Fill in the blank with your own example.

I used electricity today to _____.

9. Draw a picture of the three types of clean energy resources:

1	2	3

Bonus Question: Fill in the blank with your own example.

If I were to work for a company that delivered hydropower electricity, I would want my job to be _____.

Additional resources

Activities and lesson plans

- [Energy Curriculum and Activities](#) (Bonneville Power Administration)
- [Hydropower STEM Educational Resources Portal](#) (National Renewable Energy Lab)
- [Hydropower Flows Here Activity Book](#) (Bonneville Power Administration) [En Español](#)
- Hydropower Flows Here Coloring Sheet [#1](#) and [#2](#) (Bonneville Power Administration)
- [DIY: Hydropower Pop-Up Model](#) (Bonneville Power Administration)
- [DIY: The Water Cycle Hexaflexagon](#) (Bonneville Power Administration)
- [Bonneville Dam Curriculum Collection](#) (U.S. Army Corps of Engineers Portland District)
- [Sources of Electricity Activity Book](#) (Foundation for Water and Energy Education)
- [Nature of Water Power Curriculum \(grades 6-8\)](#) (Foundation for Water and Energy Education)
- [Make Your Own Hydropower](#) (Foundation for Water and Energy Education)

Infographics and booklets

- [Hydropower System Poster](#) (Bonneville Power Administration) [En Español](#)
- [Carbon Footprint Infographic](#) (Bonneville Power Administration)
- [Northwest Renewable Sources Infographic](#) (Bonneville Power Administration)
- [Fuel Mix Infographic](#) (Bonneville Power Administration)
- [Booklet: Following Nature's Current](#) (Foundation for Water and Energy Education)

Presentations

- [Northwest Sources of Electricity](#) (Foundation for Water and Energy Education)
- [The Water Cycle](#) (U.S. Geological Survey)

Videos

- [How energy moves from nature to your home](#) (Bonneville Power Administration)
- [The Incredible Life Cycle of Northwest Salmon](#) (Bonneville Power Administration)
- [Hydro Heroes](#) (Foundation for Water and Energy Foundation)
- [Energy 101](#) (U.S. Department of Energy)
- [BPA Historic Film Collection](#) (Bonneville Power Administration)
- [Hydropower in America](#) (National Hydropower Association)
- [Bonneville Dam Video Collection](#) (U.S. Army Corps of Engineers Portland District)

Websites

- [Bonneville Power Administration – Hydropower Education](#)
- [Foundation for Water and Energy Education](#)
- [U.S. Department of Energy Hydropower Basics](#)
- [Pacific Northwest National Lab – Hydropower](#)
- [U.S. Army Corps of Engineers Hydropower Program](#)
- [Bonneville Dam](#) (U.S. Army Corps of Engineers, Portland District)
- [U.S. Geological Survey](#)
- [National Hydropower Organization](#)

Please contact Communications@bpa.gov for information on Bonneville Power’s educational offerings and classroom program.