

## “Don’t pollute our water. It’s beneath you.” Billboard Contest Ideas

The world’s supply of clean, usable water is decreasing faster than it can be replaced. With climate change concerns and pervasive droughts, nearly everyone is looking for ways to conserve and preserve water so that we can build a sustainable future together. It’s our water and our future. What does that look like to you?

You and your classroom can make a difference by entering the KSPS and Spokane Aquifer Joint Board Billboard Contest. The theme this year, “Don’t pollute our water. It’s beneath you.” allows for a wide variety of STEM content connections. You could use any of these content ideas as a pathway to engage students in our contest while working toward meeting learning standards.

### Content Connection Ideas

- **Earth Systems:**

- What type of rocks form the Spokane Valley Rathdrum Prairie (SVRP) aquifer?
- How did water (ice age floods) shape the aquifer boundaries and transport sand and gravel into the valleys that now hold our drinking water?
- In what ways can humans impact the SVRP aquifer?
- What kinds of things are individuals/communities doing to protect water resources?
- Is water a renewable resource?
- Design and evaluate a solution(s) that could reduce human impact on water resources.

**Applicable NGSS Standards:**

**ESS2 Earth’s Systems**

ESS2.E: Biogeology	
K-2	3-5
Plants and animals can change their environment.  <b>PE:</b> Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.	Living things affect the physical characteristics of their regions.  <b>PE:</b> Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

**ESS3 Earth and Human Activity**

ESS3.A: Natural Resources		
K-2	3-5	6-8
Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do.  <b>PE:</b> Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live	Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not.  <b>PE:</b> Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment	Humans depend on Earth’s land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes.  <b>PE:</b> Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes.

ESS3.C: Human Impacts on Earth Systems		
K-2	3-5	6-8
<p>Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things.</p> <p><b>PE:</b> Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.</p>	<p>Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.</p> <p><b>PE:</b> Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.</p>	<p>Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.</p> <p><b>PE:</b> Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.</p>

• **Life Science:**

- What is the role of water to sustain all life?
- Do environmental changes affect the availability of resources?
- What are some causes and effects of water contamination on populations and the environment?
- Sustainable Future
  - One of the [United Nations Sustainable Development Goals](#) is to: [Ensure access to water and sanitation for all](#). Probably something we hardly think about in Washington and Idaho, but for many parts of the world access to safe water is a daily struggle. Globally, 1.8 billion people use a source of drinking water that is fecally contaminated. Water scarcity affects more than 40% of the global population and is projected to rise.

**Applicable NGSS Standards:**

**LS2 Ecosystems**

LS2.A: Interdependent Relationships in Ecosystems		
K-2	3-5	6-8
<p>Plants depend on water and light to grow.</p>	<p>The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem.</p> <p><b>PE:</b> Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment</p>	<p>Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors.</p> <p>In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction.</p> <p>Growth of organisms and population increases are limited by access to resources.</p> <p><b>PE:</b> Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.</p>

- **Engineering and technology:**

- How is our drinking water delivered to us through public water systems or private wells?
- How do we test our drinking water to ensure it is safe to drink?
- How do we remove impurities from wastewater to reclaim it for reuse?
- How do we store water for future use?
- Can you think of a new technology that purifies water?

**Applicable NGSS Standards:**

**Engineering Design:**

<b>ETS1:A Defining and Delimiting Engineering Problems</b>	
<b>K-2</b>	<b>3-5</b>
<p>A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions.</p> <p><b>PE:</b> Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. K-2-ETS1-1</p>	<p>Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.</p> <p><b>PE:</b> Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</p>
<b>ETS1:B Developing Possible Solutions</b>	
<b>K-2</b>	<b>3-5</b>
<p>Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people.</p> <p><b>PE:</b> Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</p>	<p>Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions.</p> <p>At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs.</p> <p><b>PE:</b> Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.</p>

- **Stewardship:**

- What can every person do to conserve our drinking water?
- [Water Conservation Ideas](#)
- Protect our drinking water quality
- Safely dispose of all wastes especially hazardous household products. See the Spokane Waste Directory for disposal information and vendors. [www.spokanewastedirectory.org](http://www.spokanewastedirectory.org).
- Find Alternative Products and Tips to reduce the use of hazardous materials for every part of your home.

**Links to organizations that work to protect our water quality and quantity:**

- **SAJB:** The [Spokane Aquifer Joint Board](#) is an organization of water providers who work every day to provide your homes with safe drinking water. The website contains a wealth of educational materials.
- [City of Spokane's Water Stewardship Program](#)
- [Spokane County Water Resources](#),
- [Spokane County Conservation District](#),
- [Idaho Washington Aquifer Collaborative](#),
- [Spokane County Stormwater](#)