Nature-Watch Activity Kit

Water Cycle Wheel

(Nature Watch Kit #153)

Kit Contents

	Kit Size	
	25	**100**
Item:	Qty.	
Water cycle wheels (front	25	100
Brass fasteners	25	100
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This page includes the Next Generation Science Standards (NGSS) mapping for this kit and Science, Technology, Engineering, and Math (STEM) extensions (on back) to use in adapting and extending this activity to other subject areas.

See Back for STEM Extensions

Next Generation Science Standards Alignment

K-PS3-1. Make observations to determine the effect of sunlight on Earth's surfaces.

K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.

2-ESS1-1. Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

2-ESS2-3. Obtain information to identify where water is found on Earth and that it can be solid or liquid.

MS-ESS2-4. Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

MS-ESS3-3.
Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

This Nature Watch Activity Kit contains an Instructor Manual and materials to implement the curriculum. The kit was designed to be used with adult supervision only. Unsupervised use is not recommended.

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STEM Extensions

Science

Pretend you are a water molecule. Write a story or draw a cartoon demonstrating your journey through the water cycle.

Experiment with small bowls of water to see what factors speed up or slow down evaporation. Try using shallow bowls versus deep bowls, bowls kept in hot conditions versus cooler ones, bowls in "windy" areas (near a vent) versus areas with still air, and bowls in the sun versus the shade. Make sure to start with the same volume of water in each bowl so you can accurately compare the results.

The average American uses 100 gallons of water per day. Many people around the world do not have access to enough fresh water. To survive, a person needs at least one gallon – four liters – of water per day. Challenge yourself to see how far you can make four liters go. Fill two two-liter bottles (or four one-liter bottles) with water and try to use it sparingly. Describe your experience. How long did your four liters last? What did you change about your daily habits? How did you feel?

Technology

Find a water use calculator online to estimate how much water you use daily, and brainstorm ideas for reducing your water usage.

Go online to find out about the distribution of water around the Earth (how much is in oceans, groundwater, swamps, etc.). Use computer software to make a pie chart that displays this distribution.

Engineering

Soil is a natural filtration system for water. As rainwater moves into the ground and through the soil, the components of the soil catch impurities. Build a water filter that mimics this system. Cut a two-liter bottle across the middle, so that the top part is slightly smaller than the bottom part. Flip over the top half and place it into the lower half so that the neck of the bottle is pointing down to the bottom of the lower half. Build your filter by adding sand, rocks, gravel, charcoal, or other natural objects. Try out different combinations and thicknesses of the layers. Pour "dirty water" (water mixed with potting soil) into your filter and see how clean the water is that comes out in the bottom of the bottle. What substances work well as a filter?

Research rain barrels as a tool to recycle rainwater. Plan where you would place a rain barrel and how you would use the rainwater collected there.

Math

(Younger) Of all the water on Earth, only 0.02% of it is fresh water that is available for humans to use. Using paper clips or some other small and inexpensive object, set up a visual representation of this proportion. Start with 1,000 paper clips as the total water on Earth. Set aside 970 paper clips to represent 97% of the Earth's water as ocean water. The remaining 30 paper clips represent fresh water. About 69% of the fresh water (20 paper clips) is frozen into glaciers or icebergs. That leaves approximately 30% of the fresh water in unfrozen form (10 paper clips), but less than 1% of fresh water (less than one-third of a paper clip!) is accessible for humans to use.

(Older) Direct students to complete the same demonstration as described above, but ask them to calculate the number of paper clips that should go into each pile.