



# Sun, Wind, Water

Students use art skills to emphasize the role of energy in the water cycle.

**Grade Level:** K–4

**Subject Areas:** Art, English Language Arts, Science

**Setting:** Classroom

**Time:**

**Preparation:** 30 minutes

**Activity:** 50 minutes

**Vocabulary:** Condensation, Energy, Evaporation, Sun, Water, Water cycle, Wind

**Major Concept Areas:**

- Energy flow in systems
- Energy flow in nonliving systems

**Getting Ready:** Several days before this activity, show students the sealed glass jar and mark the water level. Put the jar in a sunny window. Assign students to observe the jar several times each day, noticing changes in the water level and the formation of water droplets on the side of the jar. The water level will drop when water evaporates, and rise when it condenses (see **Background** and **Step 1**).

**Objective**

Students will be able to explain the contribution of sun, wind, and water energy to the water cycle.

**Rationale**

Understanding the water cycle helps students appreciate that energy flows through nonliving systems.

**Materials**

- Copies of *Energy Source Illustrations* (sun, wind, and hydropower) (optional)
- A sealed glass jar containing about one inch (2.5 cm) of water
- Felt material and felt board
- Scissors
- Find additional resources related to this activity on [keepprogram.org](http://keepprogram.org) > Curriculum & Resources

**Background**

It is a warm day and the wind is blowing gently. Suddenly you are dampened by a brief shower. Then the clouds move away, and the cause of all these events is revealed: the sun.

The sun is Earth's primary source of energy, and it influences many activities on Earth. The sun heats Earth's surface, which heats the surrounding air. When the heated air rises, cooler air rushes in to take its place; the result is wind. Therefore, the sun helps create wind. Both a feather floating in the breeze and a tornado blasting through the countryside illustrate that wind has energy.

Wind also moves clouds. Some of these clouds are heavy with water droplets. Clouds are surrounded by very cold air, so water droplets often combine to form ice crystals. When the crystals are too heavy, they fall to Earth. Usually they fall as snow, but during spring, summer, and autumn they melt to form raindrops. In winter, the crystals continue falling as snow. Rain and melting snow filter into the ground and run over the land; sometimes this runoff collects in small streams. The water in the stream carries sediments, leaves, and other materials along. This movement is evidence that flowing water has energy.

Water in lakes and streams often returns to the clouds. What makes this possible? The sun. The sun heats the water, causing the water

molecules to become more active. When the molecules receive enough energy they break away and move through the air. This is called evaporation. During evaporation, liquid water becomes water vapor (water in its gaseous form). When the molecules lose enough energy, they settle down again.

The process of water vapor becoming a liquid is called condensation. Sometimes condensation occurs on tiny dust particles in the sky, creating a water droplet. (Water droplets are very tiny; it takes thousands of droplets to make one water drop.) Many water droplets floating near each other is called a cloud. When a cloud forms near the ground, it is called fog.

Rain, runoff, evaporation, and condensation are all parts of the water cycle. The water cycle is powered by the sun. So when we are sitting outside on a warm day and feel a light breeze and a shower, we are experiencing a small segment of the water cycle and one effect of the sun's energy.

## Procedure

### Orientation

Write the words “sun,” “wind,” and “water” on the board or show students the [Energy Source Illustrations](#). Have them describe qualities of each term. Review the definition of energy (the ability to move or change things). Ask students to list examples where the sun, wind, and water move or change things, and note their answers.



### Steps

1. Show students the sealed jar of water (see **Getting Ready**). Discuss what happened to the water level. Students should notice that the water level dropped during the sunnier part of the day and rose when the jar was in the shade.
2. Introduce the terms evaporation (liquid water heating up and turning into a vapor) and condensation (water vapor turning into a liquid). Discuss how the sun's energy caused water to evaporate (heated the water). When the water cooled down (lost heat energy), it condensed. Stress that evaporation and condensation are evidence of how the sun's energy is able to do work or change things. NOTE: If the glass jar is unavailable, have students recall a puddle they've seen evaporate.
3. Ask students what would happen to the evaporated water if the lid were not on the jar; where would the water vapor go? Point out clouds in the sky or have students imagine clouds, and tell students that instead of water condensing on the side of a jar, it condenses on tiny dust particles in the sky. Clouds are made up of many tiny droplets of water. Ask students “What makes the clouds move?” Students may know the wind blows clouds from one place to another.
4. Review the water cycle with students. If available, read one or more trade books about the water cycle (see **Resources**). Discuss the following concepts related to the water cycle and compare the water in the jar to a mini-water cycle.
  - What happens when water in rivers and lakes becomes heated by the sun? Allude to the evaporation of sun-heated water in the jar. Some of the water collects and turns back into a liquid (condenses) in a cloud.
  - What happens to the cloud when it collects more and more water? Help students understand that eventually the water droplets become too heavy and fall as rain. NOTE: Precipitation from clouds often falls initially as snow and melts as it is warmed by the atmosphere, but this detail may not be necessary for students to know.
  - Where does rain go? Students will provide a variety of answers, but mention that water flows over land and collects in rivers and lakes. Students may understand how gravitational forces cause water to move downward.
5. Have the class work in small groups to design components of the water cycle out of felt. Instruct each group to make the following: a sun, a cloud, rain or snow, and a symbol for evaporated water (possibly wavy lines). Students can also create other items such as trees, lakes, rivers, buildings, etc.

## Closure

Challenge groups to use their felt items on the felt board to tell a story about the water cycle (see **Assessment**). Students might find a creative way to portray that there is no beginning or end to the water cycle. For example, a narrator can tell the audience that they are seeing the water cycle “already in progress.”

## Assessment

### Formative

- Can students define evaporation and condensation and explain the role of energy in each?
- Are students able to identify the presence of sun, wind, and water in the water cycle?

### Summative

Check to make sure students’ stories about the water cycle include the following:

- Water falling out of the sky as rain (gravity pulls it down)
- Water filtering into the ground or flowing over the land, pushing things as it moves
- Water being heated by the sun, and water molecules evaporating
- Water molecules collecting in a cloud (condensation)
- The wind moving the cloud from one location to another

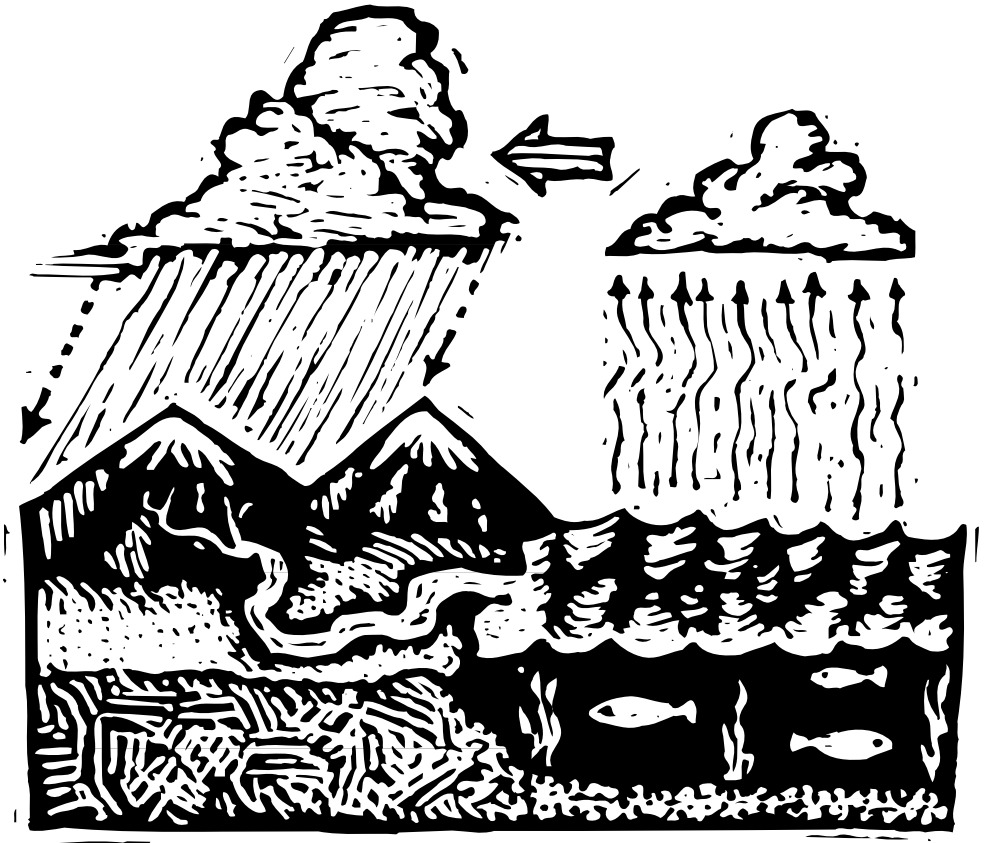
Have students cut out copies of the letter E to represent energy. They should place the E anywhere that energy from water, wind, or the sun is used.

## Extension

Have students adapt the water cycle illustration to include snow. Discuss how the weight of snow can move things and how melted snow moves things as well.

## Related KEEP Activities

Prior to and following this activity, you could have students participate in exercises such as those found in K–5 Energy Sparks for Theme II: “Sunvestigations, Windy Wonders, and Water Fun.” Students can also monitor weather changes as they relate to the water cycle (see “Taking Temperatures” for ideas on keeping a record of temperature changes). Other uses of the sun’s energy are found in activities such as “Shoobox Solar Cooker” and “Waterwheels, Windmills, and Turbines.”



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# Energy Source Illustrations

