

The water cycle is an endless circulation of water through the three phases of matter: gas, liquid and solid. Water occurs in all three phases on earth. The liquid phase includes water in rain, sea water, lakes, streams, clouds, the ground and in living things. Solid water comes in the form of snow, ice and glaciers where the temperature is below freezing. Water in the gas phase is found primarily in our atmosphere – in the air we breathe.

Most of the water found on or in the earth has been here since the earth was formed, perhaps some 4.6 billion years ago. The same molecule of water that fell from the mouth of a dinosaur 100 million years ago may be in the water you drink from a fountain today.

More than 97 percent of earth's water is contained in oceans and seas. Ice caps and glaciers contain almost 2 percent of all water. The ground contains more than 1 percent of earth's water. Less than one hundredth of 1 percent of earth's water is contained in each of the remaining sources of water – lakes, inland seas, rivers and the atmosphere.

Water travels from one source to another in an endless cycle. It moves from one part of the cycle to another by the processes of evaporation, condensation, precipitation and melting.

# The Water Cycle Hexaflexagon

Melting occurs when water changes from the solid phase to the liquid phase. Evaporation occurs when water changes from a liquid to an invisible gas. Rapid evaporation takes place when you boil water on a stove, while slower evaporation takes place when you perspire or leave a glass of water in the open air. The rate of evaporation depends on temperature and humidity, which is the amount of water vapor (gas) that is found in the air. Condensation takes place when water vapor changes from a gas to a liquid. Water can condense at any temperature below boiling. The lower the temperature is, the faster the rate of condensation. Precipitation occurs when water falls from the air in the form of rain, sleet, snow, hail or dew, so water can precipitate in either the liquid or solid phase.

Sometimes water is stored or locked in one phase for thousands of years. Water that has evaporated, condensed and fallen as solid snow or ice in a cold climate may remain that way for a very long time before it either melts or evaporates and rejoins the cycle. Water that percolates into the ground may remain in the liquid phase in an underground reservoir or bound within mineral or rock crystals.

In other circumstances, water may go through the cycle over and over very quickly. In the tropics, for example, water evaporates from the ocean, condenses and falls back to the ocean as rain daily.

The water cycle can be very interesting to think about if you consider the possible journeys and history of the water we all use every day. The next time you take a drink of anything, think about the places the water in it may have been.

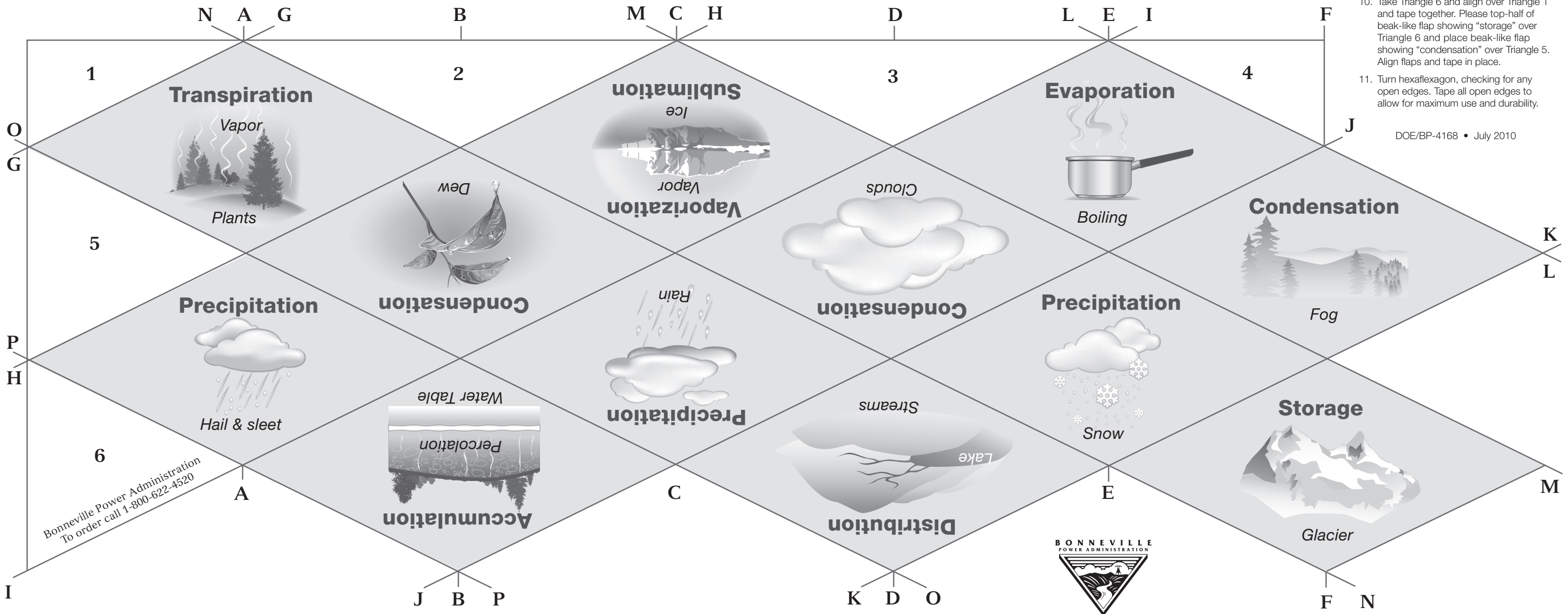
The Bonneville Power Administration depends on the water cycle to provide enough water for generating the region's electricity. The habitats of fish and other wildlife in the Columbia River watershed also depend on the water cycle to provide a suitable environment. We, too, rely on the water cycle to provide rain and snow, lakes and rivers for all to enjoy and use. Future generations depend on the preservation of our region's water resources, and BPA is committed to helping preserve and educate people about our cycle of water. This hexaflexagon uses a special geometric form to show the phases of the water cycle and how they affect us.

## To Assemble the Water Cycle Hexaflexagon

Items needed to assemble: ruler, scissors, clear tape

- Place drawing with printed side up on a table. Place ruler on paper to connect point A to point A. Using the long edge of one scissors blade, press the scissors on paper and move along the line from point-to-point to make an indent/mark. (This is known as scoring.) Be careful not to cut through the paper. Accurate scoring and folding is essential for easy manipulation of the finished hexaflexagon.
- Repeat Step #1 for point B to point B, C-C, through point F-F. When done, A-A through F-F will be vertically scored.
- Repeat Step #1 for point G-G, H-H, I-I, through P-P. These lines are diagonally placed.
- Cut out the hexaflexagon along the far OUTSIDE border.
- With the printed side up, fold all vertically scored lines face-to-face. (A-A through F-F). Then, straighten out each fold.
- Fold all diagonally scored lines (G-G through P-P) so they are back-to-back. Then straighten out each fold.
- Hold the hexaflexagon with the printed side down and the beak-like flap pointed towards you. Bring the "Accumulation" section to fit over Triangle 2. Align and tape open edge.
- Bring the "distribution" section over Triangle 3. Align and tape.
- Bring the "storage" section over Triangle 4. Align and only tape upper one-half of section. Leave two beak-like flaps free.
- Take Triangle 6 and align over Triangle 1 and tape together. Please top-half of beak-like flap showing "storage" over Triangle 6 and place beak-like flap showing "condensation" over Triangle 5. Align flaps and tape in place.
- Turn hexaflexagon, checking for any open edges. Tape all open edges to allow for maximum use and durability.

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For additional information, please call 503-230-INFO [4636] in Portland, or toll free 1-800-622-4519 outside of Portland.