

Photo Description



This image shows a house with a beautiful stone water fountain made from stacked flat rocks in the front yard. Water flows down through the different levels of stones, creating a small waterfall. The fountain is surrounded by plants and sits in a garden with mulch covering the ground.

Scientific Phenomena

The anchoring phenomenon is water cycling through a human-made system that mimics natural processes. Water is pumped from a reservoir at the bottom through hidden tubes back to the top of the stone stack, where gravity pulls it down through the gaps between rocks. This demonstrates how water moves in continuous cycles, just like in nature where water evaporates, condenses, and flows downhill due to gravitational force. The fountain shows properties of water including flow, adhesion to rock surfaces, and the water cycle in action.

Core Science Concepts

1. **Water Cycle Components:** The fountain demonstrates evaporation (water turning to vapor), condensation (if you observe early morning), and precipitation (water flowing down like rain).
2. **Gravity and Water Flow:** Water always flows downhill due to gravitational pull, following the path of least resistance through gaps in the rocks.
3. **Properties of Matter:** Water maintains its liquid state while demonstrating properties like adhesion (sticking to rocks) and cohesion (water molecules sticking together).
4. **Human Impact on Water Systems:** This artificial system shows how humans can create water features that support local ecosystems and provide habitats for wildlife.

Pedagogical Tip:

Have students trace the water's journey with their finger in the air while explaining each step. This kinesthetic movement helps cement the concept of cyclical processes in their minds.

UDL Suggestions:

Provide multiple ways for students to represent their understanding: drawing the water cycle, acting it out with body movements, or building a model with clay and small rocks to accommodate different learning preferences.

Zoom In / Zoom Out

1. Zoom In: At the molecular level, water molecules are constantly moving and forming hydrogen bonds with each other and with the rock surfaces. This molecular attraction causes water to stick to rocks (adhesion) and flow in streams rather than individual droplets.
2. Zoom Out: This fountain connects to the larger watershed system. The water that evaporates joins the atmospheric water cycle, potentially becoming clouds and precipitation that feeds rivers, lakes, and groundwater systems across the region.

Discussion Questions

1. How does this fountain model the natural water cycle happening in our local environment? (Bloom's: Analyze | DOK: 3)
2. What would happen to the fountain if the pump stopped working, and how does this compare to what drives the natural water cycle? (Bloom's: Evaluate | DOK: 3)
3. What evidence can you observe that shows water is interacting with the rock materials in this fountain? (Bloom's: Apply | DOK: 2)
4. How might this fountain affect the plants and animals in the surrounding garden ecosystem? (Bloom's: Synthesize | DOK: 3)

Potential Student Misconceptions

1. Misconception: "The water disappears and new water appears at the top."
Reality: The same water is recycled continuously through a pump system, just like nature recycles water through evaporation and precipitation.
2. Misconception: "Water flows uphill naturally in fountains."
Reality: A mechanical pump uses energy to move water uphill against gravity, similar to how the sun's energy drives evaporation in the natural water cycle.
3. Misconception: "Only rain and rivers are part of the water cycle."
Reality: All water on Earth is part of one continuous cycle, including water in fountains, puddles, plants, and even our bodies.

NGSS Connections

- Performance Expectation: 5-ESS2-1 - Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
- Disciplinary Core Ideas: 5-ESS2.A - Earth's major systems interact through physical and chemical processes
- Disciplinary Core Ideas: 5-ESS2.C - Human activities affect Earth's systems
- Crosscutting Concepts: Systems and System Models - A system is a group of related parts that make up a whole
- Crosscutting Concepts: Energy and Matter - Matter and energy can be transferred between systems

Science Vocabulary

- * Evaporation: The process when liquid water changes into invisible water vapor and rises into the air.
- * Gravity: The force that pulls objects toward Earth, causing water to flow downhill.
- * Adhesion: When water molecules stick to other materials like rocks or glass.
- * Reservoir: A place where water is collected and stored for later use.
- * Cycle: A series of events that repeat over and over in the same order.

* Precipitation: Water that falls from clouds as rain, snow, sleet, or hail.

External Resources

Children's Books:

- The Magic School Bus at the Waterworks by Joanna Cole
- A Drop Around the World by Barbara Shaw McKinney
- The Water Cycle by Rebecca Hirsch

YouTube Videos:

- "The Water Cycle | The Dr. Binocs Show" - Animated explanation perfect for elementary students showing evaporation, condensation, and precipitation: <https://www.youtube.com/watch?v=ncORPosDrjI>
- "Bill Nye the Science Guy: Water Cycle" - Engaging demonstration of water cycle processes with real-world examples: https://www.youtube.com/watch?v=YQs_2ksYzAk