



Mojave Water Agency WATER SLEUTH

Elementary School Programming

Hands-on groundwater science for upper-elementary students in grades 4 to 6.

Program Overview

Mojave Water Agency's Water Sleuth Program invites elementary school students to become groundwater scientists for the day. Through hands-on STEM activities, students investigate a resource they use every day but rarely get to see: groundwater.

The program is proposed for grades 4-6, with final participating grade levels and scheduling determined with administration and staff. Activities emphasize observation, measurement, experimentation, problem solving, environmental stewardship and STEM careers.

Students will also connect classroom science to a real project underway in their community. Project connection depends on construction schedules. Note: Water samples and tests are for educational purposes only and are not used to make project, regulatory, or household water-quality decisions.

Role of MWA: MWA is a regional water management agency and State Water Project contractor. It is not the retail water provider serving individual homes and is not the drinking-water regulatory agency.

Part 1 - Meet the Water Sleuths

Big Question: How can scientists study water underground when they cannot see it?

Objectives

- Meet MWA scientists, engineers and outreach staff.
- Learn what MWA does and how its role differs from a local retail water provider.
- Learn why groundwater is especially important in the Mojave Desert.
- Explore STEM careers involved in managing water.

Subject Areas: Environmental Science, Earth Science, Local Government, Math, STEM Careers

Activity: Water Level Station

Students use model PVC wells and real groundwater-level measuring equipment to determine the depth to water. They record and compare measurements and discuss why groundwater levels can change over time.

Water Sleuth Challenge: Which model well has the highest water level? Which has the lowest? What measurement proves your answer?

Part 2 - Get the Scoop on Groundwater

Big Question: If we put water on top of the ground, where does it go?

Objectives

- Understand what groundwater is and where it is stored.
- Explore how water moves through rock, gravel, sand and finer materials.
- Learn the meaning and purpose of groundwater recharge.
- Connect the lesson to the West Victorville Groundwater Recharge Basin.

Subject Areas: Earth Science, Hydrology, Engineering, Math

Activity: Human Groundwater + Build a Recharge Basin

First, students become 'earth particles' and 'water molecules' to model how pore space affects movement. Then small groups compare infiltration through containers with different earth materials, measuring a set amount of water and timing how quickly it moves through.

Water Sleuth Challenge: Which material allowed water to infiltrate fastest? What observations support your conclusion?

Part 3 - I Drank What?!

Big Question: Is clear water always exactly the same?

Objectives

- Learn that water can naturally contain dissolved minerals.
- Distinguish between visible material and dissolved constituents.
- Measure selected characteristics such as pH and total dissolved solids (TDS).
- Practice forming a hypothesis, collecting data and comparing results.

Subject Areas: Chemistry, Environmental Science, Math, Scientific Inquiry

Activity: Mystery Water Parameter Station

Students compare prepared mystery samples such as distilled water, tap water, bottled water and a prepared higher-TDS sample. Using test strips and handheld meters, they record measurements, compare results and reveal the sample identities.

Water Sleuth Challenge: Can you identify the mystery samples from the data alone? What can these measurements tell us - and what can they not tell us?

Part 4 - The Case of the Traveling Water

Big Question: How does imported water travel from the State Water Project to groundwater recharge in our desert?

Objectives

- Trace the general journey of imported water into MWA's regional system.
- Learn why infrastructure is needed to move and manage water.
- Understand the function of the Traveling Screen facility.
- Connect engineered water delivery to groundwater recharge.

Subject Areas: Engineering, Geography, Earth Science, Infrastructure

Activity: Follow the Water

Using maps, photographs and/or a simple sequencing activity, students trace water through the State Water Project and MWA facilities, then connect that journey to recharge. The Traveling Screen facility provides a tangible engineering example of removing debris before water enters MWA's pipeline system.

Water Sleuth Challenge: Put the water journey in order. Where do engineers and operators have to solve problems along the way?

Part 5 - Water Sleuth: What's in My Water?

Big Question: How can scientists compare water samples without deciding whether water is 'good' or 'bad'?

Objectives

- Practice careful sample collection and observation.
- Compare selected characteristics among different water sources.
- Understand the difference between an educational measurement and a comprehensive drinking-water analysis.

Subject Areas: Environmental Science, Chemistry, Data Comparison, Problem Solving

Activity: Optional Home Water Comparison

Students may bring a small sample from home for an educational comparison. No home address is requested. A sample may be identified only by general source, such as tap, filtered tap, bottled or other/unknown. Staff may measure selected characteristics such as pH or TDS and compare class results.

Water Sleuth Challenge: How are the samples similar or different? What additional testing would be needed before anyone could draw conclusions about drinking-water safety?

Important Water-Quality Distinction

Water Sleuth testing is conducted for educational purposes. Measurements made during the program are not comprehensive drinking-water-quality testing and should not be interpreted as determining whether water is safe or unsafe to drink. Mojave Water Agency is not the drinking-water regulatory agency. Optional student samples may be anonymous and will not be used by MWA to make regulatory, project, or water-management decisions about individual homes or properties.

Optional Phase II - Field Experience

Subject to school transportation requirements, construction conditions, safety requirements and MWA operational availability, Brentwood and MWA may explore a follow-up field experience. A visit to the Traveling Screen facility could allow students to see water infrastructure in operation. If feasible, the outing could also include an appropriate viewing or drive-by of the West Victorville Groundwater Recharge Basin construction area.

Recognition and School Partnership

- Each participating student receives a Water Sleuth certificate and patch.
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