

SCIENCE MUSEUM OF MINNESOTA

WATER RESIDENCY, GRADES 3-5



Concepts, Learning Goals, & Logistics

Overview

Students plunge into discovering more about water concepts introduced in the Water Assembly. Both lessons can be taught independently of each other. Due to the set-up logistics of these sessions, it works best if the school can provide a dedicated learning space that has access to water.

Groundwater Session

Discover how water can be stored in a variety of places - even in layers of underground rock. Student teams use a unique model to investigate where groundwater comes from, where it goes, and how it can be replenished, depleted, or polluted. Pumping water from a “well” and producing “rain” reveals what’s happening to the water beneath their feet.

Science Learning Goals

- Water moves through and can be stored in rock below the Earth’s surface.
- Water can be depleted and used faster than it can be collected underground.
- Groundwater can be polluted, making it unavailable or unsuitable for life.

Vocabulary Introduced:

- Wastewater, Contaminant, Porous, Water Table, Point Source Pollution

Wastewater Session

Explore what happens to water after it goes down drains in buildings as wastewater and street drains as storm water run-off. Teams apply an open-inquiry approach as they use strainers, funnels, cups and sponges of tubs of water containing things that could be found in wastewater and run-off. Discussing successes and challenges helps students understand processes used to treat these waters and develop ideas for keeping harmful waste products out of these systems.

Science Learning Goals

- Water that goes down drains in buildings and streets carries waste products; some can be harmful to living things and the environment.
- Cleaning waste products from water is difficult.
- Some waste products can be removed from water, some cannot.
- People make a positive effect on wastewater cleanup and storm water run-off by using water wisely and reducing waste products that go down drains.

Vocabulary Introduced:

- Wastewater, Contaminant, Pollution, Nitrates

If you have further questions on bringing programming to your school, please contact our Outreach Registration Coordinator at (651) 221-4748 or schooloutreach@smm.org.

Program Length: 50 minutes

Audience Size: Up to 30 students

Preparation: The Science Museum instructor brings all needed equipment and materials. The school provides two tables for the assembly demonstration and access to electricity. Allow 60 minutes before and after the programs for set-up and take-down.

The school provides classroom space for the residency sessions. The space needs tables and chairs for students and two tables for teaching materials and equipment, and access to water.

Standards

MN Academic Standards/Benchmarks: Earth and Space Science

4E.1.1.2 Ask questions about how water moves through the Earth system and identify the type of question. (P:1, CC:5, Cl:ESS2)

4E.1.2.1 Students will be able to design and conduct investigations in the classroom, laboratory, and/or field to test students' ideas and questions, and will organize and collect data to provide evidence to support claims students make about phenomena.

4E.3.1.1.1 Develop a model based in part on student observations or data to describe ways the geosphere, biosphere, hydrosphere, and atmosphere interact. (P:2, CC: 4, Cl:ESS2)

6E3.1.1.3 Develop a model, based on observational and experimental evidence, to describe the cycling of water through Earth; systems driven by energy from the Sun and the force of gravity. (P:2, CC: 5, CL:ESS2)

6E3.2.1.3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. (P:6, CC: 2, CL:ESS3, ETS1)

NGSS Disciplinary Core Ideas:

Conservation of Energy and Energy Transfer (PS3.B)

Weather and Climate (ESS2.D)

Life Science (LS1.C; LS2.C; LS4.D)

Earth and Human Activity (ESS3.C)

Biodiversity and Humans (LS4.D)

NGSS Science and Engineering Practices:

Asking Questions and Defining Problems

Developing and Using Models

Planning and Carrying out Investigations

Constructing Explanations and Designing Solutions

NGSS Crosscutting Concepts:

Cause and Effect

Scale, proportion and Quantity

Systems and Systems Models