

Hydrologist

Career Files teach about important jobs in science and how science is used in other jobs. Careers with the STEM symbol focus on Science, Technology, Engineering, or Math.



Do you know that water can cause giant canyons to form? Over millions of years, the flow of water carves away rock, changing

the face of Earth. *Hydrology* is the study of how water flows and the properties of water.

Hydrologists can work in many different areas of study, depending on their interests. Some hydrologists are scientists who study features of water flow, such as how water



Horseshoe bend in the Grand Canyon is an example of how water can shape landforms.

can change landforms. Some collect information about water flow that can help people prepare for floods or erosion that could affect the towns where they live. Hydrologists may work with engineers who are planning new sewer or drainage systems for cities. Others tell biologists what types of particles are getting into streams or lakes. Contaminants may harm animals and plants that live in or near the water. In addition, hydrologists may work for a government, helping to create new laws to protect and preserve natural waterways and our water supply.

Hydrologists need to understand many science topics. They use chemistry to test the water. They use physics and geology to understand how water moves in and on Earth.

Hydrologists attend college to study chemistry, biology, and geology. After college, they continue their education and earn a graduate degree in hydrology.



A hydrologist testing water samples in the field

Credits: left: © courtesy of Stephen Ausmus/USDA; right: © iStockphoto.com/Xu's Studio

Irrigation Specialist

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Large farms often cover hundreds of acres of land.

Imagine trying to water these farms by hand!

Instead, irrigation specialists

design systems to make sure that crops get enough water to grow.

Irrigation systems are networks of pipes, hoses, and sprayers. They carry water from a source, such as a river, canal, or lake.

They deliver water to fields where crops are growing. Irrigation specialists are engineers. They carefully design systems that provide enough water to the growing

crops. Since water is a limited resource, the systems are also designed to ensure that no water is wasted.

In places that receive little rainfall, farms depend heavily on irrigation. Some crops need more water than others, and different kinds of land need different irrigation methods. For example, plants growing in sandy soil need more water than plants growing in clay soil. Irrigation specialists must design the right system for each crop, each type of soil, and each part of the world.

Irrigation specialists attend college to study math and science. Then they attend graduate school to earn a degree in civil or agricultural engineering.



An irrigation specialist using a computer to program irrigation machinery

Credits: (inset): © Jupiterimages Corporation; (background): © iStockphoto.com/Steve Mcsweeney

Water Treatment Plant Operator

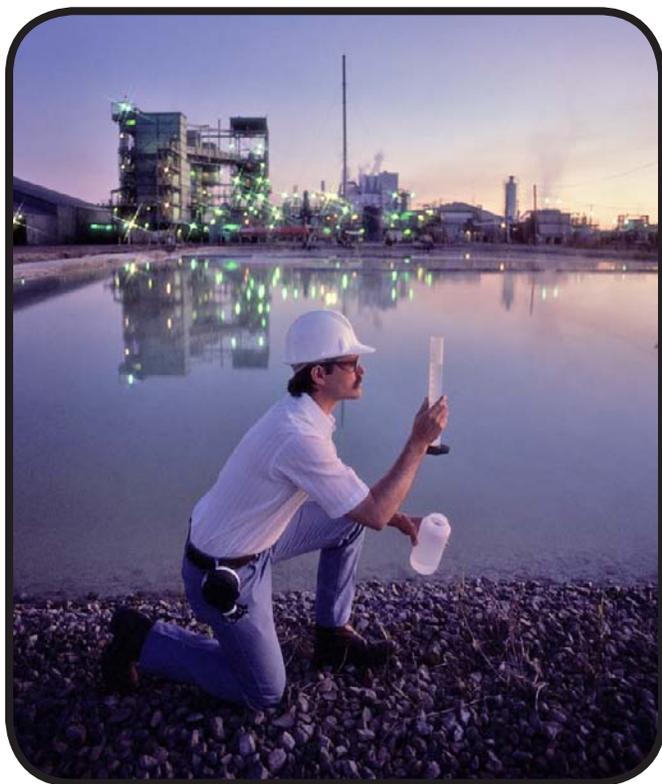
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Water. You turn on the tap, and out it comes. You drink it, shower in it, and brush your teeth with it. But is it safe to drink? Water treatment plant operators make unclean water safe before it enters your home or school.

Water treatment plant operators work at treatment plants. They oversee equipment such as carbon filters and chlorine tanks. This equipment is designed to remove *pollutants* and *microorganisms*—such as bacteria—from the water.



A water treatment plant operator checking purification tanks at a plant



Cleaning water takes skill and knowledge of chemistry.

After the water has been processed, operators check it by putting it through a series of chemical tests. The tests must show that no pollutants or harmful bacteria are present. Then the water is considered clean and ready for distribution.

Understanding chemistry is an important part of this career. Water treatment plant operators must look at the water's pH levels and the chemical content. Chemistry teaches them how to accurately read test results.

Water treatment plant operators must graduate from high school. They also need training in a water treatment technology program, which is offered by many colleges.