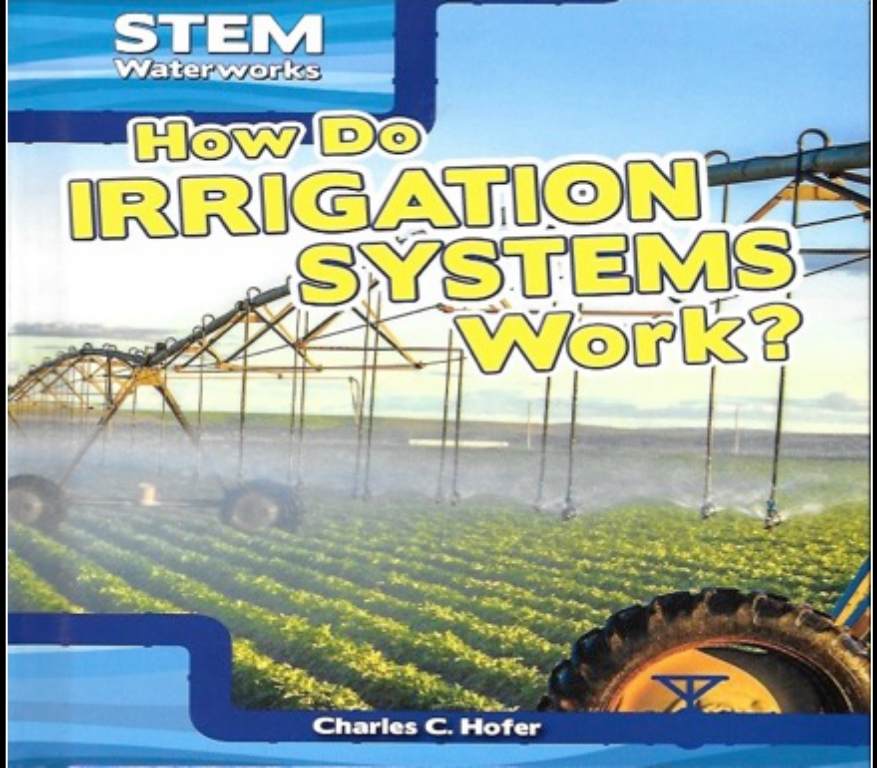

STEM
Waterworks
How Do
IRRIGATION
SYSTEMS
Work?
Charles C. Hofer

# Water Is Life

Without water, there would be no life on Earth. We need water to drink. We need water to produce food. We need water to live.

The water we need is found on top of snow-capped mountains or in underground **aquifers**. It also comes from lakes and rivers and wetlands. But we need to get that water from its sources to where we can use it. Irrigation helps us capture this water and deliver it to where we need it most.

Irrigation is the application of water to land using man-made technology. It's mostly used to deliver water to farmland where it feeds thirsty crops. Humans first used irrigation techniques to transport and store water thousands of years ago. Civilizations were founded and humans flourished—thanks in large part to irrigation.

Irrigation brings water to where we need it most. Irrigation gives life to our food supply and provides us with drinking water.



## In the Pipe

Water systems—which include **aqueducts**, canals, dams, **reservoirs**, sewers, and irrigation systems—are vital to the growth and prosperity of civilizations. We wouldn't have any of these important water systems without science, technology, engineering, and math. Altogether, these topics are known as STEM. Scientists and engineers need a solid understanding of these topics.

center pivot irrigation

flood irrigation

lawn sprinkler

# The Water We Use

Even though Earth's surface is 71 percent water, most of it is salt water found in oceans around the world. Unfortunately, salt water is mostly useless to humans. Although technologies exist that can remove salts from salt water to make freshwater, it's too costly to be a common practice. We have to rely on our freshwater stores to maintain our food supply and to provide drinking water.

Only 2.5 percent of our planet's water is freshwater—the water we need to drink, water our crops, and provide for our animals. In the United States, more than one-third of our freshwater is used to irrigate crops and produce food. Moving this freshwater to where it's needed, such as a house or a farm, requires good irrigation practices.

Although Earth is covered in water, most of this salt water is useless for our needs. We can't drink salt water. The freshwater we do have must be managed properly to meet the demands of a growing population.



## In the Pipe

Desalination is the process of removing salts from seawater to make freshwater. However, current desalination technology uses a lot of power and is extremely expensive. Only by improving these technologies can we make desalination more cost-effective to help solve water shortages.

# History of Irrigation

Many ancient cultures developed methods of irrigation to help tame wild rivers and send water where it was needed. Perhaps the most successful of these cultures was that of the ancient Egyptians.

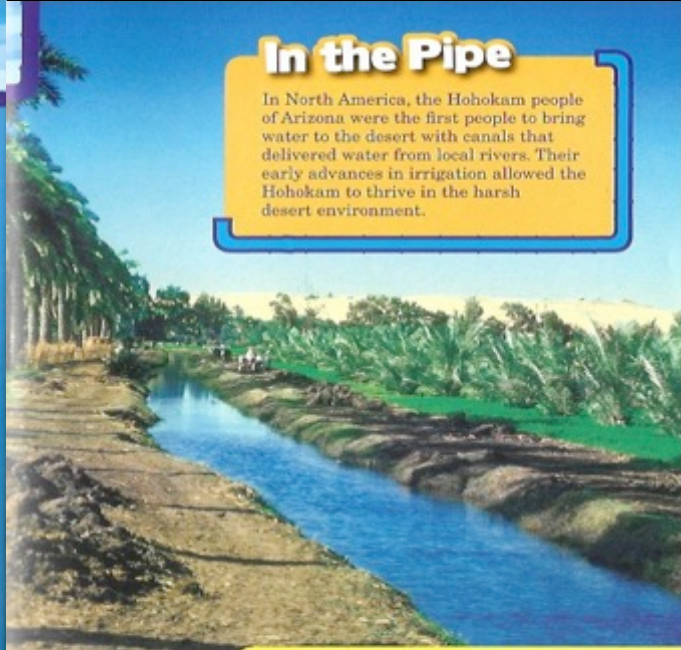
Much of Egypt is covered in vast, dry desert. Running through this land is the mighty Nile River, which provides water to this **arid** country. For centuries the Egyptians dealt with seasonal flooding that was good for crops but could also be destructive. Starting around 3000 BC, however, the Egyptians built irrigation systems that ultimately better harnessed the power of the Nile River.

In the Americas, the ancient Maya also developed irrigation systems around 1500 BC. The Maya built irrigation canals to deliver water to people living in massive cities. Irrigation helped the Maya develop into one of the greatest civilizations in the Americas.



## In the Pipe

In North America, the Hohokam people of Arizona were the first people to bring water to the desert with canals that delivered water from local rivers. Their early advances in irrigation allowed the Hohokam to thrive in the harsh desert environment.



The ancient Egyptians were one of the first people to develop irrigation systems. These advances allowed the Egyptian civilization to flourish despite its arid location.