For students & educators

Camp Fire
MINNESOTA

# My nature connection

HYDROLOGY & DAMS

GRADE: 5-12
TIME: 20-30 min.

DID YOU KNOW: MINNESOTA HAS 1,150 DAMS? THAT'S A LOT OF ENERGY!

WHAT YOU'LL NEED

- Access to the Internet (phone, computer, or tablet)

## ACTIVITY (20-30 MINUTES)

### INTRODUCTION

Hydrology in its most simple form is the study of Earth's water and atmosphere. Scientists called hydrologists study the occurrence, circulation, distribution and movements of waters around the globe, as well as its interaction with both the physical and biological environments. They work to form a better understanding of how we can use renewable resources to harness energy and replace more environmentally harmful forms of energy.

### NEED FOR HYDROELECTRIC STUDIES

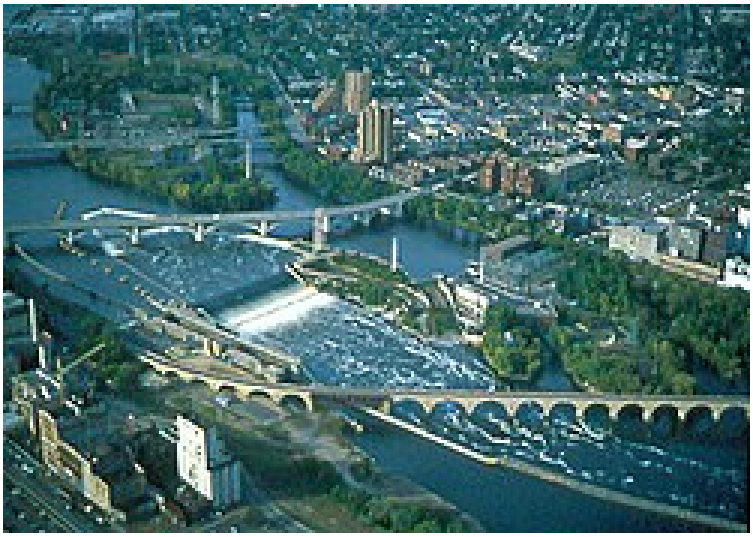
In many countries, water Is the main source of energy for agriculture, putting it at the forefront of economic growth. Storing water is very important because rainfall isn't certain in many areas where drought is common, leading to the loss of farm crops and food necessary for survival. Hydrologists help to better plan and develop water resources where needed, as well as understand precipitation levels, seasonal flows of rivers, and accommodates for population growth.

STUDENTS WILL:
Gain a better understanding of the importance of hydrology.

SETTING:
A comfortable spot to complete the water footprint calculator online.

## ST. ANTHONY FALLS

Minneapolis would not be as successful of a city as it is today without the power of researchers, engineering, and dams built into the river for energy and power.



St. Anthony Falls, which is just east of downtown, was the only natural waterfall in the upper Mississippi. After the natural falls collapsed In 1869, they were replaced with a concrete overflow spillway, otherwise known as a dam, thus beginning a new era of milling and business for the factories in the area.

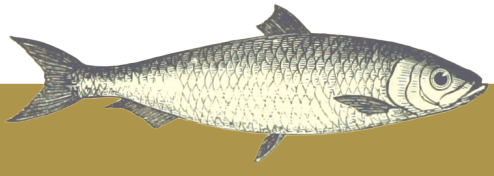
in 1872, when St. Anthony and Minneapolis merged into one city, they worked together to use the fast pacing rapids as operations for milling along the river. As business was booming, so was the city. From 1880 to 1930, Minneapolis was known as the flour milling capitol of the world, all thanks to the power of dams.

The falls created a booming flour business, successful city, and an attractive attraction to those in the area. Without the dam we know today, the city could have very well gone Into extinction like much of our mining cities up north and west.

## CULTURAL SIGNIFICANCE OF THE RIVER

While the creation of the lock and dam help business boom for factories in the area, it is also important to note the cultural significance of the falls.

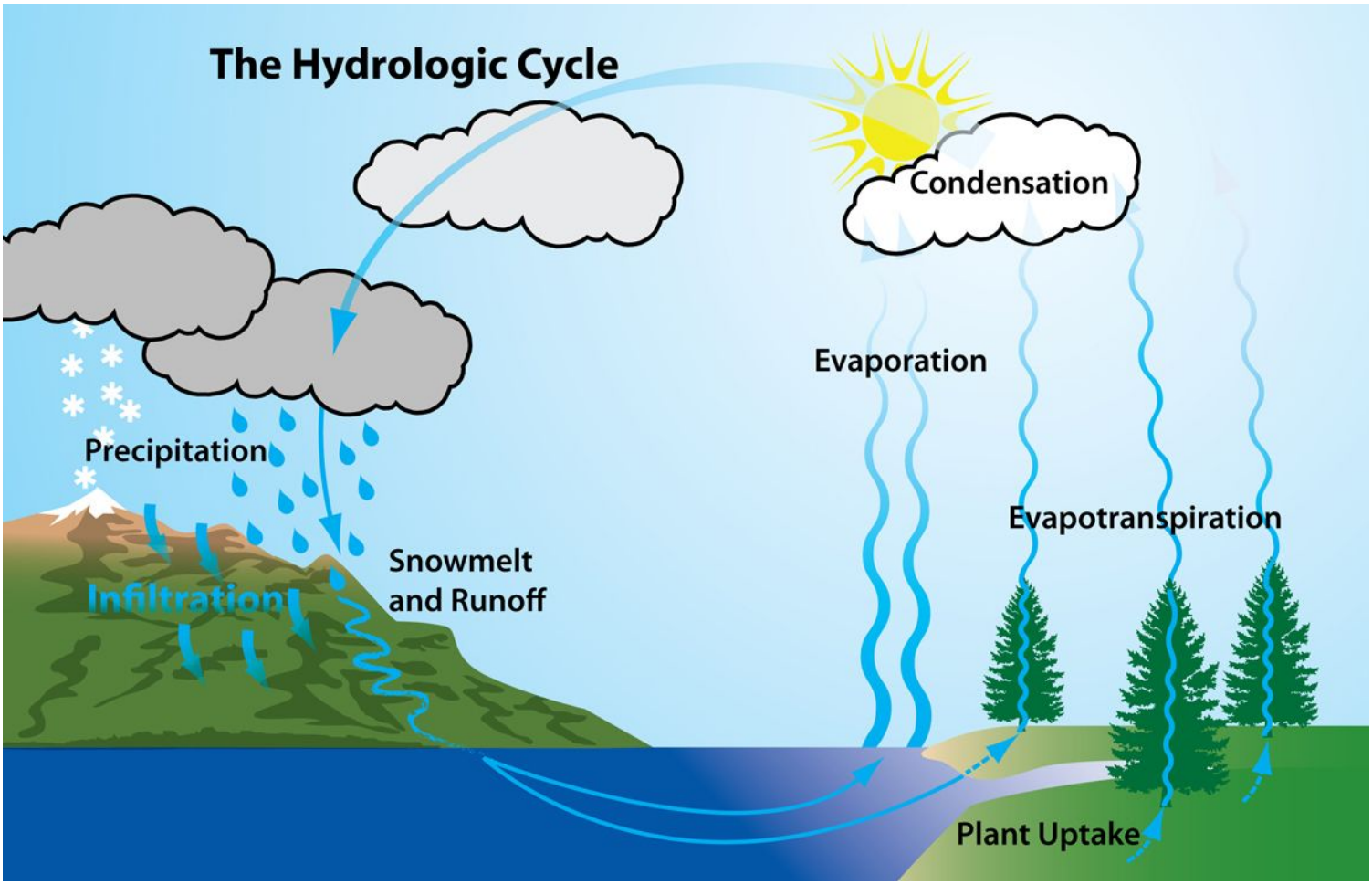
According to wikipedia, "Before European exploration, the falls held cultural and spiritual significance for native tribes who frequented and lived in the area. The falls was an important and sacred site to the Mdewakanton Dakota and they called the Mississippi River, hahawakpa, "river of the falls"."



FUN FACT:

THE UPPER LOCK AND DAM OF ST. ANTHONY FALLS CLOSED INDEFINITELY IN 2015 TO STOP THE SPREAD OF INVASIVE SPECIES GOING FURTHER DOWN THE RIVER!

Take a look at the Hydrologic Cycle, which is also known as the Water cycle, to better understand how water flow works.




## ACTIVITY: What's your water footprint? (15 minutes)

For this activity, you will be calculating your water footprint. Use the link provided, and find out how much water you use!

https://www.watercalculator.org/

## CONNECTING WITH QUESTIONS

With a partner, discuss the results of your water footprint. Why was yours higher or lower than your partner? Do you one of you have a diet that differs from the other?

What dams are In your area?  is It still an active dam, or used to control floods?

For the water footprint activity, how much water do you use? What ways could you get that number down and save on water?

What are some other ways that dams play a role In water quality?

## RESOURCES

https://www.nps.gov/miss/planyourvisit/uppestan.htm

https://www.dnr.state.mn.us/whaf/about/5-component/hydro_concepts.html

# EDUCATION STANDARDS

## Social Emotional Learning Competency:

| Grade Level | Science Education Standard |
| --- | --- |
| Grade 5 | 5.1.3.2.1 Describe how science and engineering influence and are influenced by local traditions and beliefs. |
| Grade 6 | 6.1.2.1.4 Explain the importance of learning from past failures, in order to inform future designs of similar products or systems. |
| Grade 7 | 7.4.2.1.3 Explain how the number of populations an ecosystem can support depends on the biotic resources available as well as abiotic factors such as amount of light and water, temperature range and soil composition. |
| Grade 8 | 8.1.3.2.1 Describe examples of important contributions to the advancement of science, engineering and technology made by individuals representing different groups and cultures at different times in history. |
| Grades 9-12 | 9.1.3.1.2 Identify properties of a system that are different from those of its parts but appear because of the interaction of those parts. |