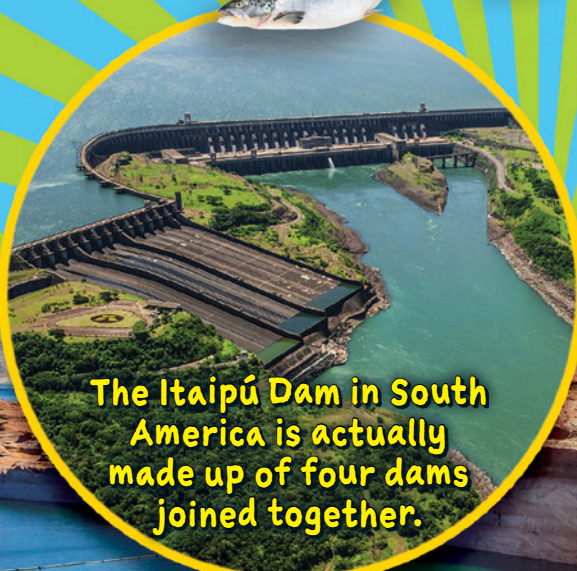


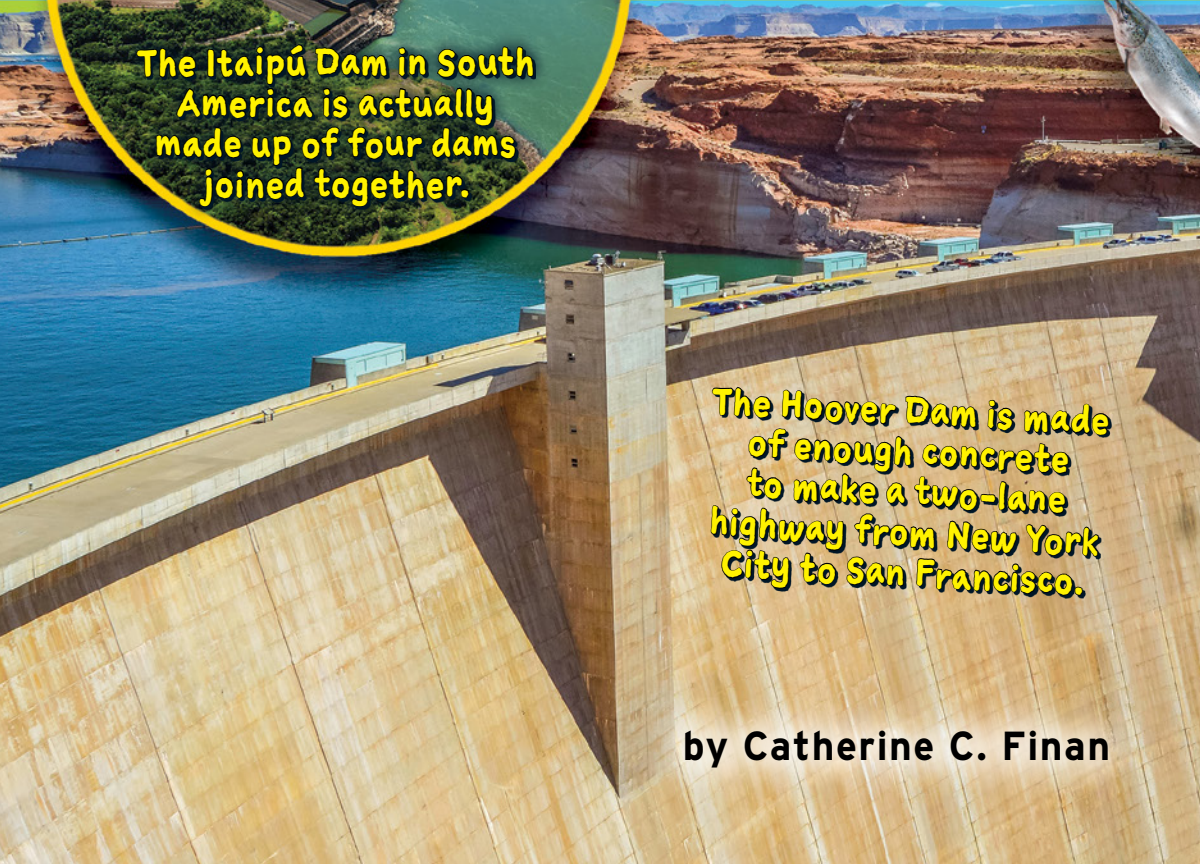
**X-TREME FACTS: ENGINEERING**

# DAMS



A salmon cannon was invented to help the fish over dams!

The Itaipú Dam in South America is actually made up of four dams joined together.



The Hoover Dam is made of enough concrete to make a two-lane highway from New York City to San Francisco.

by Catherine C. Finan

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# Dams Can Do That!

Imagine a structure so large and strong that it can block the flowing waters of a massive river and create a huge lake. That structure is a dam! Dams are marvels of **engineering** that hold back and store water. This water can be used for people to drink or to **irrigate** crops. It is even used to make electricity. Dams are amazing!

Beavers build little dams of sticks, rocks, and mud. **Humans basically stole their idea!**

There are about 60,000 large human-made dams around the world.

CAN'T THOSE HUMANS COME UP WITH THEIR OWN IDEAS?

THEY KNOW A GOOD THING WHEN THEY SEE IT.

OKAY, YOUR DAMS ARE NICE. BUT OURS ARE MUCH LARGER!

**Dams create human-made lakes called reservoirs.** Some people use reservoirs for fishing, boating, and swimming.

AWESOME! AND ITS RESERVOIR IS A GREAT PLACE TO GO FISHING!

THIS DAM PRODUCES A LOT OF ELECTRICITY.



Dams use water to make **hydroelectric** power, which provides about 16 percent of the world's electricity.

**Water from dams is used to grow crops** that feed about 15 percent of Earth's **population**. That's 1.2 billion people!



I'M NOT TRYING TO STEAL YOUR THUNDER, LADY LIBERTY.

DON'T WORRY, I'M NOT THE JEALOUS TYPE.

The Rogun Dam, which is under construction in Tajikistan, will be the world's tallest dam at 1,099 feet (335 m). **That's taller than the Statue of Liberty!**



# A Long History

People have been building dams throughout history. Even the earliest dams, built thousands of years ago, were used to prevent floods, irrigate farmland, and store drinking water. These huge dams were built by hand, without the help of machines or computer technology. And some of these **ancient** dams are still in use today. Let's dig into the history of dams!

The oldest known dam, the Jawa Dam, was built about 5,500 years ago. Its **ruins** are in present-day Jordan.



The Saad-el-Kafara Dam contained 100,000 tons (90,718 t) of stone and gravel.



The ancient Egyptians built the large Saad-el-Kafara Dam in northwestern Egypt about 4,700 years ago.

The ancient Romans built the Cornalvo Dam in Spain about 2,000 years ago. It is still used today!

THAT'S WHAT I CALL SOME SOLID ENGINEERING.

YEAH, IT BRINGS BACK SO MANY MEMORIES!



Hundreds of years ago, small dams were built in Europe to power **paddle wheels**. These were used to **grind grain and saw wood**.



I DON'T WANT TO WORK ON THE DAMS!

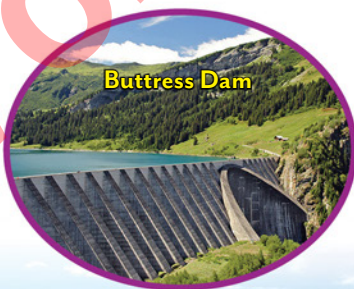
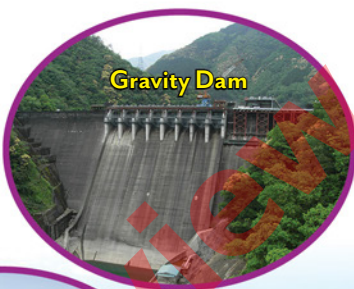
About 3,000 workers built a set of dams in the Yangtze River basin in ancient China. The construction took nearly 10 years.

COME ON! THEY'LL ONLY TAKE 10 YEARS.



# Built with Style

Today, there are a few main types of dams. An arch dam has a curved shape that holds back the water behind it while a gravity dam is usually built straight across a river valley. A buttress dam uses supports called buttresses to strengthen it. And an embankment dam is like a gravity dam, but it's made from natural materials. Although they all look a little different, most dams are made of **concrete** and have the same main parts. Let's check them out . . .



The part of a dam that stretches along the top is called the crest.

LET'S TAKE A SELFIE WITH IT.

COOL CREST!

People can walk or drive on the crests of some dams.

Some dams have a tunnel called a **gallery**, where workers can go to check for cracks or other problems.

I THOUGHT  
THIS PLACE WAS  
BUILT SOLID . . .

YEAH, I HOPE WE  
DON'T FIND ANY  
CRACKS!

A **sluiceway** can help clear out  
**mud and soil** that builds up at  
the bottom of a dam's reservoir.

A **spillway** is where  
water from the reservoir  
can spill out over a dam.

In hydroelectric dams,  
water from the reservoir  
flows through a **turbine**  
and spins its blades.

The spinning turbine  
powers a **generator**,  
which makes electricity.

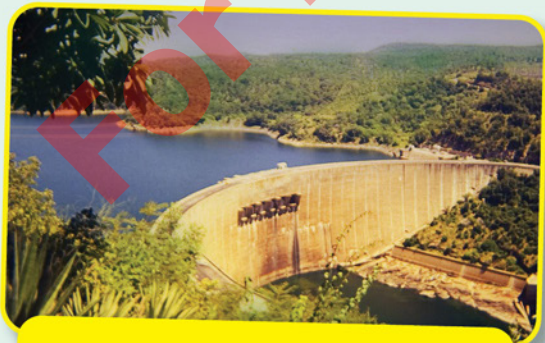
# Arch Dam

## Craft Project

Imagine you're an engineer and your job is to design a dam across a narrow river valley. What style of dam might work best in such a spot? An arch dam! Try building your very own arch dam.



The ancient Romans built the world's first known arch dam, Glanum Dam, more than 2,000 years ago.



Kariba Dam is an arch dam on Zambezi River in Africa. Its reservoir, Lake Kariba, holds the most water of any human-made lake in the world.

### What You Will Need

- A plastic container approximately 8 x 13 inches (20 x 33 cm)
- About 1 pound (500 g) of modeling clay
- Three craft sticks, cut in half
- A measuring cup
- 2 cups (0.5 L) of water

