



It's Dry Here!



California is a dry state. It often has **droughts**, which are long periods of time when little rain or snow falls. Since we all need water to survive, getting enough water is always an issue in California. One source of water is found in the snow of the Sierra Mountain Range. The **Hetch Hetchy Reservoir** in Yosemite National Park provides San Francisco and the surrounding areas with some of the highest quality drinking water found in the world. **Hetch Hetchy** is a Miwok word that means "grass with edible seeds." The Miwok are one of the many native peoples that lived in California for thousands of years. A **reservoir** is a large area like a lake or a big tank that **reserves** or collects water in one place so that it can be used later.

Once Upon a Time...



Up until the mid-1800s, people in San Francisco gathered fresh water from local streams, wells and springs. The Gold Rush of 1849 increased San Francisco's population from 1,000 to 25,000 people!

The local springs and wells could no longer provide enough water for the growing community. People had to buy water from barrels that were carried in carts, or slung across the back of a donkey. Water was expensive; it cost \$1 a bucket, which equals about \$26 today!

A Problem to Solve



As San Francisco continued to grow, water was getting harder to come by. So, in 1857 the city dammed the mouth of Lobos Creek in the Presidio, as a way to help provide more water to local residents. A **dam** is a barrier that stops the flow of water in a river so that the water can collect into a large area. This water can then be released for a variety of uses in the area, or moved somewhere else through pipes and channels. It can also be released in dry times of the year when it doesn't rain. Two million gallons of water a day were piped from Lobos Creek and pumped to reservoirs on Russian Hill. Today, San Francisco uses about 85 million gallons a day. It has 13 reservoirs and 7 tanks, storing 440 million gallons of water—enough to last six days in an emergency!

The Great Fire of 1906



On April 18, 1906, a huge earthquake hit San Francisco, where almost 400,000 people then lived. Fires broke out and for three days and nights, the city burned; 25,000 homes and other buildings were destroyed. The earthquake broke the main water pipes, so there wasn't enough water available to fight the fires, and more than half the city was left homeless. This wasn't the first time a fire

destroyed San Francisco, but for city leaders, it was the last straw! San Francisco needed a much larger water supply in order to meet the needs of the booming population, and to keep the city safe from another disaster. City leaders decided to dam the Tuolumne River so that the Hetch Hetchy valley could become a reservoir that would hold a huge amount of water. This water could then be piped to San Francisco. Not everyone supported this idea however, including **John Muir**. He was an environmentalist who started the Sierra Club and opposed this project for years.

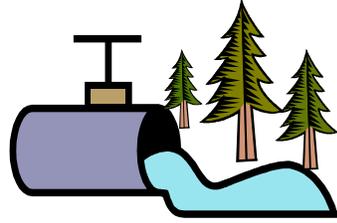
The Raker Act



In 1913, the U.S. Congress passed **The Raker Act**. This law gave San Francisco the rights to use water from the Tuolumne River. This meant the city could

dam the river and flood the Hetch Hetchy valley to create a reservoir that would provide the growing city and its surroundings with fresh water to meet all their needs. In order to build the dam, a railroad was first built to carry all the heavy machinery and supplies up the steep mountain. This railroad took two years to build and was 68 miles long! In 1923, after working day and night for nearly four years, workers completed the **O'Shaughnessy Dam**. It became a source of **hydroelectric power**. This is a clean form of energy made from the force of water as it falls down from the top of a dam and turns **turbines**, or engines, that create electricity. San Francisco government buildings and other agencies outside of the city use this clean, "green" power today!

The Hetch Hetchy Aqueduct



In order to move or **transport** water from the new Hetch Hetchy Reservoir to San Francisco, an aqueduct was built. An **aqueduct** is

a canal or series of large pipes that connect the source of water to its final destination. This system took 21 years to build! In 1934, the first waters from Hetch Hetchy finally reached the San Francisco area, traveling 167 miles downhill with the help of gravity. While the force of gravity has been used for thousands of years to move water through aqueducts, the Hetch Hetchy system was one of the biggest gravity aqueducts ever built. Not only that, but by using gravity to move the water, very little energy is needed to get the water to our faucets. Compare this to the rest of California where almost 20% of all the energy our state uses is needed to transport water from one place to another!

San Francisco Water



Today, Hetch Hetchy provides water to 2.4 million people in San Francisco and the Greater Bay Area. The San Francisco Public

Utilities Commission manages the Hetch Hetchy system and works to help protect natural resources and conserve water. Since California is a dry state, it is important that we save or **conserve** water so that we have enough for people and wildlife, and enough to keep our rivers healthy, our farmland productive and our businesses successful!



Hetch Hetchy

Student Comprehension Questions

1. Why is getting enough water in California always an issue?

2. How did people in San Francisco buy water during the Gold Rush days?

3. How do dams and reservoirs provide people with a water supply?

4. Why was the Raker Act so important for San Francisco?

5. How far does water travel from the Hetch Hetchy reservoir to San Francisco, and how many residents in the Greater Bay Area use this water?

6. Why do you think it is important to save, or conserve water?



1. Why is getting enough water in California always an issue?

Getting enough water in California is always an issue because California is a dry state that often has droughts.

2. How did people in San Francisco buy water during the Gold Rush days?

People bought water from barrels that were carried in carts or on the back of a donkey.

3. How do dams and reservoirs provide people with a water supply?

Dams are barriers that stop the flow of water so that it can collect into a large area, and reservoirs are a large container or area that keeps the water in place for future use.

4. Why was the Raker Act so important for San Francisco?

The Raker Act was a law that gave San Francisco the rights to use water from the Tuolumne River. This meant the city could dam the river and flood the Hetch Hetchy valley to provide San Francisco with fresh water to meet all their needs.

5. How far does water travel from the Hetch Hetchy reservoir to San Francisco, and how many residents in the Greater Bay Area use this water?

The water travels 167 miles and provides water to 2.4 million residents.

6. Why do you think it is important to save, or conserve water?

(subjective answer)