



Hoover Dam VR

Teacher Answer Guide

HOOVER DAM

- **What is the approximate weight of the dam?** 6 million tons (app may incorrectly give it in “billions” in the exploratory section of the app)
- **How much energy does it produce?** 2000 megawatts/hour

- **What two states does it separate?** Arizona and Nevada
- **During what years was it built?** 1931-1936, it was completed 2 years ahead of schedule
- **How high is it?** 726.4 feet high
- **What is the length?** 1244 feet long
- **What special technique did they use to help make the concrete solid? Why?** They used 1” steel pipes to pump cold river water through the concrete to cool it faster. If not, the structure would have taken 125 years to solidify completely as a solid monolith.

- **How did they divert to Colorado River during construction?** They dug four tunnels to divert the water. After completion, they filled two in, but two are still used.

INTAKE TOWERS

- **Hydraulic Head**
 - **Describe the energy change that takes place in the hydraulic head.** Water stored in the reservoir is accumulated energy or potential energy. After the gates are opened, the water flows down the pipes and is converted into kinetic energy.
 - **What is the energy dependent upon?** The amount of energy is dependent on the volume (amount of water) and how high the water is in relation to the turbine. The higher the pressure, the more electricity is generated.



- **Dimensions**
 - **How many intake towers are there?** Four
 - **What is the size of each one?** Each tower is 395 feet tall
- **Water Flow**
 - **Describe how the water flow is regulated and what other purpose it serves?** Water flow is regulated through gates (there are 3 sections of them). The gates also help filter out litter.

SPILLWAYS

- **Where are the spillways located?** Spillways are located 27 feet from the top of the dam
- **What is the purpose of the spillways?** Their purpose is to help keep water levels low so the dam is not breached (the water does not go over top of the dam).

POWER PLANTS

- **How many powerhouses are there? Where are they located?** There are two. One on the Arizona side and one on the Nevada side.
- **What type of turbines are used?** Francis turbines
- **List some statistics. How many turbines are there? How much energy do they produce? What is the total capacity in megawatts? How many horsepower can it produce?**
 - There are 17 turbines and generators.
 - Each one can generate up to 133 megawatts of energy.
 - The total horsepower is 3 million and the maximum capacity is over 2000 megawatts/hour.



POWER LINES

- **How many miles do they span?** They span 266 miles
- **What city do they reach?** Los Angeles

BRIDGE

- **How high is the bridge?** 900 feet
- **How long is the bridge?** 1900 feet across
- **What is the maximum load capacity?** 17,000 cars
- **What was the cost to build?** \$240,000,000
- **How many arches are there?** The main arch consists of two parallel arches

