



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

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Project Title
What's Up? Solving the Mystery of Water Towers and Their Purpose

Abstract

Objectives/Goals
Why are water tanks located up on top of towers or on top of hills? I hypothesized it has something to do with creating pressure for better flow of water and decided to create an experiment to test my hypothesis.

Methods/Materials
I created a homemade water tank using a five-gallon bucket and various parts. I created a water pressure measuring device that included a low pressure gauge. I connected my tank to my gauge via a garden hose. I filled the water tank with water and I conducted experiments measuring water pressure by elevating my tank on a ladder to 3 ft., 5 ft., 7ft., 10 ft., and 20 ft. heights. I measured the pressure with my gauge at each elevation and found that as the tank was lifted higher, the water pressure became greater. I conducted expanded research within my own neighborhood. By using a G.P.S. device, I was able to find the elevation of the water tanks that service my home. I found the elevation of my home. By using a mathematical equation (Tank elevation minus home elevation divided by two) I determined the water pressure at my home. I tested my finding by connecting a high water pressure gauge to my home faucet. The reading was the same.

Results
My results: At 3 feet-A little under 1 1/2 pounds of pressure. At 5 feet-Approx. 2 1/2 pounds of pressure. At 7 feet-Approx. 3 1/4 pounds of pressure. At 10 feet-Approx. 5 pounds of pressure. At 20 feet-Approx. 10 pounds of pressure. In my expanded research, the water tanks (T) servicing my home are at 809 feet and my home (H) is at approx. 700 feet. When I use the equation T minus H divided by 2, I came up with approx. 55 pounds, which I verified by placing a high pressure gauge on my home faucet and turning on the water. The read-out was approx. 55 pounds.

Conclusions/Discussion
My hypothesis was correct. The higher a water source, the higher the water pressure. This is because of GRAVITY. Gravity pushes down. Water tanks that sit up high will have gravity to assist in creating water pressure to the homes below it. This means when you go to turn on a faucet in your home, you will get a nice steady stream. On the other hand, if you have a house on a hill with a water tank below it, you will not have gravity helping to push water up hill, you would need a man-made pump to create this pressure. Without this pressure, the water would be nothing but a trickle. This project helped me to solve the mystery of the water tower and its purpose.

Summary Statement
How elevating a water source affects water pressure.

Help Received
Mother helped type report. Father gave directions for using power tools and making tank, and assisted with lifiting water filled tank.