

Water Tower

Course/Grade Level: 9-12

Experiment Duration: 30 minutes

Website Link to Experiment: ([Water Tower](#) | [Rowan Research](#) | [Rowan University](#))

Expectations:

1. Students will be able to understand and explain the concept of water pressure.
2. Students will demonstrate the ability to accurately measure and record the distance that water sprays out of holes in the graduated cylinder.
3. Students will be able to calculate the water pressure at different levels in the cylinder using the measurements they have taken.
4. Students will work collaboratively and engage in scientific inquiry as they explore the concept of water pressure.
5. Students will ask questions and make predictions about how changing the height of the water in the cylinder will affect the water pressure.
6. Students will be able to apply the concept of water pressure to real-world situations, such as explaining how a water tower works or how water is distributed in a building.
7. Students will have a better appreciation for the importance of accurate measurement and data recording in scientific experiments.

Sample Data/Tables if Needed:

Context for Learning

Objective:

To enable students to calculate the water pressure at different levels in the graduated cylinder by measuring the distance that water sprays out of holes at various heights.

How this experiment relates to wastewater/water treatment:

Water pressure is essential in water and wastewater treatment because it's used to move water through the treatment process. The pressure is applied to overcome resistance and gravity, and it is used in pumping water from a source to the treatment facility and moving water through filters, membranes, and other treatment stages. Understanding water pressure is crucial to ensuring that the water treatment process is effective in providing clean and safe water for use.

Instructional Delivery

Materials:

1. Water Tower
2. Water
3. Tape (masking or duct tape)
4. A ruler or measuring tape
5. A pen or marker for labeling the holes in the cylinder
6. Safety goggles or glasses (optional, but recommended)
7. A towel or tray to catch water spills or drips

Procedures:

1. Fill the water tower with water to a level that covers all of the holes along the side, and cover each hole with a piece of tape.
2. Label each piece of tape with a number or letter so that each hole can be identified later.
3. Choose a hole near the bottom of the cylinder and remove the tape.
4. Use a ruler or measuring tape to measure the distance that the water sprays out of the hole.
5. Record the measurement and label it with the corresponding number or letter for that hole.
6. Repeat steps 3-5 for each hole at different heights along the cylinder, starting from the bottom and working your way up.
7. Once all measurements have been taken, calculate the water pressure at each level using the measurements taken in step 5.
8. Record your data in a table or chart, and use it to compare the water pressure at different levels in the cylinder.

Assessment/Evaluation

Questions:

1. What is water pressure, and how does it work?
2. How does the height of the water affect the pressure exerted by the water?
3. How did you measure the distance that water sprayed out of the holes in the cylinder?
4. What patterns or trends did you observe in your data?
5. How did you calculate the water pressure at each level in the cylinder?
6. How might the results of this experiment be useful in real-world situations?
7. What factors might affect the accuracy of your measurements or calculations?
8. What questions or ideas do you have for further investigation?
9. What did you learn about the importance of accurate measurement and data recording during this experiment?
10. How did working collaboratively with your classmates help you to understand the concept of water pressure?

Notes: