

WATER PRESSURE

1 Have you ever heard the term *water pressure*? Water has mass, and gravity causes this mass to press down on whatever is beneath it. There isn't a lot of water in a bathtub, so if you were to lie under it, you wouldn't have too much water pressing down on you. However, if you were lying at the bottom of the ocean, there would be a lot of water — and all of it would be pushing down on you! This is water pressure. Here are two experiments to help you explore this idea further.

EXPERIMENT ONE

MATERIALS

2 A 2 L plastic drink bottle, a nail, some tape, a sink and water.

AIM

To demonstrate that water exerts different pressures at different depths.

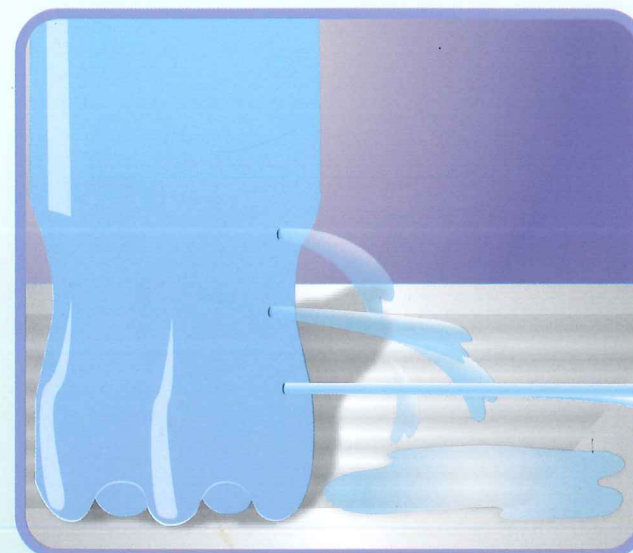


METHOD

- 3 **A** Use the nail to poke three holes in the side of the 2 L drink bottle. Make sure you start near the base of the drink bottle and that the three holes are 7 cm apart from each other.
- B** Take one long piece of tape and use it to cover the three holes. This will stop the bottle from leaking when you fill it up with water.
- 4 **C** Fill the bottle with water and then stand it upright over a sink.
- D** Quickly remove the tape. You will notice that the three holes all let water flow out of them in different ways.

CONCLUSION

5 The hole at the base of the bottle has the strongest squirt because of the amount of pressure exerted by the water above it. The top hole had the least pressure and, therefore, the weakest squirt, because it had less water pushing from above it.



EXPERIMENT TWO

MATERIALS

6 A very tall jug, two straws and some sticky tape.

AIM

To demonstrate that water exerts different pressures at different depths.

METHOD

- 7 **A** Tape the two straws together to make one long straw.
- B** Fill the jug to just below its top.
- 8 **C** Put the straw into the water to a depth of about 2 centimetres and blow some bubbles.
- D** Put the straw into the water to a depth that is about 2 centimetres from the bottom of the container and blow some bubbles.
- 9 **E** You will notice that it was harder to blow bubbles when the straw was put deeper into the water.



CONCLUSION

10 It gets harder to blow bubbles the deeper the straw is. This is because water has mass, and the deeper it gets, the more mass it has and therefore the more pressure exerted on itself and other objects.



Questions

- Water pressure is
 - how heavy water is.
 - how strong water pushes down.
 - how far water can spurt.
- How far apart should the holes be in Experiment One?
 - 2 cm
 - 3 cm
 - 7 cm
- In Experiment One, why does the lowest hole squirt water the furthest?
 - There is the lowest pressure at the bottom of the bottle.
 - There is the highest pressure at the bottom of the bottle.
 - The tape is removed from the bottom hole last.
- In Experiment Two, how far do you fill the jug to?
 - just below its top
 - two centimetres from the top
 - two centimetres from the bottom
- It is harder to blow bubbles
 - at the top of the jug.
 - at the bottom of the jug.
 - outside of the jug.
- What is the difference between Experiments One and Two?
 - You need to use sticky tape in Experiment One.
 - Experiment One is about something coming out of the bottle, while Experiment Two has something going into the jug.
 - Experiment One finds that there is higher water pressure at the top of the bottle, while Experiment Two finds it at the bottom of the jug.

Vocabulary

Find words in the text that match the meanings below. The word is in the section shown in brackets.

- To be under or below something (1)
- Used forcibly or put forth (5)
- A word meaning to show or display (6)
- The deepness of an object (8)
- The opposite of introduction (10)

Grammar

Articles (*the, a, an*) are words that are situated before a noun to show a specific or general thing. E.g. *the cat, a table, an apple*. Add an article to these sentences below from the text.

- This will stop ___ bottle from leaking.
- Stand it upright over ___ sink.
- There isn't a lot of water in ___ bathtub.
- Use ___ nail to poke three holes.

Back To The Text...

- Which experiment is a little simpler and less messy?
 - Experiment One.
 - Experiment Two.
- Experiment Two could be re-named
 - Water Squirter.
 - Bubble Blowing.
- In which part of the library would you find this text?
 - fiction
 - non-fiction

Sequencing

Look back at Experiment One to find what happened first. Choose **a** or **b**.

- The bottle was filled with water.
 - Three holes were poked in the bottle.
- The bottle was stood in the sink.
 - The tape was removed.

Look back at Experiment Two to find what happened first. Choose **a** or **b**.

- The straw was placed 2 centimetres from the bottom.
 - The straw was placed 2 centimetres from the top.

Think About This

- The illustration on page 3 is described in
 - section 6.
 - section 7.
 - section 8.
 - section 9.
- The word *exerted* in section 5 means
 - exercised.
 - removed.
 - filled.
 - applied.

Challenge Option

Research: Find out how towns store water and increase water pressure.

