

Effect of Volume on the Force of Water

Question

What effect does the volume of water have on the water's force?

Materials

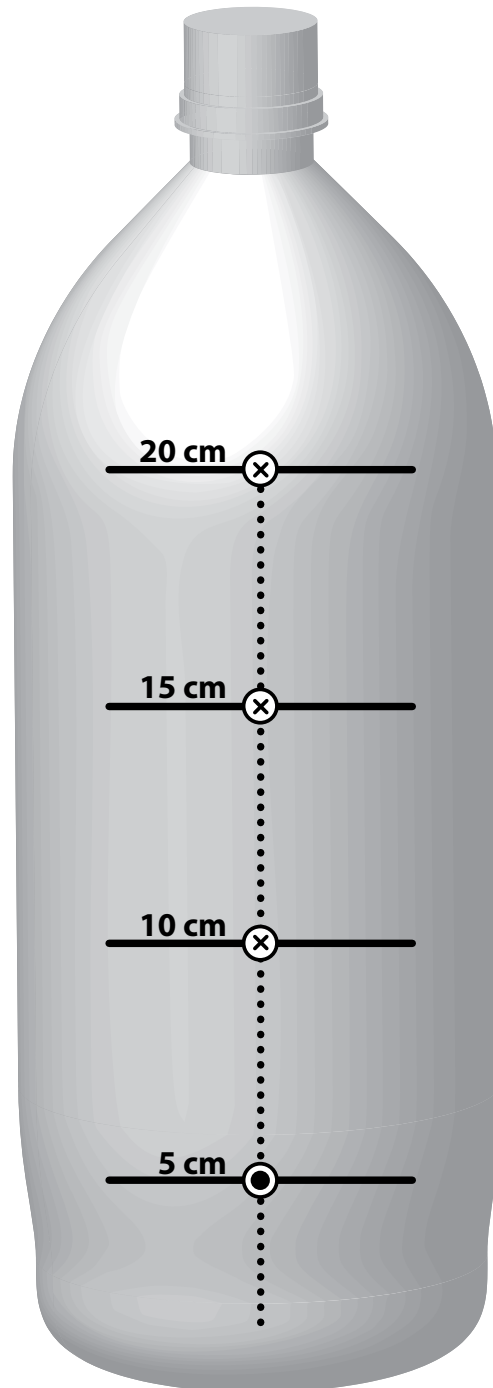
- 1 2-Liter soda bottle
- 1 Ruler
- 1 Push pin
- 1 Wallpaper pan
- Towel or paper towels
- Permanent marker
- Water supply
- Duct tape

Preparation

- Use the ruler to measure from the bottom of the bottle to 5 cm. Mark this spot with a dot, and also mark a line horizontally across the bottle at this height. Continue marking straight up every 5 cm, and horizontally at each mark until you reach 20 cm.
- Use the push pin to make a hole at the 5 cm mark only. Put a piece of duct tape over the hole.
- Read the procedure. Record your hypothesis on the next page, or in your scienc notebook before completing your investigations.
- Decide if you will need to remove the cap, loosen the cap, or keep the cap in place.

Procedure

1. Fill the bottle with water to the 20 cm mark.
2. Place the bottle in the wallpaper pan with the hole pointing into the pan. Place the ruler at the base of the bottle and make marks on the bottom of the pan at each 2 cm increment until you reach the end of the pan.
3. Remove the duct tape and immediately measure the distance the water projects out from the hole. Cover the hole with your finger.
4. Record the distance in your table.
5. Repeat steps 1-4 two more times for a total of three trials.
6. Repeat steps 1-4 three times filling the bottle to 15 cm. Record your data with each trial.
7. Repeat steps 1-4 three times filling the bottle to 10 cm. Record your data with each trial.
8. Repeat steps 1-4 three times filling the bottle to 5 cm. Record your data with each trial.



CONTINUED ON NEXT PAGE

Effect of Volume on the Force of Water

Question

What effect does the volume of water have on the water's force?

Hypothesis

Observations and Data

Record your data in the table below.

VOLUME	TRIAL 1	TRIAL 2	TRIAL 3	AVERAGE

Conclusion

Was your hypothesis correct? Why or why not? What is the effect of the volume of water on the water's force? Use data to support your answer.

Effect of Penstock Height on the Force of Water

Question

What is the relationship between the penstock height and the force of water?

Materials

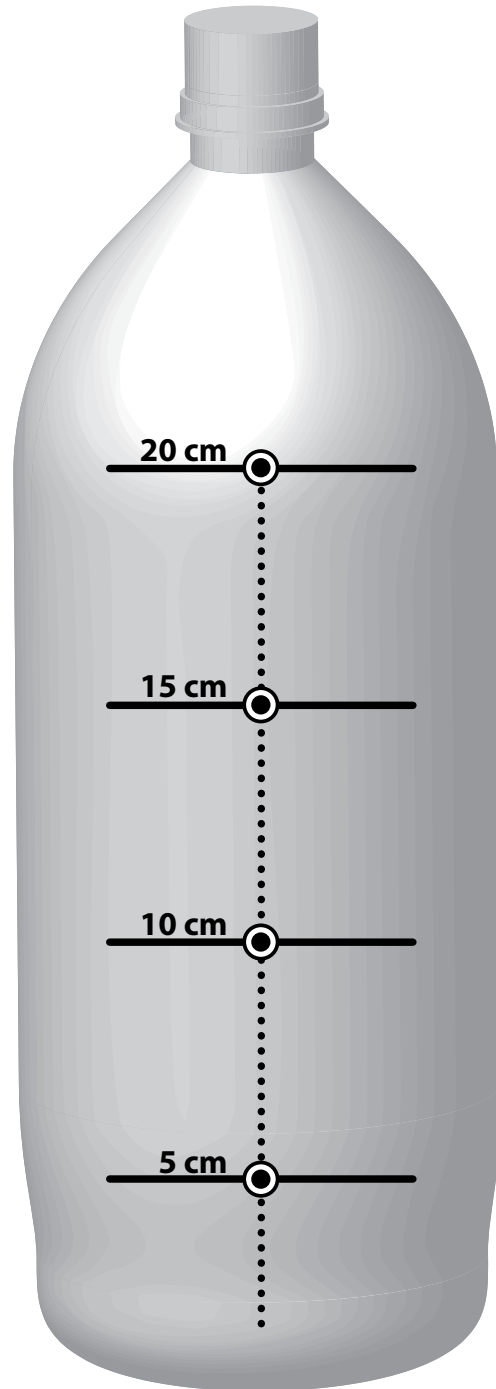
- 1 2-Liter soda bottle from previous investigation
- 1 Ruler
- 1 Push pin
- 1 Wallpaper pan
- Towel or paper towels
- Water supply
- Duct tape

Preparation

- Make sure the outside of the bottle is dry.
- Using the push pin, make holes at the 10 cm, 15 cm, and 20 cm marks. Cover each hole with a piece of duct tape.
- Read the procedure. Write your hypothesis on the next page or in your science notebook before completing your investigation.
- Decide if you will need to remove the cap, loosen the cap, or keep the cap in place.

Procedure

1. Fill the bottle with water to the 20 cm line.
2. Place the bottle at one end of the wallpaper pan with the holes pointing into the pan.
3. Remove the duct tape from the 5 cm hole and immediately measure the distance the water projects from the hole. Record the results on your data table.
4. Cover the hole with your finger, refill the bottle with water to the 20 cm line and place back in the pan. Uncover the hole and measure the distance the water projects again. Record your results. Repeat once more for a total of three trials.
5. Dry the outside of the bottle. Tape the hole closed.
6. Follow steps 1-5 again for the 10 cm, 15 cm, and 20 cm holes.



CONTINUED ON NEXT PAGE

Effect of Penstock Height on the Force of Water

Question

What is the relationship between the penstock height and the force of water?

Hypothesis

Observations and Data

Record your data in the table below.

Penstock Height	Trial 1	Trial 2	Trial 3	Average

Conclusion

Was your hypothesis correct? Why or why not? What is the relationship between penstock height and the force of water? Use data to support your answer.
