

UNIT 9 - RESPIRATORY SYSTEM

ACTIVITY – Measuring Exhalation

Objectives:

Students will determine the volume of air as it is exhaled.

Materials:

food coloring	2-hole rubber stopper
water	plastic tubing
paper towel	glass tubing
two liter plastic bottle	graduated cylinder

Strategy:

Measuring the Volume of Exhaled Air

1. Fill a plastic bottle four-fifths full of water. Add several drops of food coloring to the water.
2. Put a short glass tube (does not reach the water) and a long glass tube (almost reaches the bottom of the bottle) through the 2-hole rubber stopper.
3. Connect the rubber tubing. To the short glass tube connect a piece to blow into. To the long glass tube connect a piece that will touch the bottom of a graduated cylinder.
4. Cover the opening of the shorter length of rubber tubing with a paper towel, and after inhaling normally, exhale normally into the rubber tubing.
5. The exhaled air will cause an equal volume of water to move through the outer length of tubing into the graduated cylinder. Record the volume of the water in ml in a data table.
6. Pour the colored water from the cylinder into the 2-L plastic bottle.
7. Repeat steps 4-6 two more times. Record the results in your data table. Calculate the average of the three readings.
8. Run in place for two minutes and exhale into the rubber tubing. Record the volume of the water in the graduated cylinder.
9. Rest for a few minutes until your breathing returns to normal. Then repeat step 8 two times and record the results. Calculate the average of the three readings.

Discussion:

What happens in the plastic bottle as you exhale into the rubber tubing?

Why is it important to measure the volume of exhaled air three times before and after exercise?

How does your average volume of exhaled air before exercise compare to your average volume of exhaled air after exercise?

What effect does exercise have on the volume of exhaled air? Explain