

Measure the Capacity of Your Lungs

Teacher Preparation Information

IMPORTANT: If you have asthma, you should not do this activity.

Materials:

- large glass jar (e.g., 4 litre pickle jar)
- plastic storage bin, or unused aquarium (container larger than the jar)
- rubber tubing (about 40 cm long)
- straws to act as mouthpieces

Procedure:

- 1) The apparatus should be set up according to the diagram.
- 2) You and your partner will each take a turn to measure your lung capacity.
- 3) Use a fresh piece of straw as a mouthpiece, and insert it into the end of the tubing.
- 4) Inhale as deeply as you can, and then exhale as much as possible through the tube and into the jar.
- 5) Use the markings on the side of the jar to measure the volume of air you exhaled.
- 6) Start over and have your partner try the same activity.

Questions to answer:

- 1) Why did the water stay inside the inverted jar?
- 2) Why did you have to inhale as deeply as possible before exhaling?
- 3) When exhaling, what do you have to do in order to get a true measure of your total lung capacity?
- 4) What factors could affect the volume of air different people can exhale?

Explanation:

By inhaling as deeply as we can, we are actually filling our lungs with air. When we blow all the air out through the tube and into the jar, we are moving the volume of air held in our lungs. This is the capacity of the lungs. Larger volumes of air indicate an individual with better health. Other factors that can affect the volume of air exhaled include the size of the person, age, and other existing respiratory conditions.

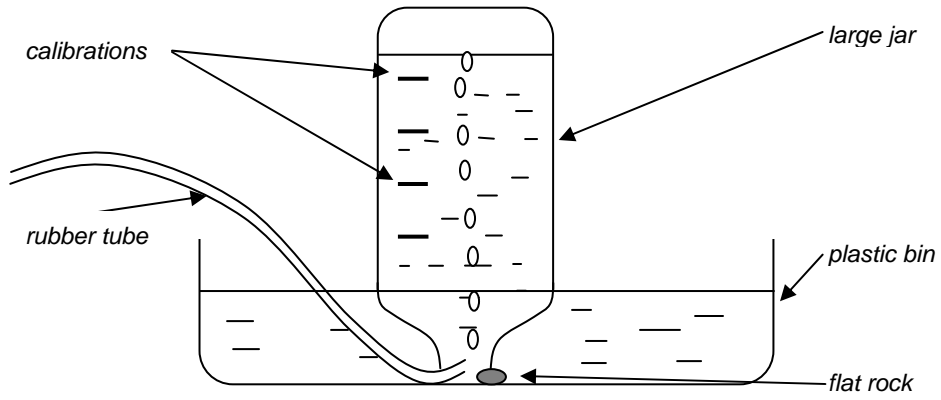
Note to the teacher: The jar should be calibrated prior to the start of this activity. Carefully pour water into the empty jar, one litre at a time, and mark the levels on the side of the jar with permanent marker or masking tape.

The jar should be completely filled with water, and the plastic bin should be about $\frac{1}{2}$ to $\frac{3}{4}$ filled with water. Use flat stones or other objects to

Adapted from the activity:

17.22 Measure the Capacity of Your Lungs, page 452,
Invitations to Science Inquiry, 2nd ed.,
Tik L. Liem,
Ginn Press, 1987

Diagram of the apparatus:



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Student Instructions

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- 6) Start over and have your partners try the same activity.
- 7) Complete the information required on the worksheet provided.

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