

# IMPACTS AND POLLUTION

## Activity IP01

### Theme

Demonstration (D) and Class activity (CA). Students investigate why we need air and how much air our lungs can hold.

### Objectives

Introduces the impacts and pollution topic, gets children thinking about how we rely on the environment for fresh air to survive.

### Curricular Strands

SESE, Science–Human life; Variety and characteristics of humans; Human life processes; Caring for the environment

### Skills

Questioning, observing, predicting and estimating

### Time

20 minutes introduction; 20 minute investigation

### Links to Green Schools

Importance of clean air in your environment

# Take a deep breath!

## INVESTIGATING LUNG CAPACITY

### WHAT YOU NEED

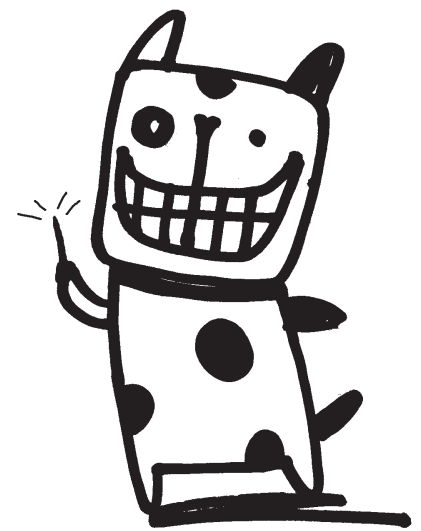
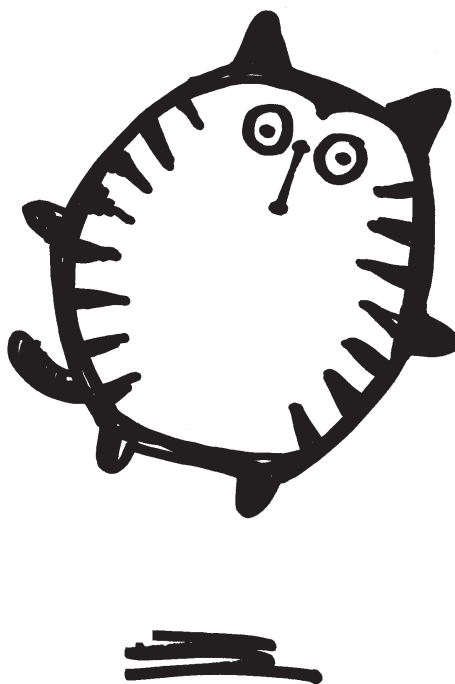
- A large clear plastic bottle with a capacity of at least 2 litres (an empty large water dispenser or drinking fountain bottle works best)
- A strip of paper
- Clean plastic tubing about 60cm long (or a bendy straw will work)
- Glue
- A basin of water (with capacity at least twice that of the bottle)
- Paper, pens

Ideally assemble four sets of equipment to allow the students to work in four separate groups

### WHAT YOU DO

- 1 Ask the class to take a deep breath, to hold it for a moment and then exhale.
- 2 Discuss with the class why we need to breathe. Our bodies need clean air to stay alive.

- 3 Ask the children to feel their rib cage. Explain that these are the bones that protect a very important organ in our body—our lungs.

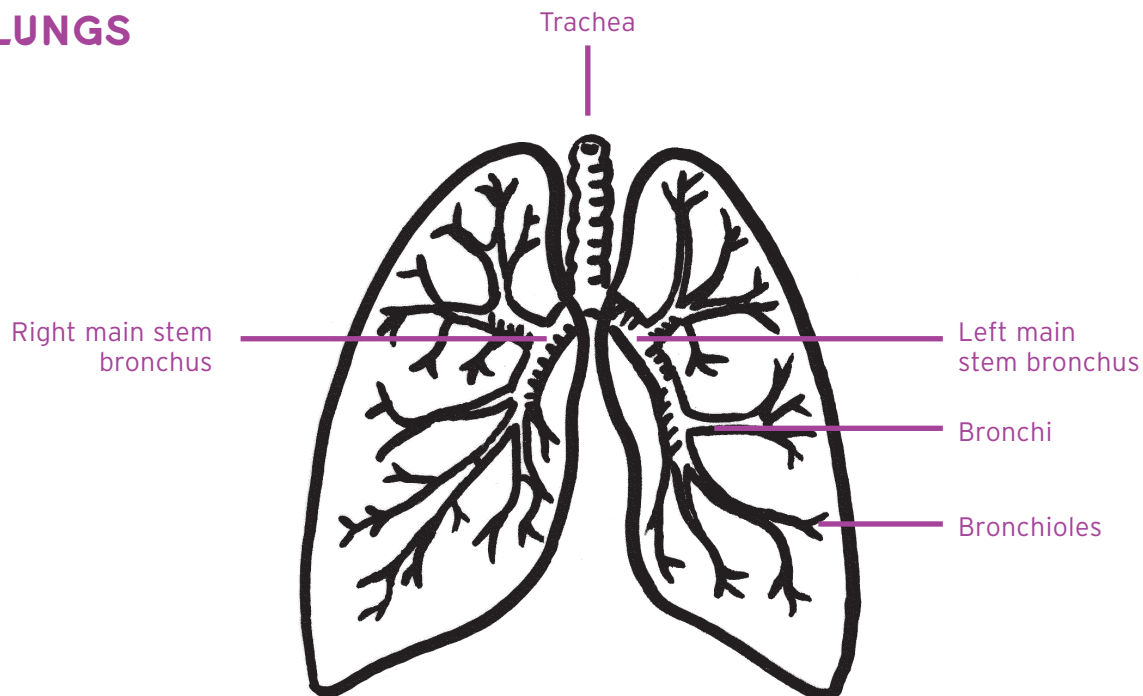


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## LUNGS

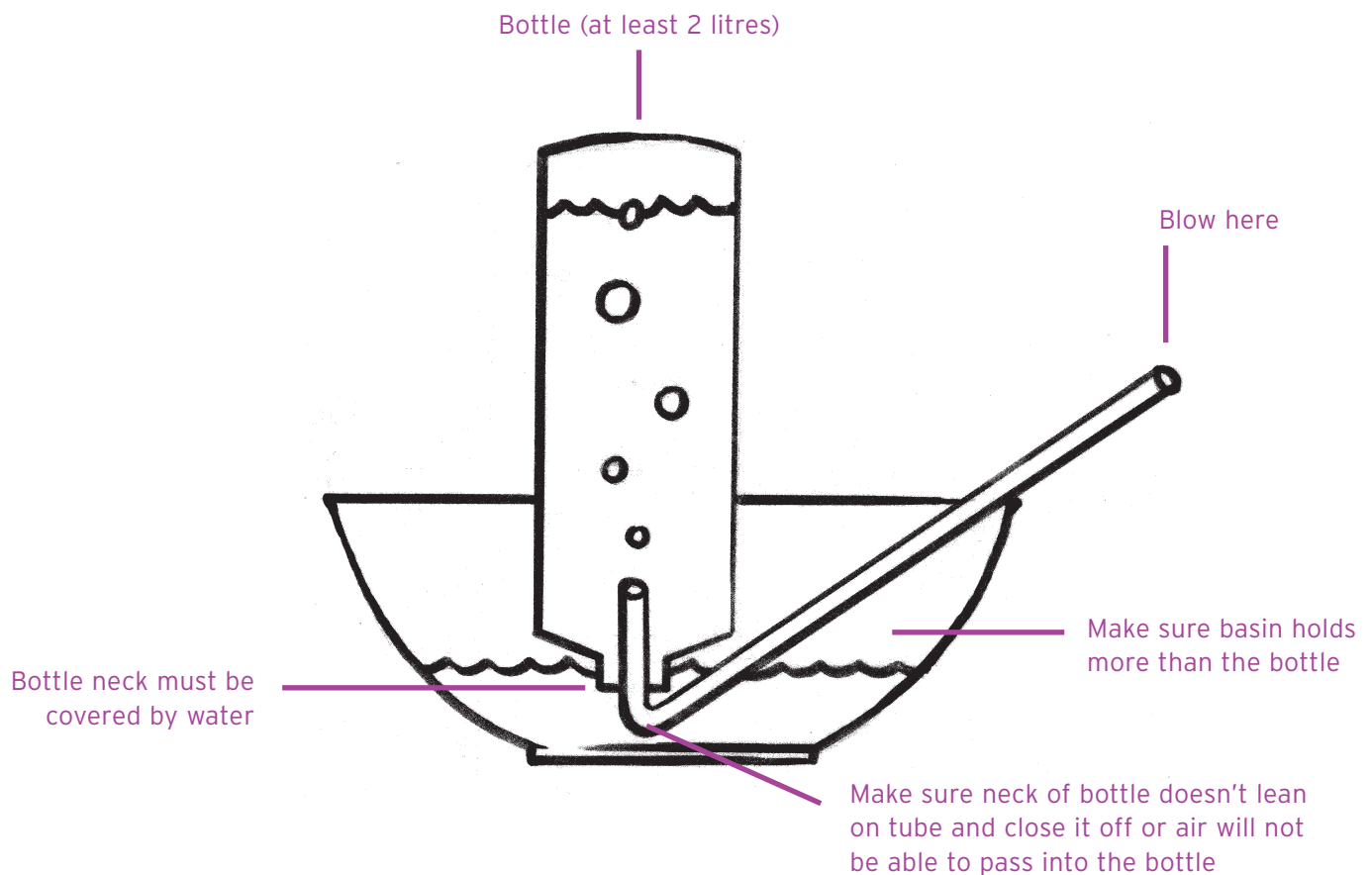


- 4 Using the diagram of the lungs illustrate how we breathe in clean air through our nose and/ or mouth. This air passes down our windpipe into our lungs. In our lungs the air travels through tiny tubes: eventually these tubes get so thin that the oxygen can pass through the wall of the tube and into our blood. Our blood carries this oxygen around our body where it is used in every living cell to make energy for us to work and play.
- 5 Our lungs also expel used air when we breathe out, in much the same way that our lungs draw in and absorb oxygen.
- 6 Ask the class to take another deep breath, but this time imagine where the air is going—travelling around our body, into our blood and back out again through our lungs.
- 7 Discuss with the class what it is like walking along a path beside a traffic jam. Is the air we breathe in very clean?
- 8 Fortunately our lungs are able to get rid of some of the bigger pieces of dirt we inhale. Tiny hairs in our nose and lungs trap some of the dirt and dust. When you sneeze or cough, the dirt is expelled from your body.
- 9 Clean air is a very important part of our environment. We all need clean air to survive: if you were breathing dirty air all the time you would be more likely to become ill.
- 10 Students are going to investigate how much air they need every time they breathe in. This is called our 'lung capacity'. As we are all unique, with different shapes and sizes, the amount of air we breathe into our lungs can differ.
- 11 Divide the class into four groups.

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- 12** Get each group to measure out a scale in centimetres (with their rulers) on a strip of paper. Stick this to the side of the bottle with some glue.
- 13** Half fill the basin with water and fill the large plastic bottle to the top with water.
- 14** Hold the bottle over the bowl, put one hand on the top, closing the mouth of the bottle and carefully turn the bottle upside down so the neck is submerged in the water in the basin. Now remove your hand.

Note: the bottle may be heavy—the teacher may need to lift it.

- 15** Put one end of the plastic tubing into the neck of the bottle. A student or the teacher should hold the bottle steady throughout the investigation.
- 16** Get the students to note the level of the water against their scale at the side. Write down the name of the first student who will breathe into the tube. Students may wish to devise their own table for recording data at the beginning of the lesson.

- 17** Ask the student to take a deep breath and to put the tubing into their mouth and exhale for as long as they can. What is the level of the water now?

- 18** The difference between the two levels is roughly how much air your lungs can hold—your lung capacity.

**Note:** make sure to clean the tube tip between uses, using a dilute solution of Milton or another sterilising solution.

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### Questions

- 1 If you always lived in an environment with poor air quality (with 'air pollution'), how do you think that might affect how much air you could breathe in? How might polluted air affect plants or animals?

### Go further

- 1 This could develop into a maths exercise in which students determine their lung capacity, count how many breaths they take in one minute and then calculate then how much air they breathe in every day or every year.