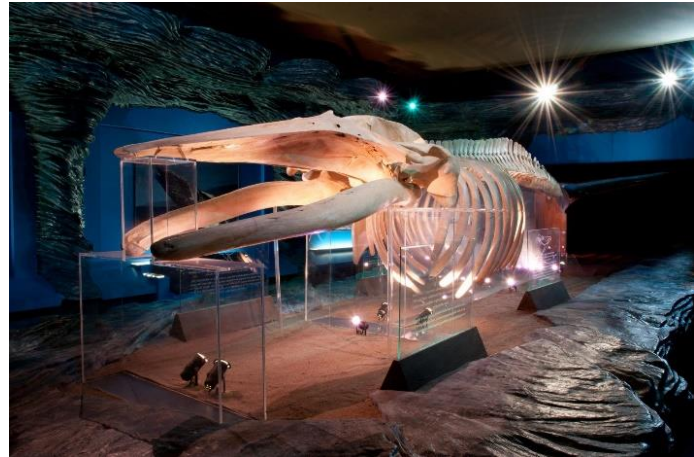


Measuring Lung Capacity

Breathing is a way of bringing useful gasses into our bodies and getting waste gasses out of our bodies.

Mammals (including humans) have a pair of lungs which they use for breathing.

Most mammals live on land however some mammals, such as whales, live under water. Humpback whales, like the one at National Museum Cardiff, use their lungs to breathe air, just like humans.



You will need:

- An empty 5L bottle of water (preferably with lid)
- Roughly 1.5m of flexible plastic pipe
- A measuring jug
- A permanent marker
- Disinfecting wipes/tablets
- The sink (or even the bath!)

This activity uses a lot of water which can get very heavy.

Always ask an adult for help

Instructions:

1. Measure 250ml of tap water. Pour this into the 5L bottle and use the permanent marker to mark the water level.
2. Repeat this process until the 5L bottle is completely full. You should now have a scale of 250ml increments along the side of the 5L bottle.
3. Fill the sink/bath with roughly 10cm of water. Put the lid on the 5L bottle, invert the bottle and place the mouth below the water level of the sink (use your hand if the lid is missing). **Ask for help!**
4. Remove the lid/your hand from the bottle mouth. The water will stay in place.



Measuring Lung Capacity

The bottle can hold a maximum of 5L of fluid and is already full of water. If we try and force any extra fluid into the bottle, something will have to come out to make space.

The next step is to breathe as much air as possible out from our lungs, through the plastic tube and into the 5L bottle. This will force air into the bottle and the water already inside the bottle will be forced out.

Method:

- Slide the flexible plastic tube into the 5L bottle (make sure the mouth stays below the water level)
- **Breathe in all the way**
- Place the other end of the tube into your mouth
- **Breathe out all the way**
- Use your scale to measure the volume of air you exhaled.



Make sure you breathe all the way in **before** putting the tube into your mouth.

Please don't breathe in any water!

Why not practice before trying the test?

Where Next?

This test shows roughly how much air your lungs can hold. Everybody's lung capacity will be different. For example, adults have bigger lungs than children so will also have a larger lung capacity. People who exercise a lot or play wind instruments like the flute or saxophone might also have a large lung capacity.

It probably took at least 10 seconds for you to breathe all the way out. Some whales can empty and refill their enormous lungs in as little as 2 seconds!

Why not ask other people in the house to try this test? Will their lung capacity be different from yours? Remember to **change the water** and **disinfect the tube** before trying this test.



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