Making a Model of the Lungs

Equipment:

- A clean, clear plastic bottle (with a narrow neck / about 500ml)
- A balloon
- Modelling clay
- A drinking straw
- Sticky tape
- A strong plastic food bag
- Scissors
- Sand paper (optional)

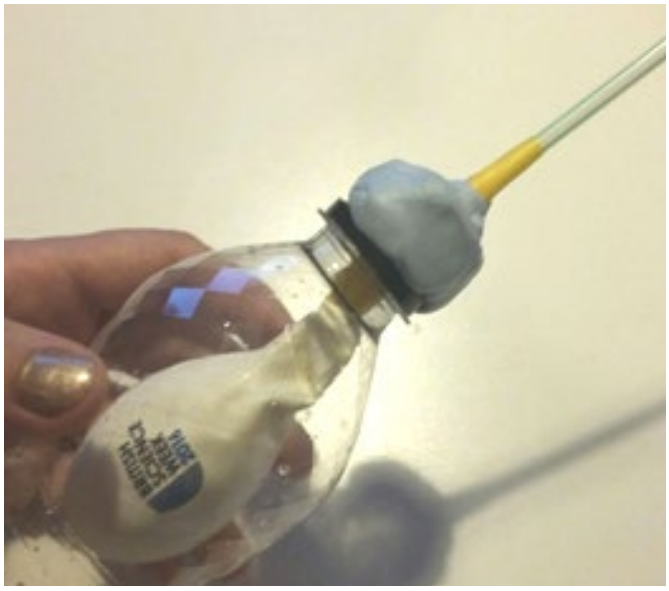
Step 1: Remove and discard the lid from your bottle.

Carefully cut all the way around the bottle, about a quarter of the way up, in order to remove the bottom of the bottle.

Step 2: (optional) Carefully sand the rough edges from the bottom of the bottle to avoid cutting yourself or tearing the plastic you will later attach.

Step 3: Carefully insert one end of the drinking straw into the opening of the balloon. Secure well with sticky tape so there are no gaps at all.

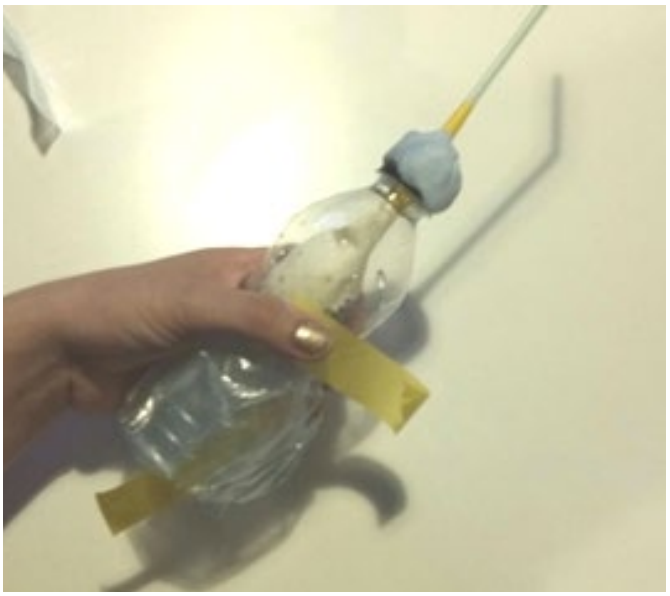
Step 4: From the bottom of the bottle, insert the straw through the opening in the neck of the bottle.



Step 5: Secure the straw in the bottle neck by packing modelling clay around it. You need to ensure that you do not crush the straw, but also that the seal is completely airtight.

Step 6: Take the plastic food bag and create a tab on the bottom, by folding the middle of a strip of tape on it's self, then attaching with the sticky ends.

Step 7: Place the bag over the cut end of your bottle, and stuff the excess gently into it.



Step 8: Secure the plastic bag around the bottle with tape. Again you need to ensure that the seal is completely airtight.

Step 9: Gently pulling the tab down should inflate the balloon. Try it and then observe carefully.

Questions

Use your model to answer the questions about how the lungs function.

1. Match the parts of your model to the parts of the gas exchange system they represent by drawing a straight line.

straw	chest cavity
bottle	diaphragm
balloon	bronchi
plastic bag	lungs

2. Pull the tab on your model. This represents the diaphragm contracting. Now complete the sentences.

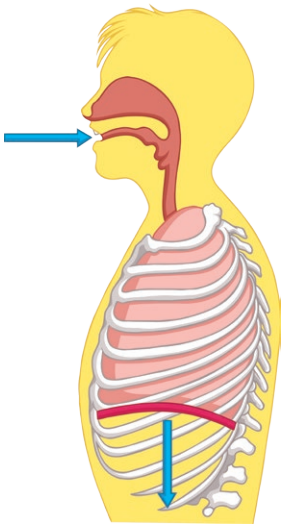
   a. When the diaphragm contracts, it moves _____

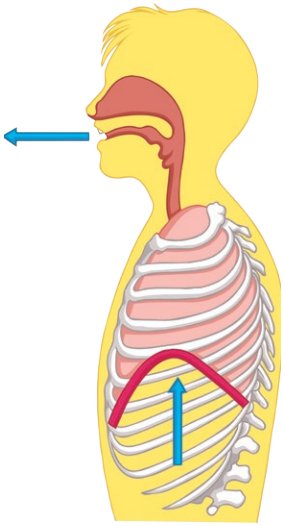
   b. When the diaphragm relaxes, it moves _____

   c. When the diaphragm contracts, the lungs _____

   d. When the diaphragm relaxes, the lungs _____

3. Label and describe the changes in each picture below.

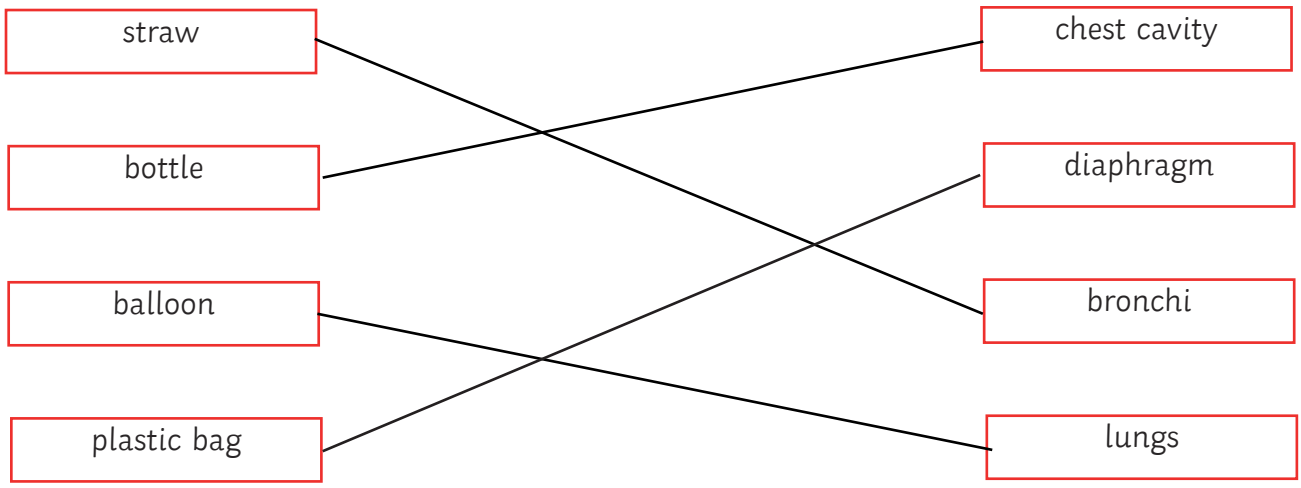




Answers

Use your model to answer the questions about how the lungs function.

1. Match the parts of your model to the parts of the gas exchange system they represent by drawing a straight line.



2. Pull the tab on your model. This represents the diaphragm contracting. Now complete the sentences.

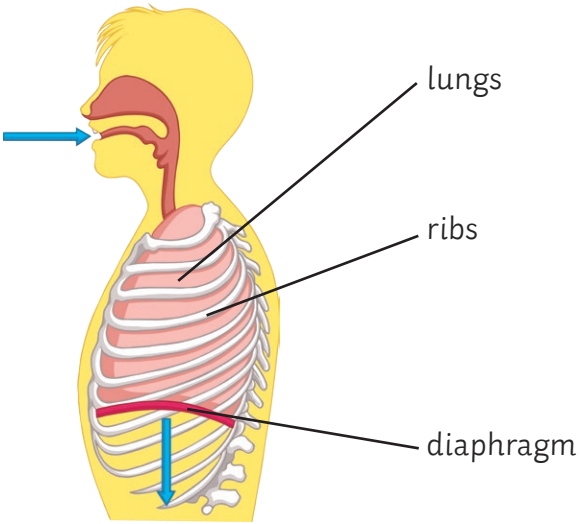
   a. When the diaphragm contracts, it moves **Downwards**

   b. When the diaphragm relaxes, it moves **Upwards**

   c. When the diaphragm contracts, the lungs **Inflate**

   d. When the diaphragm relaxes, the lungs **Deflate**

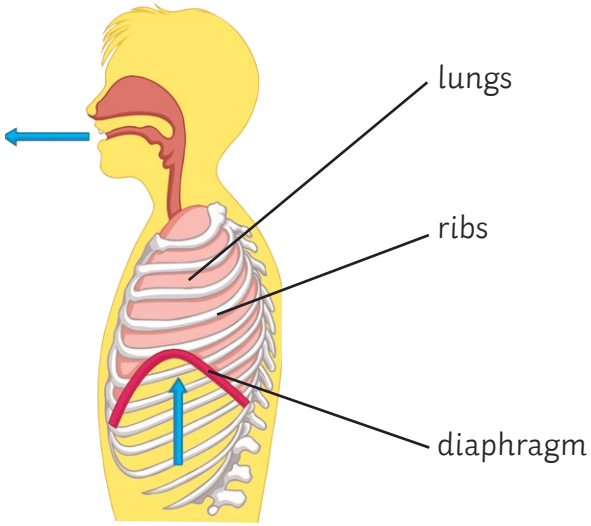
3. Label and describe the changes in each picture below.



The lungs inflate and fill with air.

The spaces between the ribs widen and increase the volume of the lungs.

The diaphragm contracts and moves downwards, opening the lungs.



The lungs deflate and push out the air.

The spaces between the ribs narrow and decrease the volume of the lungs.

The diaphragm relaxes and moves upwards, compressing the lungs.