

# WELCOME TO CAMBRIDGE NATURAL SCIENCE

Welcome to the amazing world of natural science. In this book, you will:



## learn about recyclable materials





create a health awareness campaign

organise a table quiz

find machines in your neighbourhood



### You will also find out:

- what your respiratory rate is
- how alcohol affects your senses
- how to detect oxygen
- how to see the oxygen plants release
- whether certain objects sink or float
- how levers work.



# HOW ARE WE MADE?



What do we get from the air that helps us live?







What body systems are the people in these photos using?

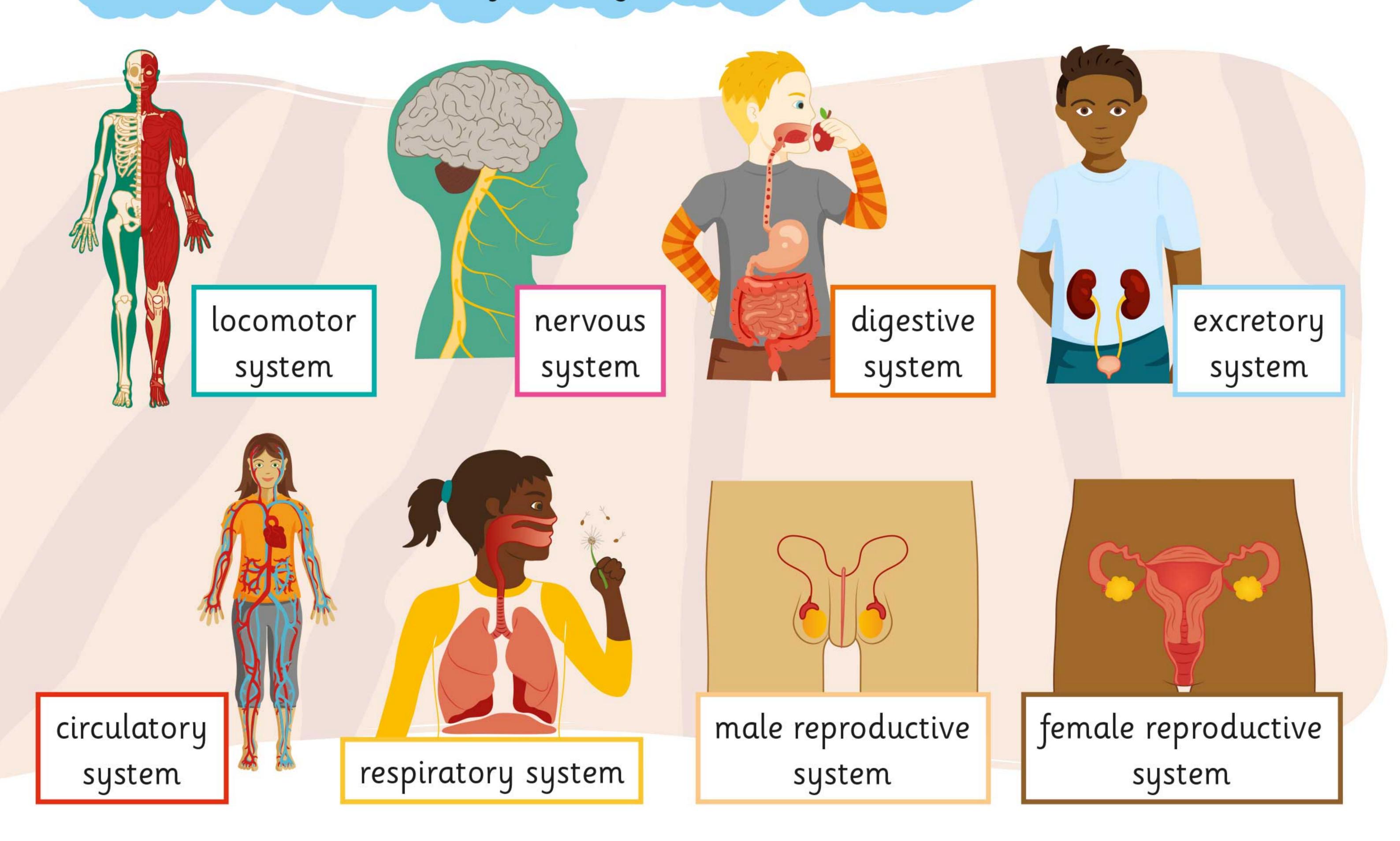




## WHY ARE BODY SYSTEMS VITAL?

**Body systems** are groups of organs which work together to perform a specific job. For example, the locomotor system allows us to move around from one place to another. Do you remember what each one of these systems allows us to do?

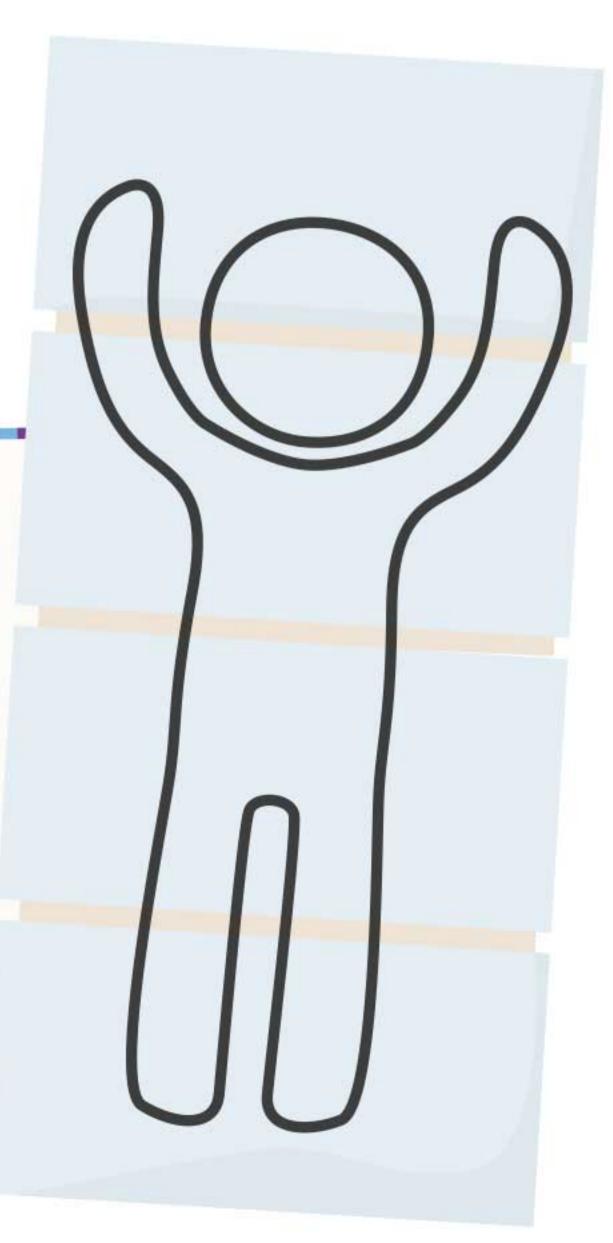
By the end of this lesson, you will know what the main body systems are.



Body systems are sometimes called 'vital systems'. In English, the word vital means 'absolutely necessary' and 'essential for life'.

# nVestigies stage 1

- In groups of four, join four sheets of A2 card together. Lay out the sheets horizontally and tape them together from behind.
- One member of the group lies down on the long piece of paper with their arms, legs and fingers spread out.
- The other group members trace the outline of their body.





### Hands Ch...

#### Before you start

The doctor checks our vital signs to make sure that our body systems are working properly. You can also check some of the vital signs of your classmates.

#### Materials

pencil, notebook, digital thermometer, clock or stopwatch

#### Method

1 Work with a partner. Copy and complete the table in your notebook:

	Body temperature	Pulse (beats per minute)	Respiratory rate (breaths per minute)
Your name	°C	bpm	bpm
Your partner's name	°C	bpm	bpm

- 2 Measure your partner's body temperature using the thermometer. Make a note of it in your notebook.
- 3 Measure your partner's pulse. Place your forefinger and middle finger on your partner's wrist and count the pulsations for one minute. Write it down.
- 4 Finally, measure your partner's respiratory rate.
  Using the clock, count how many times they breathe in and out in one minute.
- 5 Then, it is your turn to be the patient.
- 6 Run once around the school patio and repeat the process.

#### Conclusions

Are your results very different from your partner's?

How have the results changed after you ran?





My partner had a higher / lower body temperature than me.

My pulse was quicker / slower than my partner's.

### HOW DO YOU GET OXYGEN FROM THE AIR?



The respiratory system is a group of organs that perform respiration. Respiration is another way of saying 'breathing'. In respiration, we breathe in air which contains oxygen and we breathe out carbon dioxide. Our body needs oxygen to perform nutrition and give us energy.

Do you know that one of your lungs is smaller than the other? Find out why!

1 Air enters our body through the mouth

and the **nose**.

2 The air passes through a tube called the trachea, to two large tubes called the bronchi.

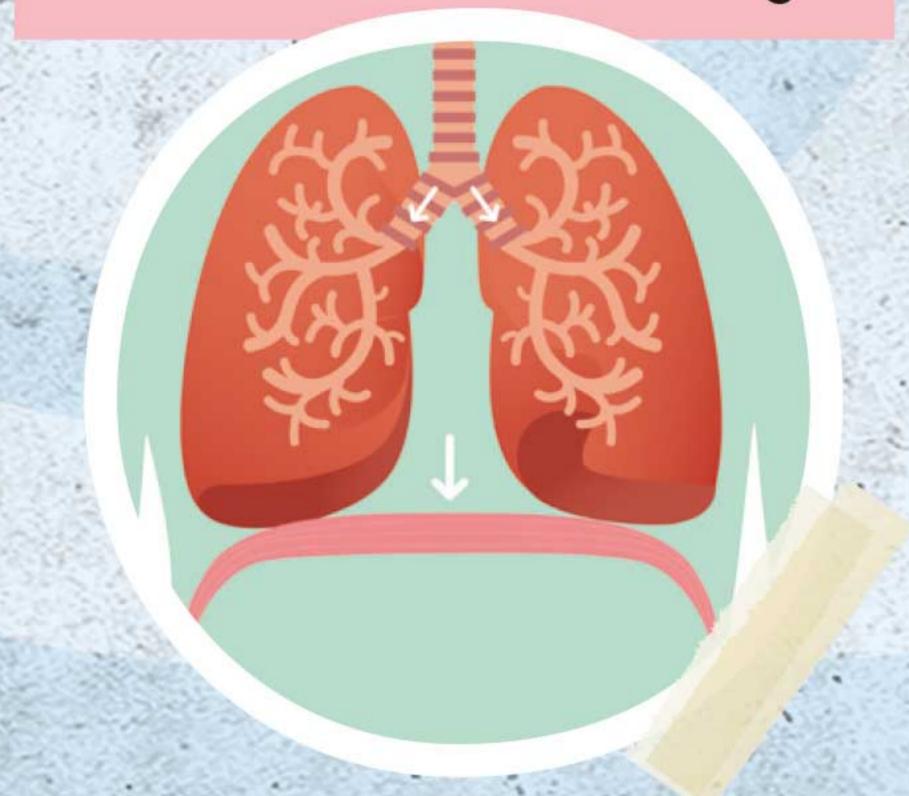
mouth trachea bronchi

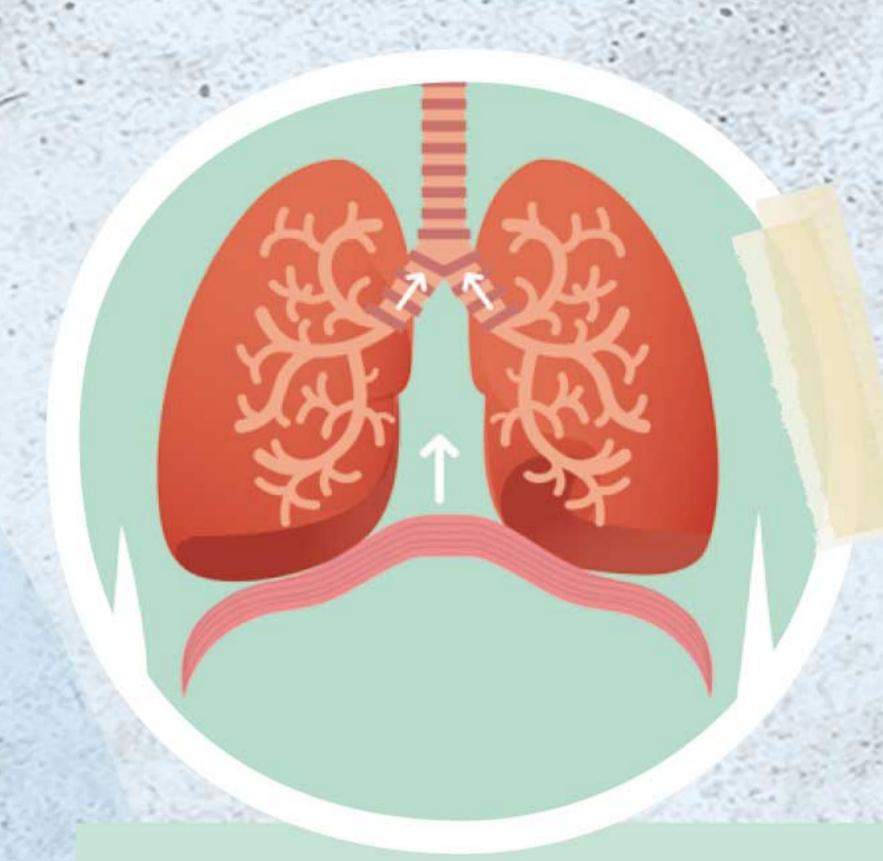
lungs

nose

On average, a child of your age takes about 1200 breaths per hour. So, how many times do you breathe in a day?

4 Below the lungs, there is a muscle called the diaphragm. This muscle helps the lungs to perform respiration. When it contracts, air is drawn into<sup>1</sup> our lungs.





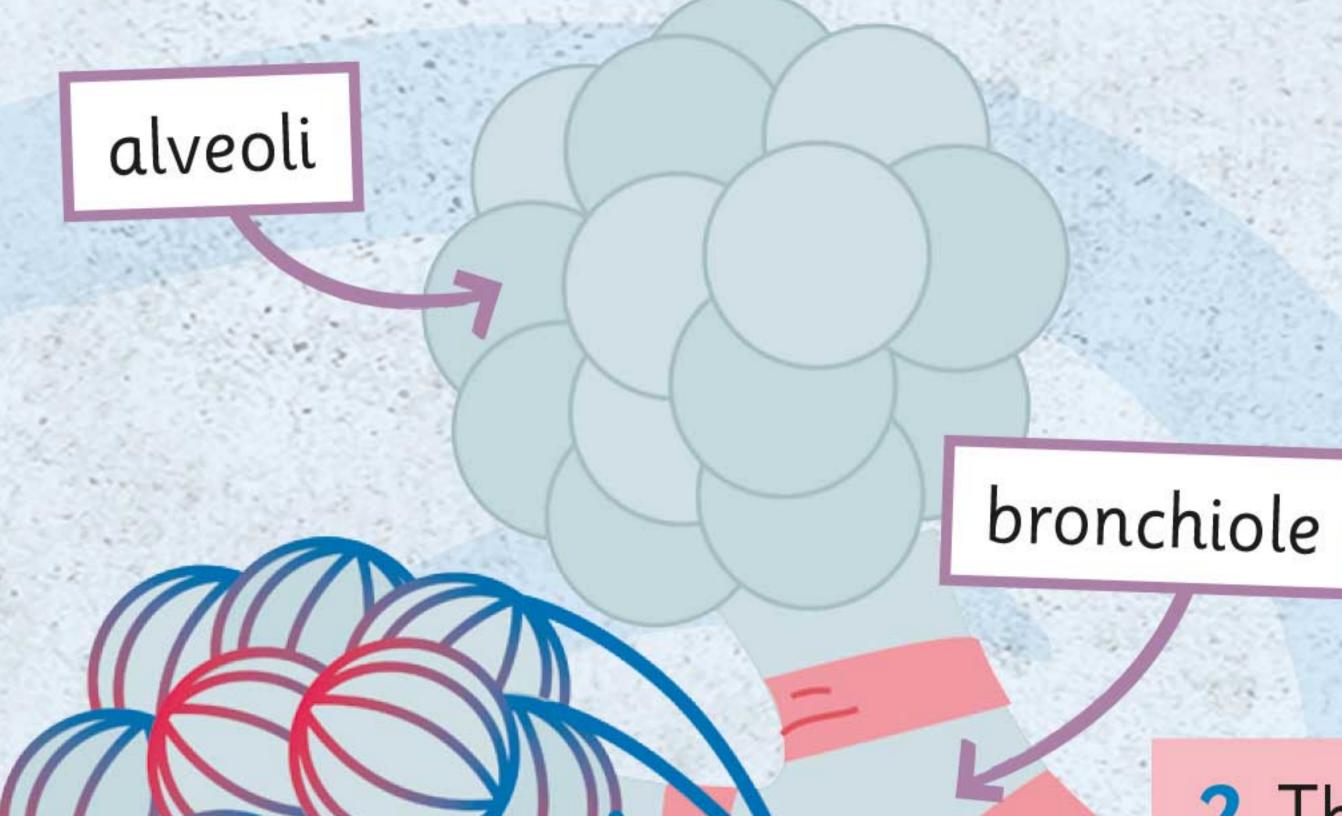
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diaphragm

5 When the diaphragm relaxes, air is expelled from our lungs.

3 The bronchi lead to two large organs which are responsible for breathing: the lungs.

# Oxygen goes in, carbon dioxide comes out



1 The bronchi divide into smaller tubes inside the **lungs**.
These tubes are called **bronchioles**.

By the end of this lesson, you will know how many bronchioles are in each lung.

2 There are tiny air sacs called alveoli at the end of each bronchiole. The alveoli are covered in capillaries.

Did you know there are about 30,000 bronchioles in each lung? Each one is about as thick as a hair.

# Try this ...

The amount of air we can fit in our lungs is called our lung capacity.

Get into groups of five.

Each pupil has a balloon.

Everyone takes a deep
breath and blows into the
balloon until they run out
of air. Observe the different
lung capacities.



In the alveoli, the oxygen from the air we breathe in passes into the blood. The carbon dioxide our body produces leaves the blood through the alveoli, and is expelled when we

capillaries

breathe

out.

### mVasticity stage 2

- Make a model of the respiratory system using plasticine or mixed materials, such as balloons, plastic bags, straws, cardboard rolls ...
- Attach your model to the body outline using glue, tape or staples.
- Label each part. You can make labels using card.