

CAMBRIDGE

Student's Book

# Science

## Path 4

A small illustration of a telescope on a tripod, positioned between the words 'Science' and 'Path'.

Better  
Learning



# SCIENCE PATH 4



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**More hands on!**

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# WELCOME TO CAMBRIDGE SCIENCE PATH

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



make a  
3D model



become a wildlife park ranger





learn about recyclable materials



create a health awareness campaign



explore our world through maps



find machines in your neighborhood



**You will also find out:**

- what your respiratory rate is.
- how to detect oxygen.
- how to see the oxygen plants release.
- whether certain objects sink or float.
- how levers work.
- how to make a compass.
- what the highest mountain in the world is.



1

# HOW DO OUR BODY SYSTEMS WORK?

Look and see ...

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

How do you feel after running around for a long time?



What body systems are the people in these pictures using?

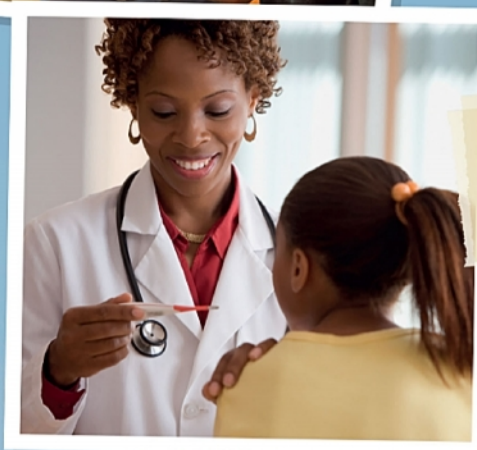




**Song** 02

Pumping and breathing

What is happening  
in each picture? Why?



**DOCUMENTARY**

Respiration and circulation

## Investigate

In this unit, you will create a 3D body systems mural. To do this, you will:

- work in groups to create a mural.
- learn more about the respiratory system, including how we get oxygen from the air.
- learn more about the circulatory system, including how the heart pumps blood.
- present each part of the mural to the class as a group.



# WHY ARE BODY SYSTEMS VITAL?



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

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



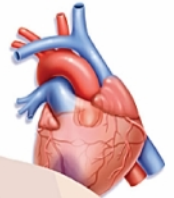
musculoskeletal system



nervous system



digestive system



excretory system



circulatory system



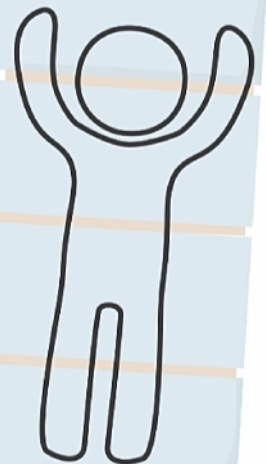
respiratory system

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



## STAGE 1

- In groups of four, join four sheets of paper together. Lay out the sheets horizontally and stick 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.





# VITAL SIGNS

## Hands on!

### 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. Write 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 schoolyard 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?

04



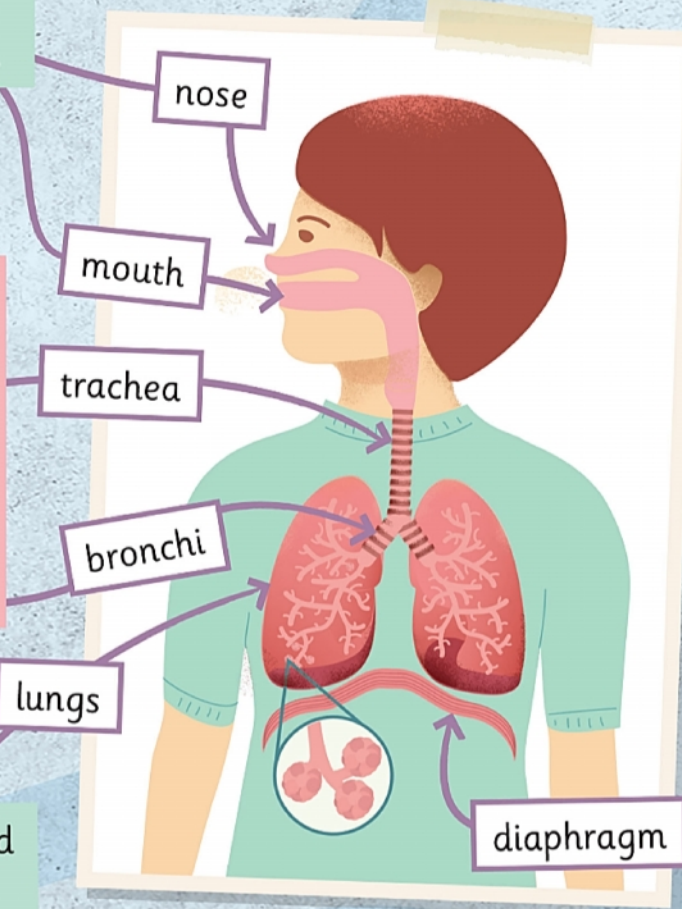
The **respiratory system** is a group of organs that perform respiration. **Respiration** is another way of saying 'breathing'. In respiration, we breathe in air that contains oxygen and we breathe out carbon dioxide. Our body needs oxygen to process food that gives us energy.

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

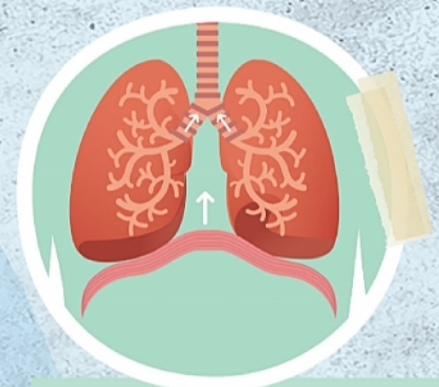
1 Air enters our body through the **mouth** and the **nose**.

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

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



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 our lungs.



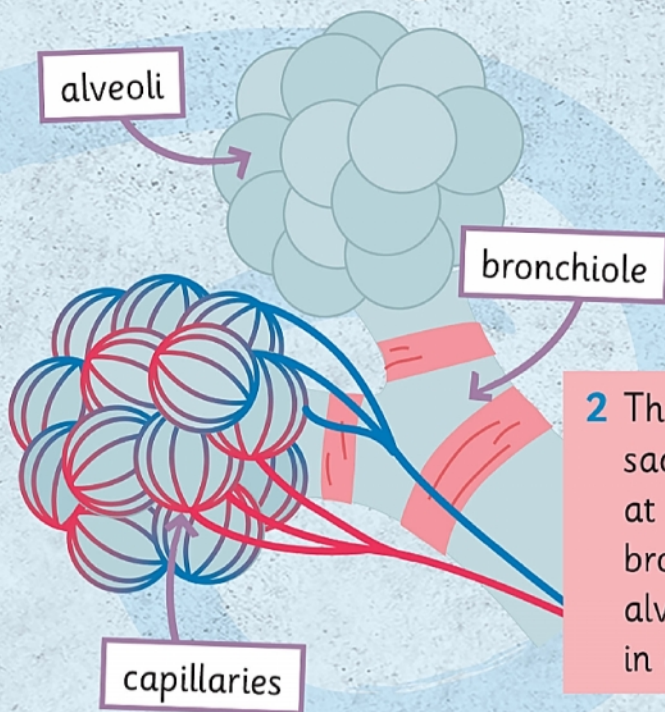
On average, a child of your age takes about 1,200 breaths per hour. So, how many times do you breathe in a day?

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





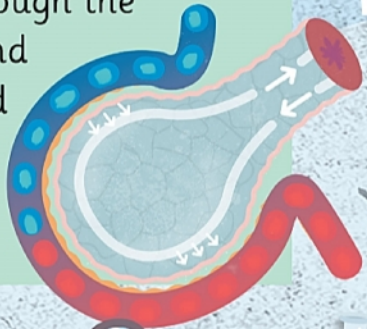
Oxygen goes in, carbon dioxide comes out



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

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

3 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 breathe out.



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

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

## Try this ...

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

Get into groups of five. Each student has a balloon. Everyone takes a deep breath and blows into the balloon until they run out of air. Observe the different lung capacities.



## Investigate STAGE 2

- Make a model of the respiratory system using modeling clay 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 construction paper.