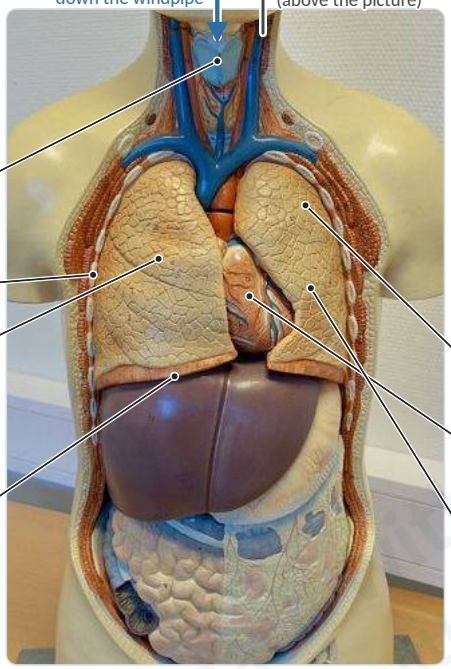
LEARN WITH AKSHADA · PICTURE LESSON

Breathing: the journey of air

Every minute, without thinking about it, you breathe in and out many times. Let us follow one breath of air on its trip into your body and out again.



Seen from the front: your left lung is on the right side of the picture.

For the parent *read in 1 minute*

Our body needs **oxygen**, a gas in the air, to get energy from food. Air goes in through the **nose** (or mouth), down the **windpipe**, along **two branches** and into the two **lungs**.

Deep inside the lungs, tiny **air sacs** pass oxygen into the blood. The used air, with more **carbon dioxide**, is breathed out.

The lungs cannot move by themselves. A dome-shaped muscle, the **diaphragm**, and the muscles between the ribs do the work.

How to use these pages

- Point to each part in the big picture and trace the blue arrows together.
- Pages 2 and 3: one step at a time. Page 4: try things at home.
- Quick check on page 5; answers on page 6.

Talk about it *before turning the page · 5 minutes*

1. **Put your hand in front of your nose. What do you feel?**
   Listen for: warm air coming out when we breathe out.
2. **Can you hold your breath for a whole day? Why not?**
   Listen for: no; the body needs fresh air all the time, even when we sleep.
3. **After a game of running or cricket, how does your breathing change?**
   Listen for: it becomes faster and deeper; the body needs more air.

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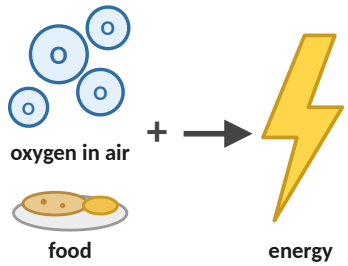
The journey of air, step by step

Nose or mouth → windpipe → two branches → two lungs → tiny air sacs → blood

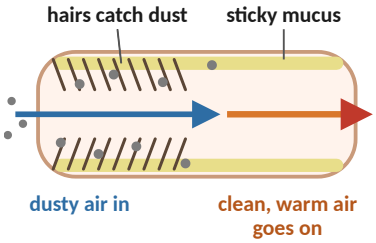


1 Why do we need air?

Air has a gas called **oxygen**. We cannot see it or smell it, but our body needs it all the time.

Our body uses oxygen to get **energy** from the food we eat, like roti and dal. This energy helps us run, play, think and grow.

Remember: we breathe all day and all night, even when we are asleep.

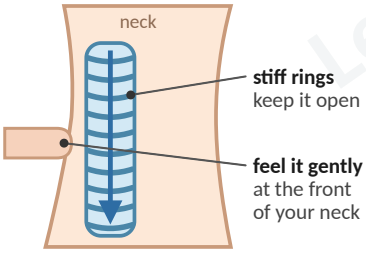


2 In through the nose (or the mouth)

Air goes in through the two holes of the nose. Inside, tiny **hairs** and sticky **mucus** catch dust and germs, like a filter.

The nose also **warms** the air and makes it a little damp before it goes on. We can breathe through the mouth too, but the nose cleans the air better.

Remember: breathe through your nose when you can.



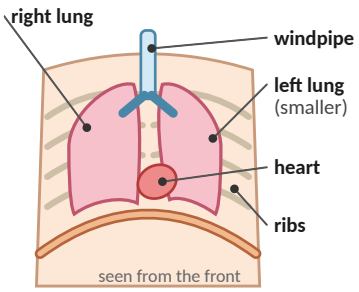
3 Down the windpipe

From the back of the nose and mouth, air goes down a tube in the neck called the **windpipe**.

The windpipe has stiff **rings**, so it always stays open, like a pipe that does not get squashed. Touch the front of your neck gently: you can feel the bumpy rings.

Remember: the windpipe carries air; food goes down a different tube behind it.

For curious minds: the rings are made of cartilage, the same bendy-but-firm stuff as the tip of your nose.



4 Two branches, two lungs

At the bottom, the windpipe splits into **two branches**, one for each lung. The lungs are soft and **spongy**, and they sit safely inside the **ribcage**.

The **left lung is a little smaller** than the right one, to make room for the heart.

Remember: we have two lungs, a right one and a left one, both protected by our ribs.

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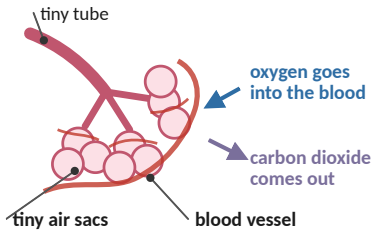


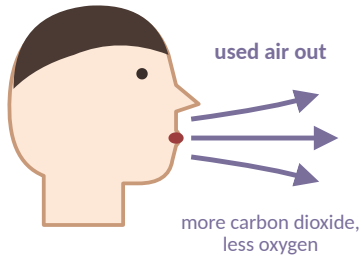
5 Tiny air sacs: oxygen into the blood

Inside each lung, the branches split again and again into very thin tubes. At the end of each tube are **tiny air sacs**, like bunches of grapes.

Each air sac is wrapped in tiny blood vessels. **Oxygen** passes from the air sac into the blood, and the blood carries it all over the body.

Remember: the blood takes oxygen from the lungs to every part of the body.

For curious minds: the air sacs are called alveoli. There are hundreds of millions of them!

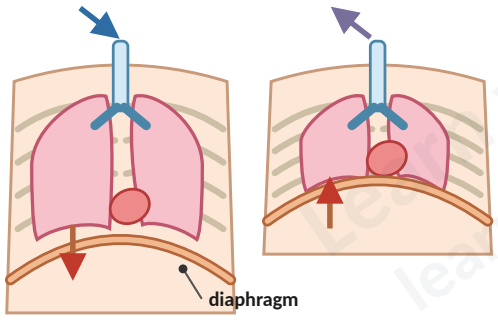


6 Breathing out the used air

The body makes a waste gas called **carbon dioxide**. The blood brings it back to the air sacs.

When we breathe out, this **used air** leaves through the nose or mouth. It has less oxygen and more carbon dioxide. That is why we need to keep breathing in **fresh air**.

Remember: breathe in fresh air with oxygen; breathe out used air with carbon dioxide.



Breathe IN
diaphragm moves down, lungs fill up

Breathe OUT
diaphragm moves up, used air goes out

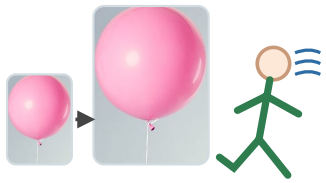
7 The diaphragm does the pulling

Under the lungs is a dome-shaped muscle called the **diaphragm**. When we breathe **in**, it moves **down** and makes more space, so air rushes into the lungs.

When we breathe **out**, it relaxes and moves back **up**, the chest gets smaller and the used air goes out.

The lungs have **no muscles of their own**. The diaphragm and the muscles between the ribs do the work.

Remember: in = diaphragm down; out = diaphragm up.



breathe out: chest falls
breathe in: chest rises
after running: faster breaths

8 Up and down, like a balloon

Put your hands on your chest. When you breathe in, your chest **rises** and gets bigger, like a balloon filling up. When you breathe out, it **falls**.

After running, you breathe **faster and deeper**. Your busy muscles need more oxygen, so you take in more air.

Remember: the more active we are, the faster we breathe.

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Try it at home

1. Feel your windpipe

Gently run a finger down the front of your neck, below the chin. Feel the bumpy rings. Now swallow and feel them move up and down.

Safety: Touch softly; never press hard on the neck.

2. Count your breaths

Sit still for 1 minute while a grown-up keeps time. Count every breath in. Then jump or run on the spot for 1 minute and count again. Which number is bigger? Why?

Safety: Stop if you feel dizzy, and play on a safe floor.

3. Measure your chest

Wrap a piece of string or a dupatta around your chest. Mark it after breathing out fully, then after a big breath in. The string shows how much your chest grows.

Safety: Keep it loose; never tie anything around the neck.

4. Make a model lung

A grown-up cuts the bottom off a small plastic bottle. Put a balloon inside the neck of the bottle and stretch a second, cut balloon over the open bottom. Pull the bottom balloon down: the balloon inside fills up. This bottom balloon works like the diaphragm.

Safety: Only a grown-up uses the scissors. Never put a balloon or balloon pieces in the mouth; throw away burst pieces at once (choking risk). Skip it if anyone has a latex allergy.

5. Balloon-belly breathing

Sit with your back straight. Breathe in slowly through your nose while counting to 4; feel your tummy puff up like a balloon. Breathe out slowly while counting to 4. Do this 5 times. This is like simple pranayama.

Safety: Breathe gently; do not hold your breath for long.

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Keep your lungs healthy



Open the windows to let fresh air into the house.



Breathe slowly and calmly for a few minutes, like pranayama.



Cover coughs and sneezes with your elbow or a hanky, so germs do not spread.



Play outside and stay active: running, cycling, skipping, cricket.



Stay away from smoke from cigarettes, burning rubbish and crackers, and from thick dust.



Spend time near trees and plants, in a park or garden.

Key points to remember

- We breathe in air to get **oxygen**; the body uses it to get energy from food.
- Air travels: **nose → windpipe → two branches → two lungs → tiny air sacs → blood**.
- The nose **cleans and warms** the air; the windpipe has **stiff rings** to stay open.
- We breathe out **used air** with more carbon dioxide.
- The **diaphragm** moves down when we breathe in and up when we breathe out; the lungs have no muscles of their own.

Quick check 10 questions · answers on page 6

1. Which gas in the air does our body need?
   (a) smoke (b) oxygen (c) carbon dioxide (d) steam

2. What catches dust inside the nose?
   (a) teeth (b) the tongue (c) hairs and sticky mucus (d) the ribs

3. The dome-shaped muscle under the lungs is called the:
   (a) heart (b) diaphragm (c) windpipe (d) air sac

4. True or false: the lungs have their own muscles to pull air in.
   ☐ True ☐ False

5. True or false: the left lung is a little smaller than the right lung.
   ☐ True ☐ False

6. **Order the steps.** Write 1 to 5 to show the journey of air.
   ___ lungs ___ nose ___ tiny air sacs ___ windpipe ___ two branches

7. Match each part to its job. Write the letter.

1. Nose ___	A. protect the lungs like a cage
2. Windpipe ___	B. pass oxygen into the blood
3. Ribs ___	C. cleans and warms the air
4. Air sacs ___	D. a tube with stiff rings that carries air

8. When we breathe **in**, the diaphragm moves:
   (a) up (b) down

9. **Why** do we breathe faster after running?

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10. Tick (✓) the **two** things that are good for our lungs.
    ☐ playing in the park ☐ standing near smoke from burning rubbish ☐ opening the windows
    ☐ sneezing into the air

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Answers

1. (b) oxygen. The body uses it to get energy from food.
2. (c) hairs and sticky mucus. They work like a filter.
3. (b) diaphragm.
4. False. The lungs have no muscles; the diaphragm and the rib muscles do the work.
5. True. It is smaller to make room for the heart.
6. nose 1, windpipe 2, two branches 3, lungs 4, tiny air sacs 5.
7. 1-C, 2-D, 3-A, 4-B.
8. (b) down. This makes more space, so air rushes into the lungs.
9. When we run, our muscles work hard and need more oxygen, so we breathe faster and deeper to take in more air (and to breathe out more carbon dioxide).
10. Playing in the park and opening the windows. Smoke harms the lungs, and sneezing into the air spreads germs.

Going further (for curious minds)

- A grown-up at rest breathes about 12 to 20 times a minute; children breathe a little faster.
- When you breathe out on a cold mirror or steel plate, it gets misty: the air we breathe out is warm and damp.
- A small flap called the **epiglottis** closes over the windpipe when we swallow, so food goes down the food pipe. That is why we should not talk or laugh with food in the mouth.

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