

How we breathe



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Learning objectives

- Understanding how we breathe
- Identifying what an allergy is and how it affects our breathing
- Learning the different effects smoking and exercise have on the respiratory system



Curriculum links

- Science (Biology)
 - Gas exchange systems
 - Health
- Mathematics
 - Reason mathematically
 - Geometry and measures



Resources required

- How we breathe slides



Time needed: 15 mins

This activity is designed to be followed by the **Dust and breathing** module, once students have been introduced to the basics of the respiratory system.

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Starter activity (15 mins)

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Slide 1

Introduction: How we breathe

- Tell students they will be covering the respiratory system



Slide 2

Introducing the respiratory system

- Begin by explaining that the respiratory system is a system of organs and structures that allows us to breathe
- Oxygen from the air diffuses into the lungs and is transported around the body via red blood cells to muscle tissues, where it helps convert glucose into energy
- Explain to students that carbon dioxide is a waste product of the process which is expelled when we breathe out
- Before moving on, tell students to pay attention to the different parts of the system. They will be asked a question about breathing movement in the next slide



Slide 3

Breathe in, breathe out

- Next, tell students to breathe in deeply and pay attention to their torso. Ask if they can explain what happens. Encourage them to think about which of the things pictured in the previous slide they can feel working
- Use these to help the discussion:
 - Breathing in: The rib cage expands and diaphragm contracts, allowing more air to be drawn into the lungs
 - Breathing out: The rib cage contracts, and diaphragm expands, pushing on the chest and moving air out of the lungs

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Slide 4 Allergens

- Tell students that some allergies can affect your breathing. Allergies can make your airways narrower, or even block them completely
- Anything that sets off an allergic reaction is called an allergen
- People can be allergic to a lot of different things, such as gluten, nuts and wool
- Ask students if they can suggest some other allergies. Ensure students are aware that allergies are common and important to keep in mind, not to be ashamed of, or made fun of in others
- Examples can be found on **Slide 8**



Slide 5 Smoking

- Introduce smoking as another thing that can impact your ability to breathe, it's not just allergies
- Ask students to suggest conditions they know can be caused by smoking. Write these on the board, or students can create their own list
 - Examples: bronchitis, mouth cancer, heart disease, cataracts, liver cancer
- Another downside of smoking for your health is increased levels of carbon monoxide, a toxic chemical, which takes the place of oxygen on red blood cells, reducing the amount of oxygen being carried around the body
- The airways are coated with a thin runny layer of mucus, which particles in the air like dust and bacteria stick to when we breathe to help keep us healthy
- Allergies and smoking both cause thicker mucus to be produced and inflames the airways causing them to narrow, limiting the amount of oxygen traveling around the body



Slide 6 Exercise

- Ask students how running around affects their breathing
- Explain that this is due to your body requiring more energy to perform exercise. Your heart beats faster to get the oxygen to your blood cells quicker
- Repeated exercise can increase your vital capacity (the volume of air you can inhale and exhale), and therefore help with overall performance

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Slide 7

How do we breathe? Quiz

- Tell the class they will be answering questions based on the information they have covered in the session
- Answers can be written down either on the board or on paper, or raised hands and shared with the wider class
- Show answers on final slide. Questions in green are true and those in red are false
- You may choose to divide the class into two or more groups to compete for correct answers:
 - As a stretch activity with a more able group, make the quiz competitive by offering bonus points to those who can offer the correct answer to the false statements
- Explain any right answers to the false statements if necessary



Slide 8

How do we breathe? Answers

1. True
2. False – the main waste product is carbon **dioxide**
3. False – allergies can cause thicker mucus to be produced
4. True - other allergies include:
 - a. Shellfish
 - b. Peanuts
 - c. Tree nuts
 - d. Gluten
 - e. Wheat
 - f. Lactose
 - g. Penicillin
 - h. Dust
 - i. Wool
 - j. Latex
5. True
6. False – mucus traps unwanted bacteria and allergens, while also protecting areas such as your lungs, throat and nasal passages
7. True

Try next: This activity also functions as a starter to the **Dust and breathing** module, which looks at the airways, and the things that can affect their function, in more detail. Why not try that next?