Your notes

KS3 Science: revision notes

B2.1 Tissues and organs

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The skeleton and muscles

- The **skeleton** supports the body, protects organs (the skull protects the brain; the ribs protect the heart and lungs), helps us move and makes blood cells in the bone marrow.
- **Joints** are where bones meet. **Ligaments** join bone to bone, and cartilage cushions the ends of bones. Hinge **joints** (elbow, knee) move one way; ball and socket joints (hip, shoulder) move in many directions; some joints, such as those in the skull, are fixed.
- **Tendons** join muscles to bones. Muscles can only pull (contract), so they work in antagonistic pairs.
- To bend the arm, the biceps contracts and the triceps relaxes. To straighten it, the triceps contracts and the biceps relaxes.

Breathing

- Air passes through the nose or mouth, down the **trachea** (windpipe, kept open by rings of cartilage), into the **bronchi**, then the bronchioles, and finally the **alveoli** (tiny air sacs).
- Breathing in: the **intercostal muscles** contract, moving the ribs up and out; the **diaphragm** contracts and flattens. The volume of the chest increases, the pressure falls, and air is drawn in.
- Breathing out: the muscles relax, the ribs move down and in, and the **diaphragm** domes upwards. The volume decreases, the pressure rises, and air is pushed out.

Gas exchange

- In the **alveoli**, oxygen diffuses into the blood and carbon dioxide diffuses out of the blood.
- **Alveoli** are adapted for this: a huge surface area, thin walls (one cell thick), a good blood supply and a moist lining.

Drugs and organ donation

- A **drug** is a substance that changes the way the body works. Medicinal **drugs** treat illness (paracetamol for pain, antibiotics for bacterial infections). Recreational **drugs** are taken for enjoyment (caffeine, alcohol, nicotine) and some are illegal.
- **Drugs** can have side effects and can be addictive.
- Smoking: tar causes cancer and damages the **alveoli**; nicotine is addictive; carbon monoxide reduces the oxygen the blood can carry; the smoke damages the cilia that clean the airways.
- Alcohol slows reaction times and can damage the liver and brain.
- Organ donation: in an opt-in system, people register if they want to donate; in an opt-out system, everyone is a donor unless they say no. People debate consent, religious beliefs and the shortage of organs.

Key terms

Skeleton	The bones that support and protect the body and help it move.
Joint	A place where two bones meet.
Ligament	Joins bone to bone at a joint.
Tendon	Joins a muscle to a bone.
Antagonistic muscles	A pair of muscles that pull in opposite directions.
Trachea	The windpipe, which carries air to the lungs.
Bronchi	The two tubes that branch off the trachea into the lungs.
Alveoli	Tiny air sacs in the lungs where gas exchange happens.
Diaphragm	A sheet of muscle below the lungs that helps with breathing.
Intercostal muscles	Muscles between the ribs.
Gas exchange	Oxygen entering the blood and carbon dioxide leaving it.
Drug	A substance that changes the way the body works.
Addiction	Needing a drug and finding it hard to stop taking it.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. Which of these is a job of the skeleton?
2. What joins a muscle to a bone?
3. What happens to the biceps when you bend your arm?
4. Why do muscles work in antagonistic pairs?
5. What type of joint is the knee?

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6. What are the tiny air sacs in the lungs called?
7. What happens to the diaphragm when you breathe in?
8. When you breathe in, what happens to the volume and pressure inside your chest?

Answers

1. Protecting organs
2. A tendon
3. It contracts
4. Muscles can only pull, not push
5. A hinge joint
6. Alveoli
7. It contracts and flattens
8. The volume increases and the pressure decreases

What to do next

Practise 15 questions on this topic

Try 4 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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