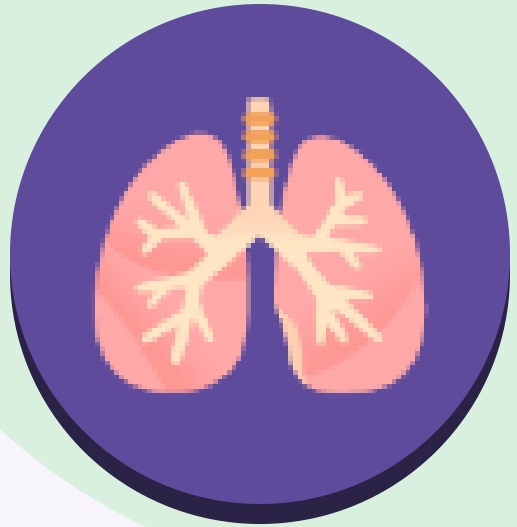
Biology A · Unit 5 · Level 2 (modified)

Breathing, Exercise & Energy



TODAY'S PLAN

- 🔥 Cellular respiration
- 🪙 ATP
- 🫁 Heart and lungs
- 🏃 Exercise data
- 🍞 Yeast and combustion

Review · 5 minutes

Quick Review



🍬 Carbohydrates are broken into **glucose** in digestion.

🌀 Glucose goes into the blood in the small intestine.

❓ What do cells do with glucose? (make energy)

Words to Know

Words to Know



Cellular respiration

Cells use glucose + oxygen to make energy (ATP). Carbon dioxide and water come out.



ATP

The energy molecule cells can use right away. Like energy coins.



Oxygen

The gas we breathe in. Cells need it to burn glucose.



Carbon dioxide

The gas we breathe out. It is made when cells burn food.

Words to Know

More Words to Know



🫁 **Lungs**: Organs that take in oxygen and get rid of carbon dioxide.

❤️ **Heart**: A muscle that pumps blood with oxygen and glucose to the cells.

🔥 **Combustion**: Burning: fuel + oxygen → carbon dioxide + water + energy (heat and light).

🍞 **Yeast**: A one-celled fungus. It eats sugar and makes carbon dioxide gas.

Learn

Cellular Respiration



🔥 Glucose + oxygen → carbon dioxide + water + ATP (energy).

🌿 Plants and animals do cellular respiration.

🏭 It happens in the mitochondria.

🃏 Check 1 of 3



What are the inputs of cellular respiration?

Hold up 1, 2, or 3:

1️⃣ Carbon dioxide and water

2️⃣ Glucose and oxygen

3️⃣ Light and water



Glucose and oxygen

Inputs = glucose + oxygen.

Learn

ATP: Energy Coins



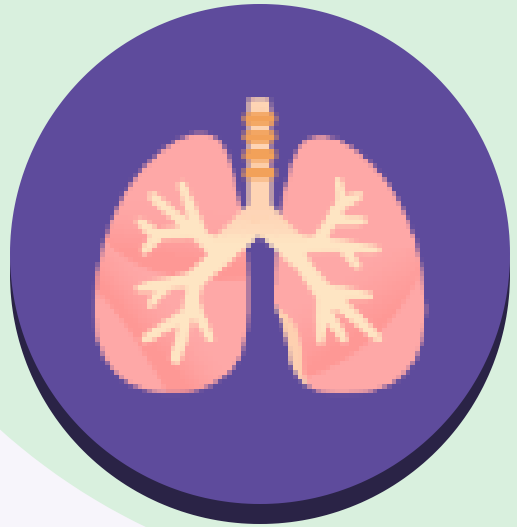
🪙 **ATP** is energy cells can use right away.

💥 Energy is released when a phosphate group comes off.

☀️ The energy first came from the **sun** (through food).

Compare

Heart and Lungs



Lungs

Take in oxygen
Get rid of carbon dioxide

Heart

Pumps blood
Brings oxygen + glucose to cells

Learn

Exercise Lab (A2)

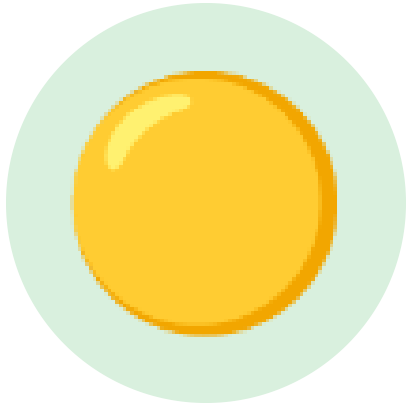
📏 3 clues of respiration: **breathing rate**, **heart rate**, **CO2**.

🪑 Measure at rest, then after 2 minutes of exercise.

🟡 BTB turns yellow **faster** after exercise = more CO2.



🃏 Check 2 of 3



After exercise, BTB turns yellow faster because…

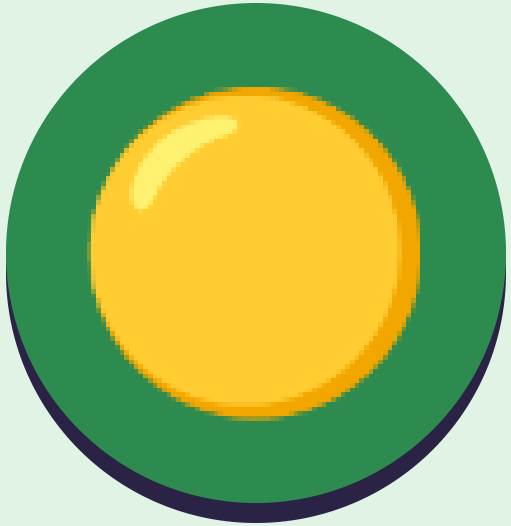
Hold up 1, 2, or 3:

1️⃣ We breathe less

2️⃣ Water gets colder

3️⃣ Cells make more carbon dioxide

✅ Answer · Card 2 of 3



Cells make more carbon dioxide

More muscle work = more respiration = more CO2.

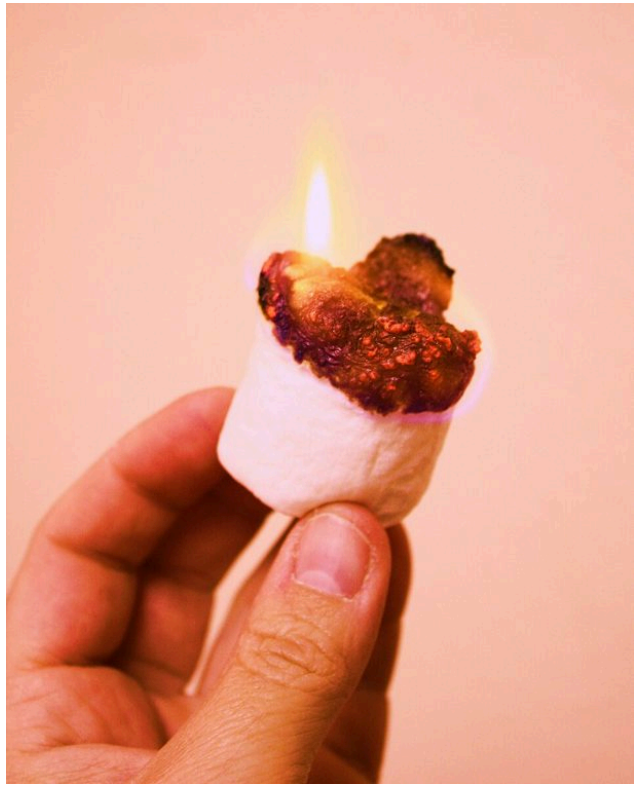
Learn

Combustion (A3, A5)

🔥 Burning: fuel + oxygen → carbon dioxide + water + heat and light.

⚖️ A burning marshmallow **loses mass**: its atoms go into the air as CO2 and water.

🏃 Our cells do the same thing, slowly and safely.



🃏 Check 3 of 3



Where did the marshmallow's lost mass go?

Hold up 1, 2, or 3:

1️⃣ Into the air as carbon dioxide and water

2️⃣ It disappeared

3️⃣ Into the skewer

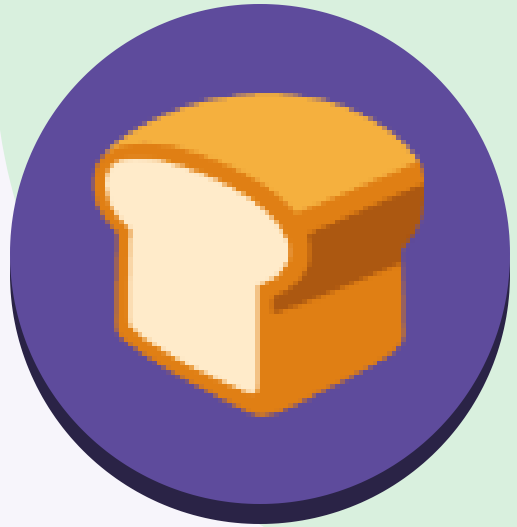


Into the air as carbon dioxide and water

Matter is not destroyed; it leaves as gas.

Learn

Yeast Feast (A4)



🍞 Yeast is alive. It uses glucose and gives off CO2.

🧪 Tubes: glucose, starch, water (+ 1 choice).

🫧 More CO2 = the yeast used more of that food.

Compare

Same Reaction



Burning

🔥

Fast
Heat + light
CO_2 + water

Respiration

🫁

Slow, in cells
ATP + heat
CO_2 + water

Wrap-Up

Recap



Respiration

glucose + oxygen → CO2 + water + ATP



ATP

usable energy



Exercise

↑ breathing, heart rate, CO2



Yeast

CO2 shows respiration

Wrap-Up

Exit Ticket



1️⃣ Write the word equation for cellular respiration.

2️⃣ What 3 things go up with exercise?

3️⃣ Where does a burning marshmallow's mass go?