

Cellular respiration

Compare aerobic respiration and fermentation, and explain how cells release usable energy.

Aerobic respiration

Glucose is broken down using oxygen, producing carbon dioxide and water. Energy is transferred to ATP. Glycolysis occurs in the cytoplasm; the later aerobic stages take place in mitochondria.

Without oxygen

Fermentation enables glycolysis to continue when oxygen is unavailable. Yeast can produce ethanol and carbon dioxide; muscle cells can form lactate. Fermentation yields much less ATP per glucose than aerobic respiration.

Formula sheet



Worked example

Explain why germinating seeds can warm an insulated container.

1. Germinating seeds are living and actively respire.
2. Respiration releases energy from stored food.
3. Some energy is transferred as heat, warming the container.

Try it yourself

1. Where does glycolysis occur?
2. Name the gas released during alcoholic fermentation by yeast.

Check your answers

1. In the cytoplasm.
2. Carbon dioxide.

Common mistake

Breathing moves air; cellular respiration releases usable energy within cells.

Source and scope

Original Pass Papers ZA revision notes; curriculum reference linked below.

Updated 2026-10-28. Selected revision topics, not an official examination paper. Check your teacher's scope.

Official DBE curriculum / textbook reference

Read online: <https://passpapers.co.za/study/revision/grade-11-life-sciences-cellular-respiration>