

Full Higher Separate content. ★ = Higher Tier. ◆ = Separate Science only.

**Q1. Write the word equation for aerobic respiration and state where it occurs in the cell.**

[2 marks]

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**Q2. Explain why a student is wrong when they say: "Respiration is just breathing."**

[3 marks]

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**Q3. Explain why muscle cells contain large numbers of mitochondria.**

[3 marks]

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**Total: 8 marks**

**Q1 (2 marks)**

*Write the word equation for aerobic respiration and state where it occurs in the cell.*

- Glucose + oxygen → carbon dioxide + water [1]
- Mitochondria [1]

**Q2 (3 marks)**

*Explain why a student is wrong when they say: "Respiration is just breathing."*

- Breathing is the physical movement of air in and out of lungs (ventilation) [1]
- Respiration is a chemical process in cells that releases energy (ATP) from glucose [1]
- Respiration occurs in every living cell continuously — not just in lungs [1]

**Q3 (3 marks)**

*Explain why muscle cells contain large numbers of mitochondria.*

- Muscle cells require large amounts of energy for contraction [1]
- Energy is produced by aerobic respiration in mitochondria [1]
- More mitochondria → more aerobic respiration → more ATP produced → muscle can contract more / for longer [1]