

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

**Q1. State THREE differences between mitosis and meiosis.**

[3 marks]

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**Q2. Explain why meiosis is essential for maintaining chromosome number across generations.**

[2 marks]

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★ HIGHER TIER

**Q3. ★ Explain how crossing over during meiosis produces genetic variation.**

[3 marks]

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**Total: 8 marks**

**Q1 (3 marks)**

State *THREE* differences between mitosis and meiosis.

- Mitosis: 2 daughter cells; meiosis: 4 [1]
- Mitosis: identical; meiosis: genetically different [1]
- Mitosis: diploid; meiosis: haploid [1]

**Q2 (2 marks)**

Explain why meiosis is essential for maintaining chromosome number across generations.

- Meiosis produces haploid gametes (23 chromosomes) [1]
- Fertilisation of two haploid gametes restores the diploid number (46) [1]

**Q3 (3 marks) [★ HT]**

★ Explain how crossing over during meiosis produces genetic variation.

- Homologous chromosomes pair up in meiosis I [1]
- Sections of chromatids exchanged between homologous chromosomes [1]
- New combinations of alleles on each chromosome — each gamete genetically unique [1]