Higher Tier — Separate Science

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

Q1. Explain how biological sex is determined in humans.

[2 marks]

Q2. Use a genetic cross diagram to show the expected ratio of male to female offspring.

[3 marks]

★ HIGHER TIER

Q3. ★ Explain what a sex-linked characteristic is. Give ONE example and explain why it is more common in males.

[3 marks]

Total: 8 marks

Sex Determination

Q1 (2 marks)

Explain how biological sex is determined in humans.

- Females: XX sex chromosomes; males: XY sex chromosomes [1]
- Eggs always carry X; sperm carry either X or Y — sex of child depends on which sperm fertilises the egg [1]

Q2 (3 marks)

Use a genetic cross diagram to show the expected ratio of male to female offspring.

- Father XY: gametes X and Y; mother XX: gametes X and X [1]
- Cross: XX and XY (two female, two male outcomes) [1]
- 50% male : 50% female — 1:1 ratio [1]

Q3 (3 marks) [★ HT]

★ Explain what a sex-linked characteristic is. Give ONE example and explain why it is more…

- Sex-linked: a gene located on the X chromosome (not Y) [1]
- Example: red-green colour blindness / haemophilia [1]
- More common in males: males are XY — only one X chromosome, so a single recessive allele on X is expressed (no second X to mask it) [1]