This is the **Foundation Separate** version. Higher Tier (★) questions have been removed. All remaining questions are Foundation-level.

Meiosis and DNA (3.1–3.3)

Specification reference: 3.1

Q1. Explain why meiosis is important for sexual reproduction and genetic variation.

[4 marks]

Genetic Crosses (3.4–3.6)

Specification reference: 3.4

Q2. Huntington's disease is caused by a dominant allele (H). A person with Huntington's disease (Hh) has children with an unaffected partner (hh). Use a Punnett square to calculate the probability of an affected child.

[4 marks]

Q3. Explain the difference between continuous and discontinuous variation. Give an example of each.

[3 marks]

Total: 11 marks

Meiosis and DNA (3.1–3.3)

Q1 (4 marks)

Explain why meiosis is important for sexual reproduction and genetic variation.

- Produces haploid gametes (23 chromosomes in humans) [1]
- Fertilisation restores diploid number (46) — essential for species to maintain chromosome number [1]
- Crossing over creates new combinations of alleles on chromosomes [1]
- Independent assortment: random distribution of chromosomes → genetically unique gametes [1]

Genetic Crosses (3.4–3.6)

Q2 (4 marks)

Huntington's disease is caused by a dominant allele (H). A person with Huntingto…

- Gametes of Hh: H and h. Gametes of hh: h and h [1]
- Punnett square: Hh, Hh, hh, hh [1]
- 50% probability of Huntington's disease (Hh) [1]
- 50% probability of unaffected (hh) [1]

Q3 (3 marks)

Explain the difference between continuous and discontinuous variation. Give an e…

- Continuous: a range of values with no distinct categories — controlled by many genes and environment (e.g. height, mass) [1]
- Discontinuous: distinct categories with no intermediates — usually one gene (e.g. ABO blood group) [1]
- Continuous shows a normal distribution; discontinuous shows separate groups [1]