



QUESTION WORKBOOK

Meiosis: two divisions, and why no two gametes come out the same

Inheritance and population genetics · Unit B16

AQA 3.2.2 · OCR A 2.1.6 · Edexcel A Topic 3.10–3.13 · CAIE 16.1

6 questions · 21 marks

NAVY SCREEN EDITION

SECTION A · Short, 1 to 2 marks

- A1** State the stage of meiosis at which homologous chromosomes are separated, and state the stage at which sister chromatids are separated. [2]

SECTION B · Standard, 3 to 5 marks

- B1** Describe how crossing over happens during prophase I of meiosis, and describe its effect on the chromatids involved. [4]

- B2** Explain how meiosis produces gametes that are genetically different from one another, naming the stage at which each process happens. [4]

- B3** A species of plant has a diploid number of 14. Calculate the number of different chromosome combinations its gametes could carry from independent assortment alone, and calculate the number of different chromosome combinations possible in a zygote formed by two such plants. [4]

- B4** Compare mitosis with meiosis, referring to the number of divisions, the chromosome number of the daughter cells, the behaviour of homologous chromosomes and the genetic result. [4]

- B5** A chemical prevents chiasmata from forming in prophase I but allows the rest of meiosis to run normally. Suggest what this does to the genetic variation of the gametes produced, and suggest why they would still not all be the same. [3]