AQA, OCR, Edexcel

A Level

A Level Biology

Meiosis Questions

Name:

MME

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Total Marks: /21

Meiosis

1. While the majority of cell division that occurs is mitosis. Meiosis is an essential process of cell division that causes variation in the daughter cells. Meiosis reduces the number of chromosomes to produce four daughter cells, otherwise known as gametes.

a) i) What are gametes? (2 marks)

ii) What is meant by the terms haploid and diploid cells (2 marks)

iii) Why do gametes only have a haploid number of chromosomes? (1 mark)

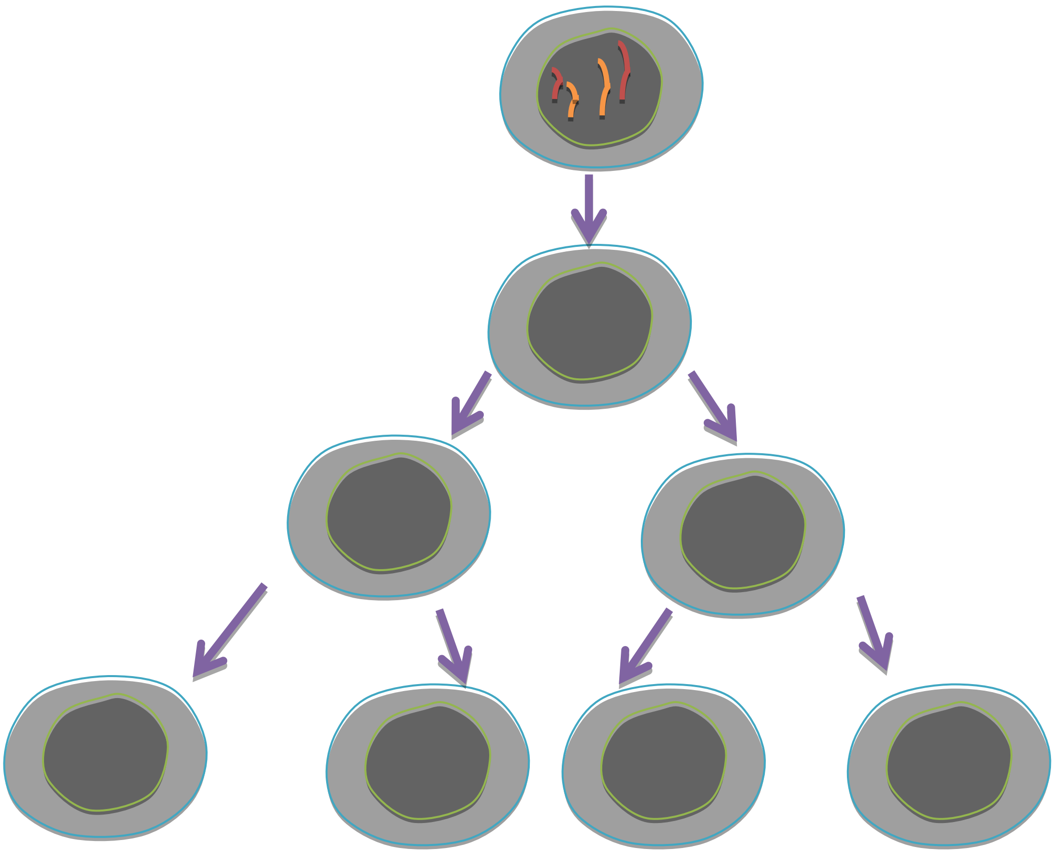
b) The process of meiosis differs from mitosis because there are two cell divisions ultimately forming four daughter cells.

i) What is meant by the term homologous pairs? (2 marks)

ii) What happens to the DNA in meiosis I? (1 mark)

iii) What happens to the DNA in meiosis II? (1 mark)

c) Using the diagram below, draw in the chromosome arrangement in the next three stages of meiosis. (3 marks)



2. The purpose of meiosis is to create variation in the genes that cells contain so that they will not be genetically identical to one another so will create a more diverse population.

a) Crossing over is one way that variation is increased in gametes.

i) What is crossing over, where does it occur in mitosis and how does it cause variation in the gametes? (3 marks)

ii) Independent segregation is another process that increases variation. What is independent segregation? (2 marks)

iii) Identify one way in which gamete cells increase variation in a population? (1 mark)

b) A mule, pictured below, is the reproductive offspring between a female horse and a male donkey. Mules are sterile which means that they cannot reproduce. A mule gets 32 chromosomes from the female horse and 31 chromosomes from the male donkey.

i) Why is the mule sterile? (3 marks)