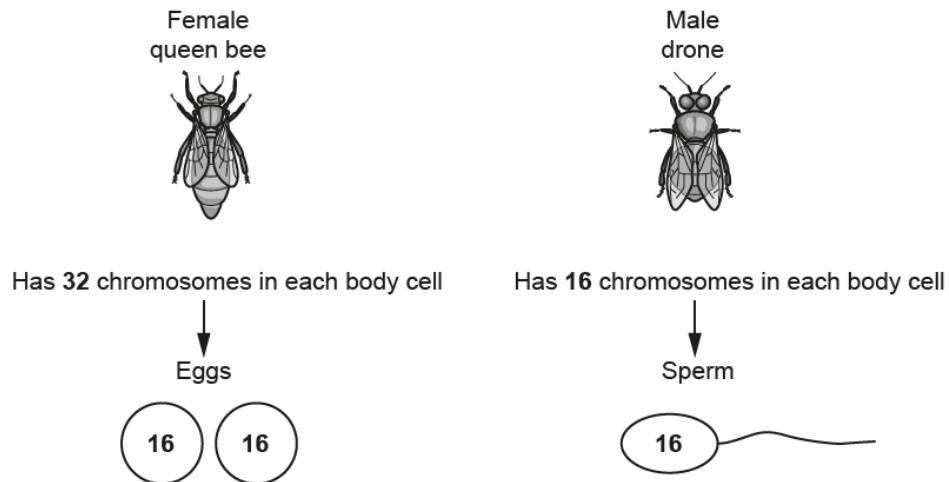


GCSE Biology B (Twenty First Century Science)
J257/01 Breadth in Biology (Foundation)

Question Set 16

1. Female and male bees have different numbers of chromosomes.

The diagram shows the number of chromosomes in female queen bees and male drones.



Use the information in the diagram to answer the following questions.

(a) How is the number of chromosomes found in body cells in the queen bee different to those in the male drones?

female has a double of male's

[1]

(b) The female queen bee produces eggs.

Which type of cell division makes eggs?

meiosis

[1]

(c) Fertilised and unfertilised eggs can both become offspring. The sex of the offspring is determined by whether or not the egg was fertilised.

Complete the table.

Egg	Number of chromosomes in offspring	Sex of offspring
Egg is fertilised	<i>32</i>	<i>female</i>
Egg is not fertilised	<i>16</i>	<i>male</i>

[4]

(d) Bees make honey from nectar.

Nectar is made of sucrose and water.

Bees have an enzyme called invertase. This enzyme converts the sucrose in nectar into two separate sugars.

enzyme → substrate

- (i) Use the 'Lock and Key' model to describe how the enzyme converts the sucrose into two separate sugars. [3]

- enzyme's active site & sucrose are complementary to each other
- enzymes are specific
- bind together to make enzyme-substrate complexes
- enzyme adds pressure & weakens bonds in sucrose to break it down

- (ii) A student investigates the effect of temperature on the rate of the reaction catalysed by the enzyme invertase. [2]

What effect will increasing the temperature have on the rate of reaction? Explain your answer.

- increase rate of reaction
- particles have more kinetic energy so more collisions between enzyme & substrate and more enzyme-substrate complexes and more products formed per unit time (higher chance of ^{successful} collisions in a given time.)

Total Marks for Question Set 16: 11

OCR

Oxford Cambridge and RSA

Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge