

**GCSE Biology B (Twenty First Century Science)**  
**J257/03 Breadth in Biology (Higher)**

**Question Set 26**

1 Onion plants are grown for food.

(a) Onion plants can reproduce sexually or asexually.

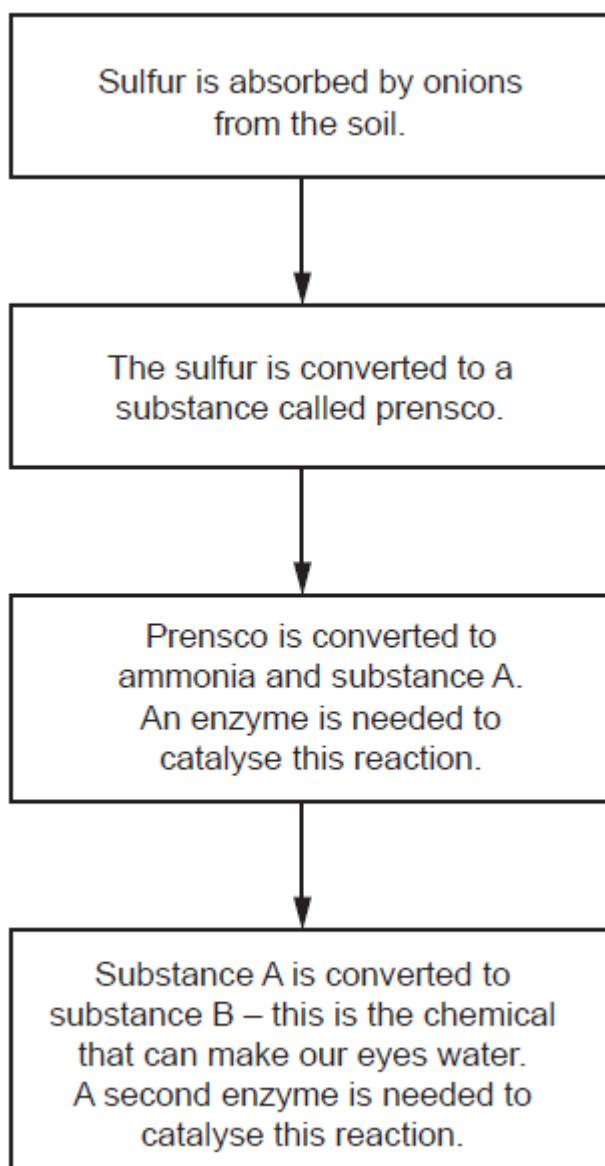
Give **one** advantage of using each type of reproduction for growing onions.

reproducing sexually increases genetic diversity [2]  
reproducing asexually is easier and faster as only one parent needed

(b) When an onion is cut during food preparation, it can cause our eyes to water.

Research suggests that this is a result of a chemical that is made by the onion.

The diagram shows how the onion produces this chemical.



- (i) Suggest which type of cell absorbs sulfate mineral ions from the soil. [1]  
**root hair cells**
- (ii) It has been suggested that if you put the onions in freezing cold water or hot water before cutting the onion, it may reduce the quantity of substance B that causes our eyes to water.

Use the information in the diagram and your knowledge of enzymes to suggest why this may work.

Putting in a freezing cold water would lead to the enzymes that convert substance A to B to act very slow thus the rate of conversion from A to B be slow. Putting in a hot water would denature those enzymes thus they would be no longer functional (can't bind to A as its active site shape is no longer complementary to A)

- (c) Suggest how scientists could produce onions that make our eyes water less. [1]

By genetically engineering producing onion that does not form those enzymes.

**Total Marks for Question Set 26: 7**

---

**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](http://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