

# 3

91603



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## Level 3 Biology 2022

### 91603 Demonstrate understanding of the responses of plants and animals to their external environment

Credits: Five

| Achievement   | Achievement with Merit   | Achievement with Excellence   |
|---|--|---|
| Demonstrate understanding of the responses of plants and animals to their external environment. | Demonstrate in-depth understanding of the responses of plants and animals to their external environment. | Demonstrate comprehensive understanding of the responses of plants and animals to their external environment. |

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

**You should attempt ALL the questions in this booklet.**

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–12 in the correct order and that none of these pages is blank.

Do not write in any cross-hatched area (✂). This area may be cut off when the booklet is marked.

**YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.**













### QUESTION THREE: DODDER



Source: [https://upload.wikimedia.org/wikipedia/commons/4/42/Cuscuta\\_campestris\\_covering\\_host01.jpg](https://upload.wikimedia.org/wikipedia/commons/4/42/Cuscuta_campestris_covering_host01.jpg)

Source: <https://bygl.osu.edu/node/1682>

The golden dodder (*Cuscuta campestris*) is a leafless and rootless plant that lives off other plants.

It has a growth response, enabling it to wind up and around a host plant, branching to form a tangled mass, which can spread from the initial host to nearby plants. It uses a special organ, the haustorium, to attach itself to the host and grow into host tissues. Through the haustorium, it gains water and nutrients from the host plant.

The flowering time is critical for the successful reproduction of the dodder. Various environmental cues, especially changes in night length (photoperiod), are perceived by the plant. Very little is known about how flowering of the dodder is triggered to start; however it is known that the dodder has both short-day plant (SDP) hosts and long-day plant (LDP) hosts. Scientists have found that the flowering of the dodder seems to be synchronised with the flowering of their hosts, as they flower when the host does.

Discuss reasons for the success of the dodder.

In your answer

- identify and describe the interspecific relationship between the dodder and the host plant
- explain how auxin enables the dodder to grow up and wind around the host plant, and identify and describe this growth response
- discuss how, through the ability to live off other plants and flowering at the same time as their hosts (both SDP and LDP), the dodder species is successful.

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**Extra space if required.  
Write the question number(s) if applicable.**

QUESTION  
NUMBER

91603