

To Investigate the conditions necessary for germination

Apparatus required: 4 test-tubes; cotton wool

Also required: cress seeds; oil; cool boiled water

Method

1. Set up the four test-tubes as shown in Fig. 15.14, page 98.
2. Boiling the water used in test-tube C removes the oxygen from it. The layer of oil prevents oxygen getting back into the water.
3. Place test-tubes A, B and C in a warm place for a week.
4. Place test-tube D in a fridge for a week.

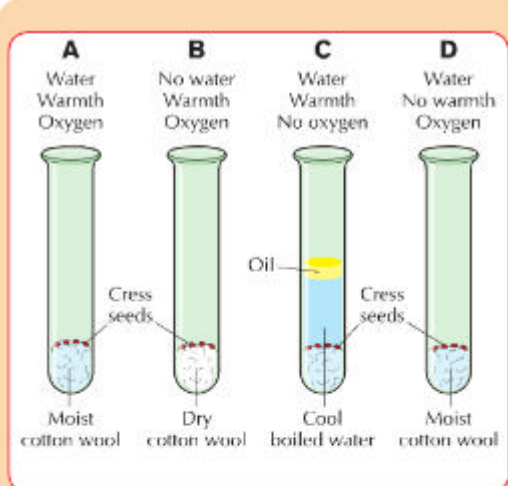


Fig. 15.14 Set up to show the conditions necessary for germination.

Results

Test-tube A: The cress seeds germinate. These seeds have all the conditions for germination.

Test-tube B: The seeds do not germinate. They have no water.

Test-tube C: The seeds do not germinate. They have no oxygen.

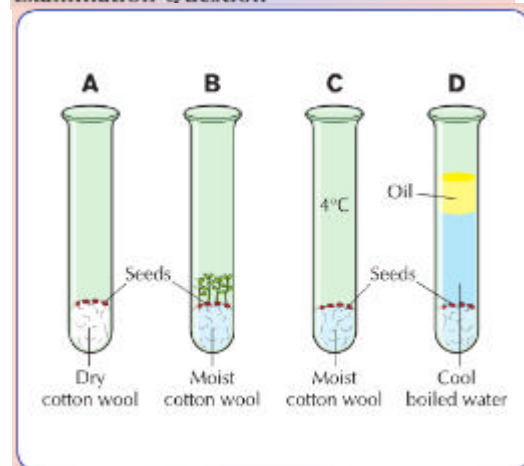
Test-tube D: The seeds do not germinate. They have no warmth.

Conclusion

Seeds need water, oxygen and warmth to germinate. If any of these factors are missing the seeds do not germinate.

Exam Question

Junior Certificate Ordinary Level
Examination Question



(i) Why do only the seeds in test-tube B germinate?

A: Because these seeds are the only ones to have all the things needed for germination, i.e. they have moisture, oxygen and a suitable temperature.

(ii) Why is the water in test-tube D boiled before use?

A: Boiling the water removes the oxygen from the water.

(iii) Explain why the seeds in test-tube C failed to germinate.

A: The seeds did not have a suitable temperature, it is too cold.

(iv) Why is this investigation considered to be a 'fair test'?

A: Because only one thing changed at a time in each of the tubes.