

6 (b)

Another response affected by plant hormones is phototropism.

A student completed an investigation into phototropism in cress seeds. This was the method used:

- Place 50 cress seeds (*Lepidium sativum*) on a sterile paper towel in a petri dish.
- Water with 10 cm³ of distilled water.
- Repeat for 3 different sets of seeds:
 - Set 1 is placed in a box to prevent light shining on the seeds.
 - Set 2 is placed in a box with light from above only.
 - Set 3 is placed in a box with light from the right hand side only.
- Keep all 3 sets at 25 °C.
- After 72 hours, remove 20 of the seedlings from each set and count how many have bent.

Identify **two** limitations of the student's method.

For each limitation, explain how it limits the validity of conclusions that can be drawn **and** suggest an improvement that would improve the validity of conclusions made.

limitation 1: ~~Trials were not repeated.~~.....

explanation: ~~Means cannot be calculated nor anomalies identified.~~.....

improvement: ~~Repeat the experiment at least a further two times.~~.....

limitation 2: ~~No method is outlined for selection of the 20 seedlings.~~.....

explanation: ~~Non-random selection may lead to biased results.~~.....

improvement: ~~Random selection e.g. number seedlings and select using random number generator.~~..... [6]

Total Marks for Question Set 6: 12

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