

17 Gibberellin causes stem elongation in plants.

Fig. 17.1 shows the effect of gibberellin on cabbage plants.

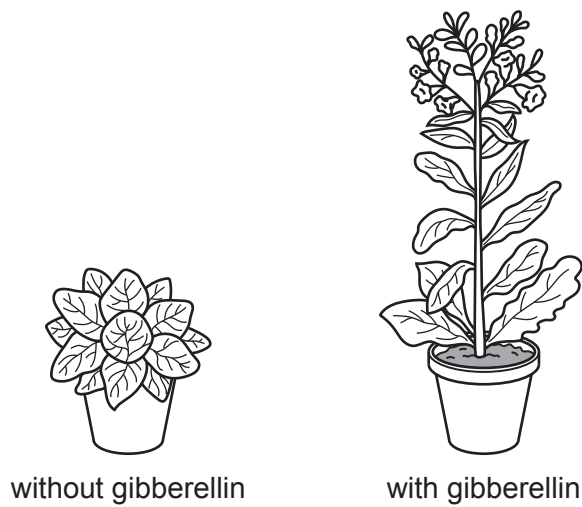


Fig. 17.1

Gibberellin causes an increase in the distance between the leaves on the stem, which is known as the internodal length.

(a) Explain why gibberellin is classed as a plant **hormone**.

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- (b) A scientist carried out an investigation into the effect of gibberellin on cabbage plants.

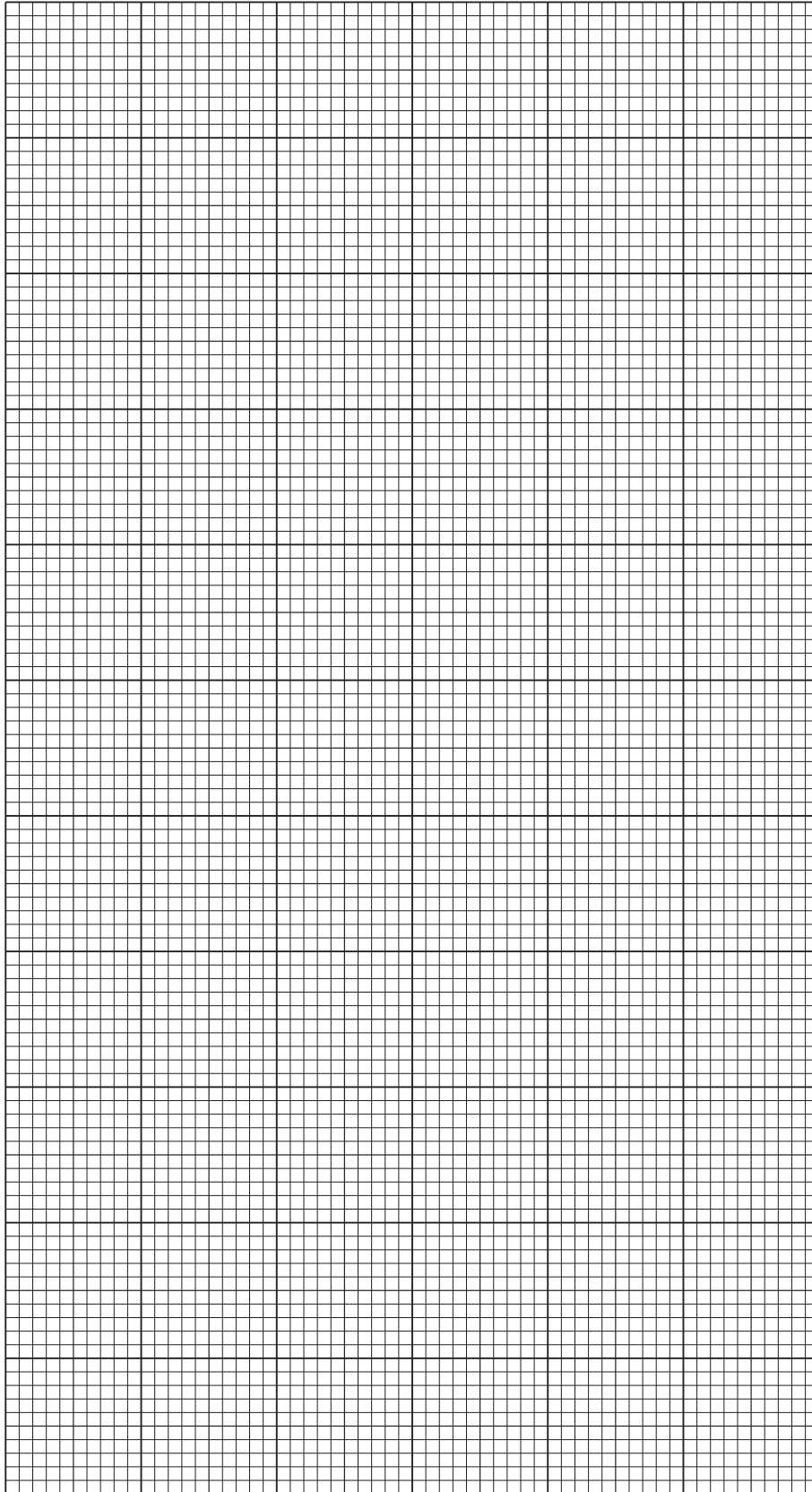
The scientist applied a range of volumes of gibberellin and measured the rate of increase of internodal length over 30 days.

Table 17 shows the scientist's results.

Volume of gibberellin applied ($\times 10^{-3} \text{ cm}^3 \text{ kg}^{-1} \text{ day}^{-1}$)	Rate of increase of internodal length (mm day^{-1})
0.0	1
0.2	1
0.4	2
0.6	4
0.9	22
1.2	47
1.4	48
1.8	49
1.9	50
2.0	50

Table 17

- (i) Plot the results from Table 17 as a suitable graph.



[4]

- (ii) Gibberellin causes an increase in internodal length.

State one **other** role of gibberellin in plants.

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 [1]

- (c) A student carried out chemical tests on cabbage leaves to investigate which molecules were present.

The student's method was as follows:

- Add 50 cm³ of distilled water to 2 large cabbage leaves and blend into a smooth liquid using a food mixer.
- Place 1 cm³ of the blended cabbage leaf liquid into 5 test tubes:
 - Tube 1: Add 5 drops of biuret reagent and mix.
 - Tube 2: Add 2 cm³ of Benedict's solution, mix, then place tube into a water bath for 5 min. Remove and cool.
 - Tube 3: Add 2 drops of iodine solution and mix.
 - Tube 4: Add 2 cm³ of ethanol and mix. Then add 2 cm³ of distilled water and mix.
 - Tube 5: Insert a glucose test strip into the liquid then compare the colour to the colour chart provided (see Fig. 17.2 on the **Insert**).

- (i) Name a **type** of food molecule that the student will **not** be able to detect using these chemical tests.

..... [1]

- (ii) The table below is a summary of some of the student's findings.

Complete the table by writing in the missing observations and conclusions.

Tube	Observation	Conclusion
1	Protein present
2	Yellow colour
3	Pale brown colour
4	Fat present
5	Glucose concentration small (15 mg dm^{-3})

[2]

- (iii) The student then used a colorimeter to measure the absorbance of the contents of Tube 2.

Explain how the use of a colorimeter could improve the student's conclusion.

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