

PPQ Units 16.1-16.4 – plant reproduction

1 The following four processes occur during reproduction in a plant.

- 1 The male nucleus fuses with the female nucleus.
- 2 The male nucleus is released from the pollen tube.
- 3 The male nucleus travels down the pollen tube.
- 4 The pollen grain grows a pollen tube.

In which order do these processes occur after pollination?

	first	→	last
A	3	4	1 2
B	4	3	2 1
C	3	4	2 1
D	4	3	1 2

2 Which set of conditions will best enable seeds to germinate quickly?

	water	oxygen	temperature (°C)
A	absent	present	20
B	present	absent	20
C	present	present	20
D	present	present	0

3 Seed dispersal, fertilisation, seed germination and pollination are processes in plant reproduction.

What is the correct sequence for events after pollination?

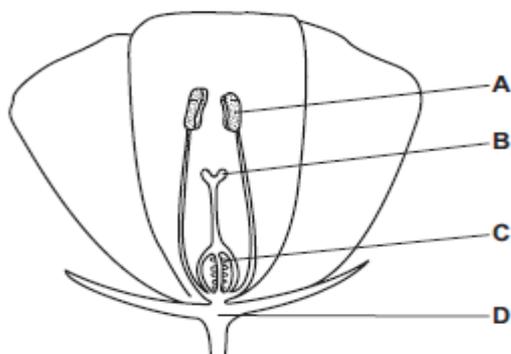
- A dispersal → fertilisation → germination
- B dispersal → germination → fertilisation
- C fertilisation → dispersal → germination
- D germination → fertilisation → dispersal

4 What is not normally essential for germination?

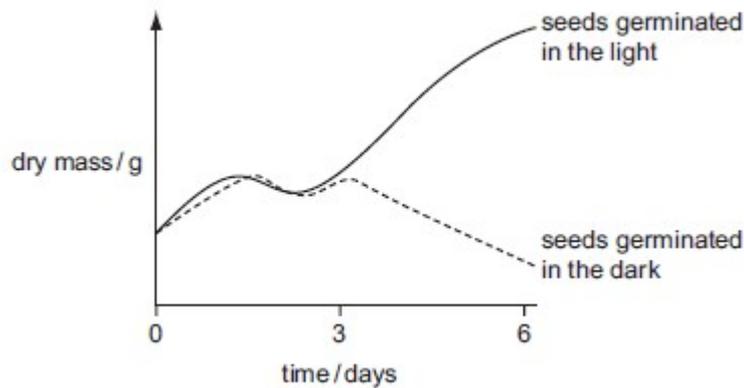
- A enzymes
- B light
- C oxygen
- D warmth

5 The diagram shows a flower in section.

Where will fertilisation occur?



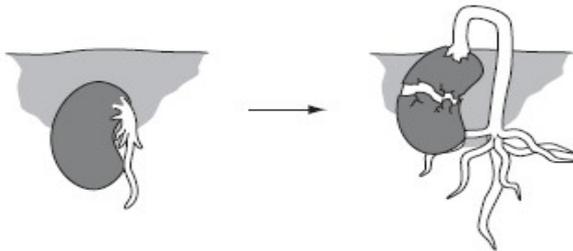
6 The graph shows the changes in the dry masses of two similar samples of seeds from the start of germination.



What causes the change in dry mass after day 3 of the seeds germinated in the light?

- A All the stored food has been used up.
- B A lot of water has been absorbed.
- C Photosynthesis has begun.
- D The respiration rate has increased.

7 The diagram shows a bean seed when planted and the same seed two days later.

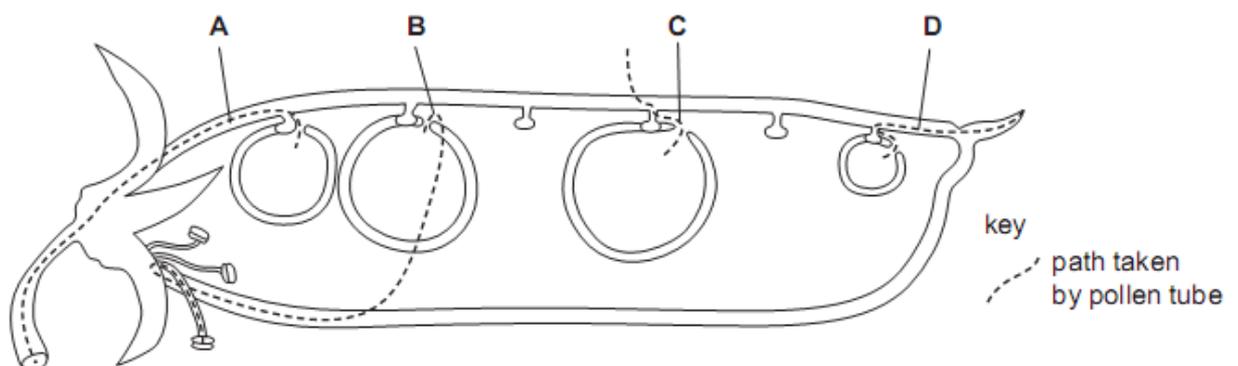


Which conditions are necessary for these changes to occur?

	suitable temperature	presence of water	presence of carbon dioxide	presence of oxygen
A	✓	✓	✓	x
B	✓	✓	x	✓
C	✓	x	✓	✓
D	x	✓	✓	✓

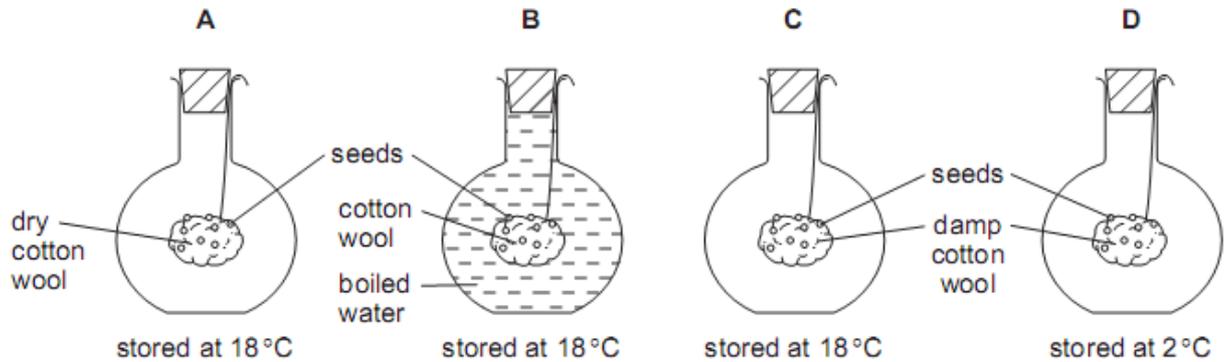
8 The diagram shows a pod from a pea plant.

Which line correctly shows the path that was taken by a pollen tube to an ovule?

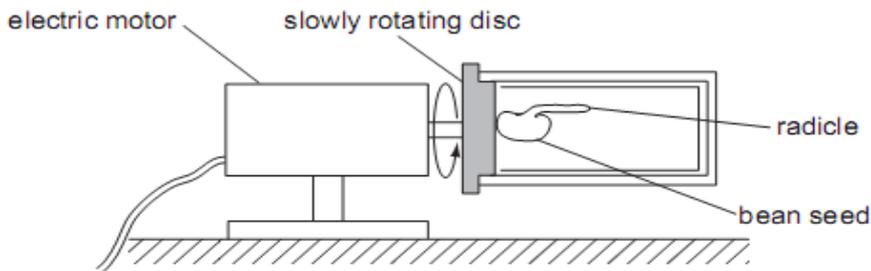


9 The diagram shows four flasks which were set up to investigate the conditions needed for germination.

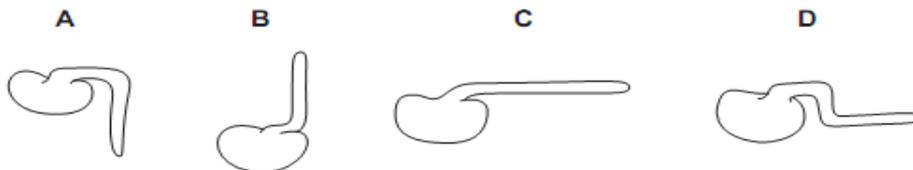
In which experiment will the seeds germinate most quickly?



10 The diagram shows a germinated bean seed with a horizontal radicle. This is placed on a slowly rotating disc and is left for three days. (see unit 14.9)

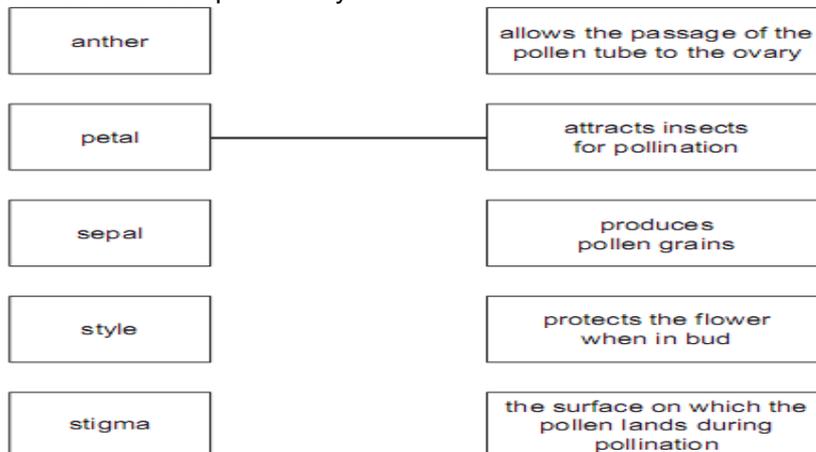


Which diagram shows the appearance of the radicle after three days?



11 (a) Using straight lines, match the names of the flower parts with their functions.

One has been completed for you.



[4]

(b) Describe how the stigmas of wind-pollinated flowers differ from the stigmas of insect-pollinated flowers. Relate these differences to the use of wind as the pollinating agent.

.....
..... [3]

(c) Discuss the implications to a species of self-pollination.

.....
..... [3]

[Total: 10]

12 (a) Sexual reproduction in flowering plants involves both pollination and fertilisation.

(i) Explain the difference between pollination and fertilisation.[3]

(ii) Name the part of a flower where pollination happens.[1]

(iii) Name the part of a flower where fertilisation happens.[1]

(b) Sexual reproduction in flowers results in the production of seeds and fruits. From which part of a flower is each of these formed?

Seed:

Fruit: [2]

(c) Describe the role of the wind in the life cycle of some flowering plants.[2]

[Total: 9]

13 The sweet potato plant, *Ipomoea batatas*, has fibrous roots and storage roots. Fibrous roots absorb water and ions from the soil. Storage roots store insoluble carbohydrates.

Fig. 3.1 shows the growth of these roots on a sweet potato plant.



Fig. 3.1

(a) Explain, using the term water potential, how fibrous roots absorb water. [3]

The membranes of root hair cells contain proteins for the absorption of ions.

(b) Describe how root hair cells are adapted for the absorption of ions. [3]

Sweet potato plants produce flowers to reproduce sexually. Sweet potato plants also reproduce asexually when shoots grow from the storage roots to form new plants.

Fig. 3.2 shows the life cycle of sweet potato. The diploid number of this species is 90.

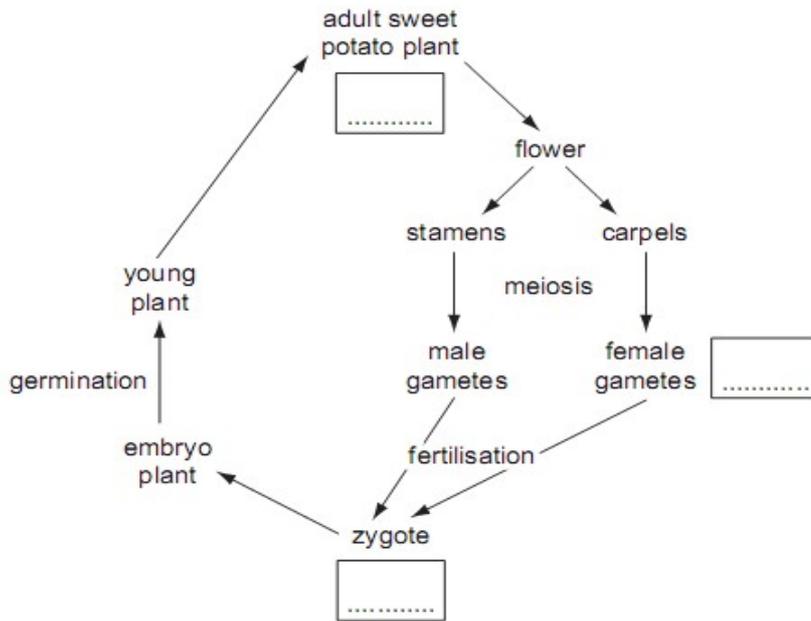


Fig. 3.2

(c) Complete Fig. 3.2 by writing the number of chromosomes in the three boxes. [2]

(d) State two advantages and one disadvantage of asexual reproduction for plants, such as sweet potato.

advantage 1

advantage 2

disadvantage [3]

[Total: 11]

14 Fig. 2.1 shows a tomato and Fig. 2.2 shows an apple, both are cut in half longitudinally through the middle.



Fig. 2.1



Fig. 2.2

(a) Make a large, labelled drawing of the cut surface of the tomato fruit shown in Fig. 2.1. [5]

(b) (i) Complete Table 2.1 to show four differences between the two fruits visible in Fig. 2.1 and Fig. 2.2.

Table 2.1

	tomato	apple
1		
2		
3		
4		

[4]

(ii) Describe two similarities between the two fruits visible in Fig. 2.1 and in Fig. 2.2.

1.

.....

2.

.....
 [2]

(c) Describe an investigation you could carry out to compare the reducing sugar content of these two fruits.

Include any safety precautions you will need to consider.

.....
 [6]

[Total: 17]

15 Fig. 2.1 shows an insect-pollinated flower which has been cut vertically.



Fig.2.1

(a) Make a large, labelled drawing of the visible floral parts.

Fig. 2.2 shows the structure of a wind-pollinated flower.

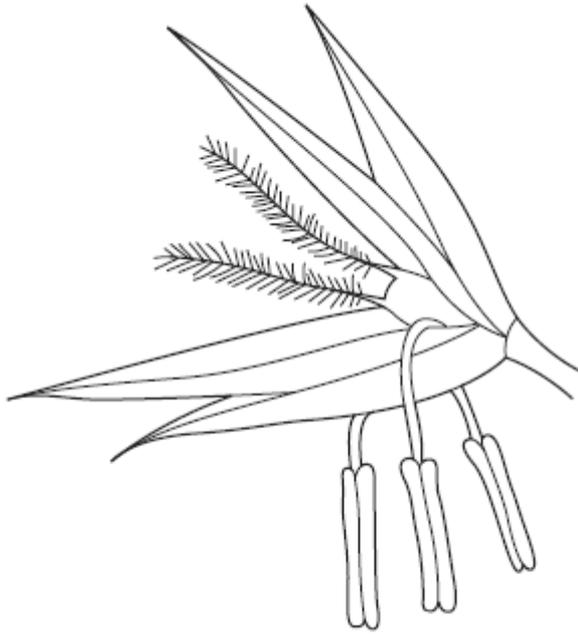


Fig. 2.2

(b) Label the visible floral parts of Fig. 2.2.
Explain how each floral part is adapted for this type of pollination.[3]

(c) (i) State one similarity in the adaptations for pollination of the flowers shown in Fig. 2.1 and Fig. 2.2.[1]
(ii) Complete Table 2.1 to show four differences in the adaptations for pollination of the flowers shown in Fig. 2.1 and Fig. 2.2.

Table 2.1

	Fig. 2.1	Fig. 2.2
difference 1
difference 2
difference 3
difference 4

[4]
[Total: 14]