

Passage III

A student performed 2 studies to investigate the factors that affect the germination of peony seeds.

Study 1

Peony seeds were placed in dry containers. Some of the containers were stored at 5°C for either 4, 6, 8, or 10 weeks. The temperature and time periods were defined as the *storage temperature* and the *storage period*, respectively.

The peony seeds were divided evenly so that there were 20 sets of 25 seeds. Twenty petri dishes were then prepared. Each contained damp paper. Each set of seeds was placed in a separate petri dish. Each petri dish was maintained at 1 of 4 temperatures for 30 days. The temperature and time periods were defined as the *germination temperature* and the *germination period*, respectively. Table 1 shows the number of seeds that germinated in each dish.

Table 1

Storage period (weeks)	Number of peony seeds that germinated when maintained at a germination temperature of:			
	13°C	18°C	23°C	28°C
0	0	0	0	0
4	0	2	0	0
6	3	8	6	0
8	7	22	18	0
10	15	24	21	1

Study 2

Peony seeds were placed in dry containers. The containers were stored at various temperatures for 10 weeks.

The peony seeds were divided evenly so that there were 20 sets of 25 seeds. Twenty petri dishes were then prepared. Each contained damp paper. Each set of seeds was placed in a petri dish. The petri dishes were maintained at 1 of 4 temperatures for 30 days. Table 2 shows the number of seeds that germinated in each dish.

Table 2

Storage temperature (°C)	Number of peony seeds that germinated when maintained at a germination temperature of:			
	13°C	18°C	23°C	28°C
0	15	24	21	1
5	16	23	21	1
10	0	6	4	0
15	0	0	0	0
20	0	0	0	0

- In general, the results of Study 1 suggest that peony seeds that are placed in a petri dish containing damp paper are most likely to germinate when they are maintained at which of the following temperatures?
 - 13°C
 - 18°C
 - 23°C
 - 28°C
- Suppose another set of 25 peony seeds had been included in Study 2 and these seeds had a storage temperature of 25°C and a germination temperature of 18°C. Based on the information provided, the number of seeds that would have germinated after being maintained for 30 days would most likely have been closest to:
 - 0.
 - 8.
 - 16.
 - 24.
- In Study 2, at the storage temperature of 5°C, as germination temperature increased from 13°C to 28°C, the number of seeds that germinated:
 - decreased only.
 - increased only.
 - decreased, then increased.
 - increased, then decreased.
- Which of the following sets of seeds were exposed to the same conditions prior to being placed in the petri dishes?
 - The seeds from Study 1 that were stored for 8 weeks and the seeds from Study 2 that were stored at 5°C
 - The seeds from Study 1 that were stored for 8 weeks and the seeds from Study 2 that were stored at 15°C
 - The seeds from Study 1 that were stored for 10 weeks and the seeds from Study 2 that were stored at 5°C
 - The seeds from Study 1 that were stored for 10 weeks and the seeds from Study 2 that were stored at 15°C
- A student stored 100 peony seeds at a constant temperature for 10 weeks. The student then divided the seeds into 4 sets and maintained them as described in Study 2. The results were as follows:

Germination temperature (°C)	Number of seeds that germinated
13	1
18	6
23	3
28	0

These seeds most likely had a storage temperature of:

- A.** 0°C.
- B.** 5°C.
- C.** 10°C.
- D.** 15°C.

6. The experimental designs of Study 2 and Study 1 differed in that in Study 2:

- F.** storage temperature was held constant.
- G.** storage time was held constant.
- H.** germination temperature was varied.
- J.** germination time was varied.