**Topic 9.4 (AHL) – Plant Reproduction**

**Understandings, Applications and Skills** (This is what you will be assessed on)

|  |  |  |
| --- | --- | --- |
|  | **Statement** | **Guidance** |
| 9.4.U1 | Flowering involves a change in gene expression in the shoot apex. |  |
| 9.4.U2 | The switch to flowering is a response to the length of light and dark periods in many plants. |  |
| 9.4.U3 | Success in plant reproduction depends on pollination, fertilization and seed dispersal. | Students should understand the differences between pollination, fertilization and seed dispersal but are not required to know the details of each process |
| 9.4.U4 | Most flowering plants use mutualistic relationships with pollinators in sexual reproduction. |  |
| 9.4.A1 | Methods used to induce short-day plants to flower out of season. | Flowering in so-called short-day plants such as chrysanthemums, is stimulated by long nights rather than short days. |
| 9.4.S1 | Drawing internal structure of seeds. |  |
| 9.4.S2 | Drawing of half-views of animal-pollinated flowers. |  |
| 9.4.S3 | Design of experiments to test hypotheses about factors affecting germination. |  |

**Recommended resources:**

Mrs. Tyler’s Website

Bioninja

Allott, Andrew. *Biology: Course Companion.* S.l.: Oxford UP, 2014. Print.

1. Define the term angiosperm. What is the reproductive unit of an angiosperm?
2. Label and define the function of the following parts of the flower:

 a. Petals –

 b. Stigma –

 c. Style –

 d. Ovary –

 e. Anther –

 f. Filament –

 g. Sepals –

 h. Peduncle –

 i. Ovule -



1. Which parts of the flower are male? What is this called?
2. Which parts of the flower are female? What is this called?
3. What are the male and female gametes for plants?
4. Describe each of the three steps needed in order for sexual reproduction in plants to occur.

 1.

 2.

 3.

1. Why is seed dispersal necessary? List at least four common methods of seed dispersal in plants.
2. Define the term monecious.
3. Define the term cross-pollination. Why is this advantageous?
4. What are some examples of animals that pollinate flowers?
5. Describe the mutualistic relationship that exists between pollinators and flowers. Include how flower structure aids this process.
6. Explain the relationship between seasons and pollinators in triggering gene expression changes to initiate flowering.
7. Control of flowering is governed by photoperiodism. Explain this process and what the critical factor is that plants detect during this process.
8. What is a phytochrome?



1. Fill in the chart and paragraph to explain how phytochromes work.

|  |  |  |
| --- | --- | --- |
|  | Phytochrome Red (Pr) | Phytochrome Far Red (Pfr) |
| Active or Inactive |  |  |
| Absorbs what type of light |  |  |
| Most abundant during… |  |  |

During the daylight, lots of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ light is abundant, so \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is converted into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. At night, there is neither red nor far red light, so \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is slowly converted into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Plants will detect levels of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to measure the length of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to determine whether or not it is time to bloom.

1. Compare and contrast the flowering of long and short-day plants. Be sure to include the role of Pfr in each.
2. What is ‘critical night length’?
3. When trying to get plants to bloom out of season, why is it best not to interrupt the dark cycle with light?
4. List a couple of mechanisms one could use to get each of the following to bloom out of season:

 A. Long-day plants

 B. Short-day plants

1. Label and Define the following parts of the seed:

 A. Plumule -

 B. Radicle -

 C. Cotyledon -

 D. Testa -

 E. Micropyle –



1. Define germination.
2. What are the basic requirements that all seeds need in order to germinate. Why?
3. Explain a few of the more specialized requirements certain seeds may have in addition to the basics to germinate.
4. Use a flow chart to describe the steps of germination in starchy seeds.