

The Secret Life of Pines

Pollen Cone

1. What does a pollen cone consist of? Can you describe its parts?
2. Can you describe how spores are formed?
3. What differences are there between a spore cell and a pollen grain?
4. Where would you look in order to find the male tissue (male gametophyte) in pine?

Ovule cone and pollination

5. Describe how the young ovule cone is organised. Be sure to give the location of the ovules.
6. Can you describe the various parts of a young pine ovule?
7. Explain how the pollen grain (male tissue or gametophyte) arrives at the ovule cone and then reaches the ovule.
8. What portion of the ovule is designed to capture pollen grains? How does it do this?
9. What is the function of the pollination drop?
10. The ovule cone and ovule are open at the time of pollination. Can you describe the changes that occur after pollination is completed? What advantages do these changes have to the survival of the ovule?

Male and female tissue.

11. Where would you look to find the female tissue (gametophyte) in pine? Can you describe what it consists of?
12. Describe the appearance of the female reproductive structure (archegonium) in pine.
13. How many reproductive structures can the female tissue (gametophyte) form and where are they located?

Fertilisation

14. There are several reproductive structures (archegonia) in the pine female (female gametophyte). Can more than one be fertilised? Explain.

15. How many sets of chromosomes are present in the fertilised egg? Can you explain where they came from?

Embryo

16. Can you explain how several embryos can form from a single fertilised egg (zygote)? Do they ALL survive?

17. The fertilised egg is inside the female reproductive structure (archegonium), yet the embryos come to lie within the female tissue (gametophyte). Can you explain how this came about?

18. What is the source of nourishment for the developing pine embryos? Can you explain why only one embryo usually reaches maturity while the others degenerate?

19. If you cut open a pine seed, could you name all the parts starting from the outside? Can you give the function of each part?

20. When you eat pine nuts (the shelled pine seed), what exactly is it that you are consuming?

Seed germination

21. What is the function of the female tissue (gametophyte) when the seed germinates?

22. The root emerges from the seed first. Why is this so important?

23. Can you explain why the seed is lifted out of the soil during germination?

24. What happens to the seed leaves when the pine seed is lifted out of the soil? What function do they then perform?