

Unit: Plants Without Seeds

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I Objectives:

1. To know: (a) the names of some of the common plants that do not have seeds like the fern, bracket fungi, mushrooms, moss and molds; (b) some of their distinguishing characteristics.
2. To study their parts in order to discover how they can produce new plants.
3. To find how they help man.
4. To perform some experiments in order to clarify their ideas of how some of these plants grow, use food and reproduce.
5. To realize the importance of these plants.

II Facts worth taking up in the study of the unit.

A. Fern

1. has a creeping underground stem called the rootstock.
2. this rootstock pushes forward and sends up fresh fronds each year.
3. parts—
 - a. frond—all of the fern which grows on one stem from the rootstock.
 - b. blade—the portion which bears leaflets
 - c. stipe or stem
 - d. pinna—a chief division of the midrib or rachis, when the fern is compound.
 - e. pinnule—a leaflet of the last division
 - f. sori—the fruit dots
 - g. sporangia—spore cases
 - h. spores—fine dusts which comes from the spore cases.
4. some common varieties
 - a. Christmas fern
 - b. Bracken
 - c. Royal fern
 - d. Cinnamon fern
 - e. Walking lead fern
 - f. Interrupted fern

B. Mushroom

1. has no sign of the living green of other plants.
2. a large number are edible although a few are poisonous.
3. there are many kinds varying in form, color and size.
4. parts
 - a. cup or volva—lower part of the stem
 - b. stipe or stem
 - c. ring or annulus—remnant of the cup when it spreads wide.
 - d. cup—umbrella-shape part
 - e. gills—platelike growths under the cup which contain the spores.
5. What to do to avoid eating mushrooms that may be poisonous
 - a. avoid all mushrooms that are covered with scales or that have the base of the stem included in a sac.
 - c. avoid those that have milky juices; unless the juice is reddish in color, the mushroom should not be eaten.
 - d. avoid those with shiny, thin, or brightly colored cups.
 - e. no mushroom should be eaten after its meat has begun to turn brown or become infected with larvae.

C. Bracket fungus

1. comes from a stem which extends into the woods.
2. this stem divides into many branchlets.
3. from these branchlets there hang long fleshy fringes like miniature icicles
4. these fringes always hang downward when the fungus is in natural position.
5. these fringes contain the spores.
6. bracket fungi usually attack living trees and do great damage.

D. Moss—story of the moss cycle

1. A plant with an egg cell at its tip; another

plant with a star-cup holding the moss sperm cell which is splashed by a raindrop over to the waiting egg.

2. the egg cell as soon as fertilized develops into a spore capsule which is lifted up on a beautiful shining stem and is protected by a silky cap.
3. the cap comes off; the lids of the spores case opens and the spores are shaken out and scattered by the wind
4. those spores that find suitable places to germinate grow into a net of green threads.
5. these green threads send up moss stems which repeat the story.

(In short, its stages of development are: the egg or ovule, the spores, the branching green threads and the moss plants with their green foliage).

E. Molds

1. spores are everywhere and help to make dust
2. grow on any substance which gives them - nourishment (if the temperature is warm, the air is moist, and the sunlight is excluded).
3. are of many kinds.

F. Value of plants which do not have seeds.

1. ferns are generally used as decorative plants.
2. as a table delicacy, mushrooms are highly prized. (edible mushrooms are nutritious).
3. some species of the bracket fungi live only on dead wood—they help in reducing dead branches and stumps until they fall and become a part of the soil again.
4. moss can be used by children to make dish gardens.

III Suggested activities

1. Make a collection of ferns found in the locality. Note some characteristics which may distinguish one kind from the other.
2. Look for ferns with spores. Get some spores and plant them. Watch and see them grow into ferns.
3. Take a field trip to observe bracket fungi and moss. Where did you find the bracket fungi? The moss? Take some moss to the classroom. Use it to make a dish garden.
4. Take a freshly opened mushroom. Cut off the stem even with the cap and set the cap, gills down, on white paper. Cover with a tumbler or other dish to exclude draught. Leave it for 24 hours and then remove the cover, lift the cup carefully and examine the paper.
What is the color of the imprint?
What is its shape?
What makes the imprint?
5. Grow a mould garden. In five tumblers place respectively some jam, preserved fruit, bread and two other foods of your own choice. Ex-

pose them to air for a day. Cover them with a glass sealer top. Observe the way mould grows, the colours, the little knots which come on it and contain spores.

6. Prepare a class chart of plants without seeds. Mount and label pictures of these common plants without seeds.
7. Press some fern leaves and keep in an album. Label correctly.
8. Bring to class samples of various species of bracket fungi that you can find. Let your teacher help you identify them.

Examine the tree where you find each specie.

Is there an open wound in the tree where the fungus entered?

Is there a wound also where the bracket fungus grew out?

9. Go to a florist shop if you have one in your locality. What ferns do they commonly use in making bouquets?
10. Take a walk to the meadow. See if you can find mushroom growing in a ring. Write an imaginative story about them.
11. Arrange flowers in various ways using ferns as the background.
12. Try to propagate a walking fern. (Get the little plants that grow at the end frond of the fern and plant them).
13. When all your ferns have grown, have an exhibit of just fern as the main attraction.
14. Keep in a small notebook all new names and terms you have learned in connection with this unit: volva, mycelium or sprawn, sporangia, bracket, pinnule, voracious, parasite etc.
15. Let your teacher tell you the story of the first umbrella. (first umbrella — mushroom; used by an elf so he would not get wet).
16. The Department of Agriculture and Natural Resources gives out some pointers on how to produce mushrooms artificially. Study them and try to see if your class can prepare a bed for growing mushrooms artificially. Get some spran from the said department and grow them.

References:

1. Comstock, Asana B. *Handbook of Nature Study*. Comstock Publishing, Inc. Ithaca, New York. c. 1941.
2. Frasier, etal, *The How And Why Club*.
3. ————— *How And Why Experiments*.
4. Partridge, J. A. *Natural Science Through The Seasons*.
5. Pamphlets and Leaflets from the Dept. of Agriculture and Natural Resources.