

Activity #20: *The Tale of Chipilo* Epiphytes & Birds

Introduction:

Epiphytes are a group of tropical plants that live on trees like live oaks. These plants belong to the pineapple family and are also called bromeliads. Most bromeliads are found within the tropics. However some bromeliads are found in areas just outside the tropics such as the southern United States. The pineapple is a tropical bromeliad that you might buy in a grocery store. Epiphytes have roots that attach to a tree instead of having roots in the ground. Epiphytes are not parasites; they are commensals meaning they survive by getting help from another species and the other species is not harmed or helped. The tree provides a place for the epiphyte to live but the tree is not harmed or helped. Epiphytes do not get food from the host tree. Epiphytes can become a problem if there are too many of them on a tree. **Many insect eating birds like warblers search for insects found on epiphytes in trees.** Two epiphytes that live in trees in the southern United States are ball moss and Spanish moss. They are actually not mosses; they are epiphytes and have flowers. Mosses are non-flowering plants.

Terms:

Epiphyte: a flowering plant that lives rooted on a host tree but does not harm the tree. It gets nutrients through photosynthesis. *Examples: pineapple, orchid, Spanish or ball moss.* They are also called **bromeliads** because they belong to the Family Bromiliacidae or Pineapple Family.

Tropical Plants: Plants that live in tropical regions or regions near the tropics.

Tropics: The area of the Earth between the Tropic of Cancer and Tropic of Capricorn. The equator is midway between these two latitudes.

Parasites: Plants or animals that get their nutrients from another host plant or animal.

Commensal: A plant or animal that is helped to survive by a host plant or animal. The host is neither harmed nor helped.

Host: Plant or animal that provides food, or a place to live for another species.

Materials:

- ball and or Spanish moss which can be found in oak trees (pineapples, bromeliads, or orchids can be substituted)
- hand lenses or dissecting scopes
- tray for specimens

- pineapple from the grocery store
- map of the Earth showing latitude and longitude (from social studies texts or online)

Pre Activity:

Have students use a map of the Earth to create their own sketch map labeling the equator, the Tropic of Capricorn, and the Tropic of Cancer.

Procedure:

1. Look carefully through the leaves of the moss for small insects. Use a hand lens and tweezers. Why are epiphytes a good place for insects to hide? How does a warbler beak help it find insects in an epiphyte like ball moss?
2. Look at a leaf of the ball or Spanish moss. The dark spots are the “stomates” or openings in the leaf that are used for gas exchange. These openings are in pits in the leaf surface. What else is on the leaf surface? (Answer: hairs)
3. Are the leaves thick or thin? Epiphyte leaves are adapted to dry conditions. (Answer: Somewhat thick and not thin)
4. Epiphytes live in trees without roots in the soil. How would they be similar to desert plants? (Answer: water not readily available)
5. Epiphytes must get most of their water from moisture in the air. Would humid air or dry air be better for epiphytes? (Answer: humid)
6. Place a drop of water on the leaf or spray the leaves with water. What color does the leaf turn? Can this plant carry on photosynthesis? (Answer: gray-green; yes)
7. Look at the plant. Are flowers present? Is this a flowering or non-flowering plant? (Answer: yes; flowering)
8. Observe (use hand lens) some other epiphyte specimens (pineapple, bromeliad, orchid). How are they similar to ball or Spanish moss? (Answers will vary)

Discuss Results:

- How many insects were found? Describe them.
- What characteristics do epiphytes have to help them live in their habitat?

Discuss Conclusions:

- Would these types of plants be found in the wintering and breeding ranges of the Golden-cheeked warbler? Explain.
- Why are epiphytes a good place for birds to find insects? Explain.
- How do the characteristics of ball moss or other epiphytes help them survive? Explain.

Alignment:

Grade 3 (red)

Grade 4 (blue)

Grade 5 (green)

Grade 6 (purple)

English Language Arts & Reading student expectations: 3, 4(A,B); 1, 2(A,B), 13(B); 1, 2(A,B), 13(B); 1, 2(A,B), 12(B)

Mathematics student expectations: N/A

Science student expectations: 2(A,C,F), 3(A), 4(A), 9(A), 10(A); 2(A-D, F), 3(A), 4(A), 7(C), 9(A,B), 10(A); 2(A-D, F,G), 3(A), 4(A), 9(A,B,D); 2(A-E), 3(A), 4(A), 10(C), 12(E,F)

Social studies student expectations: 4(A), 5(A,C,D), 17(C,E); 6(A), 21(A-C), 22(A,D); 6(A), 7(B), 24(A-C), 25(A,D); 3(A-C), 4(D,F), 6(B), 21(A-C), 22(A,D)



ball moss on tree



ball moss with flowers



Spanish moss



Spanish moss

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Follow the directions with each number, observe the specimen and then answer the question(s).

1. Look carefully through the leaves of the moss for small insects. Use a hand lens and tweezers. Why are epiphytes a good place for insects to hide? _____

- How many insects were found? _____
2. How does a warbler's beak help it find insects in an epiphyte like ball moss? _____

3. Look at a leaf of the ball or Spanish moss. The dark spots are the "stomates" or openings in the leaf that are used for gas exchange. These openings are in pits in the leaf surface. What else is on the leaf surface?

4. Are the leaves thick or thin? _____
5. Epiphyte leaves can live in dry conditions. Why? _____
6. Epiphytes live in trees without roots in the soil. How would they be similar to desert plants?

7. Epiphytes must get most of their water from moisture in the air. Would humid air or dry air be better for epiphytes?

8. Place a drop of water on the leaf or spray the leaves with water. What color does the leaf turn?

Can this plant carry on photosynthesis? _____

9. Look at the plant. Are flowers present? _____

10. Is this a flowering or non-flowering plant? _____

11. Using a hand lens, observe some other epiphyte specimens (pineapple, bromeliad, orchid). How are they similar to ball or Spanish moss?

Answer Key Activity #20: *The Tale of Chipilo-Epiphytes & Birds*

- 1) Many parts to hide under or inside
- 2) It is sharp and pointed to get inside the ball or Spanish moss and catch the insect
- 3) Hairs
- 4) More thick than thin
- 5) Their thick leaves can hold more moisture and they are not soft outside so they do not dry out so easily
- 6) Don't get much water without roots
- 7) Humid
- 8) Gray-green; Yes
- 9) Yes
- 10) Yes
- 11) They have thicker gray green leaves