

**LESSON GOALS**

1. Students will learn to question, classify objects based on similarities and differences, communicate with others, make inferences and predictions, use estimation and measurement, use evidence to construct explanations, make sketches and diagrams to explain ideas.

2. Use books and other media to obtain information related to science concepts.

3. Identify and practice accepted safety procedures manipulating science equipment and materials.

4. Actively engage in the learning process via hands-on/minds-on science activities and experiences. Use appropriate tools to collect and analyze data and solve problems.

5. Recognize how plants and animals interact on one another. Illustrate the many ways plants and animals interact (pollination, shelter, and seed dispersal).

This study will be useful because it will give the children an opportunity to internalize through the use of hands-on activities and the excitement of an outdoor experience.

This study will be exciting to the students because they would get to go to the Nature Trail or out of doors somewhere on the schoolyard and bring back items which are hooked-on their socks which they can discuss things about them and look at them through a hand lens.

**MATERIALS**

- Old cotton socks- one per student (The socks should be large enough to fit over the student's shoes.)
- A few extra socks
- Hand lenses or dissecting microscopes
- Chart paper

**QUESTIONS FOR INQUIRY**

1. How do some seeds and fruits attach to your clothes?
2. Do some attach better than others?
POSSIBLE STUDENT-DRIVEN QUESTIONS
1. How do these structures aid in dispersal?
2. Why did some seeds or fruits fall off?
3. What made the others stay attached?

PROCEDURE
Sampling sites: Take the class on a nature hike around the schoolyard or along a Nature Trail if you have one close by. Remember that common trees that produce winged fruits include elm, ash, maple, and pine. Closed pine cones collected in the fall will release their seeds if allowed to dry indoors. Common plants that produce hooked fruits include Queen Anne's Lace, Great Burdock, Sticktight, Beggar-tick, Spanish needle, Cockleburs, and Pitchfork.

Methodology
1. Review that previous lesson where children have learned that plant seeds can be scattered through air to places where they can grow. Do you think seeds are scattered, any other way? (This is where the children will generate their discovery questions as stated above.) As the children generate the questions write them on chart paper. This will lead to: Today we are going to discover the answers to these questions. In order to do this we are going to the Nature Trail (schoolyard) with our socks over our shoes.

2. Have each student put on a pair of socks over his or her shoes. Take the class on a nature walk through a field with low, dry plants.

3. Return to the classroom, and have students remove their socks and examine the seeds they have picked up.

4. Let them view the seeds using hand lenses. Have students describe the appearance of the seeds or fruits. (Barbed hooks and long projections.) How do these structures aid in dispersal? (The hooks attach to animal's fur or people's clothing.)

5. Have the students predict which seed or fruit will stay attached to a cotton sock the longest. Have them write their predictions on the data table.

6. Tell students to press the assortment of seeds and fruits onto cotton socks, and gently shake the socks. Did any seeds or fruits fall off? If so, have students record types that fell off the socks.

7. Tell students to shake the socks again with more vigor, and repeat shaking the socks with more vigor each time. Which seed or fruit remained on the sock the longest? (Answers will vary.)

8. Using Explorer's Activity Book page 12 (attached) with their knowledge gained through activities have each student fill in the chart.

RESOURCES
- Schoolyard or an area nature trail
- Books
  - Discover the Wonder. (Scott Foresman. 1996).


BUDGET

A. School Provided
   1. Schoolyard or nature trail
   2. Explorer’s Activity Book page 12

B. Student Provided
   1. One pair large old cotton socks

EXTENSIONS

- Language Arts: Discuss other ways in which seeds or fruits are scattered. Read Seeds, Stick, Glide by Patricia Lauber.
- Math: Help children add other seeds or fruits to their charts. Use seeds or fruits found outdoors or provide additional pictures of seeds or fruits for this purpose. Then have children count the number of fruits with hooks. Ask children to determine which kind of fruit they have in the greatest number.
- Encourage children to make models of winged fruits by pasting paper wings on table tennis balls. Invite them to take their winged models outdoors to test how well they fly. They may make models of hooked fruits by covering table tennis balls with hook-and-loop fastener fabric. Affix the “fruits” to children’s shoelaces and see how long they remain attached.
- With socks they have already caught seeds or fruits moisten the sock and "plant" it. Keep it moist and ask children to observe what kinds of plants grow.