

CCBER: Seeds and Seed Dispersal

Next Generation Science Standards

2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]

3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. [Clarification Statement: Changes organisms go through during their life form a pattern.] [Assessment Boundary: Assessment of plant life cycles is limited to those of flowering plants. Assessment does not include details of human reproduction.]

3-LS4-2. Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. [Clarification Statement: Examples of cause and effect relationships could be plants that have larger thorns than other plants may be less likely to be eaten by predators; and, animals that have better camouflage coloration than other animals may be more likely to survive and therefore more likely to leave offspring.]

3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. [Clarification Statement: Examples of evidence could include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on each other.]

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin.] [Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.]

Lesson Plan: Seeds and Seed Dispersal

Objective: Students will learn about seeds and why plants produce seeds. They will be exposed to a variety of different seeds and the methods of dispersal used.

Materials

- 3 sets of large cards (one for each pair of students) with the different methods of dispersal written on the front and a brief description.
- 25 bags of mixed seeds for the children to sort
- 3 sets of laminated seed cards
- large picture of a seed and the different parts
- additional worksheet available in journal
- apple, orange, coconut, papaya, blackberries, strawberries, almonds, walnuts
- large brown bucket and water

Preparation: Place some of the seeds that use the various methods of dispersal on a plate behind each card. Atriplex in a bowl of water. Also place some grass specimens in jars with water for display, Nassella is a good example as the seeds are held at the top of very long stems. Purchase a variety of fruits, berries (blackberries) and nuts the previous day and cut some in half to show seeds inside (papaya, apple, orange) or leave intact to show seeds on the outside (strawberry). Fill the brown bucket 2/3 full with water and place on the table on a tray, this is to show how the coconut floats.

Introduction

Stand up in front of the students and pretend to be an apple tree.

Ask the students what the apple tree needs to be successful and grow to be very old and produce a lot of apples. ***It needs plenty of light, nutrients, carbon dioxide and water.***

What do apples have inside of them? ***Seeds***

What are seeds? ***Seeds contain the embryo of a new plant and a small food supply.***

What happens to the apples when they fall off the tree? ***You're looking for answers like - they get eaten, they rot and they grow into new apple trees.***

For the new apple trees to be successful, what do they need to grow? ***Light, carbon dioxide, water and nutrients.***

If all of the apples germinate and grow into more apple trees right under the parent plant, will they be able to get enough of the things they need? ***Probably not.***

Would it be better for the apples to germinate farther away from the parent plant?

Absolutely!

How do apples get far away from the parent plant since they don't have legs? ***Answers might include, they roll away, they get eaten, kids throw or kick them.***

We call this dispersal.

Recap

Q. What is a seed?

A seed contains everything needed to form a new plant.

Show the children the peanuts (beans) and let them dissect the peanuts with their fingers.

Look at the different parts of the peanuts (beans) and see if we can tell where the roots and shoots (leaves) will come from.

Q. Why do plants produce seeds?

Seeds insure that plants will continue to live on earth and even if the parent plants dies, it will produce enough seeds to form lots of baby plants of the same species.

Q. Why do plants need to disperse their seeds?

Plants have developed different methods of dispersal to prevent over-crowding, increase chances of survival and lessen competition with other seeds and with the parent plant.

Q. Can anyone name some ways plants disperse their seeds? There are four main ways. Talk about these in more detail.

1. Wind – small light seeds with wings or feather-like structures. Plants that produce wind dispersed seeds often produce huge numbers of seeds to ensure some reach a great place to germinate. Can someone tell me a seed that is dispersed by the wind?
2. Water – aquatic plants or plants that live near the water have seeds that can float and are carried away by the water. The seeds float to a new place away from the parent plant and germinate at the new site. Who can name a very big seed that floats? Other seeds that float?
3. Self-dispersal – quite often, plants have unique ways to disperse seeds. Some plants have pods that burst open and the seeds are scattered away from the parent plant. Others produce their seeds in a shaker, like the poppy. Can anyone name some plants that produce pods or shakers?
4. Animals (human) – disperse seeds internally and externally. Burrs and hooks to attach to skin, fur or even clothing or a tasty fruit reward. Squirrels bury acorns (a type of seed) and woodpeckers make holes in tree trunks and put the acorns in the holes.

Activity

Students need to be in pairs/threes for this activity. Give each pair a bag of seeds to sort into the type of dispersal method they think the plant will use for that particular seed. Talk about why they chose that method.

Give them a set of laminated fruit/nut/seed cards and get them to sort these.

If time permits, they can make a start on the worksheet in the journal.