

Post-Program Resource Garden Detectives

2nd-5th Grade

Seed Dispersal Mini-lesson & Experiment

Duration: 45 minutes

Objective: to extend student learning from their field trip to Tudor Place by learning about seed dispersal methods. Students will apply their learning about wind-dispersed seeds by conducting a hands-on experiment.

NGSS Standards Met:

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

LS2.A: Interdependent Relationships in Ecosystems

- Plants depend on water and light to grow. (2-LS2-1)
- Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)
- LS1.B: Growth and Development of Organisms
 - Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)

Materials Needed:

Seed dispersal presentation

Link to access presentation:

https://docs.google.com/presentation/d/1RKnDDqfs291WYWs5xUKvuYVsqYbNQrhz Af1tSoNEdzo/edit?usp=sharing

Various experiment materials to construct seeds

- Coffee filters, tissue paper, regular paper, tooth picks, popsicle sticks, paperclips, cotton balls, string, toilet paper tubes, fabric scraps, yarn, pipe cleaners, etc.
- o Scissors, tape, glue

Floor fan (optional)

Stopwatch or timer

Seed Dispersal Exploration

Link to access presentation:

https://docs.google.com/presentation/d/1RKnDDqfs291WYWs5xUKvuYVsqYbNQrhzAf1tSoNEdzo/edit?usp=s haring

Tips for the Presentation:

Questions/prompts will automatically appear. Click to go to the next slide or reveal an answer. Everything else is animated. You may want to run through the slides beforehand to become familiar with the presentation.

- (Slides 1-5) Slides will prompt review of parts of a plant and the things they need, as learned at Tudor Place.
- (Slide 6) Main Question: How do new plants grow?
 - They grow from seeds.
 - Overview of plant life cycle from seed to plant to fruit/etc.
- (Slide 7) We plant seeds on purpose to grow things. If you put 50 seeds in one tiny hole, do you think they would all grow? Would 50 plants grow?
 - Why not?
 - They need more space, water, sun and nutrients than they would be able to get if they were bunched together.
 - This is true for all plants. Only so many can grow in one spot. Plants have had to come up with ways to spread their seeds around so that they have the best chance to grow up into adult plants.
- (Slide 8) Have students brainstorm methods of seed dispersal, answering the question: "If plants can't all grow in the same spot, then how do seeds move around?"
 - Encourage students to look at the images on the slide as examples and think about how those seeds move around.
 - After this initial brainstorm, the presentation will go over three primary methods of seed dispersal. After the examples are shown on the screen, ask them what all the examples have in common.
- (Slide 9) Seeds are dispersed by water. Some plants have their seeds travel by water. The water takes the seeds far away where they can grow.
 - Ex) Coconut, palm tree, water lily, willow
 - They all float and are 'water proof'
- (Slides 10-11) Seeds are dispersed by animals. Some plants use animals to carry their seeds far away where the seeds can grow.
 - Ex) Fruit, berries
 - They all taste good/are sweet. Often, they are colorful to attract animals to them.
 Seeds are protected so animals can't digest them. Instead, animals poop them out far away from the original plant.

- The plant uses a lot of resources to make sugar to put into the fruit. Fruit tastes good so that animals eat it.
- Ex) Burs/sticky seeds
 - Common burdock, cocklebur, puncture vine
 - They are all pokey, usually round. They can look like Velcro.
 - Think about a dog running through a field in the summer and getting covered in spiky seeds. Or maybe they get stuck to your shoe laces when you play outside, etc.
- (Slides 12) Seeds are dispersed by air. Some plants use wind to carry their seeds far away.
 - Ex) Dandelion, milkweed, cottonwood trees, cattails
 - What do all of the air ones have in common? How are they different?
 - They are 'fluffy' or light. Usually, long seeds with a fluffy top
- (Slide 13) Review the big ideas of the plant life cycle and seed dispersal. Ask students what they learned before revealing the key points.
 - Emphasize that seeds need to travel in order to grow. If they all fell to the ground, there would not be enough sun, water, and air for them all to grow.
- (Slide 14) Next, students will use what they learned about air dispersal of seeds to create a seed of their own. The instructions will encourage students to explore the scientific method, using draft seeds, revisions and retesting.

Seed Dispersal Experiment

- Using limited resources, groups of students will create a 'seed' that will be dispersed by wind. Their goal will be to make a seed that stays in the air the longest.
 - First, students will make a prototype or draft seed. They will test this seed with their group to see if it works. Then, they will make any changes they want to the seed design.
 - Encourage students to make multiple rounds of revisions. Tell them that this process is exactly what scientists do.
- *Recommended materials:* Two coffee filters/pieces of tissue paper, one toilet paper roll, three paperclips, two toothpicks, four pieces of tape, one glue stick, one pair of scissors, one sheet of paper, two cotton balls, and two 6-inch pieces of yarn/string
- The groups will have 15-20 minutes to create their seed model. Encourage students to think creatively and try different methods.
- If students are stuck, have them draw inspiration from the different air-dispersed plants from the presentation.

Testing: Have groups test their models to see whose stays up the longest. Have students stand on a step stool, if possible, to have a higher drop point and more time for seed movement.

- *Option:* Test each seed two to three times and use the longest time. This will allow students to experiment with dropping methods.
- *Option:* Use a floor fan behind the drop spot on a low setting to simulate a breeze blowing the seed.