Wild Seed Project
RETURNING NATIVE PLANTS TO THE MAINE LANDSCAPE

LESSON 3: COLLECTING

THE IMPORTANCE OF SEEDS

LESSON FOCUS: UNDERSTANDING WHY PLANTS MAKE SEED, THE ROLE OF SEEDS IN THE LIFE CYCLE OF PLANTS, AND HOW TO COLLECT SEED TO GROW MORE PLANTS.

STANDARDS:

Next Gen Science: 2-LS4-1
Make observations of plants and animals to compare the diversity of life in different habitats.

Common Core - Literacy: RI.3.2
Determine the main idea of a text; recount the key details and explain how they support the main idea.

OBJECTIVES:

Students will understand...

1. What a seed is and what is its purpose
2. Why it is important to notice and know the unique characteristics of a plant before collecting its seed
3. Different types of plants have different uses.

TEACHER NOTES:

There is important background knowledge in this lesson that students may or may not be familiar with. It might be useful to spend some more time talking about and refreshing students on the processes of germination and pollination. If students are unfamiliar with these, there are loads of plant life cycle lessons. Knowledge of the exact processes of germination and pollination are not necessary to engage in this lesson, but knowing that a seed becomes a seedling and a flower becomes a fruit/seed is important.

MATERIALS:

- Plant texts
- Plant pictures
- Drawing paper (optional)
- Pencil (optional)
- Clipboard (optional)

VOCABULARY:

- Identify
- Observe
- Characteristics
- Unique

TEACHER RESOURCES:

It is helpful to look at some plant identification keys to see the steps people take in identifying a plant, and the language used to describe different ways plants appear in their environments. You can find paper copies at bookstores near you, or you can find online keys, like this one:

gobotany.nativeplanttrust.org/simple/non-monocots

PRE-LESSON: WHAT PLANTS DO YOU KNOW?

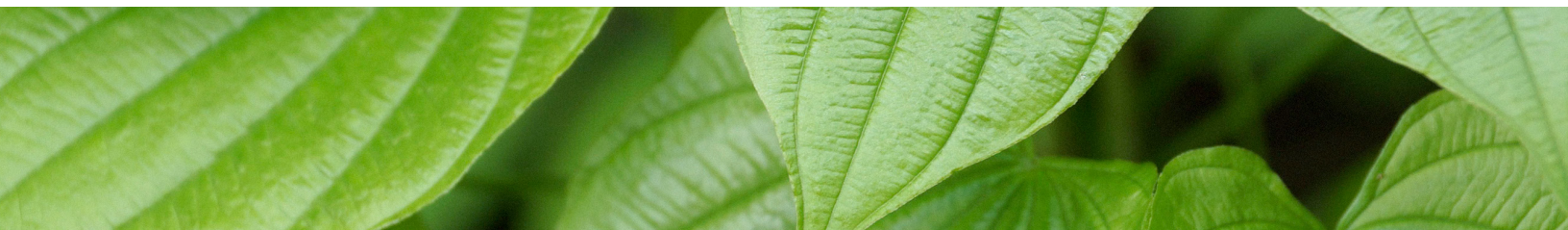
Take some time with students to highlight the knowledge that already exists in the group before you start plant identification. Have each student answer the question "what is a plant that you know the name of and could recognize and name if you found it outside?" Give students time to think, and remind them that there are some plants we might all know. Have everyone share their answers. Once everyone has shared, ask students to think about the most memorable characteristic of that plant. Give students a minute to think about that and then have them turn and talk to a friend about how they know this plant. If time allows, compile some of the ways students know these plants already (answers might include: because of its fruit, because of where it grows, because of its leaves, because of its flowers, etc.)

INTRODUCTION: WHAT IS A SEED?

Hand out small pieces of paper to students, and start the lesson by having them answer the question "what is a seed?" They can write down a full definition, or just important words, but make sure everyone writes down something as a starting point. Give them 5 minutes to think about this and write something down, and then have students share their definition with one other person.

Once students are done sharing, write your own answer to the question "what is a seed" on the board. You can use or come up with whatever definition feels best to you, some good definitions include: "a seed is the beginning of a new plant," "a flowering plant's unit of reproduction," "an undeveloped baby plant, packaged with the food it needs for its initial growth."

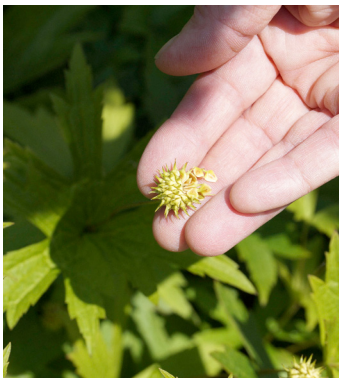
Explain to students that seeds are an important part of the reproductive stage of a plant's life cycle, and that all the stages of a plant's life are connected. Draw a seed on the board, and ask students if they know what happens after a seed is planted into the ground. Call on a few students, and either expand upon their answers or explain that seeds will germinate into young seedlings (draw that on the board following the seed). You can continue asking about the next stage of a plant's life cycle, or start explaining it and drawing it on the board. Following germination, a small seedling will start to grow, that seedling will get bigger until it flowers, at which point the flower will be pollinated by the wind or an insect, and that fertilized flower will become a seed, and often that seed is surrounded by a fruit (fruit in this case can refer to both edible and non-edible seed coats. The maple samara (helicopters) is a fruit, though we do not eat it.). That seed, if it is dispersed, will then go through this entire cycle again on its own, and make its own seed, and have its own plant offspring.



Tying this cycle to the human/animal life cycle often clarifies the ongoing nature of this process for students, but isn't necessary. Finish this lesson by explaining to students that plants make a lot of seed, and as a result have a lot of offspring (if you're talking about animal life cycles, you can use this as a point of contrast). They make so many seeds in the hopes that some of their offspring can find their way to new environments, and grow really well there. Humans can interact with this part of the plant's life cycle by collecting and dispersing some of the plant's seed to help it out.

ADD-ON: DIALOGUE

For older students, you can facilitate a conversation around why it is beneficial for plants to have a lot of seeds, and a lot of potential offspring, and what the benefits are for species that produce a lot of young, versus benefits for species that only produce a few young.



ACTIVITY: DATA COLLECTION/ETHICAL HARVEST

Explain that you are now going to go find some seeds and collect them to help the plant grow. Helping these plants grow will do many beneficial things for the environment: they will provide habitat and food for insects and birds, they will help hold the soil in place, they will create diversity in the landscape and more. Spend as much time as needed to dive deep into why it is important to plant these plants. See the informational plant texts for more about what each plant does for its environment. *Note:* I would recommend collecting seeds from plants you've already interacted with during previous lessons, so students have seen them before. Going around your schoolyard, or other areas where you have found plants to learn from, find plants that have ripe seed, and show students where that seed lives on the plant. If you have seen this plant flowering, explain how the seeds are now in the same place where the flowers were, because the flowers transformed into the seeds. If there is fruit around the seed, pick off some of the fruit and open it so students can see the seeds. Let students explore and find more seeds in the surrounding area.

Explain that we are going to be helping this plant by distributing its seed, but to do that we also need to take from the plant. When we are taking anything, we have to be respectful and thoughtful about the way we do that, so we are going to make sure we have a lot of information about the plant before we collect its seed. Explain that we have a list of questions, and in answering these questions, we will figure out if it's a good idea to take the seed from the plant. Students can receive this as a printed list of questions, with places for checkmarks or for filling in longer answers.

Questions:

- Do we know who this plant is? How?
- Where are they growing?
- Are there lots of individuals of this plant growing in this area?
- Do each of the individuals have a lot of seed? Or only a little?
- Where are the seeds stored in the plant? Are they hard to get to?
- Is there something eating and getting nourishment from the seeds?

There is no "right" way to answer these questions, but hopefully they stir an interesting conversation. In general, you want to make sure you know who the plant is, because there are endangered plants and you are legally not allowed to collect their seeds, and it is important when you are planting seeds to know what plant they came from and will turn into; there are an abundance of individuals of that plant growing in the area you want to collect from (usually 10+ within 100 square feet); and that each of those individuals have an abundance of seed (50-100 seeds per plant). Goldenrod, asters, and milkweed consistently have a lot of individuals, and those individuals have a lot of seed, so they are a good place to start.

Have students take responsibility for keeping track of this information. Give them all their seed collecting worksheets and have them fill the worksheets out after you have determined that it would make sense to collect this seed. Give them 10 minutes of independent time writing their observations and drawing the plants.

ACTIVITY: SEED COLLECTION

Now it is time to collect the seed from the plant! Give each student a paper bag, for dry seeds, and have them staple or tape their collecting sheet onto the bag. Then show them some techniques for collecting seed. For most dry seeds, it works to shake the plant so the seed falls off into the bag. There are some trickier seeds, but you can look up how to process those seeds, or try processing them ahead of time, so you can model for the students. Once they have all collected some seed, you can bring the bags into the classroom and let them dry for a week, before you put the seeds into the fridge until you are ready to sow them.

For wet seeds (seeds covered in fleshy fruit) give each student a plastic bag, have them attach the collecting sheet, and have them collect the fruit and seed into that bag by picking individual fruits. Seal the bag, and let them mash up the fruit with their hands until it becomes a paste in the bag and you can see the seeds. Leave the seeds in your classroom in the bags for the week so they can ferment (this mimics the seeds passing through an animal's digestive tract). After that week, clean the seeds with some water in a fine mesh sieve, and sow them right away or put them in the fridge until you are ready to sow them.

DEBRIEF: DEFINITION UPDATE

After students have spent so much time learning about seeds, and interacting with them on the plants, give them 5-10 minutes to update their original answer to the question "what is a seed" and ask them to answer a second question, "and why are seeds important." They can do this on the same sheet of small paper. Collect this paper at the end of the lesson.