

# Sow a Seed

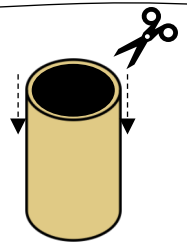
**Objectives:** Campers will create a plant pot using repurposed materials and examine and experiment with plant needs through planting seeds and tending their own plants.

**Time:** 30 – 45 minutes + additional time to monitor and tend to your seed

**Materials/Needs:** a toilet paper tube, scissors, soil, seeds, water, patience (!)

## Steps:

1. On one end of the toilet paper tube make two cuts across from each other, about 1" up the tube.
2. Fold the tabs in towards each other so that they overlap. They should stay in place, but you can add a piece of tape to secure it. This will be the bottom of your pot.



3. In the opening of the pot, fill soil to the very top. You can give the bottom a gentle tap so that the soil settles.
4. Read the "Secret of the Seed" story, attached, and determine how deep to plant the seeds in the soil.
5. Determine what your seeds needs (by reading Seeds 101, attached), find a sunny windowsill for your pot, and continue to monitor your seed. Remember to keep the soil moist by gently watering. Use the ruler on your Outdoor Survival Guide keychain to measure the growth of your seed over time.
6. If you would like, transplant your plant once it is about 6 inches tall into a larger container, outdoors in a garden, or even bring it to Cedar Circle Farm and we can find a space for it!

**Discuss:** Together, talk about what this newly planted seed needs in order to grow!

**Top Tips:** Not all seeds sprout; if you don't see any signs of germination in 2 weeks, start again with another seed. Seeds need moist (not sopping wet) soil to germinate. Water gently, allowing the seed to remain in its position in the soil.

### Lesson Wrap-Up (suggested questions to ask your camper):

- » What is the most exciting part about growing your own plants?
- » If you could grow any kind of plant from seed, what would you want to try?
- » How might these seeds survive in the wild, without someone planting them and tending to them? How would all of their needs be met?

### Ways to Dig Deeper:

- » Do more experiments! Toilet paper tubes (or paper towel tubes—2 in 1!) are usually plentiful, so try out some other experiments. What happens if you change the location of your pot to alter the sun exposure? What happens if you change the amount of water you give it? What happens if you play it classical music? Heavy metal? Keep a log of your experimental observations in your Nature Journal!
- » Soak some of the seeds overnight and then dissect them the next day. You can split a bean seed right along its seam. What do you notice inside a seed?

### Other Resources:

*A Seed is Sleepy*, by Dianna Hutts Aston (2007).

“32,000-Year-Old Plant Brought Back to Life—Oldest Yet,”

National Geographic, <https://www.nationalgeographic.com/news/2012/2/120221-oldest-seeds-regenerated-plants-science/>

# Seeds 101

Seeds are incredible little structures! While they may appear lifeless, like a little pebble found in your shoe, they are actually tiny miracles that allow for the plants on our planet to continue to live! Seeds can be dormant for many, many years (a 32,000-year-old seed was discovered, and it *still* germinated!) and are just waiting for the precise setting in which to germinate.

## Seed Needs:

Seeds have specific “instructions” in them (in their DNA) that determines how they will grow, and what they need in order to do so; sort of like how we are born with a pre-programmed determination of how tall we will be when we grow up. Some seeds just need warm soil and plenty of water, while others actually need to experience a naturally-occurring forest fire in order to germinate and begin to grow!

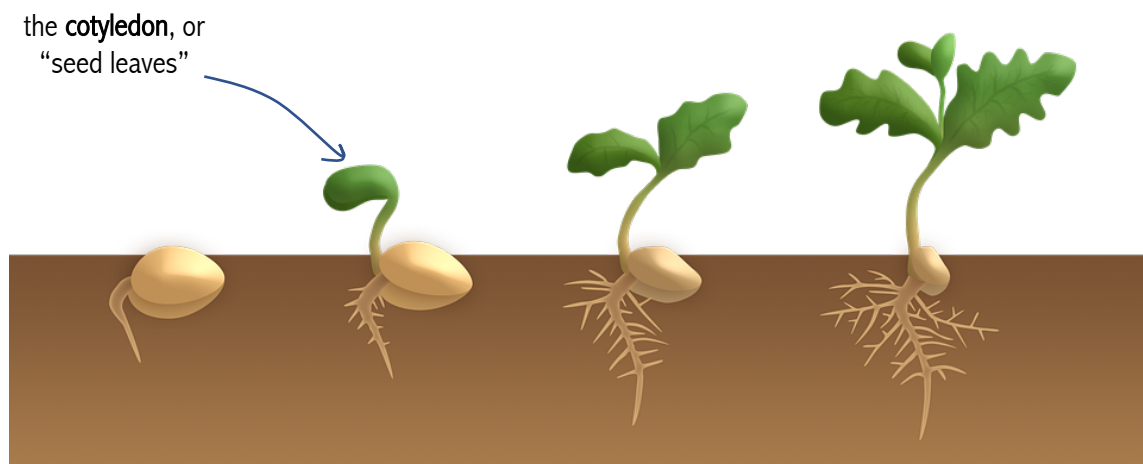
Generally speaking, however, in order for a seed to grow up into a healthy, strong plant, it needs: **Nutrients** (found in the soil), **water**, **warmth**, **space** to grow, **sun** for photosynthesis in order to make food (and **love**!).

## A Very Important Seed Part: the Cotyledon

All seeds have a store of energy, called a **cotyledon** (pronounced: “kot-ah-leed-in”), which look like the sprout’s first set of leaves. These “seed leaves” allow the plant to live underground and then as young sprouts until they start producing their “true” leaves so that they can **photosynthesize**. Different sized seeds have different sized cotyledon, which is why we plant a tiny lettuce seed at a different depth than a much larger bean seed.



**Think of the cotyledon as a backpack.** When we go to school or out for another adventure, we pack snacks with us so that we’ll have energy for the day. *But* the snacks in this backpack will not be our only source of food for our lives. Similarly, the cotyledon only serve the plant before it can start producing its own food using the sun through photosynthesis (or, for us, before we can get back to our refrigerator to make more food).



# THE SECRET OF THE SEED

A long, long, long, long time ago, before there were farms, before there was summer camp, or seed packets, all the seeds lived out on their own. They lived in huge families and villages, waiting until they were called on to be planted. Many of them shared family traits like their size and smile, while still being beautifully different from each other. Sungold Tomato and Purple Potato were in the same large family, so were Watermelon and Pie Pumpkin. Believe it or not, Peanut and Bean were too.

Soon, all of the signs of the planting season arrived. Birds returned chirping and hungry, posing a threat to some of the seeds. Buds of tree leaves started to swell and open. Sun spent more of its time up in the sky, delighting in making the days longer and warming up the soil that had just been frozen for months. It was time for the seeds to be called on to be planted.

Many members of the Bean Family were brave, eagerly bursting through the soil up above them as they grew, determined to reach the sky by climbing anything around them—fences, poles, even other plants. Bush Bean, however, did not feel this way. She was afraid about being called on to be planted and worried about getting it right and growing big enough to create long pods of her own beans.

Bush Bean was finally called on to be planted. She was nervous about the deep dark soil, and there was a lot of pressure to grow to be just right. How would she know in which direction to grow her roots? Or to send up her sprout? The rest of Bush Bean's family members were all so busy and not making time for her, so she decided to ask for help elsewhere. Bush Bean saw Buttercrunch Lettuce seed getting ready to plant itself, so Bush Bean decided to ask for advice.

Buttercrunch Lettuce said, "It doesn't take much to be planted, just a tiny sprinkle of soil as a blanket!" Bush Bean tried as Buttercrunch Lettuce said, sprinkling just a little bit of soil over her plump body, but it was just too bright and cold, and she couldn't concentrate on growing. She brushed the dirt off herself and went looking for more help. She decided to ask a bigger plant and approached Sugar Maple to ask for help.

Sugar Maple said, "It's hardly any work at all! Just trust your instincts and let go! Wind does the work for you." It didn't take long for Bush Bean's instincts to tell her that she was not designed for Wind to help her grow, and that she needed to go back to the soil and go deeper. Bush Bean packed a snack and went deep down until she bumped into Wise Worm. Wise Worm said there's plenty of growing and other work to do deep down, but that's not the kind of growing Bush Bean needed; she didn't much care for eating dead leaves and she felt so far away from Sun. Plus, Bush Bean hadn't packed enough of a snack to stay down deep for too long.

Bean was so sad and confused she wanted to give up. Just then, two other Bush Beans passed by on their way to look for a place to be planted, and Bush Bean decided to ask for help. They told her they'd go with her to her place to be planted so that she wouldn't be afraid. The three Bush Beans stacked themselves together and sent Bush Bean down into the soft warm soil first. With a full backpack full of snacks, she could still feel the warmth of Sun above her and the cozy the soil beneath her. Things felt just right at this depth and, as a spring rain began to fall, she realized that the place where she was called on to be planted and wasn't so bad. She thanked the other Bush Beans and got to growing right away. She thought of Sugar Maple's words as her instincts told her to grow her tiny root down towards where Wise Worm lived and to grow her little sprout grew up towards where Buttercrunch Lettuce had planted himself.

Bush Bean grew tall and wide and got so big and strong and brave that she created long pods of Bush Beans to join the family. She made sure to teach every single Bush Bean that when they were called on to be planted, it was okay to be scared and that they only need two friends to guide them on their way into the soil. From then on, the seeds learned to ask for help and to not keep their nervousness a secret anymore. To this day the perfect depth to plant a seed is the depth of three of the same type of seeds stacked up on each other, so you are planting at a depth of three times their width. And that is the secret of the seed.