



THE JOURNEY OF A SEED

We are going to be jumping into the lifecycle of a plant - from seed all the way to adult. Plants are all around us. We depend on them not only for the air we breathe but for food, clothing, medicine, building materials, recreation, cleaning our water, and so so so much more! Before we dive in, we are going to start a journal where you can record your observations, what you have learned, and answers to questions as you carry out the activities below. Some activities you can do in a number of different ways: if you have a yard or a nearby park you can go and do them outside with a parent... but if you need to stay inside, it's fine to do them inside instead.

ACTIVITY ONE START YOUR "SEED TO PLANT JOURNAL"

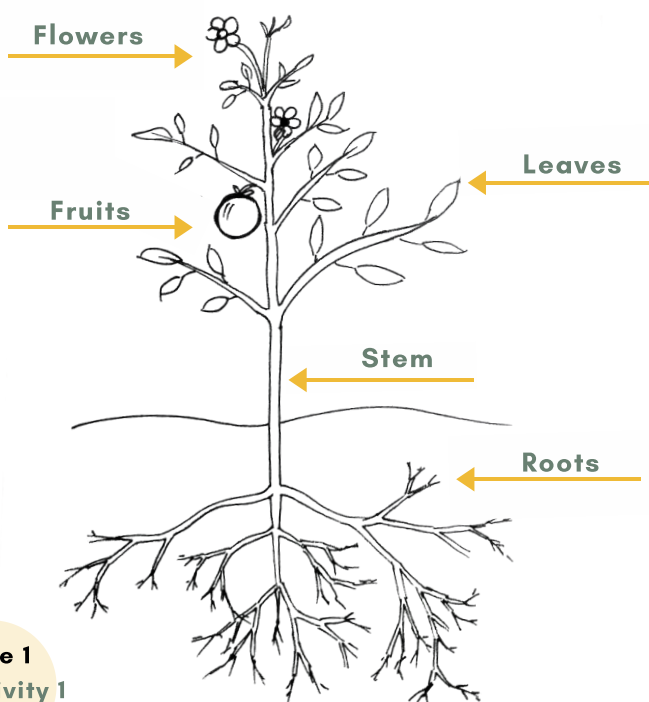
First things first, find a notebook or staple some blank sheets of paper together for your journal, and let's make a title page. You can use the template **at the end of this booklet**.

Once your journal is ready, head out into your garden or a nearby park and find a plant to draw. If you are working at home, choose a plant you have inside or can see from your window. Make your drawing fill the page and include as many details as you can. Feel free to colour it in!

For the rest of this workbook when you see the  image, that means it is time to open up your **Seed to Plant Journal** and do some writing or drawing.

ACTIVITY TWO EAT A FULL PLANT IN PIECES

Label your drawing from Activity One. Use the drawing below to help you!



What do the different parts of a plant do?

Flowers: Help in reproduction, attract pollinators like bees.

Leaves: Harness the sun's energy to create sugar from water and carbon dioxide.

Stems: Help leaves get up into sunshine and out from under the shade of other plants.

Roots: Support the plant and absorb water and nutrients from the soil.

Fruits: Contain the seeds of the plant - can be fleshy like a pear, or dry like a nut.

Seeds: Contain everything needed to start a new baby plant.

Seed coat: A layer on the outside of the seed that protects it against damage and drying out. Sometimes it is covered in things like hooks or fine hairs that help the seed get carried to a new place.

When you have finished labelling your drawing, look in your kitchen for items of food that are part of a plant. Ask a parent if you can try eating some! Can you find a flower, a leaf, a fruit, a stem, a root and a seed? Examples of things to look for: celery, tomatoes, lettuce, carrots, rice, cauliflower, pumpkin seeds, sweetcorn, dried beans, cinnamon sticks, and peppercorns.

What food did you find? What part of the plant were the things you found?

Write the foods you found below:

Root: _____

Stem: _____

Leaf: _____

Flower: _____

Fruit/Seeds: _____

If you found some fleshy fruit (like a banana, apple, plum, or strawberry), can you find the seeds inside? If you found several different types of fruit, what is the **same** about the seeds? What is **different**?



Open your journal on a new page. Write '**Parts of a Plant**', include the date and then reflect on what you learned about the parts of a plant when you were investigating food in your home. What are some facts you would like to share with your family? Things you think are really cool and interesting? Did any questions pop into your head? Write them in your journal and decorate your page with pictures of the plant food you found.

ACTIVITY THREE TRAVEL THE WORLD LIKE A SEED

Did you know that most plants reproduce by using seeds? Some seeds are really big like coconuts. Some seeds are really small like strawberry seeds. Seeds can come in many different shapes and colours and they are all the start of a new plant.

Can you think of some foods you eat that contain seeds? Sometimes we eat the flesh of the fruit and throw away the seeds (like when we eat a plum), sometimes we eat the flesh and swallow the seeds whole (like when we eat a tomato), and sometimes we eat the seeds themselves (like sunflower seeds).

**DID YOU KNOW
COCONUTS ARE
HUGE SEEDS?**



PLANT FACT

Plants reproduce in a bunch of different ways, not just by seeds!

Plants may reproduce from cuttings (small parts of the plant that are cut off and planted in soil), from runners (long creeping stems that grow from the parent plant and start a new baby plant at the end), or from spores (tiny reproductive cells that don't contain food or other helpful things that seeds have to help a baby plant germinate). Ferns are examples of plants that reproduce from spores.

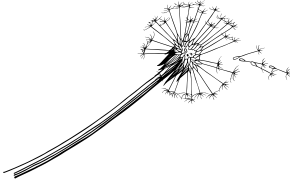

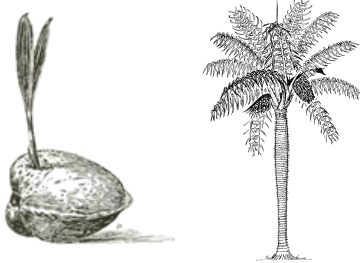




In the summer, bears can eat up to **200,000** buffaloberries per day! The buffaloberry seeds pass through the bears' digestive system and are pooped out. Bears play an important role in the distribution of buffaloberry seeds.



To find space to grow, seeds need to find a way to travel away from their parent plant. Can you think of how the seeds below might travel? Fill in the chart below with the following travel types:

- **Hitchhiking:** Seeds hook onto animal fur or human clothes and fall off in another location.
- **Wind:** Seeds catch the wind and are blown far away.
- **Water:** Seeds float in the water and are carried to a new location.
- **Eaten:** Seeds are surrounded by soft juicy flesh and animals and birds eat them. The seeds are swallowed with the flesh and then pooped out somewhere else later. If the animals crunch up the seeds they are destroyed. This method only works if the seeds are swallowed whole.
- **Catapulted:** Some seeds have pods or outer coatings that burst open or explode, flinging the seeds away from the parent plant

SEED	PLANT	TYPE OF TRAVEL
	Dandelion	
	Giant Burdock	
	Coconut (Not found in Canada but a very tasty and familiar food for a lot of people! Often grows on beaches.)	
	Caragana (has seeds similar to the beans you will be planting later on)	
	Saskatoon Berry	



Get out your journal. Go outside and see if you can find any seeds. **Hint:** Can you find some cones under a spruce tree? Can you find dandelion fluff, or fluff from cottonwood trees? Can you find berries on bushes or trees? Can you find any seeds stuck to your socks? Or, look at the seeds you have in your kitchen. There are seeds inside soft fruits or vegetables like apples or squash, hard seeds like nuts, or dried seeds like peppercorns or beans. What about dried soft fruit like raisins – can you find seeds in them?

What do the seeds look like? How do you think they travel (look at the methods described above)? Draw a picture of four seeds traveling to a new place in your journal.

ACTIVITY FOUR TIME FOR AN EXPERIMENT!

We are going to sprout some seeds (this is called germination) and watch them grow into plants in this activity. We are also going to put on our scientist thinking caps. If you want to dress up like a scientist while working on this activity too, why not?

We are going to think about the question, '**What are the needs of plants?**', make some predictions, conduct a study, take observations and finally come to an answer!



In your journal, start a new page with '**What are the Needs of a Plant?**'. Write down some ideas you might have. Think of what you need to survive and grow – do plants need some of the same things? We will come back to this question at the end of the experiment.

Let's begin! In your kitchen find uncooked, dry beans – the seeds of bean plants. Take a couple of beans and examine them. Try breaking a few apart.

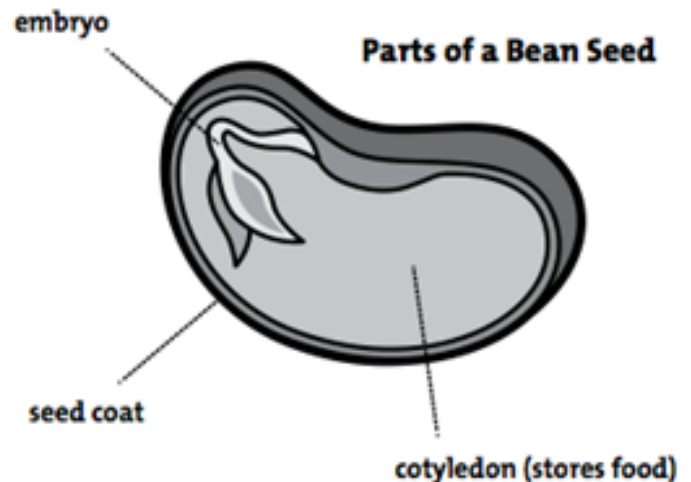
What are they like inside? Are they soft or hard? What colour are they? What do they smell of?



In your journal, on the '**What are the Needs of a Plant?**' page, write down what you observe about the beans. Try opening a couple of the seeds and write about what they are like inside. Why do you think the seed has a hard outer shell?

DID YOU KNOW?

Soaking beans helps germination by softening and breaking down the seed's tough outer case – the seeds defence against drying out and getting damaged. This would happen naturally if the bean was outside in the sun, soil, and rain. This protective outer coating can also help make sure the bean or seed germinates at the right time and in the right place. It wouldn't be a good idea to start sprouting in the middle of winter or when hooked on your sock! By keeping your seeds in a warm, damp container you are mimicking warm spring weather and nice moist soil.



Germinating the seeds

1. Take 10 beans (the best to choose are kidney beans but you can try others) and set them aside.
2. Soaking seeds can help with germination. Put the seeds (the beans) in a bowl filled with lukewarm water for two hours.
3. Dampen some paper towels or napkins.
4. Line the bottom of a tupperware box or plastic container with a couple of layers of the damp paper towel.
5. Take the soaked beans out of the bowl and place them on the paper in the container, leaving about 4 cm between each bean.
6. Put another couple of layers of damp paper towel over the beans.
7. Put the lid on the container sealing the moisture in, and leave it somewhere warm like a sunny windowsill.
8. Check the beans every day and keep the paper towel moist.
9. Once you see a tiny white root starting to emerge from the bean, it has germinated!
10. You can plant your beans in soil the moment you see the root is visible, or you can leave the beans a couple more days to watch the root grow. Try planting a few early on and some a bit later.

Note: It usually takes between 4 and 7 days before roots sprout, but this varies with the age of the seed and the conditions. Some beans may not sprout.



**TIME TO
PLANT ME**



Write a new entry in your journal every day after you check if your beans have germinated. Write down your observations. What do you notice? What has changed?

Planting the seeds

1. Find 6 small containers at least 10cm deep. Old yoghurt cartons with holes poked in the bottom for drainage work fine.
2. Fill with soil to about 2cm below the top of the containers.
3. Moisten the soil (don't soak) and use your finger to poke a hole into the soil about as deep as your half your pinky finger (about 2cm deep).
4. Place a sprouted bean seed in the hole with the sprouted root side pointing downwards. Careful with the sprouted seeds, their roots are very fragile! It is okay if a little paper towel is stuck to the germinated seeds – just cut around the seed and put it into the soil with the bit of paper towel.
5. Lightly push soil down into the hole to cover the seed.
6. Stand the 6 containers on saucers or a tray, put on a sunny windowsill, water lightly, and record your observations everyday.



Using a Clear Container

If you have a see-through container (either glass or plastic) use one of these, even if you can't make a hole in the bottom.

Plant one of your beans right against its side and you will be able to watch the root grow through the soil.

If there are no holes in the bottom of this container it will be hard to care for this plant. Can you think why?

The Experiment

- 1. The beans may take a week to start to poke up through the soil. Be patient!
- 2. Once the beans have come up and grown a couple leaves, use a sharpie to number each of the pots
- 3. Plants 1, 2, and 3 can stay on the sunny windowsill, but put plants 4, 5, and 6 somewhere dark (in a cupboard or shady spot at the back of a room).
- 4. Water plants 1 and 4 with ordinary tap water. For plants 2 and 5, choose another liquid for watering (for example, you could use juice, pop, or milk). Don't water plants 3 and 6 at all!

PLANT NUMBER	WATER	SUN
1	YES	YES
2	OTHER LIQUID	YES
3	NO WATER	YES
4	YES	NO
5	OTHER LIQUID	NO
6	NO WATER	NO

- 5. Find a ruler and measure the height of each plant every 3 days for 3 weeks Record the measurements in the chart below.
- 6. If one of your seedlings is not looking well, try changing its position and/or its watering. Record what happens. Does it recover?

Observations

Once you have planted your germinated seeds, measure and record the height grown by each plant each day in centimeters.

OBSERVATION	PLANT NUMBER					
	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						
7						



Answer the following questions in your journal as you watch your seeds sprout and your plants grow over the coming weeks. Record your daily observations. Try drawing your favourite bean plant:

1. What kind of beans did you try to grow?
2. What date did you start growing your beans?
3. What date did you see the first bean start to sprout?
4. Did all the beans sprout? (yes or no)
5. Why do you think some of the beans didn't sprout?
6. Make some predictions. Do you think the plants will grow differently based on what we water them with and how much sun they get?
7. Which plant do you think will grow the best? Why?
8. Which plant do you think will grow the worst? Why?

Wrap Up

After your plants have been growing for 3 weeks, think about and answer the following questions in your **Seed to Plant Journal**.

1. Did some of the plant grows better than others?
2. Which one grew the most?
3. Which one grew the least?
4. How did the results compare with your predictions from the beginning?
5. Why do you think some of the plants grew better than others?
6. What does this tell you about what plants need to grow and survive?
7. Do you think your plants will grow better in summer or winter? Why?
8. Can you think of anything else that might affect how well a plant grows?

ONLINE RESOURCES FOR YOU

- Watch a Weaselhead Naturalist germinate a seed on Youtube:
<https://www.youtube.com/watch?v=OHTm5I7DH0M>
- Check out our website: <http://theweaselhead.com/>
- Send us an email! If you need help completing these activities, you can send us your questions here. If you want to show off your work, you can send us photos of your growing beans, too!
education@theweaselhead.com



I LIKE TO
LISTEN TO
MUSIC TOO!

PLANT FACT

Scientific research has proven that playing music for your plants supports their growth! Try playing your favourite song for your plants as they continue to grow.



THANKS FOR
COMPLETING
THE WEASELHEAD
AT HOME
FIELD TRIP



MY SEED TO PLANT JOURNAL



OBSERVATIONS, EXPERIMENTS, AND IDEAS
BY
