Starting Seeds

Seed Starting Resources to use:

Seed planting chart
This chart includes all seed varieties with recommendations whether they should be planted into peat pellets or directly into growing containers, the average days to maturity, days to germination, planting depth and spacing.

Seed Starting Log
Don't forget what you planted and when you planted it! Use this simple seed starting log to chart your planting dates and varieties for later use.

Making Newspaper Pots
Making your own newspaper pots are a great way to be resourceful, have fun and save some money. Make your seed starting pots using recycled newspaper and a soup can. Simply fill with soil and plant!

Salad Celebration Planning Chart
One of the favorite activities of our Little Green Thumbs classrooms is to plan their garden for a 'Salad-bration' harvest. That means, planting their vegetables at the right time so that they can harvest everything at the same time. Use this Salad Celebration planner to figure out when you should plant all your vegetables, so that you can harvest them at the same time!

Find all of these resources in the online Teacher Portal.

Students in a Saskatchewan Little Green Thumbs classroom got curious about seeds after planting their garden! Students began saving their seeds from their lunches to see if they could sprout. Peppers, lemons, avocado, apples, sunflower seeds... chocolate chips?! The students experimented each year to see what they could sprout!

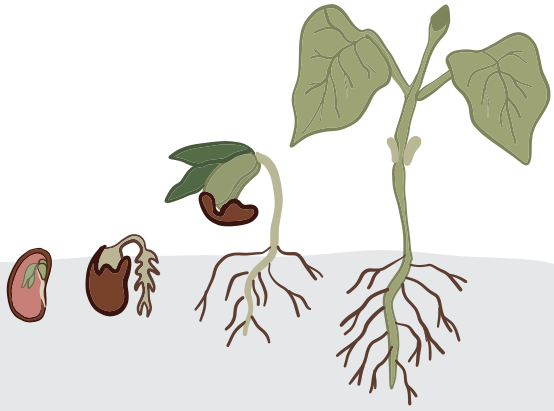
Sing a song!

I'll Plant A Little Seed Original Author Unknown
Sung to: "I'm A Little Teapot"

I'll plant a little seed in the dark, dark ground.

Out comes the yellow sun, big and round.

Down comes the cool rain, soft and slow. Up comes the little seed, grow, grow, grow!



A seed contains the food for the baby plant, which is stored in the seed leaves. This supplies the forming seedling with the energy to form roots, extend a stem and begin to grow.

C Starting Seeds with Pellets

We recommend starting your seeds with pellets, sometimes called peat pellets or Jiffy pellets. Pellets come as compacts disks that swell up when the pellet is soaked in water. A pellet is made from sphagnum peat or coconut coir. Lime and a special fertilizer with a low ammonium content are added to the peat in order to stimulate growth. The pellets have a pH of approximately 5.3 and are wrapped in a thin, biodegradable net.

Pellet Benefits

Pellets hold enough moisture to germinate seeds, but also drain well so as not to drown them. The netting surrounding the pellet allows air to circulate through the root ball. Pellets also minimize transplant shock, as there is minimal disturbance to the roots during transplanting.

To start your seeds, you will follow 6 basic steps:

Arrange pellets in trays, soak/expand your pellets, plant into your pellets, label your seeds, cover with your dome cover and then place under lights.

Once the seedlings are big enough, they will be transplanted into larger 4" pots or directly into your growing boxes. Decide how many pellets you will need, based on the number of mature plants you would like. It is always a good idea to start extra plants and choose the strongest plants for your growing boxes.

1. Arrange your pellets

First, arrange your black plastic trays in the correct order. You have one tray with holes and one without. Always place a tray with holes into a tray without holes. This helps with drainage. Next, arrange your pellets into your black 1020 planting tray with the flat side down (leaving the side with the small dent facing up). It is best to arrange the pellets in rows of 5, or the number of seeds of each variety you want. This will make it easier once you mark you trays. You will be able to just mark the row, versus each individual pellet.

2. Expand/soak pellets

Pour warm water over top of your pellets. Pour enough water to submerge your pellets. Water level will be about 2cm from the top of the tray. Peat pellets will take about 10 minutes to fully expand, though it may take a bit longer depending on the temperature of the water. If more water is needed, add more water. After expansion, pour off the extra water so that there is no standing water in the bottom of your tray. **You may need to give each peat pellet a squeeze to encourage full expansion.**

To Soak or Not to Soak

Many gardeners will soak seeds to assist with germination. Soaking a seed overnight before planting can give your seeds a boost and cut down on a few days germination time. In the Little Green Thumbs garden, we recommend soaking peas, beans and nasturtiums, though it is not required. You can even try soaking chard! Smaller seeds like lettuce, radish and basil are difficult to handle once soaked and don't really require soaking anyways.

Starting Seeds

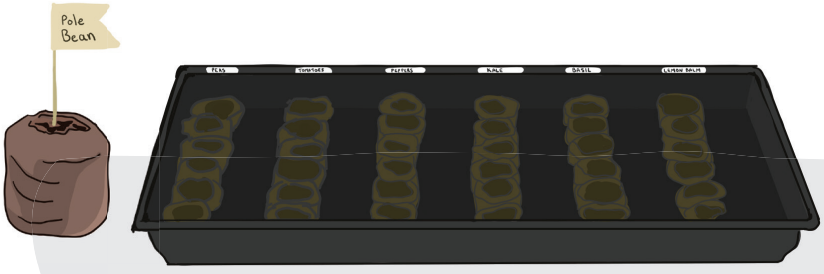
3. Plant pellets

Slightly tear the top of the netting on each pellet. Use a pencil, toothpick or your baby finger to dig a well in the peat pellet where your seed will be planted. Plant your seeds in the well and lightly cover them with the peat/coir in the pellet. You can do this by giving each pellet a little squeeze. We recommend planting 2 seeds in each pellet in case one doesn't sprout.

Use your seed starting chart to mark the date your seeds were planted. Go back to the chart to mark when you first saw the seeds germinate. You can then calculate approximately when you will be able to harvest your vegetables based on the 'Days to Maturity' listed on the seed package. You can even have students make their predictions for when the seeds will germinate and when they will be ready to harvest!

4. Label pellets

Always label your seeds! You can mark your seed row with a masking tape label on your black plastic tray, or label each individual peat pellet with a small masking tape and toothpick flag. **This is a great activity for students. Cut a small piece of masking table about 4cm long. Wrap around a toothpick as a small flag. Write the name of the seed on the masking tape and place into each individual peat pellet.**



Two different ways to label!

5. Cover pellets with dome cover

Cover your tray with your plastic dome cover. Place the tray into a warm place. Your garden seeds do not require light to sprout, so they do not need to be placed directly under the lights. You may choose to set your timer and lights now so that everything is set for when your seeds sprout. Only water the pellets once they are looking dry – if the soil is a little damp to the touch, that's perfect!

6. Place under Lights and Remove Dome

Once seeds have sprouted, take off the plastic dome and place planted pellets under your grow lights. If more than one seed sprouts in a peat pellet, simply pinch off or cut the other seedling so that you have one healthy plant per pellet. Cutting them off is the best option versus pulling the seedling out, because it doesn't disturb the roots of the sprout that you are saving. It hurts, but you have to do it! Otherwise, instead of one vigorous plant you'll have 2 or 3 weak, spindly plant. You may choose to leave 2 herb sprouts or 2-3 chard or kale sprouts growing in one peat pellet. These can be planted together win the same pellet.

Remember to keep your lights closer to your seedlings to encourage compact growth. Depending on the type of bulb you are using, this distance varies. If using an LED or fluorescent light tube, keep your lights about 10cm above the soil/plant canopy and move up as plants grow If using a Metal Halide bulb (with cooling tube), keep your light 30cm (1 foot) above the soil, and move up as plants grow. If the light is kept too high, plants will become leggy and reach for the light.

We recommend cutting one side of your jiffy pellet netting once you transplant. Though they are designed for the roots to push through this fine netting, we have found it is easier for the plant if you cut or tear one side of the netting before planting.

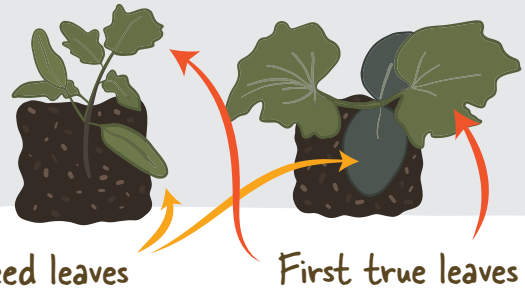
7. Transplant pellets into 4" pots or growing boxes

Once seedlings have sprouted their first true leaves, you can plant into your 4" (10cm) pots or newspaper pots. See how to make your own newspaper pots as a fun classroom activity in the online Teacher Portal. Transplanting into a 4" pots or newspaper pots helps create more soil volume, so that plants dry out less quickly. You can continue growing your seedlings in pellets until they have 3-4 sets of true leaves and then transplant into your growing boxes, but your pellets will dry out very quickly under grow lights. Transplanting into small pots helps with moisture retention.

What are 'true leaves'?

First true leaves are the second set of leaves to emerge from a plant.

Cotyledons, also known as 'seed leaves', are the first leaves to emerge from the soil when a plant germinates. They often look nothing like the mature plants' leaves. The true leaves unfurl above the cotyledons on the seedling, and look like a smaller version of the plant's adult foliage.



d Germination tips

Moisture: Adequate and consistent moisture is critical for germinating seeds. The first role moisture plays is to open the seed coat and to release the seed from dormancy. Seeds like a consistently moist, but not soggy environment. They do not tolerate repeated wet-dry cycles. If the environment becomes soggy, or saturated, they may suffocate or develop a fungal rot known as damping off.

We recommend using your clear plastic dome on your seed trays while they are germinating. You can also wrap seed trays with a plastic or wax paper. This helps you to maintain adequate moisture. Remove the dome once seeds sprout. You can also use the dome cover if you plan to be away from the garden for a couple days, in order to preserve moisture.

Warmth: Seeds also require warmth for germination. If you are concerned about the temperatures in your classroom, you can wrap your germinating seeds in a towel. Some people choose to use heat mats for their germinating seeds. This is a small mat that will give out a small amount of heat in which you can place your tray on top of. These can be found at most garden supply stores or online.

Light: Most seeds do not require light to germinate, but instead need dark (with the exception of some wild flower seeds). Because your seeds are covered with soil, placing them directly under your lights won't hurt germination.

Germination failure

Failure of your seeds to germinate can be due to a number of reasons. The most common is that the soil dried out or the seed was no longer viable. You can do a germination test to ensure your seeds are still good to use.

These are the most common reasons for lack of germination:

- Damping off disease (seedlings suddenly fall-over – find more in Troubleshooting)
- Seeds planted too deeply
- Soil temperature too low
- Poor seed to soil contact
- Soil dried out
- Seed is no longer viable
- Soil too wet and seeds rotted

You can check if your seeds are still viable with a simple germination test. Count the number of seeds you are going to test. Soak a piece of paper towel and spread the counted seeds over one side of the towel. You can also fold the other half over the seeds. Place your towel and seeds into a ziplock or plastic bag. Check the Days to Germination for your particular seeds. This number can be found on the seed package and is the number of days it will take for seeds to sprout. After that amount of days, open up to see if your seeds have sprouted. Check every day for a few days. Count the number of healthy looking sprouts and divide by the number of seeds you first laid out. This is your germination percentage. Ensure your paper towel does not dry out for this time period. Adjust the amount of seeds you plant based on your germination percentage.

Germination tests are quick and fun!

e Direct Seeding into Earthboxes/GrowBoxes

You can also plant some seeds directly into your Earthboxes/Growboxes. We recommend planting *peas and beans* directly into your boxes, though you may also start them in peat pellets. Peas have very sensitive root systems and so they do not like having their roots disturbed during transplanting. Follow the planting depth and spacing recommendations for your particular seeds when you plant directly into your soil. Make sure that you pat the soil down firm and water on top of the soil until the roots are established. After that, continue only watering into the bottom reservoir of your containers.

Effects of soil temperature on germination

Too high or too low soil temperatures can dramatically impact your days to germination! This table illustrates the effects of temperature on carrot seed germination. Adapted from *GrowLab: A Complete Guide to Growing in the Classroom*

Temperature - Celsius	Days to Germination
35	8.6
25	6.2
20	6.9
10	17.3
5	50.6

f Planting Your Lettuce Tray

We recommend planting your lettuce directly into a black plastic tray, known as a 1020 tray (10”x20”). You will want to arrange you trays similar to when you arranged your pellets: place one black tray WITH holes, inside of a tray WITHOUT holes.

1. Fill your tray with soil, about ¾ inch from the top.

2. Spread your lettuce seeds over the top of the soil. Lettuce seeds are small so sowing them uniformly can be difficult, but you want them spaced about .5-1cm from each other. You can also sow more thickly and thin seedlings out as you go. Cover the seeds with about ¼ to ½ cm of soil and pat down.

3. Water your lettuce tray and place your clear plastic dome overtop. When you first plant, it will be easiest to add 1cm of water into your bottom tray (without holes) and then place your tray with holes, soil and seeds on top. Ensure that the soil wicks up the water and all of the soil is moist. If the top of the soil is not moist, you will need to water seeds from the top the first time. Water your seedlings enough to keep the growing medium moist but not soaking wet. You will probably want to water every few days with 1cm of water. You can do this again by watering into the bottom tray.

4. Once your lettuce begins to sprout (within 3-10 days) place your seeds under grow lights. Keep grow lights at about 4” above your seeds if using fluorescent or LED bulbs and about 1 foot if using a Metal Halide (with cooling tube) light. At this time, you can remove the clear plastic dome. Continue watering as needed. You may want to water with a spray bottle so as not to disturb your seeds but will need to do so regularly.