

# Indoor Seed Starting Q&A

## **Q: Do you have general suggestions for starting seeds indoors?**

**A:** Each type of seed has slightly different growing requirements, but the basics are the same:

1. Use shallow containers (2 to 3 inches deep) with drainage holes. You can purchase seed starting supplies or use something as simple as an egg carton or yogurt containers with holes punched in the bottoms for drainage. It is easiest to monitor moisture in containers that are no more than a few inches deep - and they require less potting medium!
2. Use a lightweight soilless potting mix. These mixes are made primarily of ground peat moss and have been sterilized, so they are less apt to contain weed seeds, fungi, and bacteria that may hamper growth than garden soil. These mixes also provide good drainage, providing both the aeration and moisture seedlings need. Avoid using garden soil, as it won't provide sufficient aeration and can introduce disease-causing organisms.
3. Moisten the potting mix before placing it in containers. If you can squeeze a handful of the mix and water comes out, it is too wet and you'll need to add more of the dry mix. The ideal moisture level feels like a well-wrung sponge.
4. Fill the containers with moistened potting mix to about ½ to 1 inch below the rim of the container. Rap the container against the countertop to settle the mix.
5. Follow the recommended planting depth on the seed packet when sowing seeds. This is generally 1-1/2 to 2 times the width of the seed. However some seeds need light to germinate and must be "surface sown" meaning they should simply be pressed into the surface of the potting mix and not be covered at all; the seed packet will note if this is the case.
6. Water seeds after planting using the mist setting on a spray bottle to avoid dislodging seeds with a strong stream of water. Check daily to make sure the mix stays even moist, but not soggy. Seeds must stay moist in order to germinate properly.
7. If the air in your classroom is very dry, you can maintain adequate moisture for germination by creating a tent over the pots or flats with clear plastic wrap. Prop the plastic wrap off the surface of the planting mix using popsicle sticks or other 'posts' so seedlings don't stick to it. Remove any coverings gradually as germination begins.
8. Most seeds germinate best in warm conditions. Although average room temperature (70°F) is generally adequate for most seed germination, you'll get faster and more consistent germination if you place newly seeded containers in a warm spot (70 to 80 degrees F) or on top of a heat mat (available from garden stores). With the right conditions, most garden seeds should germinate in 7 to 14 days (unless otherwise noted on the seed packet). Once seeds have germinated and produced their first set of true leaves (the very first you see are called seed leaves, and all that grow after that are true leaves), move containers of seedlings off the heat mats.
9. Good light is essential. Once you see the first signs of germination, move the seed trays to a light-filled area. Seedlings need full sun from a south- or west-facing window or, even better, fluorescent lights positioned 2 to 3 inches above the foliage. Use a timer to keep fluorescent lights on for 12 to 16 hours a day. Suspend the light fixtures so that you can move them up as your plants grow, keeping them a consistent height above the tops of the seedlings. Leggy or pale green seedlings are an indication that plants need more light. If your seedlings are growing on a windowsill, rotate containers regularly to keep plants from reaching toward the light source.
10. Keep the soil moist but never wet, as this encourages rot. At first, lightly mist the soil. Once seedlings emerge, place the containers in a tray and water from the bottom to encourage deep root development. Check daily and do not let the soil mix dry out.
11. Wait to fertilize until the seedlings' true leaves (the second set) appear. Then use a weak solution of a high-phosphorus fertilizer (e.g., 5-10-5), which will help the seedlings develop a strong root system.
12. When seedlings have one to three sets of true leaves and are a couple of inches tall, transplant them to a deeper container for growing on until planting time.

### **Q: What is the ideal temperature for starting seeds indoors?**

**A:** While specific seeds have more precise optimal germination temperatures, in general the following guidelines work fine for many vegetable and flower seeds. For starting seeds, aim for a daytime range of 60 to 80 degrees F and a nighttime temperature that's 10 to 15 degrees cooler. On average, 77 degrees F is optimal, and temperatures should not exceed 95 degrees F or drop below 40 degrees F. If you feel comfortable, chances are your seeds do too. If you are still not certain, always refer to the seed packet for specific information regarding ideal germination temperature. Bottom heat (from a heat mat) will speed the germination of some seeds, especially warmth-lovers like tomatoes, peppers, and eggplants, but are not a requirement.

### **Q: Is there a systematic way to start seeds indoors with my class?**

**A:** First, mix and moisten enough potting soil for all your containers. If possible, use containers that are all the same size. This will help standardize seeding, watering and transplanting. Fill the containers with exactly the same amount of the soil mixture.

Have just one type of seed per planting station or per session so that different plants do not get combined in any one pot. Once seeds are planted, label them clearly with the name and planting date so you know what went where. You can do this with store-bought labels, popsicle sticks or good-quality masking tape stuck to the outside of the containers. Be sure to write on labels with an indelible marker.

Finally, keep a log of what you did so you can repeat it next time (or not!), and compile a cumulative record of your activities for future reference.

### **Q: Do you have any helpful hints for very small children planting seeds indoors?**

**A:** Overall, **choose easy-to-grow annuals** that grow quickly and are gratifying-sunflowers, tall zinnias and cosmos are three quick and easy flowers and radishes, lettuce and dill are three super-fast and easy edibles.

- **Give children a sense of plant life cycles** – before planting time. It's nice to show children a mature plant or photos of mature plants before sowing seeds. If possible, also show them a seedpod or seed head from the actual plant you are growing. Providing this link between plant and seed adds to the child's understanding of the planting ritual and the cyclical nature of gardening.
- **Be smart when choosing seed sizes** – Young children have tiny fingers and may have an easier time with smaller seeds than an adult might. A child's 'pinch' of somewhat fine seeds can actually be quite small. Young children delight in carefully counting out two or three seeds and putting them in each pot or cell. Others might do better with larger seeds, such as bean, melon, squash or marigold. If you have packets of plants with both larger and smaller seeds, try assigning different sized seeds to children based on each child's perceived skill set.
- **Teach potting and spacing technique** – There are several techniques to help children space seeds evenly when planting. For starting seeds in a tray, draw a light line in the potting soil with a pencil or stick and then ask children to space the seeds along that line as far apart as their thumb is wide, or as far apart as a specific spoon is wide. For small pots, instruct children to place one seed at the top, one at the bottom, one on the left, one on the right, and one in the middle for luck.
- **Have fun labeling!** All children love decorating labels for their own pot of seeds, but you can add their (legible) initials, too!

### **Q: What common things can we use to make our own seed-starting containers?**

**A:** Different plants need different-sized containers, but most do reasonably well in 6-inch pots. You can use smaller pots to germinate seeds, but you'll need to transplant the seedlings later. To keep it simple, use the same 6-inch container for germinating and growing. Here are a few container ideas:

- Milk cartons - Cut quart containers down to make 4-inch by 6-inch containers, or have kids collect pint-size cartons from school.

- Plastic soda bottles - Two-liter bottles make nice deep containers. Cut off the tops to make 6-inch planting pots.
- Yogurt cups - The six- or eight-ounce cups are ready-made seed-starting pots.
- Egg cartons - Egg cartons work well for starting seeds, but you'll have to transplant them to larger containers as soon as they've sprouted.
- Old shoes, hats, baskets, etc. - You can use anything that can hold soil, as long as it has drainage.

Important: No matter what your homemade container originally was, you must first clean it thoroughly and add a drainage hole in the bottom to avoid waterlogged plants. Drainage holes are usually about the size of a dime.

**Q: Since kids can be impatient, what are some fast-germinating vegetable and flower seeds we can grow?**

**A:** Big seeds have the most energy and often germinate the fastest-especially if they are seeds for annuals. Flower seeds that germinate quickly include sunflowers (4 to 5 days), gloriosa daisy (5 to 10 days), ageratum (6 to 10 days), cosmos (4 to 6 days), sweet alyssum (8 to 10 days), zinnia (5 to 7 days) and marigold (5 to 7 days).

Vegetable seeds worth trying include corn (5 to 7 days), cucumber (5 to 7 days), squash (4 to 6 days), tomato (6 to 10 days) and watermelon (5 to 7 days).

To ensure success, plant your seeds in moistened seed-starting mix and place the containers in a warm area, such as on top of the refrigerator.

**Q: My children want to try growing plants from seeds they've collected from the wild. What do we need to know to be successful?**

**A:** It's exciting but can also be challenging to grow plants from wild-harvested seeds. Seeds of many plants have adaptations that ensure dormancy until conditions are right for successful germination. This fact can inspire young gardeners to ask questions and conduct investigations. Here are the basics.

Some seeds require a period of cold temperatures (winter) followed by warmth (spring) to germinate. Others have hard seed coats that soften up during freeze-and-thaw cycles. If you're not planting the seeds right away, dry them in a room with good circulation and then store them in a cool, dry place. Some seeds may germinate without treatment; try soaking some seeds overnight in water and then wrapping them in a wet paper towel and placing the towel in a plastic bag for 5 to 7 days.

To break the dormancy of a seed with a hard coat (such as acorns, honey locust, lupine) you'll need to make an opening in the hard shell that allows air and water to reach the embryo. Use a file or sandpaper to lightly scar the shell before planting it. Boil lupine seeds then let them soak overnight in the water before planting. Seeds collected in the fall may require a chilling period for successful germination. Place the seeds in moist sand in a covered glass jar, or sow them directly in pots filled with a soilless mix and wrapped in plastic. Keep the seeds in the refrigerator for one to four months. Periodically check to make sure they are staying moist.

Sow tree seeds at a depth of three times the diameter of the seed, and wildflower seeds about the same depth as the seed diameter. Press very fine wildflower seeds and grass seeds into the soil and don't cover them.

Remember to provide light, warmth, and moisture while the seeds are germinating. After two to four months of growing indoors (or when spring arrives), you can transplant the seedlings outside.

A word of caution: Never harvest seeds of plants you know to be endangered or in short supply in your area!

**Q: Many of the seeds my kids started indoors last year never sprouted, what did we do wrong? We bought commercial potting mix and containers and planted the seeds according to the packet directions. We kept the room between 70 and 75 degrees F and watered faithfully.**

**A:** Please don't give up. Gardening indoors has a few challenges and many rewards. The seeds might have been over watered - drowned seeds are a common occurrence with eager young gardeners. Misting the soil gently provides seeds with enough water to germinate without becoming waterlogged.

Seed germination may be another factor. Most seed packets list another piece of information: germination rate. This indicates the percentage of seeds in the packet that are likely to germinate when planted according to directions. Even a packet of the freshest seeds, germination is unlikely to be 100%. Seeds may experience damage from the environment; some may not be mature; others may possess genetic defects that hamper growth. Measuring the germination rates and then translating that into charts or graphs can make an excellent math lesson. It can also spark inquiry.

If you are planting seeds you saved from a previous season, you might want to test their viability before planting. Use the “wet paper towel” test to ensure that the seeds you plant will actually sprout. Take 10 seeds from each type being tested and lay them on moist paper towels (one seed type per towel). Fold up each moistened towel and place it in a labeled plastic bag. After 7 to 10 days unroll the paper towels and count the number of seeds that germinated in each towel. If fewer than five of the 10 seeds in a towel sprouted, buy fresh seeds.

There are also a few other explanations for why your seeds may not have germinated:

- The soil temperature was too cool or too hot. Check the seed packet labels for recommended temperatures.
- The soil mix dried out. Make sure the soil mix is evenly moist before you plant the seeds, and keep it lightly misted during germination. If you keep the containers covered with plastic or wax paper, the soil mix will stay warm and moist.
- The seeds were planted too deeply. Most seeds should be planted at a depth of three times the diameter of the seed. Sow very fine seeds on top of the soil mix and pat down gently.

**Q: Our young gardeners were heartbroken when newly emerged seedlings died. What might have happened?**

**A:** When newly germinated seedlings appear healthy and start to grow, then wilt unexpectedly, the cause is probably a fungal disease called damping off. This fungus attacks the stem near the soil, weakening it and causing it to rot. In addition to killing seedlings, damping off can sometimes prevent seeds from germinating.

Damping off can occur when seed containers are reused without first being sterilized, or when a nonsterile potting medium (such as garden soil) is used. Overwatering and overfertilizing with nitrogen also contribute to the problem, as does poor air circulation.

To prevent damping off, use new soilless potting mix, sterilize containers with a bleach solution (1 part bleach to 9 parts water), keep soil evenly moist but not wet, and wait to apply fertilizer until seedlings have their first set of true leaves. Also, thin seedlings so they aren't crowded in the container.

If damping off occurs, remove infected seedlings and surrounding soil at once. Check the soil moisture and, if needed, allow it to dry out slightly. If seedlings are crowded, thin them to promote air circulation. If you need to replant, sterilize the containers and utensils, and use fresh commercial seed-starting soil.

**Q: The kids have had the basic “this is a seedling” lesson since preschool; what else can we teach them?**

**A:** Despite their common characteristics, plants have a seemingly infinite number of variations. Children love to discover ‘oddities’, so try starting a wide selection of seeds and examining the resulting seedlings.

Begin introducing botanical concepts, such as alternate and opposite leaves, so you can compare and contrast the plants easily. See if the children can predict an unknown plant’s ultimate identity and size based on the seedlings’ growth at various stages. See if they can match the seed to the fruit or flower from which it came. Look at the seedlings in terms of leaf texture, shade of green, overall form, and growth rate. Can children recognize plants that are related?

Grow a few extra plants. Once established, pull them up and wash off the roots. For example, look at greens, radishes, potatoes, carrots, onions, parsley, and chives. Examine the underground parts of flowers, such as tulips, bearded iris, cannas, marigolds, and daylilies, too. Look for similarities and differences.

Try starting some seeds that germinate over a long period of time, such as tree seeds or perennial seeds, as well as your usual assortment of vegetables and annual flowers. You can also experiment with pre-germinating seeds and testing the viability of older seeds. Finally, try growing some seeds that need cold stratification in order to germinate. Kids get a kick out of putting seeds in the refrigerator for a few weeks!