

Hemp Germination Test Methods

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Germination testing basics

- These tests are used to help determine the percentage of seeds within a sample that are alive and can grow.
- Often these seedlings are disposed of after the test and not used for continued growth.
- This testing can be helpful to determine how much seed needs to be planted
- There are many reasons that seed germination can decrease
 - Improper storage – Often it is best to store seeds in a cool dry place. This prevents the development of molds and rotting of the seeds.
 - Seed age – Even with proper storage overtime seeds will age and breakdown decreasing germination.
 - Broken seeds - Seeds if not handled properly can break. Broken seeds may not germinate at all or if they do can lead to deformed seedlings that will eventually die.

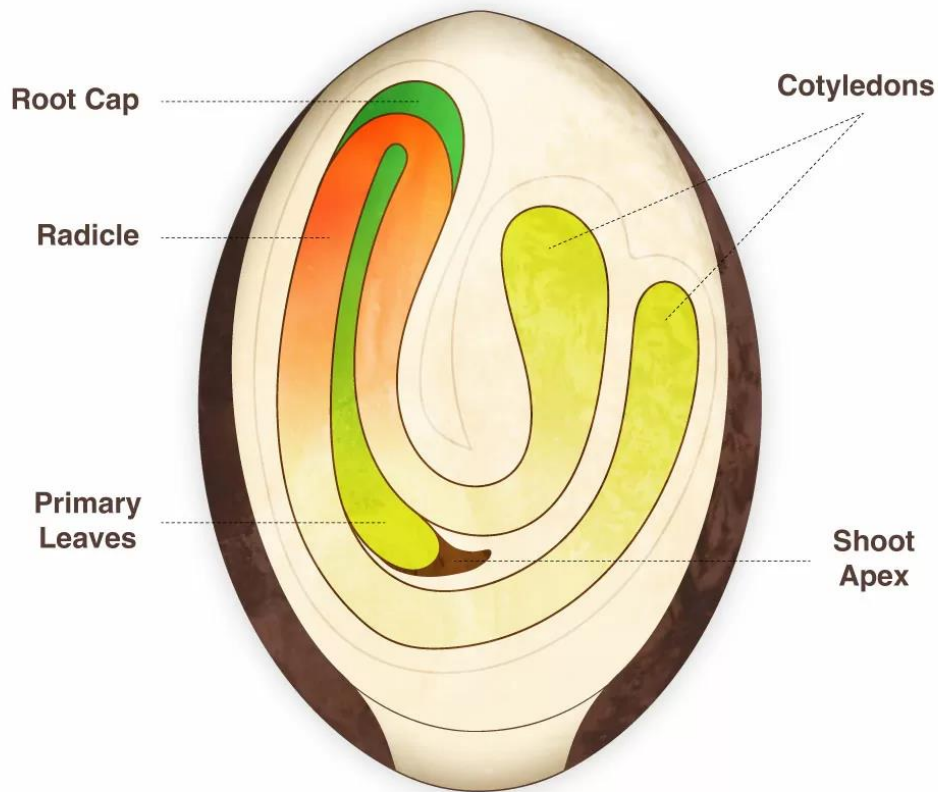
Hemp Germination

Source for more in depth information - [How to Grow Hemp for CBD – Chicago Cannabis Company \(chicannaco.com\)](https://chicannaco.com)

- Preferred germination temperature – Hemp germinates best in temperatures ranging from 65-70 degrees Fahrenheit.
- Soil pH – Hemp prefers a soil pH or around 6-7.
- Moisture – Hemp seeds need moisture to germinate like all other seeds but too much moisture can be a bad thing. Do not drown your seedlings.
- Germination time – Hemp seeds take 48-72 hours to germinate.

Hemp Seed Diagram

SEED CUTAWAY



Pic source - [Cannabis Seeds: What Growers Should Know | Amsterdam Genetics](#)

Root cap - This is where the roots will grow out of the seed. Damage here can result in seed death or deformed seedlings.

Radicle – is the first root and the first thing to emerge in germination.

Cotyledons – These are the first seed leaves. They provide energy for the seed to germinate and for the seedling until true leaves can grow.

Primary leaves – These are where the first true leaves will begin to grow once germination has occurred.

Shoot Apex – This is the start of the stem of the plant and the growth point of the plant. Damage here will kill the seedling.

Method 1

The paper method

- This method is simple and cheap, but the seedlings that do grow would be hard to transplant and continue to grow past the seedling stage.
- You only need a few materials to do this.

Materials

1. Germination paper

This can be found at the links below

[100 Sheets Seed Sprout Vegetable Planting Paper Germinating Paper for Plant Germination Tray - Walmart.com](#)

[Amazon.com : SHEING 150 pcs Germinating Growing Paper Seed Sprouter Vegetable Micro Greens Planting Paper 11.4"x 8.7", Trays NOT Included : Patio, Lawn & Garden](#)

Note: You can do this using regular paper towels, but paper towels can contain bleaches and chemicals that can negatively affect the growth of the seeds.



2. A tray

This is simply a tray you can place the damp paper in. Depending on the size of the sample this could be a sandwich Tupperware like container. Linked below are some other trays that can be used.

[Ferry-Morse Durable Seed Starting Tray 11in. x 22 in. - Walmart.com](#)

[10 Plant Growing Trays \(No Drain Holes\) - 20" x 10" - Perfect Garden Seed Starter Grow Trays: For Seedlings, Indoor Gardening, Growing Microgreens, Wheatgrass & More - Soil or Hydroponic - Walmart.com](#)

[JIFFY® Plant Tray, 11" x 22" - Runnings](#)

[Amazon.com : 10 Plant Growing Trays \(No Drain Holes\) - 20" x 10" - Perfect Garden Seed Starter Grow Trays: for Seedlings, Indoor Gardening, Growing Microgreens, Wheatgrass & More - Soil or Hydroponic : Plant Germination Trays : Patio, Lawn & Garden](#)

[Amazon.com: 8-oz. Square Clear Deli Containers with Lids | Stackable, Tamper-Proof BPA-Free Food Storage Containers | Recyclable Space Saver Airtight Container for Kitchen Storage, Meal Prep, Take Out | 20 Pack: Home & Kitchen](#)

3. Distilled water

Distilled water does not contain anything that could limit the growth of the seeds. Tap water may contain metals/chlorine or other materials that may decrease germination if used. This can be found at about every grocery store. If you do not find it easily check near the baby formula. If you do use tap water, make sure to use the same source for all samples.

4. A spray bottle to apply more water if necessary.

[Uineko Plastic Spray Bottle \(4 Pack, 24 Oz, All-Purpose\) Heavy Duty Spraying Bottles Leak Proof Mist Empty Water Bottle for Cleaning Solution Planting Pet with Adjustable Nozzle and](#)

[Measurements: Amazon.com: Industrial & Scientific](#)

[Clean Living Spray Bottle - 32 oz. - Runnings](#)

[Great Value All Purpose Plastic Spray Bottle, 32 oz. - Walmart.com](#)

5. Labels – something to help you tell apart the trays and varieties.

[Amazon.com : Methdic Address Labels 1" x 2-5/8" 900 Labels Sticker Paper for Laser/Ink Jet Printer Mailing Labels 8.5"×11" White 30 per Sheet : Office Products](#)

[Amazon.com: KINGLAKE 100 Pcs 6 x10cm Plastic Plant T-Type Tags Nursery Garden Labels : Patio, Lawn & Garden](#)

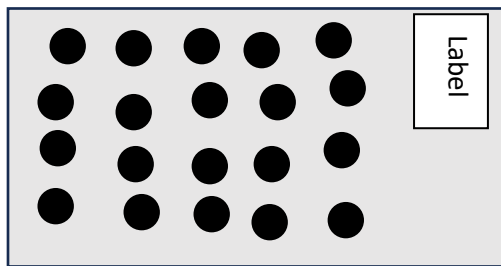
[Gardener's Blue Ribbon® T-Shaped White Garden Plant Labels - 6", Pack of 10 - Runnings](#)

Instructions

1. Count your seeds.

- a. I would recommend no less than 20 seeds per variety. Seed testing labs do a minimum of 100 per variety but for at home testing 20 is a good starting point.
- b. Use the same amount of seeds per variety.

2. Label your germination paper and tray for each variety so that you know what you put where. I would use a sharpie or other permanent marker, so the moisture doesn't remove your markings. You need two pieces of paper per sample, so label both.
3. Moisten your germination paper. You want it damp but not dripping water. You need two pieces per sample.
4. Place one of your damp towels into the tray
5. Place your seeds onto the damp paper in the tray.
 - a. To make it easier to count seedlings take the time to place the seeds in a pattern. Put some space between the seeds so that they do not tangle up with one another. I would recommend at least half an inch apart.
 - b. Example layout



6. Place the second damp paper towel over the seeds.
7. Place the tray in a room with decent lighting and at about 65-70 degrees for 72 hours.
8. If the paper starts to dry out, you can add additional water by using a spray bottle and misting the paper.
9. After 72 hours remove the top towel and count how many seeds have germinated.
10. Calculate the germination percentage.
 - a. This is the amount of germinated seeds divided by the amount of seeds started with. Then multiply by 100 to get the percent.
 - b. Example
 - i. 16 seeds germinated out of 20 started.
 - ii. $(16/20) * 100 = 80\%$

Method 2

The tray method version 1

- This method is also simple but may be a bit more expensive and difficult.

Materials

1. Trays – these may be the same trays used for the first method.

[Ferry-Morse Durable Seed Starting Tray 11in. x 22 in. - Walmart.com](#)

[10 Plant Growing Trays \(No Drain Holes\) - 20" x 10" - Perfect Garden Seed Starter Grow Trays: For Seedlings, Indoor Gardening, Growing Microgreens, Wheatgrass & More - Soil or Hydroponic - Walmart.com](#)

[JIFFY® Plant Tray, 11" x 22" - Runnings](#)

[Amazon.com : 10 Plant Growing Trays \(No Drain Holes\) - 20" x 10" - Perfect Garden Seed Starter Grow Trays: for Seedlings, Indoor Gardening, Growing Microgreens, Wheatgrass & More - Soil or Hydroponic : Plant Germination Trays : Patio, Lawn & Garden](#)

2. A soil potting mix

[Expert Gardener Potting Mix for Indoor & Outdoor Potted Plants, 1 cu ft - Walmart.com](#)

[Miracle-Gro Potting Mix 1 cu. ft., For Use With Container Plants - Walmart.com](#)

[Miracle-Gro® Potting Mix, 2 Cu. Ft. - Runnings](#)

More expensive but recommended by cbd growers - [Amazon.com : FoxFarm Ocean Forest Potting Soil Mix Indoor Outdoor for Garden and Plants | Plant Fertilizer | 12 Quarts | The Hydroponic City Stake : Patio, Lawn & Garden](#)

3. Distilled water – same as the paper method

4. Spray bottle – same as the paper method

[Uineko Plastic Spray Bottle \(4 Pack, 24 Oz, All-Purpose\) Heavy Duty Spraying Bottles Leak Proof Mist Empty Water Bottle for Cleaning Solution Planting Pet with Adjustable Nozzle and Measurements: Amazon.com: Industrial & Scientific](#)

[Clean Living Spray Bottle - 32 oz. - Runnings](#)

[Great Value All Purpose Plastic Spray Bottle, 32 oz. - Walmart.com](#)

5. Labels – something to help you tell apart the trays and varieties.

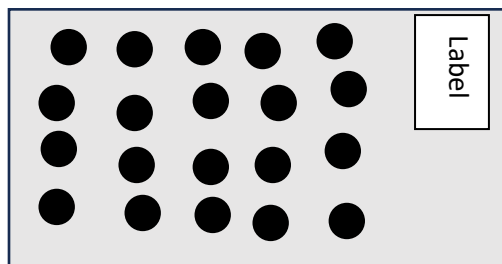
[Amazon.com : Methdic Address Labels 1" x 2-5/8" 900 Labels Sticker Paper for Laser/Ink Jet Printer Mailing Labels 8.5"×11" White 30 per Sheet : Office Products](#)

[Amazon.com: KINGLAKE 100 Pcs 6 x10cm Plastic Plant T-Type Tags Nursery Garden Labels : Patio, Lawn & Garden](#)

[Gardener's Blue Ribbon® T-Shaped White Garden Plant Labels - 6", Pack of 10 - Runnings](#)

Instructions

1. First label your trays.
2. Count your seeds. Same as the towel method, at least 20 seeds per variety.
3. Fill your trays with a layer of soil.
 - a. These trays are not deep, so you are not going to need much. The soil should be about 1-2 inches deep.
4. Get the soil good and wet. You want the soil wet but once again do not drown your seeds.
 - a. This could be done using the spray bottle or if your potting mix is extremely dry you may need to pour in larger amounts of water and work it in with your hands. This is where it can get messy and can take time.
 - b. Make sure the soil is wet all the way through. So, dig in it and make sure there are no dry patches.
5. Place your seeds on top of the soil.
 - a. Once more try placing your seeds in a pattern so that they are easy to count.
 - b. Example layout



6. Place a small layer of soil on top of the seeds and mist it with water from the spray bottle. Just barely cover the seeds with soil.
7. Place the trays in a room with decent lighting at a temperature of 65-70 degrees for 72 hours.
8. Continue to spray the soil for those 72 hours if it starts to dry out.
9. After 72 hours count how many of the seeds germinated to get the germination percentage.

- a. This is the amount of germinated seeds divided by the amount of seeds started with. Then multiply by 100 to get the percent.
- b. Example
 - i. 12 seeds germinated out of 20 started.
 - ii. $(12/20) * 100 = 60\%$

Method 3

The tray method version 2

- This method is the exact same as method 2 but uses trays that are easier for transplanting if you wish to continue growing the plants after the germination test.

- The type of trays used for this test can be –

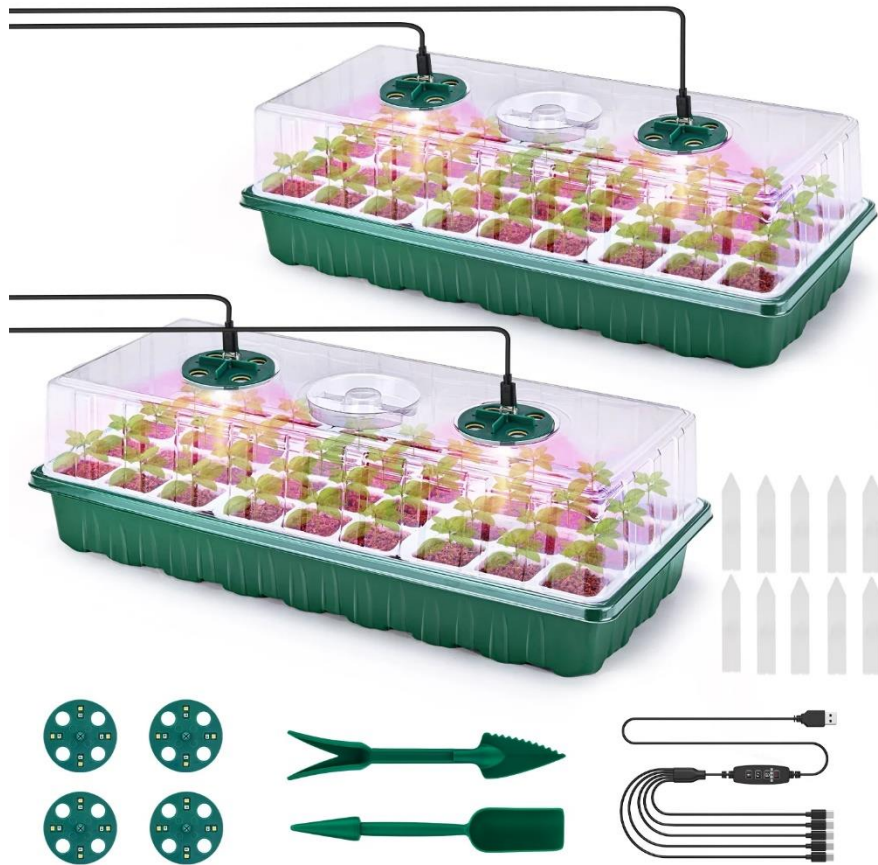
[JIFFY® 72 Cell Seed Starting Greenhouse Kit - Runnings](#)



[JIFFY® Seed Starting Greenhouse Kit with 50 Biodegradable Peat Strip Cells - Runnings](#)



[Seed Starter Tray Seed Starter Kit,60 Cells Reusable Seedling Starter Trays With Flexible Silicone Bottoms And Humidity Domes,Indoor Greenhouse Garden Propagation Set for Seed Starting - Walmart.com](#)

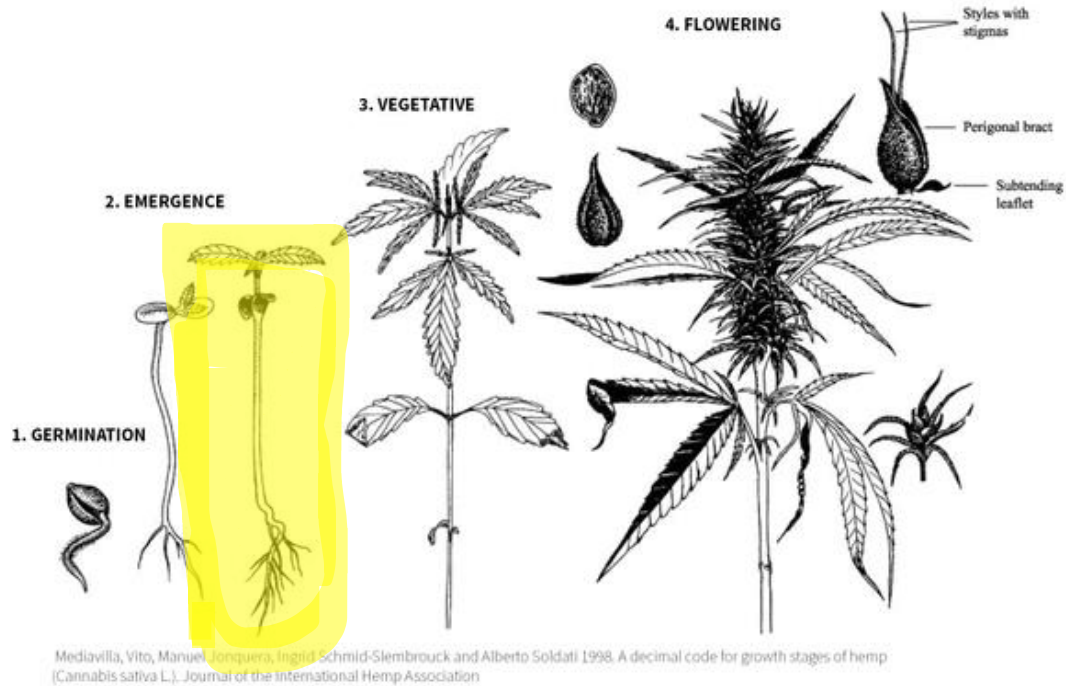


[JeashCHAT Seed Starter Tray with 24 Cells, Plant Starter Kit, Base Mini Greenhouse Germination Kit for Seeds Growing Starting Clearance - Walmart.com](#)



Transplanting your seedlings

- After your germination test you can dispose of your seedlings or if you wish you can try transplanting some of them to continue monitoring their growth.
- If you want to do this, use the last method listed above. The paper towel method and first tray method make it really hard to transplant and increase your risk of injuring your seedling when transplanting.
- After the germination test allow the seedlings to continue to grow in the trays until they have developed true leaves and are less likely for you to damage them.



[How to Grow Hemp for CBD – Chicago Cannabis Company \(chicannaco.com\)](https://chicannaco.com)

- You want your seedlings to be at least to the growth stage highlighted above
- After your seedlings reach that stage, you're going to need some more materials

Materials

1. Larger pots

- Get a pot that will be big enough for the rest of their life cycle, so you do not have to transplant more than once.
- A 1-gallon pot should be sufficient for one plant

[ZEONHAK 25 Pack 1 Gallon Flexible Plant Nursery Pots, Black Plastic Trade Pots, 1 Gallon Flower Pots with Drainage Holes, Holds 4 Quarts - Walmart.com](https://www.walmart.com)



2. More soil

- a. The same type of soil you used for starting the plants just a lot more if it.

3. Humidity

- a. Keeping the pots and plants moist is best for growth.
- b. Using an indoor planting tent/greenhouse will help keep the humidity high.
- c. How many plants you choose to transplant determines how big the tent needs to be.

- i. Examples for a few plants

[ZENSTYLE 4 Tier Mini Greenhouse with PE Cover and Roll-Up Zipper Indoor Outdoor - Walmart.com](#)

[ZenSports 3-Tiers 6-Shelves Mini Walk-in Greenhouse, Indoor Outdoor Portable Plant Gardening Canopy, W/ Roll-up Zipper Entry Door, 56" x 28.4"x 75.6", Green - Walmart.com](#) - would be one of my first choices

[Backyard Expressions Mini Greenhouse 4-Tier Growing Rack with Portable Carry Storage Bag - Runnings](#)

[Backyard Expressions Portable Walk in Greenhouse 2-Tier, 8 Shelf Growing Rack with Travel/Storage Bag - Runnings](#)

[Amazon.com : Bstrip Indoor Greenhouse with Grow Lights, 4 Tier 27.2" Lx19.9" Wx61.8" H Mini Greenhouse with Zippered PVC Cover for Seed Starting Trays, Dimmable 2FT 60W Plant Light for Indoor Plant with Timer : Patio, Lawn & Garden](#) – has built in lights

- d. If you do not use an indoor greenhouse, I would recommend keeping a humidifier near the plants.

- i. The larger the humidifier the less often you have to fill it.

- ii. Examples of humidifiers

[Amazon.com: 6L Humidifiers for Bedroom Large Room Home, Cool and Warm for Baby and Plants Mist Top Fill Desk Humidifiers Essential Oil Diffuser, Quiet with Adjustable Mist,360°Nozzle-Black : Home & Kitchen](#)

[Amazon.com: Msolok Humidifiers for Bedroom and Home & Baby - 4L Cool Mist Air Humidifiers for Plants, 26db Quiet Top Fill Air Humidifier Lasts Up to 40 Hours, Auto Shut-Off, Super Easy to Fill and Clean : Home & Kitchen](#)
[AIRCARE® Aurora Ultrasonic Humidifier, AUV20AWHT - Runnings](#)

4. Lights

- a. For the germination test lighting is not as important as moisture and temperature but if you wish to continue growing your plants you are going to need some grow lights.

- b. Some indoor greenhouse kits may come with lights already. This may be the easiest to set up.
- c. Plants grow best in red and blue lights.
 - i. Examples of lights

[4-Head LED Grow Light for Indoor Plants, Plant Light w/ Adjustable Stand \(15"-62"\) & Dual Controllers, Full Spectrum Plant Growing Lights \(Red/Blue/Mix\), 4/8/12H Timer, 10 Brightness & Auto ON/Off - Walmart.com](#)
[Great Value 4-Head Flexible LED Clamp Grow Light, 20W Selectable Spectrum - Walmart.com](#)
[LED Plants Grow Lights, EEEkit 144 LED Grow Light Bulb, 60W E27 Full Spectrum Plant Growing Lamp, Foldable Bulb Plant Grow Ceiling Lights for Indoor Plants, Basement, Shop, Greenhouse Hydroponic - Walmart.com](#)
[Amazon.com: KEELIXIN Grow Lights for Indoor Plants,5 Heads Red Blue White Full Spectrum Plant Light with 15-60" Adjustable Tripod Stand, Indoor Grow Lamp with Remote Control and Auto On/Off Timer Function : Patio, Lawn & Garden](#)

5. Other things you may want/need

- a. Fertilizer – hemp is a large faster growing plant that needs energy. Most soil potting mixes have a good amount of fertilizer to start with but as growth continues you may need to add more.
 - i. [Miracle-Gro® Water Soluble All Purpose Plant Food, 10 lbs. - Runnings](#)
[Miracle-Gro® Performance Organics™ All Purpose Plant Nutrition Granules 1.75 lbs. - Runnings](#)
- b. If you are worried about over/under watering your plants a soil moisture probe is a cheap easy to use tool.
 - i. [AgraTronix™ 4-in-1 Soil Tester - Runnings](#)
[Amazon.com: SONKIR Soil pH Meter, MS02 3-in-1 Soil Moisture/Light/pH Tester Gardening Tool Kits for Plant Care, Great for Garden, Lawn, Farm, Indoor & Outdoor Use \(Green\) : Patio, Lawn & Garden](#)
- c. A watering can – at this point you will probably want something bigger than a spray bottle to water your plants.
- d. If your plants start to fall over, you may want to stake them, so they stay upright.
 - i. [Amazon.com : NANOPRETTY Garden Stakes 4FT Tomato Stakes for Outdoor Plant Support, 0.43 inch Diameter Plant Stake Sticks for Beans Potted Climbing Plants Gardening Supplies 20 Pack : Patio, Lawn & Garden](#)
[Amazon.com : Jollybower 25pcs 1/2" D Thicker Heavy Duty Bamboo Stakes, 4FT Plant Stakes, Natural Garden Stakes for Tomato, Bean, Flowers,Trees Potted and Climbing Plant Support : Patio, Lawn & Garden](#)

Instructions

1. Label your pots
 - a. This will help keep track of the varieties.
2. Fill your pots.
 - a. These are much bigger pots so it's going to take longer and a lot more soil.
3. Get the soil wet
 - a. These pots have drainage, (if you buy pots without drainage make sure to put some holes in the bottom) so you are less likely to get the soil too wet and if you do just wait a while before transplanting the seedlings into them.
 - b. If you want, you can get all the soil mixed up and wet in a separate container and then fill the pots. No matter what, expect a bit of a mess.
4. Start transplanting
 - a. Carefully remove the plugs of soil containing the seedling from the starter trays. Squeezing the bottom of the tray and carefully pulling the stem of the seedling to remove them.
 - b. Once removed from the tray dig a hole in the new pot at least an inch deeper than the plug and wide enough for the plug.
 - c. Place the plug into the hole in the new pot and fill in the hole.
 - d. Cover the top of the plug with about an inch of soil.
 - i. Yes, this will bury part of the stem and that is okay.
 - e. Make sure the soil is good and damp.
5. Move your pots into an area where you can set up your lights and humidifier or into an indoor greenhouse that has lights.
6. Continue caring for your plants.
7. You can take basic measurements such as height, number of leaves, number of flowers to compare the varieties to one another as they continue to grow.