



## HOW PLANT SEEDS GERMINATE

The way that seeds germinate is fascinating but unfortunately, most of the time we don't get to see what happens as all the magic occurs under the ground.

Plant seeds differ in size, shape and also their needs but they are all very clever because packaged inside them is everything they need to grow roots and just a couple of leaves before they need to look for food elsewhere.

Seeds that are just sitting in an envelope or on the bench won't germinate because they are missing one thing. Water! Once they are planted in soil and water is added, the outside shell of the seed is softened and it gets the message that it is time to germinate.

Whilst we might think that the stem of the seed will germinate first, in fact, it's the roots that crack their way through the shell first. The tiniest little piece of root forces its way through and then the rest of the root gradually gets larger, opening the hole further.

The reason that the roots grow first is because the seed needs the nutrients that they absorb to have enough energy to grow the stems and leaves next. However, if there is too much fertiliser in the soil when the baby roots are emerging, the fertiliser will actually burn the roots so that they won't grow and then seed won't survive. This is why sensitive seeds are often planted into a seed raising mix which has the tiniest amount of fertiliser in it.

The roots will often have tiny hairs on them which are very important as they increase the surface area that the seed has available to it to soak up all the water and nutrients that it needs. It's a bit like the difference between drying yourself after a shower with a fluffy towel compared with a pillowcase. The hairs on the fluffy towel will soak up a lot more water because they have a huge surface area but the pillowcase doesn't have this and hardly soaks up anything leaving you still dripping wet.

The good news is that once the roots emerge, they start soaking up water immediately and because the seed still has enough nutrients stored inside, it has everything it needs to start growing a young stem and then two tiny leaves called cotyledons or 'seed leaves' grow. It's at this point that the seed would have run out of energy and will need to get nutrients from either the soil or liquid fertiliser so that it can produce the true leaves it needs to grow big and strong.

If at any stage the seed is allowed to dry out even just for a short time once the tiny roots start to emerge, the roots will shrivel up and the seed will die. This is why it is important to check to see whether seeds planted into pots or the garden need watering several times a day, especially in summer, so that they germinate properly.

## GERMINATING SEEDS



**Pumpkin seed germinating.**



**Grass seed germinating.**



**Sunflower seed germinating.**



**Green beans germinating.**



**Tomato seedlings in peat.**



**Green beans emerging from the soil.**