



DO SEEDS NEED SUNLIGHT TO GROW?

We know that all plants need sunlight to live, but do seeds need sunlight to sprout?

YOU WILL NEED

- Broad beans
- 2 glass jars
- Kitchen paper towels
- Water



WHAT YOU DO

Step 1

Dampen a kitchen paper towel and put a small amount of water in a jar.

Step 2

Place the damp kitchen paper towel in the jar, making sure it touches the water, and rest a broad bean on the paper towel.



Step 3

Repeat these steps a second time so you have two jars with kitchen paper towel and a bean in each.

Step 4

Place one jar somewhere where sunlight can reach it (such as a windowsill) and place the other jar in a dark place away from sunlight (such as a cupboard).

Step 5

Check every few days that the paper towels are damp, and compare your beans!

THE SCIENCE BEHIND IT

Both of your broad beans, the one in the sunlight and the one in the dark, should have sprouted. Therefore, this experiment is a great way to prove that seeds do not need sunlight to germinate. For a seed to germinate, which means to start growing, it needs three things. The first is water; seeds are usually dry because this allows them to hibernate, which means that they can wait for a long time for the things they need to start growing. When a seed comes into contact with water the seed coat is able to swell up and break open, and the cells of the seed embryo absorb water to become hydrated. The embryo is a tiny little plant inside the seed and it needs to be moist to „wake up,, from its hibernation and start growing.

Secondly, seeds need oxygen; although plants can take in carbon dioxide and release oxygen for photosynthesis, seeds cannot yet photosynthesise so they only take in oxygen and release carbon dioxide like people and animals do. The cells of the seed then use the oxygen together with sugar stored in the seed to make energy, which is a process called respiration.



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Finally, a seed needs warmth so that the cells can increase their metabolism, which means how quickly the cells work to make the energy and grow. It doesn't matter where the warmth comes from, whether it's from sunlight or the central heating in your house, as long as it is warm enough to start growing. Increased metabolism allows the cells of the seed to make energy and grow quicker; the colder a seed is, the slower it will grow.

The only difference between the two seedlings that you should see is that the one kept in the sunlight will be greener than the one kept in the dark. This is because the seedlings start photosynthesising once they are out of their seed coat. But if you then place the seedling kept in the dark back into the sunlight, it will be as green as the other one after a few days. Both of your seedlings will then have lots chlorophyll, which is the green pigment needed to collect energy from sunlight. The seedlings will then use this energy from the sunlight, along with carbon dioxide in the air and water from rainfall to produce sugar and oxygen by photosynthesising.

Photosynthesis looks like this:

carbon dioxide + water + sunlight → sugar + oxygen

Your seedlings will then use the sugar as food to grow. So there you go - seeds do not need sunlight to germinate, which is useful because they are normally planted in the ground!



Photo Credits

- Bean in a jar: theimaginationtree.com

