

# Seed Investigation

## Introduction

In this investigation my task was to compare different growing conditions and find out which condition the cress seeds grew and germinated best in. These conditions included light intensity and wetness. I am testing these conditions because they are the main sources of energy for the plants we will be using. I know for a fact that the seeds will not germinate without any of these vital conditions, these are: a supply of water, oxygen and temperature. Is very important, but only a little is required. Water will turn the seedlings into an aqueous condition in which enzymes are fully functional. It helps to convert stored starch into sugar and proteins into amino acids. Water is used for transport, it transports nutrients from the soil and from one part of the leaf to another. It expands the newly formed cells and causes the shoot to grow and stay that way. The rate of entry varies with the type of seed. Oxygen is necessary for germination because it is needed for respiration to perform both chemical and mechanical work. It must constantly make new cells and physically drive its roots downward and its shoot upwards. The energy required for this is released as a result of oxidation, which cannot start without a supply of oxygen.

Equation:  $\text{Oxygen} + \text{Glucose} = \text{Carbon dioxide} + \text{Water}$ .

Enzymes are biological catalysts i.e. they speed up reactions. The substance, which the enzyme acts on, is the substrate and the new substance or substances formed as the result of the reaction are the products. Molecules are constantly bumping and moving about into each other. When a substrate molecule bumps into a molecule of the right enzyme, it fits into a depression on the surface of the enzyme molecule. This depression is called an active site. The reaction then takes place and the molecules of product leave the active site. One of the main properties of an enzyme is that they can be destroyed by heat. This is because enzymes, being proteins, are denatured (the shape of the active site changes by heat and the substrate no longer fits).

The plants we will be using are cress; we are using these plants because they grow very fast compared to pot plants, their seeds are very cheap to buy and they do not need much caring for. I plan on doing two different types of experiment, testing how well the cress grows in two different light intensities and how well the cress seeds grow in two different wetnesses, the light conditions include bright light and darkness. While the two different wetnesses are saturated and dry. There is also going to be an extra dish of 20 cress seeds, these seeds will have a normal light intensity and normal wetness, this is the control plant, it will be used to measure against the other cress types in the experiment so we can see how well or how poorly the plants are growing.

I predict that the plant with the least sunlight will not grow well, but it will grow a bit, I expect it to be a yellowy colour, I expect this because the sunlight causes photosynthesis, which means that chlorophyll (the substance which makes plants green) is not created.

### Prediction

<b>Light Intensity</b>	<b>How Well The Plant Grew</b>
Bright	Very Good
Normal	Good
Dark	Poor

<b>Wetness</b>	<b>How Well The Plant Grew</b>
Saturated	Very Good
Normal	Good
Dry	Poor

## Results

<b>Light Intensity</b>	<b>How Well The Plant Grew</b>
Bright	Very Good
Normal	Good
Dark	Poor

<b>Wetness</b>	<b>How Well The Plant Grew</b>
Saturated	Poor
Normal	Good
Dry	Poor

**CONCLUSION:** The seeds in this experiment followed all of my predictions, except the experiment in which I was testing different wetnesses and I predicted that the seed that were going to be saturated would grow excellently. I believe that they grew so poorly because there was not enough oxygen getting to them, if at all, oxygen is needed because it acts like a catalyst increasing respiration and therefore giving the seed more energy. However, my results could have been inaccurate because: The light guard may not have been fitted, fully restricting light from the darkened plant. The results could have been copied wrong since we were not in school 24 hours a day, so we cannot observe seed germination at the right times i.e. after every 8 hours.

The seeds that did not germinate could have been >duds= meaning they could not germinate due to natural causes.

However, my results could have been inaccurate because:

The rubber bungs could have been fitted loosely in which case the solutions could have been contaminated.

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why results are reliable.

If seeds land in a suitable place, they will germinate i.e.: grow into a mature plant. However, no seed will germinate unless certain conditions are present, these are:

A supply of water

Oxygen and

Temperature

Weight of seeds

Height each day

Colour