

## Creating your own study

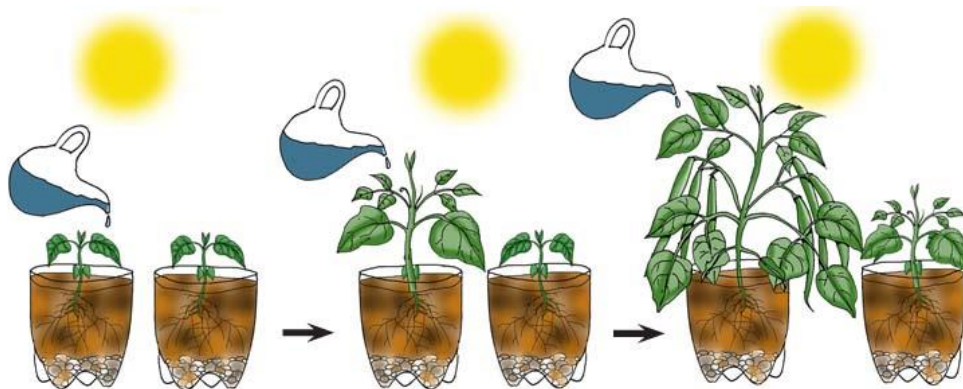
### How does moult change plant growth?



Animals moult. Mammals (including people) shed hair, birds shed feathers, reptiles shed scales. Some animals shed constantly others only at certain times of year - often coinciding with new growth of springtime.

Mammalian hairs and avian feathers evolved from scales. Hair, feathers and scales are all of similar composition in that they contain keratin. They also contain more nitrogen than manure as well as protein and elements like calcium. Animals do not eat feathers or fur, but could it be plants, fungi and algae do?

A scientific test aims to keep everything the same other than the thing you are testing. These are known as variables. A simple experiment you may have seen is controlling the variables of water or light.



We can test if moult helps plants grow in various ways, so we need to make some choices.

**What plant will you be using for your study?**

You could choose an aquatic plant (which grows under water) or terrestrial one (which grows in soil). You want both your plants to be the same type and if possible same size, with the same number of leaves.

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**What type of moult material will you be looking at?**

The easiest way is to use the hair off your own hairbrush! You could instead try feathers or the shed skin from a pet reptile. Whatever you choose, make sure your sample is collected in a safe way, it's not moult if it is still attached to a living thing so only collect shed material.

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**How long will I run my study?**

Plants are slow so you will not see results overnight. The longer you run your study the more changes you might see, though changes will slow and can stop over time. Note down how long you will run your study in days, weeks or months.

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**What variables (other than adding moult to one plant) can you think of which may change how your plants grow?**

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**How will you control variables (make them the same for each plant) so they don't change your result?** When a variable cannot be controlled it should be recorded/noted in case it is causing changes to your result.

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## What equipment will I need?

Your study is as unique as you are but here are some basics to get you started.



You will need at least **two plants** of the same type and size. Many plants produce clones of themselves on stems (which are actually modified roots) called Rhizomes.

This image shows the parent plant on the left and the rhizome connecting the baby plant on the right.

if you use a plant that reproduces this way your sample plants will have the exact same DNA as each other.

If you have chosen an aquatic plant, you will need at least two tanks or plastic containers containing the same amount of water from the same source. These should ideally be the same dimensions (size and shape) though if you are using recycled fishtanks of different sizes that is ok, as you make a note of it and use the same volume of water.

If you were keeping fish in a tank or looking to keep your aquatic plants alive for years you would need filters and inputs to make the water suitable but for this study you will not need a filter. If you do use filters or artificial temperature or light these should be the same for both. Many aquatic plants will float so having some fish tank gravel is useful to hold your plant in place.

If you are using terrestrial plants, you will need containers with compost or a space outside to plant them. As always you want to make sure your plants have the same conditions so that the only difference/variable is your moulting sample.

Whatever plant you choose and whether you are using aquatic fish tanks or potted or outdoor plants the main aim is to study the difference between adding a form of moulting (hair or feathers etc.) to one plant or group of plants and comparing to the others which are the same apart from not having moulting added. That way you can be reasonably certain the added feathers, fur or shedding of choice is the variable causing change.



### Running your study

You may wish to monitor plant growth at set times or just at the end of the study. You may wish to record the growth of stems, leaves or roots or even flowers and fruits depending on your plant. You can also measure the weight of plants at the start and end. Other changes such as water clarity (in aquatic studies) or the formation of algae or fungi in soil can be noted.

In the study of hair and the aquatic plant elodea (shown on the left) two tanks were used. One had no hair. The other tank had two plants, one plant directly on hair and another next to it. This was because the study also wanted to see if plants would grow toward the hair just as plants move toward light, which they did. Perhaps your study will discover something completely new.

### After the study

Once you've completed your study you will have measured data which you can use to produce tables or graphs. Some plants are known as invasive nonnatives. This means they



are growing somewhere they don't normally so no animals eat them and they spread too much. It is very important not to release nonnative plants into the wild for this reason.

Hopefully you will have clear differences in growth and some other interesting observations too. This kind of study can be used in a citizen science style approach all around the world showing how different moult effects different plants.

### **Why is this important?**

Animals all around our planet shed fur, feathers and scales. It seems this has been happening for millions of years but the quiet global cycle of moult has never been officially recognised as a cycle linked to plant growth.



In setting up and running your study you are helping to gather evidence that moult is an important part of plant growth and contributes to soils just as mature and mortality do.

You will be adding to Matter of trust studies such as growing food in the driest place on earth the Atacama Desert, remedying soils with the Presidio trust in San Francisco and

restoring seagrass in Scotland. Hair can reduce the need for watering, pesticides and fertiliser and so much more. If you find this interesting check out our website

<https://matteroftrust.org/>

or see our national Geographic article.

<https://www.nationalgeographic.com/environment/article/recycle-human-hair-oil-spills-fertilizer#:~:text=Your%20hair%20is%20surprisingly%20recyclable,and%20prevent%20water%20from%20evaporating.>

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