

## GCSE Science Coursework

Alternatives:

1. Carry out a suitable experiment to test the hypothesis that a leaf from a desert or semi-desert plant (Xerophyte) (for example , Sedum) loses less water than a temperate climate plant (Mesophyte) (For example, Oak or Geranium).
2. Carry out a suitable experiment to compare the loss of water from the leaves of lowland trees such as Oak, Beech and Sycamore and water loss from the leaves of upland trees such as Rowan, and Scots pine.
3. Compare the growth of cress in water obtained from different sources.

## Skill area 1: Planning

If you do this properly the rest becomes easier!  
To gain the highest marks you must....

“Use detailed scientific knowledge and understanding to plan and communicate an appropriate strategy.”

*Which means.....*

- Write **everything relevant** that you know related to the task, including
  - An understanding of how plants lose water from their leaves.
  - A description of the leaves from the particular plants under investigation including anything you know about their structure or special features for conserving water.
  - An understanding of the conditions which influence water loss in a plant.
  - An understanding of the difficulties of living in a particular habitat
  - An understanding of how you could measure water loss from a leaf

“Identify key factors to vary, control or take into account, and to make a prediction where appropriate.”

*Which means .....*

- Explain what apparatus you need and how you intend to use it.
- What factors in your experiment you will keep the same (to make it a fair test).
- What factor in your experiment you will change to see what effect it is having.
- What measurements you will take including what units you will measure in.
- How many measurements you will take.
- A prediction based on your scientific knowledge and understanding.
  - This should take the form “ I predict that.....because..... ”
- A sketch graph of the trend of the results you are about to collect and an explanation of how the trend will relate to your knowledge and understanding.

“taking into account the need to produce precise and reliable evidence,”

*Which means.....*

- Explaining why you have chosen to take a certain number of measurements in a certain way, at particular intervals to ensure that you have sufficient results for reliable evidence.
- Reliable evidence is having enough data to produce a consistent enough trend in your results to suggest that your experiment has been carried out fairly and accurately.

“use relevant information from preliminary work, where appropriate, to inform the plan”

*Which means.....*

- Trying out a pilot experiment to explain the finer details of your method and why you have designed your investigation in a particular way to prove or disprove your hypothesis.

## **Skill area 2: Obtaining Evidence**

“Collect sufficient systematic and accurate evidence and repeat or check where appropriate.”

*Which means.....*

- *Organise the collection of your results to produce a series of recordings from which you can find a trend if there is one.*
- *Repeat recordings for reliability.*

“Record clearly and accurately the evidence collected”

*Which means.....*

- *Draw a proper boxed and labelled table. This can be done on a computer for clarity.*
- *Ensure that correct units are used for any measurements.*

“Use a procedure with precision and skill to obtain and record an appropriate range of reliable evidence”

*Which means.....*

- *If your experiment is carried out fairly and your measurements are accurate then you will see little variability between repeated measurements.*

## **Skill area 3: Analysing Evidence**

“construct and use suitable diagrams, charts, graphs (with lines of best fit, where appropriate), or use numerical methods, to process evidence for a conclusion.”

*Which means.....*

- *Choose the correct format and layout for graphs or charts. These should be hand drawn.*
- *Data may need to be transformed using calculations – such as percentage change.*

“use detailed scientific knowledge and understanding to explain a valid conclusion drawn from processed evidence.”

*Which means.....*

- *Relate all the research you have done to explain the trend in your results. Is there a predictable trend to your results. Is there a numerical relationship to the results.*

“explain the extent to which the conclusion supports the prediction, if one has been made.”

*Which means.....*

- *Show how well your prediction fits the pattern of your results and what you have understood from that pattern.*

## Skill area 4: Evaluating

This is the toughest area to obtain the highest marks!

“comment on the quality of the evidence, identifying any anomalies”

*Which means.....*

- *Pick out any odd individual results or sets of results and how they affect the trend of the overall set of results*

“comment on the suitability of the procedure and, where appropriate, suggest changes to improve it”

*Which means.....*

- *Pick out any ways in which you could improve how you designed the experiment or collected your evidence.*

“consider critically the reliability of the evidence and whether it is sufficient to support the conclusion, accounting for any anomalies”

*Which means.....*

- *Is your data reliable enough for you to have a lot of faith in your conclusions. Are the odd results “odd enough” to make you doubt the overall pattern or are they just measurement errors or due to poorly set up equipment.*

“describe, in detail, further work to provide additional relevant evidence”

*Which means.....*

- *Describe another experiment which you could set up to back up your evidence but not necessarily repeat it.*