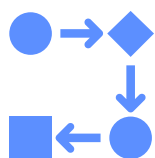




## WHY DO WE WRITE A METHODS SECTION?



The purpose of the methods section is twofold: to detail, with rationale, how you tested your hypothesis, and to provide the procedural details in such a way that it is reproducible by others. You should describe the procedure with enough detail that others can replicate it should they wish to verify your results or use the same method in their own research.

This means it is vital that you understand both **what** you have done and **why** you have made these choices. The procedure is often part of the assignment or laboratory instructions, but it is important to understand the purpose of these instructions. Making a connection between the steps taken and the aims or hypothesis can help you to understand the methodology.

When planning the methods section, there are three main questions to consider:

1. What level of detail is required?
2. What is the rationale for the procedure undertaken?
3. What were the parameters controlled during the experiment?

It may be sufficient to reference a common procedure that has been outlined in a lab manual or course book without rewriting it, but this is discipline specific. Check for specific requirements in your assignment instructions and rubric or ask your marker for clarification. If this is the case, reference the methods used and be sure to include any changes made during your experiment.

[SEE THE REFERENCING GUIDES FOR MORE](#)

## WHAT'S INCLUDED IN A METHODS SECTION?

While the methods section needs to provide enough detail for the reader to replicate the procedure, it does not contain any results. You can mention that you recorded the results at given time intervals or that you recorded them in a table, but do not include the table in the methods: save this for the results section. Include:

- Materials, subjects, and equipment used, including chemicals and experimental apparatus
- Steps taken in chronological order
- Assumptions made during the process if relevant to the results obtained



### LEVEL OF DETAIL



It can be difficult to decide whether or not to include particular details so consider the **purpose** of the methods section: to provide enough information for the experiment to be replicated. Only include only steps and details which, if changed, may impact meaningful data collection or the results.

For example, if altering the length of time a solution is heated for is likely to change the outcome, this detail must be included. However, if changing the size or shape of something *will not* impact the results, then this generally will not need to be included.

### RATIONALE

An experimental procedure is designed with the aim of testing the hypothesis and thus every step serves a purpose. Generally, this details the considerations made when designing the experiment. When detailing each step, consider *why* you have chosen (or been instructed) to do it that way and not differently. This demonstrates your understanding of the experiment and shows your reader that you were not just blindly following the manual.



## CONTROLS

Testing a hypothesis is generally done by manipulating variables. In order to test the impact of changing these variables, at least one control is used. These controls undergo the same method processes as all other samples, but the independent variable is not changed. This shows the impact that altering the independent variable has on the dependent variable, and acts as a point of comparison for all other samples.

For example, if you are investigating the impact of fertiliser type (independent variable) on the rate of plant growth (dependent variable), your control will be a plant grown in soil without fertiliser. It is important that you include the details of the control(s) used as well as the rationale behind this.

## STRUCTURE

Structure is particularly important as a high level of organisation will help to fulfil the purpose of the methods section. Below are a few tips to help create a clearly structured, reproducible methods section.

### KEEP THE STEPS IN CHRONOLOGICAL ORDER

You can think of the methods section like writing a recipe. If the oven needs to be hot when the cake is placed inside, it will need to be pre-heated. The first step of the process is then to turn on the oven, even if the oven is used in the last step of the cake making process.

### USE SUBHEADINGS

The use of subheadings in reports is common and often helpful in clearly separating sections. It may make sense to provide a separate list of required materials or to separate section of the method if it is particularly complex.

## LANGUAGE & TONE

It is important for scientific writing to remain clear, precise, and free from ambiguity so that others can understand and replicate the research. Consider the following stylistic elements ensure clarity and precision:

### TENSE USE

Refer to the data and procedures in the past tense because you have already conducted the experiment. For example:

**'increased'** instead of **'increase'**; **'had'** rather than **'has'**

### IMPERSONAL TONE AND VOICE

To keep your language formal and impersonal, write in the third person and use the passive voice when describing procedures and actions.

#### First person, active voice:

I stirred the solution until the precipitate formed.

#### Third person, passive voice:

The solution was stirred until the precipitate formed.

[SEE THE GUIDE ON WRITING STYLE](#)