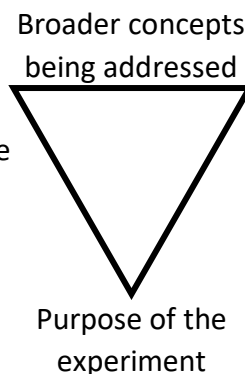


## Introduction

An introduction is used in scientific writing to provide intellectual context, state the significance of the experimental problem, and summarizing previous research done on the subject.

- Collect references before writing your introduction
- Take notes on the references you find
- Write your introduction first – it will help you understand the significance behind your research in the first place,



## Materials and Methods

The purpose of a material and methods section is to describe the steps you took in your experiment in order to achieve your results. The materials and methods section will be the most technical (and therefore easiest) section to write, so write your materials and methods early on.

- Assume your readers are familiar with common procedures, such as running a GEL or using a centrifuge.
- Include the concentrations of reagents used, the brand names of any software products or field tools used, and the settings used on any lab equipment used (EX, 1500 RMP).

Some materials and methods sections use subheadings to isolate different experiments preformed. This is an organizational tool many scientists use when writing their materials and methods section.

## Results

The results section describes the direct outcome of your experiment and includes any important values, tables, and figures. DO NOT INTERPERT YOUR RESULTS HERE.

A great results section includes the following:

1. *What's the reason?* Provide the reader with the *reasoning* behind doing your experiments. Ex.) In order to test the viability of [...] Ex) To determine the keratinocyte rate of proliferation, [...]
2. *What did you do?* Ex) A Western blot was preformed and [...]
3. *What did you see?* Refer to tables and figures Ex) Figure 2 shows the prominent fluorescence [...]

## Discussion

The purpose of a discussion is to tell the reader what your results mean. You will interpret your results and describe what they mean for the scientific community.

- What are the next steps/procedures for this scientific issue? How does this relate to the greater scientific issue (Big Picture)?

## CSUSM Writing Center Writing in the Sciences

### Let's talk about science writing

So what is science writing, you ask? Well, essentially there are two types. The first is writing about scientific subject matter. Maybe you have a report for BIOL 211 on sexual dimorphism in the animal kingdom. This type of report is going to be descriptive and factual, giving information using relevant scientific terms. The second type is writing in the context of science – where you are describing your observations and results of an experimental or non-experimental study. Where both types of writing interconnect is the way they are written – they hold a formal tone with a level of technicality. Technical writing presents information in an objective, factual tone.

### About Technical Writing

The way scientist achieve a level of technicality in their papers is through the use of language, voice, and tone. You will need to use highly factual language and typically lean towards passive voice over active voice.

**ACTIVE VOICE:** “I weighed the reagent and centrifuged it for fifteen minutes.”

**PASSIVE VOICE:** “The reagent was weighed and centrifuged for fifteen minutes.”

- Passive voice is more appropriate since it shifts the focus from the *scientist* to the *experiment*.

### The Format of a Scientific Paper

Typically, a scientific paper is composed of multiple parts describing an experiment or study. A science paper usually includes:

- Title
- Abstract
- Introduction
- Materials and Methods
- Results
- Discussion

#### Title

Your title should minimally describe your research and tell the reader your result(s) in an interesting way.

**Good title:** Genome-wide screening of aberrant DNA methylations is associated with gene expression in mouse skin cancers

**Bad Title:** Unusual DNA causes skin cancer

#### Abstract

The purpose of an abstract is to extract the most important in your paper and present it to potential readers in a clear and concise way. Remember, the abstract is often times the first thing potential researchers look at (besides the title), so it has to be good!

A great abstract explains:

- 1) The experimental topic/issue
- 2) How the experiment(s) was/were done
- 3) What the key observations were
- 4) What the observations mean