Writing an abstract

The purpose of an abstract is to describe the entire project in one or two short paragraphs. Abstracts are required for all projects and the ability to condense information is a lifelong skill which can be applied to many situations.

An abstract must contain the following:

- What was done (i.e. the purpose of the experiment)
- How it was done (the basic method used)
- The basic conclusion reached

Usually, these points are covered in one sentence each. Examples are provided for each below.

What was done:

Often one sentence is enough to tell the reader what the experiment was about.

"The efficiency of various procedures for a robot to find its own way out of a maze was investigated"

"This study tries to link the ability of a person to remember a list of words to the size of those words"

"In this experiment, batteries were made from various fruits and vegetables to find which one produces the highest voltage and current"

How it was done:

This is the basic method for the experiment and tells the reader how the experiment was done. Since the abstract does not intend to outline everything about the experiment it does not contain a lot of details – just enough to tell the story.

"A robot was built using Lego Mindstorms and various patterns were programmed to determine the fastest way to exit a maze consisting of several turns"

"Participants in the survey were shown a page of ten words, given one minute to memorize them, then asked to repeat them a day later"

"Several fruits and vegetables were used in making the battery including apples, lemons, and potatoes".

If, for example, chemicals were used or the experiment used humans in any way, including surveys, these must be outlined in the abstract here.

The basic conclusion:

Again, keep it short and just tell the reader the main conclusion.

"A procedure where the robot always takes the first right turn, turning 180-degrees at a dead-end was found to be the fastest way to go through a maze"

"The rate at which participants remember depends on the number of syllables - words with more than two syllables were remembered only 32% of the time while one syllable words were remembered 74% of the time"

"The potato produced the highest voltage of all fruits and vegetables tried for the battery".

How well an abstract is written (the level) depends on how well this information is presented. A few examples below outline this for a simple experiment in which a "lemon battery" is built from various fruits and vegetables in order to determine which one works the best.

Level 1:

> The Potato Battery
>
> We tried to make a battery from fruits and vegetables to find the best one. Potato was the best.

Why is this a level-1? The abstract says *nothing* about how the battery was built (the method), no hypothesis is presented, nothing is said about how the output from the battery was measured (again, the method) , and a conclusion is made without saying why (i.e. how did the experimenter even define "best" in the first place ? Did we go by taste ?). It is unacceptable.

Level 2:

> The Potato Battery
>
> We tried to make a battery from fruits and vegetables to find the best one. We built batteries using each, measured the output of each, and found the potato was the best.

This improved version says a bit more about the experiment but still not enough.

Level 3:

The Potato Battery

We tried to make batteries from fruits and vegetables to find the one with the best output. The hypothesis is that the lemon battery will produce the most output. To measure output we used a digital multimeter to measure voltage produced by each. The potato produced the highest voltage.

What is better about a level-3 over a level-2? First off, a hypothesis is included. Second, a description is included regarding what VARIABLE was measured: in this case output voltage of the battery. Previous versions did not define the measured parameter, this one does and this is the biggest improvement. This is an acceptable abstract.

What is missing here? Details on the experimental method (how each battery was constructed – was it the same for each battery?). Details are missing about which fruits/vegetables were tried and no real numerical results are presented to show what the "best" battery produced.

Level 4:

The Potato Battery

In this experiment, batteries were made from various fruits and vegetables to find which one produces the highest voltage and current. It was hypothesized that the lemon will produce the most output. For all fruits and vegetables tried, the battery plates were the same: one copper and one zinc. Battery voltage and current was measured using a digital multimeter. Fruits and vegetables tried include lemon, apple, orange, and potato. Surprisingly, the potato produced both the highest voltage (0.751 volts) and current (2.34 milliamps). The high output from the potato may be due to the fact that while the other fruits are acidic, potato is alkaline.

This improved version describes everything about the experiment. Note that while it is descriptive, it does not present all "raw" data but only the key data of the conclusion (i.e. what the "best" battery actually produced). Another improvement is use of two observed variables (current and voltage) instead of just one.