

## Materials and Procedure

What type of supplies and equipment will you need to complete your science fair project? By making a complete list ahead of time, you can make sure that you have everything on hand when you need it. Some items may take time to obtain, so making a materials list in advance represents good planning!

Make the materials list as specific as possible, and be sure you can get everything you need **BEFORE** you start your science fair project.

<b>A Good Materials List Is Very Specific</b>	<b>A Bad Materials List</b>
500 ml of de-ionized water	Water
Stopwatch with 0.1 sec accuracy	Clock
AA alkaline battery	Battery

### **Materials List Checklist**

<b>What Makes a Good Materials List?</b>	<b>For a Good Materials List, You Should Answer "Yes" to Every Question</b>
Have you listed all necessary materials?	Yes / No
Have you described the materials in sufficient detail?	Yes / No

### Procedure

**Write the experimental procedure like a step-by-step recipe for your science experiment. A good procedure is so detailed and complete that it lets someone else duplicate your experiment exactly!**

**Repeating a science experiment is an important step to verify that your results are consistent and not just an accident; therefore multiple trials are imperative!**

If you are doing something like growing plants, then you should do the experiment on at least three plants per experimental group.

If you are doing an experiment that involves testing or surveying different groups, you won't need to repeat the experiment three times, but you will need to test or survey a sufficient number of participants to insure that your results are reliable. You will almost always need many more than three participants!

## Key Elements of the Experimental Procedure

- Description and size of all experimental and control groups, as applicable.
- A step-by-step list of everything you must do to perform your experiment. Think about all the steps that you will need to go through to complete your experiment, and record **exactly** what will need to be done in each step.
- The experimental procedure must tell **how** you will change your one and only independent variable and **how** you will measure that change.
- The experimental procedure must explain **how** you will measure the resulting change in the dependent variable.
- If applicable, the experimental procedure should explain how the controlled variables (constants) will be maintained at a constant value.
- The experimental procedure should specify how many times you intend to repeat your experiment, so that you can verify that your results are reproducible.
- A good experimental procedure enables someone else to duplicate your experiment exactly!

## Experimental Procedure Checklist

What Makes a Good Experimental Procedure?	For a Good Experimental Procedure, You Should Answer "Yes" to Every Question
Have you included a description and size for all experimental and control groups?	Yes / No
Have you included a step-by-step list of all procedures?	Yes / No
Have you described how to the change independent variable and how to measure that change?	Yes / No
Have you explained how to measure the resulting change in the dependent variable or variables?	Yes / No
Have you explained how the controlled variables will be maintained at a constant value?	Yes / No
Have you specified how many times you intend to repeat the experiment (should be at least three times), and is that number of repetitions sufficient to give you reliable data?	Yes / No
The ultimate test: Can another individual duplicate the experiment based on the experimental procedure you have written?	Yes / No