

Designing Experiments

SNC2D

The Problem or Question that prompts an experiment should question the _____
between variables. It should be _____.

For example:

NO: "What affects the rate of a chemical reaction?"

YES: _____

The Hypothesis should then state the believed relationship between the variables in the Problem.

Hypothesis: _____

A **variable** is _____.

Most experiments change only two:

- the **independent variable**, which is the one changed _____
- the dependent variable, which is the one for which the experimenter measures _____

For the Problem above:

What is the independent variable? _____

What is the dependent variable? _____

All other variables are _____ and are known as _____ because they do not change.

What would need to be kept the same each time when measuring the time for the reaction?



These values of these constants need to be specified when the procedure is written.

To see significant changes in the dependent variable, the independent variable must be changed significantly during the experiment.

E.g., the experimenter might use concentrations of _____

you should choose at least _____ values with _____
difference between the largest and smallest

Why should the changes be large?

Not only because you want to _____ but also because you
don't want the _____ in your measurements to be larger than any changes.

And all measurements will have some experimental uncertainty or "experimental error."

Experimental errors are NOT _____ and NOT _____.

When asked for sources of experimental error, NEVER put "we might have measured the time wrong."
Measuring something "wrong" is NOT experimental error.

Experimental errors are _____ of measurements.

E.g. _____ when measuring something with a stopwatch

We expect our measurements, even if they are a little off because of error, will be _____

_____ about the actual value, which is why we do _____

of any measurement and _____ the results.

(Sometimes we may use a _____ of data.)

THE SCIENTIFIC METHOD... FOR TEN-YEAR OLDS

