



Name _____

The Experimental Stage: Designing an Experiment & Collecting Data

SAFETY: Use care handling the tubes; they will break!

Background Information: One way to investigate an answer to a question is by doing an EXPERIMENT. A true experiment involves VARIABLES.

In an experiment, scientists ask a question [called a RESEARCH QUESTION] about how one variable [called the INDEPENDENT / MANIPULATED VARIABLE] will affect another variable [called the DEPENDENT / RESPONDING VARIABLE.]

Some variables are held CONSTANT - they do not change during the experiment because the scientist controls them. These are called CONTROLLED VARIABLES.

Usually a HYPOTHESIS is made; this is an educated guess about how the independent variable will affect the dependent variable.

Then a PROCEDURE is developed to test the hypothesis.

The experiment must be REPEATED SEVERAL TIMES to be confident in the accuracy of the results.

The results [called DATA] of the experiment are recorded. A TABLE is used to collect the quantitative data.

Given this research question: Does the angle of the tube affect the time it takes the bubble to move from end of the tube to the other?

Design an experimental investigation to help you answer the question. Use the graphic organizer to help plan what you are going to do.

Remember to:

Identify all of your variables:
Independent / manipulated

Dependent / responding

Controlled / constants

Steps (What needs to be done)	Details (Materials, how much, how often, when, time, temperature)
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Creating a way to collect data:

Data gathered during an experimental investigation must be collected in some organized manner. A DATA TABLE or DATA CHART is usually used. The data table is frequently designed as part of the experimental design. Charts are lists of information; they may also be diagrams or pictures. Tables are numerical displays in columns and rows.

Quality tables and charts have a title. The title describes exactly what the data in the table or chart refers to.

Tables and charts include the variables and units of measurement. The units of measurement are put in parenthesis. They are always metric units.

The data table includes the REDUCED DATA - averages, percents, frequencies, range or other MEASURES OF CENTRAL TENDENCY. The reduced data is frequently GRAPHED so that PATTERNS, TRENDS, and RELATIONSHIPS can be seen.

Design a data table to record your observations: