



Name _____

Scientific Cents Designing an Investigation & Collecting Data

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 about how one variable [called the **INDEPENDENT VARIABLE**] will affect another variable [called the **DEPENDENT VARIABLE**.] Some variables are held **CONSTANT** - they do not change during the experiment; these are called **CONTROLLED VARIABLES**.

Usually a **HYPOTHESIS** is made; this is a prediction 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, frequently in a **TABLE**, and then analyzed.

Given this research question: Does the amount of soap in a soap and water mixture affect how much of the liquid can be held on a penny?

1. Identify the independent variable in this question.

2. Identify the dependent variable in this question.

3. Identify at least 3 *controlled variables* for this question.

Given these materials:

1 penny	1 container of pure water	1 container of 1:3 soap water mixture
1 container of 1:1 soap water mixture	Paper towels	Tweezers
Large beaker of water		

Write a procedure to test your hypothesis; use the graphic organizer to help you plan what to do.

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.	

Background Information: 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; they are usually used in descriptive research. **Tables** are numerical displays in columns and rows; they are usually used in experimental research.

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, or other **MEASURES OF CENTRAL TENDENCY**.

Design a data table to record your observations: