

Name:

Teacher:

Course:

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Planning an Investigation

As Winslow High School is undergoing construction, the school board is wondering how a new type of concrete may change over time due to processes of chemical and physical weathering. In order to help gather information on this topic they have provided you with a 1 foot cube block of concrete to test. You must choose **ONE TYPE OF WEATHERING FROM Classwork 1.3 Weathering Notes and design an investigation about how your chosen weathering process changes the concrete block.**

Using the steps below, complete the graphic organizer.

Research Question	
Cause	Identify the Independent Variable (What did you change?)
	Identify the Dependent Variable (What did you measure?)
Hypothesis	
Sketch / describe and label the Design an experiment with a control or constants and variable	
List Constants	

Step 1 Developing a Question

What 2 scientific questions “popped” into your mind as you read the scenario above? Remember that your question should result in **specific and measurable data**. *Hint: Think “What happens to X (independent variable) when I change Y (dependent variable)?”*

1)

2)

From the 2 questions you developed above, **CHOOSE ONE** to plan your investigation around. Copy and paste this question into the “**Research Question**” box of you graphic organizer.

Step 2 Identifying Variables

In order to answer the question you have chosen, what data will need to be collected? What tools will you need to collect that data? What units would that data be recorded in (seconds, centimeters, milliliters, grams, etc)? Summarize each of those answers in the “**Dependent Variable**” box of the graphic organizer.

In order to cause a change in whatever it is you will be measuring, what will have to be manipulated by you, the experimenter. Remember that whatever you are changing must be experienced at varied levels. For example, 3 trials with increasing amounts of a substance or 3 trials with decreasing amounts of time. How can you manipulate the experiment to find an answer to your question? Summarize each of those answers in the “**Independent Variable**” box of the graphic organizer.

During an experiment you need to make sure that the only thing changing your dependent variable is the independent variable. What outside factors could change your dependent variable, how can you make sure they will not interfere? Summarize each of those answers in the “**Constants**” box of the graphic organizer.

Step 3 Developing a Hypothesis

Now that you have an idea of what might cause a measurable change in your experiment, what do you think the outcome will be? How will the independent variable effect the change in your dependent variable? Copy and paste your answer to this question in the “**Hypothesis**” box of the graphic organizer.

Step 4 Create a Materials List

Based on your research question and variables, choose which materials would be necessary to conduct your experiment. Feel free to add materials that are not listed.

<div>Materials Available (not all need to be used)</div> <ul style="list-style-type: none">● Copper squares	
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- Beakers
- Salt
- Vinegar
- Water
- Tweezers
- Scale
- Teaspoon
- Marker
- Cardboard
- Hotplate
- Heat Lamp
- RainMaker (mimics raining)
- Sandpaper
- Electrical Fans
- Sand

Step 5 Develop a Procedure

Using the list of materials above create a step by step procedure **ANYONE** can follow in order to conduct the experiment you intended to be performed.

Step #	Detailed description of step.

Using the materials list and your step by step procedure, sketch what your experiment would look like in the **“Sketch / describe and label”** box of the graphic organizer below.

Step 6 Preparing to Collect Data

Remember that you **ARE NOT ACTUALLY CONDUCTING** this experiment. However, this is to assess your ability on planning an investigation, which includes the process of collecting data for analysis. Therefore, complete the drawing below as follows....

In box 1 → Repeat the question you intended to answer while conducting your experiment.

In box 2 → Design a blank data table with properly labeled columns and rows. The table **WILL NOT** contain any actual data because you did not conduct the experiment.

In box 3 → Choose which graph would be best for the experiment you planned above.

In box 4 → Create a graph with properly labeled x and y axis. The graph **WILL NOT** contain any actual data because you did not conduct the experiment.

Analyzing and Interpreting Data

1

Identify the

Research Question

2

Record the

Data

4

Representation

3

How will you represent the data?

