EXPERIMENTAL DESIGN

Design an experiment to test the ammonia levels in various water samples.

What types of water sources will you be testing in your experiment?

Experimental Question: "Which water source will have the highest levels of Ammonia?"

Please complete the following information on the experimental design sheet:

Hypothesis:

The hypothesis is a statement that answers the experimental question. This is often described as an educated guess and draws from background information that students might have. This should be a complete sentence that contains no explanation for their response.

Example: "The pond water will have higher levels of Ammonia than spring water and river water."

Independent Variable:

The independent variable is the factor that can be varied or manipulated in an experiment to determine if it impacts the dependent variable.

Dependent Variable:

The dependent variable is what is measured in the experiment and what is affected by the experiment. It is set up in the experiment to depend on the independent variable. However, sometimes the dependent variable may not be impacted by the independent variable when the experiment is carried out.

Example: In this experiment the Ammonia levels are the dependent variables.

Control Variables:

Control variables are the factors that should remain constant in the experiment to ensure they are not impacting the results of the experiment and especially the dependent variable.

Example: In this experiment students should keep the following factors constant for all three water sample tests:

1. All water sources should be tested at room temperature.
2. Test kits should be administered to water samples of equal volume.
3. While a new test strip should be used for each water sample all test strips should come from the same test kit.

Students may list other control variables in their experimental design.

Materials Needed:

Students should list out the materials they will need to complete the experiment. This should include:

1. Water samples
2. Ammonia Test Kits
3. Containers to hold water samples
4. Measurement tools for water

These items can vary from school to school based on the materials students have access to. There may be other materials utilized in addition to the ones listed above.

Procedures:

1. Place the same amount of each of the water samples in separate containers.
2. Label each container with the water source that is in it.

Collecting Data: Design a data table to collect the data from the experiment.

The data tables will serve to organize the data students collect on ammonia, levels from the various water sources they test.

Example:

Samples	Ammonia Level
Spring Water	
River Water	
Pond Water	

Results:

Students should describe the results found during the experiment in written form.

Conclusion:

Students should state whether they accept or reject their hypothesis and explain why. They should also try to explain why they feel the water sources had the ammonia levels they did.