**Study of the Water Cycle**

Your purpose in this project is to design a scientific study to determine the effect of a specific human activity on the water cycle. Three human activities have been proposed for your study, and a source for each is suggested below.

Human activities:

1. Humans are drilling into the groundwater basins to extract water for human use – article has been uploaded to Science Resources on the class website – see Earth’s Groundwater.

2. Humans (as a group) consume large amounts of meat in their diets – article has been uploaded to Science Resources on the class website – see Water Footprint.

3. In Brazil humans are burning the Amazon rainforest to clear land for farming – article has been uploaded to Science Resources on the class website – see Amazon forest.

**Project instructions:**

1. With your partner, select a human activity to be the topic of your scientific study.

2. Read the article (and other sources, if necessary). Based on what you know, *AND* what you don’t know, write a research question that your proposed study seeks to answer. (You may write multiple questions, but then you must choose the one that will be the focus of your study.)

3. Identify what the independent and dependent variables in your study will be.

Independent variable:

Dependent variable:

4. With your partner, write a description of the experiment. Your description must include how the independent variable will be changed, and how the dependent variable will be measured. Describe the control condition, if there is one.

5. Write an explanation of the water cycle. Identify evaporation, transpiration, precipitation, condensation, infiltration, groundwater, and surface runoff. Make a prediction about what part of the water cycle is most likely to be affected by the independent variable in your study. Also predict the expected outcomes for your study (for example: no change, increase, or decrease). Explain what each potential outcome would mean in terms of the original research question.

**Format of the Project:**

Your proposed study should be formatted as follows:

1. Introduction – your explanation of the water cycle as background information, followed by an explanation of why the water cycle might be affected by the independent variable you have chosen.

2. Proposed Study – your description of what you want to study (testable question), identifying the independent and dependent variables. Include how the independent variable will be changed and how the dependent variable will be measured.

3. Anticipated Outcome – your prediction of what the possible outcomes will be, and what each of these outcomes mean in terms of the question your study answers. This section should include at least one of the following: a table, a chart, or a figure to support your description.