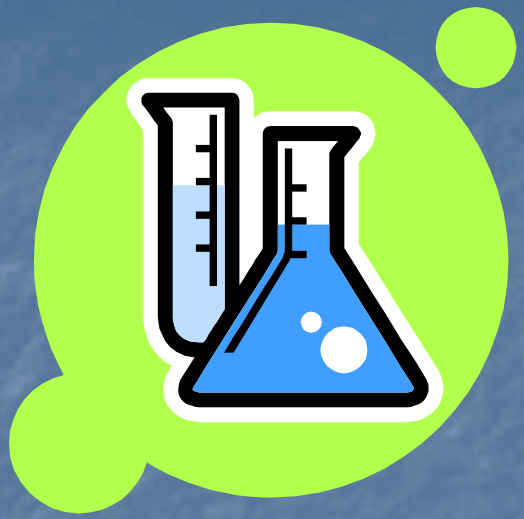


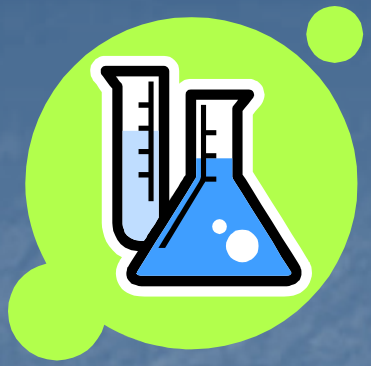
Scientific Processes

Experimental Design Unit

September 5th, 2006

Objectives

- *Construct* hypotheses when given a scientific problem
- *Predict* what would happen given the hypothesis is true
- *Label* the variables in an experiment
- *Design* an experiment to test a given hypothesis

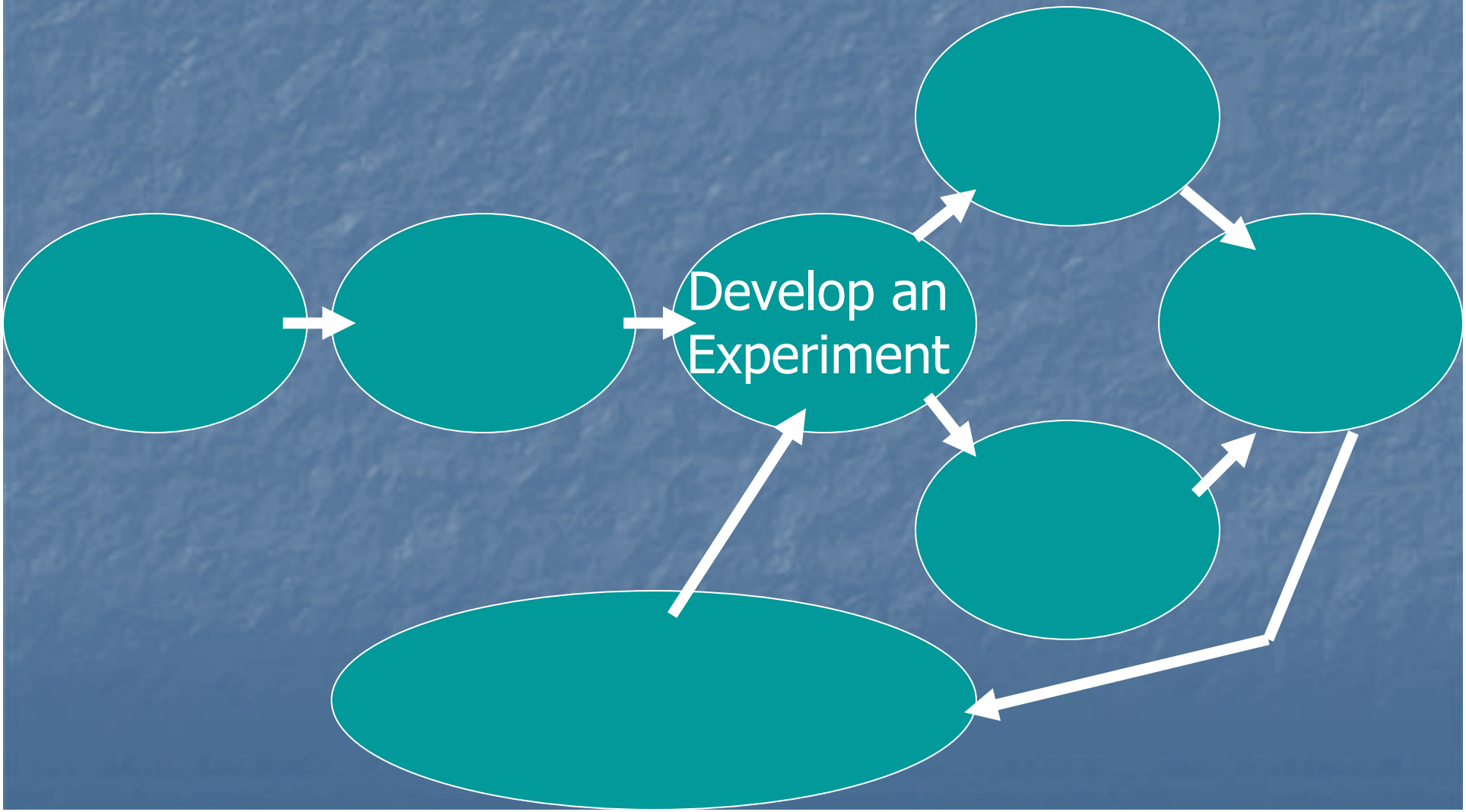


The Scientific Method

Scientific Method: (2 main points)

- Organized, logical approaches to scientific research.
- Not a list of steps, but a guideline for solving problems.

One Scientific Method…

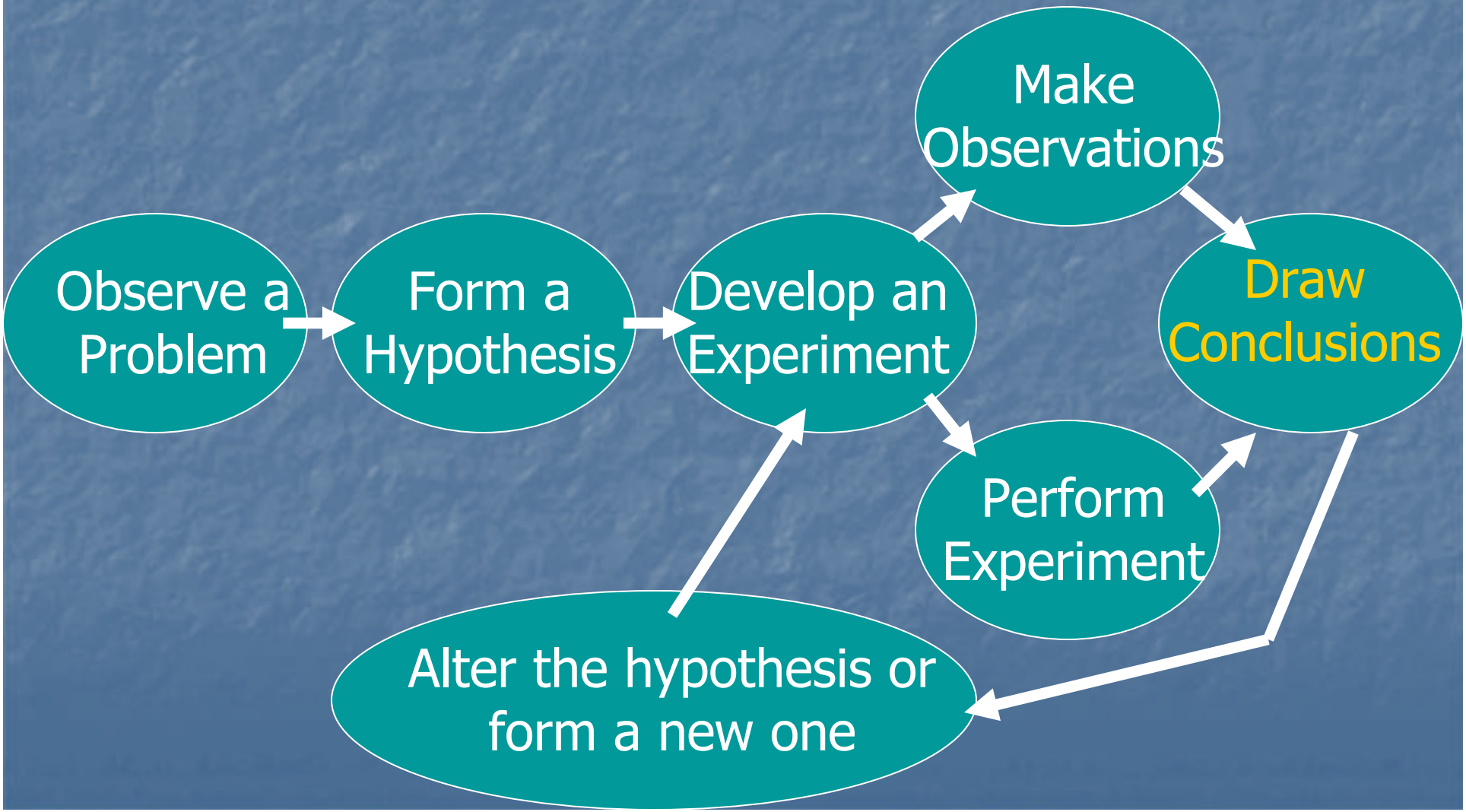


Can you fill in the rest?

Choices:

- Develop an Experiment (already given)
- Make Observations
- Draw Conclusions
- Alter the hypothesis or form a new one
- Form a Hypothesis
- Observe a Problem
- Perform an Experiment

Let's put it all together...



Let's do an Experiment

- Two identical beakers
- Both clear liquid
- One is H20, the other rubbing alcohol
- How can we tell the difference?

Control

Definition: (1 main point)

- Anything that *stays the same* in an experiment

Independent Variable

Definition: (2 main points)

- A variable that determines the value of other variables
- This is the variable that ***you*** *change*.

Dependent Variable

Definition: (3 main points)

- Is changed by the other variable
- This variable is the one *you* ***measure***
- This variable *depends* on the independent variable.

Example…

A student decides to study the affect of caffeine on test performance. Five students drink caffeinated Pepsi and the other five drink caffeine free Pepsi. They all took the same test the next day.

What is the *control?*

The test

What is the *Independent Variable*?

Caffeine or Caffeine Free Pepsi

What is the *Dependent Variable*?

Test Score