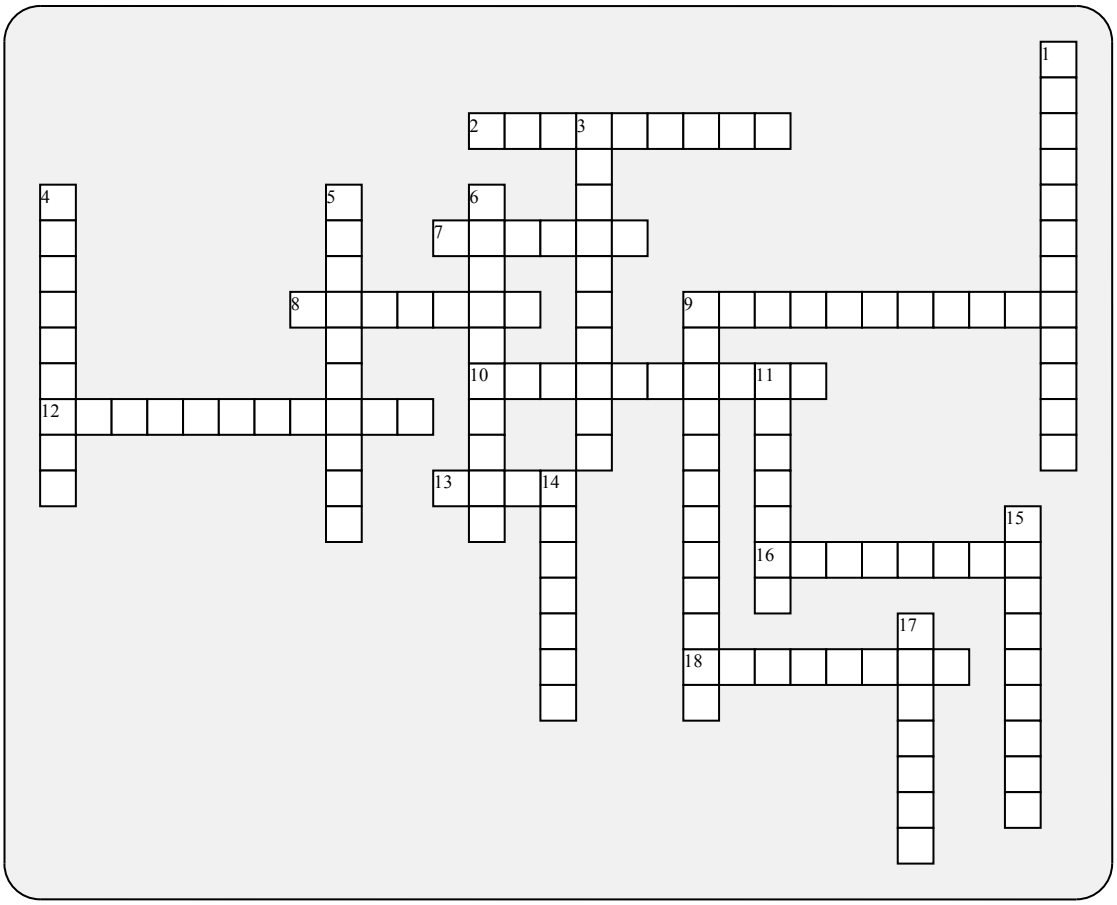
Advanced Biology
Wolkenfeld

Name:_____
Date:_____

The Scientific Method



Across:

2 - The opposite of subjective (based on feelings)
7 - Unlike religion, science is not based upon
8 - The group that is used for comparison
9 - Something that you can describe, but is difficult to express in a numerical way
10 - The results of an experiment should be _____ by teams of scientists anywhere
12 - This kind of variable is the thing you test
13 - A prejudice that makes you see things in a certain way
16 - The information that indicates whether or not something is true
18 - Opposite of a constant. Something that changes.

Down:

1 - This group is exposed to the independent variable
3 - A controlled way of observing that let's you look at one variable at a time
4 - Scientific ideas are not based on a person's status or _____
5 - An educated guess that includes a prediction.
6 - Often, the majority gets it wrong. That's why science is not
9 - Something you can measure or express as a number
11 - Science can't explain everything. It's _____ to the natural world.
14 - Learning about the natural world through observation and experimentation
15 - This kind of variable refers to the results you get
17 - A sugar pill, intended to deceive a patient into thinking that s/he is taking a real medicine

Possible Answers:

authority, belief, bias, control, democratic, dependent, evidence, experiment, experimental, hypothesis, independent, limited, objective, placebo, qualitative, quantitative, repeatable, science, variable

Name: _____ Period: _____ Date: _____

Science and the Scientific Method Review Sheet

We'll have our first quiz tomorrow (Friday, 9/18)
Here are the questions that will be on the quiz.

1. Define science
2. Define experiment
3. Define Independent variable
4. Dependent variable
5. Define experimental group
6. Define control group (and explain its purpose)
7. Compare and contrast the words *hypothesis* and *theory* (and define both)
8. List four things that science is not, and explain why
9. Design an experiment based on a description of a hypothesis.

You can memorize answers to questions 1 – 8 using the table below. If you know 1 – 8 well, you should be able to do 9.

1. Define *science*	Science is knowledge gained through observation and experimentation. This knowledge consists of hypothesis and theories that are based on evidence, and can be tested to see if they're correct.
2. Define *experiment*	An experiment is a procedure designed to test a hypothesis by carefully controlling variables and by trying to observe only one thing at a time.
3. Define *independent variable*	An independent variable is the thing that you're testing in an experiment
4. Dependent variable	The dependent variable is the part of the experiment that changes because of the effect of the independent variable.
5. Define *experimental group*	The experimental group is one of two groups set up during an experiment. The experimental group is exposed to the independent variable.
6. Define *control group*, and explain its purpose	The control group is one of two groups set up during an experiment. The control group is *not* exposed to the independent variable. Its purpose is to see what would happen when the independent variable is absent, and allows for comparison with the experimental group.
7. Contrast *Hypothesis* and *Theory* (define both)	A hypothesis is an idea that needs to be tested. It's a specific, testable prediction. In contrast, a theory is a well established explanation that is supported by a vast body evidence, and is unlikely to be altered by new observations (though that is still possible). Both are scientific ideas, but a theory is a much stronger, well-established idea.
8. List four things that science is not, and explain *why*	Science is not 1) Based on belief (because it's based on evidence) 2) Based on authority (because all scientific ideas have to be proven, no matter how important the person who promotes the idea) 3) Democratic (because a vast majority of people can hold an idea that's wrong. It's about *evidence*, not popularity). 4) Certain (because every scientific idea can be proven wrong as scientists make additional observations)
9. Design an experiment	You can prepare by reviewing to yourself how we tested the hypothesis that plants won't grow in the dark.