

# Biology Notes: Scientific Method

Directions: Fill in the blanks as we cover the topic in the PowerPoint.

Corresponds to textbook pages 13 – 17

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**What is Science?**

- Science: \_\_\_\_\_ that produces information about \_\_\_\_\_ world
- \_\_\_\_\_
- \_\_\_\_\_
- Tools and skills:
  - \_\_\_\_\_
  - \_\_\_\_\_
- Data gathered by the “ \_\_\_\_\_ ”

**Scientific Method:**

- Defined “ Series of \_\_\_\_\_ to collect information or \_\_\_\_\_ problems
- 1) Problem/ \_\_\_\_\_
  - 2) \_\_\_\_\_
  - 3) Experimentation
  - 4) \_\_\_\_\_
  - 5) Conclusion
  - 6) \_\_\_\_\_

**Observation and Hypothesis:**

- 1st step: Problem/ \_\_\_\_\_
  - Example: I seem to \_\_\_\_\_ better when I play relaxing \_\_\_\_\_
- 2nd step: Create \_\_\_\_\_
  - If... \_\_\_\_\_ statement
  - Example: \_\_\_\_\_ there is relaxing music playing, \_\_\_\_\_ I will sleep longer

**3rd Step: Design an Experiment**

Two parts to an experiment

- 1) Control group
  - Receives \_\_\_\_\_ special \_\_\_\_\_
  - Used as \_\_\_\_\_
  - The \_\_\_\_\_ group
- 2) Experimental group
  - Same as control group, but with \_\_\_\_\_ difference
  - Independent variable
    - o The one \_\_\_\_\_ that differs from the \_\_\_\_\_ group
    - o The factor you are \_\_\_\_\_
  - Dependent variable: \_\_\_\_\_ gathered

**Additional Info**

**Practice Example:**

A student wants to know if his new study method is more successful than his traditional study method. For one month, he studies for his classes using his traditional study method. The next month, he studies for his classes using his new study method. At the end, he compares his grades.

Name the control group: \_\_\_\_\_ Independent variable: \_\_\_\_\_

Name the experimental group: \_\_\_\_\_ Dependent variable: \_\_\_\_\_

**Practice Example:**

The city of Los Angeles wants to know if there is a connection between physical fitness and air pollution. Fifty volunteers from the mayor’s office agree to be tested. First, they are asked to ride a stationary bike for 1 hour in a pollution-free air chamber. A week later, the volunteers return and are again asked to ride a stationary bike for 1 hour in a chamber filled with air pollutants common to Los Angeles. Their heart rates are monitored throughout the 1 hour bike rides.

Name the control group: \_\_\_\_\_ Independent variable: \_\_\_\_\_

Name the experimental group: \_\_\_\_\_ Dependent variable: \_\_\_\_\_

***For more practice and to review, view the other examples found within these notes. You can always view/download the examples on the PowerPoint posted on my page on the school website.***

**4th Step: Data Analysis**

- Data from \_\_\_\_\_ group is \_\_\_\_\_ to \_\_\_\_\_ group
- Hypothesis is either \_\_\_\_\_ or \_\_\_\_\_
  - Not “ \_\_\_\_\_ ”

**5th Step: Conclusion**

- Your findings could be \_\_\_\_\_ and \_\_\_\_\_ by others
- \_\_\_\_\_ develops over time
  - Theory = \_\_\_\_\_ standing \_\_\_\_\_
  - Theories and hypotheses \_\_\_\_\_ based on \_\_\_\_\_ information

**Additional Info**

**Review:**

- 1) Place the 5 steps of the scientific method in order, from start to finish, by numbering their order.  
 \_\_\_\_\_ Data analysis, \_\_\_\_\_ Observation, \_\_\_\_\_ Conclusion, \_\_\_\_\_ Experimentation, \_\_\_\_\_ Hypothesis
- 2) In which stage of the scientific method are graphs usually created? \_\_\_\_\_
- 3) In which stage of the scientific method are the two variables identified? \_\_\_\_\_
- 4) Which variable is the difference between the control and experimental group? \_\_\_\_\_
- 5) Which group of an experiment is used for comparison and contains no changes? \_\_\_\_\_
- 6) How many independent variables should exist in a well designed experiment? \_\_\_\_\_
- 7) What is the data collected from the independent variable called? \_\_\_\_\_
- 8) Vocabulary: Science, Scientific method, Hypothesis, Control group, Experimental group, Independent variable, Dependent variable, Theory