Name _____ Date _____ Class _____

Introduction to Life Science

Guide for Reading

- **What skills do scientists use to find answers and solve problems?**
- **What are the general rules of laboratory safety?**

Science is a way of learning about the natural world. The body of knowledge that scientists have is always growing and changing.

Scientific inquiry consists of the diverse ways in which scientists study the natural world. **Some of the skills that scientist use are posing questions, making observations and inferences, developing hypotheses, designing experiments, making measurements and collecting data, drawing conclusions, and communicating.** Usually scientific inquiry begins with posing a question or stating a problem. **Observation** involves using one or more of the senses to gather information and collect data. **Data** are the facts, figures, and other evidence gathered through observations. Often a scientist's observations and data lead to an **inference,** which is an interpretation of an observation based on evidence and prior knowledge. Scientists may then develop a **hypothesis,** a possible explanation for observations or a scientific question. A hypothesis must be testable.

Variables are factors that can change in an experiment. Often a scientist changes one variable to test a hypothesis. This changed variable is called the **manipulated** (or independent) **variable.** A factor that changes *because of* the manipulated variable is a **responding** (or dependent) **variable.** An experiment in which all variables except one remain the same is called a **controlled experiment.**

Scientists collect data by measuring and observing. They use a standard system of measurement called the International System of Units. Data must be organized and interpreted. This leads scientists to draw a conclusion, or sum up what they have learned from the investigation. Finally, scientists communicate their results and conclusions to others. Conclusions often lead to new questions and new experiments.

A **scientific theory** is a well-tested concept that explains a wide range of observations. Sometimes, further testing can prove a scientific theory to be faulty. In this case, scientists either revise or abandon the theory.

A very important part of a scientific experiment is observing safe laboratory practices. **In general, laboratory safety means following instructions and making sure you understand all laboratory procedures before setting to work.**

Life science explores the structures, functions, and interactions of many living things. Branches of life science offer careers such as physician, botanist, marine biologist, emergency medical technician, park ranger, and physical therapist.