1.1 What Is Science?

Science From Curiosity

- How does the process of science start and end?

Science begins with curiosity and often ends with discovery.

In July 1997, the six-wheeled Sojourner rover became the first robot to explore planet Mars. Sojourner was built to answer questions about the nature of Mars.

Science involves asking questions about nature and then finding ways to answer them.
1.1 What Is Science?

**We find scientific answers through data?**

Types of Data:
- Qualitative observations
  - descriptions
- Quantitative observations
  - numerical
- Some questions—for example, how the universe began—cannot be answered by direct observations and measurements but only by other kinds of evidence.

**Science and Technology**

- What is the relationship between science and technology?

Science and technology are interdependent. Advances in one lead to advances in the other.
1.1 What Is Science?

Science and Technology

Science is a system of knowledge and the methods you use to find that knowledge. The goal of science is to expand knowledge.

Technology is the use of knowledge to solve practical problems. The goal of technology is to apply knowledge.

The telephone was invented in 1876. By 1927, it was possible to make a phone call from New York to London. The first mobile telephones, invented during World War II, paved the way for modern cellular phones. At each step, new science was applied to improve the technology of the telephone.
Branches of Science
Natural science is generally divided into three branches: physical science, Earth and space science, and life science.

Natural Science

Physical Science

Earth and Space Science

Life Science

1.1 What Is Science?
Physical science focuses on nonliving things.

- **Chemistry** is the study of the composition, structure, properties, and reactions of matter.

- **Physics** is the study of matter and energy and the interactions between the two through forces and motion.
1.1 What Is Science?

The application of physics and chemistry to the study of Earth is called Earth science.

- **Geology** is the study of the origin, history, structure, and systems of Earth.

- **Astronomy** is the study of the universe beyond Earth.

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**Natural Science**

- **Life Science**
  - Botany
  - Zoology
  - Ecology
  - Genetics
The study of living things is known as **biology**, or life science.

- Biology includes the physics and chemistry of living things, as well as their origin and behavior.

- Biologists study the different ways that organisms grow, survive, and reproduce.

**Interdisciplinary Science**

There is overlap between different areas of science.

- Much of biology involves changes that are part of chemistry
  - Field of Biochemistry

- Much of chemistry is defined by interactions that are part of physics
  - Physical Chemistry or Quantum Chemistry

- Biophysics: applies physics to biology.
The Big Ideas of Physical Science

Space and Time
The universe is both very old and very big.

Matter and Change
A very small amount of the universe is matter. All matter that you are familiar with is made up of building blocks called atoms.

Forces and Motion
Forces cause changes in motion. The laws of physics allow these changes to be calculated exactly.

Energy
Energy exists in many forms. Energy can be transferred from one form or object to another, but it can never be destroyed.
Our Quality of Life

1. Write down 2 or 3 technological devices that make your life easier or more pleasant.

2. Describe how each device’s function was accomplished before its invention.

3. Are there any devices that you can think of an improvement for the future?