

Science of Physics



Images cast by holes between leaves

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Scientific Measurement

Scientists measure EVERYTHING!

How much you know about something is often related to how well you can measure it

Some measurements are direct

[http://www.phy.berkeley.edu/~peter.schroeder/10102/10102-117/10102-117.html](#)

Some measurements are indirect

$$6.02 \times 10^{23}$$

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Scientific Attitude

Physics is the *basic science*.

It's about the nature of basic things such as motion, forces, energy, matter, heat, sound, light, and the insides of atoms.

Chemistry is about how matter is put together,

how atoms combine to form molecules,
and how the molecules combine to make up the many kinds of matter around us.

Biology involves matter that is alive.

Beneath biology is chemistry

Beneath chemistry is physics.

That's why physics is the most basic science.

An understanding of science begins with an understanding of physics.

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Fact

phenomenon about which competent observers who have made a series of observations are in agreement

Hypothesis

reasonable explanation of an observation or experimental result
not fully accepted as factual until tested over and over again by experiment
describes or explains a pattern

Law (Principle)

general hypothesis or statement about the relationship of natural quantities
has been tested over and over again and has not been contradicted

Scientific Method

orderly method for gaining, organizing, and applying new knowledge

Theory

synthesis of a large body of information that encompasses well-tested and verified hypotheses about certain aspects of the natural world

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Which of these is a scientific hypothesis?

- Atoms are the smallest particles of matter that exist.
- Space is permeated with an essence that is undetectable.
- Albert Einstein was the greatest physicist of the twentieth century.

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1. Which of the following are scientific hypotheses?

- a. Chlorophyll makes grass green.
- b. The Earth rotates about its axis because living things need an alternation of light and darkness.
- c. Tides are caused by the moon.
- d. The moon is made of green cheese.
