What is Science?

Science is often thought of as facts, laws, and theories. But it's more than that. It allows us to provide logical explanations of the world around us by using the Scientific Method.

Most scientists make the following assumptions about the natural world:

-we live in a natural world not a _____

-the natural world is mostly structured but also contains some randomness. That is why the natural world is not

always_____.

-humans have the ability to understand the _____

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Our knowledge is _____ and will be modified or grow though research

Science starts from _____ that lead to questions

_____ are evidence gained by the five senses

Frequently scientists use _____ to enhance these senses

As you can imagine, some observations are very difficult to see first hand (size of an atom, the earth is round, objects in space). In some of these cases scientists make indirect observations

and then make an _____ based on those observations.

An _____ is a tentative conclusion based on logic or reasoning.

_____ is scientific knowledge acquired by careful observation and experimentation. This can come from measurements, but can also be a result of generations of knowledge passed down (_____)

In science, a _____ is a general statement, based on empirical data about what happened: it does not explain _____ this happened.

Ex: the _____

This does not explain what gravity is, but it does explain its effects. In this case it can also be expressed as a math equation

$$F = \frac{Gm_1m_2}{r^2}$$

You can't prove that a law_____, but you can prove it to _____

But people also want to know "why?". It is up to a creative scientist to explain why a certain phenomenon takes place.

This explanation is known as _____.

To develop a theory a scientist suggests a possible answer or untested explanation called a _____.

If a theory is not disproven and seems to stand up to rigorous

testing, it may someday become _____.

Remember, not all _____ stand the test of time. Often something that has stood as a law for many years eventually

gets disproven. (Like_____)

The _____ is a way to make sure you are doing sound science. Although specific approaches differ depending on the scientist, most involve:

-asking a _____ question and developing a _____

-designing an _____, making observations and analyzing them

-drawing a _____ based on the evidence,

either proving or disproving the _____

Common science "misunderstandings"

-Science always involves an _____

-Scientific investigation provide_____

-Science is not very _____

-Science can provide the _____

Unfortunately sometimes very unscientific things get passed off as science. Beware of the following:

Religion and History, Pseudoscience, Faulty Science, Hoaxes and Frauds, Urban legends

Science drives the discovery of new technology. Often, the need to measure something in science leads to the creation of

new_____. Also, the discovery of new

_____ sometimes leads to new science.

Finally, science has a general set of rules that all scientists should follow:

-the principle of _____: don't make stuff up, even if it is tempting to do so

-the principle of _____: sloppy measurements lead to sloppy science.

-the principle of_____: you should be free to pursue new ideas and challenge old ideas

-the principle of _____: share your results and welcome constructive criticism

-the principle of _____: don't copy others results without giving credit. Also, don't credit people with work they didn't do.

-the principle of_____: report your results to the public if it has important implications, but make sure it has been thoroughly tested.