

SCIENTIFIC METHOD

The scientific method is a step-by-step procedure which is used to determine the answer to a scientific question. There are six steps involved in the scientific method.

1. Purpose (Problem or Question): The purpose is stated in a clear and concise manner.
2. Hypothesis: The hypothesis is an educated guess which provides a direction to the experimental process. A hypothesis can be proved or disproved.
3. Materials: The materials stated will include all the items that are needed for the experiment.
4. Procedure: The procedure lists a step-by-step explanation of the experimental process with appropriate detail.
5. Results: The results should be written in the form of observations.
6. Conclusion: The conclusion is drawn by looking at the results and comparing them with the problem. The results must be interpreted to answer the question.

What is the importance of the scientific method?

The scientific method allows a scientist to use a logical problem-solving approach to answer a question. If the scientist encounters a problem, or the experiment fails, the scientific method will provide clues or remedies to make logical changes in the experiment. In the past, before the scientific method was employed, experimenters used trial and error. This often led to repetition of experiments, misleading results, and incorrect conclusions.

Another important aspect of the scientific method is that it allows a scientist to repeat or replicate another scientist's experiment. If the experiment cannot be replicated, then the conclusions drawn from the original experiment are suspect and questioned. So the scientific method provides a framework for experiments and conclusions to be replicated.

For example, the recent cold fusion controversy revolved around not being able to replicate experiments or conclusions. One group of scientists claimed they were able to create fusion, a high energy source, at room temperature, which was thought to be impossible. Both the scientific community, as well as the public, were excited about the prospects of this enormous new energy source. However, as other scientists around the nation and the world tried to repeat these experiments, they were unable to do so.