**The scientific method** is an empirical method for acquiring knowledge that has characterized the development of science since at least the 17th century. The scientific method involves careful observation coupled with rigorous scepticism, because cognitive assumptions can distort the interpretation of the observation. Scientific inquiry includes creating a hypothesis through inductive reasoning, testing it through experiments and statistical analysis, and adjusting or discarding the hypothesis based on the results.[1][2][3]

Although procedures vary between fields, the underlying process is often similar. The scientific method involves making conjectures (hypothetical explanations), predicting the logical consequences of hypothesis, then carrying out experiments or empirical observations based on those predictions.[4] A hypothesis is a conjecture based on knowledge obtained while seeking answers to the question. Hypotheses can be very specific or broad but must be falsifiable, implying that it is possible to identify a possible outcome of an experiment or observation that conflicts with predictions deduced from the hypothesis; otherwise, the hypothesis cannot be meaningfully tested.[5]

While the scientific method is often presented as a fixed sequence of steps, it actually represents a set of general principles. Not all steps take place in every scientific inquiry (nor to the same degree), and they are not always in the same order.

**Definition**

**scientific method**

What is the scientific method?

The scientific method is the process of objectively establishing facts through testing and experimentation. The basic process involves making an observation, forming a hypothesis, making a prediction, conducting an experiment and finally analyzing the results. The principals of the scientific method can be applied in many areas, including scientific research, business and technology.

**Steps of the scientific method**

The scientific method uses a series of steps to establish facts or create knowledge. The overall process is well established, but the specifics of each step may change depending on what is being examined and who is performing it. The scientific method can only answer questions that can be proven or disproven through testing.

Make an observation or ask a question. The first step is to observe something that you would like to learn about or ask a question that you would like answered. These can be specific or general. Some examples would be "I observe that our total available network bandwidth drops at noon every weekday" or "How can we increase our website registration numbers?" Taking the time to establish a well-defined question will help you in later steps.

Gather background information. This involves doing research into what is already known about the topic. This can also involve finding if anyone has already asked the same question.

Create a hypothesis. A hypothesis is an explanation for the observation or question. If proven later, it can become a fact. Some examples would be "Our employees watching online videos during lunch is using our internet bandwidth" or "Our website visitors don't see our registration form."

Create a prediction and perform a test. Create a testable prediction based on the hypothesis. The test should establish a noticeable change that can be measured or observed using empirical analysis. It is also important to control for other variables during the test. Some examples would be "If we block video-sharing sites, our available bandwidth will not go down significantly during lunch" or "If we make our registration box bigger, a greater percentage of visitors will register for our website than before the change."

Analyze the results and draw a conclusion. Use the metrics established before the test see if the results match the prediction. For example, "After blocking video-sharing sites, our bandwidth utilization only went down by 10% from before; this is not enough of a change to be the primary cause of the network congestion" or "After increasing the size of the registration box, the percent of sign-ups went from 2% of total page views to 5%, showing that making the box larger results in more registrations."

Share the conclusion or decide what question to ask next: Document the results of your experiment. By sharing the results with others, you also increase the total body of knowledge available. Your experiment may have also led to other questions, or if your hypothesis is disproven you may need to create a new one and test that. For example, "Because user activity is not the cause of excessive bandwidth use, we now suspect that an automated process is running at noon every day."