

UNIVERSITY OF NORTH TEXAS
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Research Design and Geographic Applications
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The Scientific Method, Step-by-Step

The scientific method combines inductive and deductive reasoning to create a comprehensive system for obtaining scientific knowledge. This system is set up to encourage the researcher to self-evaluate their thinking, research design, results, and analysis, all in order to minimize the possibility of emotions and biases having an impact on the conclusions drawn.

In following the scientific method, the researcher progress through a series of procedures designed to help in acquiring dependable and useful information. These procedures can be summarized as a series of steps. Although sometimes some of these steps can be combined, and sometimes certain steps can be emphasized and others minimized, the progression in thinking and doing embodied in the scientific method can be summarized in a detailed form as follows:

1. Formulating and delimiting the problem
2. Thoroughly reviewing the related literature
3. Developing a theoretical framework
4. Formulating hypotheses
5. Selecting a research design
6. Specifying the object or population for study
7. Developing a plan for data collection
8. Conducting a pilot study and making revisions
9. Selecting the sample
10. Collecting the data
11. Preparing the data for analysis
12. Analyzing the data
13. Interpreting the results
14. Sharing the findings with others

The process of the scientific method as outlined above emphasizes neutrality. Even though individual researchers may have their own pet theories that they are eager to prove or disprove, rigorous application of the mind-set underlying the scientific method as outlined above helps to ensure that the impact of individual biases is reduced (even if these can never be truly eliminated).