

Chapter 1 : Steps of the Scientific Method

This concise yet comprehensive guide provides an introduction to the scientific method of inquiry. You will not only learn about the proper conduct of science but also how to recognize and question factors such as pseudoscience, untestable explanations and fallacies.

Carey teaches the scientific method in less than pages. This book is geared for students in upper high school or the college level. It divides the scientific method into three steps, 1 observation of a problem or an anomaly, 2 explaining the phenomenon by creating a theory, and 3 testing the theory. Mr Carey says these are important things to keep in mind when doing these three steps: Step 1, Observation When you are looking for an answer to a problem, and you are observing the problem to find out more about it: Is it just a coincidence? Step 2, Explain Explanations in science are sometimes called hypotheses or theories. Hypotheses are more tentative and narrow in scope, while theories are broader and have a more developed body of evidence, and a law is something well established and almost universal. There are different types of explanations: Step 3, Test A scientific test needs to be 1 verifiable, 2 falsifiable, and have a 3 clear distinction between success and failure. Verifiability means that if the test succeeds, then nothing else but our theory could have explained the success. Falsifiability means that if the test fails, then we can know that our theory was false. Every test needs to have a clear distinction between success and failure. Pseudoscience Pseudoscience often centers around controversial questions, problems, and anomalies that pseudo-scientists raise to our attention. They then advocate a solution that questions the views of mainstream scientists. There is nothing wrong with questioning mainstream science; this is how much advancement has been made. But pseudo-scientists often keep their audience unaware of the extent to which their new theory disagrees with established scientific theory, and how their theory has not been rigorously tested by independent scientists. There are several fallacies that lead to pseudoscience: This is often used in UFO books. All we can conclude is that something odd is happening. Illicit Casual Inferences “Saying that one thing caused another, when there is only a correlation, or post hoc ergo propter hoc. This fallacy ignores that everything could very well be a coincidence. Unsupported Analogies and Similarities “Showing the similarities between one very speculative theory and a different well-established theory in science. This fallacy often ignores many differences between the two things being compared and only emphasizes the similarities. Untestable Explanations “Presenting a theory that, by definition, cannot be tested. The theory may explain every type of evidence in a way that cannot be falsified. Conspiracy theories often use this fallacy. I have to present some independent evidence. Ad Hoc Rescues “Imaginative people can always keep inventing new ideas for explaining away contrary evidence. Every time someone comes forward with a problem for their theory, they invent a new exception to their theory that explains the problem. Conclusion This book provides exercises for each chapter. Some of these exercises are pedantic, but some are interesting and useful. There are not many books teaching the scientific method at a basic level. The section at the end on science fallacies was very clear and relevant, and makes that book worth reading. Copyright June 26, , all rights reserved.

Chapter 2 : A Beginner's Guide to Scientific Method - Ebook pdf and epub

scientific method, it is the simple but profoundly fundamental process wherein new ideas are put to the test-everything from the most rarefied and grand theoretical constructs to the claims of the experimenter to have discovered.

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Chapter 3 : A Beginner's Guide to Scientific Method by Stephen S. Carey

At its most basic level, scientific method is a simple, three-step process by which scientists investigate nature. Begin by carefully observing some aspect of.

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