

Unit 01 Science, Nonscience, and Pseudoscience

What is **science**? What are its goals? What are the characteristics of good science? What areas are suitable for scientific inquiry [Conversely, what areas are unsuitable for scientific inquiry?]? Upon what assumptions does science rest?

What is the **scientific method**? What steps are involved in the scientific method?

How does science differ from, say, religion as a way of knowing [How is scientific truth different from religious truth?]? According to Karl Popper, what is **falsification** [On one hand, we hear of researchers that have falsified their results and we understand that this is A Bad Thing™. On the other hand, we have this dead guy, Popper, who told us that science is only valid if the hypotheses being tested are **falsifiable**. What's up with that?]

What is **Occam's Razor** (variously spelled as **Ockham's Razor**)? What is its significance to scientific explanation?

Why is it said that science can never prove that anything is true? Why is scientific truth said to be **tentative**? How do **hypotheses**, **theories**, and **laws** differ from one another in science? What is meant by each of the following characteristics of good science: **verifiable (repeatable)**, **testable**, **progressive**, **predictive**, **falsifiable**, and **self-correcting**?

What is meant by a **properly-controlled** scientific experiment? What is the significance of **random** assignment of subjects into treatment (**experimental** versus **control**) groups? What are meant by **'blind'** and **'double-blind'** experiments?

What characteristics distinguish well-executed scientific investigation from poorly-executed scientific investigation? What features are **hallmarks of pseudoscience**?

What features distinguish **reputable publications** from the 'also-rans'? What features distinguish reputable web sites from those pseudoscientific crap-filled sites created by "we the unwilling, led by the unknowing...?"