



What Is . . .

## Scientific Research

---

*Scientific research* creates generalizable knowledge using accepted scientific methods. *Generalizable* means that the new knowledge can be used to understand and solve new problems, not just the ones that were studied. There are several types of scientific research, but most fall into two categories, basic research and applied research. Scientific research is paid for by governments, private companies, colleges and universities, non-profit organizations, and by individual donors, among other sources.

*Basic research* is not done to solve or understand a specific problem, such as, whether or not a new medicine is effective for curing headaches. Learning how chemicals are taken up by the brain is basic research. The results can be applied to the way the brain handles medications, vitamins, oxygen and environmental pollutants. To simplify the idea, basic research adds to the scientific knowledge library, and it can be borrowed by anyone to solve a variety of problems. Basic research is like money in a savings account that can be used for many purposes.

*Applied research* is used to solve a specific problem. Which of two new medicines is best for preventing an asthma attack?, is a question that is answered by applied research. What are the sources of air pollution in a specific city?, is another question for applied research. For dealing with air pollution, applied research is used by engineers that design car and truck engines, people who establish standards for air quality, and experts who design pollution control equipment. The results of applied research are generally used shortly after they are created.

Both basic and applied research are performed using strict scientific methods. These methods include analyzing the problem, studying previous research, designing a study plan, making careful measurements, analyzing the data, drawing conclusions, and publishing the study. The publication must include enough information for other scientists to understand what was done and how they could repeat the study. Training and experience are required to produce scientists that can do basic and applied research. Although scientific research requires great care, researchers find it satisfying and enjoyable. Also, it doesn't hurt that they are paid well. But the most important thing is that scientific research makes a better future for people, animals, and the environment.