

AP Physics

Science, Engineering and Technology

Science:

Science is the effort to discover and increase human understanding of how nature or the physical universe works. Science is essentially the search for understanding through pure research. Science gains understanding by making observations of physical/natural phenomena, conducting experiments, collecting, and analyzing and interpreting experimental data. Human understanding of the natural world is described and expressed in scientific laws, theories, models, and principles.

Engineering:

Engineering is the discipline which creatively applies technical and scientific principles in order to design and develop materials, structures, machines, devices, systems, and processes that realize a desired human goal and which meet certain specified criteria. Engineers try to design and make things that do not exist in nature. Engineering stresses invention! In a way, engineering exploits natural phenomena for practical human needs. Engineering has a goal to design and make things that society can use effectively.

Technology:

Technology is a broad concept that deals with humans' usage and knowledge of tools, skills, and crafts, and how it affects their ability to control and adapt to their surroundings and environment. In our society, technology is a consequence of the processes of science and engineering. Technology always has an impact on society; either for ill or good, and can bring about great change. In recent time, technology is often associated with methods of application, systems, materials, and devices. Since the onset of modern technology, philosophical debates have arisen over the present use of technology and whether it will bring about beneficial or harmful consequences to our society.

SCIENCE AND TECHNOLOGY

Science and technology are also different from each other. Whereas science involves discovering evidence and relationships for observable phenomena in nature and establishing theories that organize and make sense of those phenomena, technology involves tools, techniques, and procedures for putting the findings of science to use.

Another difference between science and technology is how each affects human lives. Ideally, science excludes the human factor. Scientists who seek to comprehend the workings of nature cannot be influenced by their own or other people's likes or dislikes or by popular ideas about what is correct. What scientists discover may shock or anger people, as did Darwin's theory of evolution. But even an unpleasant truth is likely to be useful; besides, we have the option of refusing to believe it! But this is hardly so with technology once it is developed: We do not have the option of refusing to hear the sonic boom produced by a supersonic aircraft flying overhead, we do not have the option of refusing to breathe polluted air, and we do not have the option of living in a non-nuclear age. Unlike science, advances in technology must be measured in terms of the human factor, with the understanding that technology is our slave and not the reverse. The legitimate purpose of technology is to serve people—people in general, not just some people, and future generations, not just those who currently wish to gain advantage for themselves. Technology must be oriented to human well-being if it is to lead to a better world.

We are all familiar with the abuses of technology. Many people blame technology itself for widespread pollution, resource depletion, and even social decay in general—so much so that the promise of technology is obscured. That promise is a cleaner and healthier world. It is much wiser to combat the misuse of technology with knowledge than with ignorance. Wise applications of science and technology *can* lead to a better world.

Science

The acquisition of scientific knowledge through pure research and from the reasoned investigation and study of natural phenomena.



Engineering

The application of scientific knowledge and principles to realize a desired human goal.

Technology

The consequence of science and engineering that deals with the ability of human society to use tools, materials, machines, and devices to control and adapt to its environment.

Ethics/Society ?

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