

Big Idea: Science, Technology & Society ⁽¹⁾

(1)- The Big Ideas of Nanoscale Science & Engineering: A Guidebook for Secondary Teachers. S.Y. Stevens, L.M. Sutherland, & J.S. Krajcik, NSTA Press, 2009.

The advancement of science involves developing explanations for how and why things work and using technology to apply that knowledge to meet objectives, solve problems, or answer questions of societal interest. Because nanotechnology is an emergent science, it provides an opportunity to witness and actively participate in scientific progress and in decision making about how to use new technologies.

Learning Goals ⁽¹⁾

1. Nanoscale science and engineering is an illustration of the dynamic nature of scientific progress and the development of technology.
2. Scientists, engineers, governments, and citizens all make decisions that affect the progress of science and technology.
3. Scientific advancements, even a single scientific discovery or new invention, may induce extensive changes in scientific thought and/or contribute to changes in many facets of society.
4. Nano-sized structures must be evaluated in terms of their risks and benefits to human health and the environment. Because these are new materials, their effect may not be apparent for some time. [1]



www.flickr.com/photos/compujeramey/168108824

Examples

Technology not only influences society but is also influenced by society. The rapid adoption of cell phones into worldwide culture is an example of technology influencing society. This advancement has both positive (easy, fast communication) and negative consequences (distractions while driving, unequal access). Society must ensure safer and equitable development of technologies.

Pictured: Examples of nanoscale structures.

<http://www.treehugger.com/thin-film-solar-rr001.jpg>



commons.wikimedia.org/wiki/File:Solar_Panels.jpg

Cutting-Edge Application

A very important worldwide problem is our dependence on fossil fuels. Alternative energy sources such as solar and fuel cells are a focus of nanoscale scientists and engineers. Using thin film deposition, flexible silicon-based solar panels are now available for a variety of applications. Solar "paint" is also an area of development which chemists are working to produce a nanoscale material that directly converts light to electricity by means of an array of nanoscale solar cells. The cells could be incorporated in a material that would cover a surface like plastic wrap or paint. In this way, nanoscale solar cells could be integrated into other building materials.

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Questions to Ponder

How are science and technology related?

Are the products made with new technologies necessarily better than the products they replace?

How does society influence technology?

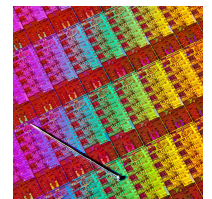
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First Transistor



Transistor Radio



Millions of transistors on a chip



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