

Nano & Society Posters Guide



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General Description

The NISE Network, in collaboration with the Center for Nanotechnology in Society at Arizona State University, developed a series of posters and related reference sheets to engage adults and older youth in informal educational experiences related to the societal and ethical implications of nanoscale science, engineering, and technology. The posters are intended to initiate conversations exploring the relationship between nanotechnology and society. They can be presented as a stand-alone exhibit, or paired with suggested activities as an educator-facilitated experience.

Program Objectives

Big idea: Nanotechnology is relevant to everyone's lives, and has important societal and ethical implications.

Learning goals:

Visitors will learn that:

1. Nanoscience and nanotechnology lead to new applications.
2. Like any technology, nanotechnology has risks and benefits.
3. Because nanotechnology has new applications, including innovative applications for known materials, we need to evaluate and reevaluate risks and benefits carefully.
4. It is important for scientists, engineers, government officials, and citizens to carefully assess the risks related to nanotechnology, and to implement safeguards protecting the environment, people who work with these technologies, and people in the broader community.

Summary:

The promise of nanoscale science is that it will dramatically improve our lives, bringing great advances in applications as diverse as medicine, energy, electrical and chemical engineering, and materials. At the same time, nanotechnology's potential negative impacts also touch on a broad range of societal concerns—environmental pollution, toxicity, and privacy violations.

The rapid, ongoing development of nanotechnology raises a number of concerns for all of us. Nanoscale particles often are familiar materials, but with new properties. The small size, unique structures, and novel behavior of such particles have experts concerned with possible health and environmental risks. But how do we go about setting policy or regulating materials for which there is very little information? Moreover, what ethical issues are raised by the new applications imagined for nanotechnology? And what are the economic, labor market, and political implications of winning or losing the worldwide race for leadership in this emerging field?

Scientists, engineers, policy makers, advocacy groups, and social scientists are involved in a range of discussions about the societal, ethical and environmental issues raised by the continuous advances in nanotechnology, and new government policies are likely to be developed soon. Meanwhile, around the world, science centers are exploring new models for engaging adults and older youth in these same issues.

The NISE Network, in collaboration with the Center for Nanotechnology in Society at Arizona State University, developed this series of posters and related reference sheets to engage adults and older youth in informal educational experiences related to the societal and ethical implications of nanoscale science, engineering, and technology. The posters are intended to establish the relevance of nanotechnology to the public, by allowing them to explore the societal and ethical implications of existing and future nanotechnologies.

Audience:

These posters can provide an opportunity for adult audiences in your community to learn about current science and technology, and to consider their relationship to society. In general, these posters can appeal to all ages, but many of the issues raised on the posters and accompanying reference sheets are targeted for older youth and adults.

NOTICE: You're welcome to alter the delivery of these posters to suit your needs. In fact, we encourage it! Change it around, and if you find something that works let us know. Post your revisions on www.nisenet.org.

Program Delivery

The Nano & Society Posters can be presented in many different ways. The posters can be presented as a stand-alone exhibit, or paired with suggested activities (see below) as educator-facilitated experiences.

If used as a stand-alone exhibit, you may wish to try some of the following examples. If possible, make the associated reference sheets accessible for viewing and available as handouts for people to take home after reading the posters.

- Set up the posters near an existing nano exhibit or program, as a way of introducing societal issues to your audiences.
- Place the posters near the entrance to a NanoDays venue as a way to attract visitors.
- Use the posters to fill in a blank wall in an exhibit hall or other common area.
- Contact your local library to see if they would be interested in hanging up one or more of the posters.
- Contact your local transit authority to see about hanging them up at bus stops, subway stations, or the airport.
- Contact your local community center or Boys & Girls Club to inquire about displaying the posters in a common area.

The posters can also be presented on their own by a facilitator or together with related consumer products or demonstrations. If facilitated, the objective of the facilitator should be to encourage participants to discuss the questions raised on the posters, encouraging them to think about how nanotechnology might affect society. The stance of the posters may seem negative, but keep in mind that they were designed to challenge visitors to think about emerging technologies in a different way! Be sure to have the accompanying reference sheet available for visitors to take home as they provide additional information and resources on each topic.

Some of the posters were also designed to provide a source of additional richness around the societal and ethical issues surrounding nanotechnology to existing programs in the NISE Net catalog and/or the NanoDays kit. Some educators prefer to do a hands-on nano activity first then present the associated poster. Others have found it useful to engage the children in the hands-on activity and then discuss the poster information with their parents.

Below is a list of suggested pairings for the posters with activities either in the NanoDays Kit or in the NISE Net catalog.

Will nanotechnology solve our energy crisis?

This poster focuses on how energy related nanotechnologies could deliver world-altering changes in the ways we create, transmit, store and use energy. It may be successfully paired with the following activities:

Exploring Materials: Thin Films – NanoDays 2011

<http://www.nisenet.org/nanodays-physical-kit-contents>

Energy and Nanotechnology

<http://www.nisenet.org/catalog/programs/energy-nanotechnology>

Energy Challenges, Nanotech Solutions?

<http://www.nisenet.org/catalog/forums/energy-challenges-nanotech-solutions>

What's hidden in *your* sunblock?

This poster focuses on issues related to titanium dioxide nanoparticles found in consumer sunscreens and raises issues around their regulation, labeling and potential effect on the environment. It may be successfully paired with the following activity:

Exploring Products: Sunblock – NanoDays 2011

<http://www.nisenet.org/nanodays-physical-kit-contents>

Are you being tracked?

This poster focuses on how new nanosized surveillance tags may affect individual privacy. It may be successfully paired with the following activity:

Privacy, Civil Liberties and Nanotechnology

http://www.nisenet.org/catalog/forums/privacy_civil_liberties_nanotechnology

Does nanotechnology belong in toys?

This poster focuses on issues related to nanosilver particles used as antimicrobial agents in consumer products. It raises issues around regulation, labeling of consumer products and its potential effects on the environment. It may be successfully paired with the following activities:

Exploring Properties—Surface Area (NanoDays 2008, 2009, 2010)

http://www.nisenet.org/catalog/programs/exploring_properties_-_surface_area_nanodays_08_09_10

Surface Area (Cart Demo)

http://www.nisenet.org/catalog/programs/surface_area_-_cart_demo

Surface Area (Stage Presentation)

http://www.nisenet.org/catalog/programs/surface_area_-_stage_presentation

Nanosilver: Breakthrough or Biohazard?

http://www.nisenet.org/catalog/programs/nanosilver_breakthrough_or_biohazard

Will nanotechnology improve living conditions around the world?

This poster focuses on how nanotechnology may provide safe drinking water for those in need in a safe and relatively inexpensive way. It may be successfully paired with the following activity:

Intro to Nano Cart Demo

<http://www.nisenet.org/catalog/programs/intro-nano-cart-demo>

Would you use a dangerous technology?

This poster is the most general of all the posters focusing primarily on the risks and benefits of nanotechnology and how it can be used safely if properly regulated. This poster could potentially work with almost any program or shown beside one of the other Nano & Society Posters.

The following list of websites may offer additional information:

The NISE Network

www.whatisnano.org

Nano and Society FAQ

<http://cns.asu.edu/nanoquestions>

nano & me: Nanotechnology in our lives

www.nanoandme.org/nano-products/energy/

www.nanoandme.org/nano-safety

www.nanoandme.org/regulation/are-there-laws-on-nano

www.nanoandme.org/social-and-ethical/

Nanotechnology-based consumer products

www.nanotechproject.org/inventories/consumer

The Responsible Nano Forum

www.responsiblenanoforum.org

Credits and Rights

These posters were created jointly by the Nanoscale Informal Science Education Network (NISE Net) and the Center for Nanotechnology in Society at Arizona State University (CNS-ASU).



This project was supported by the National Science Foundation under Award Nos. ESI-0532536 and 0531194. Any opinions, findings, and conclusions or recommendations expressed in these materials are those of the author and do not necessarily reflect the views of the National Science Foundation.