

Nanotechnology Education Resources for K-12 Educators



National Nanotechnology Coordinated Infrastructure

nnci.net/learn



activities for the public. www.mrsec.psu.edu/content/museum-shows

Project on Emerging Nanotechnology at Woodrow Wilson International Center contains many resources related to society and the safe development of nanotechnology and a list of currently available consumer products. www.nanotechproject.org/

Remotely Accessible Instruments for Nanotechnology (RAIN) Provided by Penn State's NACK Network - it allows students to access and control microscopes, like scanning electron microscopes, and analytical tools to look at nano-sized materials from the ease of classrooms. nano4me.org/remotearch

Scale of the Universe Interactive size and scale. htwins.net/scale2

South African Agency for Science and Technology Advancement Public engagement programs in nanotechnology and biotechnology which includes cartoon posters, lessons, and articles. www.npep.co.za

Try Engineering Lesson plans including ones on nanotechnology. www.tryengineering.org

Try Nano Resources, lessons, games, and general information. www.trynano.org

Understanding Nano Online resource that explains many aspects of nanotechnology and includes lessons for undergraduates. www.understandingnano.com/index.htm

University of Illinois at Urbana-Champaign CEMMS Online labs that include nano-silver, gold and investigating chocolate. nano-cemms.illinois.edu/education.html

University of Virginia Virtual Lab How SEMs, AFMs, and STMs work as well as nanoscience lessons, materials and experiments for undergraduates. wecanfigurethisout.org/VL/home.htm

Vega Science Trust Videos on basics of nanotechnology and how it will change the world. A project founded by Nobel Prize Winner the late Sir Harry Kroto. www.vega.org.uk

Wonderville.CA Resources including games and videos from Alberta Canada. www.wonderville.org/search/nanotechnology

NanoZone Lawrence Hall of Science interactive site for elementary and middle school students. nanozone.org/

National Cancer Institute Provides resource information on nanotechnology in cancer treatment. nano.cancer.gov/learn/understanding

National Nanotechnology Coordinated Infrastructure A large database of lessons written by teachers for teachers. Includes reference sheets of information essential for students in basic science classes as well as other resources. nnci.net/learn

National Nanotechnology Initiative The NNI is the overarching program for U.S. government nanotechnology activities. This site has provides information for K-12 students and teachers, including the Teaching Nano and Emerging Technologies Network for teachers and the Nano and Emerging Technologies Student Network. www.nano.gov

NBC Learn Nanotechnology Super Small Science Six videos on nanoscale science developed in collaboration with the National Science Foundation. www.nbclearn.com/nanotechnology

NISE Net National Informal STEM Network—Search nanotechnology for interesting articles, images and a catalog of activities. www.nisenet.org

Nova Making Stuff and Making More Stuff Series Hour-long video series on how nanotechnology is making stuff stronger, smaller, cleaner, and smarter. www.pbs.org/wgbh/nova/tech/making-stuff.html
www.pbs.org/wgbh/nova/tech/making-more-stuff.html

Ohio State University Center for Affordable Nanoeengineering of Polymeric Biomedical Devices Lessons provided for high school science teachers. nsec.osu.edu/educationoutreach

Omni Nano High school and college curriculum including an online course. omniano.org/

PBS Learning Media Has 60 nanotechnology-related items in its resources. www.pbslearningmedia.org/search/?q=nanotechnology

Pennsylvania State University's Center for Nanoscale Science Nano activities for kids which are museum

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Nanotechnology Lessons and Classroom Resources

We have created this list of available online resources to help K-12 educators easily find lessons and support materials to integrate nanotechnology into their classrooms.

To learn more, please visit our website at nnci.net/learn.



Children's On-line Science Magazine
www.nanooze.org
FREE classroom packs on request

California NanoSystems Institute at UCLA Nano experiments as part of the institute's High School Nanoscience Workshop for teachers. Request permission of access materials. cnsi.ucla.edu/educators/

Concord Consortium Interactive simulations and lessons for biotechnology and nanotechnology. mw.concord.org and Electron Technologies: learn.concord.org/electron-technologies

Cornell University CCMR Teacher resources & lending library of experiments. www.ccmr.cornell.edu/education/educational-resources/

Dragonfly TV-Nanosphere Shows on nanotechnology. With games, activities and interviews with scientists. kids.pbskids.com:8080/dragonflytv/parentsteachers/nano

Engineering-Go for It! Lessons, activities, resources on engineering including nanotechnology. (Search nanoscale) teachers.egfi-k12.org

European Union Nanotechnologies: A compendium for educators. ec.europa.eu/research/industrial_technologies/pdf/nano-hands-on-activities_en.pdf

GeckoMan An interactive game developed by Northeastern University's Center for High-rate Nanomanufacturing. geckomanchn.weebly.com/

Institute for Chemistry Education at University of Wisconsin-Madison Lessons for the K-12 science classrooms & after school groups. ice.chem.wisc.edu

Hitachi, HTA Inspire STEM education and cartoon book on SEM. www.inspirestemeducation.us and www.inspirestemeducation.us/

Innovation Workshop: Nanotechnology Video series with teacher guide from Fairfax County Public Schools. Students will learn about moving atoms, electron clouds, and how temperature affects matter. www.fcps.edu/node/32023

Nanozone Interactive games, videos, scale, and meet a scientist—in the *Nanozone!* nanozone.org

KQED: Nanotechnology Educator Guide A resource for using QUEST video, audio, blogs and maps in the classroom. www.kqed.org/search/index.jsp?cx=016903106374557566950%3A07-zut18mt4&cof=FORID%3A11&q=nanotechnology&sa=

Materials World Modules Sixteen instructional modules focused on material science and nanotechnology. www.materialsworldmodules.org

Molecular Expressions Exploring the World of Optics and Microscopy Includes interactive Java-powered virtual microscopes, images, and information on microscopes. micro.magnet.fsu.edu/index.html

Molecularium Teacher Guide & "Kid's site" about the atomic world. www.molecularium.com

My Scope Virtual Step by Step SEM Simulator Developed by the Australian Microscopy and Microanalysis

Research Facility & FEI. This interactive application allows you to "operate" an SEM. myscopeoutreach.org/virtualSEM.html

Nano Education Resources Portal hosted by nanoHUB - database of nanoeducation resources that can be searched by topic area, grade level, core discipline, STEM content area, and resource type. nanohub.org/publications/118

Nano4Me Provided by Penn State's NACK Network - it offers K-16 resources (including online course materials for community colleges), remote access to equipment, and career information for students. nano4me.org

NanoHub Purdue University online materials for middle school, high school, and college levels. nanohub.org

Nano-Link Provides high school and community college nanoscience curriculum modules. nano-link.org

NanoLeap Two units, one physical science and one chemistry that promote interdisciplinary nanoscale core concepts. www2.mcrel.org/nanoleap

NanoMission Learning Nanotechnology through Games Games to learn basic concepts in nanoscience through real world applications from microelectronics to drug delivery. nanomission.org

NanoSense Lesson plans and activities designed for teaching nanoscience at the high school level. nanosense.sri.com