

It's A **Nano** World After All

*using nanotech consumer products
to engage student learning*

Presenter: Katherine Chen

References

Slide 1 - Cover page

<http://www.nclt.us/>

<http://mate.calpoly.edu/>

Slide 4 - Nanotechnology Applications

<http://www3.interscience.wiley.com/cgi-bin/fulltext/108069299/HTMLSTART>

M.C. Roco, Nanoscale Science and Engineering: Unifying and Transforming Tools, AIChE Journal, Vol. 50(5), 890-897, 2004

M.C. Roco, International Perspective on Government Nanotechnology Funding in 2005, Journal of Nanoparticle Research, Vol. 7(6), 1, 2005.

<http://www.luxresearchinc.com/http://www.azonano.com/news.asp?newsID=709>

Slide 6 – Car Wax

<http://www.autobarn.net/natehighpoby.html>

http://www.enquirer.com/editions/2004/08/27/biz_nanowax27.html

Slide 7 - Mercedes-Benz Clearcoat

<http://www.canadiandriver.com/articles/tw/paint.htm>

<http://www.500sec.com/mercedesclearcoat.html>

<http://www.canadiandriver.com/articles/jk/040407.htm>

<http://www.auto123.com/en/site/printpage/index.spy?section=news¶ms=artid%3D21942%26pg%3D1&page=news&metainfo=%2Cview>

Slide 8 – Size and Scale

<http://www.computenano.com/background/nanotechmaterials.html>

http://nano.cancer.gov/resource_center/tech_background.asp

http://147.46.38.113/~epdl2002/p1_res/1_nano/nano_2_r.html

Slide 9 - Sunscreen

http://www.forbes.com/home/2003/12/29/cz_jw_1229soapbox.html

<http://www.aptpowders.com/zinclear.php>

<http://nano-infinity.tradenet.com.tw/application.htm>

http://www.smalltimes.com/document_display.cfm?document_id=5267

http://www.kosmetik-kiefer.com/shopgb/en-gb/dept_92.html

<http://www.keys-soap.com/solarrx.html>

Slide 10 - Optical Properties of Nanoparticles

<http://imagers.gsfc.nasa.gov/ems/waves3.html>

<http://nanopedia.case.edu/NWPPage.php?page=nanotransparency>

Slide 11 - Cosmetics

http://www.forbes.com/home/2003/12/29/cz_jw_1229soapbox.html

<http://www.softmachines.org/wordpress/?p=135>
http://www.loreal.com/en/_ww/research/innovations/nanosomes.aspx
<http://www.sukgyung.com/p-pro-en.htm>
<http://www.wired.com/news/technology/0,1282,59742,00.html>
http://fashiontribes.typepad.com/beautybuzz/2005/10/bionova_hits_la.html

Slide 12 - Muscle & Joint Pain Cream

<http://www.flexpower.com/Product%20info/index2.htm>
http://www.flexpower.com/About%20Us/index_newsarticle3.htm
<http://www.msnbc.msn.com/id/6713187/>

Slide 13 - Fabrics

http://www.smalltimes.com/document_display.cfm?section_id=76&document_id=6749
<http://www.cnn.com/2003/TECH/ptech/07/18/popsci.nanotech.pants/>
<http://www.nano-tex.com/>

Slide 14 - Bedding

<http://www.nano2buy.com/simmons1.htm>
<http://www.simmons.com/healthSmart/video/index.cfm>

Slide 15 - Water Repellent Surfaces in Nature

http://lotus-shower.isunet.edu/the_lotus_effect.htm

Slide 16 – Surface Coatings

<http://www.nanotech-now.com/Nanotechnology-at-BASF.htm>
http://www.corporate.basf.com/en/innovationen/felder/nanotechnologie/fotos/?id=V00-Es.3e7YULbcp.*Gnanoparticulate surface coating
<http://nanotechweb.org/articles/news/1/11/5/1>

Slide 17 - Self-cleaning Surfaces

http://lotus-shower.isunet.edu/the_lotus_effect.htm
<http://www.corporate.basf.com/en/innovationen/felder/nanotechnologie/fotos/?id=V00-cbEh17aiZbcp1x3>
<http://nanotechweb.org/articles/news/4/10/16/1/raspberry>

Slide 18 - Ski Polymer (“Nanowax”)

<http://www.vailsoft.com/cerax/>
http://www.nanogate.de/datenbank/aktuelle_meldungen_e/meldung007.htm
<http://www.azonano.com/details.asp?ArticleID=615>

Slide 19 - Sunglasses

<http://www.nanofilm.cc/nanotech/nanotech.html>
http://www.rei.com/online/store/ProductDisplay?storeId=8000&catalogId=4000008000&productId=47898217&parent_category_rn=10075654
http://www.pcimq.com/CDA/ArticleInformation/features/BNP_Features_Item/0,1846,124433,00.html
http://www.forbes.com/home/2003/12/29/cz_jw_1229soapbox.html

Slide 20 - Odor-Free Socks

www.jrnanotech.com
http://www.smalltimes.com/document_display.cfm?section_id=76&document_id=6749
X-static silver fiber:
<http://www.x-static.com/index2.html>

Slide 21 - Wound Dressing

www.nucryst.com

http://www.curadusa.com/products/product_info.asp?SubCategoryId=2&ProductCatId=34

Slide 22 - Appliances

<http://www.samsung.com/sg/silvernano/silvernano/washingmachine.html>

<http://www.manilatimes.net/national/2004/jun/05/yehey/life/20040605lif1.html>

Slide 23 - Air Purifier

http://www.nanotwin.com/airpurifier_technology.html

<http://www.noodor.net/id62.htm>

Slide 24 - Disinfectant

<http://nanobot.blogspot.com/2004/03/prosaic-potty-cleaning-nanoparticles.html>

<http://safetyplus.net/ecotru.html>

<http://www.clickondetroit.com/health/4205470/detail.html>

<http://www.envirosi.com/Products/products.html>

Slide 25 - Surface Area/ Volume: size effects

http://www.tiem.utk.edu/~gross/bioed/bealsmodules/area_volume.html

Slide 26 - Catalytic Device

<http://www.oilfresh.com/of1000.html>

<http://www.voyle.net/Nano%20Food%202005/Nano%20Food%202005-0001.htm>

Slide 27 Footwarmers

http://www.forbes.com/2005/01/12/cz_jw_0112soapbox.html

http://www.forbes.com/2005/01/12/cz_jw_0112soapbox.html

<http://aerogel.com/footwear.htm>

Slide 28 - Bowling Balls

<http://www.f-carbon.com/eng/special.html>

<http://www.nanodesu.com/balls.html>

http://www.smalltimes.com/document_display.cfm?section_id=45&document_id=6825

http://www.usatoday.com/tech/news/nano/2004-11-17-nanotechnology-sports_x.htm

Slide 29 - Golf Club Shafts

http://www.nanoshaft.com/illustrations_of_nanotechnology.htm

Slide 30 - Golf Club Shafts and Heads

<http://www.azonano.com/details.asp?ArticleID=1071>

<http://chicagoredstreak.com/features/mid-news-midwilson01.html>

http://www.usatoday.com/sports/golf/2005-08-16-nanotechnology_x.htm?csp=N009

Slide 31 - Baseball Bats

<http://baseball.eastonsports.com/index2.php>

<http://www.zyvex.com/>

Slide 32 - Tennis Racquets

http://smalltimes.com/document_display.cfm?document_id=7326

http://www.tenniscompany.com/racquets_wilson_nano_Sixonetour.html

http://www.wilson.com/wilson/racq/product.jsp?JSESSIONID=DealMjpf1E19D7D7H8OGHMrk70NE2tei23LgB5vdrzPqY6XAUBP0!694585233!168075286!7005!8005!NONE&CONTENT%3C%3Ecnt_id=10134198673957682&FOLDER%3C%3Efolder_id=2534374302752345&bmUID=1126046437930

http://www.smalltimes.com/document_display.cfm?document_id=2506

Slide 33 - Carbon Nanotubes

<http://students.chem.tue.nl/ifp03/default.htm>

http://en.wikipedia.org/wiki/Carbon_nanotube

http://home.hanyang.ac.kr/~nanotube/study_eng_3.html

Composites: (problems of interfacial contact and aggregation)

<http://www.nanotech-now.com/nanotube-buckyball-sites.htm>

Slide 34 – Tennis Balls

http://www.smalltimes.com/document_display.cfm?document_id=2997

<http://www.azom.com/details.asp?ArticleID=1665>

http://www.usatoday.com/tech/news/nano/2004-11-08-nano-on-the-move_x.htm

Slide 35 - Plastic Bottles Gas Barrier

<http://www.azonano.com/details.asp?ArticleID=857>

<http://www.plasticstechnology.com/articles/200303fa2.html>

<http://www.plasticstechnology.com/articles/200411fa2.html>

Slide 36 - Portable Water Filtration System

<http://www.hydratationtech.com/>

<http://www.hydratationtech.com/detail.php?ID=23>

http://www.packworld.com/cds_print.html?rec_id=18905

Slide 37 - Nano-clay Composites

<http://www.pslc.ws/macrog/mpm/composit/nano/index.htm>

Slide 38 - Step Assists & Car Parts

<http://www.sae.org/automag/material/10-2001/>

<http://www.scprod.com/gm.html>

<http://www.memagazine.org/backissues/april01/features/prospect/prospect.html>

<http://www.americancarfans.com/news.cfm/newsid/2041021.012/hummer/1.html>

<http://www.pslc.ws/macrog/mpm/composit/nano/index.htm>

clay layers (1 nm thick) result in *very high surface areas* of contact between dispersed nano-platelets and polymer matrix