Reflection of a Nano-Link Technology Coach

Randallstown High School,
Morgan State University's Center for Excellence in Mathematics and Science

MNTeSIG Live! Presentation / Poster
Tuesday, July 28, 2020

Nano-Link Center for Nanotechnology Education
Formed in 2006

Funded by:
National Science Foundation
Advanced Technology Education Directorate

Home Institution:
Dakota County Technical College
Rosemount, Minnesota USA

Nano-Link is an Alliance of Educational Institutions
High Schools, Colleges and Universities through out the US
Offering Certificates, 2 year degrees and 2+2 programs leading to a BS degree
Multi-disciplinary Nanotechnology (Electronics, Biotech, Materials)

Mike Opp: Director/PI Billie Copley: Center Director/Project Manager

D. Newberry: Founding Director

Nano-Link

EDUCATOR WORKSHOP

FEBUARY 29, 2020

Version 081618

Developed by
Deb Newberry

Billie Copley
billie.copley@dctc.edu

Ana-Rita Mayol
anaritamayol@gmail.com

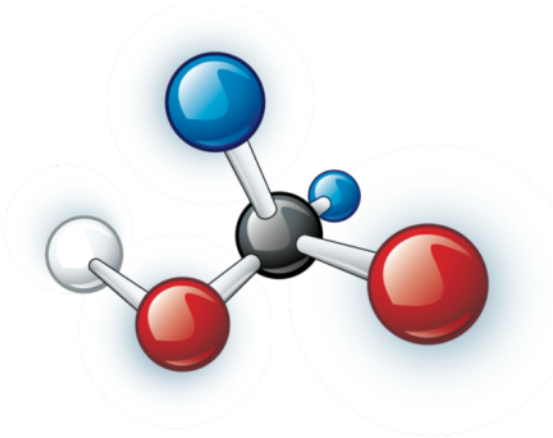
PRESENTER:
MAAJIDA L.C. MURDOCK

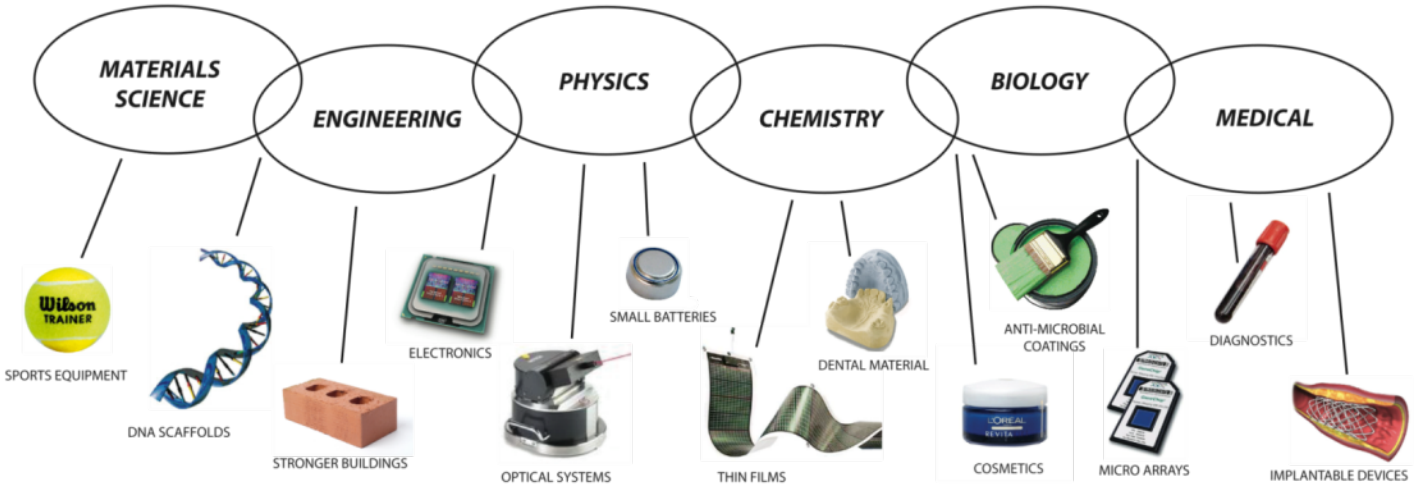
For more information contact:
billie@nano-link.org

NSF

NanoScience is...

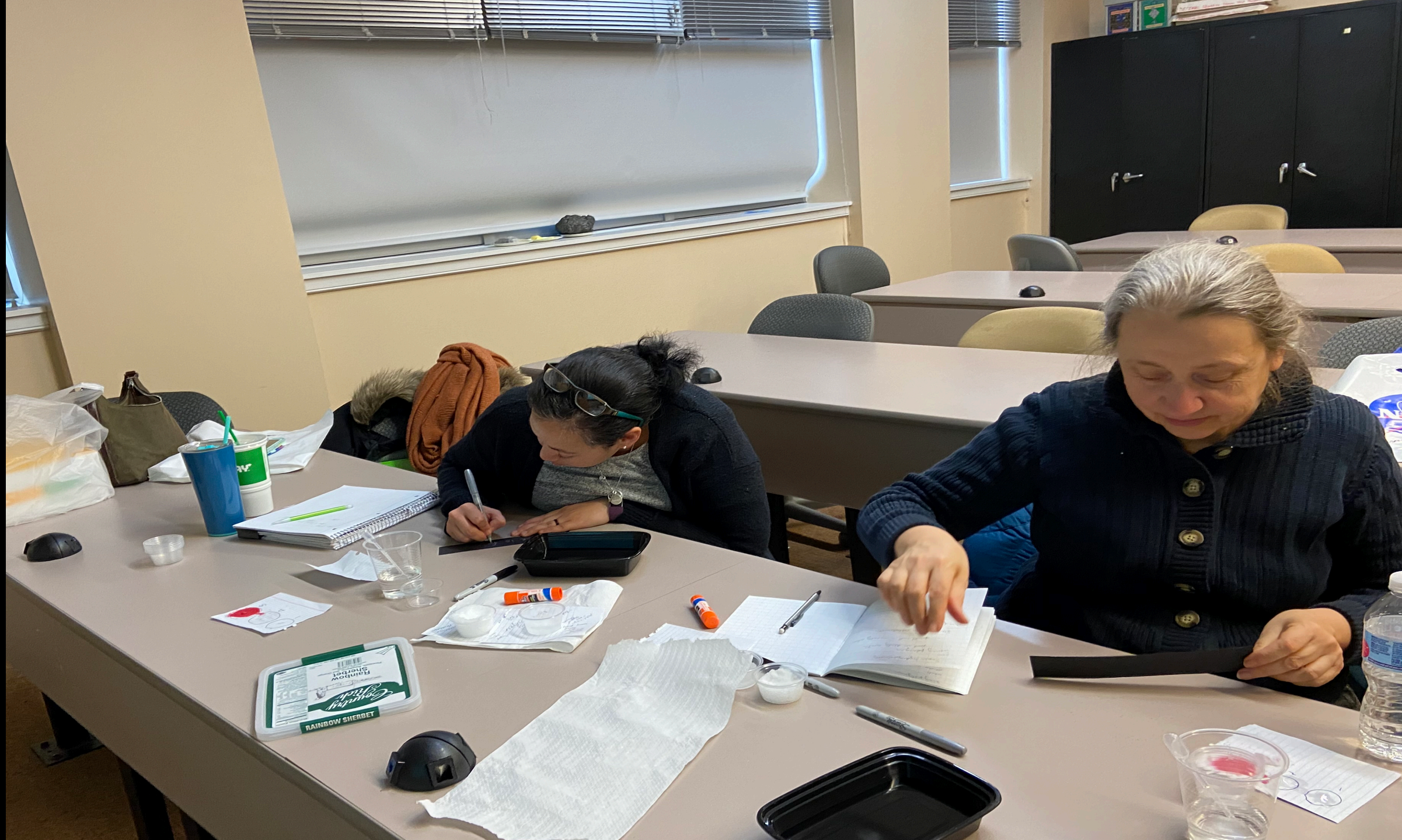
the work of applying newly developed microscopes to observing , measuring, and creating at the molecular and atomic level.





Agenda

- Introductions and Logistics
- Nanotechnology Overview
  - Why is Nano important
- Size & Scale
- Scientific method activity
- Size-Dependent Properties – Surface Area to Volume Ratio
- Structure of Matter
  - Cross Link Polymer Activity and variations
  - Ring Polymer Activity and variations
  - Discussion – what's going on with those polymers and water
- Tools & Instrumentation
  - Remote Access to nano instrumentation
- Nano Infusion Project
- Models and Simulations – Overt and Covert Assumptions
- Forces and Interactions
  - Why does salt dissolve in water
  - Cohesive and Adhesive Forces – Superhydrophobicity
  - Superhydrophobic Activity
- Self Assembly
  - Aspirin Calculation – practice with numbers, conversions – hyper vs reality – do we need this?
- Crystal Structure
- Thin films activity
- Quantum Effects - Quantum Physics and Quantum Dots
- Sunscreen Activity
- Major concepts and correlation to traditional science concepts
  - DCTC Nano Programs and Courses -- Nano-Link Modular Approach?
  - Critical Thinking
- Nano Infusion Project


Rainbow Sherbet
RAINBOW SHERBET

Scientific Method Activity

Experiment

Observe

Document

Ponder

https://www.nano-link.org/nano-infusion-modules/scientific-method-2/

Surface Area to Volume Activity

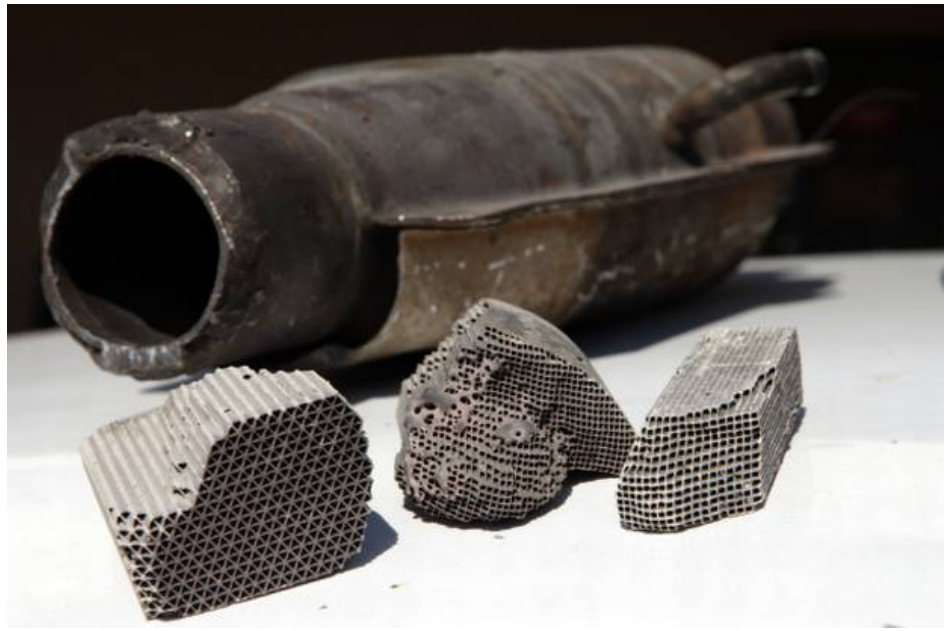
Experiment – Observe – Document – Ponder

https://www.nano-link.org/nano-infusion-modules/surface-area-to-volume-ratio/

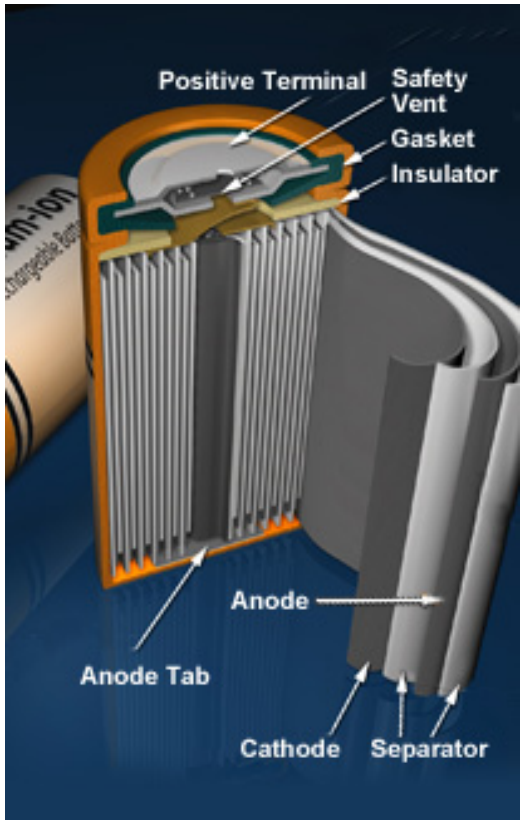
Sunscreen Activity

https://www.nano-link.org/nano-infusion-modules/Nanoparticles-and-Sunscreen/

Increased surface area for the same total volume of material
Can cost effectively increase chemical reactivity



Catalytic converter



Lithium ion battery

Instructor Guides available on the website for FREE

https://www.nano-link.org/nano-infusion-modules/


Nano-Link
EDUCATOR
WORKSHOP
Billie Copley
billie.copley@dctc.edu
Ana-Rita Mayol
anaritamayol@gmail.com
Presenter:
Maajida Murdock
For more information
contact:
billie@nano-link.org

So HOW do I get my hands on some of these modules?

1. Go to www.nano-link.org
2. Create a username and password
3. Fill out the registration form (name, address, # students, select a few “modules” etc.)
4. Click on Educator Avatar, scroll down to Modules link and click on it. This will bring you to the modules library

Nano-Link also offers Educator workshops

you provide the place and the educators

Nano-Link provides the trainers, materials and lunch