



MWM

interactive

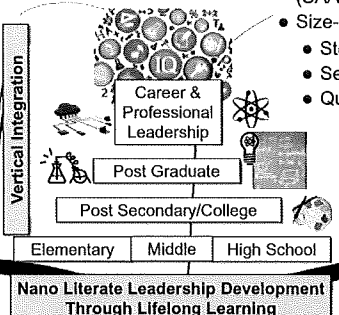
MATERIALS WORLD MODULES PROGRAM Integrated Nano-STEM Education

Nano Literate Citizenship

Example: Progression of Learning & Applying SA/V Ratio

- SA/V Applications in Research, Industry, and Policy Making**
- Ratios and Proportions: Effect of Size & Shape on 2D Perimeter/Area & 3D Area/Volume**
- Characterize 3D Objects by Length, Area & Volume**

- Nanotechnology applications:**
 - Nano catalysis
 - Energy generation
 - Water filtration & treatment
 - Target medicine delivery
 - Consumer products & safety
- Physical science applications:**
 - Dominant forces
 - Surface tension
 - Free fall & terminal speed
 - Chemical reaction kinetics
 - Human physiology
- Life science applications:**
 - Animal metabolism
 - Body thermoregulation
 - Size & bone strength

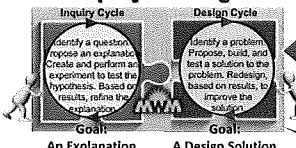


Core Nano Concepts

- Measurement & Tools
- Size & Scale
- Surface Area-to-Volume (SA/V) Ratio
- Size-Dependent Forces
- Structure & Properties
- Self Assembly
- Quantum Effects

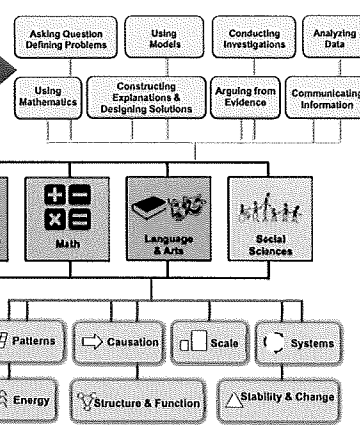
MWM Nano-STEM

Inquiry & Design



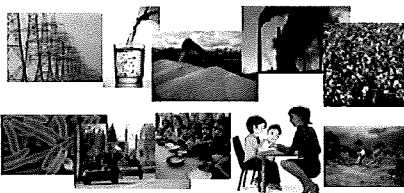
Use MWM's Inquiry and Design approach to fulfill NGSS Science and Engineering Practices Standards

Integrated STEM



Societal & Global Impact

Critical 21st Century Challenges

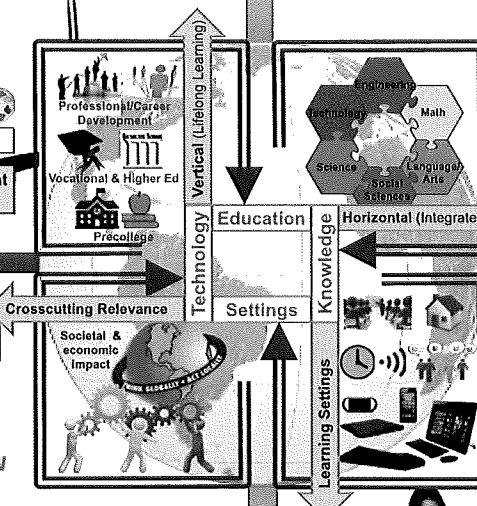


Potential Impact of Nanotechnology



Nanotechnology—Driver for All Future Technologies & New Industries

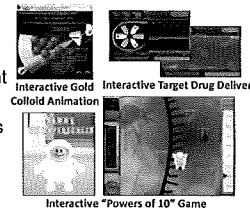
- Work towards collective understanding of nanoscale science and technology
- Optimize our use of limited resources
- Minimize environmental hazards
- Improve healthcare delivery
- Make our lives more secure
- Raise our standard of living



Anytime, Anywhere Learning

Interactive Cyber Mobile Platform

- Interactive, rich immersive multimedia
- Promote interest, motivation, and engagement
- Enhanced learning across subjects
- Seamless integration with classroom activities
- Rapid assessment feedback
- Increased flexibility and broad access
- Cyber platform for community collaboration



Personalized Learning

- Support structure for mastery of non-intuitive, difficult core nano concepts
- Customization of content delivery
- Organization of content in manageable chunks
- Ongoing assessment feedback
- Increased student responsibility for their own learning

