



Materials World Modules

An Inquiry and Design-Based Science, Technology, Engineering, and Mathematics (STEM) Education Program

Developed at Northwestern University (NU) and propelled by an initial grant from the National Science Foundation in 1994, the Materials World Modules (MWM) Program has developed a series of inquiry and design modules that encourage students to discover the interconnections between science, technology, and society. Focusing on materials that we use every day, a team of NU professors, high school science teachers, professional editors and designers created a series of nine modules each featuring a separate materials topic. The modules are designed for use in middle and high school science, engineering and technology classes. They have been extensively field-tested by teachers in a wide array of subjects, including chemistry, physics, biology, earth science, technology, engineering, and mathematics.

Why do science teachers use MWM?

- ✓ Active, hands-on learning
- ✓ Students of all abilities can relate science to real world applications
- ✓ Cutting-edge research topics
- ✓ Professional development workshops and seminars
- ✓ Summer research opportunities
- ✓ Free resources, curricula and design ideas
- ✓ Ease of use for experienced and new teachers
- ✓ Meets National Science Education Standards and State Standards

What do students say?

Students who used MWM related a perceived improvement in their science process and technological design skills in key areas such as: working as a team, connecting science to the real world, planning a design project, analyzing data and understanding science concepts – to name a few. Student surveys indicated that after using MWM there was a positive change in their perceptions about science. They related that: science classes are interesting; they talked about science among friends; they looked up science information on their own; and they considered going into science as a career.



Each module contains:

Teacher Edition: Divided into three user-friendly sections [introduction, planning guide, & appendix] to provide teachers with comprehensive instructions as well as troubleshooting and teaching tips.

Student Edition: Structured into three parts: an introduction that inspires inquiry; exploratory activities that provide background & concept information central to the topic; and design projects that challenge students to apply what they have learned by creating a functional prototype product from the materials at hand.

Kits: Contain the basic materials that a class of 24 to 32 students (eight groups of three students or four students) will need to run the activities and design projects outlined in the modules.

Current Modules:

- Composites
- Ceramics
- Concrete
- Biosensors
- Biodegradable Materials
- Smart Sensors
- Polymers
- Food Packaging
- Sports Materials

Coming Soon!

- Nanotechnology
- Environmental Catalysis

Materials World Modules

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