



# CONCRETE

## Concrete vs. Cement. What makes them different?

Students learn how the components of concrete can be modified to alter its properties. They use their knowledge to make concrete roofing tiles that meet specific design and performance criteria.

By incorporating everyday materials into science lessons, the Materials World Modules (MWM) program at Northwestern University has found the solution to getting students excited about learning science while helping teachers meet national and state education standards.

The modules are easy to organize and inexpensive to run. They can be incorporated into any science class because of the breadth of subjects covered in the Activity and Design Project sections. Each module is a supplemental science unit that takes 1-3 weeks of class time (approximately 10 hours) to complete.

### Module At-a-Glance:

#### Activities

- Hunting for Objects Made of Concrete
- Comparing Different Kinds of Cements
- Comparing Different Concrete Formations
- Testing Properties of Concrete
- Reinforcing Concrete

#### Design Project

- Designing a Concrete Roofing Tile
- Designing a New Concrete Product



MWM will give students an opportunity to understand the world around them in a way they have never experienced before. The modules promote an awareness of the roles science and technology play in society and guide students to take increased control of their work.



**MWM is designed to**

**Interdisciplinary**  
Integrates science & non-science subjects

**Flexible**  
Modify to your teaching style, students' ability and class time

**Hands-on**  
Contains activities that lead up to inquiry-centered design projects

**Cutting-edge**  
Introduces issues on the forefront of technological research

**improve STEM education**  
Science • Technology • Engineering • Math

**Connects  
to Your  
Curriculum**

### Chemistry

- Properties of Matter ■ Mixtures ■
- Chemical and Physical Changes ■
- Chemical Reactions ■ Bonding

### Biology & Life Sciences

- Biological Materials ■
- Environmental Issues

### Mathematics

- Measuring ■ Graphing (Making, Reading and Interpreting) ■ Computing
- Averages ■ Ratios

### Physics & Physical Sciences

- Forces ■ Loads and Stresses
- Tensile and Compressive Forces ■
- Energy ■ Work ■ Electrical Conductivity

### Geology & Earth Science

- Rocks and Minerals ■ Geochemical Cycles ■ Acid ■ Rain ■ Earthquakes

### Technical Education

- Designing ■ Building Materials ■
- Composites ■ Construction ■ Technology

### Language Arts

- Writing a report ■ Public speaking

## Materials World Modules

### An Inquiry & Design Based STEM Education Program

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