



NATIONAL
CENTER FOR THE
ADVANCEMENT OF
STEM
E DUCATION

STEM

nCASE proposes training the nation's Science, Technology, Engineering, and Mathematics (STEM) teacher workforce in an augmented Inquiry and Design (I&D) method of instruction. I&D, which is attracting interest among STEM educators nationwide, emulates the scientific method in the classroom. A student-centered approach, it emphasizes inquiry (science and mathematics) and design (engineering) elements. The teacher is cast in the role of a facilitator and co-researcher with scientists and engineers as mentors in a communal process of learning through inquiry and experimentation. The process shows considerable promise as a method for captivating and engaging students' inquiring minds.

DESIGNED TO

Integrate STEM into curriculum

Promote discovery/inquiry and design in learning

Encourage real-world experiences using scientists and engineers in the STEM classroom

Model a student-centered classroom using hands-on learning

Mapped to the Common Core State Standards

Promote assessment and evaluation

Middle School Acoustics

The Science of Sound

CONTENT CURRICULUM CONNECTIONS

- ◆ Sound Waves
- ◆ Hertz
- ◆ Frequency
- ◆ Doppler Effect
- ◆ Speed of Sound
- ◆ Amplitude
- ◆ Energy
- ◆ Compression Waves
- ◆ Transverse Waves
- ◆ SONAR
- ◆ Pendulums
- ◆ Motion

PROCESS CURRICULUM CONNECTIONS

- ◆ Inquiry
- ◆ Design
- ◆ Problem Solving
- ◆ Communication
- ◆ Connections
- ◆ Representations

MODULE AT A GLANCE

Activity One — Secret Messages

Activity Two — Sound Search

Activity Three — Good Vibrations

Activity Four — Analyzing Waves

Activity Five — Making Waves

Activity Six — Can You Hear Me Now

Activity Seven — Sing to Your Own Tune

Problem Solving — Design a Sound-Proof Box

