CLASSROOM OF THE SEA (COS)
• Designed to provide experiences for our students:
  • to work with deaf pupils
  • in an interactive learning environment
  • practice in a PBL environment based in marine science

• Mathematics
• Physics
• Chemistry

• Biology
• Marine Science
Need and Target Audience

• 1 in 1,000 school age children are deaf or hard of hearing

• Historically, deaf students are not held to the same high academic standards as their hearing counterparts
Project Goal

To enhance scientific literacy and provide greater opportunities for deaf students by developing and testing the effectiveness of an authentic learning environment and problem-based learning to teach science to deaf students.
The Classroom of the Sea PBL Module

COS PBL module is based on an environment that focuses on real world problems associated with the habitat for the Harbor Seal in Long Island Sound.

- they are sensitive to changes in
  - the environment
  - their physical habitat
  - their food source will also impact the size, fitness and activities of their colonies
Interdisciplinary

- biology,
- chemistry
- physics
- social studies
- Math/statistics
- English

as students prepare reports and study the seals from different points of view.

- UConn is a land and sea grant institution
- CLAS faculty
  - National undersea research center staff
    - Professors, staff,
  - Animal science, marine science, math, bio profs
- Neag faculty
  - Science and math education
  - Special education
  - Educational psychology
Student Tasks I

• To start the PBL activity with:
  – the letter from US Congressman Rob Simmons
  • Harbor Seals as one indication of the Long Island Sound environment and to determine if the seal population is changing, and if so in what way.
Students’ Tasks II

- A report of the Harbor seal in social studies and history
- Report on the harbor seal population
- Report on the migration of the harbor seals
  - When?
  - Why? Food, temperature, water quality
  - Where do they go, how many come back?
- What would happen if there were no harbor seals in Long Island Sound in the near future?
The COS PBL module - Impact of the Health of Long Island Sound on Harbor Seals

- Consistent with the principles and premises of PBL - a structured problem that requires the students to use an interdisciplinary approach to:
  - Identify the problem;
  - Generate problem definitions;
  - Plan to solve the problem;
  - Initiate the plan;
  - Monitor the solutions for the problem solving plan; and
  - Develop a report/presentation of their solution.
Curriculum Development

• Problem-based learning format (PBL)
  • Situated Learning (Brown, Collins & Deguid, 1989)
    • Authentic context for learning
    • Complex problems
  • Community of Learners and Community of Practice
    • “Learning, thinking and knowing are relations among people engaged in activity in, with, and arising from the socially and culturally structured world” (Lave, 1991)
Curriculum Development (continued)

• Cognitive Apprenticeship (Brown, et al., 1989)
  • ASD pupils studying with marine scientists as well as the Captain of the research vessel.
  • Scientists, teachers, students and pupils communicate through an asynchronous software system.
  • Hearing and deaf pupils collaborate in a rich marine science context through web technology.
Navigation Calculations
Solving problems and communications
Knowledge, Attitudes and Behaviors – KAB’s

- **Knowledge**
  - What do you know about it?
  - I know why sound travels at different wave lengths depending on water temperature.

- **Attitudes**
  - How do you feel about it?
  - Do you believe you can do it? (Self-efficacy)

- **Behaviors**
  - Do you do the associated behavior?
  - Do you use science in your everyday life?
  - Do you operate the ship’s equipment correctly?
Concept Maps Seals – Expert’s Pete

- Systematics
- Taxonomy
- Natural History
- Anatomy / Physiology
- Ecology
- Cladistics
- Evolution
- Mammalia
- Carnivora
- Pinnipedia
- True Seals
- Eared Seals
- Harbor Seals

- Distribution
- Migration
- MusculoSkeletal System
- Cardiovascular System
- Stock Assessment
- Environmental Requirements

- Birth / Mortality
- Pulmonary System
- Locomotion
- Prey and Food Preferences
- Sensory System
- Reproduction System

- Habitat
- Predators
- Homeostasis
- Adaptations

- Native Peoples
- Fishing
- Commerce
- Eco-tourism
- Land Use
- Pollution
Seals – Nick

Habitat
- Underwater, on the rocks
- Ocean

Seals

Eat
- Fish
  - They don't chew
  - They shallow the fishes
Seals

- Most Seals eat the fishes.
- Seals had a fur on it, it is for making them feel the warm and depend on the weather.
- Seals had very tiny the ear with between nose.
- Kind of seals
  - Harbor, Grey, Harp, pinnipeds, sealions, walrus
- Some seals like to swim in the warm or cold ocean.
- Some seals went to the South America for wanted to swim in the warm ocean.
- Some seals went to the North America for wanted to swim in the cold ocean.

Some seals like to swim in the warm or cold ocean.
Outcomes

- COS impacts the KABs of the students in the area of science and technology, fulfilling the objectives of the COS project:
  - “To provide greater opportunities for deaf pupils to pursue careers in science and technology.”
- And positively impacts the KAB’s of both hearing and deaf pupils.
- Positive experience for professors, teachers, students and pupils