

# 2003 Transportation Education Academy Activities

## Middle/ High School Activities: Water

### Tow Boat

**LEARNING AREA:** Inquiry and Research  
**EDUCATIONAL LEVEL:** Middle/ High School  
**CONTENT STANDARDS:** New Product Development

#### STANDARD:

A student shall research, develop, and test a new product to demonstrate an understanding of needs analysis; specific material or technologies; material processing of design techniques, or both, by:

1. Researching the need and the market of gear ratio in marine technology.
2. Designing a new or improved product that meets criteria of the towboat.
3. Creating the new or improved product.
4. Testing and evaluating the product and competing against others
5. Assessing the impact of production, use and eventual disposal of the product on the environment, society, and health, as applicable.

#### WHAT THE STUDENTS WILL LEARN:

**DESCRIPTION:** Tow Boat

Students shall research and design a towboat and gear the boat to tow four boats of the same size. The boats will be tested for efficiency.

#### PRODUCTS/EVIDENCE OF LEARNING:

**Student shall:**

1. Research gear ratio.
2. Analyze data.
3. Develop a product.
4. Test product.
5. Report data.
6. Write a report.

#### OVERVIEW:

**Objective:** Discover marine gear ratio, research it, build a small structure, and test it.

**Problem:** Discover what gear ratio will be the best for towing a certain amount of weight. Move the weight from point to point.

**Solution:** Use study guides, trial and error, and report data. Analyze and review data with the students.

**CHECKLIST:**

Students	Teacher	Project
_____	_____	1. Demonstrate an understanding of marine tech.
_____	_____	2. Demonstrate an understanding of gear ratio.
_____	_____	3. Build a working model.
_____	_____	4. Analyze and improve model.
_____	_____	5. Correctly record data.
_____	_____	6. Complete writing report.