Curriculum Units by Fellows of the Yale-New Haven Teachers Institute
1988 Volume VI: An Introduction to Aerodynamics

The Continuity Equation, The Reynolds Number, the Froude number

Guide for Curriculum Unit 88.06.04
by James F. Langan

Here is an outline of the unit. The unit discusses some physics: the continuity equation, dynamic similarity, the difference between units and dimensions, the Reynolds number, and the Froude number. Some history of model testing, towing tanks, of “The Great Eastern,” or “Turbinia” and cavitation. The unit is an opportunity for students to see uses of mathematics by reading about engineering projects and their solutions.

I see this unit as something the student can read as a start to reading about engineering projects, naval architecture and marine science. I hope the unit raises questions the student wants to answer by doing some research. Such questions as what did the ships look like? . . . the scientists?

I will use this material when we discuss variation in Algebra II. This unit itself mentions direct and inverse proportion. The naval architecture readings give examples of variation when they discuss laws of mechanical similitude, such as the wetted surface varies as the square of the length on the water line. The unit uses exponent when it does dimensional analysis. Setting the Reynolds and Froude numbers equal to each other results in an equation having fractional exponents

(Recommended for Algebra II classes, 11th grade college prep)

Key Words

Lindberg American Literature History Aeronautics Science