

50. Hydrofoam Boat

Classroom Activity: Design and build a styrofoam boat that will travel a fixed distance in a tank of water in the least amount of time.

Grade(s): 7

Strand (s): Understanding Structures and Mechanisms

This task addresses the following overall expectations:

- design and construct a variety of structures, and investigate the relationship between the design and function of these structures and the forces that act on them;
- demonstrate an understanding of the relationship between structural forms and the forces that act on and within them.

and the following specific expectations:

- follow established safety procedures for using tools and handling materials;
- design, construct, and use physical models to investigate the effects of various forces on structures;
- investigate the factors that determine the ability of a structure to support a load;
- use technological problem-solving skills to determine the most efficient way for a structure to support a given load;
- investigate methods used by engineers to ensure structural safety;
- use appropriate science and technology vocabulary, including truss, beam, ergonomics, shear, and torsion, in oral and written communication;
- use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes.

Assessment Categories:

- Knowledge and Understanding
- Thinking and Investigation
- Communication
- Application
- Teambuilding skills



Type of Activity: Classroom or Challenge Competition

Preparation: set-up mechanism to power the boat and gather materials.

Materials/Resources for teachers:

300-g weight

fishing line

tank of water

stop watch

Time needed to complete this activity: varies

Materials/Resources for students:

styrofoam (fine-grained pink or blue)

exacto knife

found materials for ballast

Activity Description:

Working in teams, students will design and carve the hull and other parts of a boat out of

styrofoam. No glue may be used. The boat will be propelled for the first 50 cm of its journey by a 300 g mass falling a distance of 50 cm. The boat must have a mechanism for attaching this towline, and it must be able to withstand the force of the falling weight. The boat that travels the greatest distance in the shortest period of time wins.