

## 54. Arctic Provision Transporter (APT)

**Classroom Activity:** Design and construct an APT to drop supplies to an Arctic expedition. The ATP must be able to carry and drop a raw egg down a ramp to land on a target 1.75 m below.

**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;
- 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



**Planning time:** 4 hours

**Time to complete:** 4 weeks

**Materials/Resources for teachers:**

Inexpensive and recycled materials provided by the students such as wood, paper, cardboard, straws, plastic tubs, Styro-foam, tape, glue, newspaper, elastics, etc. No glass or metal parts and no parts from any construction kits such as "Lego".

**Activity Description:**

Student teams must collaborate to design and construct an APT transporter to carry and drop a raw egg down a ramp to land on a target 1.75 m below.

Teams will consist of 3 to 5 students with the following responsibilities:

Designer - creates design and obtains authorization from engineer to begin construction

Materials Manager - Keeps a record of all materials used by the team

Constructor-Builders - in collaboration with all team members, puts together the car according to drawing plan and incorporates modifications

Communication Specialist - spokesperson for the team who will present the project to others.

The egg cargo must not break during the drop from a ramp 1.75 m above the target.

Judge accuracy in hitting the target, as well as creativity.