

49 High-Wire Mine Cart

Classroom Activity: Design and build a vehicle that can travel across a wire carry a load.

Grade(s): 7 and 9

Strand (s): Understanding Structures and Mechanisms (Grade 7)

This task addresses the following grade 7 overall expectations:

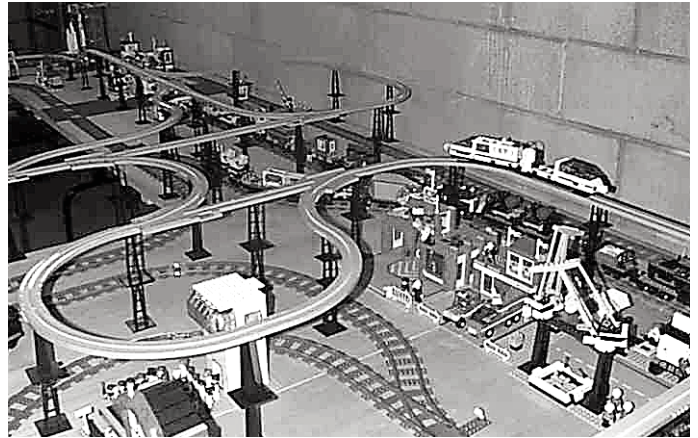
- design and construct a variety of structures, and investigate the relationship between the design and function of these structures and the forces that act on them;
- demonstrate an understanding of the relationship between structural forms and the forces that act on and within them.

and the following grade 7 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: gather materials and set up test zone.

Materials and Resources for Teachers: chairs, table, wire or fishing line to set-up the test zone.

(Cable over 3 meters in length stretched between two points)

Time needed to complete this activity: varies

Materials/Resources for students:

cardboard
wire or fishing line
strips of wood
dowels
pipe cleaners
elastics glue sticks
jelly beans or pennies
tooth picks
straws
2 pulleys
2 styrofoam cups
1 plastic cup
found materials

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Activity Description:

As a class explain the assignment. Students are to build a mining cart that can carry a removable load (jelly beans or pennies) 3 meters along a prepared test zone. The cart can be launched along the cable or it can be self-propelled. Once launched or released the cart must not be touched.

Divide students into teams and have them design and build their high-wire mine carts. The cart that travels the furthest with the heaviest load wins.

