

## 57. K'Nex Crane

**Classroom Activity:** Students design, make and use a pulley system that performs a specific task. They must manipulate pliable and rigid materials as required by a specific design. They must also identify and make modifications to their own pulley and gear systems to improve the way they move and load..

**Grade:** 4

**Strand (s):** Understanding Structures and Mechanisms

This task addresses the following overall expectations:

- investigate ways in which pulleys and gears modify the speed and direction of, and the force exerted on, moving objects;
- demonstrate an understanding of the basic principles and functions of pulley systems and gear systems.

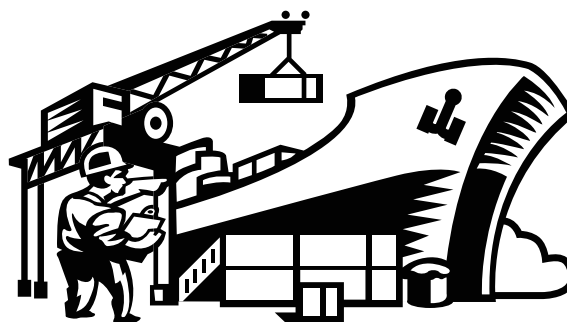
and the following specific expectations:

- follow established safety procedures for working with machinery;
- use scientific inquiry/experimentation skills to investigate changes in force, distance, speed, and direction in pulley and gear systems;
- use technological problem-solving skills to design, build, and test a pulley or gear system that performs a specific task;
- use appropriate science and technology vocabulary, including pulley, gear, force, and speed, 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;
- describe the purposes of pulley systems and gear systems.

**Assessment Categories:**

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

**Type of Activity:** Classroom, independent study



**Time needed to plan:** 1/2 hour

**Time needed to complete activity:** 8 x 40 min periods

**Materials/Resources for teachers:**

K'Nex

**Materials/Resources for students:**

K'Nex

Weights

String

**Activity Description:**

The students first participate in a workshop on how to build a strong structure, as well as the use of different pulley systems.

Students are provided with K'Nex. Their task is to build a crane that will lift a set of weights.

The students work in groups to build a crane that incorporates a pulley and gear system. A competition could be arranged to see whose crane can lift the greatest weight.

**Tips:**

Teaching a session on how a strong structure is held together, and how gears and pulleys work together to move an object helps the children understand what they are trying to accomplish.

Handout the K'Nex after the lesson on structures and pulleys. This is a great end of unit project to see who could apply their knowledge. Is also great for students who need hands on application.