

43. The Four Types of Motion

Classroom Activity: To use readily available material such as boxes, dowels, woods, plastic gear cams, string and weights to build devices demonstrating the four types of motion: linear, rotary, reciprocating, and oscillating.

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.

Assessment Categories:

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

Type of Activity: Classroom or Science Lab

Preparation: gather materials

Materials and Resources for Teachers: no additional resources required, but it might be helpful to build



models demonstrating the different types of motion or have diagrams available.

Time needed to complete this activity: 400 minutes

Materials/Resources for students:

various sized boxes
jinx wood
plastic gears
plastic pulleys
cams
1/8" masonite
plywood
nuts bolts, washers to use as weights
glue gun
glue sticks
straws to use as sleeves for the dowels

Activity Description:

Describe and demonstrate the four types of motion. Explain how they can be linked and how one type can be converted to another. For example, the knob on an overhead projector is turned making the magnifier move up and down. The rotary motion of the knob is converted into the linear motion of the magnifier.

Explain the assignment. Working in teams students are to design and build a machine that uses as many types

43. The Four Types of Motion

of motion as possible.

Divide the students into groups of 4 or 5. Have them develop and draw a design for their device, including the material they will use and how the machine will operate.

Review safety regulations before students begin construction. Building can be done over several classes.

The students graded on the quality and clarity of their design, how well the finished machine operates and matches their design.