

70. Milk Carton Catapults

Classroom Activity: To building milk carton catapults with elastics, pencils and lids that would throw a gumball the greatest distance. This activity combines the gear/pulley unit with the medieval unit

Grade(s): 4 and 5

Strand(s): Understanding Structures and Mechanisms (Grades 4 and 5)

This task addresses the following grade 4 overall expectations:

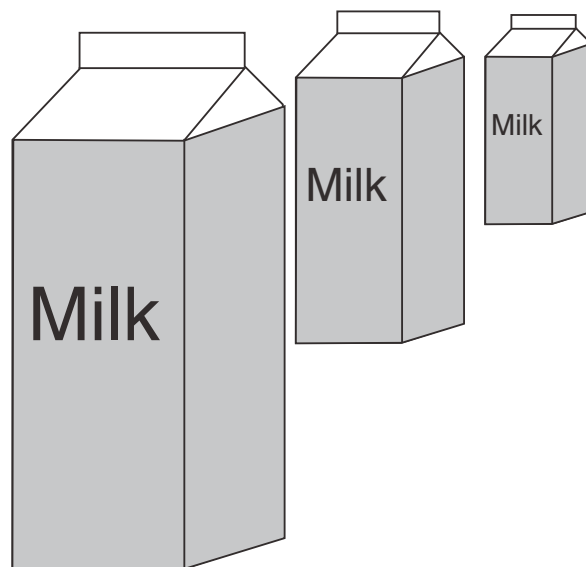
- investigate ways in which pulleys and gears modify the speed and direction of, and the force exerted on, moving objects;
- demonstrate an understanding of the basic principles and functions of pulley systems and gear systems.

and the following grade 4 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;
- describe how one type of motion can be transformed into another type of motion using pulleys or gears.

This task addresses the following grade 5 overall expectations:

- investigate forces that act on structures and mechanisms;



- identify forces that act on and within structures and mechanisms, and describe the effects of these forces on structures and mechanisms.

and the following grade 5 specific expectations:

- follow established safety procedures for working with tools and materials;
- measure and compare, quantitatively and/or qualitatively, the force required to move a load using different mechanical systems and describe the relationship between the force required and the distance over which the force moves;
- use technological problem-solving skills to design, build, and test a frame structure that will withstand the application of an external force or a mechanical system that performs a specific function;
- use appropriate science and technology vocabulary, including tension, compression, torque, system, and load, in oral and written communication;
- use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different

70. Milk Carton Catapults

audiences and for a variety of purposes;

- identify internal forces acting on a structure and describe their effects on the structure;
- identify external forces acting on a structure and describe their effects on the structure, using diagrams.
- explain the advantages and disadvantages of different types of mechanical systems

Assessment Categories:

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

Cross-discipline connections:

Social Studies (Medieval history)

Mathematics (Measurement)

Type of Activity: Classroom and Independent study

Time needed to complete activity: 2 hours

Materials/Resources for teachers:

Pictures and Models of Catapults

Elastics

Milk cartons

Gumballs

Pencils

Hot glue

Scissors

Rulers

Bottle caps

Popsicle sticks

Activity Description:

Discuss what a catapult is and how it works. Follow this up with pictures, models and a demonstration. Provide each student with the appropriate materials and have them design and build their own catapult. Allow time for the students to test and make any corrections needed.

Have a competition to see whose catapult can launch a gumball the farthest.