EDUCATION AT THE AMERICAN PRECISION MUSEUM

Gears, Belts, Pulleys

Introduction:

As a group, discuss what machines are. One basic definition: they make work easier.

Part One: Simple Machines

Simple Machines are the building blocks of other machines. And a Simple Machine does not move on its own, but creates an advantage for the person using it.

Traditionally, there are 6 Simple Machines. Sparkshop has created a fun dance routine to help you remember them, or our short video explains them too.

Part Two: Mechanisms and Gears

Mechanisms change 'input forces' into 'output forces' and control movement for a mechanical system. Gear trains, cams & followers, and linkages are examples of mechanisms.

There are differently shaped gears, and the four you see on these cards are not the only shapes. Go over Bevel, Worm, Rack and Pinion, Herringbone cards.

Hand out tools to students. From the clues, have kids figure out what simple machines and gears are in them. (Advanced: Pair up. Go back to back. Have someone describe how the tool works. Other person guesses what gear is being used)

Key:

Handpowered drill--Bevel, screw, wheel/axle
Winghandle corkscrew--Wheel/axle, screw, rack & pinion, lever
Adjustable wrench--Worm gear
Hand powered egg beater--Bevel
Ice Cream Scoop-Rack and Pinion
Crank pencil sharpener innards-Herringbone Gears
Pepper Grinder-Bevel

Materials List:

Handpowered drill
Winghandle corkscrew
Adjustable wrench
Hand powered egg beater
Ice Cream Scoop
Pencil Sharpener (the kind with a crank)
Pencil Sharpener (the kind you twist)
Clean, Empty Pepper Grinder

Handouts: Print single-sided copies of page 3 of this document.

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Conclusion: Career Context

Even though a lot of the museum dates back two hundred years, manufacturing continues to evolve and change. Do you think we still make and use simple machines? Can you think of a job that might use pulleys?

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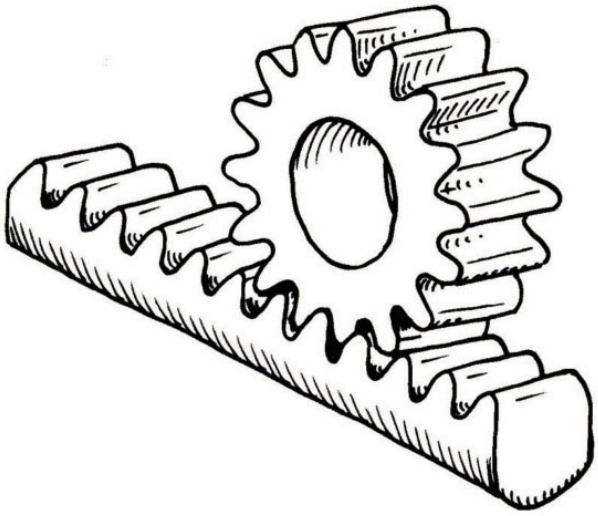
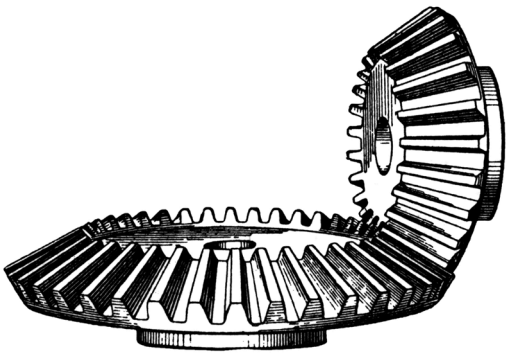
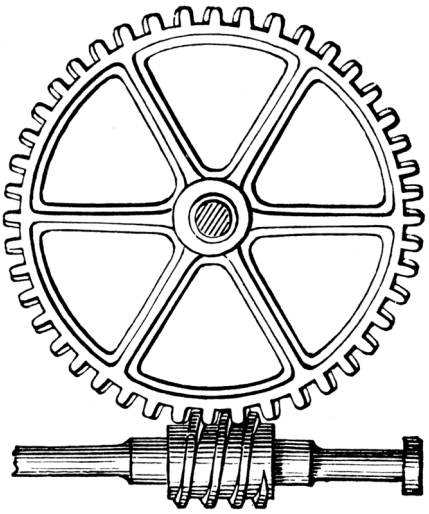


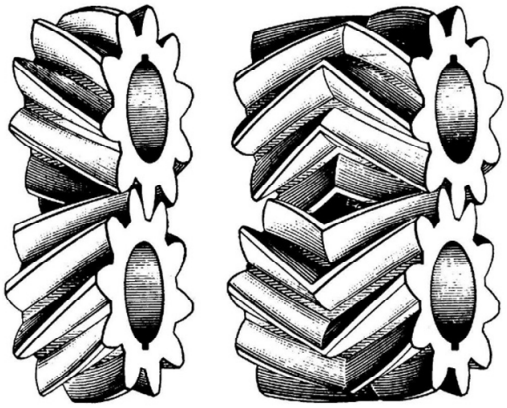
Rack and Pinion



Bevel Gear



Worm Gear



Herringbone Gear