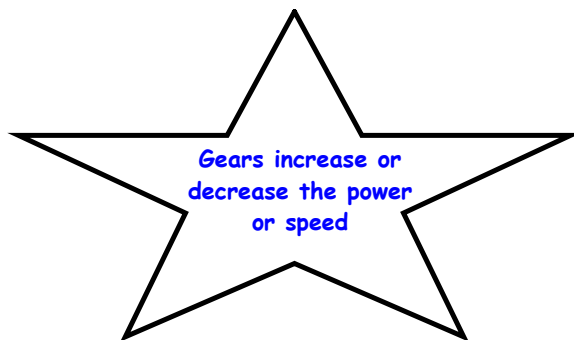




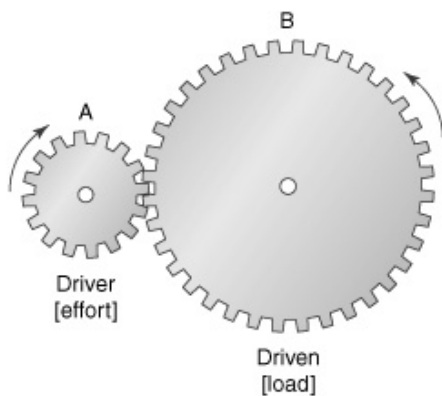
Gears

- Gears are wheels with teeth
 - Gears have interlocking teeth that connect with and move each other.
 - It helps transfer movement in objects.
-
- When the gears interlock with each other, one gear will cause another to move
 - The size and movement direction of the gears depends on the number of teeth it has compared to the others



Gears can be found in everything from cars to clocks. Get your parents' approval before checking the listed items in your house to see whether or not they use gears

- Clock
- Can opener
- DVD player

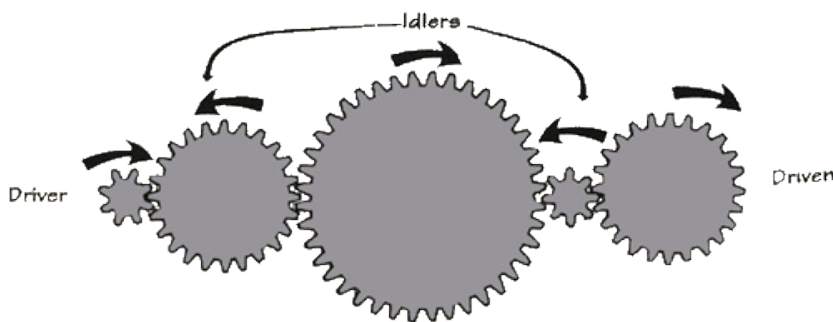


Driver Gear vs. Driven Gear

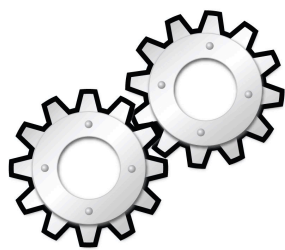
Driver Gear: the INPUT gear, or driver gear, is where the force is first applied

Driven Gear: the final gear on the gear train to which the force is first applied

Idler Gear: any gear in between the driver and driven gears.



This diagram shows five **meshed** gears. The arrows show the direction the gears are turning. Gears will either turn clockwise or counterclockwise.



Important Features of Gears

Number of teeth

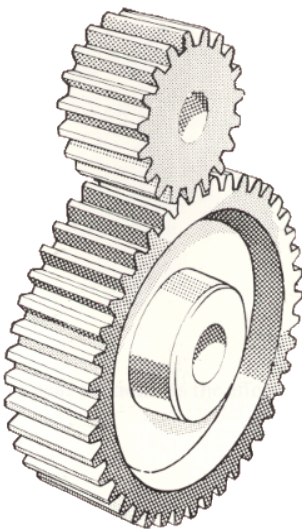
Size of the gear

Where it is placed in the gear train

Rotation clockwise or
counterclockwise

Different Types of Gears

Spur Gears



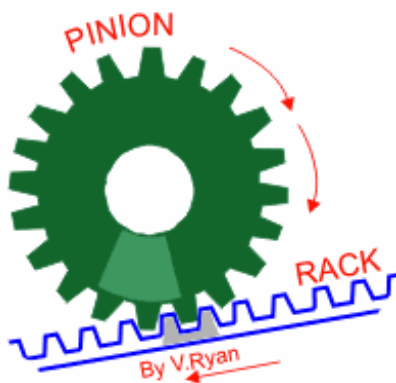
In spur gears, the teeth meet on a flat surface and can change the speed and direction of motion. Spur gears move opposite of each other because they are meshed together.

In the picture below, gear 'A' is called the driver. As gear 'A' turns it meshes with gear 'B' and it begins to turn as well. Gear 'B' is the driven gear.



Examples: washing machine, clothes dryer

Rack and Pinion

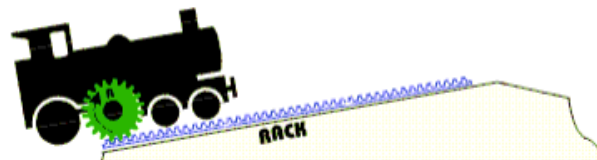


A single gear, a PINION, meshes with a sliding toothed rack.

Examples:

- Rear wheel of a bicycle
- Windshield wipers in cars
- A clock pendulum
- The wheel of a wheelbarrow

Rack and Pinion Gears: In rack and pinion gears, a single gear, called the pinion, meets with a toothed rack. The rack may slide or stay in one place. The system changes circular motion into motion in a straight line





Bevel Gears

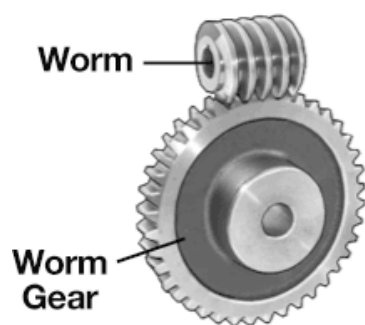
In bevel gears, two gears connect at an angle. Bevel gears are often cone-shaped. They can also change the speed and direction of motion.

Examples of bevel gears can be found in hand drills and small bevel gears are found in DVD players



Worm Gears

In worm gears, a axle or shaft has a screw thread that connects with another gear. This system is used to reduce the speed and change the direction of motion.



Worm gears are often found in elevators and escalators



Worm drive controlling a gate

How gears change force, speed and direction using gear systems

Input vs. output component

In order for a gear to work, something has to make them turn.

The place where the energy is put into the system is called the INPUT.

On a bicycle, the pedal is the input.

You push on the pedal to make the pedal gear in the system turn. As you push, the gear moves the chain.

The last thing to move on the system is called the OUTPUT. The back wheel is the output of the system.

BICYCLE

What do you do with the pedals?

What happens when you push on the pedals?

What other parts of the bike are put into motion?