Name: _____ Date: _____

PULLEYS AND GEARS

Over the last two months you have learned a great deal about pulleys and gears. You have had the opportunity to learn about different types, practise building systems, and see how we use them in everyday life. For the end of our unit we will not be writing a test, instead you will answer the questions to follow by using the work you have done in class throughout this unit.

1. Describe the purpose of pulley systems and gear systems. (Why do we have them?)

   To facilitate changes in direction, speed, or force.

   They make it easier to do work.

2. Describe how rotary motion in one component is transferred to another component in the same structure. (How can we turn something to make something else turn?)

   When a gear turns it forces a meshed gear to also turn.

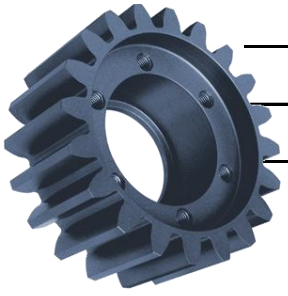
   When a sprocket is turned it causes a chain to move, which causes another sprocket to move.

3. Describe how one type of motion can be transferred into another type of motion using pulleys and gears. (How can we change the type of motion, e.g., how can we turn something to make something else go straight?)

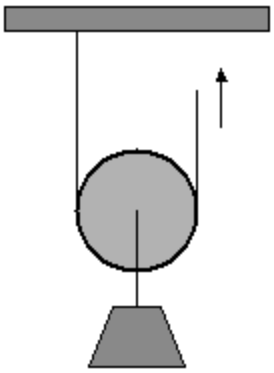
   A rack and pinion transfers rotary to linear motion.

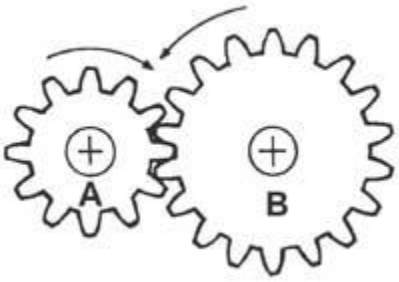
   A clock pendulum transfers rotary motion to oscillating (back and forth) motion.

   A pulley can transfer a downward motion to an upward motion.



4. In the space below draw:
    a. A pulley system that makes it easier to lift something.
    b. A gear system that increases the speed of motion.





Turn B to make A go fast

5. Describe how gears operate in one plane (what type uses a flat surface) and in two planes (what type does not sit on a flat surface?).

Spur gears lie flat and turn in one plane.

Bevel gears operate at a 90 degree angle.

6. Identify pulley systems and gear systems that are used in daily life.

Pulley Systems – clotheslines, flagpoles, cranes, elevators, etc

Gear Systems – clocks, bicycles, hand drills, transmissions, etc

7. Explain how the gear system on a bicycle works. Identify the input to make the bicycle work (what makes it go?) Identify the output (what is the final result of operating the bicycle).

The rider turns the peddles (the input), which are attached to the front set of sprockets. The sprockets have a chain that runs around them. This chain is also attached to a set of sprockets at the back of the bicycle. The chain forces the back sprockets to turn. The back sprockets are attached to the back wheel on the bicycle, so when the back sprockets turn the back wheel turns (this is the output).