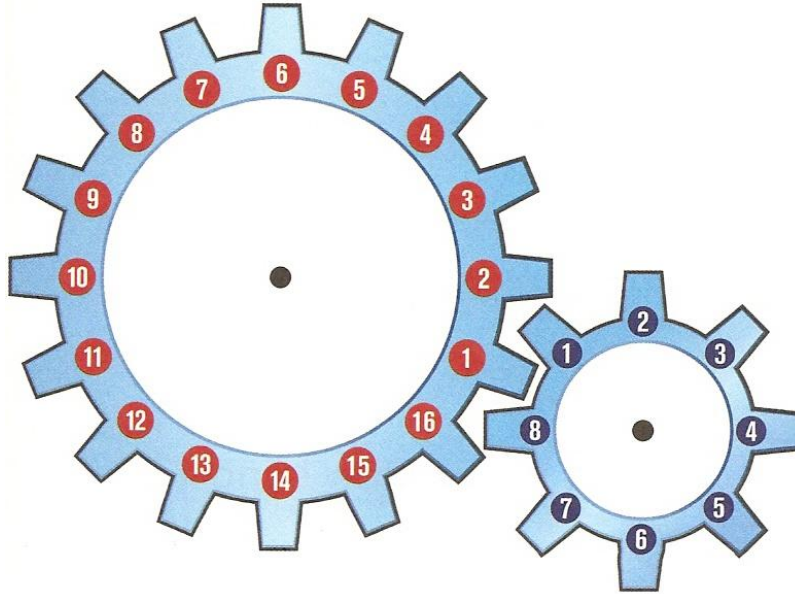Name: _____   Date: _____

GEARS

Use the following gear system to answer all six questions on this page.

1. If we turn the large gear around once, how many times will the small gear turn?

   _____2 times_____

2. Does the small gear turn faster or slower than the large gear?

   _____Faster_____

3. If we turn the small gear around twice, how many times will the large gear turn?

   _____1 time_____

4. Does the large gear turn faster or slower than the small gear?
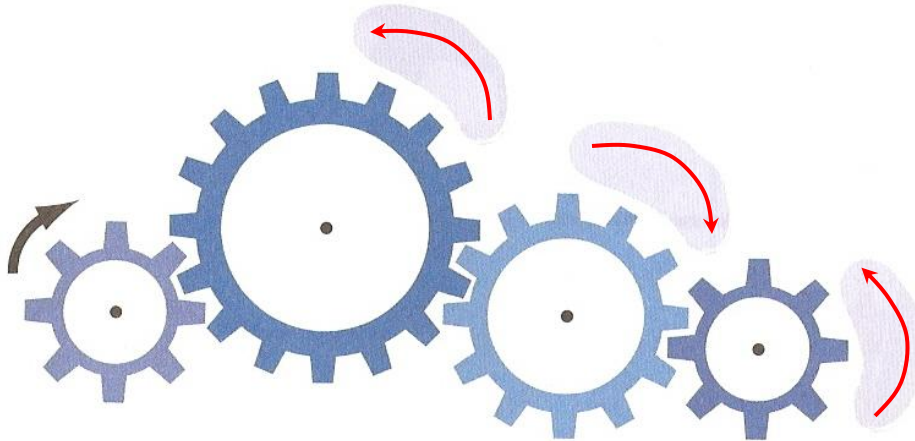
   _____Slower_____

5. Do you think gears can change the speed of rotation?

   _____Yes_____

6. How many times would we have to turn the small gear in order to make the large gear turn 7 times?

   _____14 times_____

Us the following gear system to answer the first three questions on this page.

1. If you turn the first gear clockwise, what directions do the second, third and forth gear turn. Draw arrows to show the direction.

2. If we add one more gear after the fourth gear, what direction will it turn?

   Clockwise

3. Do you think gears can change the direction of rotation?

   Yes

You have seen that gears can change the direction and speed of movement (rotation), but those are not the only reasons for gears. One other use for gears is to change a rotation into motion in a line. Look at the image below. When you turn the handle, the apparatus moves up. In this picture there are two gears that you can not see, draw them in place. Then, in the space below, explain how this rack and pinion operates, and what it might be used for.

First you turn the handle. This turns an axle, on which there is a worm gear. The worm gear turns a pinion (a standard gear) located inside the metal box. The teeth of the pinion push down on the teeth of the rack. This forces the box part to move upwards. A platform or something else may be attached to the box part so it can be raised and lowered.