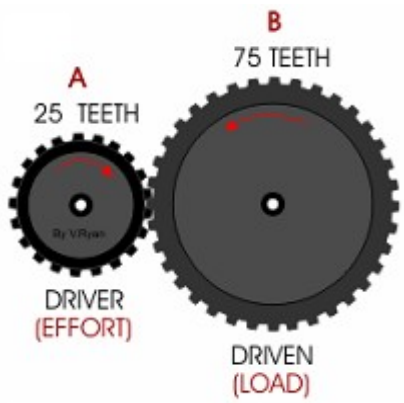
Gears and Gear Trains
SPH4C

Gears are _____ and are therefore members of the

_____ family. The teeth prevent _____.

Gears are used to transfer or _____ _____.

Example:



The load gear will turn at _____ of the rotational speed of the effort gear (_____). This _____ of the number of teeth of the effort gear to the number of teeth of the load gear is called the _____ which is equal to the _____.

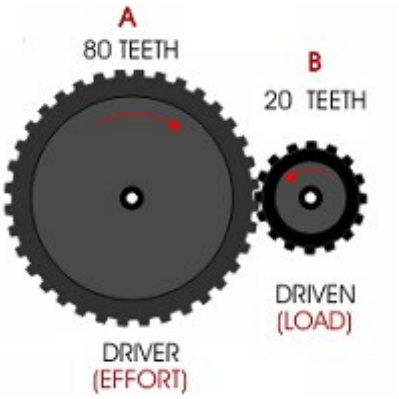
Why would one want to use gears with an IMA of less than 1?

The trade-off is that when you _____, you _____.

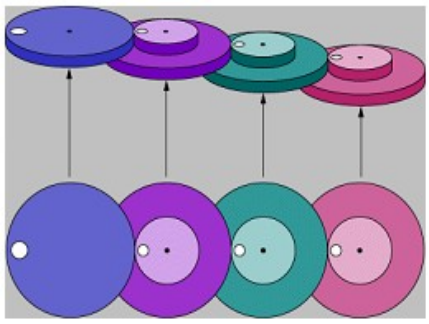
Example: What is the IMA of the following set of gears?

IMA = _____

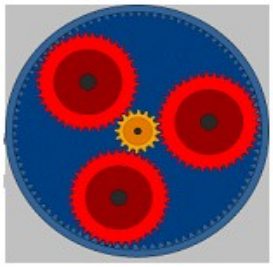
(or the gear ratio = _____)



To create _____ gear ratios, gears are often connected in _____.



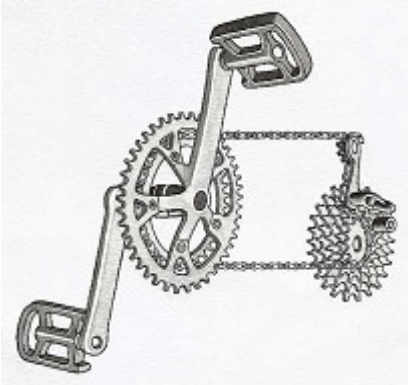
Example: Each gear turns at twice the speed of the one to its left, which means that the rightmost gear turns at _____ times the speed of the leftmost gear.



_____ **gear trains** allow the output shaft to be along the _____ as the input shaft. Such a gearing system would be used in a device such as _____.

More Practice

1. (a) If the driver (pedal) gear of a bicycle has 80 teeth and the driven (sprocket) gear has 20 teeth, what is the gear ratio?



(b) If the driver gear has 80 teeth and the driven gear has 40 teeth, what is the gear ratio?

(c) If the driver gear has 60 teeth and the driven gear has 20 teeth, what is the gear ratio?

(d) In the three questions above, has the gearing increased torque or increased speed?

2. (a) If you have gears in a gear train in a ratio of 1:3, 1:4, and 1:5, what is the overall ratio?

(b) *Extension*: If the input rpm (rotations per minute) is 10 500, what is the output rpm?

(c) Explain why someone might want to use such a gear train.