

Gears Mechanical Advantage

Crazy Contraptions 2.0

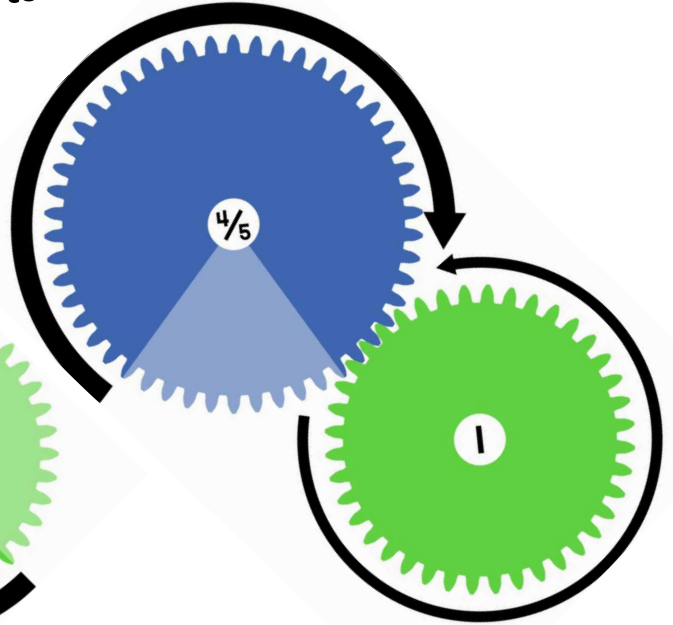
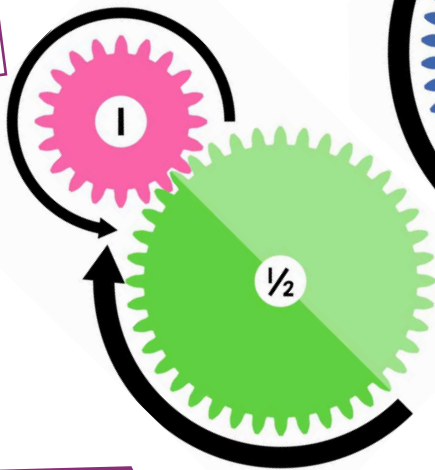
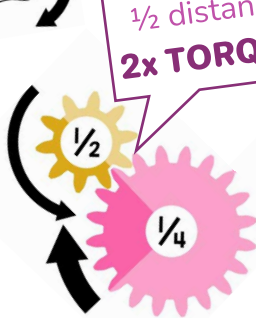


Mechanical advantage lets you amplify **torque** or distance, but you need to trade one to get the other!

Twisting Force



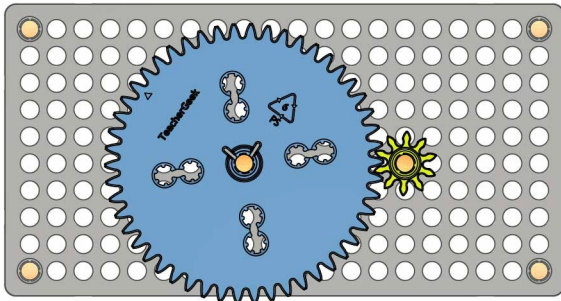
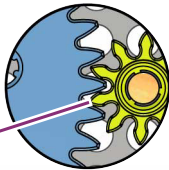
$\frac{1}{2}$ distance
2x TORQUE



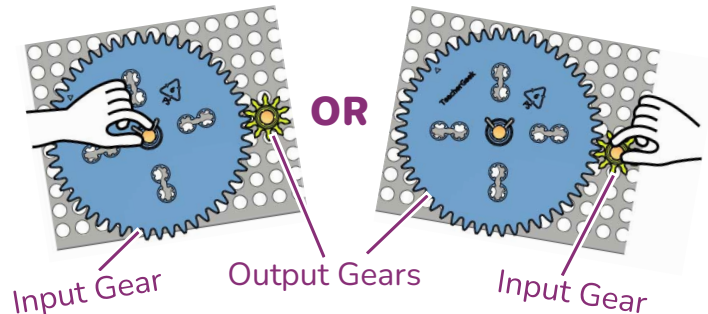
Feel the Advantage

Mesh two different sized gears.

Meshing

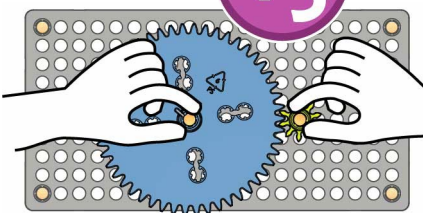


Try spinning your gears, switching the input and output gears. Which way amplifies speed?

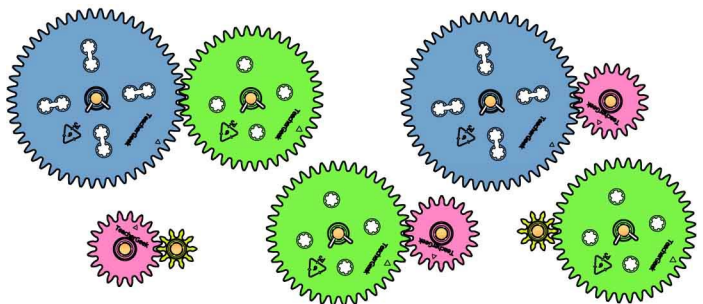


Have a twisting contest with a partner! Which gear amplifies force?

Vs

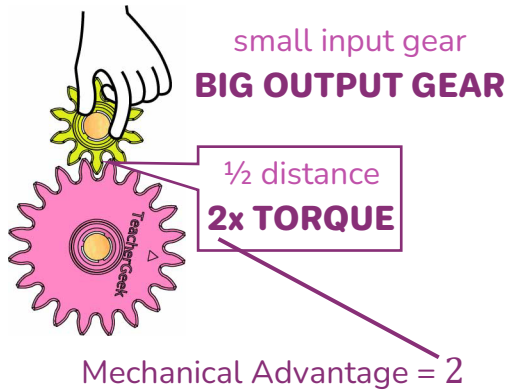


Try different sets of gears!

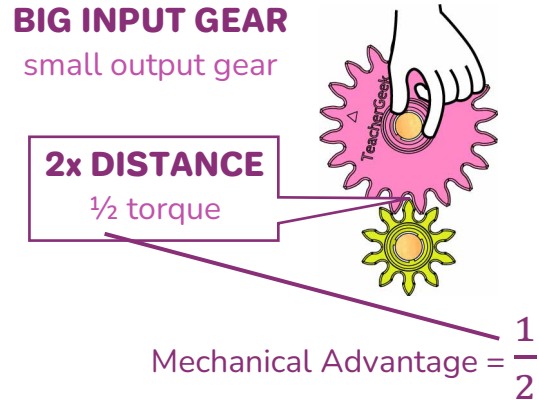


How's It Work?

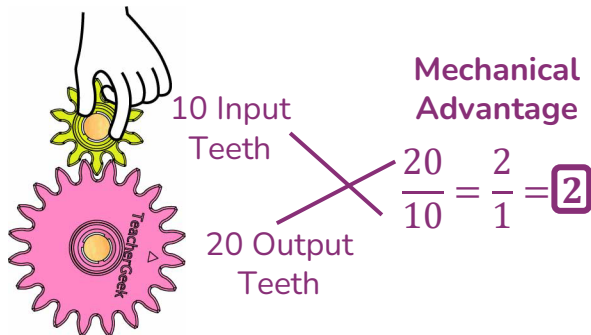
Amplifying Force



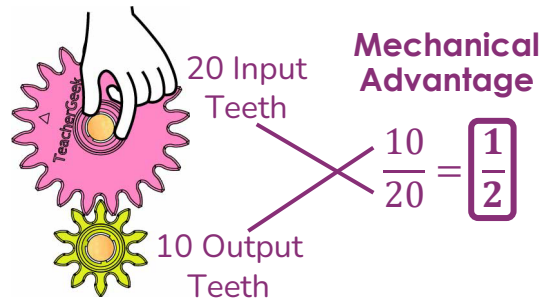
Amplifying Speed



Find mechanical advantage using the gears' teeth.



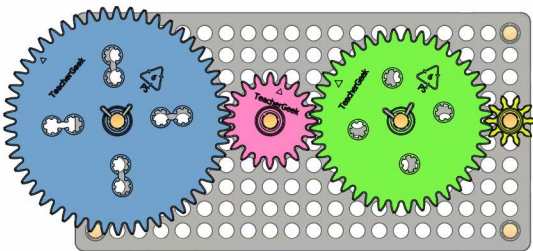
When mechanical advantage is bigger than 1, force goes up (and speed goes down).



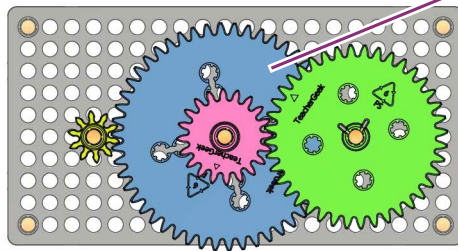
When mechanical advantage is less than 1, force goes down (and speed goes up).

OPTIONAL GEAR TRAINS

Make a gear train! Can you get more speed? Force?



What if you use compound gears in your gear train?



Compound gears are two gears on the same axle.

