

Gearing Up

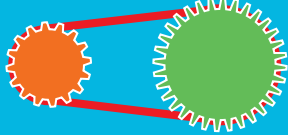
You need a 10-speed or mountain bike (to look at)



Activity

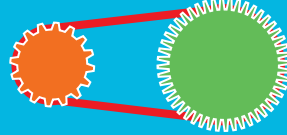
1. a. Look at the toothed cogs shown below. Each pair of cogs is joined by a chain. As the chain-ring cog in each pair turns one rotation, how many times does the free-wheel cog turn?

i. 16 sprockets 32 sprockets



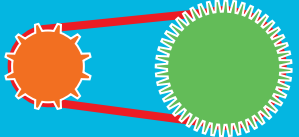
free-wheel cog chain-ring cog

ii. 16 sprockets 48 sprockets



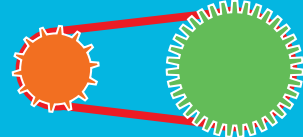
free-wheel cog chain-ring cog

iii. 12 sprockets 48 sprockets



free-wheel cog chain-ring cog

iv. 14 sprockets 35 sprockets



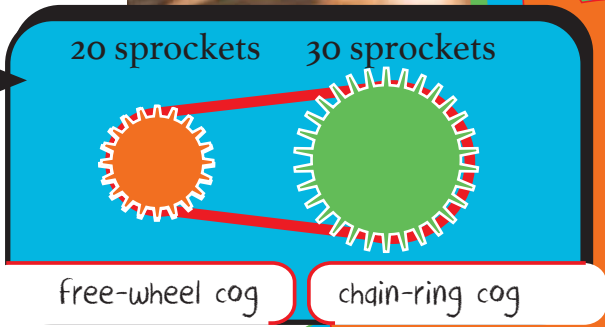
free-wheel cog chain-ring cog

b. Discuss with a classmate how you can work out the number of turns by using the number of sprockets on each cog.



2. Look at the gears on a 10-speed or mountain bike.
 - a. How many different chain-ring cogs are connected to the crank?
 - b. How many different free-wheel cogs are on the free-wheel cluster (at the rear hub)?
3. If you have a 10-speed or mountain bike you are allowed to ride, try changing gears on it.
 - a. What happens as you change gears?
 - b. How many different gears does the bicycle have?

4. In question 1, you found the ratio of each gear. The ratio of this gear is $30 : 20$ or $1.5 : 1$. This is the number of turns the free-wheel cog (and therefore the back wheel) makes as the chain-ring cog turns once (and, therefore, so do the pedals).



- a. Count the number of sprockets on each chain-ring and free-wheel cog of your bike. Use this information to work out the gear ratios.
- b. Which gear ratios are best for climbing hills? Why?
- c. Which gear ratios are best for cycling fast? Why?

