

## Gearing and Shifting

The gears on a bike allow you to ride all kinds of terrain: flats, up hills and down hills. Learning to use the gears may come easily to some riders, or may be more of a challenge. With San Francisco's hills, it is a good idea to learn to use your gears, or you'll likely be walking up some of our steeper hills.

**BICYCLE GEARS** are changed in two groups: front "chain rings," located on the pedal cranks (see picture below), which are changed by using the shifter lever on the left handlebar; and rear gear "cogs," located on the back wheel (also pictured below), which are changed by using the shift lever on the right handlebar.

*Note: some bicycles are now equipped with indicators on the shifters that show which gear you are in. (ie. Gears 1-8 on the right shifter and Chainrings 1-3 on the left shifter. In this case the lower the number, the lower the gear.)*

When the chain is on each of the front "chain rings," there is a corresponding group of gears (5-10 gears) on the back wheel that you can use. The small chain ring, which is closest to the inside, and nearest the bike frame, allows you to use the lowest set of gears. These lowest gears are used for climbing steep hills. The middle and outer chain rings give you a middle range of gears and a high range of gears. The middle range of gears are the most commonly used. The high gear range is usually used for going fast on flat roads or going downhill.

If you sit on your bike and look down at the chain and gears they will look something like the pictures below. On both the front chain rings and rear gear cogs, when the chain is on the left side of the range of gears, you are in a lower gear. Conversely, when the chain is on the right side of the range of gears, you are in a higher gear.



Side view of a bicycle drive-train: rear gear cogs; rear derailleur, chain, front derailleur, front chain rings and pedal cranks.



Front chain rings (3)

Rear gear cogs  
(8 speed)

## HOW MANY GEARS DO I HAVE?

If you have 8 or 9 gear cogs on the rear wheel, and 3 front chain rings, you have 24 gears (8 gears x 3 chain rings) or 27 gears (9 gears x 3 chain rings). This wide range of gears allows the rider to ride at a more consistent level of effort when riding uphill, downhill or on the flats. Learning to use your gears effectively will allow you to ride more smoothly and comfortably in all situations. Practice

## PEDALING CADENCE

### (pedal revolutions per minute)

“Cadence” is how fast you are pedaling. Combined with the gear you are in, cadence dictates how fast your bike goes. Typically, a pedaling cadence of 75-90 revolutions per minute is the most efficient and has the least impact on your knees. Assuming that you pedal consistently at 75 rpms, and you are in a “low” gear that turns the rear wheel a lower number times per pedal revolution, your bike will go slower. At the same pedal RPMs, when you are in a “high” gear, your bike will go faster.



These two types of mountain bike shifters both show the rider what gear the bike is in.

## SHIFTING GEARS

Shifting gears on your bike is done by moving the shift levers to pull (or release) metal cables, that in turn move the front and rear derailleurs. The derailleurs in turn move the chain from one chain ring (front gears) or gear cog (rear gears on the back wheel) to another.

## YOU CAN ONLY SHIFT GEARS WHEN YOU ARE PEDALING!

The chain must be moving in order for it to move from one gear to another. If you shift when the pedals are not turning, the result will be a noisy and abrupt change of gears when you start pedaling again, and you may even cause the chain to fall off of the chain ring or rear gear cog.

**ANTICIPATE WHEN YOU WILL NEED**

**TO SHIFT.** If you are approaching a hill and will need a lower gear to climb the hill, don't wait until you are struggling to pedal up the hill to change gears. Shift before your pedaling cadence starts to slow down, and you will make a smoother transition into the hill. Similarly, if you are going down hill, you may want to shift before you build up too much speed, or when you begin to pedal your pedals will spin freely and not help to push you down the hill. Finally, shift to a lower gear as you approach stop signs and red signal lights. You'll need a lower gear to start from a stop, and shifting while trying to begin riding across a busy intersection may be troublesome, directing your attention away from the traffic and down to your gears. Also, starting from a stop in high gear is slow and hard, and puts undue strain on your knees. Prepare for stop signs and signals by shifting down as you slow to a stop – and remember to keep pedaling while you shift, or you'll start out on the green light by having your chain jump violently from the old gear to the new one.