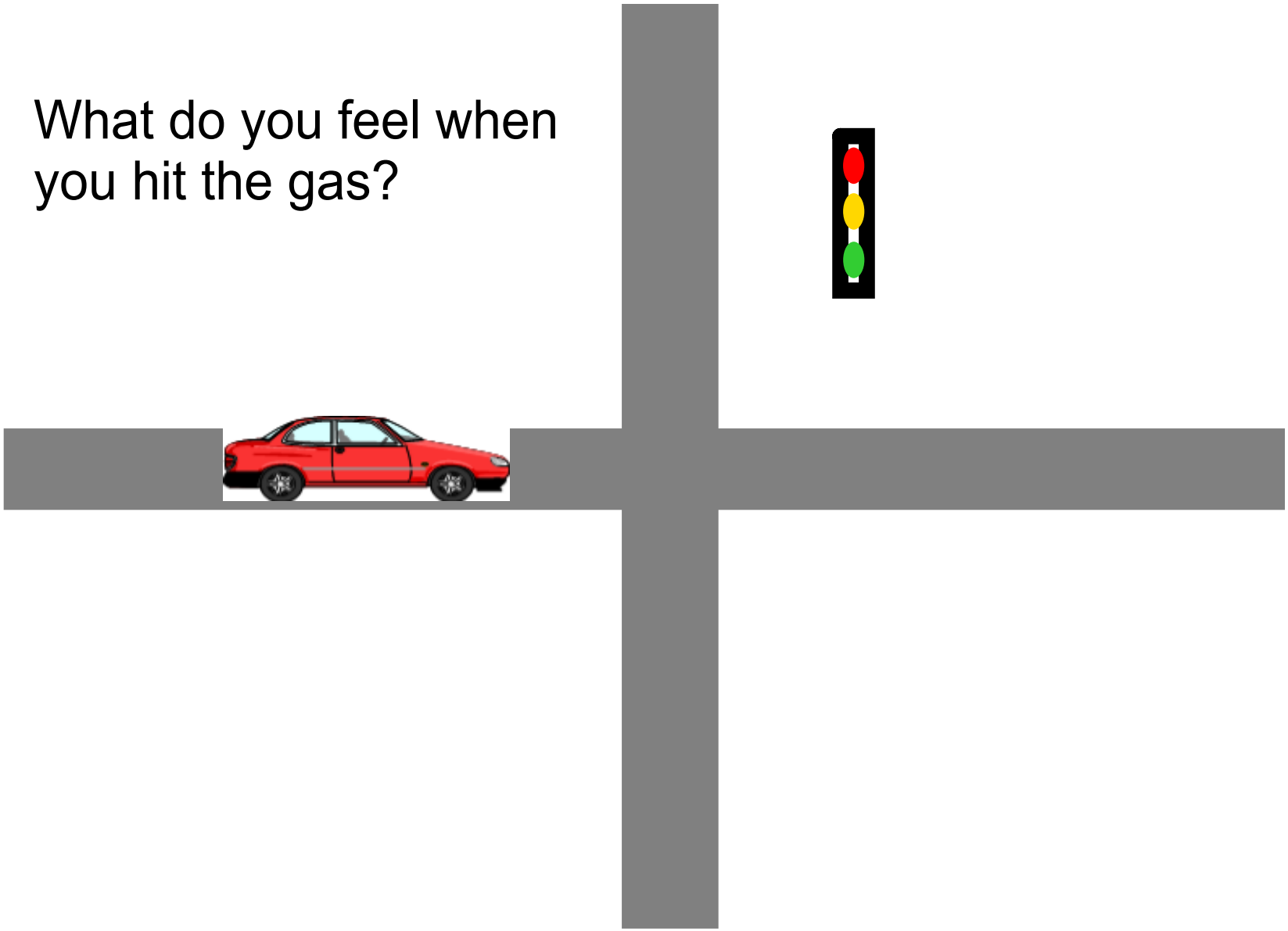
Velocity
Speed
Acceleration

What do you feel when you hit the gas?



Velocity- how fast you are going in a given direction.

example- 30mph East

Velocity

speed

+

direction

Speed- rate without direction

$$s=d/t$$

speed = distance divided by time

If a car travels 400m in 20 seconds how fast is it going?

$$s = \frac{d}{t}$$

$$s = \frac{400m}{20sec}$$

$$s = 20\ m/s$$

If you move 50 meters in 10 seconds, what is your speed?

$$s = \frac{50\,m}{10\,s}$$

$$s = 5\,m/s$$

You arrive in my class 45 seconds after leaving math which is 90 meters away. How fast did you travel?

$$s = \frac{90m}{45s}$$

$$s = 2\,m/s$$

A plane travels 395,000 meters in 9000 seconds. What was its speed?

$$\frac{395{,}000\text{m}}{9000\text{s}}$$

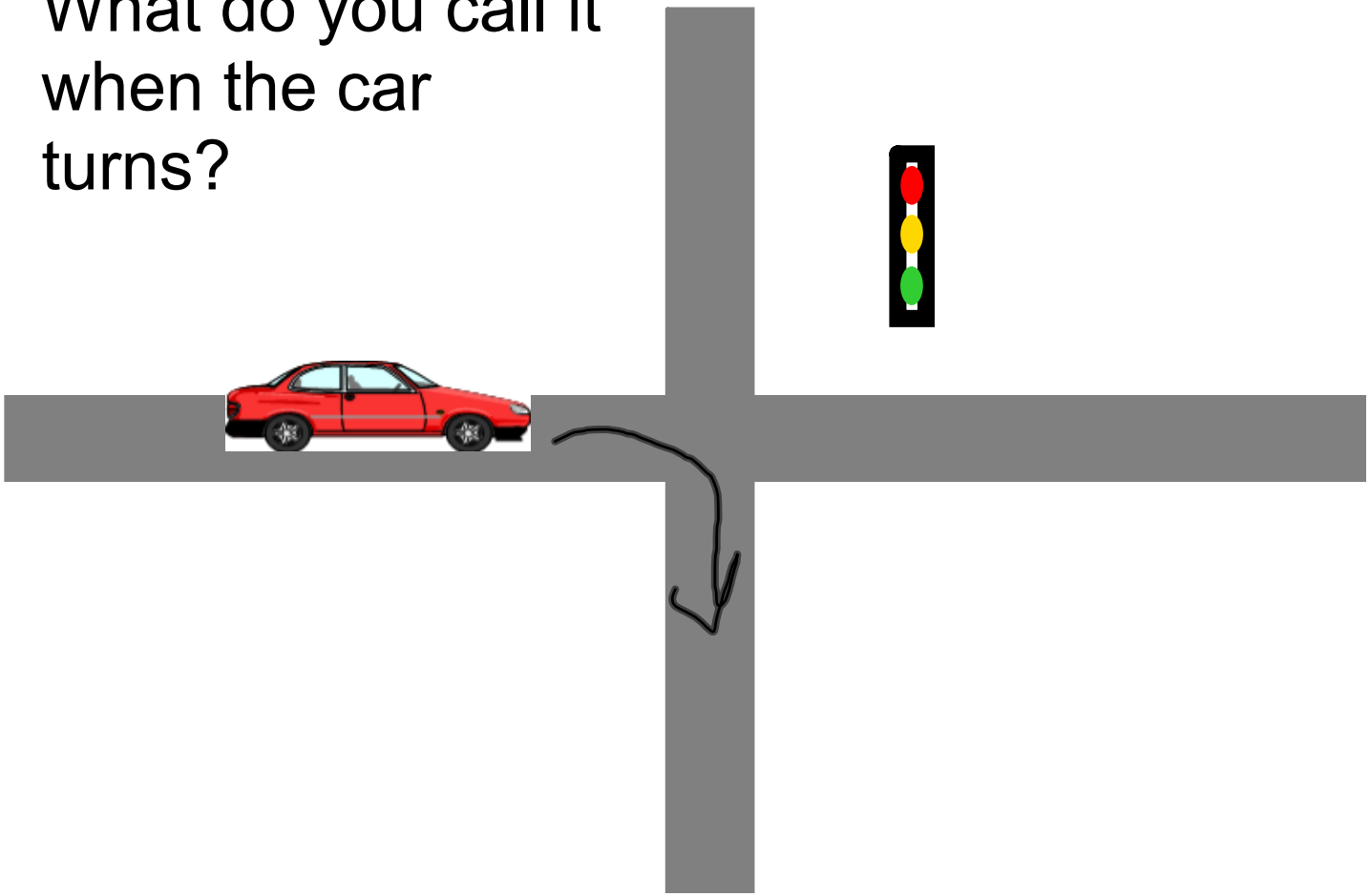
$$43.89\text{m/s}$$

It takes Serina 0.25 hours to drive to school. Her route is 16 km long. What is Serina's average speed on her drive to school?

$$\frac{16\text{km}}{15\text{min}}$$

$$1.06\text{km/min}$$

What do you call it when the car turns?



Acceleration- change in speed OR direction

Change

OR

speed

direction

$$a = v/t$$

$$\text{acceleration} = \frac{\text{final speed} - \text{original speed}}{\text{total time}}$$

A roller coaster car rapidly picks up speed as it rolls down a slope. As it starts down the slope, its speed is 4 m/s. But 3 seconds later, at the bottom of the slope, its speed is 22 m/s.
What is its average acceleration?

$$\frac{22\,m/s - 4\,m/s}{3s.}$$

$$\frac{18\,m/s}{3s} = 6\,m/s^2$$

A cyclist accelerates from 0 m/s to 8 m/s in 3 seconds. What is his acceleration ? Is this acceleration higher than that of a car which accelerates from 0 to 30 m/s in 8 seconds?

$$\frac{8\,m/s - 0\,m/s}{3s} = 2.67\,m/s^2$$

$$\frac{30\,m/s - 0\,m/s}{8sec} = 3.75\,m/s^2$$

A car advertisement states that a certain car can accelerate from rest to 70 km/h in 7 seconds. Find the car's average acceleration.

$$\frac{19.4\,m/s - 0\,m/s}{7\,sec}$$

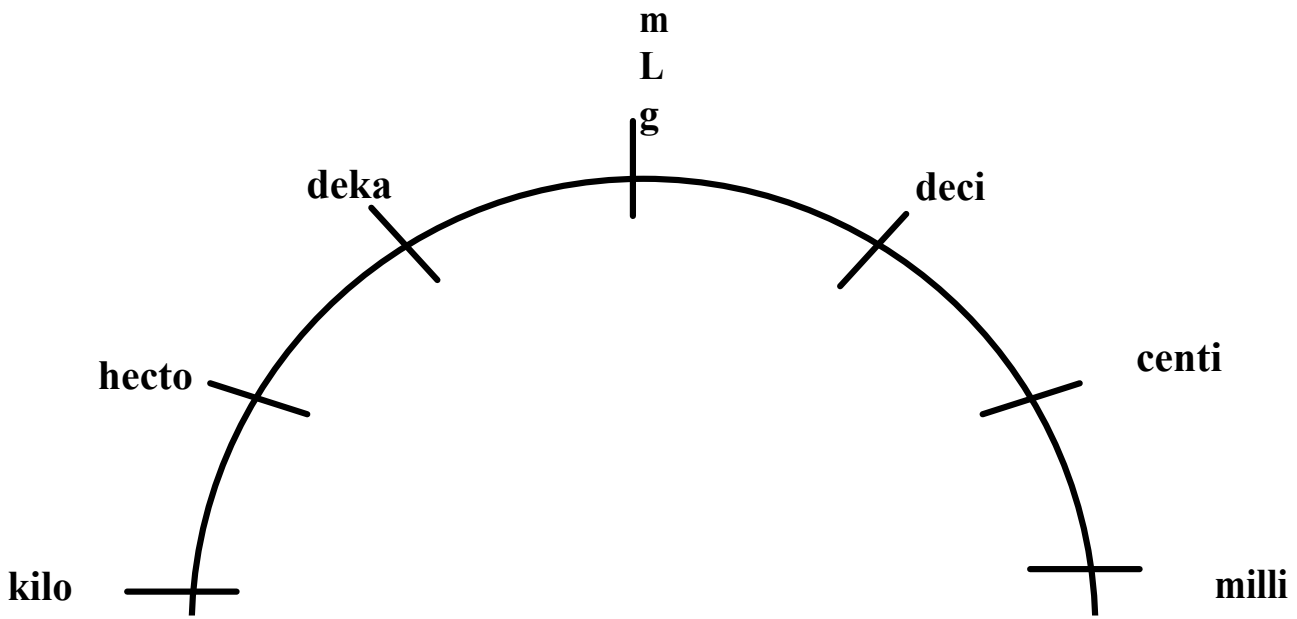
$$2.78\,m/s^2$$

$$70\,km/hr$$

$$70\,km/3600\,sec$$

$$0.194\,km/sec$$

$$19.4\,m/sec$$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A lizard accelerates from 2 m/s to 10 m/s in 4 seconds.
What is the lizard's average acceleration?

$$\frac{10\,m/s - 2\,m/s}{4\,sec}$$

$2\,m/s^2$

A runner covers the last straight stretch of a race in 4 s.
During that time, he speeds up from 5 m/s to 9 m/s.
What is the runner's acceleration in this part of the race?

$$\frac{9\,m/s - 5\,m/s}{4\,sec} = 1\,m/s^2$$

Frame of reference-The way an object moves: but moves with regard to **what**