Acceleration:

- A change in an object's velocity over time
  - → speeds up
  - → slowing down
  - → changing direction

fast at start	fast at end
plane (biggest velocity)	✓
car	
motorcycle ✓ (fastest acceleration)	

Acceleration equation:

$$\text{acceleration} = \frac{(\text{final velocity} - \text{initial velocity})}{\text{time}}$$

$$a = \frac{(v_f - v_o)}{t}$$

Units: $\frac{\text{meters}}{\text{second}^2} \Rightarrow \frac{m}{s^2}$

Example:

My rocket car goes from $10\frac{m}{s}$ to $100\frac{m}{s}$ in 5 seconds. What was my acceleration?

1a $v_0 = 10\frac{m}{s}$ $v_f = 100\frac{m}{s}$ $t = 5s$

1b a

2 $a = \frac{(v_f - v_0)}{t}$

3 $a = \frac{(100\frac{m}{s} - 10\frac{m}{s})}{5s}$

4 $a = \frac{(100-10)}{5}$

$a = \frac{90}{5} = \boxed{18\frac{m}{s^2}}$ * think about direction

5 $a = \frac{(v_f - v_0)}{t}$

$t \cdot \frac{18}{18} = \frac{(100-10)}{t} \cdot \frac{t}{18}$

$t = \frac{(100-10)}{18} = \frac{90}{18} = 5$ ✓