

- Derby races due Fri. 1/16
- No outside of class work time
- Appx. 40-50 minutes/class
- Is this unfair for you? WRITE  
A NOTE (name + date) & turn in

Acceleration occurs when:

- An object speeds up
- An object slows down
- An object changes direction

$$a = \frac{v - v_0}{t}$$

final velocity  $\rightarrow$   $v$   $\leftarrow$  initial velocity  $v_0$   
 $t$   $\leftarrow$  time

units for acceleration:  $\frac{m}{s^2}$   $\left( \frac{\text{dist}}{\text{time}^2} \right)$

Acceleration is a vector

- $\rightarrow$  direction matters
- $\rightarrow$  step 4: if you calculate acceleration, put a direction!
- $\rightarrow$  (make up a direction if it's unclear)

A baseball is thrown at someone's hair. The baseball starts with a velocity of  $4.2 \text{ m/s}$ . 3.1 seconds later, it is traveling at  $7.4 \text{ m/s}$ . What is the baseball's acceleration?

(#11) 1a.  $t = 3.1\text{ s}$   $v_0 = 4.2\text{ m/s}$   $v = 7.4\text{ m/s}$

1b.  $a$

2.  $a = \frac{v - v_0}{t}$

3.  $a = \frac{7.4 - 4.2}{3.1}$

4.  $a = \frac{3.2}{3.1} = 1.03\text{ m/s}^2$  towards the hair

5.  $a = \frac{v - v_0}{t}$

$t \cdot 1.03 = \frac{7.4 - 4.2}{1.03} \cdot t$

$\cancel{1.03} t = \frac{7.4 - 4.2}{\cancel{1.03}}$

$t = \frac{7.4 - 4.2}{1.03} = 3.1 \checkmark$

