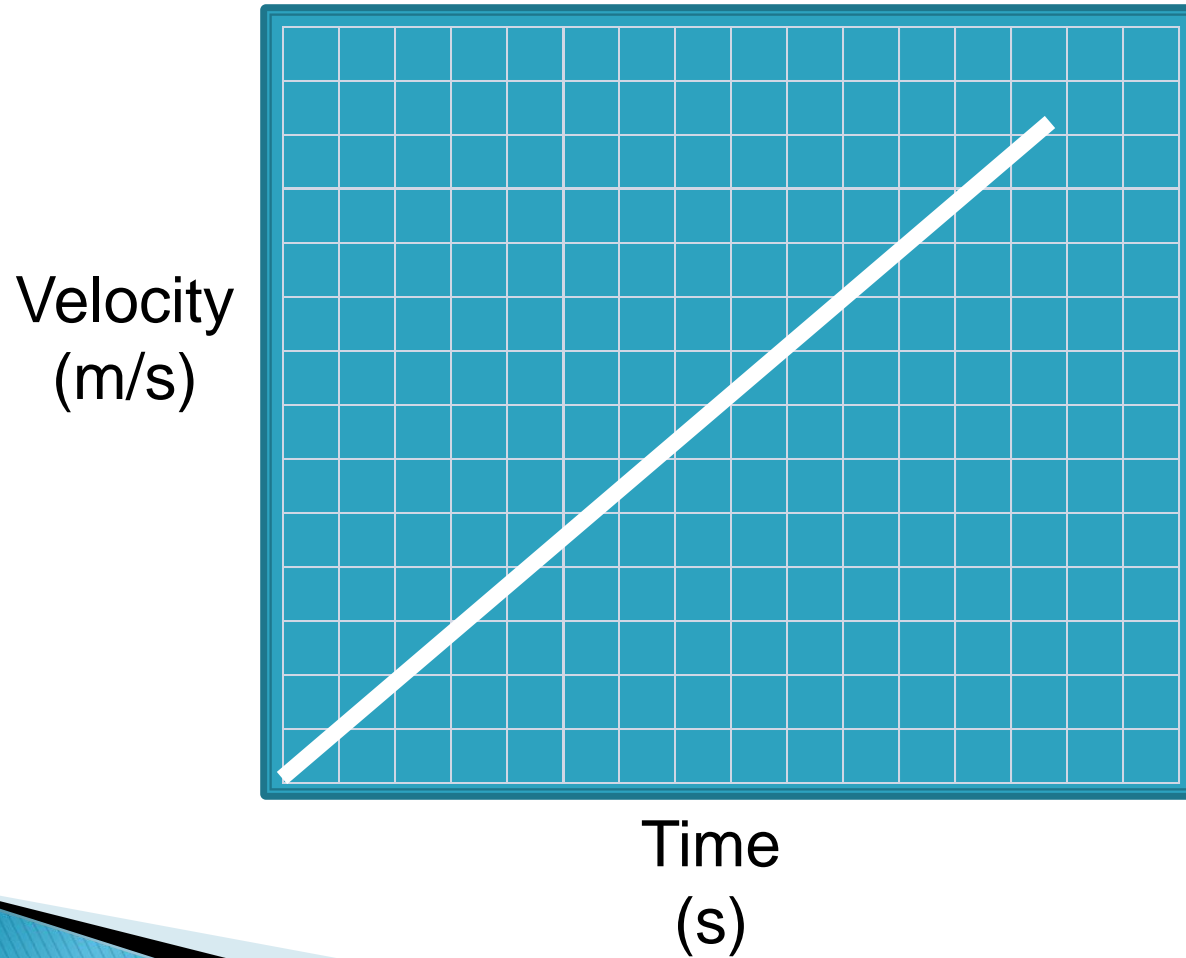# ACCELERATION

- <u>Change</u> in velocity over a period of time.

$$a = \frac{\Delta v}{t}$$
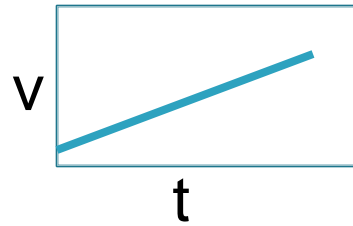
$$a = \frac{v_f - v_i}{t}$$

ACCELERATION
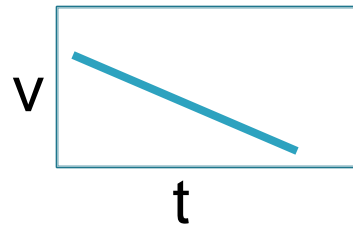# VELOCITY-TIME GRAPHS

Velocity
(m/s)

Time
(s)

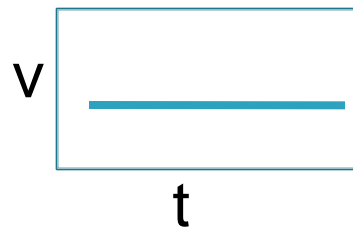▸ The slope represents acceleration of the object.

◦ positive slope, positive acceleration

v

t

◦ negative slope, negative acceleration (=deceleration)

v

t

◦ Zero slope, No Acceleration

v

t

Units for Slope Velocity-Time Graph

▸ velocity (meters/second)

▸ time (seconds)

▸ Velocity-time slope (m/s/s) or (m/s²)

  ▸ $\Delta v/t$

  ▸ *Just like acceleration*

•Curved and steep, change in speed is high

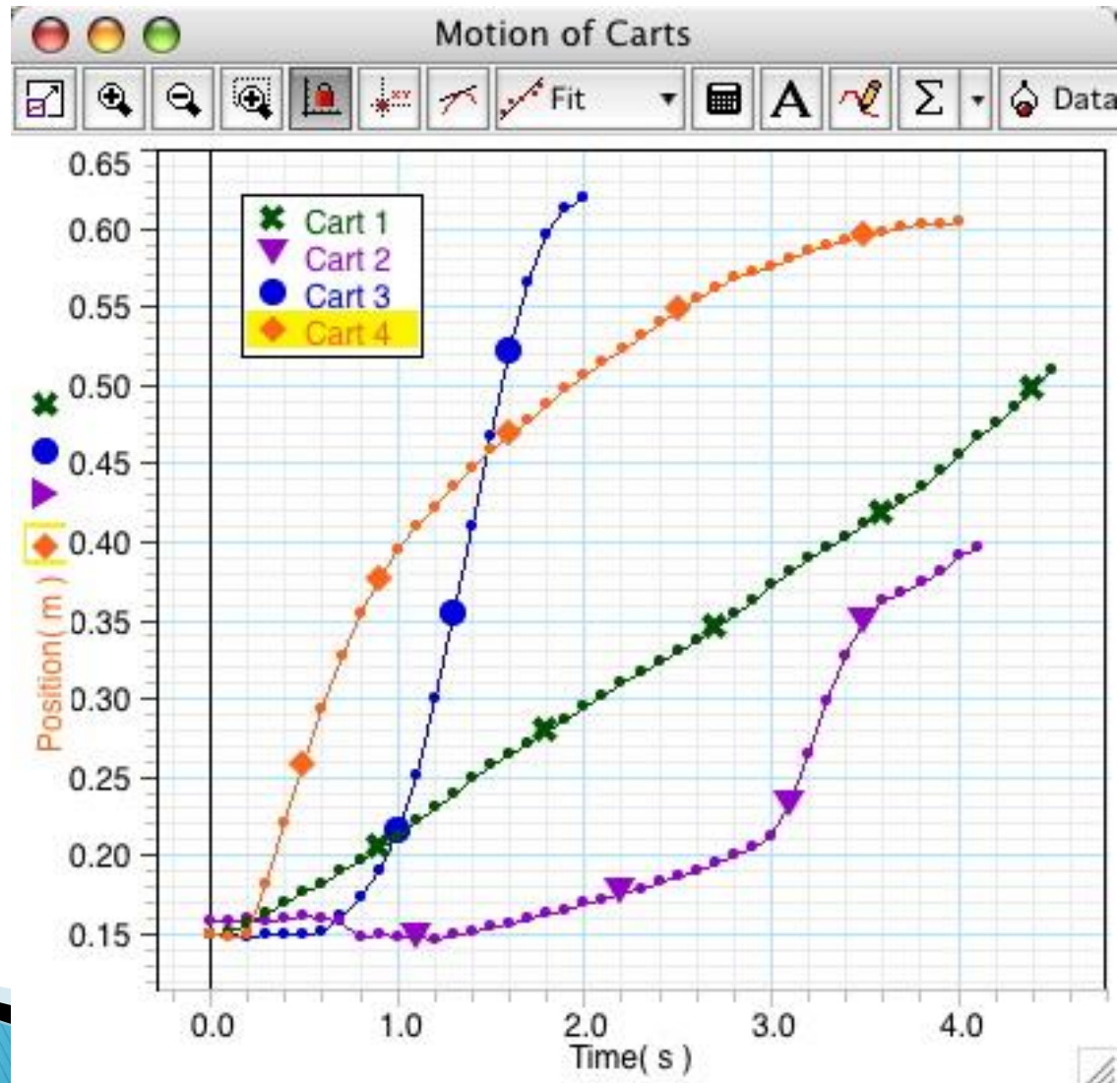•positive   or   negative

•Curved but less steep, lower change in speed

positive   or   negative

• The steeper the curve, the greater the change in velocity
   or acceleration

Which line accelerated the fastest in the first 2.0 s?

Sample Acceleration Problem

A car starts from a stoplight and travels with a velocity of 10 m/s east in 20 seconds. What is the acceleration of the car?

G v_f=10 m/s v_i=0 m/s   t=20 s

U a=?

E a=Δv/t

S a = <u>10 m/s - 0 m/s </u>

            20 s

S a = 0.5 m/s^2