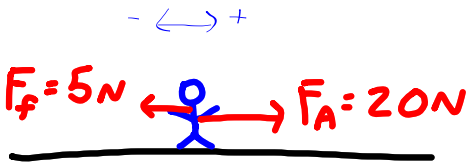
3) An 80. kg student is pulled on roller blades by a friend who exerts a force of 20.0 N. Friction between the wheels and the ground exert a force of 5.0 N. What is the student's acceleration?



$\Sigma \vec{F} = m\vec{a}$

$F_A + F_f = m\vec{a}$

$a = \frac{F_A + F}{m} = \frac{20N + (-5N)}{80kg} = 0.19 m/s^2$

4) A 1000. kg car accelerates from rest to 20. m/s in 5.0 seconds. What net force acts on the car?

$V_o = 0$

$V_f = 20 m/s$

$t = 5 s$

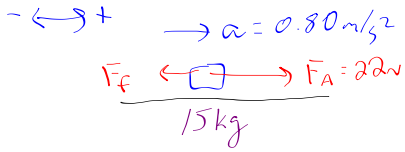
$V_f = V_o + at$

$a = \frac{V_f}{t} = \frac{20. m/s}{5 s} = 4 m/s^2$

$\Sigma \vec{F} = m\vec{a} = 1000kg \cdot 4 m/s^2$

$= 4000 N$

5) A 15.0 kg crate is dragged across the floor with an acceleration of 0.80 m/s^2 by an applied force of 22 N. How much friction is acting on the crate?



$\Sigma \vec{F} = m\vec{a}$

$F_f + F_A = m\vec{a}$

$F_f = m\vec{a} - F_A$

$(15kg \cdot .8 m/s^2) - 22N = -10N$

Mass and Weight

Mass: a measure of amount of matter or inertia

Property:

Weight: a measure of amount of gravitational force on an object

Property:

Relationship between mass and weight:

$\vec{F}_g = m\vec{g}$

Variable:	$\mathbf{F_g}$	$\mathbf{g}$
Quantity:		
Units:		
Type:		

Estimation Skills - some common masses and weights:

Penny = 3 grams (0.003 kg) 1 kilogram mass = 2.2 pounds 1 apple = 1 newton

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Estimation Skills - some common masses and weights:

Penny = 3 grams (0.003 kg) 1 kilogram mass = 2.2 pounds 1 apple = 1 newton

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1. What is the weight of a 1.0 kilogram mass: a) here on Earth? b) In deep space?

2. What is the mass of a 1.0 N apple: a) here on Earth? b) In deep space?