

$$\text{IMPULSE} = \Delta \mathbf{P} \quad \text{kg m/s}$$

SAME UNITS AS momentum

IF $\Delta \mathbf{P}$ IS \ominus Changes direction
to the left

IF $\Delta \mathbf{P}$ IS \oplus Changes direction
to the Right

IMPULSE is A vector

Δ = Change in....

$$\Delta H = H_f - H_i$$

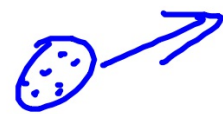
↪ height ↘ FINAL Height INITIAL height

$$6'0'' - 5'6''$$

Change in Height = 6"

Change in (final Value) - (initial Value)

$$\Delta v = (v_f - v_i)$$

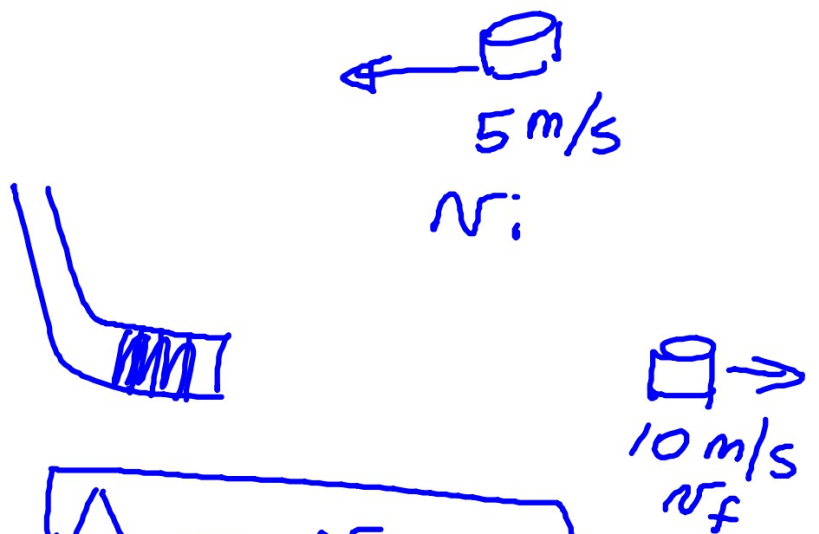


INITIAL
 $v = 0$

$$v_f = 50 \text{ m/s R}$$

$$\Delta v = (50 \text{ m/s} - 0 \text{ m/s})$$

$$\Delta v = 50 \text{ m/s Right}$$



$$\Delta v = v_f - v_i$$

$$\Delta v = (10\text{ m/s}) - (-5\text{ m/s})$$
$$\Delta v = 15\text{ m/s to Right}$$

MASS of puck is .5 kg

What's the impulse?

$$m = .5 \text{ kg}$$

$$v_i = -5 \text{ m/s}$$

$$v_f = 10 \text{ m/s}$$

$$\Delta v = 15 \text{ m/s}$$

$$\boxed{\Delta P = m \Delta v}$$

$$= (.5 \text{ kg})(15 \text{ m/s})$$

$$\Delta P = 7.5 \text{ kg m/s Right}$$



$$\Delta P = F \Delta t$$



CONTACT TIME

$$\Delta t = .5 \text{ s}$$

$$F = ?$$

$$\Delta P = F \Delta t$$

$$\Delta P = 7.5 \text{ kg m/s Right}$$

$$\frac{(7.5 \text{ kg m/s})}{.5 \text{ s}} = F \left(\frac{.5 \text{ s}}{.5 \text{ s}} \right)$$

$$15 \text{ N Right} = F$$



$$\Delta P = F \Delta t$$
$$\Delta P = m \Delta v$$

PACKING
PEANUTS +
BUBBLE WRAP
INCREASE THE
CONTACT TIME

Decreasing the
FORCE ON THE
object.

How much IMPULSE DOES A
RUNNER PUT ON THE GROUND
IF Her CONTACT TIME IS 1.0s
AND her mass is 75kg?

$$\Delta P = ?$$

$$\Delta t = 1s$$

$$m = 75kg$$

$$W = mg$$

$$F = W = (75kg)(9.8m/s^2) \\ = 735N \downarrow$$

$$\Delta P = F \Delta t$$

$$= (735N \downarrow)(1s)$$

$$\Delta P = 735 kg \cdot m/s \downarrow$$

$$s \cdot N = \frac{kg \cdot m}{s^2} \cdot s$$