

## Kinetic Energy

\* Energy due to motion

\* measured in Joules (J)

$$KE = \frac{1}{2}mv^2$$

If a bullet of mass 0.05kg moves at a speed of 150 m/s, what is its KE?

$$KE = \frac{1}{2} m v^2$$

$$KE = \frac{1}{2} (0.05) (150)^2$$

$$= 562.5 \text{ J}$$

Find KE if  $v$  now = 300m/s  
 $= 2250 \text{ J}$

\* double  $v \rightarrow$  quadruple KE

Shots fired at 5000J have a mass of 0.08 kg. What is the speed of the shots?

$$KE = \frac{1}{2}mv^2 = \frac{mv^2}{2}$$

$$\frac{2KE}{m} = \frac{mv^2}{m}$$

$$\sqrt{\frac{2KE}{m}} = \sqrt{v^2}$$

$$\sqrt{\frac{2KE}{m}} = v$$

$$\sqrt{\frac{2 \cdot 5000}{.08}} = 353 \text{ m/s}$$