

## Energy conversions (3 Megajoules = ...)

### **Dynamite (TNT)**

1 kg TNT  $\leftrightarrow$  4.612 Megajoules

$$\frac{3 \text{ MJ} \mid 1 \text{ kg TNT} \mid 2.2 \text{ lbs. TNT}}{4.612 \text{ MJ} \mid 1 \text{ kg TNT}} = 1.43 \text{ lbs. TNT}$$

### **Push-ups**

For 180 lb. person, assuming lifting 65% of weight by  $\sim$ 2 feet, a push-up takes around 300 Joules of energy.

$$\frac{3 \text{ MJ} \mid 10^6 \text{ Joules} \mid 1 \text{ push-up}}{1 \text{ MJ} \mid 300 \text{ Joules}} = 10,000 \text{ push-ups}$$

### **Vertical Leap**

At apex of leap, the PE is equal to the initial KE

$$mgy_{\max} = KE_{\text{init}}$$

$$\begin{aligned} y_{\max} &= \frac{KE_{\text{init}}}{mg} \\ &= \frac{3 \times 10^6}{(81.8)(9.81)} \\ &= 3,738.5 \text{ meters} \\ &= 12,265 \text{ feet} \end{aligned}$$