

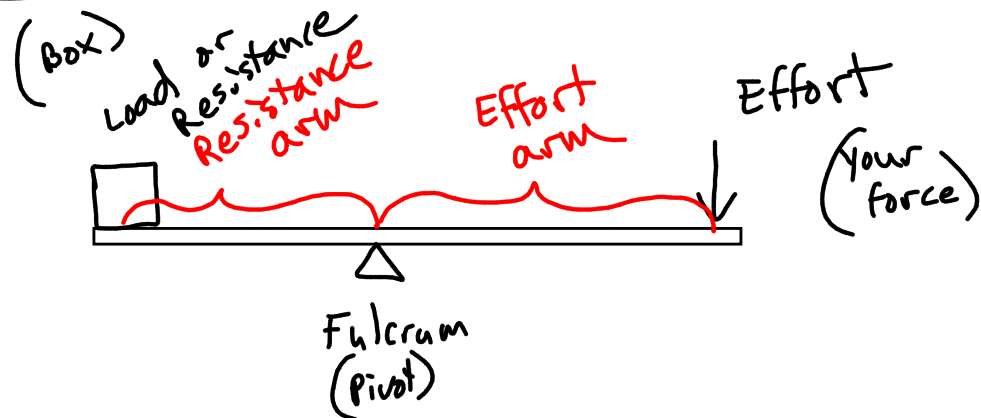
Oct 24 - CP

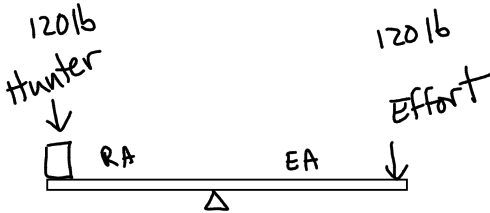
Machines

what do machines do?

1. change the direction of your force
2. change the amount of your force
3. change the "speed" of your force.

The Lever

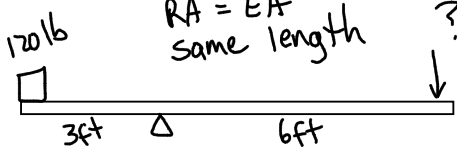




120 lb Hunter
↓
RA

120 lb Effort
↓
EA

if
RA = EA
same length
? Effort =



120 lb
3ft Δ 6ft

Mechanical Advantage (MA)
the factor by which
your force is multiplied

$$MA = \frac{EA}{RA} = \frac{6ft}{3ft} = 2$$

Effort \times MA = Load
60 lb \times 2 = 120 lb

$$MA = \frac{EA}{RA}$$

$$\text{Effort} \times EA = \text{Resistance} \times RA$$

$$60 \text{ lb} \times 6 \text{ ft} = 120 \text{ lb} \times 3 \text{ ft}$$

$$\begin{array}{l}
 127 \text{ cm} \\
 128 \text{ lb}
 \end{array}
 \quad
 \begin{array}{l}
 112 \text{ cm} \\
 ?
 \end{array}$$

$$\frac{1.27 \text{ m} (128 \text{ lb})}{1.12 \text{ m}} = \frac{1.12 \text{ m} \times X}{1.12 \text{ m}} = X$$

$$X = 145 \text{ lb}$$

$$\textcircled{172 \text{ lb}}$$

$$\begin{array}{l}
 112 \text{ cm} \\
 X
 \end{array}
 =
 \begin{array}{l}
 143 \text{ cm} \\
 172 \text{ lb}
 \end{array}$$

$$X = \frac{1.43 (172)}{1.12}$$

$$\textcircled{X = 219.6 \text{ lb}}$$

What did the see saw
lever do?

it allowed 172 lb Blake
to lift 216 lb Austin

$$MA = \frac{1.43 \text{ m}}{1.12 \text{ m}} = \boxed{1.28}$$