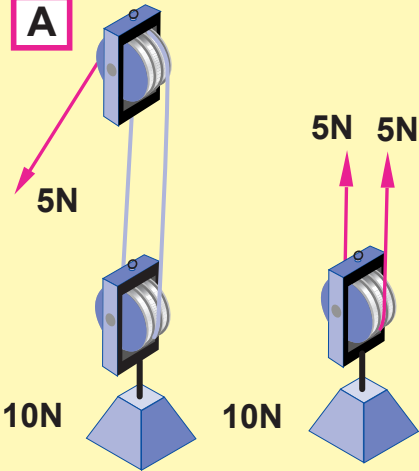
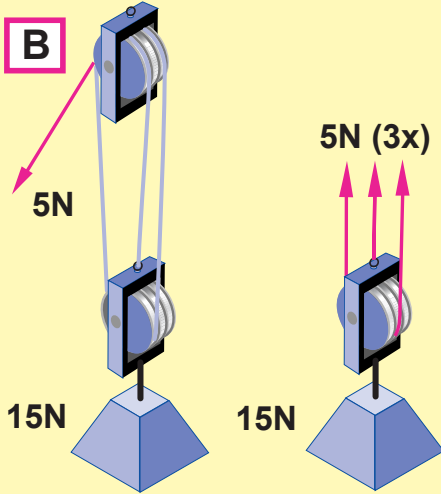


# Mechanical Advantage

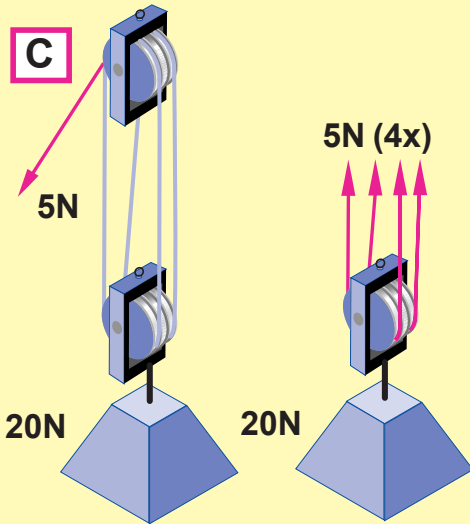
**A**



**B**



**C**

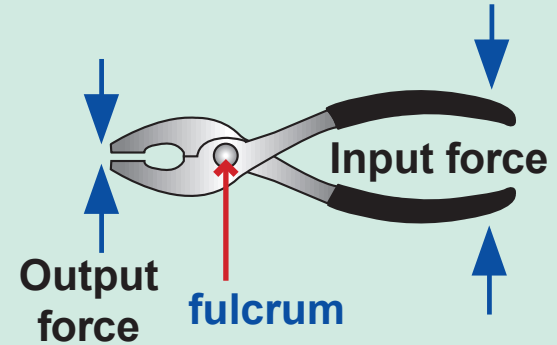
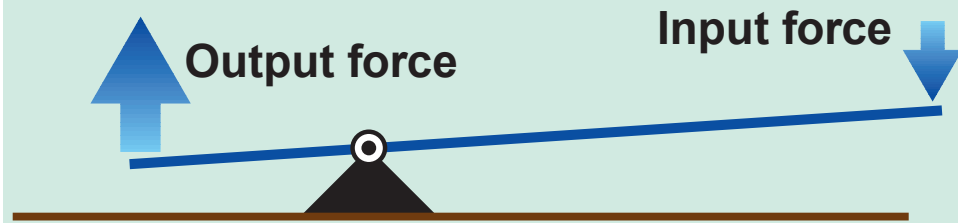


$$\text{Mechanical advantage} = \frac{\text{Output force}}{\text{Input force}}$$

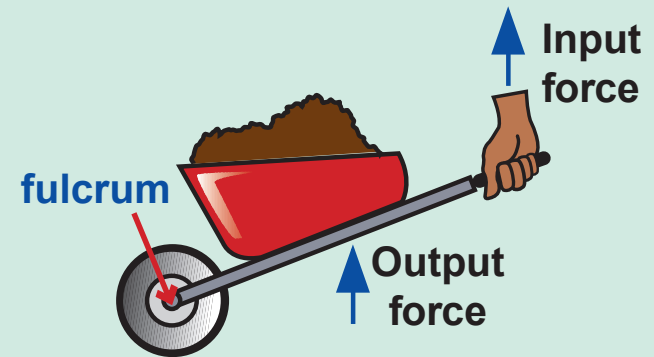
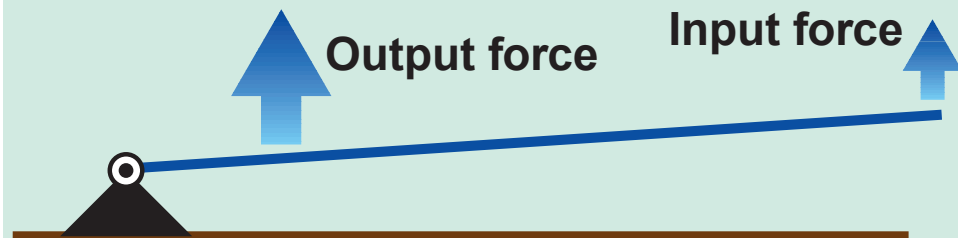
	<b>A</b>	<b>B</b>	<b>C</b>
Input force	5N	5N	5N
Output force	10N	15N	20N
Mechanical advantage	2	3	4

# The 3 Classes of Levers

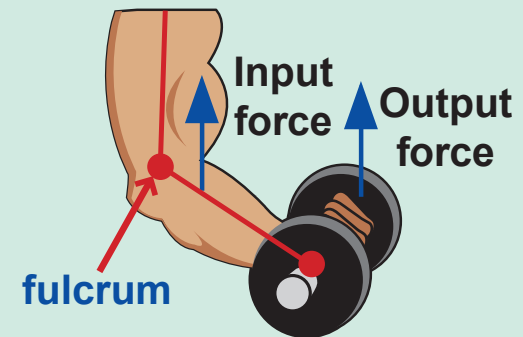
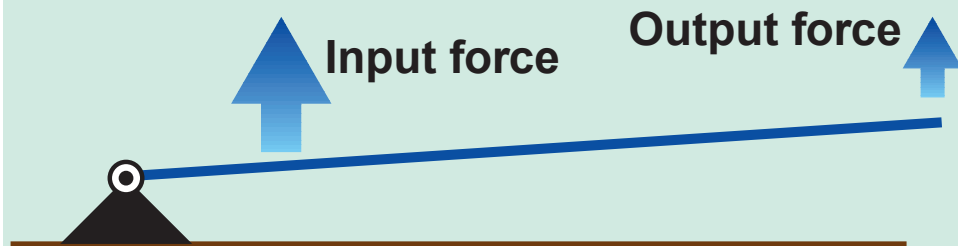
## 1st Class



## 2nd Class



## 3rd Class



# Work Done by a Machine

Force (newtons)

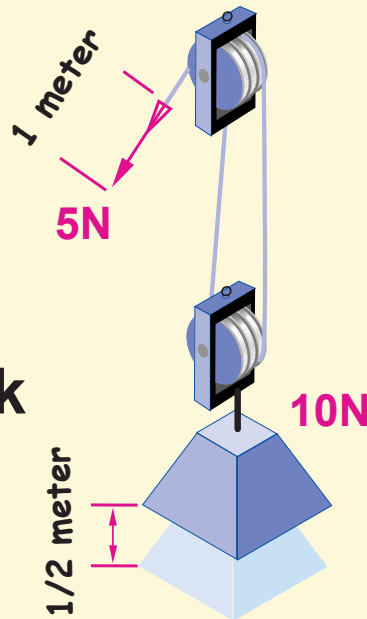
Work (joules)  $\mathbf{W = Fd}$  Distance (meters)

work formula

## Work of block & tackle

### Input work

$$\frac{1 \text{ meter} \times 5 \text{ newtons}}{= 5 \text{ joules}}$$

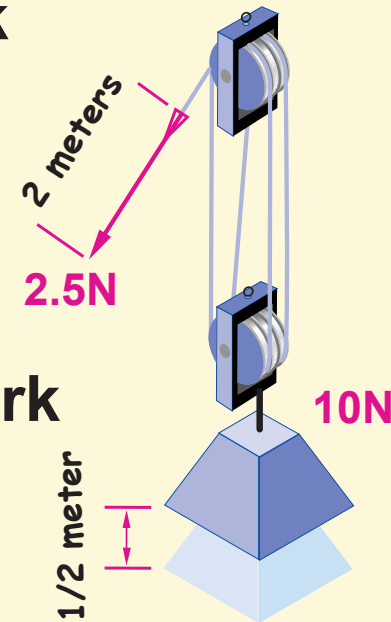


### Output work

$$\frac{1/2 \text{ meter} \times 10 \text{ newtons}}{= 5 \text{ joules}}$$

### Input work

$$\frac{2 \text{ meters} \times 2.5 \text{ newtons}}{= 5 \text{ joules}}$$



### Output work

$$\frac{1/2 \text{ meter} \times 10 \text{ newtons}}{= 5 \text{ joules}}$$

# The Flow of Energy

