

MODEL NAME:

ENERGY STORAGE AND TRANSFER
MODEL

DESCRIPTION:

This model describes how energy is stored and transferred between and within systems.

PROPERTIES:

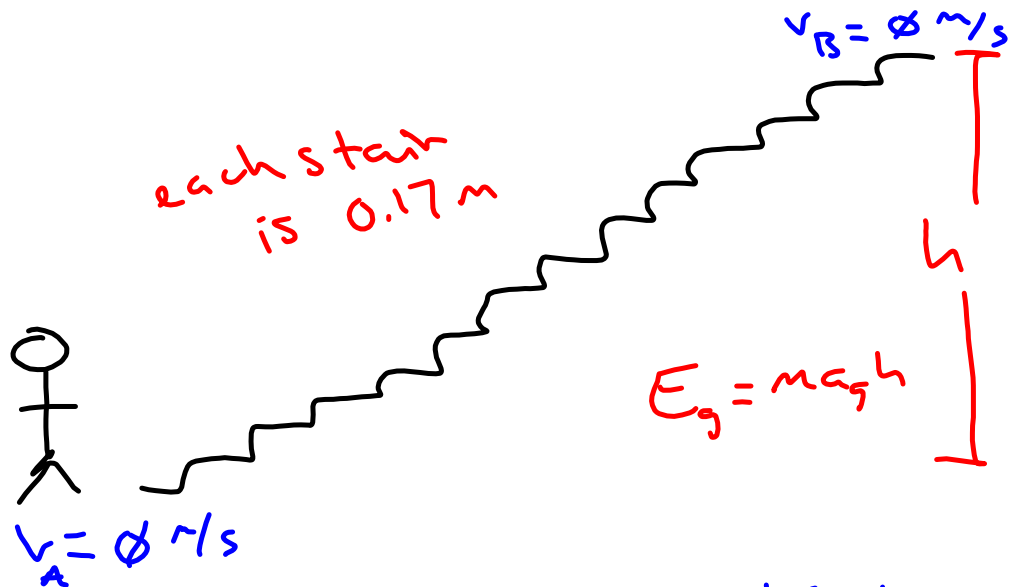
- Measured
 - Nothing new.
- Calculated
 - Energy (J)
 - Elastic $\rightarrow E_{el}$
 - Gravitational $\rightarrow E_g$
 - Kinetic $\rightarrow E_k$
 - Work (J)
 - Spring constant ($\frac{N}{m}$) $\rightarrow k$

REPRESENTATIONS

- Written/Verbal
- Graphical
 - Force-displacement \rightarrow slope = k
 \rightarrow area = W
 - Energy - (velocity)² \rightarrow slope = $\frac{1}{2}m$
 - Energy - (displacement)² \rightarrow slope = $\frac{1}{2}k$
 - Energy - height \rightarrow slope = Mg
- Diagrammatic
 - LOL Diagrams
 - Pie charts
- Mathematically
 - $E_{el} = \frac{1}{2}k(\Delta x)^2$
 - $F = -kx$
 - $E_k = \frac{1}{2}mv^2$
 - $E_g = mgh$

RULES OF BEHAVIOR

- Energy can be neither created nor destroyed (conservation of energy)
- Energy is transformed between forms
- Energy can also be used, and we typically call this work.



$$\text{Power} \equiv \frac{\text{Energy or Work}}{\text{time}}$$

$$[W] = \left[\frac{J}{s} \right]$$

$$E_{cu} = E_g$$

GROUP	HIGHEST	LOWEST
<u>1</u>	684 W	212 W
2	627 W	175 W
3	818 W	68 W
4	370 W	162 W