

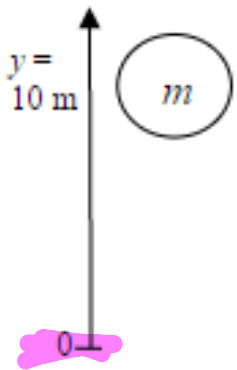
Types of energy and conservation of energy

SPH3U – Unit 3



Comparing Gravitational Energies

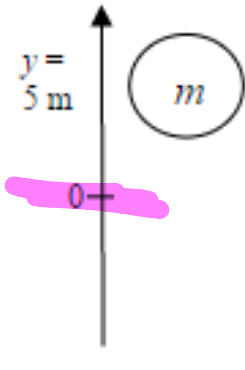
$$E_g = mgh$$



A

$$E_g = mg \cdot 10$$

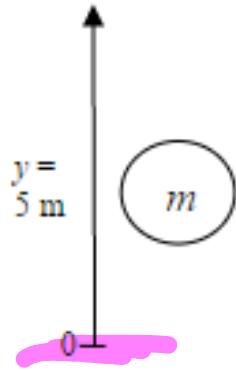
$$E_g = 10mg$$



B

$$E_g = mg \cdot 5$$

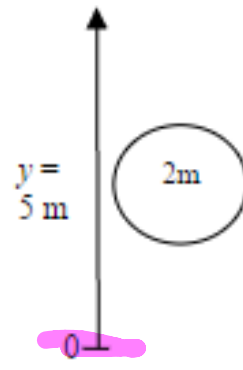
$$E_g = 5mg$$



C

$$E_g = mg \cdot 5$$

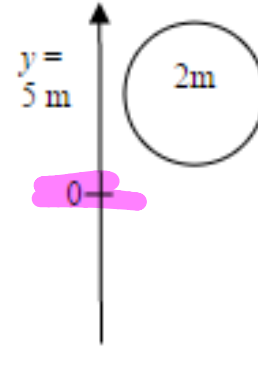
$$E_g = 5mg$$



D

$$E_g = 2mg \cdot 5$$

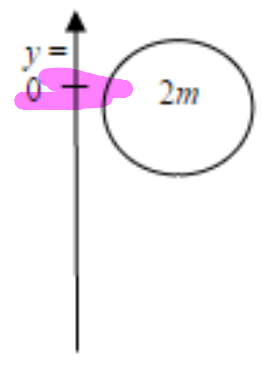
$$E_g = 10mg$$



E

$$E_g = 2mg \cdot 5$$

$$E_g = 10mg$$



F

$$E_g = 2mg \cdot 0$$

$$E_g = 0$$

ADE , BC , F



Comparing Kinetic Energies

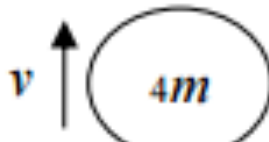
$$E_k = \frac{mv^2}{2} \text{ OR } \frac{1}{2}mv^2$$



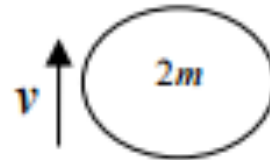
A



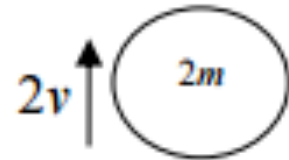
B



C



D



E

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

$$E_k = \frac{1}{2}m(2v)^2$$

$$E_k = \frac{1}{2}4mv^2$$

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

$$E_k = \frac{1}{2}2m(2v)^2$$

$$E_k = 1m4v^2$$

$$E_k = 4mv^2$$

$$E_k = \frac{1}{2}m4v^2$$

$$E_k = 2mv^2$$

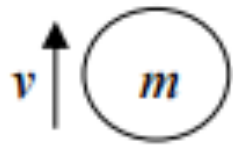
$$E_k = 1mv^2$$

$$E_k = 2mv^2$$

E, BC, D, A



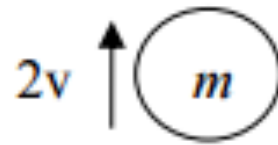
Comparing Kinetic Energies



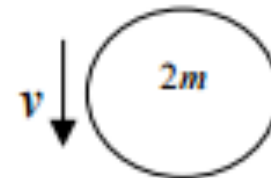
A



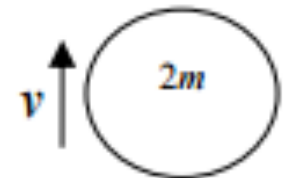
B



C



D



E



Basic roller coaster physics

- [Animation – How Roller Coasters Work](#)

- [Video – Roller Coaster Science](#)



Energy transformations

- the change of one type of energy into another type of energy
- Example: the conversion of gravitational potential energy into kinetic energy



The law of conservation of energy

- energy is neither created nor destroyed
- when energy is transformed from one form into another no energy is lost
- There is a certain total amount of energy in the universe, and this total never changes
- New energy cannot be created out of nothing, and existing energy cannot disappear



Types of energy

- mechanical energy
- gravitational energy
- radiant energy
- electrical energy
- thermal energy
- sound energy



Mechanical energy

- The sum of gravitational potential energy and kinetic energy

$$E_m = E_g + E_k$$

$$E_m = mgh + \frac{mv^2}{2}$$

Work: Complete handout!
Quiz: Next Wednesday.

