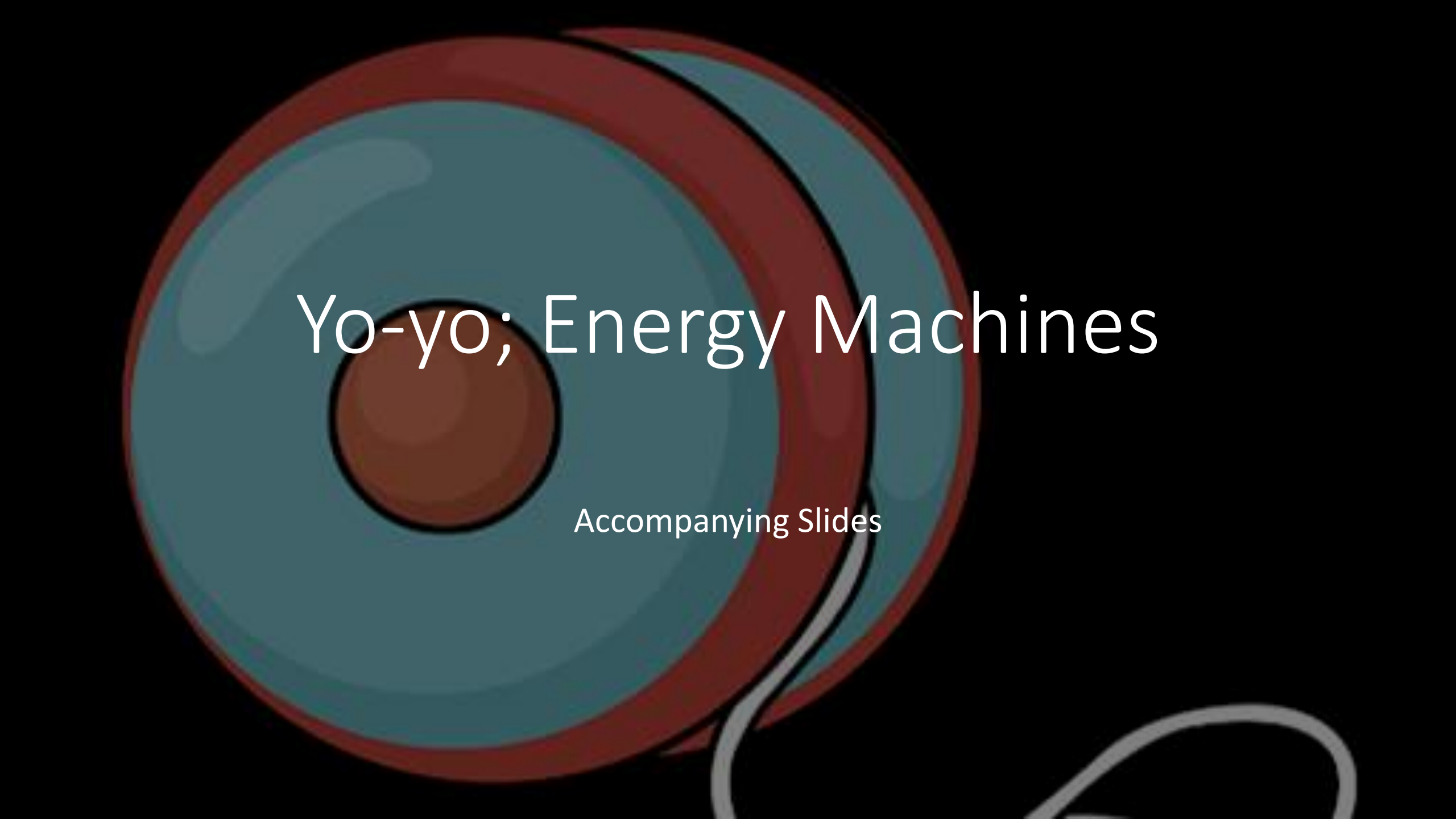
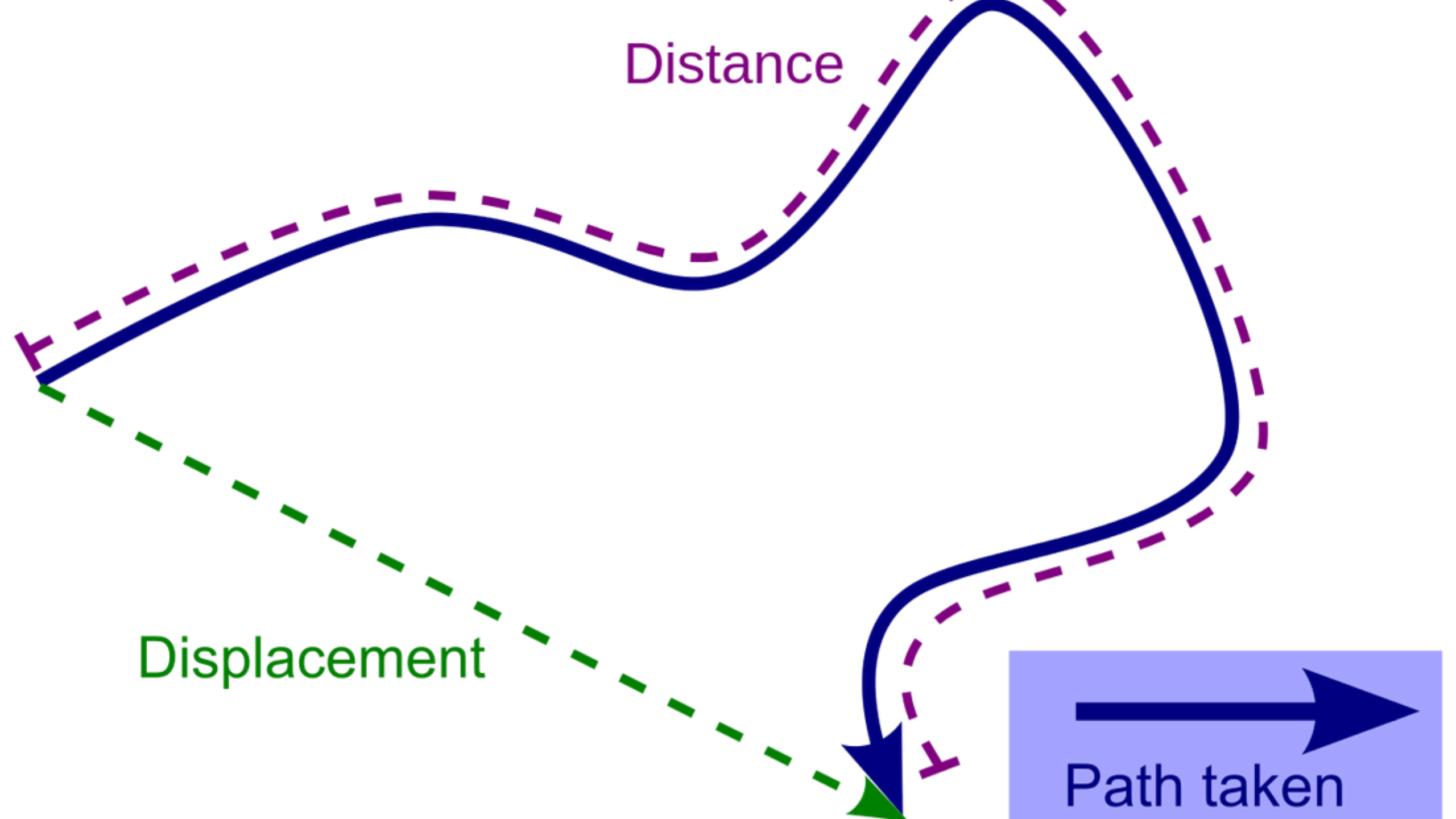


Yo-yo; Energy Machines

Accompanying Slides

Distance or Displacement?

- Distance is the **total amount travelled**
- Displacement is the amount from where you've started.
- Distance is **Always positive**
- Displacement must have a direction!

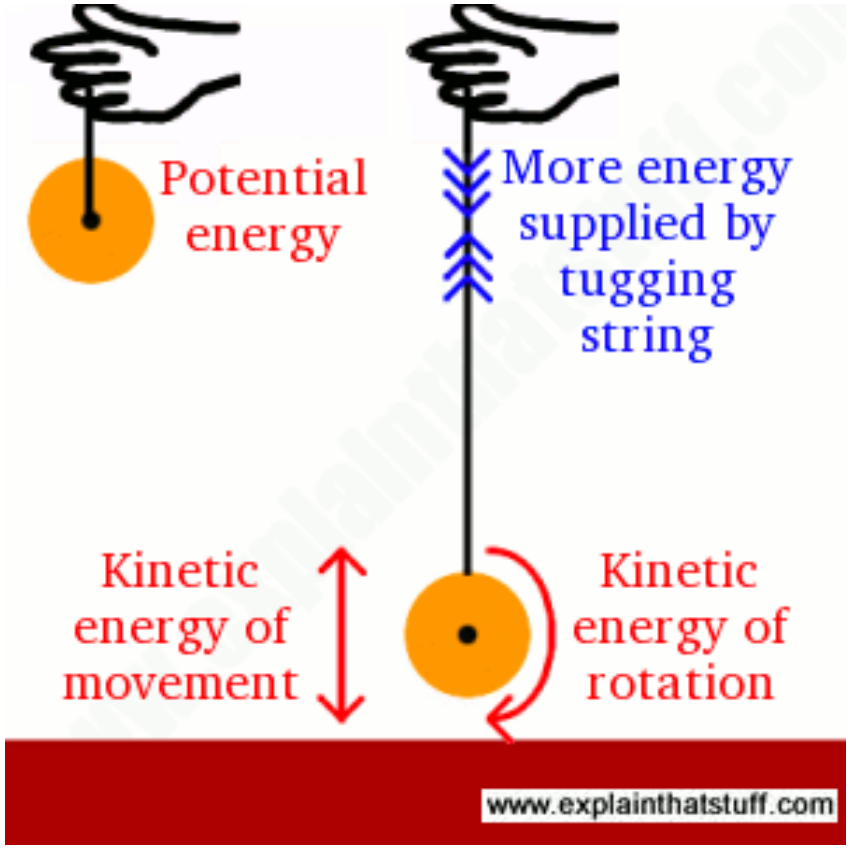

Distance
Displacement
Path taken

Energy & Work

- Energy is **the ability, or capacity to do work**
- Work is **Force x Displacement**
- As such, we can work out anything to do with these, by using the following equations:

- $Work = Force * Displacement$
- $W = F * D$
- $F = \frac{W}{D}$
- $D = \frac{W}{F}$

Energy in a Yo-yo



Gravitational Potential Energy

$$PE_{grav} = mgh$$

Elastic Potential Energy

$$PE_{elastic} = \frac{1}{2}kx^2$$

Kinetic Energy

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

Dropping the Ball

- As you can see in the video, dropping the ball at different heights causes the ball to bounce more, or less, depending on how high we drop it.
- This is because the higher it is, the more potential energy it has.