

## NRG

5.2

### Objectives

- **Identify** several forms of energy.
- **Calculate** kinetic energy for an object.
- **Apply** the work–kinetic energy theorem to solve problems.
- **Distinguish** between kinetic and potential energy.
- **Classify** different types of potential energy.
- **Calculate** the potential energy associated with an object's position.

### Kinetic NRG

- Kinetic NRG (J) is the NRG of motion
 
$$KE = \frac{1}{2}mv^2$$
- Kinetic NRG depends on mass and speed
  - Which has more KE if they are moving at the same speed? Golf ball or Ping Pong ball? Why?
- Kinetic NRG is a scalar quantity

What is the KE of a 1.5 kg block moving with a speed of 2.3 m/s?

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What is the mass of a box with a KE of 1500 J and a speed of 52 m/s?

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## Work-Kinetic NRG Theorem

$W_{net}$  = change in Kinetic NRG

$$W_{net} = \Delta KE$$

$$Fd = \left(\frac{1}{2}mv_2^2 - \frac{1}{2}mv_1^2\right)$$

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## Math Practice

- Be sure to look at the Work-Kinetic NRG Math Practice Video!




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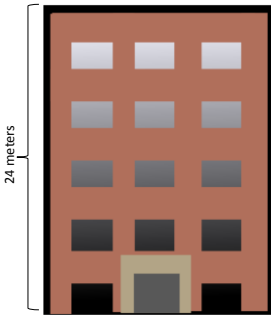
## Potential NRG

- **Potential NRG** is stored NRG
- **Gravitational Potential NRG (GPE)** is stored NRG because of location

$$GPE = mgh$$

- \*Note – the height is the distance the object can fall
  - Not necessarily how high off the ground

Not to scale



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## Question...

1. What does increasing the mass do to the GPE?
2. What does increasing the speed do to GPE?
3. What does increasing the height do to GPE?
4. What does changing the planet do to GPE?

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## Elastic Potential NRG

- Elastic Potential NRG (EPE) is the NRG stored when an object is deformed
  - Spring
  - Rubber band
  - Ball
- The *relaxed length* of a spring/rubber band is the length when it is..... relaxed
- The EPE depends on how much it is moved from the relaxed length

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## Elastic Potential NRG

$$EPE = \frac{1}{2}kx^2$$

$$EPE = \frac{1}{2} * \text{spring constant} * \text{distance}^2$$

**Spring constant** is a measurement of a springs resistance to change

Distance = distance compressed/stretched

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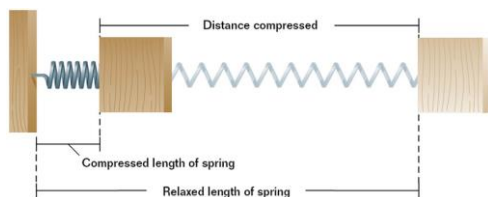
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## Spring




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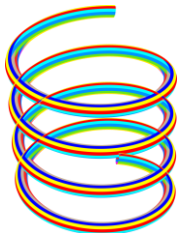
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### Math Practice

- Be sure to look at the Elastic Potential NRG Math Practice Video!



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### Page 165 – Sample Problem

- What is the question asking?
- What do we need to figure out?
- On Board

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### Assignment

- Q: 1-3, 4(a, c, d)
- 5.2 Pack
- SP – B, C

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