Work & Kinetic Energy

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Work

- **Definition**
  - **The transfer of energy from one object to another**
  - **Done by applying a force over a distance**
  - **distance must be _____ to the force**
  - **SI Unit of Joules**
- **Equation**
  - **Work = Force x Distance**
  - **W = F x D**
- **If the object doesn't move, then no work is done.**

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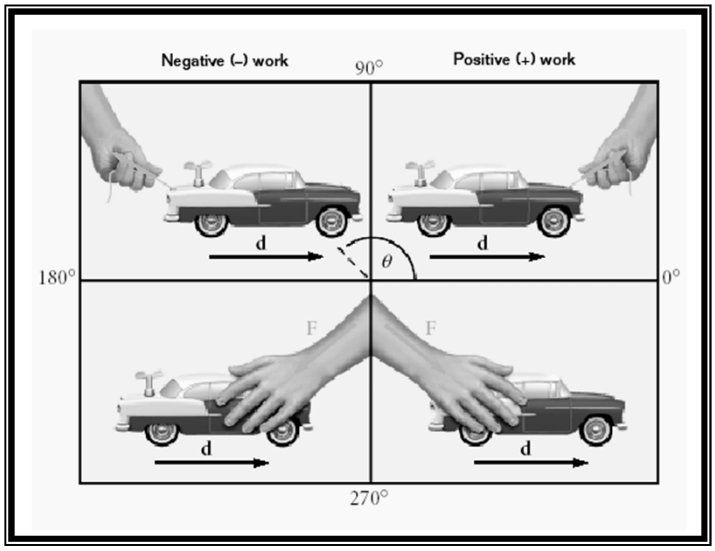
The Sign of Work



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Work – Sample Problem 1

- **Jamie lifts a 5.0 kg box from the ground to a shelf 2.3 m above the ground. How much work did Jamie do on the box?**

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Energy

- **Definition**
  - **The ability of an object to do _____**
- **Relation of energy and work**
  - **When you work, you are _____ energy to the object that you are working on.**
- **Unit of Measure**
  - **Joule (J)**

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Kinetic Energy

- **Object's energy due to its _____ or velocity**

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

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Kinetic Energy - Sample

- **A 7.00 kg bowling ball moves across the floor. If the ball has a kinetic energy of 31.5 J, how fast is it moving?**

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Work-Kinetic Energy Theorem

- **The net work done on an object is equal to the change in the kinetic energy of the object.**

$$\mathrm{W} = \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$$

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Sample Problem

- **You apply a force of 7.3 N to a stationary toy car over a distance of 25 cm. If the mass of the car is 135 g, what is the velocity of the car after you apply the force?**

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