Warm Up

1. What will be the velocity of a 1200. kg car after a 95.5 kg person pushes off if it with a velocity of 25.7 m/s?
2. What is the work done if a 72.8 kg person climbed a distance of 12.5 m up a climbing wall?
3. What is the energy of a 1045. kg car traveling at 35.7 m/s?
4. What is the energy of a 1045. kg car that is parked in a parking deck that is 35.7 m off the ground?
5. What is the velocity of a merry-go-round if a 28.5 kg child sitting 2.38 m from the center is experiencing 58.9 N of force?

Target

- I can explain why all energy is conserved.

Conservation of Energy

- The law of conservation of energy states that energy cannot be created nor destroyed. It can, however, change forms.
- This means that energy can go from one form of energy and become a different form of energy.

- An example of this is mechanical energy.
- The total energy of the system is equal to kinetic and potential energy of that system.
- E = KE + PE

- This means the mechanical energy before an event is equal to the mechanical energy after the event.
- $KE_b + PE_b = KE_a + PE_a$

Practice

- If a 55 kg person on a skateboard goes down a 20 m hill at a speed of 5 m/s, what will be the speed of the person when he gets to the top of a 12 m hill next to the first hill?
- Answer:

Practice

- How fast will a 0.25 kg pool ball be going when it hits the ground if it falls off a 0.8 m high pool table?
- Answer:

- A pendulum is an example of conservation of energy.
- When a pendulum is at the top of its swing, all of its energy is potential.
- As it starts its swing, the potential energy is converted into kinetic energy.

- At the bottom of the swing, all of its energy is kinetic.
- As it swings back up, the kinetic energy is converted back into potential energy.

- When <u>energy</u> is converted from one form into another, some energy is converted into thermal energy and sound energy.
- Usually, this new energy causes the temperature of objects to rise slightly.

- Energy is also conserved when it comes to mass.
- Einstein's $E = mc^2$ states that a small amount of mass can be converted into a large amount of energy.

Summary

- Energy cannot be created nor destroyed but can change forms.
- Potential and Kinetic energy can be converted into each other.
- Energy can be converted between the forms also.
- Some energy is lost as heat.

Assignment

- Energy Calculations