RESET
AN AEOP EFFORT aeop

5E STEM Unit: Investigating Forces and Motion: Understanding Mass and Acceleration

(2-5 class periods)

Mini Lessons



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Potential, Kinetic, and Transfer of Energy

- **Definition of Energy**
  - Energy is the ability of an object to move or do work
  - Energy can be transferred from one object to another.
  - There are several types of energy.
  - Our focus will be on Potential and Kinetic energy.



Kinetic Energy

- **Defining Kinetic Energy**
  - **Kinetic energy** is the energy of moving matter. Anything that is moving has kinetic energy—from atoms in matter to stars in outer space.
  - Things with kinetic energy can do work.
  - For example, when you throw a football, the moving football has Kinetic Energy.
  - The amount of kinetic energy in a moving object depends directly on its mass and velocity. An object with greater mass or greater velocity has more kinetic energy.



Potential Energy

- **Defining Potential Energy**
  - **Potential Energy** is the amount of energy in an object that can be converted to Kinetic Energy.
  - **Gravitational Potential Energy** is the Potential energy in an object based on its position above a certain other position on the Earth.
  - For example, a skydiver in a plane has Gravitational Potential Energy because the skydiver is above the ground.
  - Gravitational Potential Energy is based on the Earth's gravitational pull on objects.
  - Gravitational Potential is transformed into Kinetic Energy when the object falls.
  - The farther from the Earth the greater the greater an object's Gravitational Potential Energy



Potential Energy

- **Elastic Potential Energy**
- Potential Energy due to an object's shape is called Elastic Potential Energy.
- This energy results when an elastic object is stretched or compressed by a force.
- The farther the object is stretched or compressed, the greater its Potential Energy is. (for example, when the arm of the popsicle stick catapult is bent back.)



Potential Energy

- **Elastic Potential Energy**
- A point will be reached when the object can't be stretched or compressed anymore.
- When the external force is removed, it will forcefully return to its original shape.
- When an object returns to its original shape, The Elastic Potential Will be transferred from the compressed object into another object resulting in Kinetic Energy (This happens when the catapult launches the object. The object moves from the catapult to the target.)

