



Vocabulary: Roller Coaster Physics



Vocabulary

- Friction – a force that opposes motion.
 - Friction arises because of contact between a moving object and the materials it is moving over or through.
 - The friction between two objects is given by the *coefficient of friction*.
- Gravitational potential energy – energy of position.
 - The higher the object is, the greater its gravitational potential energy.
 - The more massive the object, the greater its gravitational potential energy.
 - Gravitational potential energy is represented by the symbol U .
 - Gravitational potential energy is calculated using the formula $U = mgh$, where m is mass, g is gravitational acceleration, and h is height.
 - If mass is measured in kilograms, height in meters, and acceleration in m/s^2 , then the units of gravitational potential energy are joules (J).
 - 1 Joule is equal to one newton-meter, or $1 \text{ kg}\cdot\text{m}^2/\text{s}^2$.
- Kinetic energy – energy of motion.
 - The faster an object is moving, the greater its kinetic energy.
 - The more massive a moving object is, the greater its kinetic energy.
 - Kinetic energy is represented by the symbol KE , or simply K .
 - Kinetic energy is calculated using the formula $K = \frac{1}{2}mv^2$, where m is mass and v is speed.
 - If mass is measured in kilograms and speed in m/s , then the units of kinetic energy are joules (J).
- Momentum – a measure of how difficult it is to stop a moving object.
 - Momentum is the product of an object's mass and velocity and has a magnitude and direction.
 - The magnitude of momentum (p) can be found by multiplying the object's mass and speed: $p = m \cdot v$.
 - If mass is measured in kilograms (kg) and speed is measured in meters per second (m/s), the units of momentum are kilograms-meters per second ($\text{kg}\cdot\text{m/s}$).
 - For example, the momentum of a 5-kg object moving at 4 m/s is 20 $\text{kg}\cdot\text{m/s}$.

