

## Reviewing Momentum and Energy

*Let's review what we know about momentum and energy from a Newtonian perspective.*

What symbol do we use to represent linear momentum?

Momentum is a [ ] vector [ ] scalar

If an object has a mass  $m$  and a velocity  $\vec{v}$  what is the equation for its momentum?

What are the MKS units of momentum?

Is momentum always conserved? If it is not always conserved, under what condition is it conserved?

Momentum can change if an external force  $\vec{F}$  is applied. What is the equation connecting the force to the change in momentum?

Two identical carts are placed back-to-back on a horizontal track. The carts are initially at rest. Then a spring-loaded piston in one of the carts is released, and the carts move off in opposite directions. Is momentum conserved in this situation? Explain why or why not.

What symbol do we use to represent energy? What about kinetic energy?

Energy is a [ ] vector [ ] scalar

If an object has a mass  $m$  and a velocity  $\vec{v}$  what is the equation for its kinetic energy?

What is the MKS unit for energy?

Is kinetic energy always conserved? If it is not always conserved, give an example of when it is not conserved.

Is energy always conserved? If it is not always conserved, under what condition is it conserved?

Kinetic energy can change if an external force  $\vec{F}$  is applied. What is the equation connecting the force to the change in kinetic energy?

Two identical carts are placed back-to-back on a horizontal track. The carts are initially at rest. Then a spring-loaded piston in one of the carts is released, and the carts move off in opposite directions. Is kinetic energy conserved in this situation? Explain why or why not.

Is energy conserved in this situation? Explain why or why not.