Name: _____ Date: _____ Period: _____

Inertia in Motion

Recall: All objects have inertia (the resistance to a change in motion)

When the object is in motion, we refer to the inertia as _____

The **momentum** of an object is equal to: _____

If the direction of the object is not important, we can use: _____

Example:

1. A car with a mass of 1500 kg is traveling west at 60 m/s. What is the car's momentum?

2. A horse with a mass of 400 kg is traveling at 12 m/s. What is the horse's momentum?

3. A man with a mass of 90 kg is traveling at 3 m/s. What is the man's momentum?

Law of Conservation of Momentum

Newton's _____ tells us that the velocity of an object remains the same without an outside force.

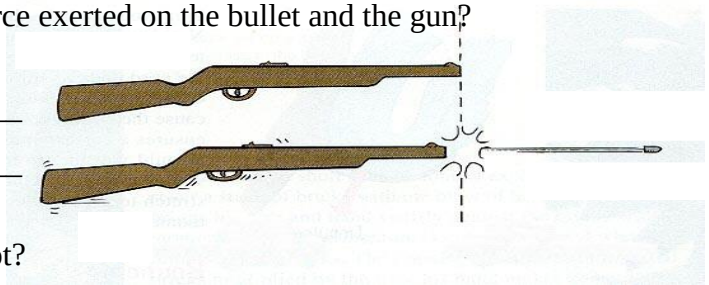
The _____of the object also remains the same.

Therefore . . .

The momentum of a system remains _____ if no

external _____ are present.

A bullet is shot from a gun. What do we know about the force exerted on the bullet and the gun?



_____

_____

Is the momentum conserved for the bullet? Why or why not?

_____

_____

Is the momentum conserved for the gun? Why or why not?

_____

_____

Is the momentum conserved for the gun-bullet system? Why or why not?

_____

_____

We can calculate the recoil velocity of the gun using the law of conservation of momentum.

A 5 kg fish swimming at 2 m/s swallows an absent minded 1 kg fish swimming toward it at a velocity that brings both fish to a halt immediately after lunch. What is the velocity of the smaller fish before lunch?