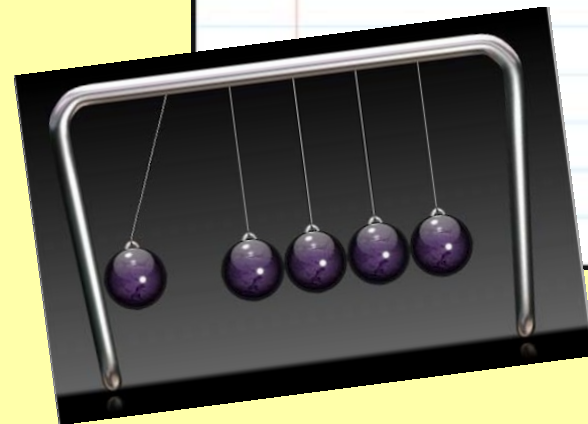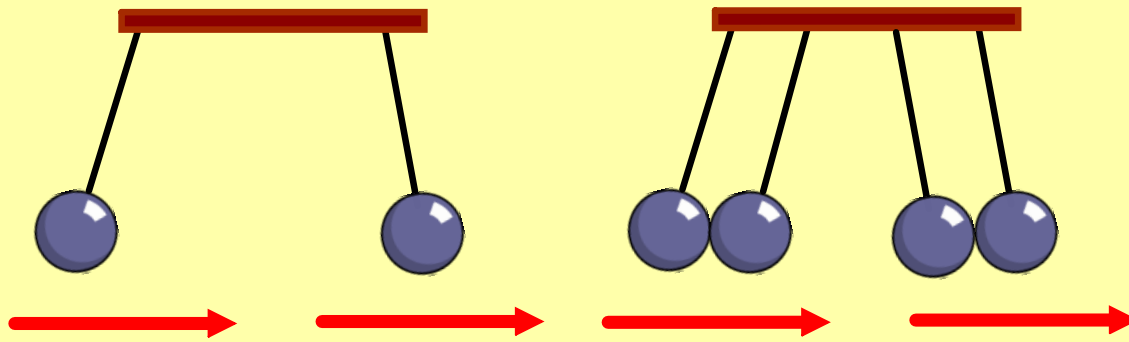# Collisions

Objectives:
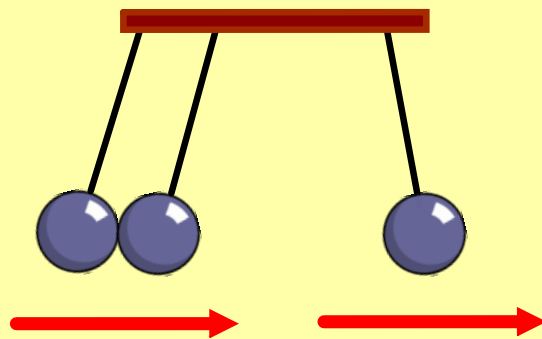
- Understand the significance of kinetic energy and momentum in elastic, perfectly inelastic, and inelastic collisions

Newton's Cradle:

http://commons.wikimedia.org/wiki/File:Newtons_cradle_animation_book.gif

Not possible!

https://www.msu.edu/user/brechtjo/physics/newtonBalls/newtonBalls.html
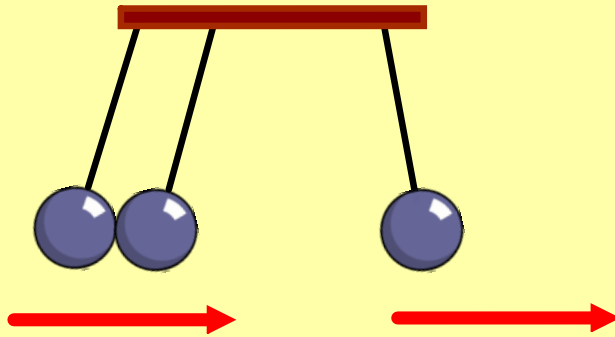
Newton's Cradle:

http://commons.wikimedia.org/wiki/File:Newtons_cradle_animation_book.gif

If momentum is conserved . . .
What would the velocity of the single ball be?

Why isn't this possible?

https://www.msu.edu/user/brechtjo/physics/newtonBalls/newtonBalls.html

Types of Collisions:

Elastic:
p is conserved
KE is conserved

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- microscopic collisions
- no deformation
- objects of similar size & shape

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p is conserved   - KE lost in collision to
KE is lost   deformation

Energy Lost to Deformation:

Energy Lost to Deformation:

Energy Lost to Deformation:

Types of Collisions:
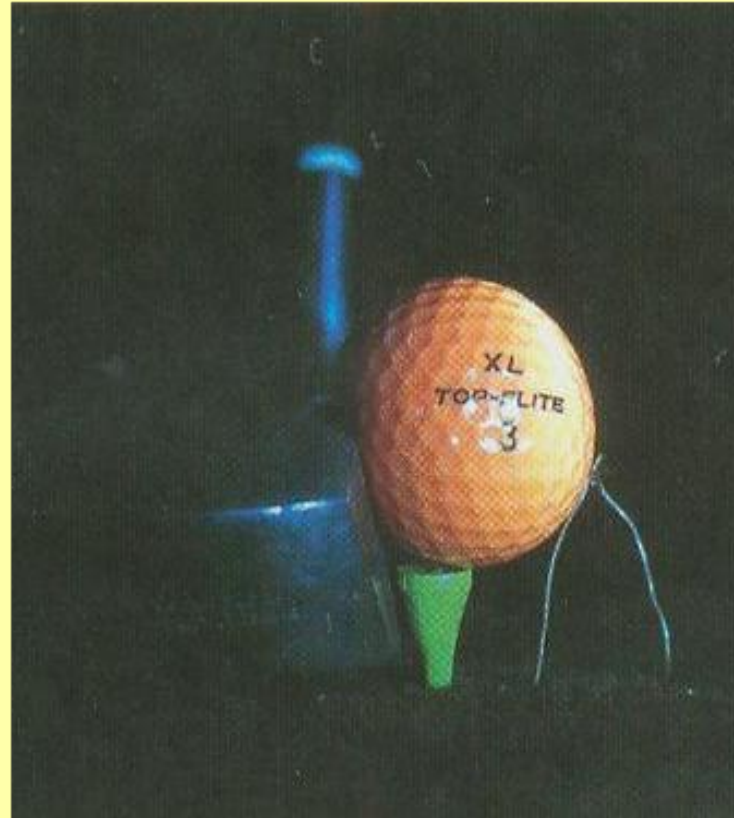
Elastic: p is conserved
           KE is conserved
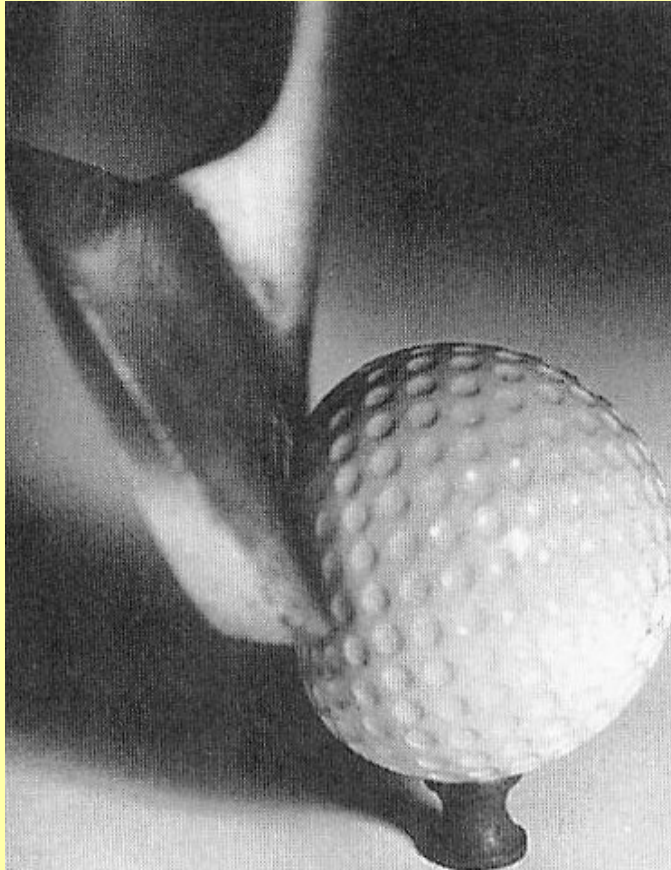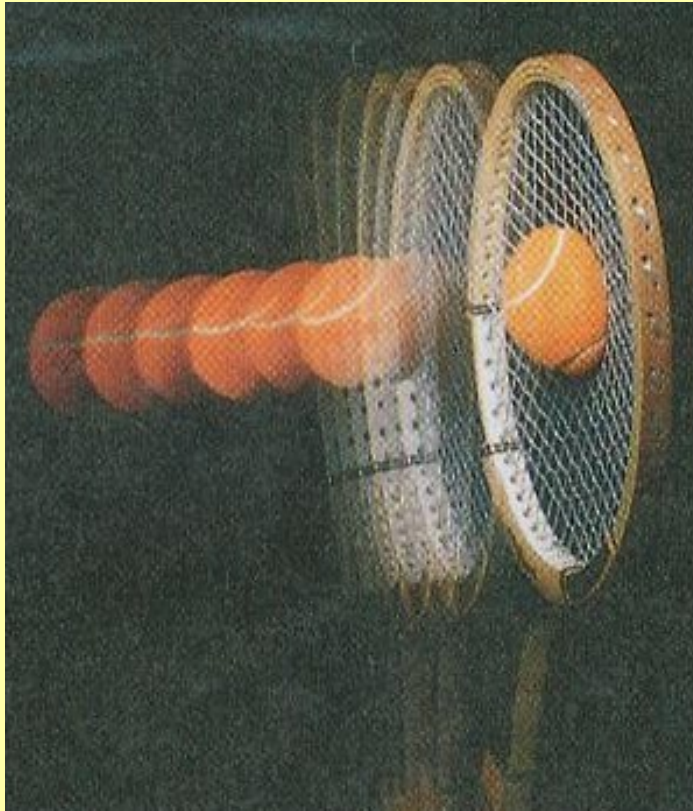
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Perfectly Inelastic:
 p is conserved
 max KE is lost

http://www.walter-fendt.de/ph14e/collision.htm

Types of Collisions:

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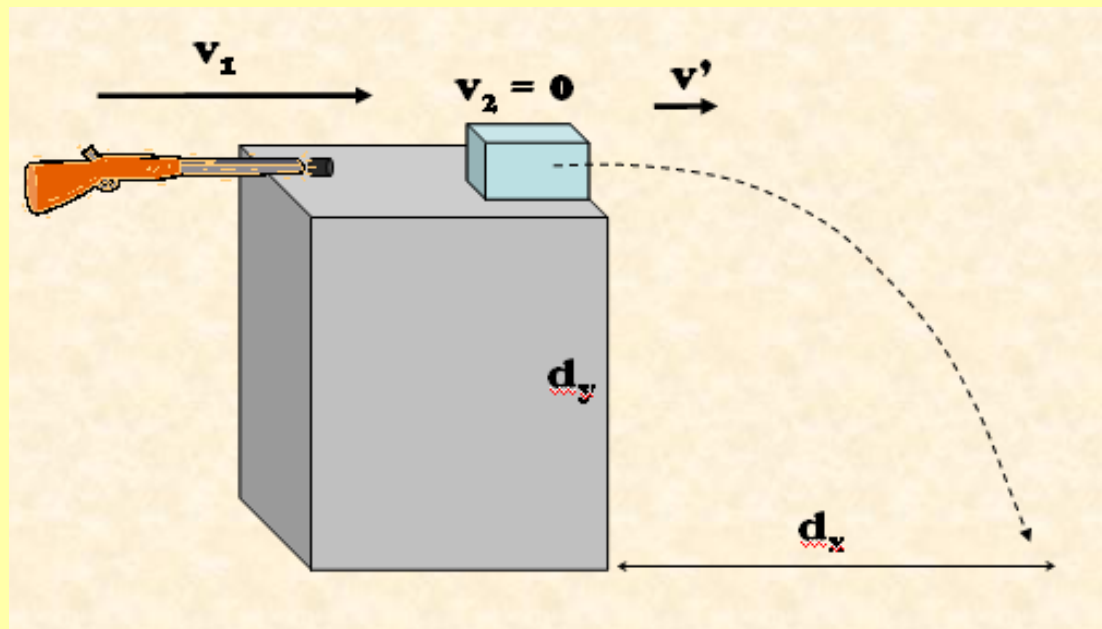- occurs when objects stick together
- may result in loss of all KE

Ballistics:

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- use conservation of momentum during the collision
- may use projectiles after the collision

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- may use projectiles after the collision
- may use conservation of energy after the collision