

Conservation of Energy



A Radiometer

- The photograph to the right is a radiometer.
- When a light is shined on the radiometer, it begins to spin.
- The black side of the square gets hotter than the white side.
- This increases the air pressure on the black side causing it to spin.



Energy Transformations

- The radiometer changes one type of energy to another.
 - Light energy turns to heat energy.
 - Heat energy causes the radiometer to spin, an example of mechanical energy.
- The radiometer provides examples of energy transformations.

Light → Heat → Mechanical Energy

Conservation of Energy

- What happens to the amount of energy as it changes from one form to another?

The amount stays the same.

- Law of conservation of energy = energy is never created or destroyed.
- During an energy transformation energy is conserved.



Tossing a Baseball

- You toss a baseball in the air.
- As it goes up, it slows down.
- Eventually it stops climbing.
- It begins to fall.
- As it goes down, it speeds up



Is the Energy of the Ball Conserved?

- As the ball rises it slows down.
 - Its kinetic energy decreases.

Is Energy Conserved?

- As the ball rises it gets further from earth.
 - Its potential energy increases.
- When a ball is tossed into the air, as kinetic energy decreases, potential energy increases.
- The sum of the kinetic and potential energy is constant.
- Energy is conserved.



That's the Way the Ball Bounces

- Why does a ball bounce when it hits the ground?
- When the ball hits the ground, it exerts an action force.
- According to Newton's Third Law, the ground pushes up on the ball.
- This causes it to bounce



But if There is Conservation . . .



- Why doesn't a ball bounce forever if there is conservation of energy?

Energy can't Disappear, but . . .

- A bouncing ball eventually slows down and comes to a stop.
- This means the ball **is** losing energy.
 - But the energy isn't really lost.
 - The ball doesn't have it, but it's still around.
- **The energy from the bouncing ball spreads through the environment as heat.**
- Even when an object loses energy to its surroundings, energy is conserved.

