

COMPILATION - Unit 7: organizing thinking about energy

Date: Fri, 03 Jan 2003

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Subject: Energy

The following is the way I've tried to organize my thinking about energy. Your comments are welcome.

Energy - the capacity of a system to produce change

1. Storage Mechanisms
  - a. Potential - energy of configuration
    - (1) gravitational
    - (2) elastic
    - (3) electrostatic
    - (4) magnetic
    - (5) chemical
    - (6) nuclear
  - b. Kinetic - energy of motion
    - (1) mechanical
    - (2) sonic
    - (3) electromagnetic
    - (4) thermal
2. Transfer Mechanisms
  - a. Working - when a force is accompanied by a displacement
  - b. Heating - when there is a temperature difference
    - (1) conduction
    - (2) convection
    - (3) radiation
3. Thermodynamic Principles
  - a. Conservation - during energy transformations or transfers
  - b. Dissipation - during energy transformations or transfers

Am I overlooking anything? Does this make good physics sense?

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Date: Sat, 04 Jan 2003

From: Paul Bianchi <pbianchi@ATTGLOBAL.NET>

Hey Mervin,

Some thoughts on organizing energy topics:

1. I prefer to present potential energies as energy associated with a position in a force field: either gravitational, electromagnetic, or nuclear. This then lets the kids see how pervasive the effects of the electromagnetic field are (it encompasses elastic, chemical and magnetic).
2. In the transfer category, you need waves as a mechanism in addition to working and heating.

I'm not sure I'd classify "conservation" as a specifically "thermodynamic" principle in relation to energy (and I make a point of saying conservation of MASS-energy, since stars are where we get all our energy from), but that may just be me!