

Tags

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Energy!

Welcome back folks,

Our transition back will begin with an overview of heat, the lowest form of energy (random, disorder, high entropy).

We'll begin with a few labs and demos, and follow the frog book for a rough overview, before diving into our normal textbook.

Here are some notes:

Semester one overview:

Unit 6: energy

Unit 7: pollution

Unit 8: global change

Unit 6(text):

ch. 12 Non renewable energy

ch. 13 Renewable energy

Frog book:

ch. 16 Climate change

ch. 17 Non renewable energy

ch. 18 Renewable energy

Energy overview

IR camera

Dashboard greenhouse example

Heat: lowest form of energy

Radiation: needs no medium, can be reflected (white, mirrored surfaces), more efficient at high temperatures (red hot), e.g. solar radiation from the sun to us, 8 light minutes away, through a vacuum.

Conduction: (contact), air over warm earth, picks up heat (thermal energy) by contact

Convection: (mass in motion), dependent on density differences, cause of all wind, storms, heat transfer to space

Frog book:

16: climate change

17: non renewable energy

18: renewable energy

Implications:

Building insulation

Hot water insulation

HVAC

Housing

Industry

Transportation

MLO= Mauna Loa ("long mountain") Observatory: Mauna = mountain, Loa = long

Begin in 1958, with Keeling, so the curve is called the "Keeling curve"

Look it up: why is it jagged? What does it look like in the southern hemisphere? Why?

Look up NOAA, this is the organization that oversees MLO

NCAR is another cool place to look up.

Find the aggi index graph—which gas is most important? which is changing most today?

why is 1990 the 1.0 mark for all gases?

What is the difference between the aggi graph and any other climate change graph?

You might also look up the ozone and CFC graphs, notice what happened to those as well.

Heat transfer lab:

conduction, convection, radiation examples

Energy literacy lab:

1000 W water heater for 1/10 hour = 0.1 kWh

1 Watt = power

1 kW = power

1 HP = power

1 kWh = energy

1 joule = energy (recall $mgh = PE$, or $1/2mv^2 = KE$)

1 calorie = energy (n.b. 1000 cal = 1 Cal, or food calorie)

1 BTU = energy (used in heating, ventilation and air conditioning systems—HVAC)

Energy monitoring lab:

Energy hunt