February 7, 2020
Sit anywhere at a table

Entry: Answer the following in your Notebook

When I say “system” what images/words come to mind?

What do you remember about “work” from last semester? If you don’t remember anything, what comes to mind?

What I say “matter” what images/words come to mind?

Housekeeping

- Problem Set #9 out Today
- Honors Assignment #5 will come out on Monday
- Winning teams I need to know your order :) by tonight for Monday
- CCR Time today

An Inconvenient Sequel

An Inconvenient Sequel Reflection questions

Response to an Inconvenient Sequel

In addition to the reflection questions take a moment to jot down your thoughts on how you are feeling/what you are thinking about climate change in this moment.

As a group discuss the reflection questions

What were your different conclusions and ideas? Record your thoughts on the piece of paper.

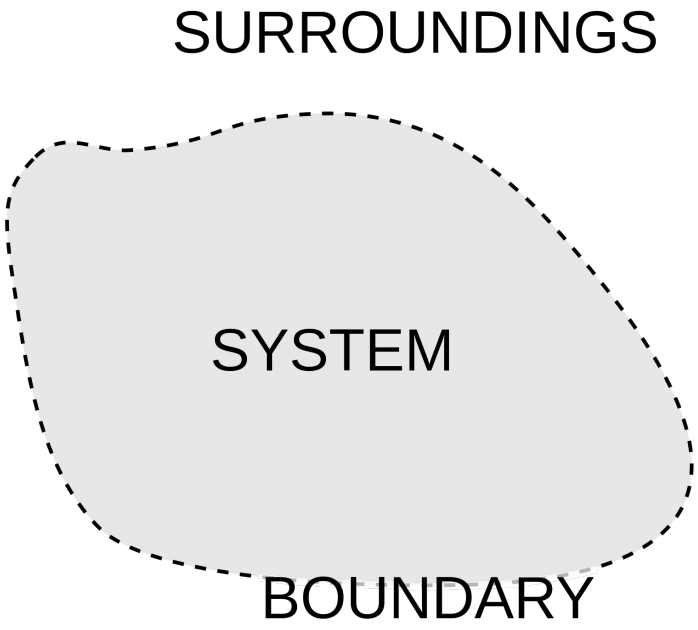
Pick one person to share out from your table, you will share out highlights from your conversation

Following up on India

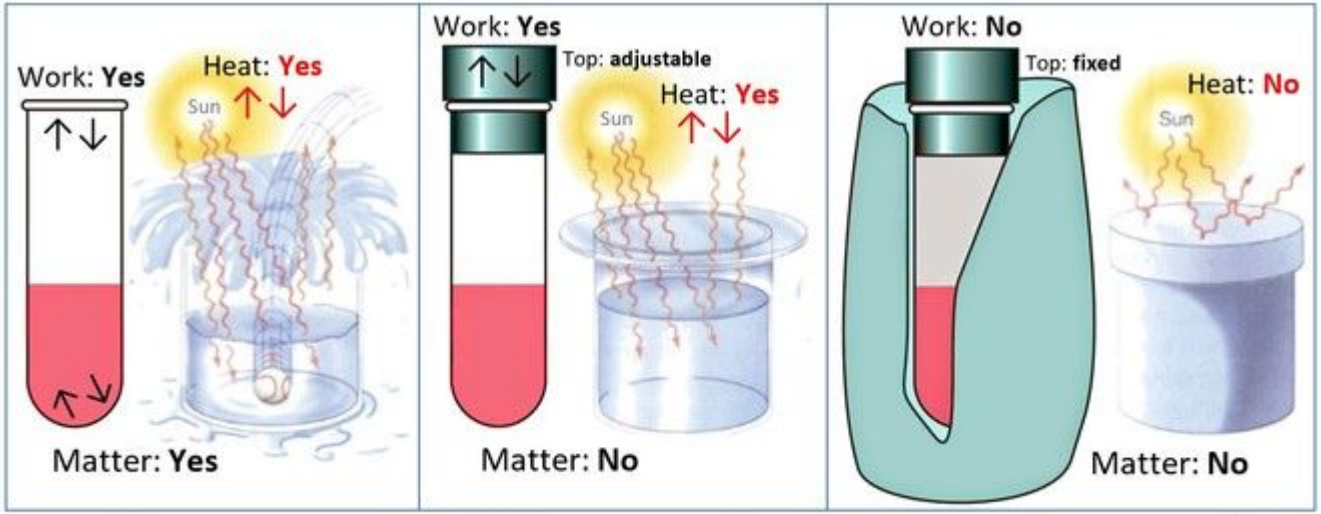
March 7th 2016

February 4th, 2020

Thermodynamic Systems



Thermodynamic Systems



Open	Closed	Isolated
Matter, Heat, and Work exchanged	Heat and Work exchanged NO Matter exchanged	NO Matter, Heat, and Work exchanged

Earth as a Thermodynamic System

What kind of system is the Earth?

Earth as a Thermodynamic System

The Earth is technically an open system

Energy (heat and work) exchanged:
Sunlight and Radiated Energy

Matter exchanged:

Meteorites, Satellites, and Astronauts

Because the amount of Matter exchanged is SO small the Earth can be approximated as a closed system

Sun as our Energy Source

To understand our Earth as a system, we need to understand how Energy Enters our world.

Which means we need to understand what happens when Electromagnetic wave/Light waves encounter materials.

Finish/Revise your models and questions

With your table group...

Using this new information about systems, label each of the systems that you observed “open” , “closed” , or “isolated”

Finish up any remaining work on your models and questions

Tape them up on a section of whiteboard

Zeroth Law of Thermodynamics

If two systems are in thermal equilibrium with a third system, then they are in thermal equilibrium with one another

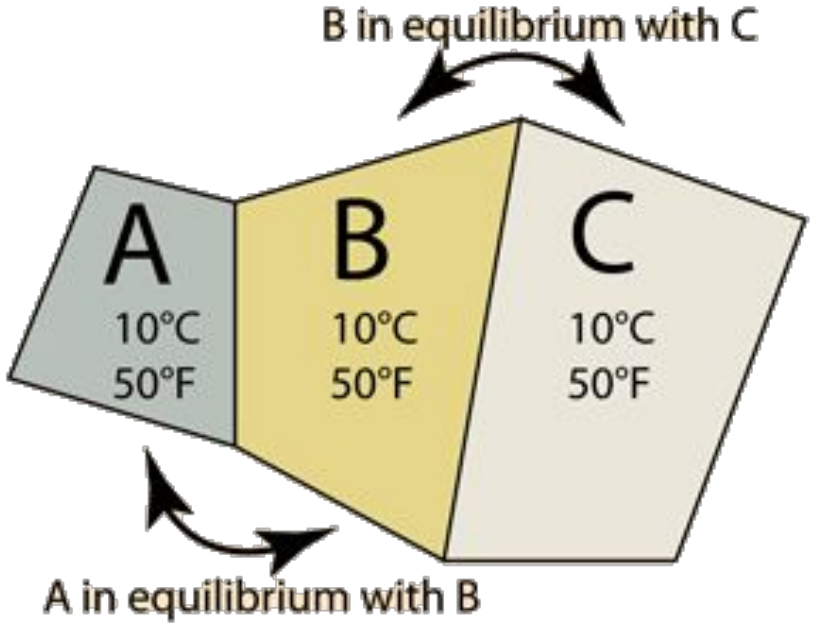
Temperature of A = Temperature of B

and

Temperature B = Temperature C

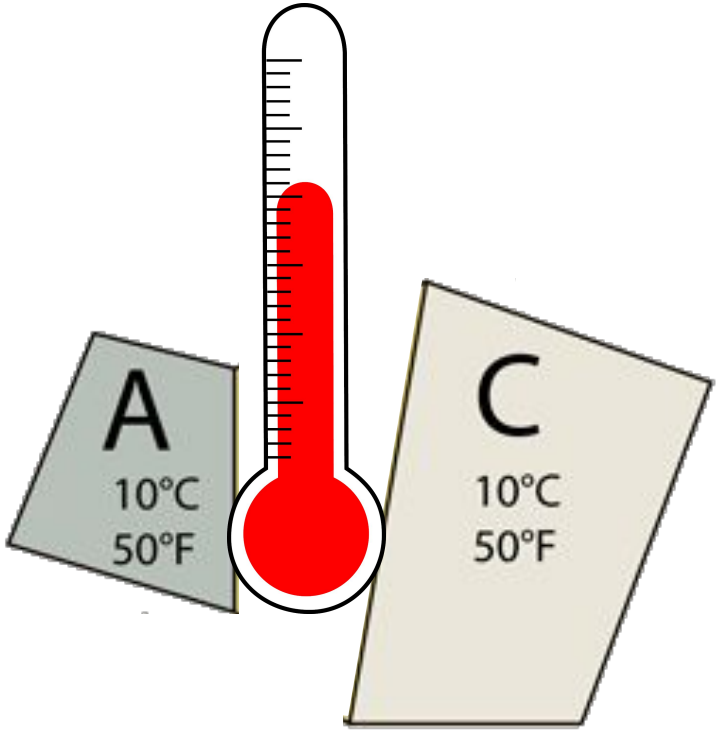
then

Temperature of C = Temperature of A

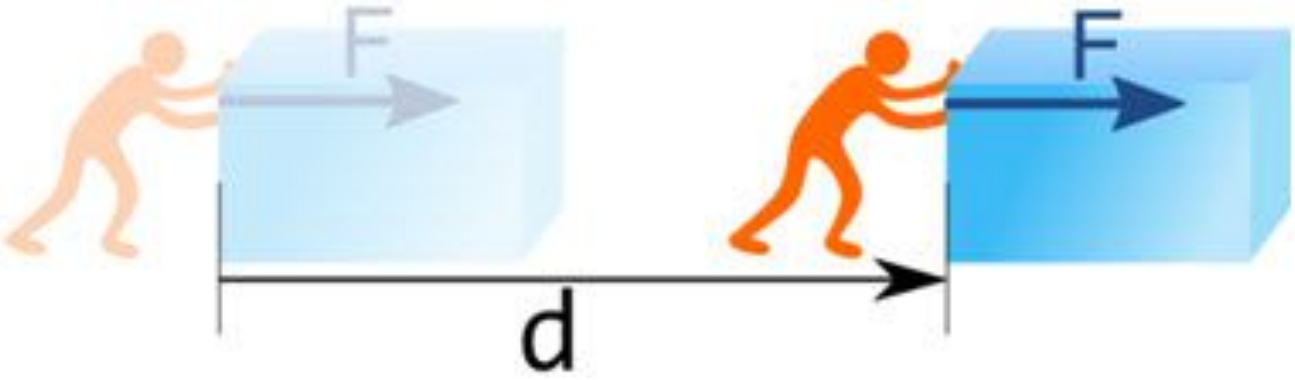


Zeroth Law of Thermodynamics

What if we replace object B with a thermometer....



Reviewing work



Work = Force x Distance

W = F*d

First Law of Thermodynamics

This is basically conservation of energy

Formally it states that the total energy of an isolated system is constant.

It can also be stated….

The change in internal energy of a system is equal to the heat added to the system minus the work done by the system.

$$\Delta U = Q - W$$

Change in internal energy

Heat added to the system

Work done by the system

In our experiment we weren't dealing with work though

First Law for Our Experiment

$$\Delta U = Q - \cancel{W}$$

Change in internal energy

Heat added to the system

Work done by the system

In our experiment we weren't dealing with work though

$$\Delta U = Q$$

Change in internal energy

Heat added to the system