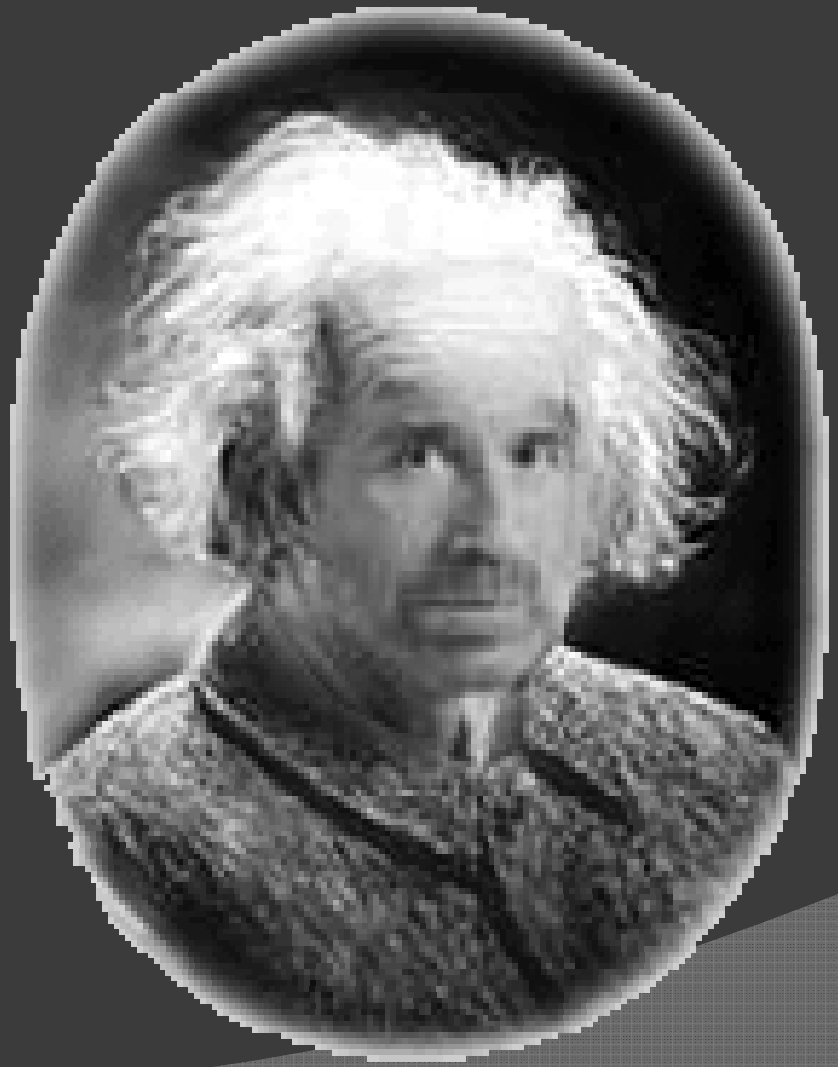
Objectives:

- Grade Energy Transfers: Work and Power
- Be able to explain how heat moves
- Be able to explain the difference between a insulator and conductor of heat
- Be able to describe 3 different forms of heat transfer

THERMODYNAMICS

The Chuck Norris of Physics



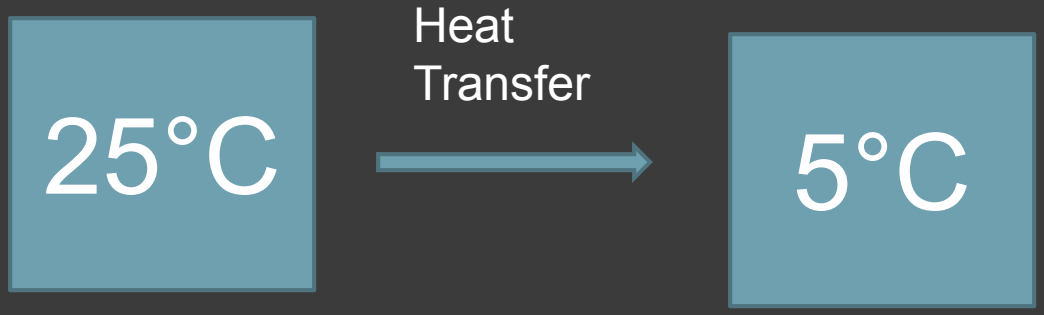
Grade Classwork

- We will correct worksheet 17 together
- If you have not completed worksheet 18, make sure that you turn in in completed
- You have until the video is over to work on your worksheets

Thermodynamics

- Study of how heat moves

- Heat **always** moves from **Hot to Cold**
- Heat does not rise (hot air does)



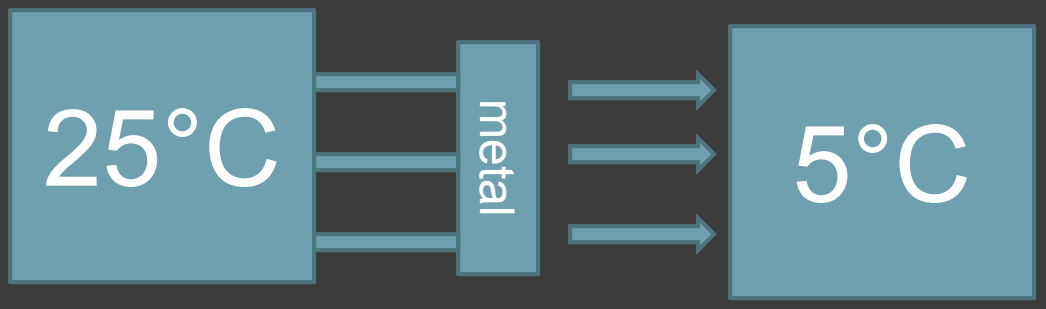
Insulators

- Insulator slow down heat transfer
- Materials with air pockets are good insulators

Slow
Transfer

Conductors

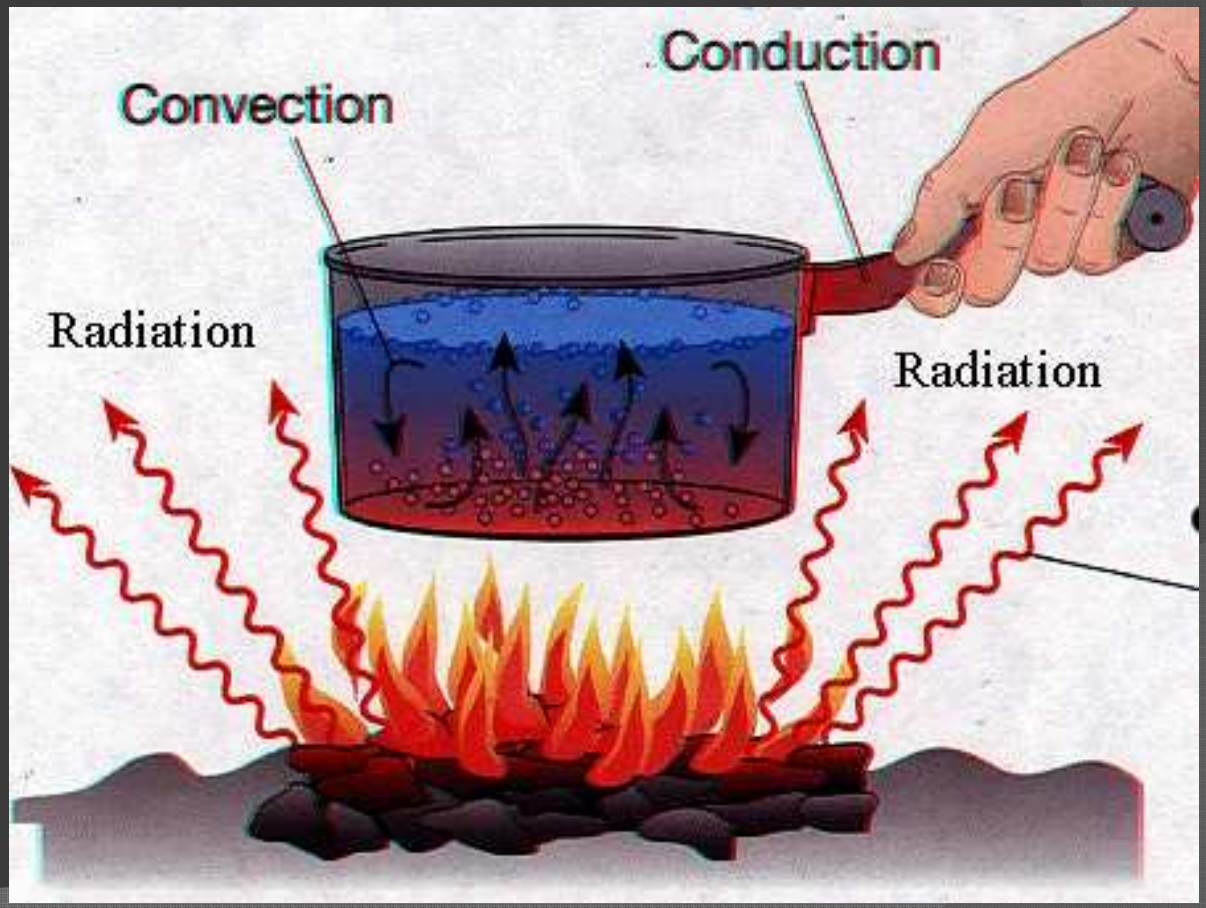
- Conductors easily allow heat transfer
- Most metals are good conductors



Fast
Transfer

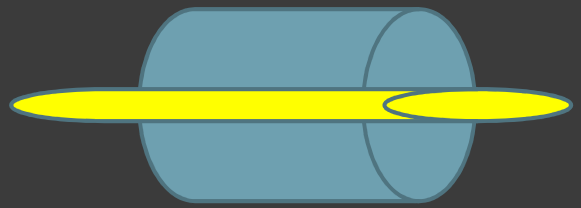
Thermal (heat) is transferred in three ways

- Conduction
- Convection
- Radiation



Conduction

- Conduction transfers heat through objects touching



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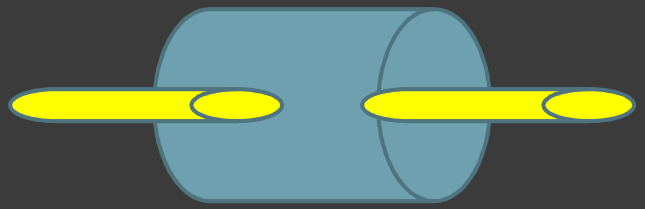
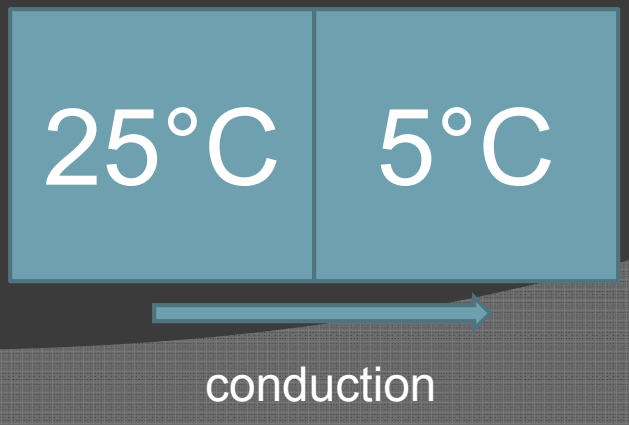


B

Conduction

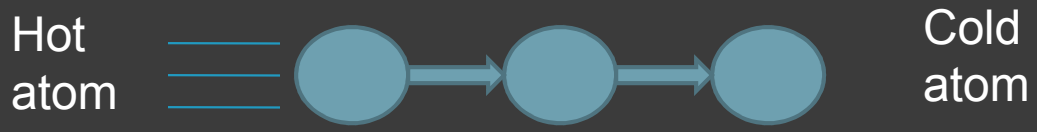
- All atoms are moving which means that they have what kind of energy?

- Heat transfer continues until both objects are at *thermal equilibrium* (the same temperature



Colliding Atoms Transfer Heat

- Conduction transfers heat by atoms colliding and transferring energy



Closer atoms mean more collisions

- Solids tend to transfer heat better than liquids and gasses
- Gasses tend to make better insulators


CHUCK NORRIS DESIGNS A HEAT EXCHANGER
OVER 100% EFFICIENCY

Convection

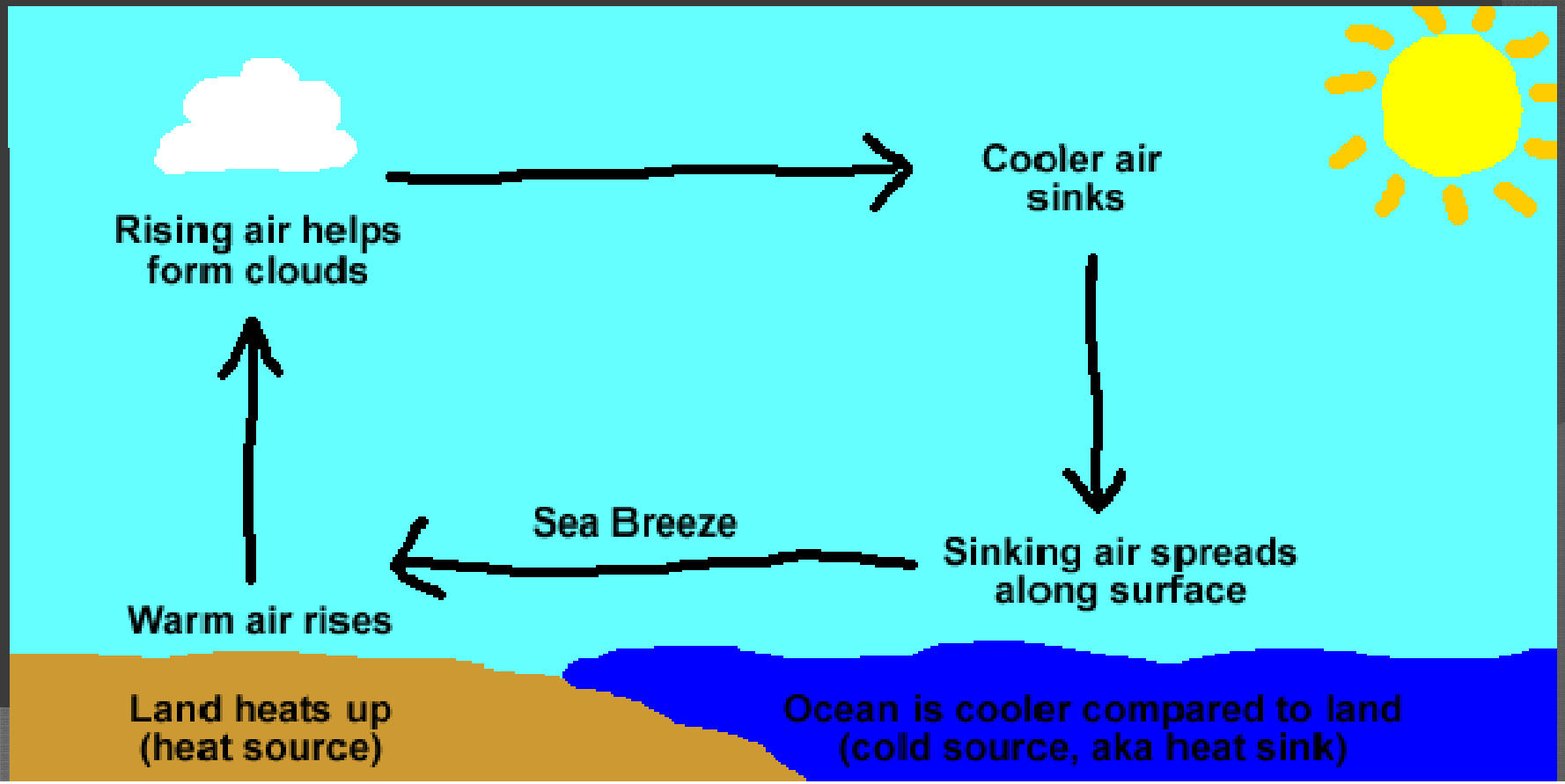
- Convection transfers heat through moving currents in gases or liquids

Heat rises, cold falls

- Hot liquids and gases are less dense and rise, causing *convection currents*
- These currents transfer heat
- Convection currents can only happen in gases and liquids but not in solids because solids can’t move

Convection and Weather

- Much of the weather on Earth comes from convection currents



Radiation

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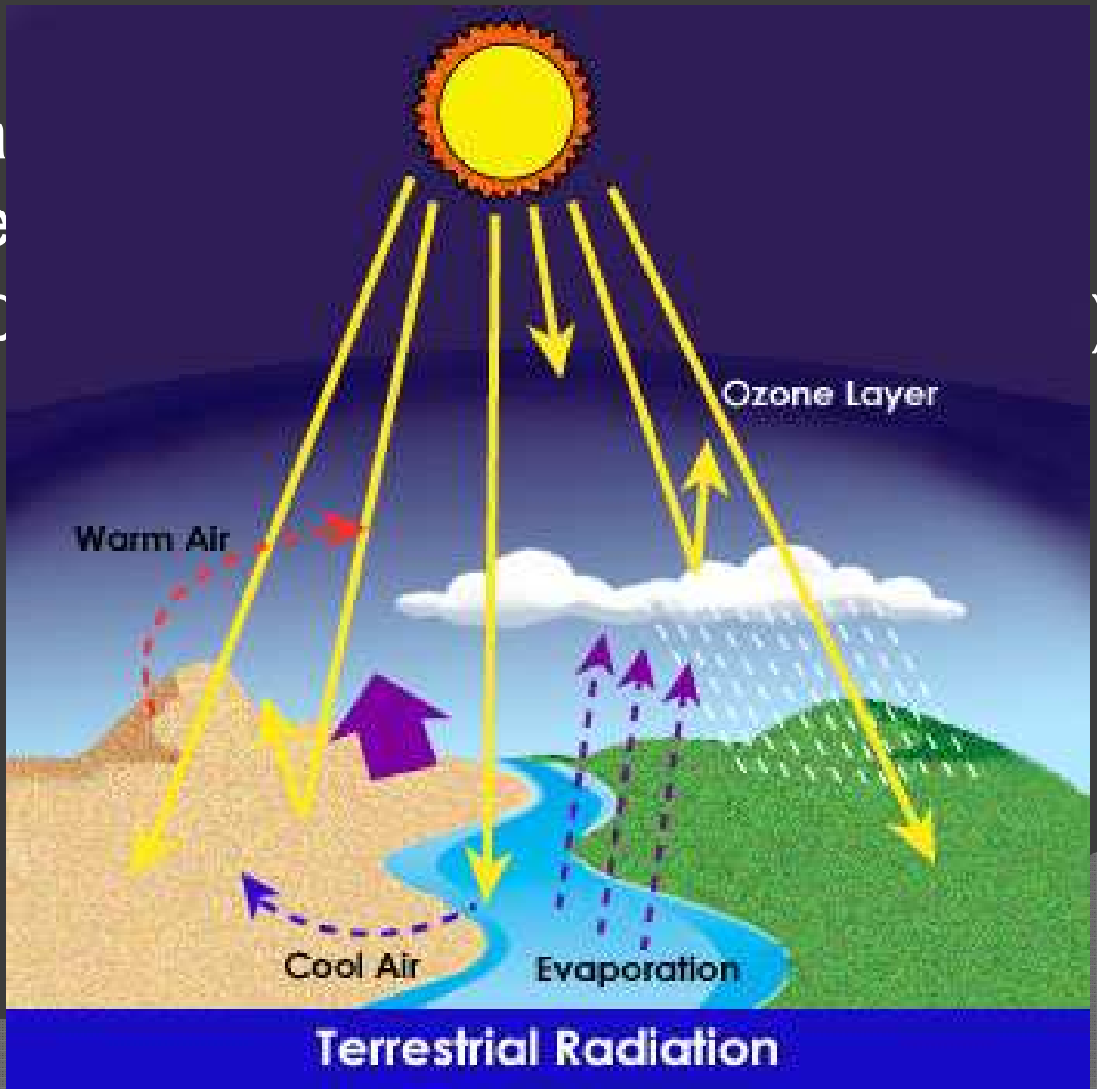
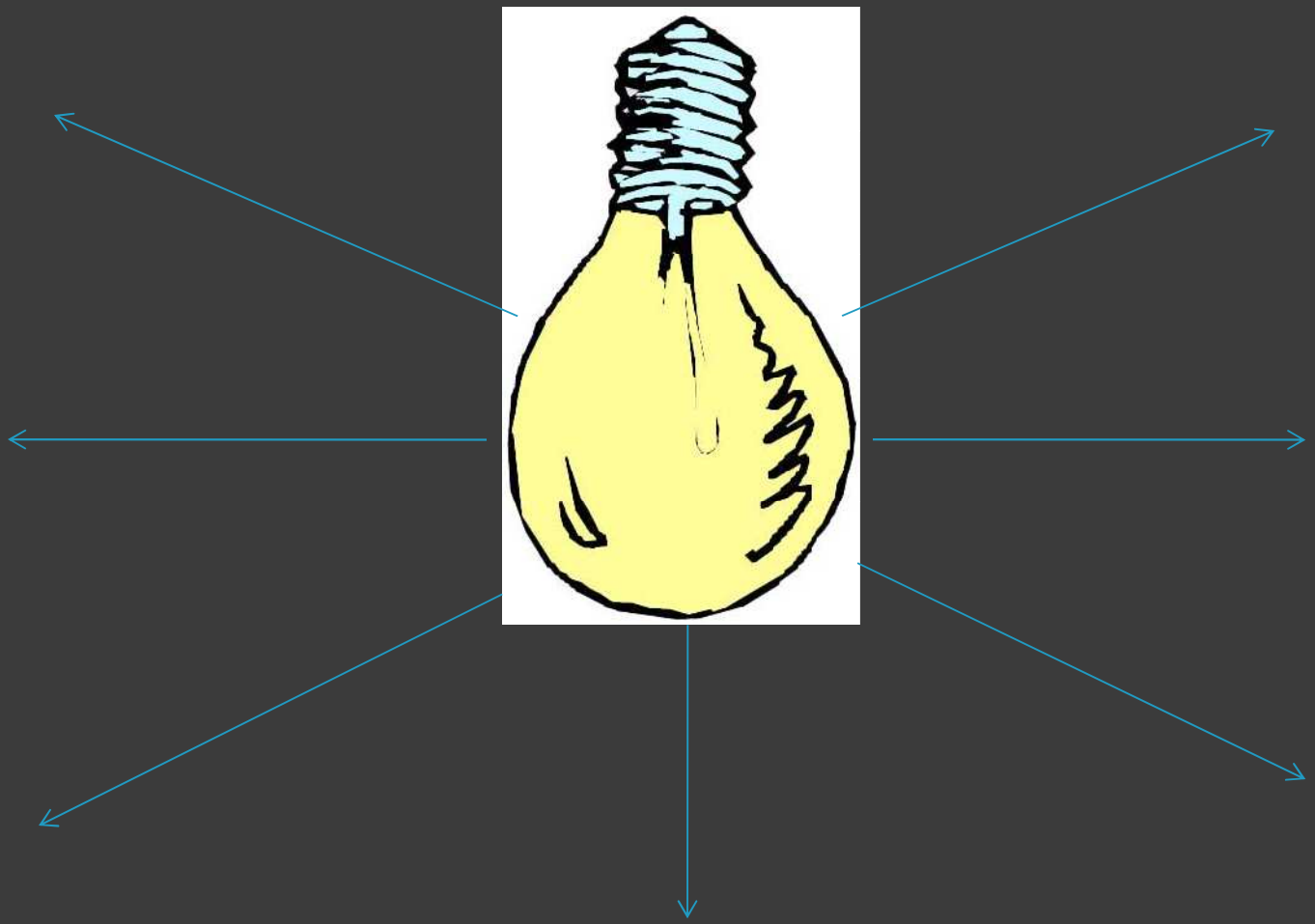
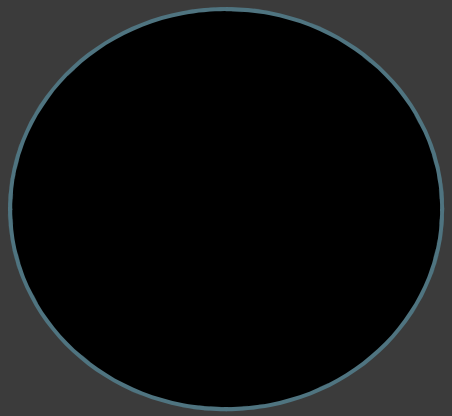




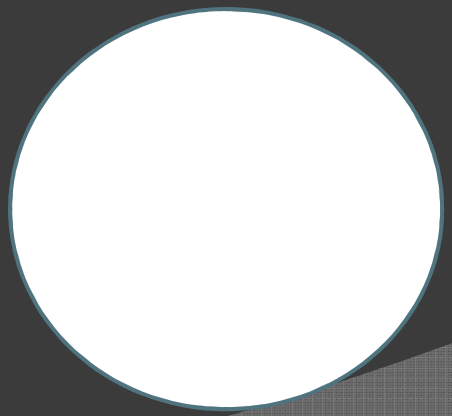
- Radiation transfers heat through electromagnetic waves-pure thermal energy

Dark Side vs. Light Side

- Dark objects absorb more radiation than light objects
- Dull objects absorb more radiation than shiny objects



High absorption of radiation
Heats fast



Low absorption of radiation
Heats slowly

Classwork

- Thermodynamics Worksheet

- Next Class
  - Skateland Park
  - Quiz 8