Name: _____ Date: _____

Notes: Energy and the Transfer of Heat

Define **kinetic energy**: _____

Define **potential energy**: _____

What are all objects made of? _____

Define **internal energy**: _____

_____

What is true of all atoms and molecules? _____

What type of energy do moving particles contain? _____

What measurement is related to the motion of particles? _____

Define **temperature**: _____

_____

How would increasing the temperature affect the motion of the particles in a system?

_____

What temperature scales do we use in science? _____

What is the mathematical relationship between these scales? _____

Which temperature scale will always report the **higher number**? _____

Convert between the temperature scales below.

100°C = _____ K	400 K = _____ °C	20°C = _____ K
350 K = _____ °C	-15°C = _____ K	273 K = _____ °C

Where is the energy needed to make a chemical bond stored? _____

What do we call the energy stored in these bonds? _____

Why is *chemical energy* considered *potential energy*? _____

Define **thermal energy**: _____

_____

What is ***heat***? _____

$$\text{Heat gained or lost} = (\text{mass})\left(\begin{matrix}\text{specific}\\ \text{heat}\end{matrix}\right)\left(\begin{matrix}\text{change in}\\ \text{temperature}\end{matrix}\right) \qquad Q = mc_p\Delta T$$

Heat, and all forms of energy, is measured in what unit? _____

What does **ΔT** stand for? _____

What does a positive (+) value of Q mean? _____

What does a negative (-) value of Q mean? _____

How much thermal energy would be gained by the piece of iron shown below if it underwent the temperature change to the right? The specific heat of iron is 0.450 J/g●°C.

Mass = _____ Specific Heat = _____ ΔT = _____

Solve for Q:

Transmitting Heat THROUGH Objects:

How does heat travel *through* a **solid**? _____

What states of matter are considered **fluids**? _____

How does heat travel *through* a **fluid**? _____

What allows liquids and gases to transmit heat this way? _____

What happens to a fluid as it is heated? _____

What happens to a fluid as it is cooled? _____

What does heating and cooling a fluids cause? _____

Transferring Heat BETWEEN Objects:

How does heat travel between objects in **direct contact**? _____

Which states of matter transfer heat this way? _____

When is the energy transferred? _____

How does heat travel between objects that are **not touching**? _____

What kind of wave is radiation? _____

What objects emit radiation? _____

What kind of EM radiation is often referred to as *heat waves*? _____

Where does most of the Earth's energy get **radiated** from? _____

Which colors absorb radiation better? _____

Which color absorbs the most radiation? _____

What do **insulators** do? _____