Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Pd: \_\_\_\_\_ Ast: \_\_\_\_\_

**Thermal Energy & Heat Notes**

1. Thermal Energy vs. Temperature
	1. TEMPERATURE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* 1. THERMAL ENERGY: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* + 1. \_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_ of each \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ together
		2. faster-moving particles have more \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_, and therefore a higher \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	1. Objects with the same thermal energy do NOT necessarily have \_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	2. Objects with the same temperature do NOT necessarily have \_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_.
	3. Compare the thermal energy and temperature of the water in beaker X and beaker Y:
1. Beaker X: 50 mL at 22°C & Beaker Y: 100 mL at 22°C
2. Beaker X: 60 mL at 5°C & Beaker Y: 60 mL at 25°C



1. Temperature Scales
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ( ) – Commonly used \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. \_\_\_\_\_\_\_\_\_\_ = Freezing Point of Water \_\_\_\_\_\_\_\_\_\_ = Boiling Point of Water
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ( ) – Commonly used \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. \_\_\_\_\_\_\_\_\_\_ = Freezing Point of Water \_\_\_\_\_\_\_\_\_\_ = Boiling Point of Water
6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ( ) – Commonly used \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
7. \_\_\_\_\_\_\_\_\_\_ = Freezing Point of Water \_\_\_\_\_\_\_\_\_\_ = Boiling Point of Water
8. “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_” ( ) means NO particle motion at all
9. Temperature & Molecules
10. What does a rise in temperature indicate?
11. What does a drop in temperature indicate?
12. What happens to the temperature during a phase change?
13. HEAT: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. CONDUCTION: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. The particles of one substance \_\_\_\_\_\_\_ \_\_\_\_\_\_\_ the particles of another substance
3. Examples from the Heat Lab:
4. CONDUCTOR: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	* + - Examples:
			- All of these have a \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_.
5. INSULATOR: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	* + - Examples:
			- All of these have a \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_.
6. CONVECTION: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. CONVECTION CURRENT: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	* + - Warmer \_\_\_\_\_-\_\_\_\_\_\_\_ fluid \_\_\_\_\_\_\_ while cooler \_\_\_\_\_-\_\_\_\_\_\_\_ fluid \_\_\_\_\_\_\_, creating a \_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_.
			- Example from the Heat Lab:
8. RADIATION: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. For example, we get heat from \_\_\_\_\_\_\_\_\_\_, mainly from \_\_\_\_\_\_\_\_\_\_ waves.
10. Radiation does NOT require \_\_\_\_\_\_\_\_\_\_ to transfer energy…heat can be transferred through \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_.
11. Example from the Heat Lab:
12. “Heat flows in one direction.”
13. Heat flows from \_\_\_\_\_\_\_\_\_\_\_\_\_ objects to \_\_\_\_\_\_\_\_\_\_\_\_\_ objects until both have \_\_\_\_\_ \_\_\_\_\_\_\_ temperature (they have reached their “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” temperature).
14. Heat will flow from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
15. Heat will flow from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
16. Heat will flow from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
17. If you hold an ice cube in your hand, why does your hand feel cold?
	* + - There is no such thing as “\_\_\_\_\_\_\_”...only an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_.
18. Why will a can of soda freeze if you place it in the freezer?