

Name:

# Energy NOTES

## OBJECTIVES

**Correctly define:** absolute zero, condensation, conduction, convection, kinetic energy, potential energy, radiation, refracted, solidification, specific heat, temperature, vaporization

### ENERGY TRANSFER AND TRANSFORMATION

- Describe the difference between kinetic and potential energy and give one real-life example of each.
- Describe the three ways energy is transferred between objects.
- Give at least one real-life example for each type of energy transfer.
- Explain how electromagnetic energy travels.
- Explain how different types of energy are told apart.
- Give examples of materials which make the best absorbers and reflectors of energy.

### TEMPERATURE

- Convert temperatures between the three temperature scales.
- Describe the relationship between temperature and molecular motion.
- Describe absolute zero in terms of molecular motion.

### SPECIFIC HEAT

- Explain the concept of specific heat in your own words and with real-life examples.
- Use the ESRTs to predict which earth materials will heat the fastest or slowest based upon their specific heats.
- Identify that water (liquid) has the highest specific heat of any Earth material.
- Explain why, in terms of specific heat, materials that are good absorbers are also good radiators.

### HEATING OF WATER

- Correctly label the water heating graph with the following characteristics: freezing, melting, condensing, and evaporating.
- Identify when heat is being gained or lost by water on the water heating graph.
- Explain which phase changes require the biggest gains/losses of energy for water.
- Calculate the rate of temperature change for water.

# Vocabulary

**Absolute Zero:**

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**Condensation:**

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**Conduction:**

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**Convection:**

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**Kinetic Energy:**

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**Potential Energy:**

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**Radiation:**

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**Refraction:**

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**Solidification:**

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**Specific Heat:**

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**Temperature:**

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**Vaporization:**

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# Key Concepts & Questions

## Energy Transfer

What is the difference between kinetic and potential energy? Give a real-life example of each

Kinetic Energy	Potential Energy
Example:	Example:

What are the three ways that energy can be transferred between objects? Give one real-life example of each.

Example	Example	Example

From where do convection ovens heat? (top or bottom) \_\_\_\_\_

From where do refrigerators cool? (top or bottom) \_\_\_\_\_

How are different types of energy told apart? \_\_\_\_\_

Which is more powerful---short-wavelength energy or long-wavelength energy? \_\_\_\_\_

How does energy get from the Sun to Earth? \_\_\_\_\_

Best Absorbers	Best Reflectors

**A GOOD ABSORBER IS A GOOD \_\_\_\_\_ !**

**SOMETHING THAT ABSORBS ENERGY QUICKLY, MUST GIVE IT OFF QUICKLY!**

# Temperature Conversion

Fill in the chart below using your Earth Science Reference Tables.

Fahrenheit	Celsius	Kelvin
30		
	30	
		330

Describe the word **TEMPERATURE** in relation to molecular motion.

What happens to molecular motion at absolute zero? What temperature is this in all temperature scales?

## Specific Heat

Why does water heat up and cool down slower than land?

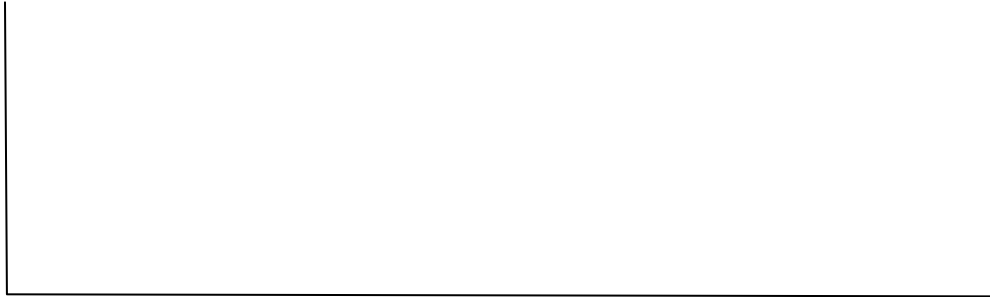
If you heated equal masses of basalt and lead, which one would record a faster increase in temperature? Explain how you know.

Which Earth material has the greatest specific heat?

# HEATING OF WATER

Draw the graph of water heating.

- Label the following terms in their correct places: condensation, vaporization, solidification, melting.



Check the box which describes whether energy is gained or lost for each process.

Process	Energy Gained	Energy Lost
Condensation		
Evaporation		
Melting		
Solidification		

How many calories are gained or lost by water for each of the following processes?

Process	Calories Gained	Calories Lost
Condensation		
Evaporation		
Melting		
Solidification		