

Conduction, Convection, and Radiation Answer Key

Page 2: Essential Questions

Answers will vary.

Page 3: Thermal Energy

Thermal energy is the energy that is generated by a source and measured by heat.

Answers will vary. Ex: the sun

Page 4: Energy Transfer

Top: Through physical touch

Middle: Through waves in the air

Bottom: Through circulation in water

Page 5: Think About It

(1) The air will get warmer (2) The person may burn their hand as it absorbs the heat from the handle/their hand will get warmer as it absorbs the heat from the handle (3) The burner gets cooler as it loses heat transfers heat to the pot. Electricity then re-heats the burner.

Page 6: Conduction

Top: The movement of heat through matter, normally solids.

Bottom: The spoon is getting hot because the water is heating up the metal spoon.

Page 7: Convection

Top: The transfer of energy through fluid, normally gas or liquid.

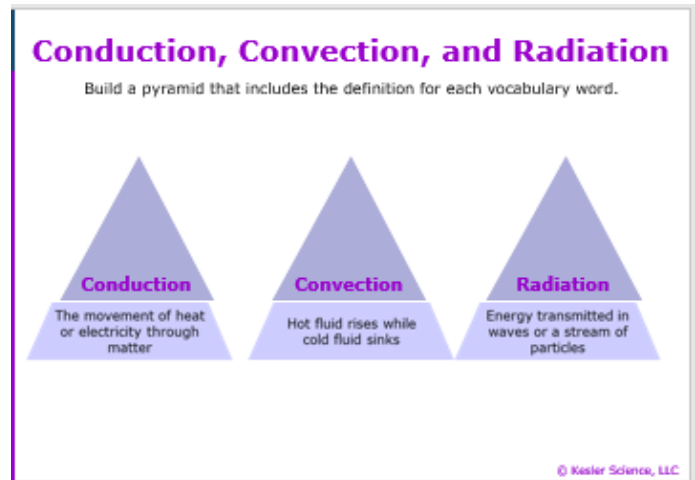
Bottom: The heat travels up the water. As heat rises it starts to cool, which then causes the cold water to sink

Page 8: Radiation

Left: Radiation is when energy is transmitted through waves.

Right: The heat from the sun travels through waves to Earth.

Page 9: Quick Action: INB



Page 10: Think About It

Answers will vary but may include: solar panels which transform radiation to electrical energy, photosynthesis which transforms radiation to chemical energy

Page 11: Ex. Of Conduction

Answer will vary. Example: placing a pot of water on the stove to heat the water.

Page 12: Ex. Of Convection

Thermal energy rises through the air, making the top floor the hottest.

Page 13: Ex. Of Radiation

Conduction

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Page 14: Quick Action: INB

Conduction, Convection, and Radiation

Feeling the warmth of a bonfire	Conduction	Convection	✓
Touching a metal spoon in a cup of hot liquid	✓	Convection	Radiation
Hot water rising in the oceans, cold sinking	Conduction	✓	Radiation
Hot magma rising in the mantle, cold sinking	Conduction	✓	Radiation
Laying out in the sun at a beach	Conduction	Convection	✓
Feeling the heat from a hot poker in a fire place	✓	Convection	Radiation

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Page 17: Check for Understanding

Conduction: Thermal energy is

transferred through direct contact. Ex. Your arm getting hot from taking a hot shower.




Convection: Thermal energy transferring through a fluid. Ex. Convection currents.

Radiation: Thermal energy transferring through waves. Ex. Feeling the heat from the back of your computer.

Page 15: Think About It

Answers will vary but may include: high roof allowing hot air to rise away from living area, built into earth to insulate from radiation/heat and help retain heat in cold areas, built off the ground to allow convection currents to cool, porches/large windows to allow convection.

Page 16: Last Look

Scenario	Description and Type of Heat Transfer
Describe the heat transfer in the picture on the right. 	Conduction. Descriptions will vary.
Describe the heat transfer in the wind, the Earth's oceans, and the Earth's mantle. 	Convection. Descriptions will vary.
Describe how sunburns are related to heat transfer. 	Radiation. Descriptions will vary.
Example 1: Type Here	Type Here
Examples 2: Type Here	Type Here