Name: _____ **Date:** _____

Answer Key: A Blanket for the Earth: First Grade Heat Energy Masterclass

Young scientists synthesize how heat moves through their world by predicting energy changes and designing solutions to keep things warm or cool.

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1. Imagine you are designing a winter coat for a penguin. Which material would be the best 'heat trapper' to stop the penguin's body heat from escaping into the cold snow?

Answer: B) Thick, fluffy wool with trapped air

Fluffy materials like wool trap air, which is an excellent way to slow down heat transfer and keep energy inside a system.

2. If you put a warm rock into a bowl of cold water, the heat energy will travel from the cold water into the warm rock.

Answer: B) False

Heat always flows from the warmer object (the rock) to the cooler object (the water) until they reach the same temperature.

3. Rubbing your hands together very fast creates _____, which makes your skin feel warm because friction turns movement into heat.

Answer: C) Energy

Movement is a form of energy that can be transformed into thermal energy (heat) through friction when things rub together.

4. If you left a chocolate bar on a dark sidewalk and a chocolate bar on a white sidewalk on a sunny day, which one would melt first and why?

Answer: C) The one on the dark sidewalk because dark colors absorb more heat

Dark surfaces absorb more radiant energy from the sun, causing them to heat up faster than light-colored surfaces.

5. A lizard sits on a hot desert rock to gather heat. This is an example of heat moving from the rock to the lizard's body.

Answer: A) True

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When two objects touch, heat moves from the hotter one (the rock) to the cooler one (the lizard) through conduction.

6. A thermos is a special bottle that is built to _____ the flow of heat, keeping your soup hot for a long time.

Answer: C) Slowing

Insulators in a thermos slow down the transfer of heat, preventing the energy from escaping into the air.

7. Look at a steaming bowl of oatmeal. The steam rising up into the air shows that warm air and water vapor _____.

Answer: B) Rise because they are less dense

In convection, warmer fluids (like air or steam) rise while cooler ones sink, creating a movement of heat.

8. Heat can travel through empty space where there is no air, which is how the sun warms our planet.

Answer: A) True

Radiation is a type of heat transfer that can move through the vacuum of space without needing any matter to carry it.

9. When you add heat to a solid ice cube, the little particles inside start moving _____ until the ice turns into liquid water.

Answer: B) Faster

Adding thermal energy makes molecules move more quickly, which causes a change in state from solid to liquid.

10. Why does a metal slide feel 'hotter' than a wooden bench even if they have been in the sun for the same amount of time?

Answer: B) Metal is a conductor that shares heat very quickly

Metal is a better conductor than wood, meaning it transfers its heat energy to your skin much faster than wood does.