

Name:

Date:

Preparing for Grandma's Arrival

A Story with Heat Transfer

Directions: As you read the following story, highlight any parts of the story that relate to conduction, underline examples of convection, and circle any radiation examples.

It was a hot summer day and Jenny and Frank were taking full advantage of their summer vacation. They were still in bed while their Mom got ready for work. "Wake up sleepy heads! You got chores to do," Mom yelled from the kitchen. She could hear the children groan as they trudged down the stairs. "The list is on the counter. Make sure you complete everything. Dad is picking Grandma up from the airport after work, so everything has to be perfect for her arrival."

The kids were thrilled to see their grandma, but less than excited to do a day's worth of chores. "Don't worry Mom. We will take care of everything," Frank called as Mom hurried out the door. "Okay first on the list is to clean the garage and the front lawn." They went through the side door to the garage. "WOW! It's so hot in here! It's definitely not this hot in the house," gasped Jenny. She could feel beads of sweat beginning to form on her face. They picked up all their sporting equipment and pool accessories from the floor and swept the entire area. Afterwards they headed outside to the front lawn. Frank grabbed his bike that had been sitting outside for a few days. The metal handle bars felt hot on his hands.

Jenny picked up her black sweatshirt that she left on the grass from the other night. "My sweatshirt is really hot," she noted. "That's because black and other dark colors absorb heat energy more than lighter colors," explained Frank. By now both children were sweating from the hot July sun. When they were done cleaning the outside they went back into the house. The air conditioning felt so refreshing. Jenny could feel the cold tile floor on her bare feet. The children dusted the living and dining room. While Jenny was

dusting around the television she noticed she felt some heat. She put her hand to the screen. It was warm to the touch. "Hey dork," Frank teased as he popped his head in the doorway of the living room. "I'm taking this box of Christmas decorations upstairs to the attic. Be right back." Frank tugged on the attic door's rope to open it. As he climbed up the ladder he was slapped with hot air. The attic's temperature was much warmer than the rest of the house.

Jenny and Frank continued to clean for the next few hours. They folded laundry, made beds, and tidied up each room. Their last few chores were in the kitchen. They had just an hour of time left before Dad and Grandma were expected home.

Mom wanted Jenny and Frank to prepare Grandma's favorite meal, spaghetti. First Frank put 10 cups of water into a large cooking pot. He turned the stove on and noticed that one of the circular spots on stovetop started to turn bright red. He placed the pot onto the heat. Jenny started on brownies. She turned the oven to 400 degrees. She mixed eggs, oil, water, and the brownie mix in a large bowl and then poured the mixture into a glass pan. When the oven beeped, indicating that it was ready, Jenny placed the glass pan into the oven. She could feel the heat as she closed the oven door. The water for the spaghetti started to boil. Steam rose from the pot and the water was rapidly moving. Frank dumped half a box of noodles into the scorching pot. He let them cook for 14 minutes and then strained them in the sink. He picked a noodle up and popped it into his mouth. He noticed the noodle left a small red mark on his hand. Jenny took the brownies out of the oven. She placed small peanut butter cups all over the top of the warm treat. They instantly started melting. To finish their special dinner for Grandma, they prepared her most favorite drink: iced tea. They made warm tea and then used ice cubes to cool it. At first the ice cubes melted immediately, but they kept adding ice to the drink until it was chilled and the ice cubes stayed intact.

As Frank and Jenny were setting the table they heard the front door open. In walked Grandma with a bright smile on her face. "It smells wonderful in here," she beamed. "You guys didn't work too hard today, did you?" she asked. "Not at all Grandma," Jenny chimed. "Piece of cake....or brownie!"