

Name _____

The Magnetic Magic Inside Your Microwave

Short Answer Key

1. The magnetron is responsible for generating microwave radiation in a microwave oven. It contains powerful magnets that create a magnetic field. When electricity is passed through the magnetron's cathode, it causes electrons to move in a circular pattern due to the magnetic field. These moving electrons interact with microwave radiation, producing electromagnetic waves in the microwave frequency range.
2. Microwave radiation emitted by the magnetron penetrates food and interacts with water molecules present in the food. These water molecules have a positive and negative end, and the microwave radiation causes them to rapidly flip back and forth. This rapid vibration generates heat within the food, effectively cooking it from the inside out.
3. Three materials safe for microwave cooking are glass, ceramic, and microwave-safe plastic. These materials do not contain metals that can cause sparks or fires in the microwave. They are also heat-resistant and do not release harmful chemicals when exposed to microwave radiation.
4. Operating an empty microwave can cause damage to the microwave's magnetron. When there is no food or liquid to absorb the microwave radiation, it gets reflected back into the magnetron, potentially damaging it. This can lead to costly repairs and render the microwave inoperable.
5. Safety precautions are crucial when using microwave ovens to prevent accidents and ensure safe usage. Two essential safety tips include:
 - Use microwave-safe containers: Only use containers and utensils that are labeled as microwave-safe to avoid melting, warping, or releasing harmful chemicals.
 - Do not use metal: Avoid putting metal objects or containers with metal accents in the microwave, as they can cause sparks and fires.

