

## Microwave Cooking – Teacher’s Guide

**Objectives:** To provide information on how a microwave oven works, tips for successful microwaving of food and appropriate microwave utensils.

**Sample statement:** *"Microwave ovens cook food differently than conventional ovens and for a successful cooking experience we need to know a few tips. Today we are going to talk about microwave cooking and ways to successfully defrost, cook and reheat a variety of foods."*

Sample **ANCHOR** questions for participants:

- *"What kinds of foods do you like to cook in a microwave oven?"*
- *"What kind of cooking do you do in the microwave oven?"*
- *"What foods do you not like to cook in the microwave oven and why?"*

**Background Information** - Choose the appropriate information below to **ADD** to your lesson.

### 1. What are Microwaves?

Microwaves cook food with electromagnetic waves that causes vibrations of food molecules and heat in the food. Heat spreads through conduction to other parts of the food, just as it does in conventional cooking.

### 2. Microwaves affect water, fat and sugar molecules.

Microwaves are attracted to different kinds of molecules in foods. Microwave energy is attracted to water, sugar and fat. Sugars and fats heat up the fastest in the microwave oven.

### 3. Food Characteristics and Microwaving

When cooking in a microwave oven, the way food is prepared for cooking will effect cooking times.

**Size:** Small pieces cook faster than large ones in both microwave and conventional cooking. Since microwaves penetrate food 3/4 to 1 1/2-inches, uniform pieces less than 2 inches in diameter cook from all sides.

**Shape:** Thin parts of food with uneven thickness cook faster than thick parts. Place thin parts toward the center of the dish where they receive less microwave energy.

**Quantity:** Small amounts cook faster than large amounts.

**Amount of bone:** Bone conducts heat. When bone is on the side of the meat, that side will cook first. Boneless cuts cook less rapidly but more evenly.

**Fat distribution:** Since fat attracts microwaves, large fatty areas attract energy away from the meat and slow cooking. Trim visible fat from food before microwaving.

**Moisture content:** Since fresh and frozen vegetables and fruits have a lot of moisture it is not necessary to add very much water to cook. Extra water slows cooking so a minimum of water should be added. Foods with low moisture do not microwave well.

**Density:** Dense, heavy foods like meat take longer to microwave than porous, airy foods like muffins. Dense foods like baked potatoes and beef roast will hold heat longer than mashed potatoes and ground beef.

**Starting temperature:** Room temperature foods cook faster than refrigerated or frozen foods.

#### **4. Dish Shapes, Standing and Testing for Doneness**

***The size and shape of your cooking dish will effect how the microwave oven cooks the food and the length of time it takes to cook the food.*** Both the size and shape of the cookware affect the way foods cook and cooking times.

**Shape:** Shallow containers expose more food surfaces to microwave energy and thus cook faster than deep containers. Round shapes cook more evenly than squares or rectangles. Avoid casserole dishes with sloping sides since the food in the shallow depth area has a tendency to overcook.

**Standing:** Since molecules within food continue to vibrate and produce heat even after the microwave oven is turned off, many foods need standing time to allow the food to reach its final cooking temperature. This takes longer in denser foods like a whole turkey or beef roast than less-dense foods like breads, small vegetables and fruits. Removing foods before they “look” done is the hardest thing to learn about cooking in the microwave. Where standing time is necessary in a recipe, it will be included in the directions. Be patient and let the food stand. If it’s not done to your taste after standing, you can microwave a little longer, whereas there’s no remedy for over-cooked food!

**Testing for Doneness:** The appearance of some foods cooked in the microwave may be different from foods cooked in the oven or on the stove. The final test for doneness is using a food thermometer. Allow foods to stand before reading the food thermometer. Open the microwave door and use a food thermometer to see if the food has reached a safe minimum internal temperature. Do not leave a food thermometer in food during microwaving unless the food thermometer is labeled safe for microwave cooking. Cooking times will vary because microwave ovens vary in their power and efficiency. Cooking whole,

stuffed poultry in the microwave oven is not recommended because the stuffing might not reach the recommended safe cooking temperature.

## 5. Use **ONLY microwave oven-safe materials for cooking in your microwave**

**oven.** Some materials work great in the microwave, while others should be avoided.

- Microwave-safe materials:
  - Some safe materials to use include parchment paper, microwave plastic wraps, wax paper, oven cooking bags and white microwave paper towels. Avoid letting the plastic wrap touch the food while cooking.
  - Heat-proof glass or ceramic cookware used in the microwave should be labeled as “microwave oven-safe” or “suitable for microwave.”
  - Any utensil labeled for microwave use.
- **NOT** safe materials in the microwave:
  - Do not use left over plastic food containers (margarine tubs, sour cream, whipped topping, cottage cheese, etc.) for thawing, cooking or reheating foods in the microwave. If you use these containers to store or freeze food, remove foods then put in “microwave-safe” dishes to thaw, cook or reheat foods in the microwave. Some plastics may melt or distort at cooking temperatures and possibly cause harmful chemicals to get into the food.
  - Pottery, porcelain and china with metal rims should be avoided in the microwave oven.
  - Metal pans reflect too much energy and should not be used.
  - Foam cups, plates, trays, bowls or plates.
  - Chinese take-out containers with metal handles.
  - Metal “twist ties” on package wraps.
  - Brown paper bags, thin plastic storage bags, plastic grocery bags, aluminum foil\*, or newspapers should not be used in the microwave. *\*It can be safe to use small amounts of aluminum foil in the microwave. Consult the owner’s manual of your microwave oven and follow manufacturer’s recommendations for use of aluminum foil.*

**Test if a dish is safe for use in the microwave oven.** Put one cup of tap water in a glass microwave-safe measuring cup. Place this cup next to (but not touching) the dish you are testing. Microwave 1 to 2 minutes at High. If the dish remains cool, it is suitable for microwaving. If it is warm or hot do not use it because the material or glaze of the dish may contain metal and cooking with it could damage the microwave oven.

## 6. Defrosting

Defrosting frozen food is one of the benefits of a microwave oven. Most ovens have a Defrost setting, but the power level may vary from 70% to 30%. If you do not have a defrost setting, select power 30%. The final quality of the food defrosted depends upon how the food was packaged and the attention paid to the food while it is microwave defrosting. Low power levels reduce the amount of attention needed.

Before defrosting food remove packaging (foam trays, plastic wrappers, paper liners) from frozen food. Place in a microwave-safe dish to thaw. Rotate and turn food upside down (if possible) at least once to get uniform thawing.

Cook meat, poultry, egg/egg casseroles, and fish/seafood immediately after defrosting in the microwave. Do not hold partially cooked foods for later cooking because temperatures reached during thawing may be suitable for bacterial growth in thawed foods.

## **7. Reheating**

Most foods reheat in the microwave oven without loss of quality or texture, but are best reheated at lower power levels than High. Meats tend to dry out and overcook at High, so reheat at 50% power or lower. Stirring and rotating foods as they reheat help to distribute the heat more evenly. Test the bottom of the cooking utensil or plate. When food is hot enough to transfer heat to utensil or plate, it's ready.

To reheat bread, wrap in a paper towel to absorb moisture. Bread toughens if overheated so heat just until warmed. One roll takes only 8 to 12 seconds to heat.

To reheat meat, arrange thick portions of food to outside of dish. Add sauce or gravy to dry meats to provide moisture. Cover individual pieces of dry meat without sauce with a paper towel under wax paper.

## **8. Cleaning**

Keep your microwave oven clean. Wipe the oven with a damp, soapy cloth after cooking in the microwave. If food is cooked to the inside of the microwave oven and is hard to remove from the sides heat one cup of water in microwave until the water steams. Keep the door shut on the microwave for a few minutes. This should soften the food stuck on the inside walls so it can be wiped off. Use only a nylon scraper or nylon net pad to scrub the inside of the microwave. Never use anything that will scratch the oven.

### **Activities (APPLY):**

When possible use a microwave oven to demonstrate this lesson. If you are not able to do this lesson using a microwave oven consider bringing to class microwave cookware and utensils and food samples cooked in a microwave oven.

### **Handouts (AWAY):**

"Microwave Cooking"

"Quick Ways to Microwave Fruits & Veggies"

"Microwave Recipes"

**Recipe #556, #981, and #722 on Wellness Ways**

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