

Amazing Rays

Level C



Microwave Project Youth Activity Guide

Name _____ County _____

Purdue University Cooperative Extension Service • West Lafayette, Indiana



REVIEWED & RECOMMENDED
National 4-H Curriculum

Note to Project Helper

Congratulations, a young person has asked you to be his or her helper. Your role as a helper is very important to the total educational experience of the young person. Not only will you be providing encouragement and recognition, you will also be the key person with whom the young person shares each of the experiences outlined in this activity guide.

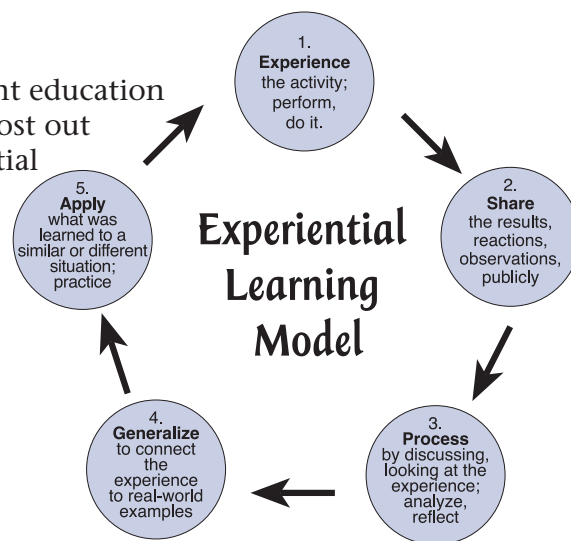
The “Microwave Magic” curriculum series is full of exciting hands-on activities that focus on using the microwave to prepare everything from simple snacks to complete meals. The curriculum is designed around four major categories: techniques and equipment, healthy food selection, food preparation, and meal time magic.

A total of five pieces are available in the “Microwave Magic” curriculum series. The four activity guides – *Bag of Tricks*, *Micro Magicians*, *Amazing Rays*, and *Presto Meals* – have been designed to be developmentally appropriate for grades 3-4, 5-6, 7-9, 10-12 respectively, but may be used by youth in any grade based on their project skills and expertise. The fifth piece, the *Project Helper Guide*, has been designed to provide you with some additional background information and some tips on helping youth through the activities in their guide.

The Experiential Learning Model

Experiential learning distinguishes 4-H youth-development education from many formal educational methods. Youth get the most out of each experience and activity by following the experiential model’s five steps.

1. Youth “learn by doing” an activity. (Experience)
2. They share their experience and reactions. (Share)
3. They discuss or reflect on what they did. (Process)
4. Youth relate skills they practiced to everyday situations. (Generalize)
5. They apply their experience to other real-world situations. (Apply)



Pfeiffer, J.W., & Jones, J.E., "Reference Guide to Handbooks and Annuals" © 1983 John Wiley & Sons, Inc. Reprinted with permission of John Wiley & Sons, Inc.

Project helpers guide youth as they explore an activity. Questions at the end of each activity help students reflect on the experience.

Acknowledgments:

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Important

Microwave oven cooking times vary based on the output wattage of the microwave oven. You should always check the item(s) being cooked when the recommended minimum cooking time has been reached. You can add additional cooking time, if needed.

When a word that is listed in the Glossary first appears in the text, the word is in *italic* type and is underlined.

Having Fun with Microwave Magic!

Are you ready?

Are you ready to do hands-on activities and use the microwave oven to prepare simple snacks and complete meals? That's what "Microwave Magic" is all about. You'll have fun learning about the microwave and using it to make lots of foods.

Your project manual is divided into four "bites": *Tricks of the trade*, *Once you swallow*, *Kitchen magic*, and *Magnificent meals*. Use the achievement sheet to plan your activities. After completing an activity, write the date completed and have your project helper initial it.

Your project helper

Your project helper is an important part of your experience in the Microwave project. This person may be your project leader or advisor, a neighbor, a family member, a friend, or anyone who has the interest to work with you to complete your activities. You need to involve your helper as you work with each activity and answer the questions. They are there to give you support and help you be successful. Write the name and phone number of your project helper here:

My project helper _____

Phone _____

E-mail _____

Action demonstrations

An action demonstration is a fun way to share what you have learned with others. The key is getting your audience involved in doing what you are doing, not just showing them. An action demo can be given anywhere there are a lot of people, like a county or state fair or a shopping mall.

An action demo can be on almost any topic. Here are some questions to ask yourself when choosing a topic.





- Is it something that can be done in 3 to 5 minutes?
- Is it something that would interest the general public?
- Is there something "hands-on" for the audience to do?
- Can the supplies for the "hands-on" activity be used over and over again or will they have to be replaced every time? (Note: If they have to be replaced, this will add to the cost.)

Your demonstration should last about 3 to 5 minutes, and you need to be able to do it over and over again with many different people. There is no prepared speech in an action demo, it is a two-way conversation. Your goal is to involve the audience, and you can do this by having them:

- | | |
|--------------------------|---------------------------|
| ■ Do what you are doing. | ■ Answer questions. |
| ■ Play a game. | ■ Do a hands-on activity. |

"Amazing Rays" Achievement Sheet

Each year, you should complete a minimum of three activities, each from a different "bite" category. Within the three-year project period, you should have completed at least nine activities and at least one activity from each of the four "bite" categories. Write the month, day, and year beside each of the activities you completed. Get your project helper to initial that you have discussed the activity with them. In addition, you may choose to do an action demonstration at the club/school or county level.

	Date Completed Month/Day/Year	Helper Initial		Date Completed Month/Day/Year	Helper Initial
 Tricks of the trade 1a Full of beans ____/____/____ 1b Well-done brown ____/____/____ 1c Pork chop ____/____/____			 Kitchen magic 3a Coffee cake ____/____/____ 3b Microwave candy ____/____/____ 3c Fruit crisps ____/____/____		
 Once you swallow 2a Chicken breast ____/____/____ 2b Mighty meatloaf ____/____/____ 2c Luscious lasagna ____/____/____			 Magnificent meals 4a Vegetable feast ____/____/____ 4b Colorful health ____/____/____ 4c One-dish spaghetti ____/____/____		

Did you do an action demonstration? ☐ Yes ☐ No Location _____

Title of action demonstration given _____

Name _____ Age _____

Club/School _____

I certify that this youth has completed all requirements for Level C of the "Microwave Magic" project and is ready to move on to Level D.

Project helper's signature _____ Date _____



Tricks of the trade

Introduction Defrosting and browning

Defrosting

Defrosting meats and other frozen items is a snap in the microwave. Many microwaves offer two types of defrost settings.

- Auto defrost or Compu defrost settings have been pre-programmed for select food items within a specified weight range. Follow the directions in your use and care manual. Many of these pre-programmed defrost settings will start out with a higher percent power and gradually reduce the percent power as your food begins to defrost.
- Manual defrost or Timed defrost settings always use 30% power. For either raw or previously cooked frozen food, the rule of thumb is approximately 4 to 5 minutes per pound.

If you have an older microwave that does not have a defrost setting, you can still defrost frozen meats. Microwave the frozen meat on Medium-Low (30% power) for 1½ to 3 minutes, and then let it stand for 1½ to 3 minutes. Continue this cooking/standing cycle until the meat is thawed. You can use the chart below for determining the safety and times used for thawing in the microwave as well as a brief description for other methods.

Methods	Refrigerator Thawing	Cold Water Thawing	Microwavable Thawing
Overview	Place meat in refrigerator	Submerge poultry in cold tap water	Place meat in microwave at medium-low power setting
Time Factor	5 hrs/lb.	2 hrs/lb.	4 to 5 minutes/lb.
Bacterial Factor	Safe	Moderately safe	Safe

Follow these tips when defrosting meat in the microwave:

- Remove the meat from the store wrap or packaging. This includes the Styrofoam tray and paper liner. Place the meat in a microwavable dish.
- Check the meat often while defrosting. Break apart frozen chunks of meat that are partially thawed. Remove any meat that is completely thawed.
- Cover meat with wax paper. This holds warmth around the food as it begins to defrost.
- Meat defrosted in the microwave must be cooked immediately. It **must not** be stored for use later.

Browning

When cooking a piece of meat, you expect the color to turn from pinkish-red to brown. Browning occurs when the fat and protein inside the meat rise to the surface and become hot enough to partially burn or carbonize. Meats that are cooked in a conventional oven automatically become brown. But sometimes meats that are cooked in the microwave look done, but do not turn the same brown color as those cooked conventionally.

Fatty meats that are cooked in the microwave for more than 10 minutes will become brown on the surface. Non-fatty meats or small pieces of meat will not brown because they have not been microwaved long enough. Microwaves cook the meat so fast there is not enough time for the fat and protein to rise to the surface and create the browning. In this case, you might want to use a browning agent. Browning agents are sauces or mixes that add color and taste to the piece of meat.

Browning agents can be savory, sweet, or unflavored. Some liquids are applied full strength, but many are diluted with water or butter. Dry browning agents are sprinkled on before or during microwaving. Choose a browning agent from the chart that compliments your food.

Browning agent	Suggested meats to meat	Method of applying
Soy or teriyaki sauce	Hamburger, beef, pork, poultry	Brush on
Barbecue sauce	Hamburger, beef, pork, poultry	Brush or pour on
Worcestershire or steak sauce	Hamburger, beef, pork	Brush on
Onion soup or gravy mix	Hamburger, beef	Sprinkle on
Taco seasoning mix	Hamburger	Sprinkle on
Melted butter with paprika	Poultry	Brush on butter; sprinkle with paprika
Jelly, preserves, or glazes	Ham or poultry	Glaze ham after microwaving; glaze poultry after half the cooking time
Bread crumbs	Poultry or pork	Coat by shaking pieces together in a sealed bag

MAGIC

1a. Full of beans

Project skill
Making chili

Life skill
Completing a task

Chili ingredients

- 2 Tablespoons chopped green peppers
- ¼ cup chopped onions
- 1 pound frozen ground beef (can use ground chuck or sirloin)
- 1 (16-ounce) can diced tomatoes
- 1 (15½-ounce) can kidney beans
- 2 teaspoons chili powder
- ¼ teaspoon ground cumin
- ⅛ teaspoon salt
- ⅛ teaspoon pepper

Supplies

- 2-qt. microwavable bowl
- fork
- plastic wrap
- colander
- paper towel
- measuring spoons
- can opener
- spoon

A warm bowl of chili tastes great, especially on a cold day. Tomatoes and beans can be found in almost every bowl of chili. Besides tomatoes and beans, there are lots of other ingredients that can be added to chili. Each chili recipe is different. Below is a list of ingredients that can be added to any bowl of chili.

- Shredded American cheese
- Shredded Cheddar cheese
- Shredded taco cheese
- Minced garlic clove
- Crackers
- Corn chips
- Chopped red peppers
- Whole-kernel corn

Try making chili in the microwave. You also can use the microwave to defrost the ground beef, if it is frozen. For extra taste, add one or more of the listed ingredients above.

1. Defrost 1 pound of ground beef per directions in your use and care manual or use 30% power for 4 to 5 minutes. See tips on defrosting on page 6.
2. Place ground meat in a 2-quart glass measuring cup or microwave-safe bowl. Microwave on High (100% power) for 3 minutes. Break the meat apart with a fork. Cover.
3. Microwave for another 1½ minutes on High until the meat is almost cooked.
4. Carefully drain the grease into a suitable container. Rinse the meat in a plastic colander. Wipe any leftover grease out of the measuring cup or bowl with paper towels.
5. Return the ground meat to the glass measuring cup or bowl. Break the meat apart into small pieces.
6. Add chopped onions and green peppers. Stir. Microwave on High for 4 to 5 minutes until vegetables are tender and meat is cooked.
7. Add the remaining ingredients. Stir.
8. Cover with large paper towel.
9. Microwave on Medium (50% power) for 20 to 25 minutes. Stir and rotate bowl halfway through the cooking time.

Save it for later

Did you have any *leftover* chili? Don't throw it out, save it for later. Follow these simple steps to freeze your leftover chili.

1. Think about how many people will be eating the next time your family eats chili. Rather than freezing the chili in one big container, freeze in portion sizes. If four people will be eating the leftover chili, freeze enough for four or if there are only two, freeze for two. You may have more than one container of chili to freeze.

2. Find a moisture- and vapor-resistant freezer container. It is best to use a container that can also be used in the microwave. This makes it easy when it is time to reheat your chili. When pouring chili in the container, leave 1 inch of headspace, so there is room for it to expand as it freezes. Select storage containers designed for the freezer and the microwave. Read the label carefully. Do not use plastic containers such as margarine tubs, take-out containers, one-time use containers, or whipped topping bowls. These containers warp and melt in the microwave oven. They do not seal the food from the cold, dry air of the freezer, causing loss of quality.
3. Record the date, contents, and amount frozen on the container or a piece of freezer tape. Reheat your frozen chili within three months. **NOTE:** Beans will get soft in the freezer.

Micro Talk

1. What is your favorite ingredient in a bowl of chili?

2. Did you add any of the listed ingredients to your chili?

3. What did you learn about defrosting meats in the microwave?

4. Name two tips you would give to a family member or friend who is defrosting meat in the microwave for the first time.



Practice good freezer management. Use the “First In First Out” rule. Label meats with name, date, and quantity. When you are ready to defrost meats, don’t grab the first one you see in the freezer. Find the one that has been there the longest.

Reheat leftovers

Three important factors in reheating are the starting temperature, the quantity of food, and whether it can be stirred. Most foods should be refrigerated if they are to be held more than two hours. If you are reheating a refrigerated plate or small bowl of food, cover with wax paper and reheat on High (100% power) for 2½ to 3 minutes, checking frequently.

Casseroles and main dishes should be covered with wax paper. Stir or rotate after half the time. Reheating times for casseroles:

- 1 serving – 2 to 4 minutes.
- 2 servings – 4 to 6 minutes
- 4 to 6 servings – 6 to 8 minutes.

When large amounts cannot be stirred (such as lasagna), microwave on Medium (50% power). You will need to increase the cooking time – you probably should double it. Be sure to check and rotate the food frequently, especially during the second half of cooking.

1b. Well-done brown

Project skill
Comparing browning agents

Life skill
Mastering technology

Hamburger ingredients

- 1 pound hamburger
- 3 browning agents of your choice

Supplies

- Microwavable dish or plate
- Wax paper (optional)

Choose three browning agents from the list below and try them on hamburgers cooked in the microwave.

- Soy sauce
- Teriyaki sauce
- Barbecue sauce
- Worcestershire sauce
- Taco seasoning
- Gravy mix
- Seasoning of your choice

1. Divide 1 pound of hamburger into four equal sections.
2. Form each section into a patty, approximately $\frac{1}{2}$ inch thick.
3. Set aside one patty as plain.
4. Coat each remaining patty with a different browning agent. Use the browning agent on both sides of the patty.
5. Place the hamburgers in a microwavable dish or on a microwavable plate. Remember which browning agent was used by drawing a diagram on a piece of paper. If your microwave has a turntable, identify the top left patty as the patty with no browning agent. After cooking, you will easily see which patty had no browning agent.
6. For juicy hamburgers, cover the dish or plate with wax paper. Microwave the hamburgers uncovered if you want a drier surface.
7. Microwave on High (100%) for 2 to 2½ minutes.
8. Turn each patty over and microwave on high for another 2 to 3 minutes.
9. Let stand, covered in wax paper, 2 to 3 minutes after cooking. Verify that each patty has reached 160°F by placing a food thermometer in the center of each hamburger. Do not use the thermometer in the microwave when it is operating.
10. Observe each patty and answer the questions on the following page before serving.





Micro Talk

1. Which browning agents did you choose?

2. Which hamburger had the most appealing brown coating?

3. What did you learn about microwaving meat?

4. How would you apply what you have learned to cooking a different meat in the microwave?



Think of other browning agents that can be used when cooking meats in the microwave. Here are some ideas:

- Lay strips of bacon over a meatloaf or roast.
- Put crumb coating or topping on chicken.

Mountain high extras

Add some condiments to your hamburger. Choose from the list below. Add a favorite if it is not on this list.

Sauces

Catsup
Barbecue sauce
Mustard
Mayonnaise
Pickle relish

Vegetables

Lettuce
Tomatoes
Onions
Cucumbers
Pickles
Mushrooms

Cheeses

American cheese
Swiss cheese
Cheddar cheese
Pepperjack cheese