

Micro Magicians

Level B



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.

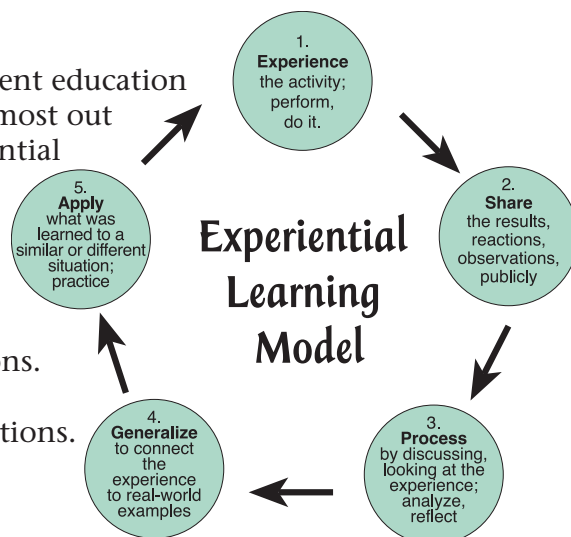
The “Microwave Magic” curriculum series is full of exciting hands-on activities that focus on using the microwave to prepare everything from simple snacks to complete meals. The curriculum is designed around four major categories: techniques and equipment, healthy food selection, food preparation, and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



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

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.

Acknowledgments:

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Micro Magicians

Overview	4
Achievement sheet	5
Bite 1 – Tricks of the trade	6
Introduction – Terms and techniques.....	6
1a Power in watts	8
1b Potato bake	10
1c Cooking two or more	12
Bite 2 – Once you swallow.....	14
Introduction – Vitamins and minerals	14
2a Vegetable parade.....	18
2b Dairy discoveries	22
2c Fondue fun	24
Bite 3 – Kitchen magic	26
Introduction – Microwave baking tips.....	26
3a Bar cookies	28
3b Crumbs and chunks of brownie	30
3c Upside-down cake.....	32
Bite 4 – Magnificent meals.....	34
Introduction – Healthy, safe foods	34
4a Cheesy macaroni.....	36
4b Super sloppy joes	38
4c Chicken nuggets.....	40
Glossary	42



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.

"Micro Magicians" Achievement Sheet

Each year, you should complete a minimum of three activities, each from a different "bite" category. Within the two-year project period, you should have completed at least six 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. Ask your project helper to initial the form after 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 Power in watts ____/____/____ 1b Potato bake ____/____/____ 1c Cooking two or more ____/____/____			 Kitchen magic 3a Bar cookies ____/____/____ 3b Crumbs and chunks of brownie ____/____/____ 3c Upside-down cake ____/____/____		
 Once you swallow 2a Vegetable parade ____/____/____ 2b Dairy discoveries ____/____/____ 2c Fondue fun ____/____/____			 Magnificent meals 4a Cheesy macaroni ____/____/____ 4b Super sloppy joes ____/____/____ 4c Chicken nuggets ____/____/____		

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

Title of action demonstration given _____

Name _____ Grade _____

Club/School _____

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

Project helper's signature _____ Date _____

Tricks of the trade

Introduction

Terms and techniques

To ensure even cooking in your microwave, you will want to become familiar with these terms and techniques.

- **Stirring** – Stir from the outside to the center of the dish to even the temperature of the food; sometimes stirring will shorten the cooking time.
- **Turn food over** – Large dense foods, such as whole vegetables or roasts, should be turned over occasionally as they are cooking, because items near the top of the oven may cook faster.
- **Rotating** – When food cannot be stirred or turned over, you will want to rotate the dish in your microwave oven. Rotate it one-quarter or one-half turn once or twice during cooking to maintain an even cooking temperature throughout the food. NOTE: Some microwave ovens have a turntable, which automatically rotates dishes.
- **Arranging food in a dish** – When placing unevenly shaped foods in a dish, place the thinner areas toward the center of the dish to prevent overcooking. Thicker and denser parts, which take longer to cook, should be placed toward the outside. Thus, broccoli spears should be in the center, and the denser stalks should be to the outside.
- **Shielding** – Sensitive areas can be protected from overcooking by shielding. Aluminum foil strips can be used over the corners of square dishes to prevent overcooking in the corners. Shielding is also necessary when cooking whole poultry or chicken legs in the microwave oven.

Shapes of dishes

- Round shapes allow more even cooking than square or rectangular dishes. In a square or rectangular dish, more energy penetrates the corners of the dish, so the food there may overcook. To prevent overcooking, try shielding the corners.
- The height of the container also affects cooking. When preparing the same quantity of food, it will cook faster in a shallow container vs. a deep container because more food surface is exposed to the microwave energy.
- Use casserole dishes with straight sides. Casserole dishes with sloping sides will cause the food to cook unevenly.

Shape and arrangement of food

The ideal shape for microwave cooking is a “doughnut,” which has no center and no corners. This shape allows the microwaves to penetrate evenly so that cooking can take place from all angles. A microwave-safe ring-mold can be used for cooking many foods. It may shorten the cooking time and reduce the need to stir or turn the food. As a substitute for a baking ring or a ring-mold, some recipes suggest placing a heavy-bottomed glass in the center of the cooking container before putting in the food. You might try this idea when cooking meatloaf. For small items such as potatoes, custards, or meatloaf in individual custard cups, place the dishes in a circle.

Covering cooking tips

- Cover any dish you would cover for conventional cooking.
- Covering the container will help speed the cooking of most foods and keep the heat evenly distributed for uniform cooking. Plus, covering will help to reduce splatters.
- NOTE: The covering you use will make a difference in the cooking time and the texture of the finished food.

CAUTION

Use caution when removing any type of covering or lid. Steam builds up in covered containers and can cause burns. Always lift the side farthest away from you first. Plastic film coverings should be punctured before they are removed.

Types of covers

- Paper towels or napkins are useful as covers for reducing splatters and trapping fat from meats such as bacon. They are also effective in absorbing moisture from foods such as potatoes or baked goods. Covering with wax paper also reduces splatters, and wax paper will hold in more heat than a paper towel or napkin.
- Some plastic films help distribute heat evenly, retain moisture, and hasten heating. You should “vent” the plastic wrap. This can be done by rolling back one edge of the wrap from the side of the dish to form a narrow opening. Venting plastic wrap lets excess steam escape so the plastic wrap does not burst open.
- Casserole covers, glass lids, saucers, or other dishes make satisfactory covers for long-term cooking when moisture must be retained.
- Aluminum foil can be used in the microwave oven for shielding. Small pieces may be used to cover tips of a roast or wing tips of poultry or corners of square containers. Use a full wrapping only after removing foods from the microwave oven. Foil helps keep foods hot until serving.

1a. Power in watts

Project skill
Determining your microwave's wattage

Life skill
Mastering technology

Output wattage supplies

- 1-quart microwavable glass measuring cup
- 2 cups tap water
- thermometer

Do some microwave ovens have more power than others? How is power measured? When talking about microwaves, watt and wattage are the words used to describe the amount of power. Think of something else that is measured in watts. Light bulbs! The higher the wattage, the more light they give off. It is the same with microwaves. A higher wattage microwave cooks foods faster than a lower wattage microwave.

There are two types of microwave wattage:

- **Input wattage** – the amount of energy that goes into the microwave, which allows it to operate. Find your microwave's input wattage on the nameplate where the serial number is printed.
- **Output or cooking wattage** – the amount of wattage the microwaves use to cook the food.

In this activity you will determine your microwave's output wattage. Knowing this will help you when preparing recipes. Many recipes have a disclaimer stating they have been tested under a certain number of watts. If your microwave's wattage is above or below the tested wattage, you may need to adjust the cooking times. For example, all the recipes in this manual have been tested with a 1,000-watt microwave. If your microwave has 600 watts, you need to increase the cooking time.

Let's find your microwave's output wattage.

1. Pour 2 cups tap water into a 1-quart microwavable glass measuring cup.
2. Take the water temperature and record below.
3. Microwave uncovered on High (100%) for 1 minute.
4. Take the water temperature and record below.

Beginning water temperature _____

Ending water temperature _____

5. Complete the formula to determine your microwave's wattage. You may need to use a calculator.

Ending water temperature _____
(Subtract) -

Beginning water temperature _____

Result _____

(Multiply) X 18.5

Microwave's wattage _____

Micro Talk

1. What is your microwave's output or cooking wattage?

2. What was the hardest step in this activity?

3. According to your microwave's output or cooking wattage, do you need to increase or decrease the cooking times for the recipes in this manual? (Note: Recipes in this manual were tested in a 1,000-watt microwave.)

4. Why is it important to know your microwave's output or cooking wattage?

5. What other household items are also labeled to let you know the wattage?



More watts does not always mean better. A lower output wattage microwave just takes longer to cook. Do more watts mean a more expensive microwave? Go to a department or discount store and research the prices of microwaves. Compare their prices to their output wattage.

Power levels

When you cook on a stove or in an oven, you regulate the temperature by turning the heat up or down. However, when cooking in a microwave, you don't have these controls. Instead you can use power levels. Different microwaves offer different levels. Some have High, Medium, and Low, while others have up to ten different levels. The following chart identifies each power level and what it is used for.

% of power	Control setting	Cooking function
100%	<i>High</i>	Full power
70%	<i>Medium-High</i>	Roast
50%	<i>Medium</i>	Simmer
30%	<i>Medium-Low</i>	Defrost
10%	<i>Low</i>	Warm

According to your wattage activity results, figure out your microwave's wattage at High (100%), Medium (50%), and Low (10%).

High (100%) _____

Medium (50%) _____

Low (10%) _____

1b. Potato bake

Project skill
Making baked potatoes

Life skill
Processing information

Baked potato ingredients

- 1 to 5 baking potatoes
- butter, sour cream, or cheese (topping)

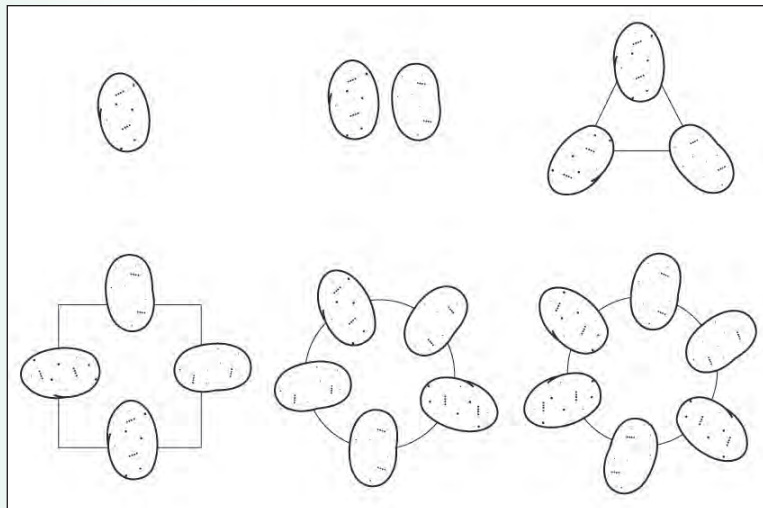
Supplies

- fork
- clean kitchen towel

What do you think of when you hear the word potato? Potato chips, fried potatoes, scalloped potatoes, or baked potatoes? Potatoes are high in carbohydrates, which is your body's main source of energy. They are also a good source of fiber and vitamin C, both important nutrients for your body. Different methods of preparing potatoes, such as frying, may remove some nutrients. Instead, try baked potatoes. Cooking baked potatoes in the microwave is a great way to learn the arrangement technique.

Here's how to bake potatoes in a microwave.

1. Scrub the potatoes under running water until they are clean. If there are any spots, carefully remove them with a paring knife.
2. Pierce the scrubbed potatoes twice with a fork so steam can escape. This is a very important step. If they are not pierced, they may explode while cooking.
3. Arrange your potatoes in the microwave following the diagram below. Be sure to leave a couple inches between each potato.



4. Microwave on High (100%) for half of the total cooking time. Use the cooking guide on the next page.
5. Turn your potatoes over and rotate.
6. Microwave on High for the remaining time.
7. Remove from microwave and let stand for 5 to 10 minutes. They may feel firm, but they continue to cook while standing. You may want to wrap them in aluminum foil or a clean kitchen towel for the standing time and to hold the cooked potatoes longer.
8. Serve with butter, sour cream, or cheese.

Number of potatoes	Cooking time
1	3 to 5 minutes
2	4 to 6 minutes
3	7 to 10 minutes
4	10½ to 12½ minutes
5	12½ to 14 minutes

Micro Talk

- How many baked potatoes did you cook at one time?

- Illustrate how you arranged the potatoes by drawing a picture below.

- Why is it important to arrange foods before cooking in a microwave?

- How can you teach your friends or family members about the arrangement technique?



Standing time means that some cooking will continue after the food is removed from the microwave oven. Check the recipe for the amount of standing time needed for doneness.

Top that tater

Below is a cheesy broccoli topping to add to your baked potatoes.

Ingredients

- 1 Tablespoon margarine or butter
- ½ cup shredded sharp cheddar cheese
- 1 Tablespoon flour
- ½ cup milk
- ½ cup chopped broccoli, cooked and drained
- ¼ teaspoon salt
- ¼ teaspoon dry mustard

Supplies

- 1-quart glass measuring bowl
- table knife
- measuring cups & spoons
- fork or whisk

1. Place the margarine or butter in a 1-quart glass measuring cup. Microwave on High (100%) for 30 seconds.
2. Use a fork or whisk to stir in the flour, salt, and mustard.
3. Gradually stir the milk into the mixture. Microwave on High for 2 to 3 minutes. Stir every minute with the fork or whisk until the mixture is thick.
4. Gently stir in the cheese.
5. Add the cooked and drained broccoli.
6. Microwave on High for 1 minute or until hot.
7. Split open your baked potatoes and pour the topping on. Enjoy!