Lesson 4: Cook!
Major concepts from unit: • Cook * Proper use of a thermometer * Minimum internal cooking temperatures for variety of foods * Proper use of microwave ovens **Terminal Objective:** To explain the proper use of microwave ovens for safely cooking food. (C-C) **Establishment of Set:** Students will view a variety of different types of thermometers used in the kitchen. They will try to properly identify the use of each thermometer. (Teacher will show candy thermometer, and a variety of different meat thermometers; such as regular oven-proof thermometers, digital, pop-up, and microwave-safe thermometers.

Objective 1: To explain proper use of cooking thermometers. (C-C) **Objective 2: To observe proper use of cooking thermometers. (P-P)**	
Content	**Learning Experience**
1 & 2. The key to safely cooking food is to first cook food thoroughly to the proper internal temperature. Next, keep or hold the food out of the danger zone (40 °F – 140° F) once it has been cooked. The only way you can be truly certain about any of these temperatures is to use a thermometer. Thermometers are pretty inexpensive and may be worth the few dollars to ensure safely cooked food. Using a thermometer takes the guesswork out of cooking. Properly used, the thermometer assures you that the food has been cooked to the proper internal temperature and is now safe to eat. It can also keep you from overcooking your food (i.e. keeping your burgers from tasting like hockey pucks!) A thermometer can be used for all foods, not just meat. Use it to measure the internal temperature of all cooked foods, such as casseroles, meats, poultry, etc. and for reheating foods. *How to buy a thermometer:* Make sure the thermometer you buy is	1 & 2. - Students will view the various types of thermometers again and listen as teacher lectures and demonstrates proper use of various thermometers. - Demonstrations will be on using a thermometer in poultry; ground meats; roasts, steaks, or chops; and casseroles or egg dishes. Real product examples will be used as appropriate. Also demonstrate on proper washing of a thermometer.

meant for meat and poultry. Other thermometers, such as candy thermometers will not do the job correctly. There are many types of meat thermometers to choose from, including regular oven-proof thermometers, digital, pop-up and microwave-safe thermometers. Choose one that has an easy-to-read dial, is made from stainless steel and has a shatter-proof lens. *How to use a thermometer* For poultry: Insert the thermometer into the center of the inner thigh area near the breast of the chicken or turkey but not touching bone. For ground meats or ground poultry: Insert the thermometer into the thickest part of the ground meat or dish, such as meatloaf. Insert the thermometer sideways into such items as ground meat patties. For roasts, steaks or chops: Insert the thermometer into the center of the thickest part, away from bone, fat and gristle. For casseroles and egg dishes: Insert the thermometer into the thickest portion. *When to use a thermometer:* When you use the thermometer depends a lot on what type of thermometer you are using. If you are using an oven-proof thermometer, you can place it in the correct spot in the food and leave it there for the duration of the cooking. A digital or other instant-read thermometer is not meant to stay in the food. Insert it periodically to check for doneness. *Don't forget to wash your thermometer!* To avoid cross-contamination, wash your thermometer thoroughly in hot soapy water in between uses.	

Objective 3: To describe the minimum internal cooking temperatures for a variety of foods. (C-C)	
Content	**Learning Experience**
3. **Minimum Internal Temperatures** Cooking food thoroughly effectively kills most harmful microorganisms. It is your best defense against food borne illness. A few simple tips to help insure you cook food thoroughly: ➢ Cook roasts and steaks to at least 145°F. Whole poultry should be cooked to 180°F for doneness. ➢ Cook ground meat, where bacteria can spread during grinding, to at least 160°F. Information from the Centers for Disease Control and Prevention (CDC) links eating undercooked, pink ground beef with a higher risk of illness. If a thermometer is not available, do not eat ground beef that is still pink inside. ➢ To check visually, red meat is usually done when it's brown or gray inside. Poultry juices should be clear. Fish should flake with a fork. ➢ To avoid salmonella contamination that may occur inside unbroken eggs, cook eggs until the yolks and whites are firm, not runny. Scrambled eggs should be firm. ➢ When you cook ahead of time, divide large portions of food into small, shallow containers for refrigeration. This ensures safe, rapid cooling. Make sure there are no cold spots in food (where bacteria can survive) when cooking in a microwave oven. For best results, cover food, stir and rotate for even cooking	3. - Students will listen as teacher discusses minimum internal temperatures of foods and reheating. They will fill in chart (Attachment A-2) with minimum temperatures from overhead/slide as they view attachment A-1 with correct minimum temperatures. - Then students will break into lab groups and complete the “Be a Good Egg” activity. Share results with class and discuss.

Reheating • Bring sauces, soups and gravies to a boil. Heat other leftovers thoroughly to 165°F. Be sure to use a thermometer. • Microwave leftovers using a lid or vented plastic wrap for thorough heating. Also need to check temperature with a thermometer. *Beyond Cooking* Use your thermometer not only to check for proper internal temperature when cooking, but also when reheating and serving foods. Most foods need to be reheated thoroughly to an internal temperature of at least 165 °F. Bring sauces, soups and gravies to a boil on the stove. For serving and holding cooked foods, remember the danger zone. Keep hot foods above 140°F to avoid the danger zone. Keep cold foods below 40°F. **Hot foods hot and cold foods cold!**	

Objective 4: To explain the proper use of microwave ovens for safely cooking food.	
Content	**Learning Experience**
4. **Food safety and the Microwave Oven** The microwave oven can heat food to a temperature that is hot enough to kill most microorganisms. However, every oven is different and microwave ovens tend to heat food unevenly. Therefore, it's important to know your microwave and read the directions carefully. Always arrange, cover, rotate, stir and turn foods to be sure they reach a safe temperature throughout. If using the microwave to reheat food, be sure to use a lid or vented plastic wrap for thorough heating.	4. - Students will listen as teacher explains about food safety and the microwave oven. - Students will break into their kitchen groups. Each group will place one cup of water into a plastic microwave safe bowl. They will heat the water at 30-second intervals for up to two minutes. After each interval the group will record the temperature of the water. (See Attachment B)

Again, read your microwave oven's owners manual for recommended power levels and times for heating and thoroughly cooking food.	

Closure – Students will complete crossword puzzle on information covered in class today. (See attached puzzle) Teacher will discuss answers with class.

Word **Clue**

Thermometer – This is used to be sure food is cooked thoroughly.
Bone – The thermometer should be placed in the thickest part of meat, away from fat, gristle, and _____.
Flake – Fish do this when they are fully cooked.
DangerZone – Between 40°F and 140°F.
Stir – When reheating in microwave you should cover, _____, and rotate the food.
Manual – Read this to find out our microwave oven's recommended power levels and times for heating and thoroughly cooking food.

Resources Needed:

- Candy Thermometer
- Variety of meat thermometers
- Examples of poultry, ground meats, roasts, steaks, chops, and casseroles or egg dishes to use to demonstrate proper use of a thermometer
- Access to water
- Soap
- Towel
- Attachment A-1 as overhead or slide
- Attachment A-2 for each student
- "Be a Good Egg" activity sheets for students
- 3 Large raw eggs for each group
- Saucepan (w/ lid) with access to heat source for each group
- Slotted Spoon for each group
- 1 Small, clear cup or jar for each group
- 3 Small paper plates for each group
- Knife for each group
- Permanent marker for each group
- White sheets of paper for each student
- Colored pencils (or crayons or markers): yellow, orange, & red
- Access to cold water
- 1 cup liquid measuring cups for each kitchen group
- Plastic microwave safe bowls for each kitchen group
- Microwave for each kitchen group
- Crossword puzzle for each student
- Attachment B for each group of students
- Thermometer for each group of students

EXPERIMENT: Be a Good Egg

Teacher Note: Fresh hard-cooked eggs are harder to peel. Use older eggs if you can!

Question? How do you know when a hard-cooked egg is safely cooked?

My Hypothesis:

Materials Needed:

Three large raw eggs
Saucepan (with lid) with access to heat source
(an electric "hot pot" with access to outlet will do)
Slotted spoon
1 small, clear cup or jar
3 small paper plates
Knife
Permanent marker
White sheets of paper for each student
Pencils; yellow, orange and red crayons or markers
Access to cold water

Getting Ready:

Choose three classmates to be "egg peelers."
Label the eggs and paper plates with permanent marker:

#1: cooked 2 minutes
#2: cooked 8 minutes
#3: cooked 15 minutes

Procedure:

1. Carefully place the three eggs (in their shell of course) in cold water in electric "hot pot" or pan. Heat until boiling; remove from heat and cover with lid.

2. Remove Egg #1 with the slotted spoon after 2 minutes, and cool under cold water.

3. Remove Egg #2 6 minutes later and cool under cold water.

4. Let Egg #3 stay in the hot water for 7 minutes more (total time: 15 minutes). Then cool under cold water.

5. Have each "egg peeler" peel one of the three cooked eggs, cut the egg in half, and put it on its labeled paper plate.

6. Observe and record the differences between the three eggs! (Use chart below.)

Record your observations: What do you see?			
Part of egg	#1: cooked 2 minutes	#2: cooked 8 minutes	#3: cooked 15 minutes
Yolk			
white			

Did You Know?
A raw egg spins more slowly than a cooked egg! The liquid inside the raw egg slows it down!

My Observations:

Illustrate: Draw a picture of each egg using pencil and yellow or orange marker or crayon to show the whites and the yolk. How are the yolks and whites different in the three eggs?

Describe and Categorize:

List as many words as you can think of to describe the whites and yolks of each egg.
Circle the words that mean that an egg is safe to eat and put a red X through the words that mean it is not.

My Conclusions:

This is what happens when you cook an egg longer:

You can tell that an egg is cooked sufficiently by:
_____
_____

What Do You Think? Is it okay to eat raw eggs if they are mixed in raw cookie dough?

Tell Your Family ...

- Bring home your picture of the three eggs and post it on your refrigerator.
- Remind your family to cook eggs until the yolks and whites are firm.

Don't use recipes in which eggs remain raw or only partially cooked.

Cooking Temperatures

Product	Fahrenheit
Eggs & Egg Dishes	
Eggs	Cook until yolk & white are firm
Egg dishes	160°
Ground Meat & Meat Mixtures	
Turkey, chicken	165°
Veal, beef, lamb, pork	160°
Fresh Beef	
Rare	145°
Medium	160°
Well Done	170°
Fresh Veal	
Medium	160°
Well Done	170°
Fresh Lamb	
Medium	160°
Well Done	170°
Fresh Pork	
Medium	160°
Well Done	170°
Poultry	
Chicken, whole	180°
Turkey, whole	180°
Poultry breasts, roasts	170°
Poultry thighs, wings	180°
Stuffing (cooked alone or in bird)	165°
Duck & Goose	180°
Ham	
Fresh (raw)	160°
Pre-cooked (to reheat)	140°

Attachment A-1

Cooking Temperatures

Product	Fahrenheit
Eggs & Egg Dishes	
Eggs	
Egg dishes	
Ground Meat & Meat Mixtures	
Turkey, chicken	
Veal, beef, lamb, pork	
Fresh Beef	
Rare	
Medium	
Well Done	
Fresh Veal	
Medium	
Well Done	
Fresh Lamb	
Medium	
Well Done	
Fresh Pork	
Medium	
Well Done	
Poultry	
Chicken, whole	
Turkey, whole	
Poultry breasts, roasts	
Poultry thighs, wings	
Stuffing (cooked alone or in bird)	
Duck & Goose	
Ham	
Fresh (raw)	
Pre-cooked (to reheat)	

Attachment A-2

Attachment B

Directions: Measure one cup of tap water. Place in a microwave safe bowl. Record the beginning temperature of the water. Then place the water into the microwave for 30 seconds, record the temperature below. Repeat this procedure four times.

Beginning temperature _____

30 Seconds temperature _____

One Minute temperature _____

One Minute 30 Seconds temperature _____

Two Minute temperature _____