SAFE OR SORRY™

Teaching Food Safety

MINNESOTA MDH DEPARTMENT OF HEALTH

Safe or Sorry-Food Safety Program of the Minnesota Department of Health, Environmental Health Division, April 2001© Revised 2006, United States Copyright Registration Txu 937-469. May be copied for non-profit use only.

SOS Curriculum Contents

Sample Press Release
Introductory Parent Letter

Lesson 1 – Safe or Sorry Kickoff

- Lesson
- Food Safety Pre Questions
- Poster Contest Guidelines

Lesson 2 – Foodborne Illness

- Lesson with overheads
- Leader instructions for petri dish student activity
- Word Search worksheet and answer key

Lesson 3 – Bacteria Are Just Like You In Many Ways

- Lesson
- Leader instructions for student activity
- Lunch Bag Choices activity student instruction sheet
- Word Scramble worksheet and answer key
- Food safety glossary

Lesson 4 – The Temperature Danger Zone

- Lesson
- Leader instructions for student activity
- Balloon Blow Up activity student instruction sheet
- Jody's Submarine Sandwich worksheet and answer key
- Temperature worksheet and answer key
- Parent letter, Home Food Safety Quiz

Lesson 5 – It's All In Your Hands!

- Lesson with overheads and video
- Leader instructions for student activity
- Bread In A Bag activity
- Ultraviolet light handwashing activity

Lesson 6 – The Chicken Who Crossed the Lettuce

- Lesson with overheads
- Leader instructions for activity
- Solve the Mystery worksheet and answer key

Lesson 7 – "Crazy Cooks In the Kitchen" Video

- Lesson and video
- "Crazy Cooks In the Kitchen" mistakes answer key

Lesson 8 – Gem Survivor Quiz Bowl

- Quiz Bowl instructions
- Quiz Bowl questions and answer key

Lesson 9 – Safe—Not Sorry Celebration!

- Food safety post test
- Student roundtable discussion guide
- SOS Certificates of Completion
- Parent letter and questionnaire

Poster Messages
Cross-Curricular Suggestions
Youth Service Projects

News Release

FOR IMMEDIATE USE

Contact: MDH Communications
(651) 201-4993

SAMPLE PRESS RELEASE

Three area schools will help pilot test Innovative new food safety curriculum

A pair of make-believe "chefs" stage a bogus cooking demonstration, committing a series of blunders that could – in real life – make their guests severely ill.

A trail of potentially dangerous "germs" winds its way through a typical kitchen, its path marked by a special glowing powder, as the contamination spreads from a rubber chicken to a cutting board, a knife, a bowl of lettuce, and – eventually – a ready-to-serve salad.

A dancing stuffed gorilla helps students time a thorough handwashing.

Those activities are all part of "Safe or Sorry" – an innovative new food safety curriculum being pilot tested this fall at three schools in northeastern Minnesota and two metropolitan schools. "The new curriculum is designed to teach students the basic elements of food safety," according to former Minnesota Health Commissioner Jan Malcolm. "We believe the curriculum can play an important role in preventing food-related illness."

The curriculum will be used in Family and consumer Science classes at Woodland Middle School, Duluth Central High School, and Carlton high School. The two Duluth schools offer the curriculum during September, in conjunction with National Food Safety month. Carlton High School will offer the curriculum in November. Funding for classroom materials used in the project is being provided by the Duluth Clinic Education and Research Foundation. Staff from Carlton County Public Health and the College of St. Scholastica are providing consultation and assistance on the pilots.

Foodborne disease is a major public health concern in Minnesota and nationwide, and officials believe they can have a significant impact on the problem by teaching good food safety practices to middle school students.

"Every year, hundreds of cases of foodborne illness are reported in Minnesota," Commissioner Malcolm said, "and that probably represents only a small fraction of the people who actually become ill from eating contaminated food.

-more-

"In some cases – especially when young children or people with other health problems are involved – these illnesses can be life-threatening," she said. "And if anything, the problem appears to be growing."

"Young people have an especially important role to play in promoting food safety," said Cindy Brown, Assistant Professor of Dietetics at the College of St. Scholastica. "As much as half of all foodborne disease is the result of improper food-handling practices in the home, and many young people in this age group are actively involved in preparing food for their families."

"We also know that many of these young people will soon be working as food handlers in commercial eating establishments," added Kristi Obrecht, Health Educator for Carlton County Public Health. "Their knowledge of food safety will have a very direct impact on our ability to protect the public from food-related disease."

"Safe or Sorry" makes use of humor and imagination to deliver its message, according to project coordinator Carol Schreiber, and its impact is intended to reach far beyond the classroom. The curriculum includes a number of take-home activities, designed to increase awareness of food safety among other family members. The curriculum is also designed to stimulate – and take advantage of – parental involvement in food safety issues.

-MDH-

SAMPLE PRESS RELEASE

Introductory Parent Letter

Dear Parent or Guardian:

Your child=s class is participating in a food safety program. The name of the program is **Safe or Sorry (SOS)**. A growing number of children are preparing their own snacks and meals and many will take their first job in the food service industry. With reports of foodborne illnesses making headlines, many people have become increasingly concerned about the safety of the food they eat.

The goal of **SOS** is to teach food safety measures that youth can take to ensure that the food they eat or prepare is safe. The students will be involved in interactive, hands on, age-appropriate activities in their (Family and Consumer Science) class. Students will be learning about four basic food safety concepts: proper handwashing, keeping cooking areas clean, keeping food at safe temperatures, and preventing cross-contamination of food.

At the conclusion of the nine project lessons, students will evaluate what they have learned. Parents will be asked to answer a project survey. The parent survey will have questions about food safety behavioral changes you observe in your child as a result of the **SOS** project.

We hope your child enjoys participating in the **SOS** program. More importantly, it is believed that when students learn basic food safety concepts, they will significantly reduce their chances of getting or causing a foodborne illness. We encourage home reinforcement of the food safety concepts taught and we appreciate your support.

Sincerely,

Safe or Sorry Kickoff
Lesson 1

Lesson Goal: **Introduction of nine lessons on food safety**

Time: **45 minutes**

Content Standards: **Area Eight: Decision-Making**

Objectives: **Students will be able to:**

- **Identify project name and meaning**
- **State why food safety an is important topic for youth**
- **Learn about food safety careers**

Materials:
Student pre-test
VCR
Parent letters
Poster contest guidelines

Procedure:

1. **Classroom preparation**
   *Parent letters – best method is to send to homes by mail one week ahead of lessons.

2. **Teacher introduction of topic**

   Script: For the next eight days, this class will be part of a food safety program called Safe or Sorry. Since people your age fix food at home and many of you may soon be working in restaurants or fast food places, school students are one of the best groups to receive this instruction.

   By having information on food safety you can reduce the chance to get or give someone a foodborne illness – sometimes called food poisoning.

   We will learn about bacteria, work in teams, use ultraviolet light and a rubber chicken. Some very funny cooks will make food safety mistakes and there will be a team Quiz Bowl with prizes for all.

You can start on a food safety poster anytime during the eight days and the winners will be announced on the last day. Pass out instructions for poster contest – attached.

3. **Administer pre-test of student knowledge/behavior**

   Script: I realize that most of you have not had very much information on food safety before today. In order for you to compare what you currently know to what you will learn, everyone will fill out this questionnaire. I do not expect that you have all of the answers. What will surprise you when you do this again at the end, is how much you have learned on food safety – more than what 90% of the population knows about food safety.

4. **Students take pre-test**

5. **Food safety guest experts**

   Script: We have some special guests here today. They will talk about why it is personally important for each of you to know about foodborne illness and food safety.

6. **Introduce speakers on food safety**
   Suggestions:

   a. Food industry representative/restaurant owner
      How careful restaurants need to be, careers in food service
   b. Sanitarian – Health Inspectors
      Actual visits to inspect, symptoms of foodborne illness, careers
   c. Other guest ideas
      School nurse, cook, doctor, public health educator, extension educator, parent, epidemiologist, pathologist, someone who has had a foodborne illness, careers
   d. Questions

7. **Letter to parents mailed one week ahead (preferred) or home with students.**

Name _____
Class _____

Food Safety Pre and Post Questions

1. **What is a foodborne illness? Check the correct answer.**
   ___ An illness which makes you too sick to eat.
   ___ An illness caused by eating too much food.
   ___ An illness caused by eating foods that are high in fat and cholesterol.
   ___ An illness caused by disease causing microorganisms in food.

2. **What is the "temperature danger zone"? Check the correct answer.**
   ___ The temperature range where food is too hot to eat safely.
   ___ The temperature range where bacteria can multiply rapidly.
   ___ The temperature range where food will get freezer burn if kept too long.
   ___ The temperature range where food will dry out, resulting in poor quality.

3. **For the past four hours, leftovers from your family's big holiday dinner have been sitting out in the kitchen for guests to eat. Check the foods that are still safe to eat.**
   ___ Fudge
   ___ Roasted turkey
   ___ Mashed potatoes
   ___ Whole-wheat buns
   ___ Baked ham
   ___ Sliced watermelon

4. **Unsafe food will always have a strange appearance and odor. Check the correct answer.**
   ___ True
   ___ False

5. **Last night it was your turn to clear the dinner table and clean up the kitchen. At midnight, you woke up and realized that you had forgotten to refrigerate the leftover potato salad. If the potato salad had been left out since 7 p.m., what should you do with the potato salad? Check the correct answer.**
   ___ Put the salad in the refrigerator immediately. Refrigeration will kill any bacteria that grew in the salad.
   ___ Taste the salad and if it tastes okay, it is safe to refrigerate it and eat it the next day.
   ___ Throw the salad away, because there is no way to make it safe to eat again.
   ___ Feed it to the dog, and if he likes it, it is still safe.

6. **When refrigerating raw chicken, where should you store it to prevent cross-contamination of other foods? Check the correct answer.**
   ___ On the top shelf inside the refrigerator.
   ___ On the bottom shelf inside the refrigerator.
   ___ In the drawer with your other meats, such as salami and leftover ham.

7. **If you were preparing submarine sandwiches for your family, which <u>one</u> of the following activities would you do first?**
   ___ Wash and cut the lettuce and tomatoes.
   ___ Wash your hands.
   ___ Cut the bread.
   ___ Lower the periscope on the sub.

8. **If your friend was grilling hamburgers and asked how you wanted your hamburger cooked, how <u>should</u> you respond?**
   ___ Rare
   ___ Medium rare
   ___ Well done

9. **When you were helping make chocolate chip cookies, you ate a large spoonful of the raw cookie dough. The next day you were sick with diarrhea and stomach pain. Why do you think that you became sick?**
   ___ Because the flour wasn't cooked and formed a ball of dough in your stomach.
   ___ Because the cookie dough had too much sugar in it.
   ___ Because the cookie dough had uncooked eggs in it.
   ___ Because the cookie dough had uncooked margarine in it.

10. **After you use a cutting board for cutting raw meats, what do you do with it? You wash it with soap and water. Circle your answer.**

    Always Sometimes Rarely Never

11. **Recommended thorough handwashing takes how long?**
    ___ 20 seconds
    ___ 1 minute
    ___ 2 minutes

12. **Freezing food will:**
    ___ Kill all bacteria
    ___ Not kill all bacteria

Name _____
Class _____

Food Safety Answer Key

1. **What is a foodborne illness? Check the correct answer.**
   ___ An illness which makes you too sick to eat.
   ___ An illness caused by eating too much food.
   ___ An illness caused by eating foods that are high in fat and cholesterol.
   _x_ An illness caused by disease causing microorganisms in food.

2. **What is the "temperature danger zone"? Check the correct answer.**
   ___ The temperature range where food is too hot to eat safely.
   _x_ The temperature range where bacteria can multiply rapidly.
   ___ The temperature range where food will get freezer burn if kept too long.
   ___ The temperature range where food will dry out, resulting in poor quality.

3. **For the past four hours, leftovers from your family's big holiday dinner have been sitting out in the kitchen for guests to eat. Check the foods that are still safe to eat.**
   _x_ Fudge
   ___ Roasted turkey
   ___ Mashed potatoes
   _x_ Whole-wheat buns
   ___ Baked ham
   ___ Sliced watermelon

4. **Unsafe food will always have a strange appearance and odor. Check the correct answer.**
   ___ True
   _x_ False

5. **Last night it was your turn to clear the dinner table and clean up the kitchen. At midnight, you woke up and realized that you had forgotten to refrigerate the leftover potato salad. If the potato salad had been left out since 7 p.m., what should you do with the potato salad? Check the correct answer.**
   ___ Put the salad in the refrigerator immediately. Refrigeration will kill any bacteria that grew in the salad.
   ___ Taste the salad and if it tastes okay, it is safe to refrigerate it and eat it the next day.
   _x_ Throw the salad away, because there is no way to make it safe to eat again.
   ___ Feed it to the dog, and if he likes it, it is still safe.

6. **When refrigerating raw chicken, where should you store it to prevent cross-contamination of other foods? Check the correct answer.**
   ___ On the top shelf inside the refrigerator.
   _x_ On the bottom shelf inside the refrigerator.
   ___ In the drawer with your other meats, such as salami and leftover ham.

7. **If you were preparing submarine sandwiches for your family, which one of the following activities would you do first?**
   ___ Wash and cut the lettuce and tomatoes.
   _x_ Wash your hands.
   ___ Cut the bread.
   ___ Lower the periscope on the sub.

8. **If your friend was grilling hamburgers and asked how you wanted your hamburger cooked, how <u>should</u> you respond?**
   ___ Rare
   ___ Medium rare
   _x_ Well done

9. **When you were helping make chocolate chip cookies, you ate a large spoonful of the raw cookie dough. The next day you were sick with diarrhea and stomach pain. Why do you think that you became sick?**
   ___ Because the flour wasn't cooked and formed a ball of dough in your stomach.
   ___ Because the cookie dough had too much sugar in it.
   _x_ Because the cookie dough had uncooked eggs in it.
   ___ Because the cookie dough had uncooked margarine in it.

10. **After you use a cutting board for cutting raw meats, what do you do with it? You wash it with soap and water. Circle your answer.**

    <u>Always</u> Sometimes Rarely Never

11. **Recommended thorough handwashing takes how long?**
    _x_ 20 seconds
    ___ 1 minute
    ___ 2 minutes

12. **Freezing food will:**
    ___ Kill all bacteria
    _x_ Not kill all bacteria

SOS Poster Contest

ASSIGNMENT: Design and produce an original poster to promote food safety.

- ☺ Use the general topic of food safety or a more specific theme, such as cross-contamination, proper food storage, proper handwashing or any of the other topics discussed in class.
- ☺ Use the tag board provided or feel free to be creative with other types of backing.
- ☺ Use markers, stencils, paint or other suitable materials to create the design and message.
- ☺ Put your name and class period on the back of the poster.

This is a regular class assignment; it is to be due by _____.
OR
This is for extra credit and is an optional project; it is to be completed on your own time.

JUDGING AND GRADING GUIDELINES:

Use the following guidelines to help create an effective and attractive poster.

- ☺ The main theme is clear when you first look at it.
- ☺ The information is accurate.
- ☺ The poster is very neat and presentable.
- ☺ The poster is creative and interesting.

Foodborne Illness
Lesson 2

Lesson Goal: **The students will be able to discuss the problem of foodborne illness.**

Time: **45 minutes**

Content Standards: **Area Eight: Decision Making**

Objectives: **Students will be able to:**

- **Define terms related to foodborne illness.**
- **Discuss the problem of foodborne illness.**
- **Describe the symptoms and consequences of foodborne illness.**
- **List who is most at risk from foodborne illness**

Glossary: **Terms related to foodborne illness:**

a. *Centers for Disease Control and Prevention (CDC)* – A government agency that is concerned with the cause, spread and control of diseases.

b. *Contamination* – The presence of pathogenic microorganisms or harmful substances in food.

c. *Foodborne Illness* – Disease that is caused by pathogenic microorganisms in food.

d. *Incubation period* – The time period from when a person consumes the contaminated food until they develop symptoms of illness.

e. *Listeriosis* -- A disease caused by bacteria that can produce mild flu-like symptoms in healthy individuals. In pregnant women, newborns and people with weakened immune systems, the bacteria can cause septicemia, meningitis, encephalitis, and miscarriages/stillbirths.

f. *Microorganism* -- A very small life form. Bacteria, viruses, parasites, yeasts, and molds are types of microorganisms.

g. *Norwalk-like virus* – A small round virus that can cause diarrhea, nausea, vomiting, abdominal cramps, headaches and low-grade fever.

h. *Pathogenic* – Disease causing.

Procedure:

1. **The problem of foodborne illness**

Script: Does anyone know what a microorganism is? A microorganism is a very small life form. Microorganisms can be found almost everywhere; however, they are so small that we can't see them without using a microscope. **On each square centimeter of your skin there are about 1,500 bacteria. There are an average of 229,000 germs per square inch on frequently used faucet handles.** Sometimes when harmful microorganisms get into food, they can make us sick. This is called foodborne illness. It takes less than 10 E.Coli bacteria to make you sick. Foodborne illness is a widespread problem and a serious public health concern. It is estimated that as many as 76 million cases of foodborne illness occur each year in the United States. Although most cases of foodborne illness are neither long lasting or life threatening, some are very serious and as many as 5000 people die each year in this country as a result of foodborne illness.

The Centers for Disease Control and Prevention (CDC) estimates that of all reported foodborne illness, 3 percent occur from problems with food processing or manufacturing, 50-74 percent occur in food service, and 23-50 percent occur in the home. The CDC reports that the most commonly reported food preparation practice that contributes to foodborne illness involves improper cooking temperatures and improper storage temperatures of foods in refrigerators or hot holding equipment. The second most commonly reported practice involves poor personal hygiene (such as poor handwashing practices) of food handlers.

2. **Symptoms and consequences of foodborne illness**

Script: How long do you think it takes to become sick after eating food contaminated with harmful microorganisms? Most people believe that they will become sick within a few hours after eating contaminated foods. The truth is that with some foodborne illnesses you might become sick within an hour of eating the contaminated food and with other foodborne illnesses it might take several weeks before you become sick. The average amount of time it takes for a person to develop

symptoms after eating contaminated food (known as the incubation period) is 24-72 hours. In most cases, microorganisms cause intestinal illnesses that people call the stomach flu. Symptoms may include an upset stomach, nausea, vomiting and diarrhea. Have you heard these symptoms called anything else? (Allow students time to answer). Other foodborne illnesses can be more serious and result in more serious consequences such as permanent kidney damage or even death.

3. Who is most at risk from foodborne illness?

Script: Who do you think is most likely to become sick from foodborne illness? Foodborne illness is more dangerous for children, pregnant women, elderly people, and people with a weakened immune system due to chronic illness.

4. Examples of foodborne illness outbreaks

Script: When two or more people become sick after eating the same food, it is called a foodborne illness outbreak. Some examples of foodborne illness outbreaks are:

- *Brainerd Diarrhea* – 122 residents of Brainerd, Minnesota became ill with chronic diarrhea after consuming raw milk from a local dairy. 75% of the cases were ill for at least one year and did not respond to antibiotics.

- *Norwalk-like virus* – 3000 people in the Minneapolis/St. Paul area became ill after consuming bakery items with frosting. One sick foodhandler was responsible for contaminating large quantities of frosting and making 3000 people sick.

- *Listeriosis* – 100 people in 22 states became ill after eating contaminated hotdogs and deli meats. There were a total of 21 deaths as a result of this foodborne illness outbreak, 15 adults and six miscarriages/stillbirths.

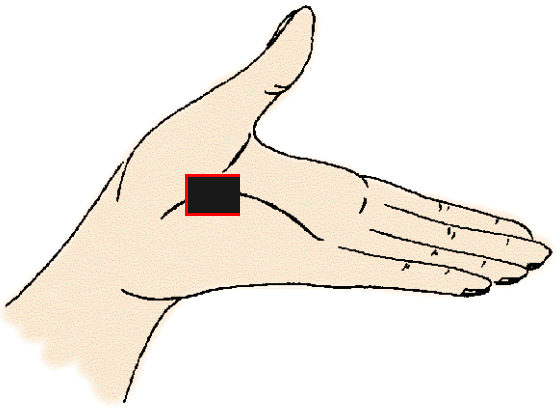
Assessment: **At the end of the lesson, ask the students to respond to the following questions:**

- What is a foodborne illness?
- What are the symptoms of foodborne illness?
- Who is the most at risk from foodborne illness?

Activity: **See Leader Instruction Sheet: Activities for Lesson 2**

- Activity #1: Microorganisms are Everywhere
- Activity #2: Growing Microorganisms
- Activity #3: Word Search and Define

On each square centimeter of your skin there are about 1,500 bacteria.



An average of 229,000 germs per square inch on frequently touched faucet handles.

Leader Instruction Sheet
Activities for Lesson 2

Activity #1: **Microorganisms Are Everywhere!**

Materials:

Glitter-Bug Powder
Ultraviolet light stick, extension cord
Overheads of microorganisms

Procedure:

Very lightly sprinkle (so it doesn't show) *Glitter-Bug Powder* around the classroom before the students enter the room. At the end of the discussion of Lesson 2, shine the ultraviolet light around the classroom. The room should glow wherever the powder was placed.

Script: Before class started, I sprinkled a substance called *Glitter-Bug Powder* around the room. Even though the powder is all over the room, the only way we can see it is using an ultraviolet light. Microorganisms are a lot like this powder. Microorganisms can be everywhere, even though we can't see them without the use of a microscope. (Show overheads of harmful microorganisms.)

Activity #2: **Growing Microorganisms**

Materials:

Sterile petri dishes *See notes
Distilled water
Permanent markers
Sterile swabs or Q-tips
Masking tape

Procedure:

Script: Today we will each be selecting an object or surface to sample for microorganisms. We will be growing the microorganisms in containers called petri dishes. The red gelatin-like substance in the petri dishes is called agar. The agar provides nutrients or food to the microorganisms so that they can grow. It will be interesting to see which objects or surfaces have the most microorganisms

1. Give each student the following items:

   Sterile petri dish
   Sterile swab

2. Instruct the students to select one surface or object that they would like to test for the presence of microorganisms. Each student should attempt

to test a different surface or object, rather than several students testing the same thing. They can mark the bottom of the petri dish in half with marker and test two sites or touch with their fingers.

3. Instruct the students to hold the swab at one end, and rub it over the surface or object to be tested. If the object or surface is dry, the student should wet the swab with distilled water and then rub the swab over the object or surface. If the object or surface is wet, the student should use a dry swab to rub over the object or surface. The student should then gently rub the swab on the agar, close the lid, and tape the dish shut around the edge. Dishes should be labeled with the students name, class period, and the name of the surfaces or objects tested.

4. Label one clean, unused petri dish as the control. The control is used to show that a petri dish that was not opened would not have any microorganisms growing on it. Any growth on the student's petri dishes is coming from the surface or objects that they tested.

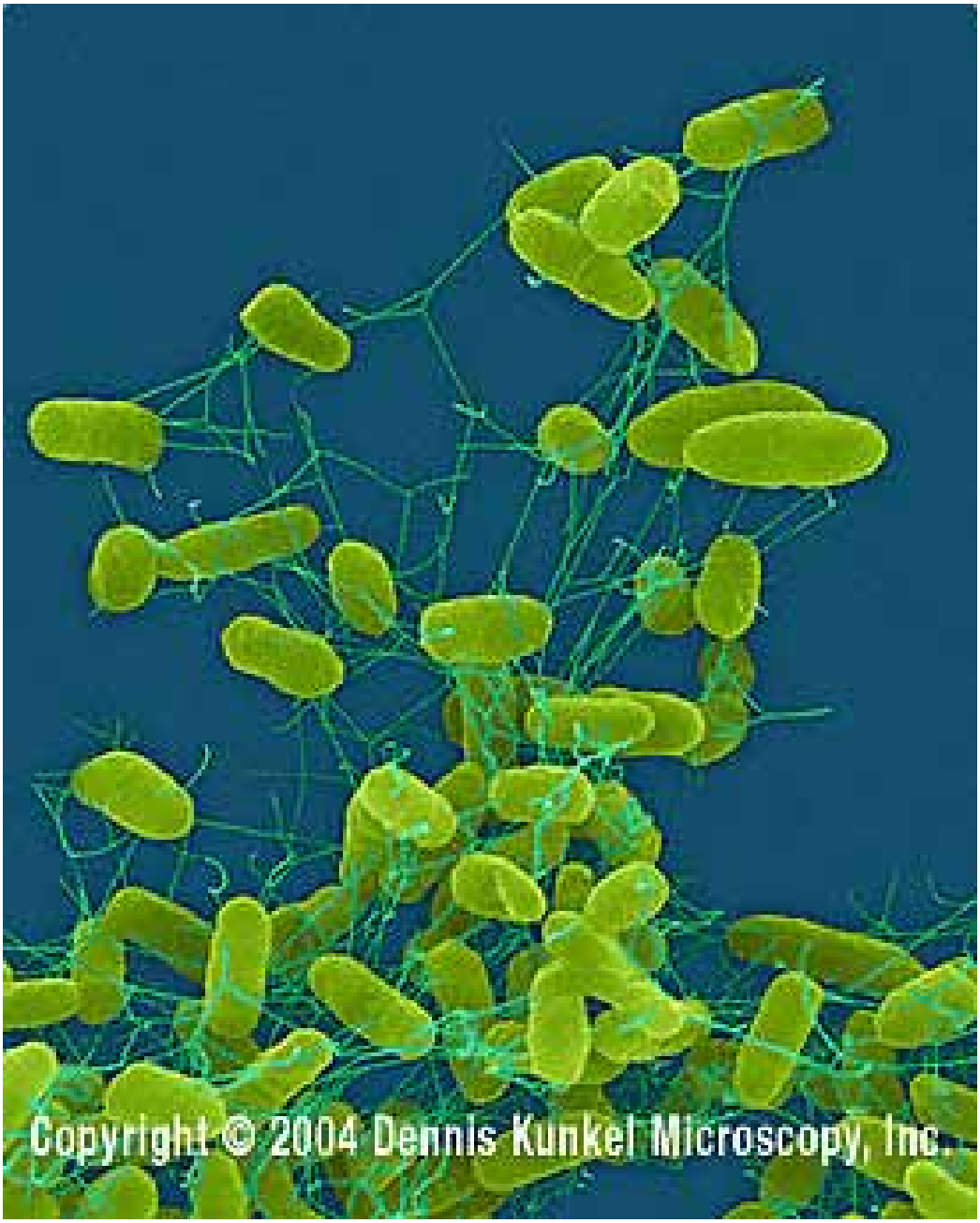
5. Place the dishes in a warm spot (such as on top of a refrigeration unit, wrapped in plastic in a sunny window, or on top of a radiator) for three days.

6. Without opening the dishes, the students should examine the petri dishes daily and record their observations on their instruction form. ***Safety Note: Students should be instructed to never open the dishes anytime after adding the contaminant. The dishes could contain harmful microorganisms, which could cause illness if students are exposed to them.***

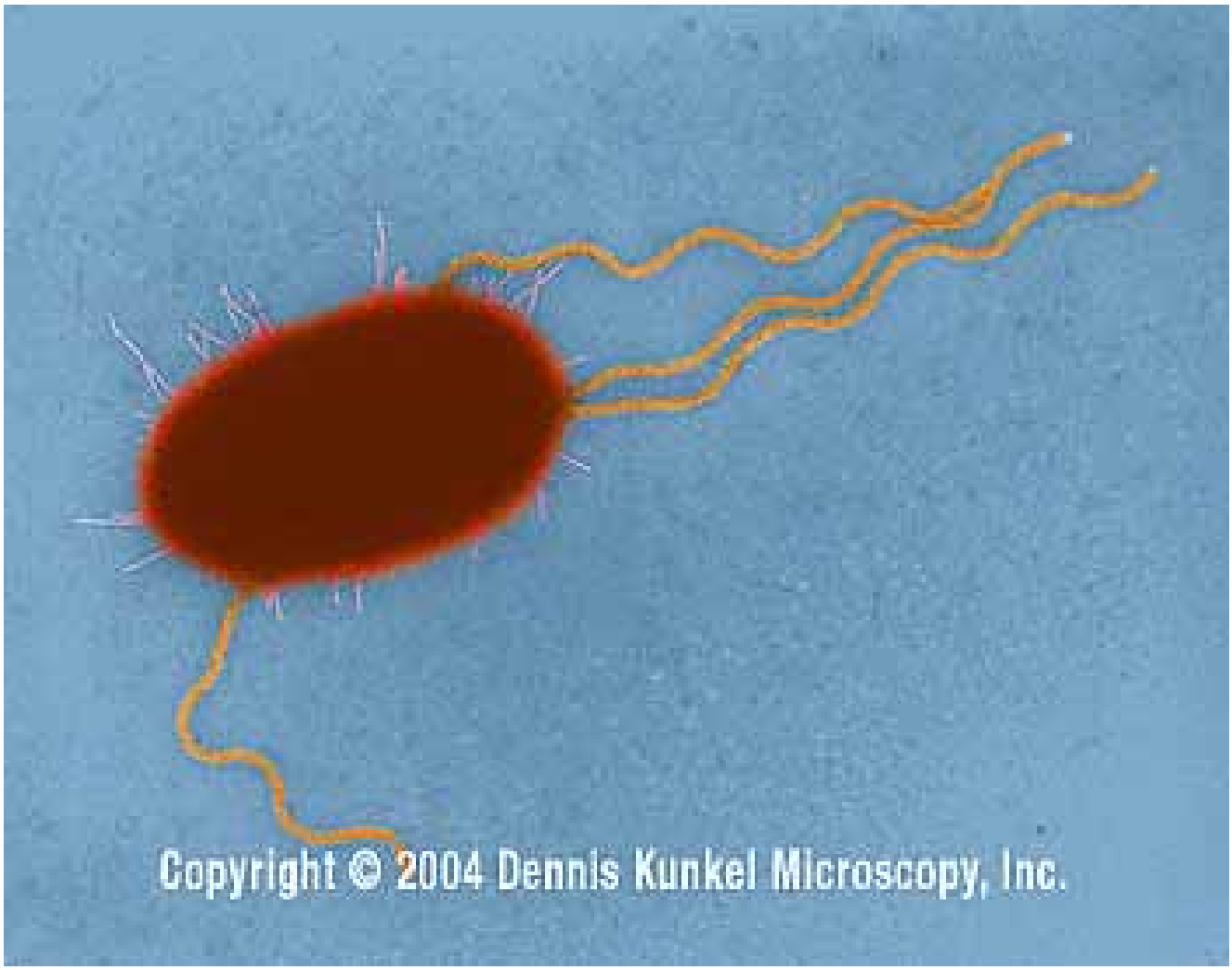
7. At the end of the exercise, collect dishes for proper disposal. Check with the custodian or janitor.

8. Note: A cross-curricular activity suggested is to have the students look at their plates under a microscope.

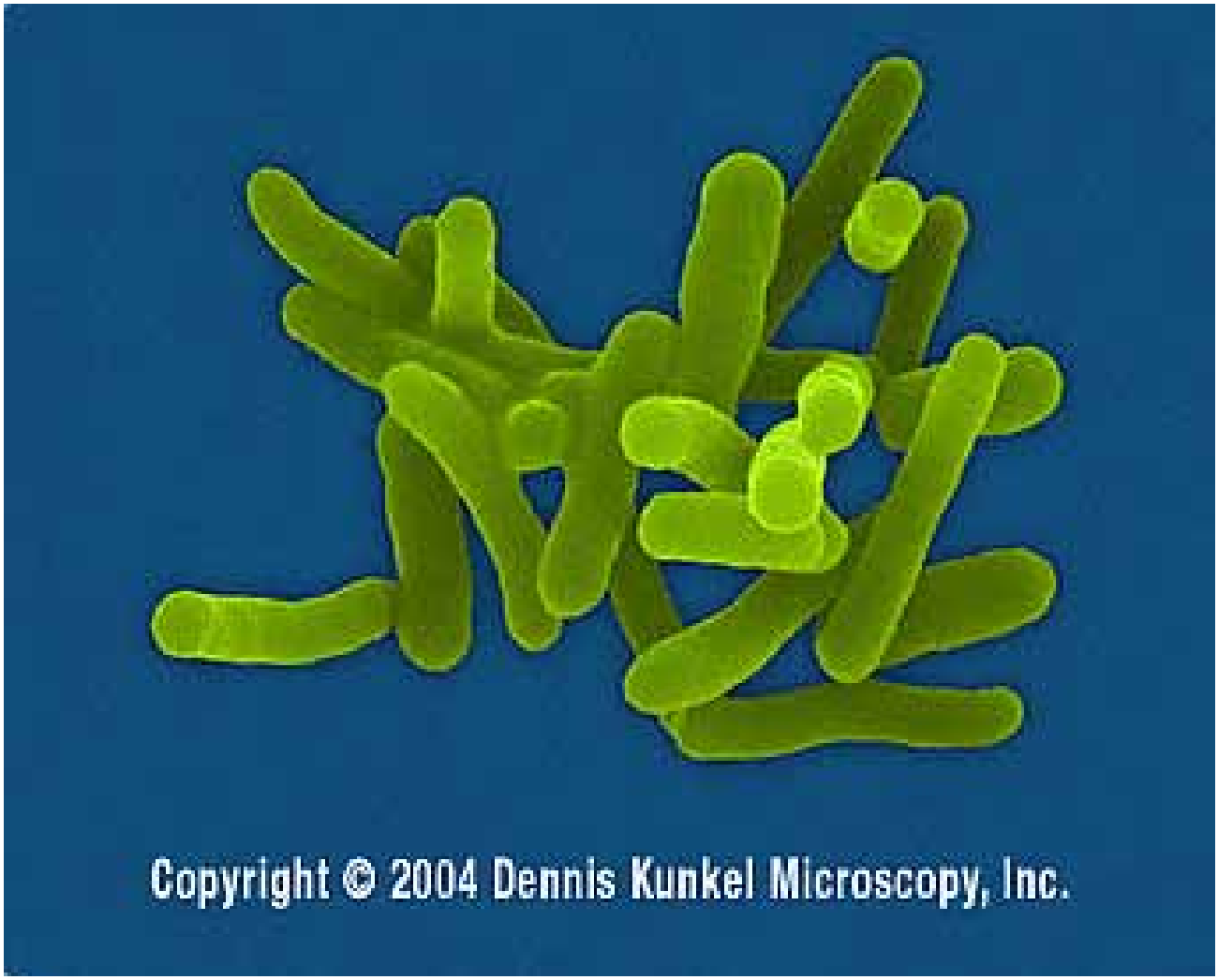
***Notes:** Petri dishes can be obtained from a local hospital or clinic. If they have reached an expiration date, the facility cannot use them for tests. They still will work for this experiment. Red jello made with less water can be used for this experiment as well. Small sample plastic cups from a local deli will work well to hold the jello.



SALMONELLA



E. COLI

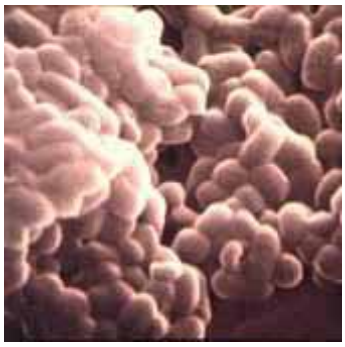


SHIGELLA

Escherichia coli 0157:H7

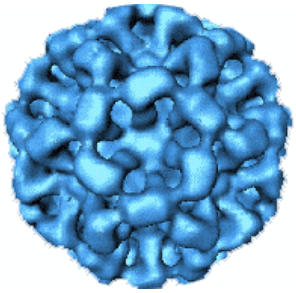
Cause of illness:	Strain of enteropathic E. coli
Incubation period:	Two to four days
Symptoms:	Hemorrhagic colitis; hemolytic uremic syndrome
Possible contaminant:	Ground beef, raw milk, alfalfa sprouts, unpasteurized fruit juices, dry-cured salami, lettuce, game meat, and cheese curds.
Steps for prevention:	Thoroughly cook meat; avoid cross-contamination; only use pasteurized fruit juices

Listeriosis



Cause of illness:	Infection with Listeria monocytogenes
Incubation period:	Two days to three weeks
Symptoms:	Meningitis, sepsticemia, miscarriage
Possible contaminant:	Vegetables, milk, cheese, meat, seafood
Steps for prevention:	Pasteurize milk, cook foods properly, avoid cross- contamination; use sanitary practices

Norwalk virus

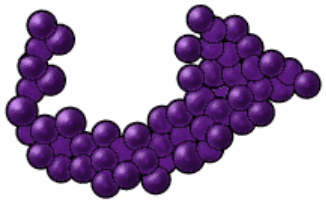


Cause of illness:	Infection with Norwalk virus
Incubation period:	12-48 hours
Symptoms:	Nausea, vomiting, diarrhea, abdominal cramps
Possible contaminant:	Raw oysters/shellfish, water and ice, salads, frosting, person-to-person contact
Steps for prevention:	Adequate treatment and disposal of sewage; restriction of infected food handlers from working with food until they no longer shed virus

Salmonellosis

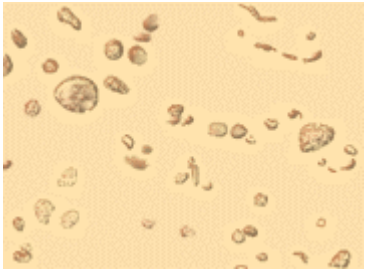
Cause of illness:	Infection with Salmonella species
Incubation period:	12-24 hours
Symptoms:	Nausea, diarrhea, abdominal pain, fever, headache, chills, prostration
Possible contaminant:	Meat, poultry, egg or milk products
Steps for prevention:	Cook thoroughly; avoid cross-contamination

Staphylococcus



Cause of illness:	Toxin produced by certain strains of Staphylococcus aureus
Incubation period:	One-six hours
Symptoms:	Severe vomiting, diarrhea, abdominal cramping
Possible contaminant:	Custard or cream-filled baked goods, ham, poultry, eggs, potato salad, cream sauces, sandwich fillings
Steps for prevention:	Refrigerate foods, use sanitary practices

Toxoplasma gondii



Cause of illness:	Parasitic infection
Incubation period:	5-23 days
Symptoms:	In healthy children and adults, may cause no symptoms or a mild illness. For unborn babies and immuno-compromised individuals, Toxoplasmosis is a very severe infection
Possible contaminant:	Cat, rodent or bird feces; litter boxes
Steps for prevention:	

Student Activity Sheet
Word Search and Define – Lesson 2

Directions: Find the words below and fill in the blanks.

P	A	T	H	E	R	S	I	S	O	I	R	E	T	S	I	L	C	D	L
L	I	S	A	S	K	U	M	I	C	R	P	J	F	G	S	S	E	N	O
C	I	N	E	N	A	R	M	T	R	D	N	O	I	T	A	G	R	A	S
F	O	D	I	L	L	I	N	E	S	R	T	C	Q	W	E	P	G	S	A
J	F	O	O	D	B	V	E	R	Z	S	I	P	L	C	D	M	P	S	O
M	S	I	N	A	G	E	R	O	P	L	I	E	R	G	A	N	A	E	B
G	L	R	E	R	C	K	A	S	F	B	N	I	O	R	T	E	W	N	X
A	S	E	C	D	M	I	C	R	O	O	R	G	A	N	I	S	M	L	L
A	B	P	A	T	H	L	C	D	E	F	N	O	R	W	A	K	K	L	M
C	O	N	T	A	P	K	O	L	C	F	D	E	R	W	A	S	R	I	E
R	N	O	R	W	P	L	A	C	E	N	O	T	T	H	E	W	R	E	L
C	I	I	O	M	B	A	A	S	C	F	I	O	S	I	S	A	A	N	W
L	P	T	U	R	W	W	T	C	V	U	L	W	A	S	H	E	R	R	O
M	I	A	X	A	S	R	C	H	R	T	U	O	L	W	S	T	R	O	X
M	I	B	V	S	W	O	R	T	O	Y	R	I	L	A	T	E	V	B	R
M	L	U	M	I	C	N	R	P	L	G	N	M	D	S	Y	C	M	D	E
E	M	C	I	R	W	S	A	S	P	O	E	T	Q	D	C	L	P	O	B
L	O	N	O	I	T	A	N	I	M	A	T	N	O	C	B	E	L	O	K
H	P	I	K	L	N	M	E	E	S	S	L	I	I	J	N	R	T	F	K
L	K	J	M	K	E	D	E	W	S	M	N	M	I	C	R	O	O	R	G

Listeriosis	Microorganism	Contamination	Pathogenic
Norwalk-like virus	Foodborne Illness	Incubation Period	CDC

1._____ The abbreviation for the government agency that is concerned with the cause, spread and control of diseases.
2._____ Disease causing.
3._____ The time from when a person consumes contaminated food until they develop symptoms of illness.
4._____ Disease that is caused by pathogenic microorganisms in food.
5._____ A disease that can result in miscarriages and still birth.
6. _____A very small life form that cannot be seen without the use of a microscope.
7._____ A small virus that can cause diarrhea, nausea, and vomiting.
8._____ The present of pathogenic microorganisms or harmful substances in food.

Student Activity Sheet
Word Search and Define – Lesson 2

Directions: Find the words below and fill in the blanks.

P	A	T	H	E	R	S	I	S	O	I	R	E	T	S	I	L	C	D	L
L	I	S	A	S	K	U	M	I	C	R	P	J	F	G	S	S	E	N	O
C	I	N	E	N	A	R	M	T	R	D	N	O	I	T	A	G	R	A	S
F	O	D	I	L	L	I	N	E	S	R	T	C	Q	W	E	P	G	S	A
J	F	O	O	D	B	V	E	R	Z	S	I	P	L	C	D	M	P	S	O
M	S	I	N	A	G	E	R	O	P	L	I	E	R	G	A	N	A	E	B
G	L	R	E	R	C	K	A	S	F	B	N	I	O	R	T	E	W	N	X
A	S	E	C	D	M	I	C	R	O	O	R	G	A	N	I	S	M	L	L
A	B	P	A	T	H	L	C	D	E	F	N	O	R	W	A	K	K	L	M
C	O	N	T	A	P	K	O	L	C	F	D	E	R	W	A	S	R	I	E
R	N	O	R	W	P	L	A	C	E	N	O	T	T	H	E	W	R	E	L
C	I	I	O	M	B	A	A	S	C	F	I	O	S	I	S	A	A	N	W
L	P	T	U	R	W	W	T	C	V	U	L	W	A	S	H	E	R	R	O
M	I	A	X	A	S	R	C	H	R	T	U	O	L	W	S	T	R	O	X
M	I	B	V	S	W	O	R	T	O	Y	R	I	L	A	T	E	V	B	R
M	L	U	M	I	C	N	R	P	L	G	N	M	D	S	Y	C	M	D	E
E	M	C	I	R	W	S	A	S	P	O	E	T	Q	D	C	L	P	O	B
L	O	N	O	I	T	A	N	I	M	A	T	N	O	C	B	E	L	O	K
H	P	I	K	L	N	M	E	E	S	S	L	I	I	J	N	R	T	F	K
L	K	J	M	K	E	D	E	W	S	M	N	M	I	C	R	O	O	R	G

Listeriosis	Microorganism	Contamination	Pathogenic
Norwalk-like virus	Foodborne Illness	Incubation Period	CDC

1. CDC The abbreviation for the government agency that is concerned with the cause, spread and control of diseases.
2. Pathogenic Disease causing.
3. Incubation Period The time from when a person consumes contaminated food until they develop symptoms of illness.
4. Foodborne Illness Disease that is caused by pathogenic microorganisms in food.
5. Listeriosis A disease that can result in miscarriages and still birth.
6. Microorganism A very small life form that cannot be seen without the use of a microscope.
7. Norwalk like virus A small virus that can cause diarrhea, nausea, and vomiting.
8. Contamination The present of pathogenic microorganisms or harmful substances in food.

Bacteria Are Just Like You In Many Ways
Lesson 3

Lesson Goals: **The students will be able to recognize the conditions that are necessary for bacterial growth. They will also be able to recognize the foods in which bacteria are most likely to grow and cause problems and methods to prevent or destroy bacteria.**

Time: **45 Minutes**

Content Standards: **Area Eight: Decision making**

Objectives: **The students will be able to:**

- **Define terms related to microorganisms.**
- **List the conditions necessary for bacterial growth.**
- **Recognize the types of foods that must be under temperature control to prevent bacterial growth.**
- **Learn about the process of food irradiation.**

Teacher Glossary: **Terms related to microorganisms:**

a. *Bacteria* – Living single celled microorganisms that can be spread by food, water, wind, insects, plants, animals and people. Bacteria survive well on skin and clothes and in human hair. They also thrive in the mouth, nose, throat, intestines, and in certain foods held at room temperature.

b. *Dehydrated* foods – Foods from which the water has been removed.

c. *Food Irradiation* – Process of exposing food to controlled levels of radiation to kill harmful bacteria, pests, or parasites, or to preserve freshness.

d. *Foodborne Illness* – Disease that is caused by pathogenic microorganisms in food.

e. *Microorganism* – A very small life form. Bacteria, viruses, parasites, yeast, and molds are types of microorganisms.

f. *Molds* – These organisms have many cells that make up a tangled mass of thread like structures. Some molds are used in food processing such as the manufacturing of Blue cheese. Molds are also involved in food spoilage and some molds produce poisonous substances in food that can cause serious health problems.

g. *Parasites* – An organism that grows, feeds or lives on or in another organism. Parasites do not reproduce or multiply while in food; however, they can reproduce once they have been consumed by another living organism.

h. *pH* – The measure of the acidity or alkalinity of a substance. The pH scale ranges from zero to 14. A pH of seven is neutral. Distilled water has a pH of seven. As the pH goes below seven the substance becomes more acidic and as the pH goes above seven the substance becomes more alkaline. Bacteria does not grow very well in foods with a pH of 4.6 or less. Some foods that have a low pH include soda pop, vinegar, ketchup, mustard and orange juice.

i. *Radura symbol* – A circular symbol, used internationally, that must appear on all irradiated food unless the food is used as an ingredient in a processed food.

j. *Temperature Danger Zone* – The temperature range in which bacteria grow best; 40°F to 140°F (approximately 4°C to 60°C).

k. *Viruses* – Viruses are much smaller than bacteria. When viruses are in a food, they are simply there and do not replicate or increase in number. The virus will only multiply after it is consumed by a living organism. The virus can then take over the organism's cells and produce millions of new viruses.

l. *Yeast* – A single celled organism. Yeasts are typically larger than bacteria. They are used to make wine, beer, and bread. They are not associated with foodborne illness, but can cause spoilage problems in foods such as sauerkraut, fruit juices, syrups, jellies, meats, beer and wine.

Procedure:

1. **Microorganisms and foodborne illness**

   Script: As was discussed in lesson two, microorganisms are very small life forms. Bacteria, viruses, parasites, yeasts and molds are all types of microorganisms. Some microorganisms are helpful and are even used in food production. For example, yeasts are used to make wine, beer, and bread. One type of mold is used in the manufacturing of blue cheese. However, there are other microorganisms that can be harmful and can cause foodborne illness.

   Viruses are very small organisms that can cause foodborne illness. Viruses do not increase in numbers while they are in food. They are just catching a ride to the next human where they will start to multiply and increase in numbers. Some viruses that cause foodborne illness are Hepatitis A and Norwalk-like viruses. Most viruses that cause foodborne illness are spread through poor handwashing or poor hygienic practices. Viruses can be spread through almost any ready-to-eat food, including ice.

   Bacteria are small single celled organisms and are responsible for causing most cases of foodborne illnesses. Unlike viruses, bacteria will multiply in certain foods if given the right conditions. In order to make our food safe from bacterial growth, we need to understand what bacteria need to grow. Basically, bacteria are a lot like us. They need food, water, a nice environment, and time to grow.

2. **Conditions necessary for bacterial growth**

   Script:

   a. *Food* – Bacteria need food to grow and multiply. They prefer high protein foods such as meats, poultry, seafood, eggs, dairy products, cooked vegetables such as beans, and cooked cereal grains such as rice.

   b. *Water* – Bacteria need available water in order to grow and multiply. We can control bacterial growth by limiting the water that is available for bacteria. Some foods are dehydrated to remove the water and prevent bacterial growth. Examples of these foods are cereals, dried fruits and uncooked macaroni shells. Other foods have a large amount of salt or sugar added to combine with the water and make it unavailable to bacteria. Some examples of these foods are jams, honey, and marmalade.

c. *Temperature* – Bacteria need a nice environment in which to live and part of the environment is the temperature. The temperature range in which bacteria grow best is 40°F to 140°F. This is referred to as the temperature danger zone. We can control bacterial growth in our foods by keeping our foods out of this temperature danger zone. We either want to keep our foods below 40°F or above 140°F to prevent bacteria from growing.

   Freezing or refrigerating foods will slow or stop the growth of bacteria in our foods. It is important to remember however, that neither refrigeration nor freezing kills bacteria. Some bacteria will continue to grow very slowly at refrigerated temperatures. Because of this, leftovers should not be kept any longer than three or four days. Other bacteria will start to multiply again if the temperature of the food rises into the temperature danger zone.

   Thoroughly cooking foods at high temperatures will kill most bacteria. Once food is cooked, we can control regrowth of bacteria by maintaining our foods at 140F or above.

d. *Time* – Bacteria need time to grow and multiply while in the temperature danger zone. If conditions are favorable, bacteria can double in numbers every 20 minutes. Foods should not be allowed to stay in the temperature danger zone for very long. Foods need to be kept hot or cold. When foods are cooled from hot to cold, they need to be cooled as fast as possible. The same is true for reheating. Always reheat foods as quickly as possible, so that foods do not remain in the temperature danger zone for very long. If foods have been left out at room temperature for more than two hours, they should be considered unsafe and should be discarded.

e. *Acidic Foods* – Another part of the bacteria's environment is the acidity of the food. Bacteria don't grow very well in acidic foods. Some examples of acidic foods include soda pop, orange juice, ketchup, sauerkraut, and most fruits. Some food manufacturers control bacterial growth in their foods by making them more acidic.

3. **Which foods must be kept out of the temperature danger zone to prevent bacterial growth?**

Script: Although bacteria doesn't grow in all foods, there are many foods in which they will readily grow. We will call these foods risky foods. Risky foods must be kept either hot or cold to prevent bacteria from growing in them. Risky foods include:

a. *Foods from an animal source* (both raw and cooked). Examples include eggs, meat, fish, and poultry.

b. *Foods from a plant source that have been heat-treated or cooked.* Examples include baked potatoes, mashed potatoes, cooked beans, cooked macaroni, and cooked rice.

c. *Raw seed sprouts*. Examples include alfalfa sprouts and bean sprouts.

d. *Cut melons.* Examples include watermelon, cantaloupe and honeydew.

Foods will not be risky if they are too acidic (such as ketchup or sauerkraut) or if they do not have enough water available (such as cereal) for bacteria to grow.

In addition to risky foods, there are other foods that we keep in the refrigerator such as soda, bottled water, raw fruits and vegetables, and jelly. The reason that we keep foods such as soda or bottled water refrigerated is because they taste better when cold. The reason we keep foods such as raw fruits and vegetables refrigerated is because refrigeration slows the growth of spoilage organisms, and the quality of food will stay better longer. Spoilage organisms are not usually the organisms that cause foodborne illness. The exception to this is cut melons and raw seed sprouts which must always be refrigerated to prevent bacterial growth. When you're not sure whether a certain food has to be refrigerated or not, always refrigerate the food. It is better to be safe than sorry!

Sometimes bacteria can cause problems even in foods considered non-risky. These foods may become contaminated through improper food handling practices or through other environmental sources. Even though non-risky foods don't support the growth of bacteria, some bacteria can survive in these foods and when eaten, can make us sick. There have been foodborne illness outbreaks involving foods such as orange juice, apple juice, and dry cereal,

which are usually considered non-risky. Refrigeration of these foods would not have prevented the outbreak, because remember, refrigeration does not kill bacteria. The way to prevent future outbreaks is to prevent contamination of the food in the first place by following proper growing and food handling practices. One step that food processors are taking to prevent these outbreaks is to pasteurize (heat treat) juices or to use other processes to kill any harmful bacteria that are present. Some ground beef is currently being irradiated (electronically treated) which is similar to the pasteurization of milk and eggs. Some fruits and vegetables may soon also be irradiated to prevent outbreaks.

4. Irradiation of Food

You may have heard about people eating undercooked hamburgers and becoming very sick. They have a sudden onset of abdominal pain, severe cramps and even bloody diarrhea that lasts for days and days. One type of bacteria that can show up in ground hamburger is called E. coli. It can damage the kidneys and can even kill people. There is a scientific procedure that can fix this problem.

Many years ago, people got sick from drinking milk that had dangerous bacteria. Eventually, milk was heated slightly to kill the germs – called pasteurization. Milk is now safe to drink.

Today, foods like hamburger can be treated to kill all germs and the process is called irradiation. It kills 99 point 999 percent of the E. coli in hamburger.

a. <u>How does it work?</u> Food is sent through a shielded room on a conveyor belt. High-energy radiation goes through the package and product. The beam destroys the bacteria's DNA making it impossible for the bacteria to continue living. It takes from one to three seconds. The Radura symbol is placed on all product packages which are irradiated and the words "irradiated for food safety."

b. <u>History of irradiation:</u> Scientists received a patent on the process in 1905; NASA began using for all astronaut food in 1972; spices irradiated beginning in 1983; approved for poultry, beef, veal and other red meat in1990 and irradiation of refrigerated and frozen raw meat and shell eggs in 2000. Common items, such as cotton balls, adhesive bandages, baby bottles and medical supplies are irradiated for safety.

c. Where can it be purchased? Dairy Queen hamburgers, Schwan's meats, many grocery stores including SuperValu, HyVee and Cashwise and others.

d. Does irradiation make the food radioactive? No, the energy passes through the food, but does not remain in it. It works like a dental X-ray. Teeth are not radioactive after an X-ray.

e. Does irradiation change the food? The amount of energy is controlled and food changes are minimal, preserving the foods' safety, nutritive value and quality.

f. Is the US the only country using irradiation? Almost 40 countries permit irradiation of over 50 different foods.

Recommendation – online virtual tour of a food irradiation facility: http://www.gmabrands.com/publicpolicy/foodsafety.cfm

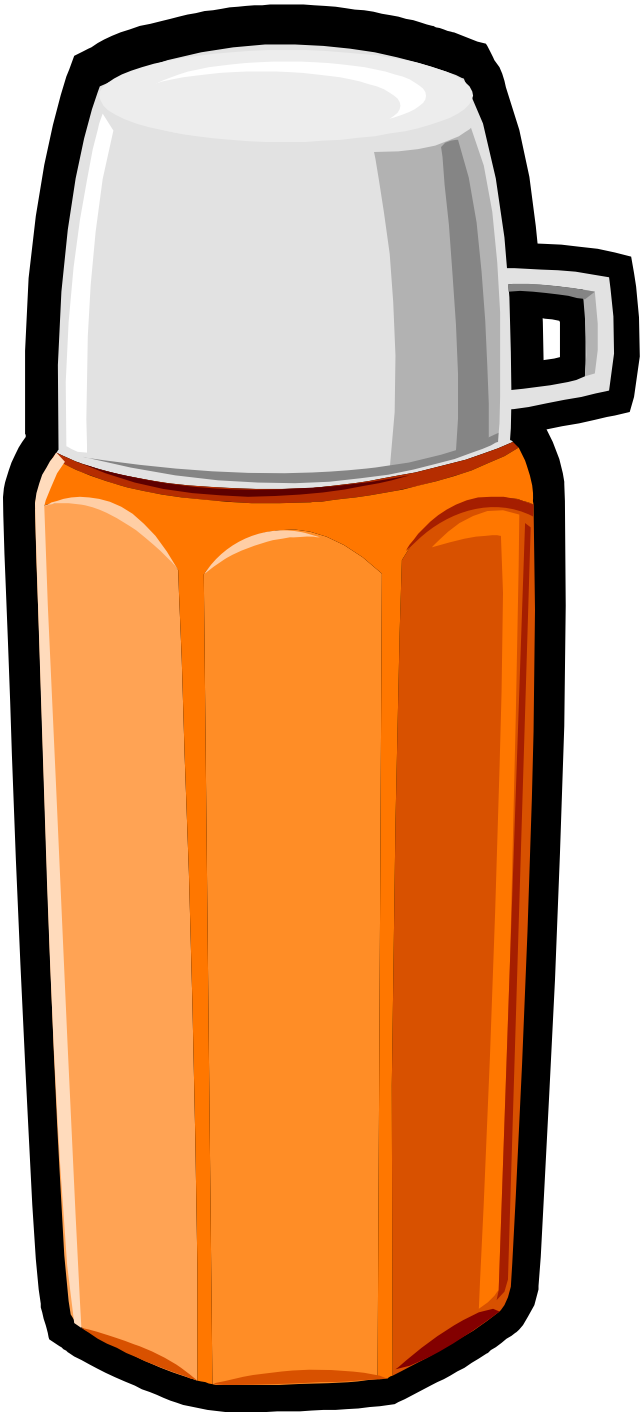
*Note: More information on irradiation at www.mnbeef.org

Assessment: At the end of the lesson, ask the students to respond to the following questions:

- What does bacteria need to grow?
- What are some types of microorganisms?
- What is the temperature danger zone?
- Name a risky food.
- Why is food irradiated?

Activity: **See Leader Instruction Sheet: Activities for Lesson 3**

- Activity #1: Lunch Bag Choices
- Activity #2: Word Scramble



Cold Pack

Leader Instruction Sheet
Activities for Lesson 3

Activity #1: **Lunch Bag Choices**

Materials:

Student Activity Sheets (Lunch Bag Choices)
12 paper lunch bags
6 pictures of cold packs
6 pictures of a thermos
1 set of food pictures

Procedure:

1. Divide the class into 4 to 6 groups of students

2. Give each group the following items.

   Student Activity Sheet (Lunch Bag choices)
   Two lunch bags
   1 picture of a cold pack
   1 picture of a thermos
   1/6 of the food pictures

3. Instruct the students to place the pictures of the thermos and cold pack in one of the bags.

4. Instruct the students to separate their foods into risky foods (those foods which need to be either kept cold or hot to prevent bacterial growth) and non-risky foods. The students should place the risky foods into the bag with the thermos and the cold pack. The students should place the non-risky foods in the empty bag. ***Before asking the groups to start working on their foods, demonstrate the exercise to the class by using the foods in the teacher's set of foods (milk, noodles, fried egg, roasted chicken, corn and cantaloupe).***

5. Ask each group of students to share their decisions with the rest of the class. The groups should be prepared to discuss why they make the decisions that they did.

Answer Key: **Risky Foods:** Food and reasons for classification as risky foods.

1. **Baked beans** – cooked food from a plant source
2. **Baked potato** – cooked food from a plant source
3. **Black-eyed peas** – cooked food from a plant source
4. **Bologna** – animal product
5. **Burrito** – meat and cheese are animal products
6. **Cantaloupe** – cut melons
7. **Carrots** – cooked food from a plant sources
8. **Cheese** – animal product
9. **Cheeseburger** – meat and cheese are animal products
10. **Chef salad** – meat, cheese, and eggs are animal products
11. **Chicken** – animal product
12. **Chicken noodle soup** – chicken is an animal product, noodles and vegetables are cooked food from a plant sources
13. **Chicken pot pie** – chicken is an animal product, vegetables are cooked food from a plant source
14. **Chicken stir fry** – chicken is an animal product and mushrooms are cooked food from a plant source
15. **Chili** – meat is an animal product and beans are cooked food from a plant source.
16. **Chop suey** – meat is an animal product and vegetables are cooked food from a plant source
17. **Clam chowder** – clam is an animal product and potatoes are cooked food from a plant source
18. **Corn** - cooked food from a plant source
19. **Cottage cheese** – animal product
20. **Egg noodle** – cooked food from a plant source
21. **Eggs** – animal product
22. **Enchilada** – meat, cheese and sour cream are animal products
23. **Fish sandwich** – fish and cheese are animal products
24. **Fish sticks** – animal product
25. **French fries** – cooked food from a plant source
26. **Gravy** – animal product
27. **Green beans** – cooked food from a plant source
28. **Green peas** – cooked food from a plant source
29. **Ground beef** – animal product
30. **Ham** – animal product
31. **Hash browned potatoes** - cooked food from a plant source
32. **Hot dog** – animal product
33. **Ice cream** – animal product
34. **Italian sausage** – animal product
35. **Lasagna** – meat and cheese are animal products, noodles are cooked food from a plant source

36. **Macaroni** – cooked food from a plant source, cheese is an animal product
37. **Mashed potatoes** – cooked food from a plant source
38. **Milk** – animal product
39. **Milk shake** – animal product
40. **Navy beans** – cooked food from a plant source
41. **Oatmeal** – cooked food from a plant source
42. **Pasta** – cooked food from a plant source
43. **Pizza** – cheese is an animal product
44. **Pork chop** – animal product
45. **Pork sausage** – animal product
46. **Pudding** – milk ingredient is an animal product
47. **Quiche** – eggs and milk are animal products
48. **Refried beans** – cooked food from a plant source
49. **Rice** – cooked food from a plant source
50. **Roast beef** – animal product
51. **Roast beef sandwich** – meat is an animal product
52. **Salmon** – animal product
53. **Shrimp** – animal product
54. **Sour cream** – animal product
55. **Spaghetti** – meatballs are an animal product and noodles are cooked food from a plant source
56. **Squash**– cooked food from a plant source
57. **Steak** – animal product
58. **Stew** – meat is an animal product and vegetables are cooked food from a plant source
59. **Submarine sandwich** – meat is an animal product
60. **Sweet potato** – cooked food from a plant source
61. **Taco** – meat and cheese are animal products
62. **Tuna** – animal product
63. **Tuna salad** – animal product
64. **Turkey sandwich** – turkey is an animal product
65. **Turkey** – animal product
66. **Watermelon** – cut melon
67. **Zucchini** – cooked food from a plant source

Non-risky Foods:

1. **Angel food cake** – not enough water available to bacteria
2. **Apple** – not a cooked plant product
3. **Banana** – not a cooked plant product
4. **Bran flakes** – not enough water available to bacteria
5. **Bread** – not enough water available to bacteria
6. **Broccoli** – not a cooked plant product

7. **Brownie** – not enough water available to bacteria
8. **Cabbage** – not a cooked plant product
9. **Catsup** – too acidic
10. **Cauliflower** – not a cooked plant product
11. **Celery** – not a cooked plant product
12. **Chocolate candy bar** – not enough water available to bacteria
13. **Chocolate cake** – not enough water available to bacteria
14. **Cookie** – not enough water available to bacteria
15. **Corn flakes** – not enough water available to bacteria
16. **Dinner roll** – not enough water available to bacteria
17. **Doughnut** – not enough water available to bacteria
18. **Graham crackers** – not enough water available to bacteria
19. **Granola** – not enough water available to bacteria
20. **Granola bar** – not enough water available to bacteria
21. **Grapefruit** – not a cooked plant product and also too acidic
22. **Grapes** – not a cooked plant product
23. **Green pepper** – not a cooked plant product
24. **Hard roll** – not enough water available to bacteria
25. **Hot dog bun** – not enough water available to bacteria
26. **Jelly** – too acidic
27. **Lettuce** – not a cooked plant product
28. **Mustard** – too acidic
29. **Orange** – not a cooked plant product and also too acidic
30. **Orange juice** – too acidic
31. **Peach** – not a cooked plant product
32. **Peanut butter** – not enough water available to bacteria
33. **Peanut butter and jelly sandwich** – not enough water available to bacteria
34. **Peanuts** – not enough water available to bacteria
35. **Pear** – not a cooked plant product
36. **Pickle** – too acidic
37. **Pie** – the apple is too acidic
38. **Pineapple** – not a cooked plant product
39. **Popcorn** – not enough water available to bacteria
40. **Potato chips** – not enough water available to bacteria
41. **Pretzels** – not enough water available to bacteria
42. **Raisins** – not enough water available to bacteria and also too acidic
43. **Rye crackers** – not enough water available to bacteria
44. **Saltine crackers** – not enough water available to bacteria
45. **Snack crackers** – not enough water available to bacteria
46. **Snow peas (raw)** – not a cooked plant product
47. **Soft drink** – too acidic
48. **Spinach** – not a cooked plant product
49. **Strawberries** – not a cooked plant product

50. **Sugar** – not enough water available to bacteria
51. **Sunflower seeds** – not enough water available to bacteria
52. **Tomato juice** – too acidic
53. **Tomato** – not a cooked plant product
54. **Tortilla chips** – not enough water available to bacteria
55. **Tossed salad** – not a cooked plant product

Student Activity Sheet
Lunch Bag Choices - Lesson 3

Materials

Paper lunch bags
Picture of a cold pack
Picture of a thermos
Pictures of food

Directions

1. Each group should obtain 2 lunch bags, 1 picture of a cold pack, 1 picture of a thermos, and pictures of food.

2. Place the pictures of the thermos and the cold pack in one of the bags.

3. Separate the pictures of foods into risky foods (those foods which need to be either kept cold or hot to prevent bacterial growth) and non-risky foods. **Note:** ***Remember that risky foods include:***

   - Foods from an animal source (examples: eggs, milk, meat, fish and poultry)

   - Foods from a plant source that have been cooked (examples: cooked potatoes, cooked rice, and cooked pasta).

   - Raw seed sprouts (examples: alfalfa sprouts and bean sprouts)

   - Cut melons (examples: watermelon, cantaloupe, and honeydew)

4. List the foods that you have determined to be risky foods. Explain why you decided that they are risky.

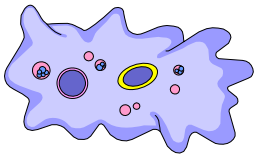
Name of Risky Food	Reasoning for Decision
Example: Cooked Rice	This is a cooked food from a plant source.
1.	
2.	
3.	
4.	

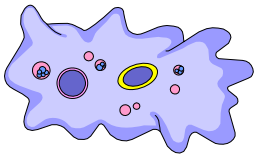
5.	
6.	
7.	
8.	
9.	
10.	

5. List the foods that you have determined to be non-risky foods. Explain why you decided that they are non-risky. Non-risky foods may include foods that you usually refrigerate because they taste better cold or their quality is better if they are kept refrigerated. They don't have to be kept cold to prevent foodborne illness. Some examples of non-risky foods that you might normally refrigerate are; strawberries, grapefruits, ketchup (too acidic for bacteria to grow) and pancake syrup (this contains enough sugar to combine with the water, so there isn't enough water available to bacteria to grow). When you're not sure whether a certain food has to be refrigerated or not, always refrigerate the food. It is better to be safe than sorry!

Name of Non-Risky Food	**Reasoning for Decision**
Example: Raw carrots	It is from a plant source, but it hasn't been cooked.
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

6. Share your decisions with the rest of the class. Be prepared to discuss why you made the decisions that you did.





Student Activity Sheet
Word Scramble – Lesson 3

Directions: Unscramble the words listed at the bottom of the page and use them to fill in the blanks.

1. _____ In order to grow, bacteria need this in addition to food, time, and a nice environment.

2. _____ A living single celled organism that causes most of the foodborne illnesses.

3. _____ This microorganism is sometimes used in food processing, such as in the manufacturing of Blue Cheese.

4. _____ Bacteria, viruses, parasites, yeasts and molds are types of these.

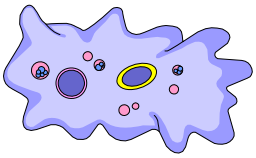
5. _____ These are very small and are commonly spread through poor handwashing practices.

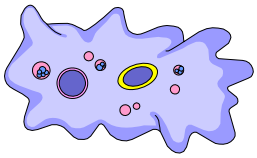
6. _____ A single celled organism used to make wine, beer, and bread.

7. _____ A disease that is caused by pathogenic microorganisms in foods.

8. _____ The temperature range of 40°F. To 140°F.

RWTAE	NEOBDOFRO SISLNEL	MMNRIIOOSCGARS
RDGANE EZNO	STAEY	RSSEUVI
DMOL	RTBAACEI	





Student Activity Sheet
Word Scramble – Lesson 3

Directions: Unscramble the words listed at the bottom of the page and use them to fill in the blanks.

1. _____Water_____ In order to grow, bacteria need this in addition to food, time, and a nice environment.

2. _____Bacteria_____ A living single celled organism that causes most of the foodborne illnesses.

3. _____Mold_____ This microorganism is sometimes used in food processing, such as in the manufacturing of Blue Cheese.

4. _____Microorganisms_____ Bacteria, viruses, parasites, yeasts and molds are types of these.

5. _____Viruses_____ These are very small and are commonly spread through poor handwashing practices.

6. _____Yeast_____ A single celled organism used to make wine, beer, and bread.

7. _____Foodborne Illness___ A disease that is caused by pathogenic microorganisms in foods.

8. _____Danger Zone_____ The temperature range of 40°F. To 140°F.

RWTAE	NEOBDOFRO SISLNEL	MMNRIIOOSCGARS
RDGANE EZNO	STAEY	RSSEUVI
DMOL	RTBAACEI	

Food Irradiation:

Ensuring Your Food's Safety

The International Food Irradiation Symbol – The Radura

Treated with Radiation
Treated by Irradiation

www.cfs.purdue.edu/extension/irradiation

Purdue Extension
Knowledge to Go
1-888-EXT-INFO

Current food applications

- **Spices, herbs, dehydrated vegetables and seasoning mixtures**
- **Strawberries**
- **Papayas**
- **Mangos**
- **Potatoes**
- **Mushrooms**

Consumers are Already Buying Irradiated Products!

- Band-Aids
- Pet Treats
- Cosmetics
- Baby bottles
- Computer Chips
- Feminine Products
- Baby Diapers
- Wound Care
- 50% of all medical devices
- Animal vaccines

Big Fears Versus Real World Risks

When you think of risk, you usually think: What are my chances of ___? It's healthy to put your risks in perspective, to see which are bigger or smaller. (Remember, these numbers are for the average American, and everyone's individual risk will vary. The numbers are intended to give a general perspective, not an actual statement of individual risk.)

The Fear	The Real Risk
Terror attack	Too small to calculate
Deadly shark attack	1 in 280 million
Deadly anthrax attack	1 in 57 million
Getting sick from anthrax	1 in 22 million
Deadly airplane accident	1 in 3 million
Shot by a sniper	1 in 517,000
Losing your job	1 in 252
Home burglary at night	1 in 181
Developing cancer	1 in 7
Catching a foodborne illness this year	**1 in 4**
Catching a sexually transmitted disease	1 in 4
Developing heart disease	1 in 4
Dying 5-10 years early if you're overweight	1 in 4
Death from tobacco related illness (smokers)	1 in 2

Chart source: David Ropeik, Harvard Center for Risk Analysis

Student Glossary

Bacteria – Living single celled microorganisms that can be spread by food, water, wind, insects, plants, animals and people. Bacteria survive well on skin and clothes and in human hair. They also thrive in the mouth, nose, throat, intestines and in certain foods held at room temperature.

Centers for Disease Control and Prevention (CDC) – A government agency that is concerned with the cause, spread and control of diseases.

Contamination – The presence of pathogenic microorganisms or harmful substances in food.

Cross-Contamination – The transfer of harmful microorganisms from a contaminated food or other source to food.

Dehydrated foods – Foods from which the water has been removed.

Escherichia coli (E. coli) O157:H7 – Bacteria which can cause bloody diarrhea, abdominal cramps, fever, and vomiting. In children under five and in the elderly, it can cause kidney failure and possibly death. This organism is often associated with undercooked hamburger, unpasteurized milk, unpasteurized apple juice or cider, raw fruits and vegetables, and contaminated water.

Foodborne Illness – Disease that is caused by pathogenic microorganisms in food.

Incubation Period – The time period from when a person consumes the contaminated food until they develop symptoms of illness.

Irradiation – The process of exposing food to controlled levels of ionizing radiation to kill harmful bacteria, pests or parasites, or to preserve its freshness.

Listeriosis – A disease caused by a bacteria that can produce mild flu-like symptoms in healthy individuals. In pregnant women, newborns and people with weakened immune systems, the bacteria can cause septicemia, meningitis, encephalitis, and miscarriages/stillbirths.

Microorganism – A very small life form-invisible to the naked eye. Bacteria, viruses, parasites, yeasts, and molds are types of microorganisms.

Molds – These organisms have many cells that make up a tangled mass of thread like structures. Some molds are used in food processing such as the manufacturing of Blue cheese. Molds are also involved in food spoilage and some molds produce poisonous substances in food that can cause serious health problems.

Norwalk-like virus – A small round virus that can cause diarrhea, nausea, vomiting, abdominal cramps, headaches and low grade fever.

Pathogenic – Disease causing.

pH – The measure of the acidity or alkalinity of a substance. The pH scale ranges from 0 to 14. A pH of 7 is neutral. Distilled water has a pH of 7. As the pH goes below 7 the substance becomes more acidic and as the pH goes above 7 the substance becomes more alkaline. Bacteria does not grow very well in foods with a pH of 4.6 or less. Some foods that have a low pH include soda pop, vinegar, ketchup, mustard and orange juice.

Risky Foods – Foods in which bacteria will readily grow. Risky foods include:

1. Foods from an animal source (both raw and cooked). Examples include eggs, meat, fish, and poultry.

2. Foods from a plant source that have been heat treated or cooked. Examples include baked potatoes, mashed potatoes, cooked beans, cooked macaroni, and cooked rice.

3. Raw seed sprouts. Examples include alfalfa sprouts and bean sprouts.

4. Cut melons. Examples include watermelon, cantaloupe and honeydew.

These foods will not be risky if they are too acidic (such as catsup or sauerkraut) or if they do not have enough water available (such as cereal) for bacteria to grow.

Salmonella enteritidis – Bacteria which can cause nausea, vomiting, abdominal cramps, diarrhea, fever, chills, and headaches. CDC estimates that 75% of Salmonella enteritidis foodborne illness outbreaks are associated with the consumption of raw or inadequately cooked eggs.

Temperature Danger Zone – The temperature range in which bacteria grow best; 40° F to 140° F (approximately 4° C to 60° C).

Viruses – Viruses are much smaller than bacteria. When viruses are in a food, they are simply there and do not replicate or increase in number. The virus will only multiply after it is consumed by a living organism. The virus can then take over the organism's cells and produce millions of new viruses.

Yeast- A single celled organism. Yeasts are typically larger than bacteria. They are used to make wine, beer, and bread. They are not associated with foodborne illness, but can cause spoilage problems in foods such as sauerkraut, fruit juices, syrups, jellies, meats, beer and wine.

The Temperature Danger Zone
Lesson 4

Lesson Goal: **The students will be able to relate the relationship of time and temperature to food safety.**

Time: **45 minutes.**

Content Standards: **Area Eight: Decision Making**

Objectives: **The students will be able to**

- **Define the term "temperature danger zone".**
- **Explain how time and temperature affect food safety.**
- **Explain why raw animal products should be cooked thoroughly before they are eaten.**
- **Explain how to properly thaw foods.**
- **Explain how to properly cool foods.**
- **Discuss reheating.**

Materials: Letters for parents
Home Food Safety Quiz
Home activity sheet

Teacher Glossary:

1. **Terms related to bacteria and the temperature danger zone.**

   a. *Escherichia coli (E. Coli) O157:H7* – Bacteria which can cause bloody diarrhea, abdominal cramps, fever, and vomiting. In children under five and in the elderly, it can cause kidney failure and possibly death. This organism is often associated with undercooked hamburger, unpasteurized milk, unpasteurized apple juice or cider, raw fruits and vegetables, and contaminated water.

   b. *Salmonella enteritidis* – Bacteria that can cause nausea, vomiting , abdominal cramps, diarrhea, fever, chills, and headaches. CDC estimates that 75% of *Salmonella enteritidis* foodborne illness

outbreaks are associated with the consumption of raw or inadequately cooked eggs.

c. *Temperature Danger Zone* – The temperature range in which microorganisms grow best; 40°F to 140°F(4°C to 60°C).

Procedure:

1. How do time and temperature affect food safety?

Script: As we discussed in Lesson Three, bacteria require food, water, time and a nice environment (low acidity and the right temperature) in order to grow. Because of water availability, acidity, and other factors, bacteria will grow in some foods, but not in others. The foods in which bacteria will grow include foods from animal sources, cooked foods from a plant source, raw seed sprouts, and cut melons. We have been referring to these foods as risky foods. To prevent bacterial growth, we must try to keep risky foods out of the temperature danger zone of 40°F to 140°F. Freezing or refrigerating foods will slow or stop the growth of bacteria, but will not kill bacteria. Maintaining foods at temperatures of 140°F or above will also stop the growth of organisms. The only way to kill bacteria is by thoroughly cooking the food. You cannot kill bacteria by refrigerating or freezing. Irradiation is another method of killing bacteria in food.

It would be great if risky foods were never in the temperature danger zone, however that isn't always possible. Foods must pass through this zone when they are cooked, cooled, and reheated. We can't prevent the foods from passing through this temperature danger zone, but we can limit the time that we keep risky foods in this zone. By limiting the time that these foods are in this danger zone, bacteria are not given enough time to grow and make us sick. Remember, bacteria doubles every 20 minutes!

Activity:

See Leader Instruction Sheet: Balloon Blow Up Activity

<u>NOTE: This experiment should be done at this point in the lesson to give the balloons time enough to expand (about 20 minutes).</u>

- Activity #1: Balloon Blowup Activity (Bacterial Growth)

2. Why should raw animal products be cooked thoroughly?

Script: Many of the raw food products that come from animal sources, such as meat, poultry, fish, and eggs, may contain microorganisms that can make us sick. Some of these products may be contaminated with microorganisms from the very beginning, as in the case of Salmonella enteritidis which may be present in eggs when they are laid by the chicken. Other products may become contaminated when they are slaughtered and processed, as in the case of Escherichia coli O157:H7 in ground beef. We make these foods safe by properly cooking the foods to kill these harmful microorganisms. When we eat animal products that are either raw (such as raw eggs in cookie dough) or not cooked thoroughly (such as a hamburger that is still pink in the middle), we run the risk of becoming ill with a foodborne illness. To reduce the risk of foodborne illness, food products that come from animal sources should always be properly cooked.

3. Thawing Foods

Script: Risky foods should never be thawed at room temperature, because this allows the temperature of the outside layer of the food to enter the temperature danger zone, even though the center may still be frozen. If you were thawing a turkey on a countertop, the temperature of the legs of the turkey could be at 50°F, even though the rest of the turkey could still be frozen. Risky foods should be thawed either in the refrigerator or in the microwave. Do not thaw foods by putting in a sink with standing water – it is not safe.

4. Cooling Foods

Script: When hot foods are cooled, they must pass through the temperature danger zone. To limit the time that risky foods are in the temperature range of 40°F to 140°F, we must try to cool these foods as quickly as possible. Do not allow hot foods to cool at room temperature before putting them in the refrigerator or freezer. We want to get the food out of the temperature danger zone as soon as possible. Some things that you can do to help cool hot foods faster include:

- Put foods into smaller containers and then refrigerate.
- When placing hot food in the refrigerator, don't cover foods tightly until after they are cooled, it traps the steam inside.
- Chill large containers of hot food in an ice bath in the kitchen sink and stir often.

5. Reheating Foods

Script: When foods are reheated, they must pass through the danger zone again. Reheating should be done quickly (not in slow cookers or crock pots) and should only be done once. By the time the food has been reheated once, it has already passed through the temperature danger zone two times, once when it was cooled and again when it was reheated. Each time risky foods pass through the danger zone, the chance for bacteria to grow and cause problems is increased. Foods should be thoroughly reheated to kill off bacteria that might have grown during the cooling process.

If risky foods are left out at room temperature for more than two hours, they should no longer be considered safe to eat and should be thrown away. There is no way to make the food safe again. Cooking, refrigerating or freezing food after it has been in the temperature danger zone for too long does not make the food safe again. Cooking will destroy the bacteria, but it doesn't necessarily destroy the poisons that may have been produced by bacteria during growth.

Assessment: At the end of the lesson, ask the students to respond to the following questions:

- How do time and temperature affect food safety?
- Why should you never eat raw meat, eggs, poultry or fish?

Activity: **Take home activity:**

- Jody's Submarine Sandwich

Handouts: Send home parent letters with Home food Safety Quiz.

Leader Instruction Sheet
Activities for Lesson 4

Activity #1: **Balloon Blowup Activity**

Materials:

Student Activity Sheets	Three balloons
3-600 ml beakers	2-250 ml flasks
Three labels	Thermometer
¼ cup of sugar	One package of dry yeast
Room temperature water (about 80EF)	Warm water (about 130EF)
Ice water (below 40EF) and ice cubes	One spoon

*Note – Beakers and flasks can be borrowed from school science lab.

Display Model: Set up a display of two beakers with water at the half way mark and two flasks placed in the beakers with balloons over the openings of the flasks. This helps the students visualize what their end product should look like and speeds the process.

Procedure: ***Script:*** Today's activity will demonstrate that we can control the growth of microorganisms like bacteria and yeast by controlling their temperature. One flask of yeast will be chilled with ice to maintain the temperature at 40°F or less. The other flask will be held at about 130°F. As the yeast grows, it produces a gas and the balloon will inflate. In which flask do you think the yeast will grow and cause the balloon to inflate? Why?

1. Have a group of students do the experiment.

2. Give the group the following items:

Student Activity Sheets	Two balloons
Three 600 ml beakers	Two 250 ml flasks
Three labels (masking tape)	1/4 cup of sugar
1 package of yeast	One spoon
Thermometer	

3. Instruct the students to label the beakers:

   Mixing Beaker"
   "Warm Water Bath"
   "Ice Water Bath"

4. Instruct the students to fill the ice water beaker with water and ice cubes to the half way mark on the beaker. Temperature must be below 40EF. The students should use a thermometer to measure the temperature of the water. Set aside.

5. Instruct the students to fill the mixing beaker with 500 ml of room temperature water – 80oF (will feel cool.) The students should use a thermometer to measure the temperature of the water.

6. Instruct the students to add the sugar to the "mixing beaker" and stir until the sugar is dissolved.

7. After the sugar has dissolved, instruct the students to add the packet of yeast to the sugar/water mixture and stir until dissolved – will take about one minute of stirring to dissolve. Instruct the students to pour half of this mixture into each one of the two flasks shaking the mixture several times as they pour it into the flasks.

8. Instruct the students to put enough warm water to fill to <u>half way</u> mark of third "warm water" beaker. Use thermometer to measure water at 130oF. <u>Cannot be warmer than 130oF</u>.

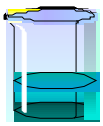
9. Ask the students to fill the balloons with some air to stretch, and then allow the balloons to deflate. Instruct the students to carefully stretch the balloon openings to fit over the openings of the two flasks.

10. Have students put flasks in the two beakers – the warm water and the ice water.

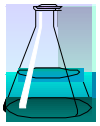
11. Instruct the students to observe and record what happens after 5 minutes, after 10 minutes, after 20 minutes, and after 1 hour (This last observation may have to be made by the teacher)

Student Activity Sheet
Balloon Blowup Activity - Lesson 4

Materials:



(Beaker)



(Flask)

Student Activity Sheets
Three 600 ml beakers
Three labels
1 package of yeast
1 Thermometer

Two balloons
Two 250 ml flasks
¼ cup of sugar
One spoon
Water (room temperature, ice water, and warm water

Directions: Each student in the group can do one of the steps below – goes faster

1. Label the beakers:
   "Warm Water Bath"
   "Ice Water Bath"
   "Mixing beaker"

2. Fill the ice water beaker with water and ice cubes to the half way mark on the beaker. Temperature must be below 40°F. Set aside.

3. Fill the mixing beaker with 500 ml of room temperature water--80°F (will feel cool.) Use a thermometer to measure the temperature of the water.

4. Add the sugar to the mixing beaker and stir until the sugar is dissolved.

5. After the sugar has dissolved, add the packet of yeast to the sugar/water mixture and stir until dissolved–will take about one minute of stirring to dissolve. Pour half of the mixture into each one of the two flasks.

6. Put enough warm water to fill to half way mark of third "warm water" beaker. Use thermometer to measure water at 130°F. Cannot be warmer than 130°F.

7. Fill the balloons with some air to stretch, and then allow the balloons to deflate. Carefully stretch the balloon openings to fit over the openings of the two flasks.

8. Place the two flasks into the two beakers(warm water and ice water.) Can add ice to cold beaker if have room.

9. Observe and record what happens after 5 minutes, after 10 minutes, after 20 minutes, and after 1 hour (This last observation may have to be made by the teacher)

	5 minutes	10 minutes	20 minutes	1 hour
Warm Water Bath				
Ice Water Bath				

10. What do you think will happen to the balloon on the ice water flask, once the ice has melted and the temperature of the water increases?

Student Activity Sheet
Alternate Bad Germs Yeast Experiments
Lesson 4

Alternate #1 – Clemson University Extension

3 small dishes	Yeast
Water	3 packets of yeast
Ice	

Put ¼ cup of lukewarm water in 1st dish, ¼ cup boiling water in 2nd dish, and ¼ cup ice water in the 3rd dish. Read the yeast label to see if you need to add sugar to help yeast grow.

In a few minutes you should have dramatic evidence that yeast grows faster at room temperature than at hot or cold temperatures. This is because you started with billions of live yeast cells, and at the right temperature yeast produces a lot of gas (carbon dioxide) that makes it bubble and rise. It demonstrates how fast "germs' can grow.

Most bacteria do not produce gas to bubble and rise and most foods do not have as many bacteria on them as the amount of yeast that you started with, but it also takes fewer bacteria to make people sick.

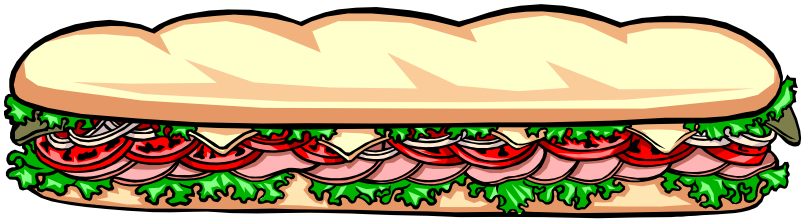
Alternate #2 – Patty Garcia, Norman County Extension

3 glass jars with lids	Yeast
Sugar	Thermometer
Hot water – over 140 degrees	Warm water – 110 degrees
Ice water	

Place 1 tsp. Of yeast and 2 tsp. Of sugar in each jar.
Microwave or heat 2 cups of water to over 140 degrees.
Add 2 cups of ice water, 2 cups of the hot water and two cups of warm water to each jar. Cover, shake well and then **UNCOVER** all three jars to prevent explosion. In about 20 minutes, observe rate at which the "bacteria" has grown or not grown and why.

Free yeast and disposable strip thermometers may be available from the Red Star Yeast Company.

Student Activity Worksheet
Jody's Submarine Sandwich - Lesson 4



Directions: As you read through the story on your activity sheet, note any possible food safety problems.

It was 12 o'clock noon on a hot summer day when Jody's father took her to the local submarine sandwich shop for lunch. Jody was only able to finish half of her turkey, cheese, tomato and lettuce sandwich while at the shop. She took the rest of it with her to eat later. On the way home she was thinking about all the chores that she had to finish before she could go to the movies that evening. In a rush, she left the sandwich in her father's car and ran into the house. It was 1:30 by the time Jody entered the house.

Jody was just getting started on her chores when her friends called. By the time they finished talking about the movie they were going to see, and the clothes they were going to wear, an hour had already passed.

At 3:00 p.m., Jody finally started her chores. She had to clean her room, feed the dog, and take out the garbage. It was 6:00 p.m. before she finished. Jody then showered and got dressed for her big night out. By this time it was 7:00 p.m. and Jody was getting hungry. She remembered that her sandwich was still in the car. She ran out to the car and brought the sandwich inside. The sandwich was a little warm and the lettuce was a little wilted, but otherwise the sandwich looked fine. Jody quickly ate the sandwich and left the house to meet her friends for the moving.

Answer the following questions:

1. Do you think the sandwich was safe to eat?

   If not, why?

2. How might Jody feel during the next day or two?

3. If there were 5 bacteria in the sandwich when it was made, and if the bacteria doubled in numbers every 20 minutes, how many bacteria would there have been in the sandwich by the time Jody ate it at 7:00? Complete the following chart:

Time of Day	Number of Bacteria
12:00 noon	5
12:30 p.m.	10
12:40 p.m.	20
1:00 p.m.	40
1:20 p.m.	
1:40 p.m.	
2:00 p.m.	
2:20 p.m.	
2:40 p.m.	
3:00 p.m.	
3:20 p.m.	
3:40 p.m.	
4:00 p.m.	
4:20 p.m.	
4:40 p.m.	
5:00 p.m.	
5:20 p.m.	
5:40 p.m.	
6:00 p.m.	
6:20 p.m.	
6:40 p.m.	
7:00 p.m.	

4. How many bacteria did Jody ingest when she ate her sandwich?

Jody's Submarine Sandwich Key

1. Do you think the sandwich was safe to eat? **No**

2. If not, why? **The turkey and cheese are risky foods. The sandwich should have been refrigerated as soon as Jody got home.**

3. How might Jody feel during the next day or two? **Jody could be sick with vomiting, diarrhea, and nausea.**

4. If there were 5 bacteria in the sandwich when it was made, and if the bacteria doubled in numbers every 20 minutes, how many bacteria would there have been in the sandwich by the time Jody ate it at 7:00? Complete the following chart:

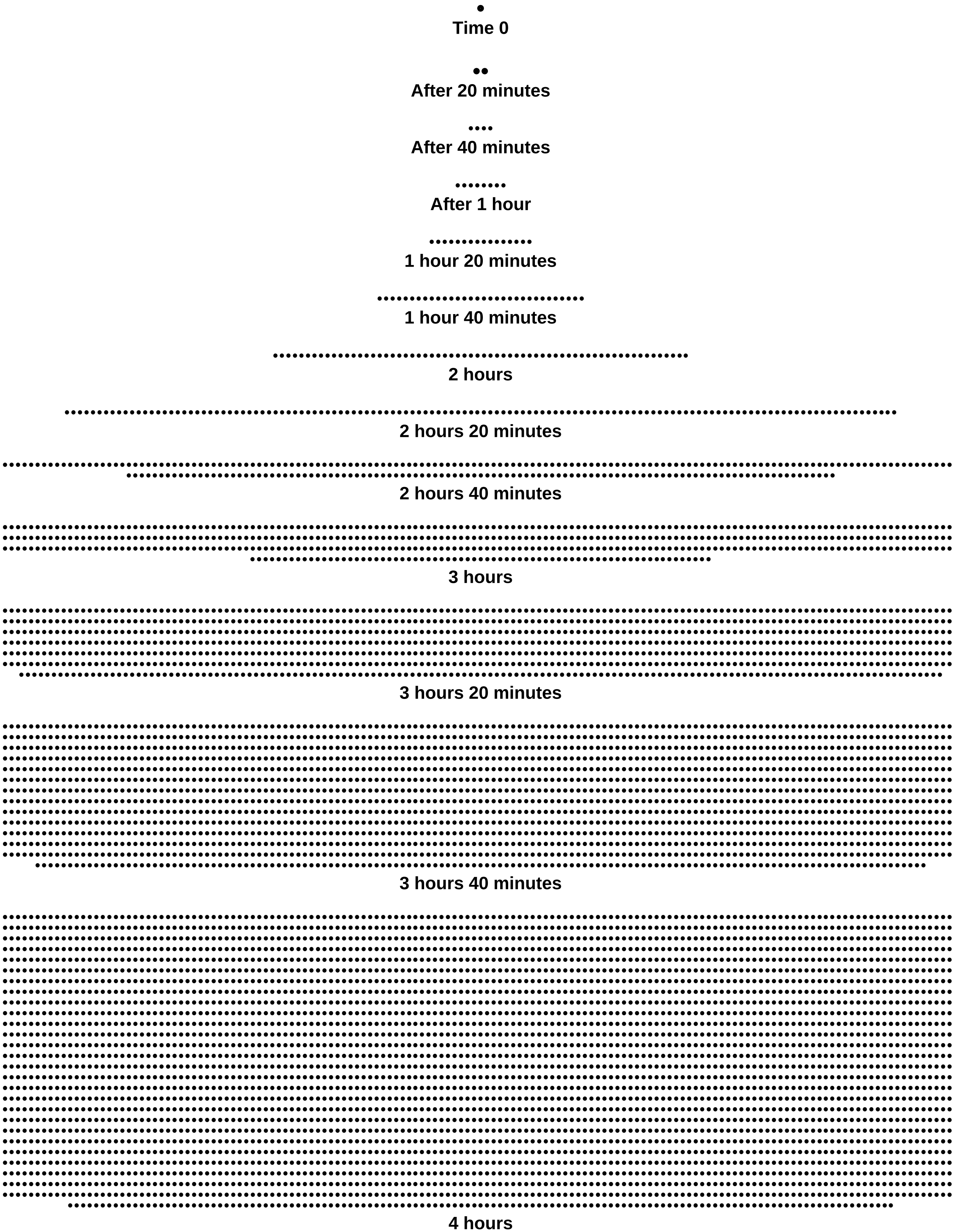
Time of Day	Number of Bacteria
12:00 noon	5
12:30 p.m.	10
12:40 p.m.	20
1:00 p.m.	40
1:20 p.m.	80
1:40 p.m.	160
2:00 p.m.	320
2:20 p.m.	640
2:40 p.m.	1280
3:00 p.m.	2560
3:20 p.m.	5120
3:40 p.m.	10,240
4:00 p.m.	20,480
4:20 p.m.	40,960

4:40 p.m.	20
5:00 p.m.	40
5:20 p.m.	80
5:40 p.m.	160
6:00 p.m.	320
6:20 p.m.	640
6:40 p.m.	1280
7:00 p.m.	2560

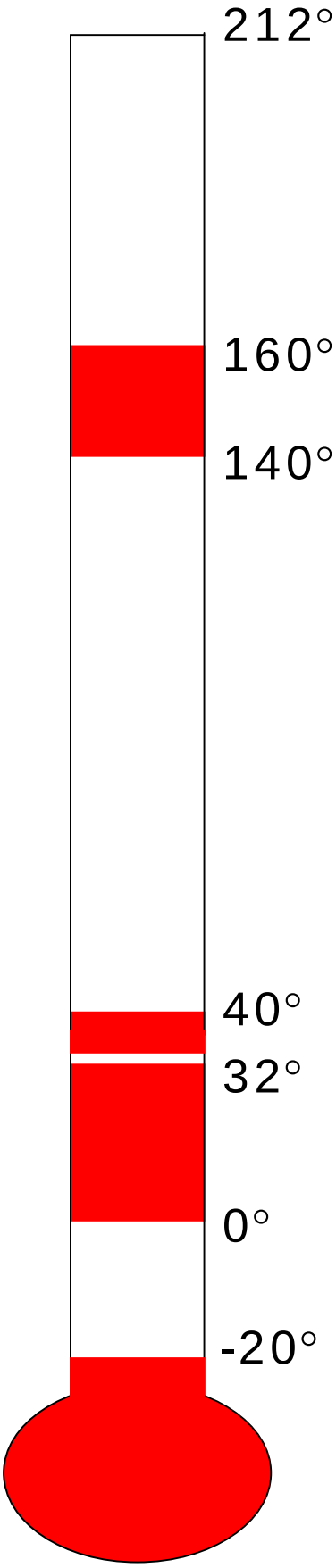
5. How many bacteria did Jody ingest when she ate her sandwich?

10,485,760 – Over 10 million!

Bacteria Doubles Every 20 Minutes



Temperature Is Important To Keep Food Safe



160° - 212°_____

140° - 160°_____

40° - 140°_____

32° - 40°_____

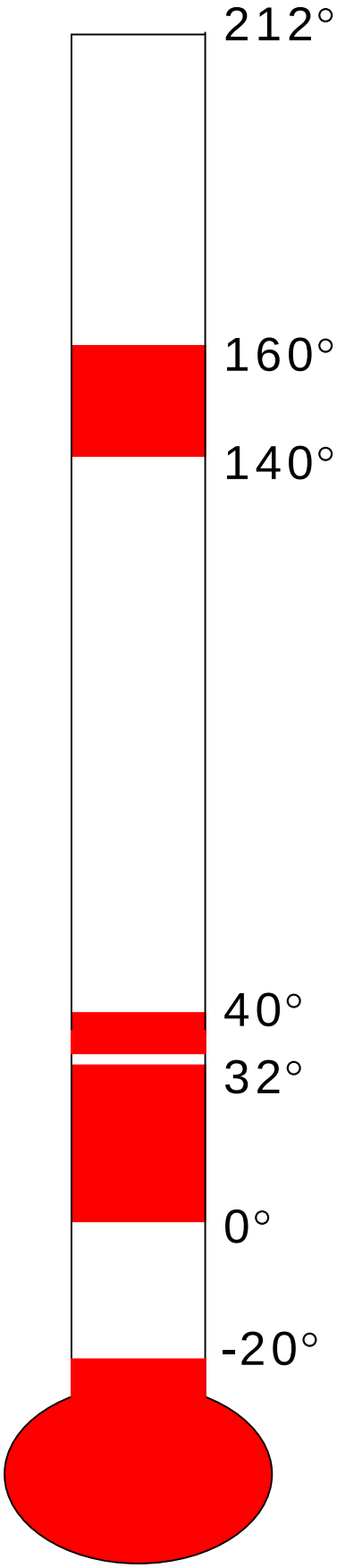
-20° - 0°_____

Put these terms next to temperatures above:
Color in the Temperature Danger Zone in red.

- ***Refrigerator temperature-will not kill bacteria**
- ***Hot enough to prevent most harmful bacteria from growing**
- ***Temperature Danger Zone**
- ***Freezer temperature-will not kill bacteria**
- ***Hot enough to kill most harmful bacteria**

Temperature Is Important To Keep Food Safe

ANSWER KEY



160° - 212° **Hot enough to kill most harmful bacteria**

140° - 160° **Hot enough to prevent most harmful bacteria from growing**

40° - 140° **Temperature Danger Zone**

32° - 40° **Refrigerator temperature**

-20° - 0° **Freezer temperature**

Sample Parent Letter

Dear Parent or Guardian:

Today was lesson four of **Safe or Sorry** – the food safety program in your child's class. The students learned about the food temperature ***Danger Zone*** (40 to 140 degrees Fahrenheit). They also learned the importance of time and temperature for keeping food safe. They discovered that cooking foods thoroughly can prevent foodborne illness.

At the end of the lesson, students were able to determine the conditions which cause bacteria to grow in food. Working in teams, they completed an experiment using yeast water to show how fast bacteria can grow if food is not kept at the correct temperatures.

Enclosed is the food Safety Quiz which was used at the Minnesota State Fair.

Sincerely,

Test Your Home Food Safety Knowledge

1. It is okay to eat hamburgers that are pink, but not red, in the middle. True or False?

2. Fruits and vegetables should be washed with running water before eating. True or False?

3. Choosing chicken and ground meat treated with irradiation will decrease your chances of getting foodborne illness. True or False?

4. Food containing bacteria that causes foodborne illness always smells, looks or tastes bad. True or False?

5. Frozen meat, poultry or fish products should be defrosted in the refrigerator or microwave. True or False?

6. You should always use a thermometer to test the doneness of whole chicken or turkey. True or False?

7. The temperature of your home refrigerator should be 40 degrees F. or less. True or False?

8. You will feel sick within 24 hours of eating contaminated food if you have a food borne illness. True or False?

9. As long as you rinse your cutting board before you use it to cut a different type of food, you won't have any problems.
   True or False?

10. When you wash your hands you should
    A. wash for at least 20 seconds (sing "Happy Birthday" twice)
    B. scrub well and rinse under running water
    C. use soap
    D. all of the above

Answers ☞☞

Check your food safety knowledge:

1. **False. Ground meat needs to be cooked until the juices run clear and there is no pink inside. If you use a thermometer, the internal temperature should be at least 160 degrees F. It is especially important to cook ground beef thoroughly to be sure that harmful bacteria like e.coli are killed.**

2. **True. It is important to wash fruits and veggies with water only. You can scrub them with a brush if they have a firm skin or hard rind like potatoes or melons. For more fragile fruits and veggies like berries or broccoli, fill a bowl or clean container with enough cool water to cover the produce. Let soak for a couple minutes. Drain and rinse under running water. The running water washes the dirt and bacteria off your fruits and veggies and down the drain.**

3. **True. Irradiation, or "ionizing pasteurization" destroys many bacteria in food that can make you sick.**

4. **False. Many bacteria that cause foodborne illness can be present in uncooked food in high enough numbers to make you sick before food looks, smells or tastes bad.**

5. **True. Experts recommend thawing foods in the refrigerator or microwave oven. Gradual defrosting overnight is best because it helps maintain the quality of the food. Foods defrosted in the microwave should be used immediately.**

6. **True. The thermometer measures the temperature of the inside of the chicken or turkey to be sure it has gotten hot enough (180 degrees F.) that most harmful bacteria like campylobacter and salmonella have been destroyed. Insert the thermometer into the inner thigh area near the breast of the chicken or turkey, but not touching the bone.**

7. **True. Your refrigerator should stay at 40 degrees F. or less because it slows the growth of most bacteria. The temperature won't kill the bacteria, but it will keep them from multiplying, and the fewer there are, the less likely you are to get sick from them.**

8. **False. If you or a family member develops nausea, vomiting, diarrhea, fever or cramps, you could have food borne illness. Depending on the illness, you can feel sick anywhere from 30 minutes to 2 weeks after eating bad food. Most often, people get sick within 4 to 48 hours after eating contaminated food.**

9. **False. Wash cutting boards, knives, utensils and counter tops in hot soapy water after preparing each food item and before going on to the next one. This is especially important after using the cutting board for meat or poultry. Be sure to wash your hands, too.**

10. **D. all of the above. By frequently washing your hands you wash away germs that you have picked up from other people or from contaminated surfaces. It is especially important to wash your hands before, during and after you prepare food, before you eat, after you use the bathroom or change diapers, and after handling animals or animal waste. Be sure to use warm water and soap and scrub well. It's the friction from the scrubbing that cleans your hands.**

For more info, check out the Minnesota Department of Health website
http://www.health.state.mn.us

It's All In Your Hands!
Lesson 5

Lesson Goal: **Students will understand the importance of handwashing for preventing foodborne illness.**

Time: **45 minutes**

Content Standards: **Area Eight: Decision-Making**

Objectives **The students will be able to:**

- **State why handwashing is important**
- **State when handwashing is important**
- **Demonstrate how to do a through handwashing**

Procedure:

1. **Suggestion: have a student read this lesson to the class.**

2. **Importance of handwashing**

   Script: Handwashing is one of the most important things we can do to prevent foodborne illness. Later in the lesson, we will do two experiments to prove how important it is.

3. **Do people really not wash their hands?**

   Script: **Researchers** hid in stalls or pretended to be combing their hair while observing men and women in public rest rooms across the nation.

   a. New York City: 40% did not wash in Penn train station.
   b. Chicago: 22% did not wash at the Navy Pier.
   c. New Orleans Casino: 29% did not wash.
   d. San Francisco Golden Gate Park: 31% did not wash.
   e. The worst was observed at an Atlanta Braves Game: 54% of men did not wash compared to 11% of women.
   f. Based on the study, women are cleaner than men: 74 % of women washed their hands compared to 61% of men.

4. Script: Why is handwashing important?

a. Prevents spreading germs to food or to another person
b. Germs are invisible on your hands
c. Germs can make you sick.
d. Hands are most exposed part of the body to germs.
e. Washing hands regularly can keep a person healthy.
f. 1996 Wirthlin research study of 305 school students reported that students who washed their hands four times a day had 51% fewer lost days to stomach upset.

5. Script: When is handwashing important?

a. Ask students to list things touched in one day – use any of the following to reinforce:
   - Before eating, preparing or serving food
   - Whenever hands look, feel, or smell dirty
   - After using the toilet
   - After handling raw meat, fish, poultry & before touching any other food
   - After changing diaper
   - When sick, after blowing your nose
   - Cough or sneeze – Germs get on hands from a sneeze (sneezing into the hands is not a good idea)-important to sneeze into sleeve.
   - After using common objects money, door knobs, computer keys, telephone, lockers, keys
   - After touching pet
   - After taking out the trash

Student Assessment

a. Why is handwashing important?
b. When is handwashing important

6. Two experiments

Script: Before we practice handwashing technique, we will do two experiments to prove the difference good handwashing makes.

Note: Go to Leader Instruction Sheet – Lesson 5

Leader Instruction Sheet
Lesson 5

Activities: **Bread in A Plastic Bag and Glitter Bug with Ultraviolet Light Stick**

Materials:

Glitter Bug Potion (pump)	VCR & handwashing videos
Ultraviolet light stick	Preservative-free bread (bakery)
Access to warm water	Sandwich bags, Permanent markers
Soap, Paper towels	SOS dancing/singing animal

Directions:

1. **Dirty hands on bread slice activity**

   a. Ask students to touch their desks, hair, faces to get their hands contaminated.
   b. Give each student a piece of bread or a half piece and instruct them to touch it all over–keeping it flat.
   c. Have students place bread slice in bag with two small drops of water. Seal shut.
   d. Label with name and date.
   e. Put all bread slices in a brown grocery bag and seal shut. Place in warm spot.
   f. Have one piece of bread as a "control" that was untouched.

   ***Note:** Takes about 5 days for good mold growth

2. **Handwashing experiment with *Glitter Bug Potion* and ultraviolet light**

   Warning: People with skin allergies should not use this lotion.

   a. Place 1 drop of *Glitter Bug Potion* in the palm of each student's hand, have them rub *Glitter Bug Potion* all over their hands and wrists as if they were applying hand lotion.
   b. Students observe "contaminated" hands under UV light.
   c. Instruct to wash hands **without any hints as to correct technique.**
   d. Have all students check hands with UV light for any residual *Glitter Bug Potion*.
   e. Point out areas commonly missed: cuticles, under nails, thumb and finger webs, wrists.

3. **Proper handwashing technique**

   Script: We will now look at videos which demonstrate proper handwashing. SOS Handwashing video – 3 minutes
   (junior high student demonstrates)
   Clean Hands–Safer Food video – 5 minutes (food service workers)

4. Demonstrate correct handwashing technique–overheads

Script: (Instructor talks through and demonstrates.) This is how you should wash your hands to get rid of all the germs that could get you sick & cause you to miss the big football game, a great party, a sleepover, a camping trip, a vacation. Friction while scrubbing hands and drying hands removes most of the germs.

Handwashing Technique:

Overheads to use while demonstrating the handwashing steps:

Ready....

Push up sleeves
Remove jewelry

Set....

Wet hands with warm running water
Apply soap

Go!!

Wash hands at least 20 SECONDS
Rub until you feel heat–friction helps remove bacteria
Wash 6 parts of the hands:

- **palms**
- **backs**
- **between fingers**
- **thumbs**
- **fingernails**
- **wrists**

Big Finish

Rinse well with fingertips pointed down
Dry hands briskly (friction is important) on paper or clean cloth towel
Turn off faucet with a paper towel (if available)
Do not wipe on pants as will put germs back on hands
Use towel to open public restroom door

5. **Students practice correct handwashing.**

   Have the hamster or some other method to time the practice–Say ABCs or Happy birthday twice. Remind: palms, backs, between fingers, thumbs, nails and wrists.

6. **Have students do actual handwashing.**

   a. Use singing animal as they wash their hands–each repetition of song is 20 seconds.
   b. All students use proper technique to wash hands for 20 seconds
   c. Remind them to be very careful not to touch anything when they are finished.
   d. Can recommend they can say ABCs or sing Happy Birthday twice–(both about 20 seconds.)

7. **Have students observe clean hands under ultraviolet light second time.**

8. **Have students observe bread slices** (takes 5 to 7 days)

   a. Compare differences among students' bread slices.
   b. What they will observe will be mold growth–not bacteria.
   c. Take bread slice to science class to observe under microscope.

Home Activity:

9. **Bread in bags at home**

   Instruct to try bread in bags on someone at home.

READY…

Push up sleeves

Remove jewelry

SET….

Wet hands with
Warm running water

Apply soap

GO!!

Wash hands at least 20 SECONDS

wash 6 parts of the Hands:

- ✌ **palms**
- ✌ **backs**
- ✌ **between fingers**
- ✌ **thumbs**
- ✌ **fingernails**
- ✌ **wrists**

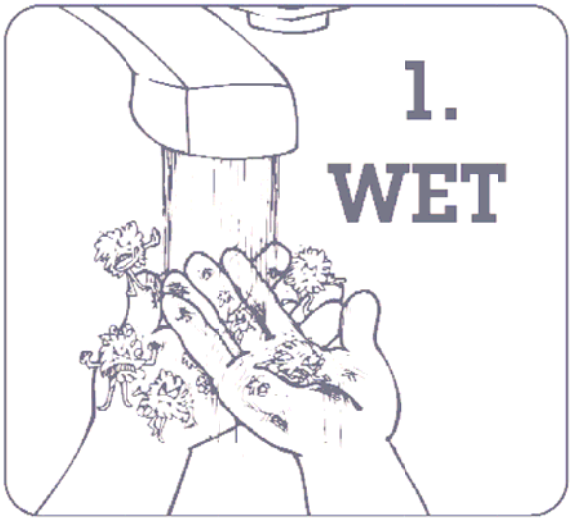
Big Finish

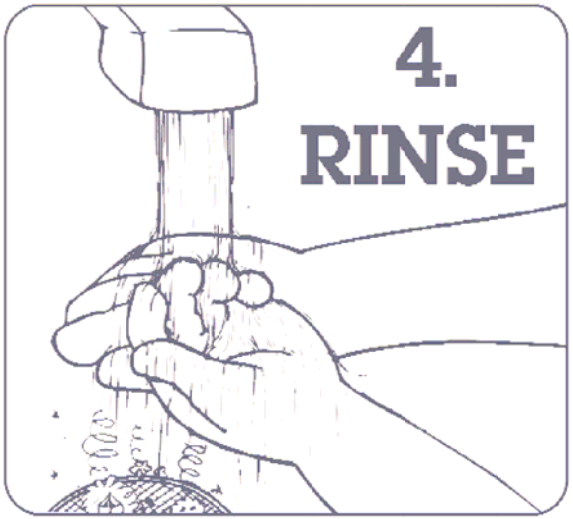
Rinse well

Dry hands briskly on paper towel or clean cloth towel

Be a Germ-Buster…

WASH YOUR HANDS!





Food Safety Center
121 East 7th Place, St. Paul, MN 55101
www.health.state.mn.us

Adapted with permission from Washington State Department of health

"The Chicken Who Crossed the Lettuce" Contamination and Cross-Contamination Lesson 6

Lesson Goal: **Students will understand that proper food handling will prevent contamination and cross-contamination resulting in foodborne illness.**

Time: **45 Minutes**

Content Standards: **Area Eight: Decision-Making**

Objectives: **Students will be able to:**

- **Define contamination and cross-contamination.**
- **State five ways cross-contamination happens to foods.**
- **Describe five ways to prevent cross-contamination.**

Teacher Glossary:

a. *Food Contamination*: Harmful microorganisms present in or on food that make it dangerous to eat.
b. *Food Cross-Contamination*: The transfer of harmful microorganisms from a contaminated food (chicken) or other source (hands) to other food.

Procedure:

1. Leader introduction of topic

Prior to students arriving, sprinkle the rubber chicken with *Glitter Bug Powder* and spread Glitter Bug Potion on both sides of a slice of play-doh. As students arrive, pass rubber chicken around the room for all to touch without telling them about the *Glitter Bug Powder*.

Script: Today's food safety topic is cross-contamination and how it can cause foodborne illness. We will find out what contamination and cross-contamination are, what causes it and how to prevent it.

2. Define contamination and cross-contamination: (Overheads)

All food has the potential to be contaminated. Cross-contamination is the transfer of harmful organisms from a contaminated food to another food through unsafe handling.

Sometimes there are harmful microorganisms present in raw meat, poultry and fish and on fruits and vegetables. Cooking meats will kill the microorganisms and washing fruits and vegetables will remove some of them. The microorganisms can contaminate other foods. That's why it is so important to be careful.

3. How do foods become contaminated and cross-contaminated?

Ask students for their suggestions and then show overheads.

Unsafe food handling practices:

- Failure to wash hands before preparing food
- Working with food when ill
- Cutting raw meat on cutting board and not washing the board before cutting something else
- Touching raw meat and not washing hands before touching other food
- Using the same plate for cooked meat as used for raw meat
- Sharing water bottles or other drinks "backwash"
- Eating or drinking out of food containers in the refrigerator
- Not washing hands after sneezing or blowing nose
- Juices from raw meat dripping down on other food in refrigerator
- Touching food with hands instead of serving piece
- Preparing food with an open cut on the hands
- Using the same spoon to stir as to taste food
- Double dipping with chips or other foods
- Reusing plastic food bags
- Wiping dishes with dirty hand towel
- Pets licking dishes

Places microorganisms can hide:

- Pets or unclean book bags on counter tops or tables
- Dirty sink drains and counters
- Telephone and other often-touched items
- Unclean cooking utensils
- Unclean door and drawer handles
- Dirty can openers
- Contaminated dishcloth
- Unsanitized sponges and scrubbies

4. How can you prevent contamination and cross-contamination? (Use same overheads)

Ask students for their answers on how to prevent the examples of contamination and cross-contamination.

Student Assessment:

a. What is contamination and cross-contamination?

b. Name five ways food can become contaminated or cross-contaminated.

c. Name five ways contamination can be prevented.

Activities:

5. See Leader Instruction Sheet

a. "The Chicken Who Crossed the Lettuce" activity

b. Extra game "Solve the Mystery of What Happened When the Chicken Crossed the Lettuce!" Key to answers.

Leader Instruction Sheet
Contamination and Cross-Contamination
Lesson 6

Activity: **"The Chicken Who Crossed the Lettuce"**

Materials:

Cutting board
Rubber chicken
Play-doh (not white or yellow)
Knife
Overheads and projector
Telephone
Paper or cloth towel (dark color)
Glitter Bug Powder
Glitter Bug Potion
Ultraviolet light stick
Extension cord
Apple or other fruit

Procedure:

1. **How does cross-contamination happen?**

   Script: Now we are going to find out how cross-contamination actually happens.

   a. Take the play doh piece of "chicken", cut it up in order to cook it (wipe hands on hand towel after cutting chicken).
   b. Then cut up some play doh "lettuce".
   c. Answer the phone or touch apple or several things in the room with contaminated hands.
   d. Tell students to pretend that the chicken you cut up had bacteria.
   e. Use ultraviolet light stick to trace the contamination trail from the chicken to the other objects.
   f. How far did the contamination travel?
   g. Ask students to state how the contamination traveled.
   h. The knife got contaminated, then the lettuce got contaminated, the towel, hands, the phone and their objects.

2. **How could this example of cross-contamination have been prevented?**

   a. Ask students which steps could have been taken to prevent the cross-contamination.
   b. Ask students what steps they can take at home to prevent cross-contamination.

3. How do hands act as cross-contaminators?

a. Everyone had a chance to touch the "contaminated" rubber chicken.
b. Ask students: If your hands were contaminated from the rubber chicken you passed around, would you want to pick up an apple and eat it?
c. Tell them that you powdered the rubber chicken with fake bacteria (Glitter Bug Powder). Take ultraviolet light around room or have students come forward to observe their hands that touched the "raw" rubber chicken.
d. If their hands had really touched raw chicken, not washed their hands and then ate an apple, they could have caused cross-contamination and potential for foodborne illness.
e. Fruits and vegetables as well as meat can be contaminated. It is very important to always wash fruits and vegetables. Sometimes they are grown under unsafe conditions and may be contaminated.

(Overhead)

Contamination

The presence of substances or conditions in or on food that can be harmful to humans

Cross-Contamination

Transfer of harmful microorganisms from a contaminated food (chicken) or other source (hands) to food.

How Bad Germs Get On or In Food

Not washing hands

Coughing or sneezing On Food or hands

Eating or drinking Out of containers in The refrigerator

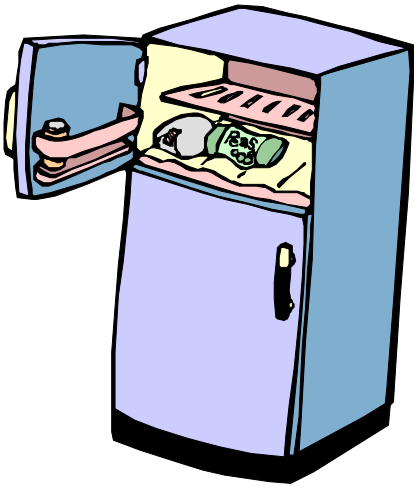
Drinking out of Someone else's Pop can or Water bottle

Dirty sink drains

Dirty can openers

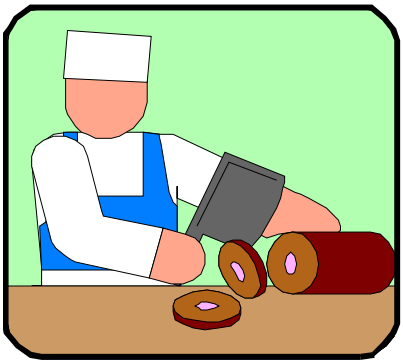
Ill people fixing food

Touching raw meat and then not washing hands



Raw meat dripping onto other food in refrigerator

Dirty counters



Using cutting board for raw meat and not washing before using it again

Touching food with hands instead of serving piece

Preparing food with an open cut on hands

Unclean cutting boards

Tasting food with same spoon as cooking with

Double dipping with chips or other food

Places where bacteria can hide

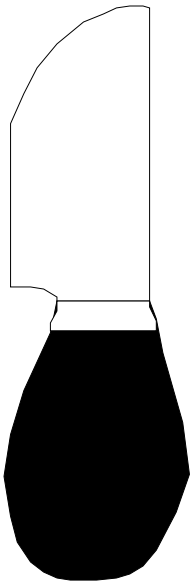
Pets or unclean book bags on counters

Telephone

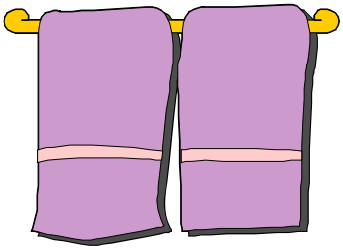
Raw meat on same plate as cooked meat

Reusing plastic food bags

Unclean knives



Using same towel for wiping hands and drying dishes

Unclean  dish cloths, sponges, scrubbies

Door handles and drawer pulls

Student Activity Sheet
Lesson 6

SOLVE THE MYSTERY OF WHAT HAPPENED when THE CHICKEN CROSSED THE LETTUCE

a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

Rob came home 1,6,20,5,18 school and was 19,20,1,18,22,9,14,7. He took some 3,8,9,3,11,5,14 out of the refrigerator. He placed it on the 3,21,20,20,9,14,7 2,15,1,18,4 and ran to answer the telephone. It was his 6,18,9,5,14,4 Mike telling him to turn on the 20,5,12,5,22,9,19,9,15,14 and that he was on his way over. They watched a one hour special on the 22,9,11,9,14,7,19. They had some 16,15,16 and 16,5,1,14,21,20,19.

When the program was over, Rob put the 3,8,9,3,11,5,14 on the 7,18,9,12,12. He then 3,8,15,16,16,5,4 some 12,5,20,20,21,3,5 on the 3,15,14,20,1,13,9,14,1,20,5,4 cutting board where he had cut the 3,8,9,3,11,5,14. The 7,21,25,19 sat outside and enjoyed their sandwiches, chips and pop. Then they called 23,5,14,4,25 and 10,15,4,25 to talk to them about meeting at the 6,15,15,20,2,1,12,12 game the next 14,9,7,8,20.

Rob did some 8,15,13,5,23,15,18,11 and talked to his dad about their upcoming 6,9,19,8,9,14,7 trip and 3,18,1,19,8,5,4.

The next morning, Rob felt 8,15,18,18,9,2,12,5. He 22,15,13,9,20,5,4 and had 4,9,1,18,18,8,5,1. He missed the football game because he had a 6,15,15,4,2,15,18,14,5 9,12,12,14,5,19,19.

When Rob cut the 12,5,20,20,21,3,5 on the dirty cutting board, he 3,15,14,20,1,13,9, 14,1,20,5,4 the lettuce with 13,9,3,18,15,2,5,19 from the raw chicken juice left on the cutting board. Even though he cooked the chicken and 11,9,12,12,5,4 the germs, the lettuce still had 12,9,22,9,14,7 microbes on it.

Rob solved the 13,25,19,20,5,18,25 of what happens when 18,1,23 chicken juices 3,18,15,19,19 lettuce–you 2,1,18,6! He was 12,21,3,11,25 – some types of foodborne illness can cause 4,5,1,20,8.

Answer Key

SOLVE THE MYSTERY OF WHAT HAPPENED when THE CHICKEN CROSSED THE LETTUCE

a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

Rob came home after school and was starving. He took some chicken out of the refrigerator. He placed it on the cutting board and ran to answer the telephone. It was his friend Mike telling him to turn on the television and that he was on his way over. They watched a one-hour special on the Vikings. They had some pop and peanuts.

When the program was over, Rob put the chicken on the grill. He then chopped some lettuce on the contaminated cutting board where he had cut the chicken. The guys sat outside and enjoyed their sandwiches, chips and pop. Then they called Wendy and Jody to talk to them about meeting at the football game the next night.

Rob did some homework and talked to his dad about their upcoming fishing trip and crashed.

The next morning, Rob felt horrible. He vomited and had diarrhea. He missed the football game because he had a foodborne illness.

When Rob cut the lettuce on the dirty cutting board, he contaminated the lettuce with microbes from the raw chicken juice left on the cutting board. Even though he cooked the chicken and killed the germs, the lettuce still had living microbes on it.

Rob solved the mystery of what happens when raw chicken juices cross lettuce – you barf! He was lucky – some types of foodborne illness can cause death.

"Crazy Cooks In The Kitchen" Video
Lesson 7

Lesson Goal	**Student review of Safe or Sorry curriculum.**
Time	**45 minutes**
Content Standards	**Area Eight: Decision-Making**
Objectives	**Students will be able to:** • **Use individual decision making to identify food safety mistakes in the skit.** • **Support reasons for identifying a behavior as a food safety mistake.** • **.Describe negative consequences of each of the food safety mistakes in the skit.**
Materials	VCR and Crazy Cooks video – 20 minutes Optional: Golf counters or score sheets for each student. Note: Contact local golf course for donation of golf counters.
Procedure	**1. Leader instructions to students** a. Introduce "Crazy Cooks In the Kitchen" video. Students will watch for any food safety mistakes the cooks make. Prize for person closest to number of mistakes. b. Optional: Pass out golf counters reminding students not to begin as it takes a long time to get the counters back to zero. Instruct students to use either of the buttons on the golf counter to count mistakes. c. Will announce number of mistakes at end of video. **2. "Crazy Cooks In the Kitchen" Video**
Student Assessment	**3. Students state mistakes and how they can be prevented.** **4. Hold drawing of all student names for prize or one closest to number.**

Lesson 7 Key

<u>Food Safety Mistakes Made by Becky Bacteria and Debbie Diarrhea in the Video</u>

D is Debbie Diarrhea and B is Becky Bacteria

D: Says she has a cold (Cooking while ill can contaminate food)

D: Washes hands for just a few seconds (thorough handwashing takes at least 20 seconds)

D: Gets hamburger from fridge (germs from unclean hands now on fridge handle)

D: Sneezes & wipes nose with cloth towel (germs from sneeze on her hands and on towel–use kleenex and wash hands)

D: Continues to patty hamburger (germs from sneeze now on hamburger)

D: Answers phone (raw meat and sneeze germs now on phone and other germs which were already on phone–should wash hands after using phone if cooking)

B: Grocery bag on cooking counter (bag bottom is not clean enough to put on cooking counter)

B: Touches hair (do not touch face or hair while cooking)

D: Touches hair (do not touch face or hair while cooking)

B: Debbie offers Becky drink from her pop can (can transfer germs by drinking out of same can–do not share pop or water bottles)

B and D: Taste grapes without washing them first (fruit and vegetables likely are contaminated–wash all fruits and vegetables)

B and D: Pick up grapes off the floor (grapes contaminated by floor–throw out)

B and D: Use bag chicken was in for grapes (bag contaminated with raw chicken–never reuse any plastic bag even if you wash it–cannot get clean enough–grapes now contaminated by chicken)

B: Started to taste suspicious food (can be "bad" even if looks, tastes and smells good–throw out)

B: Tries to eat sandwich (food in Danger Zone too long)

B: Touches chicken with cut finger (do not cook with open cut or sore)

B: Does not bandage cut well (blood leaking out of bandage–bandage appropriately)

D: Wipes blood off chicken with towel (need to completely clean blood off chicken)

B: Asks audience to help thaw chicken by touching it (audience and chicken will give each other contamination–thaw only in refrigerator or microwave)

D: Begins to make Becky her hamburger (wash hands before working with food–she still has contaminated hands from sneeze)

D: Wipes up counter with same towel (use new paper towel–this cloth towel is contaminated by many mistakes)

D: Does not wash hands after using the toilet–twice (most common way to get foodborne illness –wash hands after using the toilet)

B: Eats raw hamburger (cooking thoroughly will kill harmful microorganisms–no red or pink in the middle)

B: Drinks from milk carton (contaminates the milk–germs from one person to another can be transferred by saliva)

B: Double dips chip & dip (do not dip chip and then redip same chip–transfer of germs to dip)

B: Has Sparky the dog" lick the plate (dangerous to let pets clean plates–wash with hot soap and water)

B: Dog on counter (pets and book bags etc. put germs on counter–unload groceries away from cooking area)

B: Pets Sparky the dog (wash hands after petting dog–don't play with pets while cooking)

B: Removes dog "accident" with cooking spatula (this is a "no brainer!")

B: Wipes spatula on towel to clean (wiping off will not remove germs–wash dirty utensils with hot water and soap–towel is getting more and more contamination)

B: Cooks eggs and uses same spatula to turn (wash dirty utensils with hot water and soap)

D: Uses plate dog "cleaned"(use clean plates for food)

B: Does not wash hands after using toilet (wash thoroughly after each visit to the toilet)

D: Changes baby diaper on cooking counter (high risk of contamination–change diaper away from cooking area)

D and B: Do not wash hands after handling dirty diaper (always wash hands after changing diaper)

36 mistakes–if students count each time the cooks touch their hair or face, there will be more.

Germ Survivor Quiz Bowl
Lesson 8

Lesson Goal: **Review of SOS food safety curriculum**

Time: **45 minutes**

Content Standards: **Area Eight: Decision-Making**

Objectives: **Students will be able to:**

- **Work in teams to determine correct answers**
- **Explain reasons for correct answers**
- **Explain why other choices are incorrect**

Materials:
Germ Survivor Quiz Bowl Questions
Germ Cards
Prizes

Procedure:

1. **Divide class into teams of 4/5 students each.**

   Choose team names based on something from food safety, ie. "The Germs"

2. **Pass out eight Germ Cards to each team.**

3. **Give Germ Survivor Quiz Bowl instructions:**

   a. A quiz bowl on things learned about food safety. Object is for the team to survive the germs by getting rid of all of the germ cards first.
   b. **OPTION #1** – Instructor will read the questions and multiple choice answers to each team in turn.
   c. **OPTION #2** – Just read the question with no multiple choices and have them give the correct answer – is more difficult and more effective.
   d. Team will discuss the question and answer.
   e. One chance to answer. If incorrect, keep all germ cards.
   f. If correct, "kill" one germ and give that card to instructor.
   g. Team that loses all germ cards first, wins and is the Survivor.

4. **Administer Germ Survivor Quiz Bowl**

5. **At end of Germ Survivor Quiz Bowl**

   a. Award prizes to winning team.
   b. Review all questions and have students explain reasons for correct answers**.**

6. **Collect food safety posters for judging (before lesson 9).**

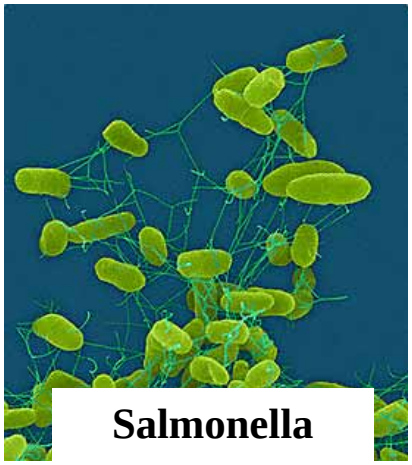
7. **Discuss the student roundtable evaluation for next lesson.**

   a. Will be held the next day.
   b. Give them a few questions, which they will be asked so they have time to think about their answers.
      * What did they like the best about SOS?
      * What did they like the least about SOS?

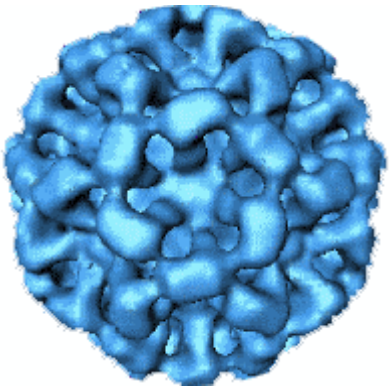
Cut on lines – laminate – glue on cardstock

Shigella

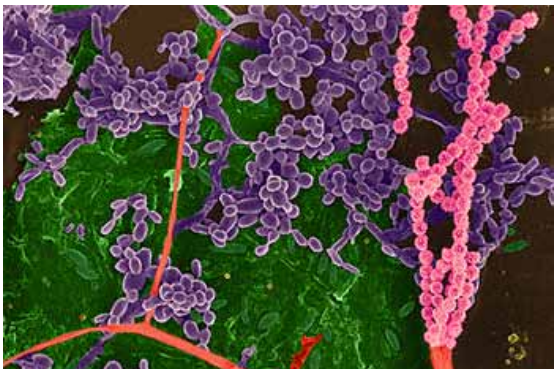
Listeria



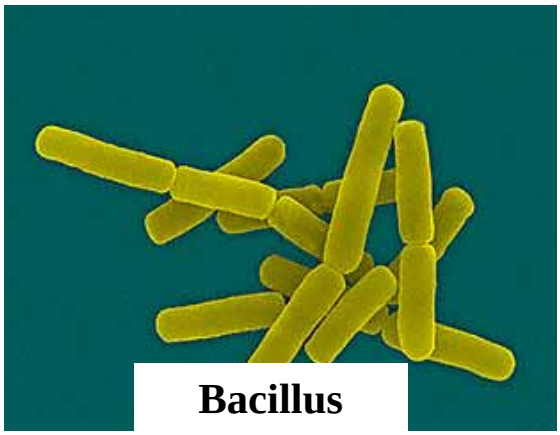
Salmonella



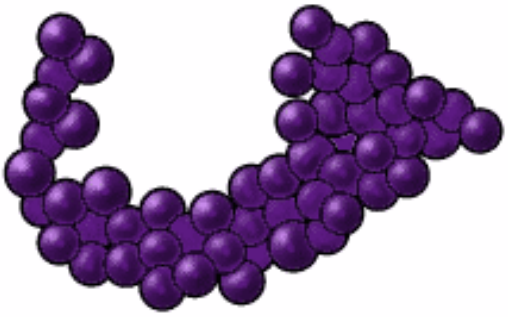
Norwalk Virus



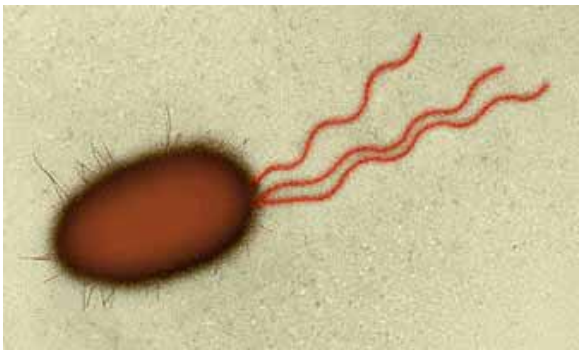
Kitchen Cutting Board



Bacillus



Staphylococcus

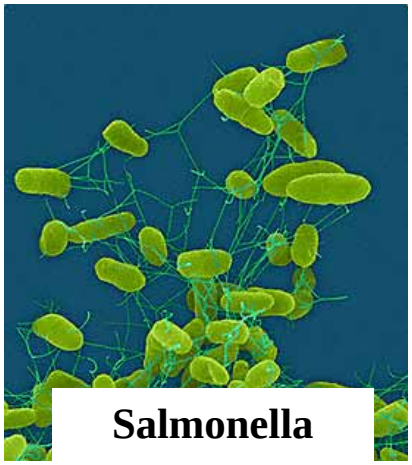


E. coli

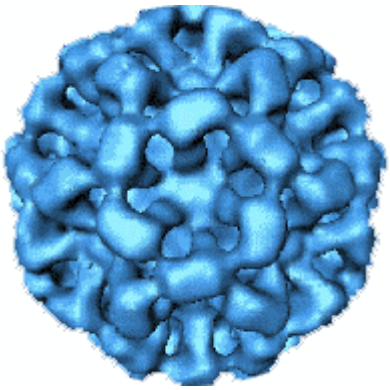
Cut on lines – laminate – glue on cardstock

Shigella

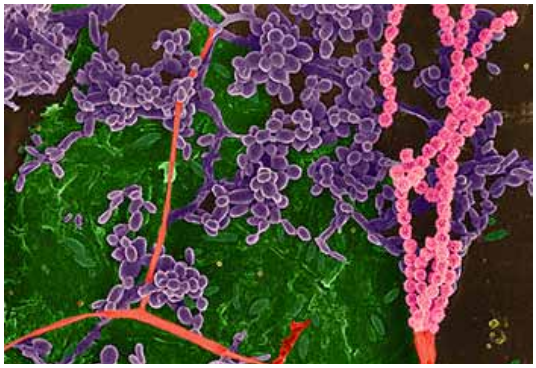
Listeria



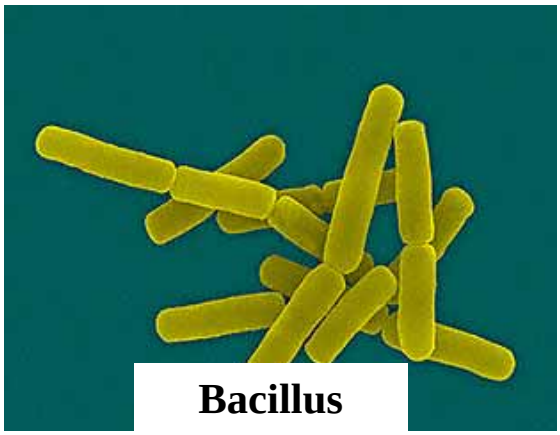
Salmonella



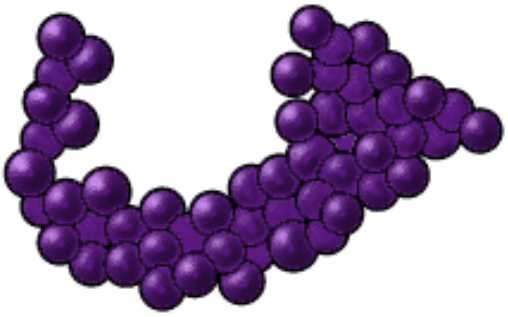
Norwalk Virus



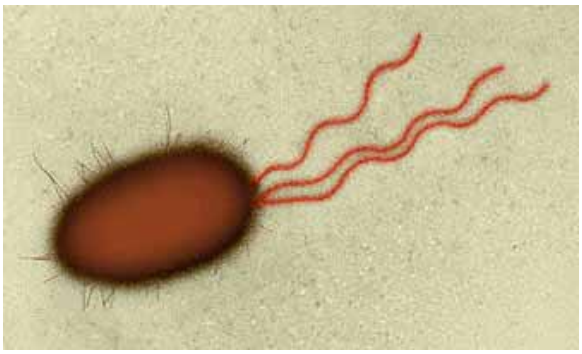
Kitchen Cutting Board



Bacillus



Staphylococcus

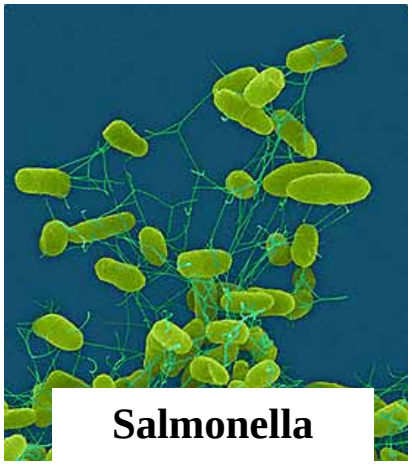


E. coli

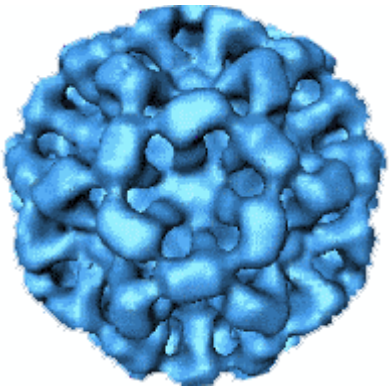
Cut on lines – laminate – glue on cardstock

Shigella

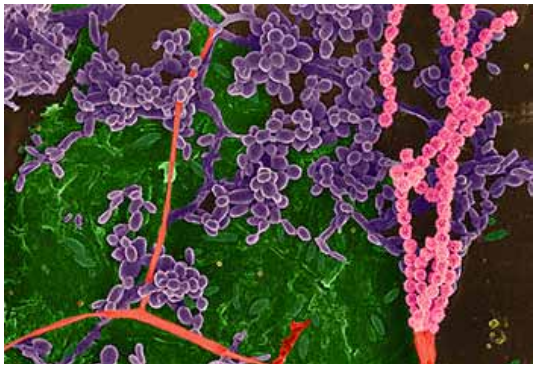
Listeria



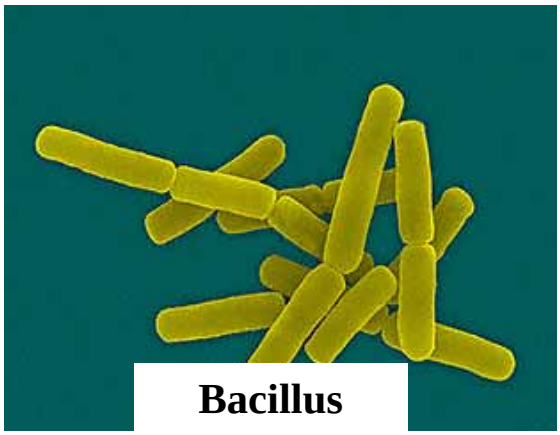
Salmonella



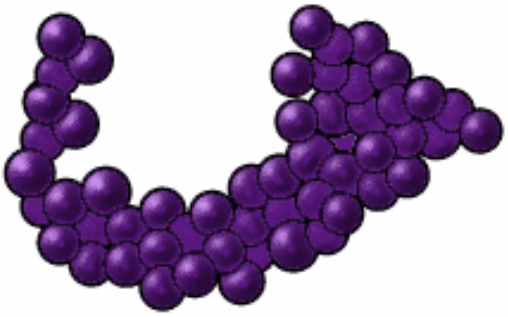
Norwalk Virus



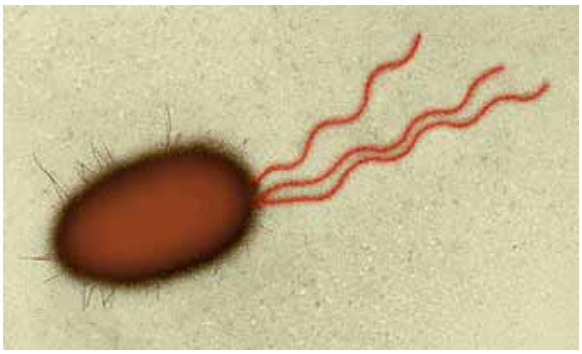
Kitchen Cutting Board



Bacillus



Staphylococcus

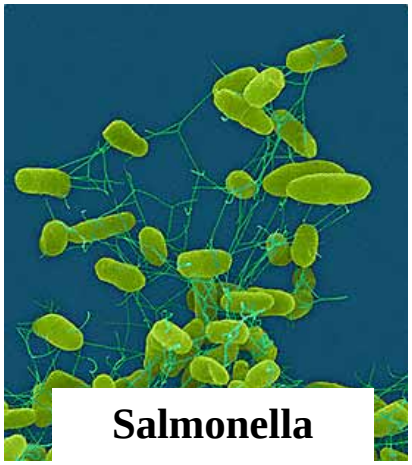


E. coli

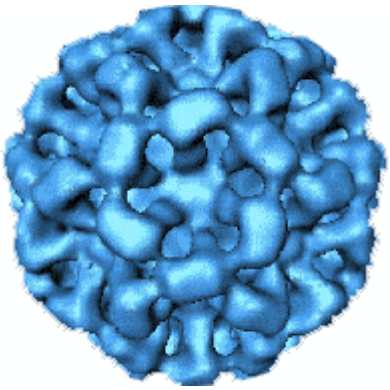
Cut on lines – laminate – glue on cardstock

Shigella

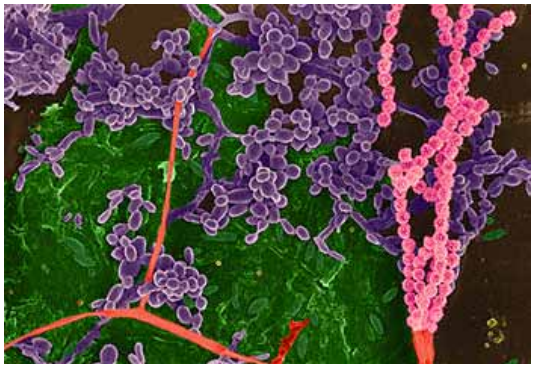
Listeria



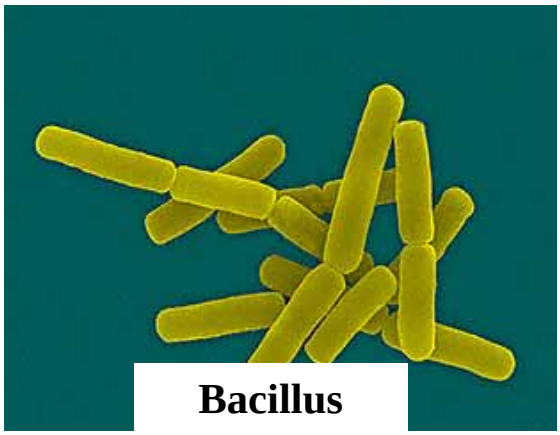
Salmonella



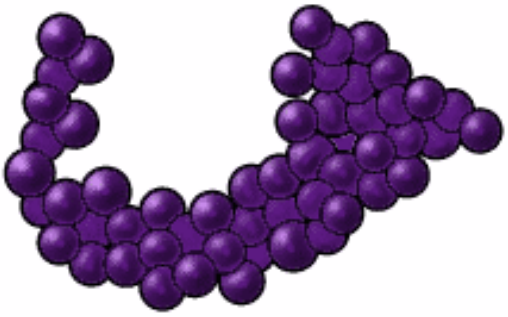
Norwalk Virus



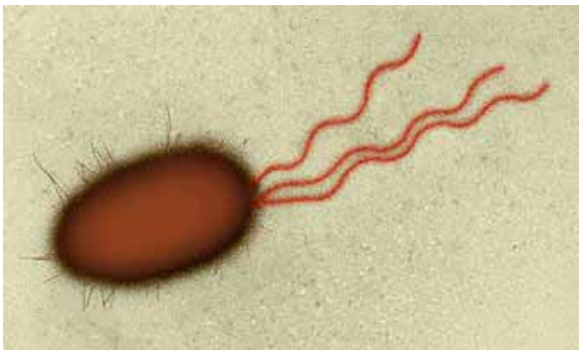
Kitchen Cutting Board



Bacillus



Staphylococcus

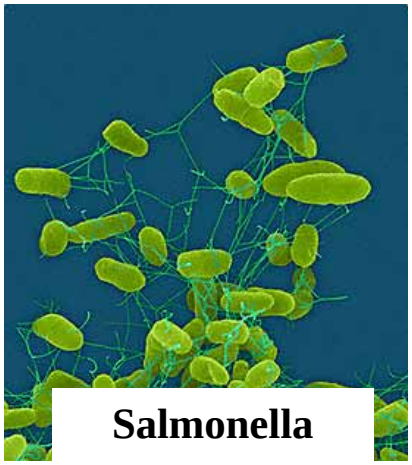


E. coli

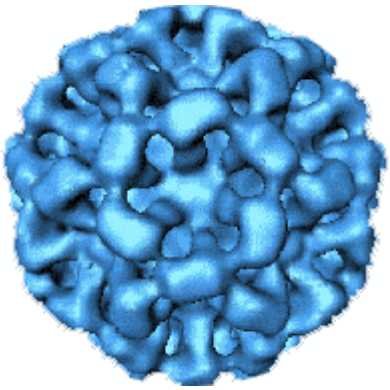
Cut on lines – laminate – glue on cardstock

Shigella

Listeria

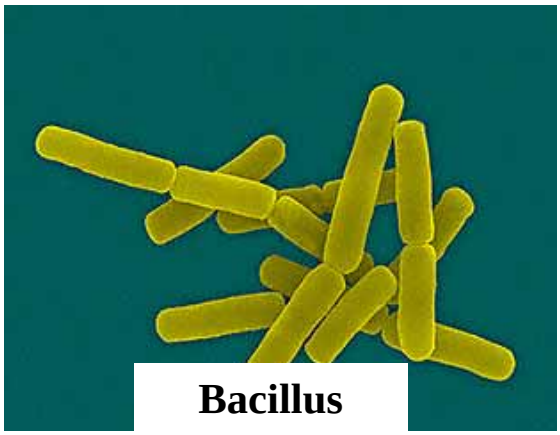


Salmonella

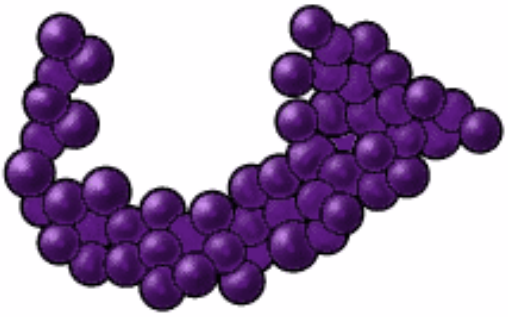


Norwalk Virus

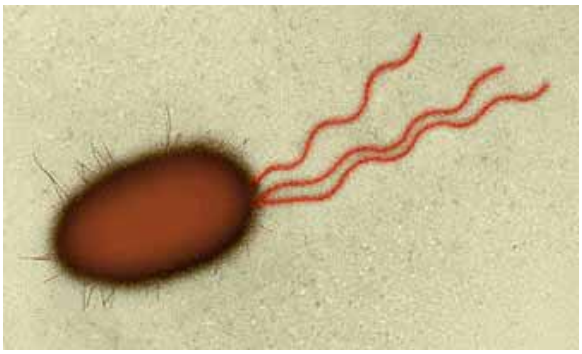
Kitchen Cutting Board



Bacillus



Staphylococcus

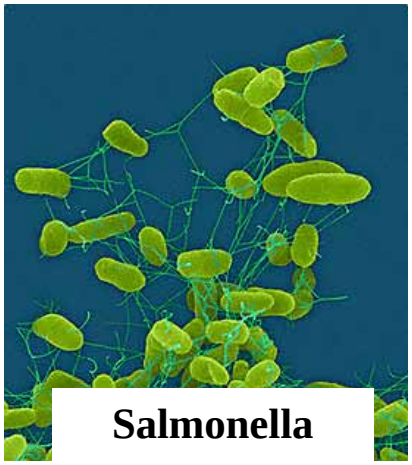


E. coli

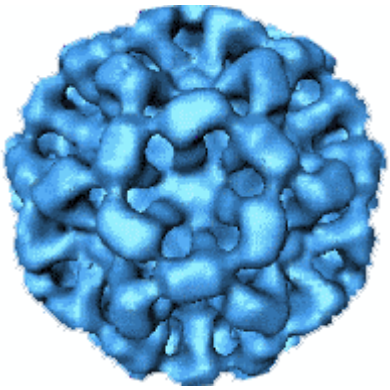
Cut on lines – laminate – glue on cardstock

Shigella

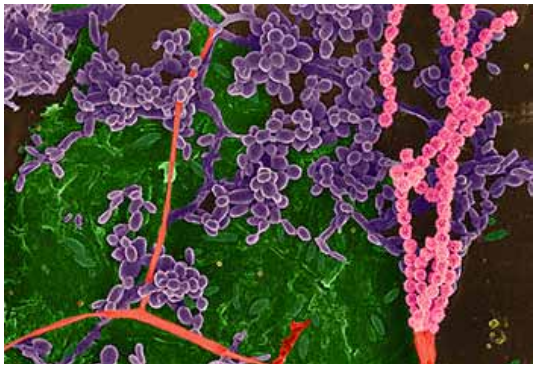
Listeria



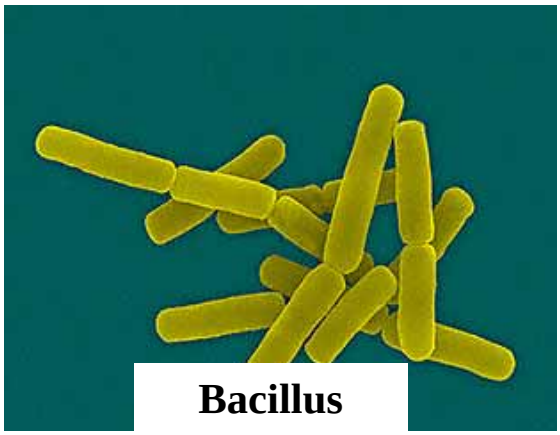
Salmonella



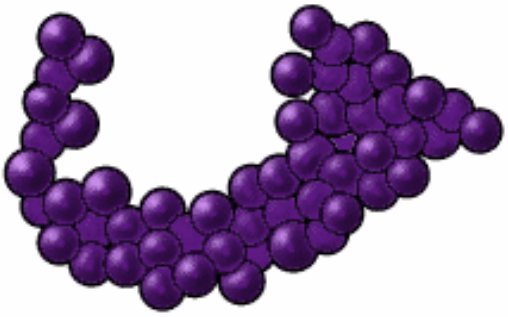
Norwalk Virus



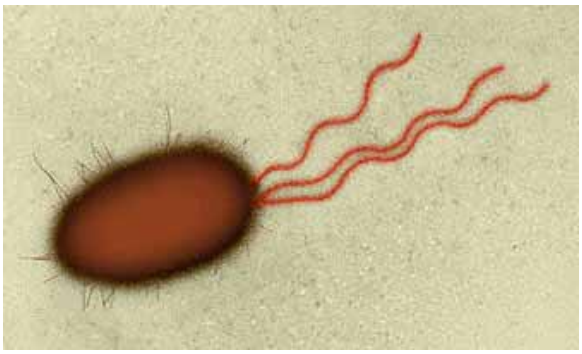
Kitchen Cutting Board



Bacillus



Staphylococcus

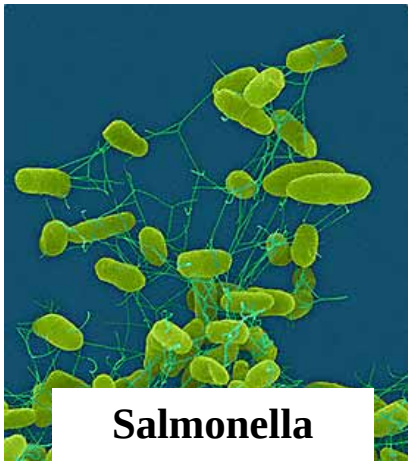


E. coli

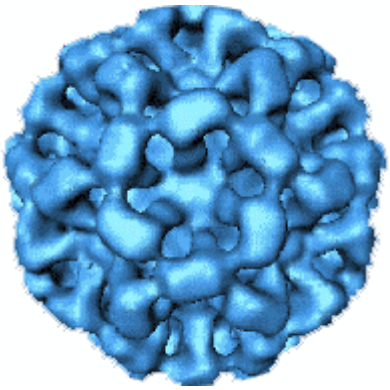
Cut on lines – laminate – glue on cardstock

Shigella

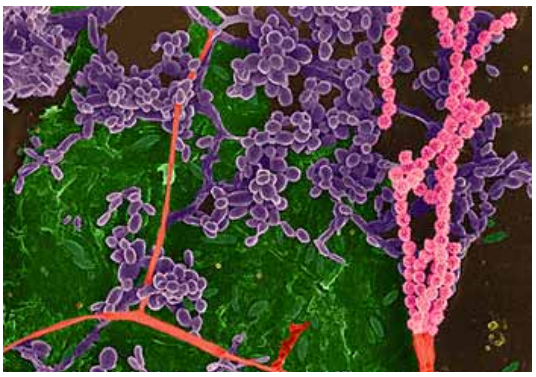
Listeria



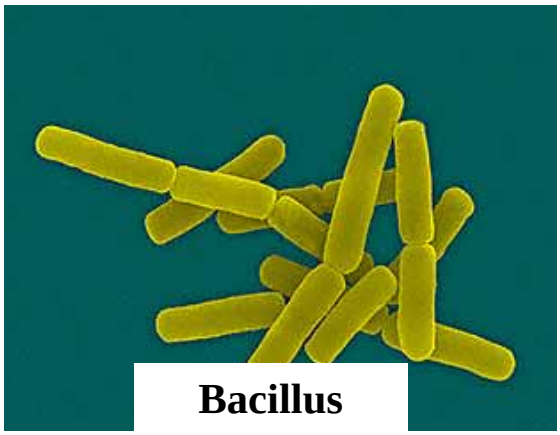
Salmonella



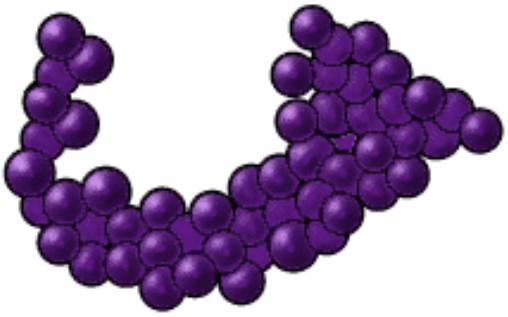
Norwalk Virus



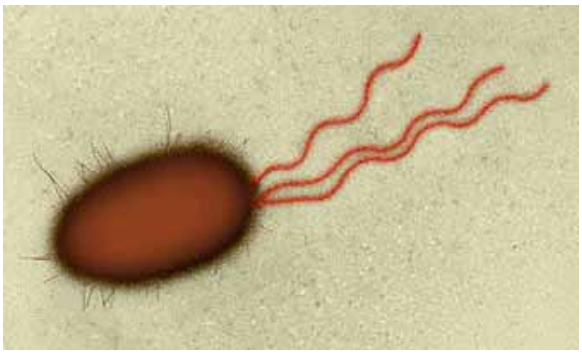
Kitchen Cutting Board



Bacillus



Staphylococcus



E. coli

Germ Survivor Quiz Bowl

Practice Question

Which sandwich is safe in my sack lunch if it cannot be refrigerated?

a. Peanut butter
b. Egg salad
c. Ham and cheese

Quiz Bowl Questions

1. The **safest** place to store raw meats in the refrigerator is:
   a. On the top shelf
   b. In the meat drawer
   c. On the bottom shelf

2. Risky foods should **not** be left at room temperature for longer than:
   a. One half hour
   b. Two hours
   c. One hour

3. Who is **least** at risk to contract a foodborne illness?
   a. A tiny baby
   b. An elderly person
   c. A lively teenager

4. Which is the **best** place to thaw meat?
   a. Refrigerator
   b. On the counter
   c. In warm water

5. Which food does **not** have to be kept cold to be safe?
   a. Eggs
   b. Meat
   c. Apple

6. Which food is safe to eat?
   a. Pizza left on the counter from last night
   b. Meat and cheese sandwich left over from school lunch
   c. Meat and cheese sandwich in lunch bag with cold pack

7. Why do fruits and vegetables need to be washed before you eat them?
   a. To remove wax
   b. To wash away germs
   c. To make them taste better

8. What should you do with food you think is unsafe?
   a. Taste to see if it is okay
   b. Throw away
   c. Refrigerate

9. It takes at least how long to thoroughly wash your hands?
   a. 1 minute
   b. 30 seconds
   c. 20 seconds

10. After using a cutting board for raw meat, what needs to be done?
   a. Wipe with a paper towel
   b. Nothing
   c. Wash with soap and hot water

11. A hamburger should be what color to be safe?
   a. Red in the middle
   b. Pink in the middle
   c. Brown/gray in the middle

12. Which one is unsafe to eat?
   a. A washed apple
   b. Cookie dough which has raw egg in it
   c. Cold tuna sandwich

13. When cooking, the safe way to clean hands is:
   a. On apron
   b. Hot water and soap
   c. On a hand towel

14. Leftover turkey should be:
   a. Left out so people can make sandwiches later that day
   b. Left out until cool enough to put in refrigerator
   c. Put in the refrigerator as soon as the meal is complete

15. Which one will not cause a food illness?
   a. Salmonella
   b. Lactobacillus
   c. E. coli

16. Placing grilled meats on the plate that held the raw meat is an example of:
    a. Contamination
    b. Cross-contamination
    c. Contaminated ingredients

17. Which one will not cause foodborne illness?
    a. An ill person preparing food
    b. Contaminated raw food
    c. Using pancake syrup which has not been refrigerated

18. Tiny microorganisms which can cause foodborne illness are called:
    a. Lice
    b. Flagella
    c. Bacteria

19. Which will **not** cause foodborne illness?
    a. A dented and rusting food container
    b. Eating a sandwich after changing a baby's diaper and not washing hands
    c. Eating an orange

20. What is the Food Temperature Danger Zone?
    a. 10 to 50 degrees Fahrenheit
    b. 40 to 140 degrees Fahrenheit
    c. 50 to 110 degrees Fahrenheit

21. In order to multiply, most bacteria need:
    a. Cold and dry conditions
    b. Being placed on the top shelf of the refrigerator
    c. Warm and moist conditions

22. What could happen if you ate a food that was unsafe?
    a. Nothing would happen if the food tasted okay
    b. You could get sick
    c. Nothing would happen if the food had been refrigerated

23. Which would not cause a germ to get into food?
    a. Double dipping with a chip in dip
    b. Drinking out of a friend's pop can
    c. Cutting lettuce on clean cutting board

24. Foodborne illness can cause:
    a. Death
    b. Itching
    c. Weight Gain

25. How long does it take microorganisms to double in numbers?
    a. Every 2 minutes
    b. Every 20 minutes
    c. Every 2 hours

26. Handwashing is <u>not</u> important:
    a. After touching raw chicken
    b. After blowing your nose
    c. After falling asleep

27. After a meal, the roasted turkey should be:
    a. Left on the counter to cool before being refrigerated
    b. Cut into smaller pieces, wrapped and put in refrigerator
    c. Cut into smaller pieces and left on the counter to cool
    d. Immediately covered and put in refrigerator

28. Which food safety behavior is okay
    a. Sharing a can of pop with a friend
    b. Letting the dog lick the dish
    c. Taste food to see if it is safe
    d. Use clean plate to take grilled chicken off the grill

29. Which is a true statement?
    a. All microorganisms are unsafe in food.
    b. Keeping food in a covered container will prevent bad microorganisms from growing in foods.
    c. Microorganisms need food, moisture, warmth and time to grow.
    d. Food that has harmful microorganisms will look funny.

30. What prevents astronauts from getting foodborne illness in outer space?
    a. High altitude
    b. Freezing temperature of space
    c. Irradiation
    d. Medicine

31. What are the most common symptoms of foodborne illness?
    a. Vomiting, diarrhea
    b. Swollen glands and rash
    c. Sneezing and cough
    d. Sore feet and legs

32. How many estimated cases of foodborne illness occur in the US each year?
    a. 1 Billion
    b. 126 Thousand
    c. 76 Million

33. Which are microorganisms?
    a. Bacteria
    b. Spiders
    c. Ants
    d. Mold
    e. Yeast

34. What could you use in your school lunch bag to keep food cold?
    a. Ice cubes in a leak proof bag
    b. Frozen juice box
    c. Cold pack
    d. Thermos
    e. All of the above

35. Which sandwiches are safe in a lunch bag without being kept cold?
    a. Peanut butter and jelly
    b. Ham and cheese with mustard
    c. Bean burrito
    d. Egg salad

36. I wash the skins of which fruits before I eat them:
    a. Melons
    b. Oranges
    c. Grapes
    d. All of them

37. In which places can food cross-contamination occur?
    a. Grocery cart
    b. On cutting board
    c. In refrigerator
    d. All of them

38. What group of high-flying individuals has routinely eaten irradiated foods?
    a. Trapeze artists
    b. Astronauts
    c. Balloonists
    d. Window washers

BONUS QUESTIONS

39. The abbreviation for the government agency that is concerned with cause and control of disease:
    a. FFA
    b. FDA
    c. HUD
    d. CDC

40. 75 % of Salmonella is associated with:
    a. Yeast
    b. Virus
    c. Eggs
    d. Hamburger

41. Which one is a risky food:
    a. Cooked rice
    b. Sauerkraut
    c. Cereal
    d. Catsup

42. Irradiated foods are identified by:
    a. A five point star
    b. The words "Safe Food"
    c. A special symbol called the radura
    d. A special package color

43. Which one does not multiply in food?
    a. Salmonella
    b. Virus
    c. E. Coli
    d. Listeriosis

44. What is irradiation?
    a. Method to destroy bacteria in food
    b. Measure of acidity in food
    c. Time until a person develops foodborne illness
    d. Presence of harmful substances in food

45. Which one will destroy most bacteria in food?
    a. Freezing
    b. Refrigerating
    c. Putting in a blender
    d. Cooking above 160

46. How many people die of foodborne illness each year in the US?
    a. 500
    b. 1,500
    c. 3,000
    d. 5,000

Germ Survivor Quiz Bowl
Answer Key

Practice Question

Which sandwich is safe in my sack lunch if it cannot be refrigerated?

a. Peanut butter
b. Egg salad
c. Ham and cheese

Quiz Bowl Questions

1. The **safest** place to store raw meats in the refrigerator is:
   a. On the top shelf
   b. In the meat drawer
   c. On the bottom shelf

2. Risky foods should **not** be left at room temperature for longer than:
   a. One half hour
   b. Two hours
   c. One hour

3. Who is **least** at risk to contract a foodborne illness?
   a. A tiny baby
   b. An elderly person
   c. A lively teenager

4. Which is the **best** place to thaw meat?
   a. Refrigerator
   b. On the counter
   c. In warm water

5. Which food does **not** have to be kept cold to be safe?
   a. Eggs
   b. Meat
   c. Apple

6. Which food is safe to eat?
   a. Pizza left on the counter from last night
   b. Meat and cheese sandwich left over from school lunch
   c. Meat and cheese sandwich in lunch bag with cold pack

7. Why do fruits and vegetables need to be washed before you eat them?
   a. To remove wax
   b. To wash away germs
   c. To make them taste better

8. What should you do with food you think is unsafe?
   a. Taste to see if it is okay
   b. Throw away
   c. Refrigerate

9. It takes at least how long to thoroughly wash your hands?
   a. 1 minute
   b. 30 seconds
   c. 20 seconds

10. After using a cutting board for raw meat, what needs to be done?
   a. Wipe with a paper towel
   b. Nothing
   c. Wash with soap and hot water

11. A hamburger should be what color to be safe?
   a. Red in the middle
   b. Pink in the middle
   c. Brown/gray in the middle

12. Which one is unsafe to eat?
   a. A washed apple
   b. Cookie dough which has raw egg in it
   c. Cold tuna sandwich

13. When cooking, the safe way to clean hands is:
   a. On apron
   b. Hot water and soap
   c. On a hand towel

14. Leftover turkey should be:
   a. Left out so people can make sandwiches later that day
   b. Left out until cool enough to put in refrigerator
   c. Put in the refrigerator as soon as the meal is complete

15. Which one will **not** cause a food illness?
   a. Salmonella
   b. Lactobacillus
   c. E. coli

16. Placing grilled meats on the plate that held the raw meat is an example of:
    a. Contamination
    b. Cross-contamination
    c. Contaminated ingredients

17. Which one will **not** cause foodborne illness?
    a. An ill person preparing food
    b. Contaminated raw food
    c. Using pancake syrup which has not been refrigerated

18. Tiny microorganisms which can cause foodborne illness are called:
    a. Lice
    b. Flagella
    c. Bacteria

19. Which will **not** cause foodborne illness?
    a. A dented and rusting food container
    b. Eating a sandwich after changing a baby's diaper and not washing hands
    c. Eating an orange

20. What is the Food Temperature Danger Zone?
    a. 10 to 50 degrees Fahrenheit
    b. 40 to 140 degrees Fahrenheit
    c. 50 to 110 degrees Fahrenheit

21. In order to multiply, most bacteria need:
    a. Cold and dry conditions
    b. Being placed on the top shelf of the refrigerator
    c. Warm and moist conditions

22. What could happen if you ate a food that was unsafe?
    a. Nothing would happen if the food tasted okay
    b. You could get sick
    c. Nothing would happen if the food had been refrigerated

23. Which would not cause a germ to get into food?
    a. Double dipping with a chip in dip
    b. Drinking out of a friend's pop can
    c. Cutting lettuce on clean cutting board

24. Foodborne illness can cause:
    a. Death
    b. Itching
    c. Weight gain

25. How long does it take microorganisms to double in numbers?
    a. Every 2 minutes
    b. Every 20 minutes
    c. Every 2 hours

26. Handwashing is not important:
    a. After touching raw chicken
    b. After blowing your nose
    c. After falling asleep

27. After a meal, the roasted turkey should be:
    a. Left on the counter to cool before being refrigerated
    b. Cut into smaller pieces, wrapped and put in refrigerator
    c. Cut into smaller pieces and left on the counter to cool
    d. Immediately covered and put in refrigerator

28. Which food safety behavior is okay
    a. Sharing a can of pop with a friend
    b. Letting the dog lick the dish
    c. Taste food to see if it is safe
    d. Use clean plate to take grilled chicken off the grill

29. Which is a true statement?
    a. All microorganisms are unsafe in food.
    b. Keeping food in a covered container will prevent bad microorganisms from growing in foods.
    c. Microorganisms need food, moisture, warmth and time to grow.
    d. d. Food that has harmful microorganisms will look funny.

30. What prevents astronauts from getting foodborne illness in outer space?
    a. High altitude
    b. Freezing temperature of space
    c. Irradiation
    d. Medicine

31. What are the most common symptoms of foodborne illness?
    a. Vomiting, diarrhea
    b. Swollen glands and rash
    c. Sneezing and cough
    d. Sore feet and legs

32. How many estimated cases of foodborne illness occur in the US each year?
    a. 1 Billion
    b. 126 Thousand
    c. 76 Million

33. Which are microorganisms?
    a. Bacteria
    b. Spiders
    c. Ants
    d. Mold
    e. Yeast

34. What could you use in your school lunch bag to keep food cold?
    a. Ice cubes in a leak proof bag
    b. Frozen juice box
    c. Cold pack
    d. Thermos
    e. All of the above

35. Which sandwiches are safe in a lunch bag without being kept cold?
    a. Peanut butter and jelly
    b. Ham and cheese with mustard
    c. Bean burrito
    d. Egg salad

36. I wash the skins of which fruits before I eat them:
    a. Melons
    b. Oranges
    c. Grapes
    d. All of them

37. In which places can food cross-contamination occur?
    a. Grocery cart
    b. On cutting board
    c. In refrigerator
    d. All of them

38. What group of high-flying individuals has routinely eaten irradiated foods?
    a. Trapeze artists
    b. Astronauts
    c. Balloonists
    d. Window washers

BONUS QUESTIONS

39. The abbreviation for the government agency that is concerned with cause and control of disease:
    a. FFA
    b. FDA
    c. HUD
    d. CDC

40. 75 % of Salmonella is associated with:
    a. Yeast
    b. Virus
    c. Eggs
    d. Hamburger

41. Which one is a risky food:
    a. Cooked rice
    b. Sauerkraut
    c. Cereal
    d. Catsup

42. Irradiated foods are identified by:
    a. A five point star
    b. The words "Safe Food"
    c. A special symbol called the radura
    d. A special package color

43. Which one does not multiply in food?
    a. Salmonella
    b. Virus
    c. E. Coli
    d. Listeriosis

44. What is irradiation?
    a. Method to destroy bacteria in food
    b. Measure of acidity in food
    c. Time until a person develops foodborne illness
    d. Presence of harmful substances in food

45. Which one will destroy most bacteria in food?
    a. Freezing
    b. Refrigerating
    c. Putting in a blender
    d. Cooking above 160

46. How many people die of foodborne illness each year in the US?
    a. 500
    b. 1,500
    c. 3,000
    d. 5,000

Safe – Not Sorry Celebration!
Lesson 9

Lesson Goal: **A celebration and evaluation of the food safety curriculum**

Time: **45 minutes**

Content Standards: **Area Eight: Decision-Making**

Objectives:

- **Measure improvements in student knowledge/behavior**
- **Facilitate student roundtable evaluation of project**
- **Determine student interest in SOS**
- **Reward student achievement in SOS**
- **Determine amount of parent involvement in SOS**

Materials:

Student food safety post-assessment
Parent letters with questionnaire
Foodborne illness hotline brochures
*Prior to students arriving, have poster contest entries judged by other faculty/cooks/school nurse, etc.

Procedure:

1. **Administer student post assessment**

   a. Students take post-assessment
   b. Review assessment with discussion of correct answers

2. **Announcement of poster contest winners**

3. **Student Roundtable evaluation of SOS (questions attached)**

4. **SOS Certificates of completion for students.**

5. **Distribute parent note with survey and foodborne illness brochure.**

   Note: It is very effective to mail to parents and have credit given for return by student.

Name _____
Class _____

Food Safety Pre and Post Questions

1. What is a foodborne illness? Check the correct answer.

___ An illness which makes you too sick to eat.
___ An illness caused by eating too much food.
___ An illness caused by eating foods that are high in fat and cholesterol.
___ An illness caused by disease causing microorganisms in food.

2. What is the "temperature danger zone"? Check the correct answer.

___ The temperature range where food is too hot to eat safely.
___ The temperature range where bacteria can multiply rapidly.
___ The temperature range where food will get freezer burn if kept too long.
___ The temperature range where food will dry out, resulting in poor quality.

3. For the past four hours, leftovers from your family's big holiday dinner have been sitting out in the kitchen for guests to eat. Check the foods that are still safe to eat.

___ Fudge
___ Roasted turkey
___ Mashed potatoes
___ Whole-wheat buns
___ Baked ham
___ Sliced watermelon

4. Unsafe food will always have a strange appearance and odor. Check the correct answer.

___ True
___ False

5. Last night it was your turn to clear the dinner table and clean up the kitchen. At midnight, you woke up and realized that you had forgotten to refrigerate the leftover potato salad. If the potato salad had been left out since 7 p.m., what should you do with the potato salad? Check the correct answer.

___ Put the salad in the refrigerator immediately. Refrigeration will kill any bacteria that grew in the salad.
___ Taste the salad and if it tastes okay, it is safe to refrigerate it and eat it the next day.
___ Throw the salad away, because there is no way to make it safe to eat again.
___ Feed it to the dog, and if he likes it, it is still safe.

6. **When refrigerating raw chicken, where should you store it to prevent cross-contamination of other foods? Check the correct answer.**
   ___ On the top shelf inside the refrigerator.
   ___ On the bottom shelf inside the refrigerator.
   ___ In the drawer with your other meats, such as salami and leftover ham.

7. **If you were preparing submarine sandwiches for your family, which <u>one</u> of the following activities would you do first?**
   ___ Wash and cut the lettuce and tomatoes.
   ___ Wash your hands.
   ___ Cut the bread.
   ___ Lower the periscope on the sub.

8. **If your friend was grilling hamburgers and asked how you wanted your hamburger cooked, how <u>should</u> you respond?**
   ___ Rare
   ___ Medium rare
   ___ Well done

9. **When you were helping make chocolate chip cookies, you ate a large spoonful of the raw cookie dough. The next day you were sick with diarrhea and stomach pain. Why do you think that you became sick?**
   ___ Because the flour wasn't cooked and formed a ball of dough in your stomach.
   ___ Because the cookie dough had too much sugar in it.
   ___ Because the cookie dough had uncooked eggs in it.
   ___ Because the cookie dough had uncooked margarine in it.

10. **After you use a cutting board for cutting raw meats, what do you do with it? You wash it with soap and water. Circle your answer.**

    Always Sometimes Rarely Never

11. **Recommended thorough handwashing takes how long?**
    ___ 20 seconds
    ___ 1 minute
    ___ 2 minutes

12. **Freezing food will:**
    ___ Kill all bacteria
    ___ Not kill all bacteria

Name _____
Class _____

Food Safety Answer Key

1. What is a foodborne illness? Check the correct answer.

___ An illness which makes you too sick to eat.
___ An illness caused by eating too much food.
___ An illness caused by eating foods that are high in fat and cholesterol.
_x_ An illness caused by disease causing microorganisms in food.

2. What is the "temperature danger zone"? Check the correct answer.

___ The temperature range where food is too hot to eat safely.
_x_ The temperature range where bacteria can multiply rapidly.
___ The temperature range where food will get freezer burn if kept too long.
___ The temperature range where food will dry out, resulting in poor quality.

3. For the past four hours, leftovers from your family's big holiday dinner have been sitting out in the kitchen for guests to eat. Check the foods that are still safe to eat.

_x_ Fudge
___ Roasted turkey
___ Mashed potatoes
_x_ Whole-wheat buns
___ Baked ham
___ Sliced watermelon

4. Unsafe food will always have a strange appearance and odor. Check the correct answer.

___ True
_x_ False

5. Last night it was your turn to clear the dinner table and clean up the kitchen. At midnight, you woke up and realized that you had forgotten to refrigerate the leftover potato salad. If the potato salad had been left out since 7 p.m., what should you do with the potato salad? Check the correct answer.

___ Put the salad in the refrigerator immediately. Refrigeration will kill any bacteria that grew in the salad.
___ Taste the salad and if it tastes okay, it is safe to refrigerate it and eat it the next day.
_x_ Throw the salad away, because there is no way to make it safe to eat again.
___ Feed it to the dog, and if he likes it, it is still safe.

6. When refrigerating raw chicken, where should you store it to prevent cross-contamination of other foods? Check the correct answer.

___ On the top shelf inside the refrigerator.
_x_ On the bottom shelf inside the refrigerator.
___ In the drawer with your other meats, such as salami and leftover ham.

7. If you were preparing submarine sandwiches for your family, which one of the following activities would you do first?

___ Wash and cut the lettuce and tomatoes.
_x_ Wash your hands.
___ Cut the bread.
___ Lower the periscope on the sub.

8. If your friend was grilling hamburgers and asked how you wanted your hamburger cooked, how <u>should</u> you respond?

___ Rare
___ Medium rare
_x_ Well done

9. When you were helping make chocolate chip cookies, you ate a large spoonful of the raw cookie dough. The next day you were sick with diarrhea and stomach pain. Why do you think that you became sick?

___ Because the flour wasn't cooked and formed a ball of dough in your stomach.
___ Because the cookie dough had too much sugar in it.
_x_ Because the cookie dough had uncooked eggs in it.
___ Because the cookie dough had uncooked margarine in it.

10. After you use a cutting board for cutting raw meats, what do you do with it? You wash it with soap and water. Circle your answer.

<u>Always</u> Sometimes Rarely Never

11. Recommended thorough handwashing takes how long?

_x_ 20 seconds
___ 1 minute
___ 2 minutes

12. Freezing food will:

___ Kill all bacteria
_x_ Not kill all bacteria

SOS Roundtable Evaluation Questions

What did you think of the SOS program?

What did you like best?

What did you like least?

How many of you talked to your friends about SOS?

What did you tell them?

How many talked to parents?

What did you tell them?

How many of you cook at home?

What do you cook?

Who do you cook for?

Page 2 – Evaluation Questions

Have you changed anything about how you handle food after learning the SOS stuff?

What was the biggest surprise about food safety that you didn't know before?

There were two letters mailed to your parents telling them about SOS. Do you know if your parents read the letters?

Do you know what SOS means?

Lesson by lesson review of curriculum

Is there anything else you want to tell us about food safety?

SAFE OR SORRY

_____

Congratulations on completion of Safe or Sorry.

You are now ready to be Safe – Not Sorry with food!

_____

Parent Survey

1. Is food safety an important subject to teach in schools?

   Very Important Somewhat Important Not Important

2. Did your child talk about the things he/she learned about food safety?

   Yes_____ No_____

   If yes, what did he/she talk about?

   _____

   _____

3. Did you learn anything new about food safety from your child or from the information sent home?

   Yes_____ No_____

   If yes, what did you learn?

   _____

4. Did you get the previous two letters discussing the project?

   Yes_____ No_____

5. Have you noticed any behavioral changes relating to food safety in your child?

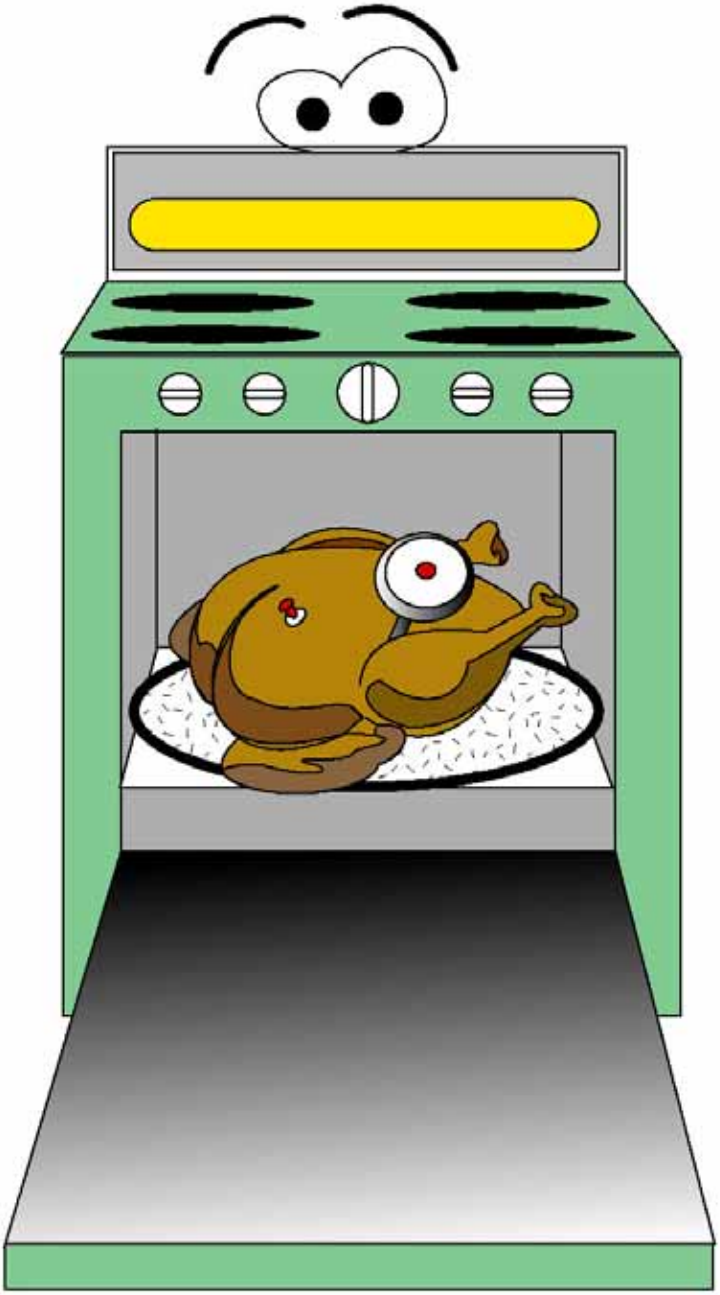
   Yes No

   If yes, please describe the changes.

   _____

   _____

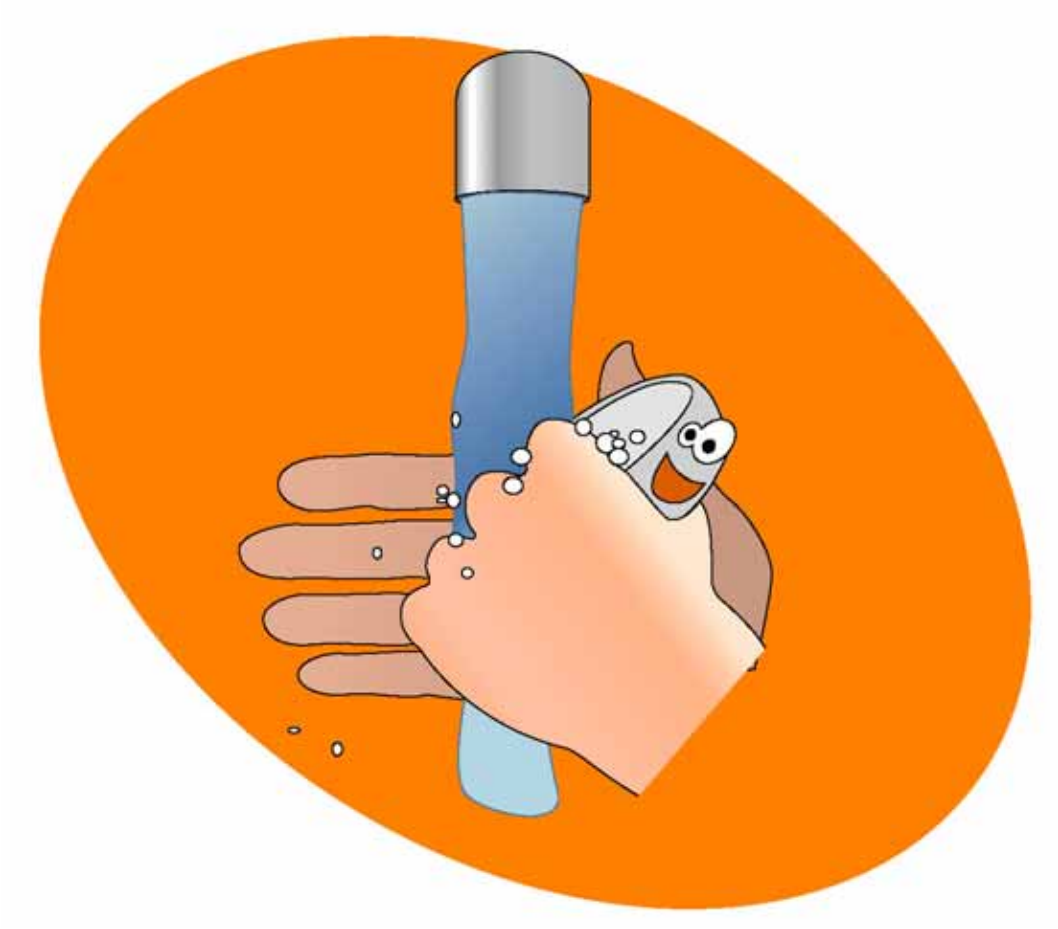
Thank you for taking time out of your busy schedules to complete this survey. Your input is an integral part of making this project a success. We value your comments. Please send this back.



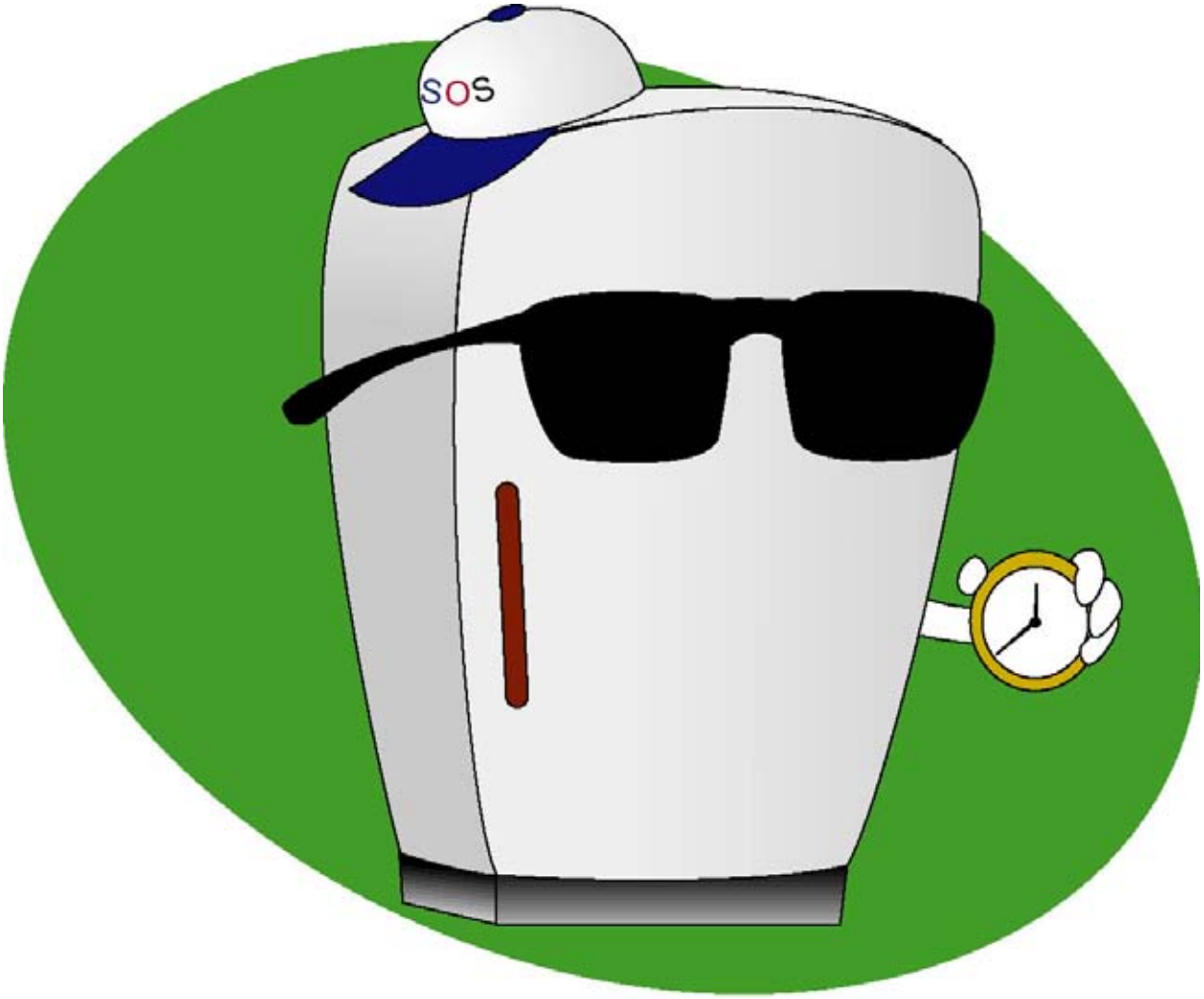
Cook food until it is hot enough to kill harmful bacteria

Wash cutting boards with hot water and soap

Wash your hands

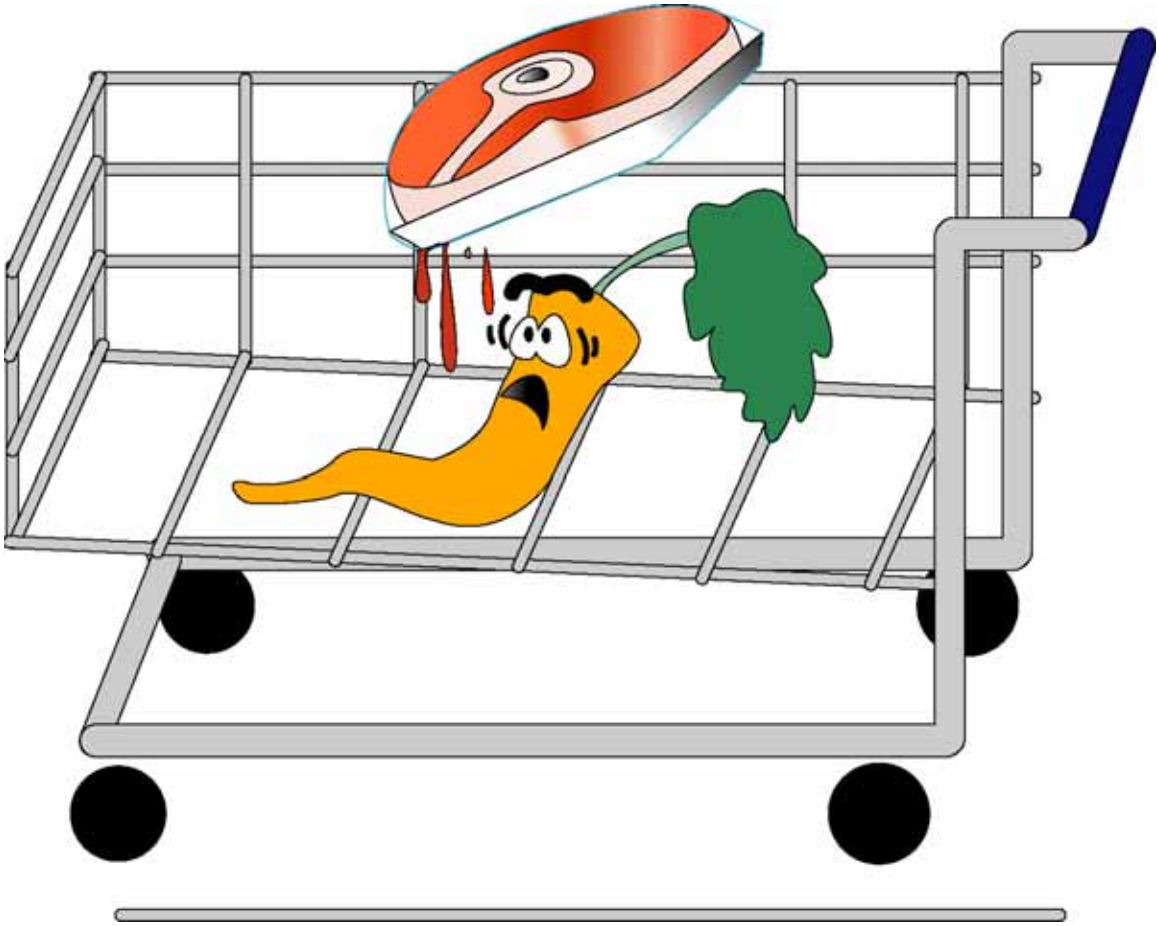


with water and soap

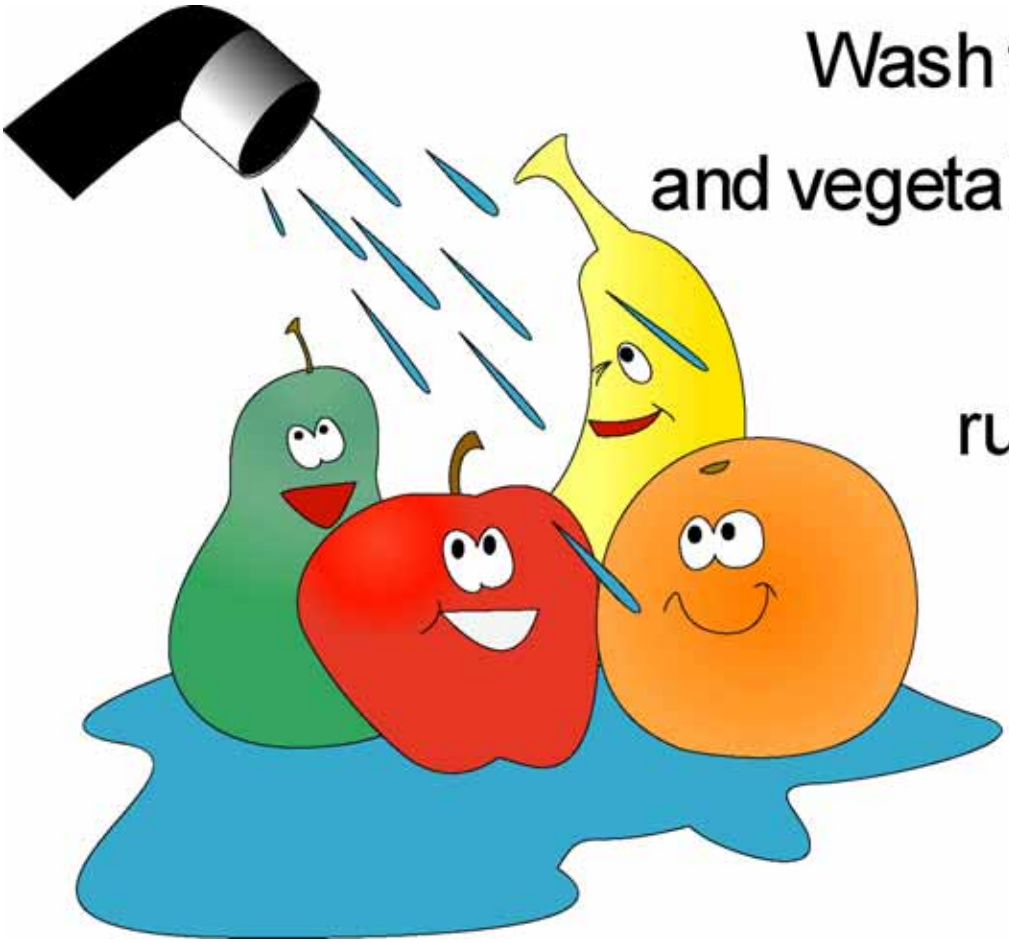


Refrigerate food quickly to keep harmful bacteria from growing

Don’t let raw meat and poultry juices drip on other food



Keep your refrigerator at 40 degrees Fahrenheit or less



Wash fruits and vegetables with running water

Cross-Curricular Suggestions

Art
Make "Germ" hand puppets.
Design food safety placemat for lunch trays.
Design food safety poster.
Make photo collage of risky food preparation activities

English/Drama/Speech
Write and perform food safety skit.
Write handwashing play or puppet show for primary grades.
Write food safety news article for local newspaper.
Write school food safety newsletter.
Give presentation to school board.
Give presentation to student council.

Family and Consumer Science
Establish student food safety council.
Contact local public health department on new food safety information or scientific breakthroughs.
Develop school food safety website

Science
Work with petri dishes/slides.
Bring contaminated items from home to view through microscope.
Interview person who had foodborne illness and report.
Contact national food safety networks for current updates and reports to class i.e. Center for Disease Control, Federal Department of Agriculture, United States Department of Agriculture.

Careers
Make community contacts: develop questions, interview, write report.
Shadow restaurant inspection with health sanitarian.
Interview doctor or nurse.
Interview restaurant owner.
Interview grocer.
Interview farmer/producer.
Interview public health nurse.
Interview school nurse.
Interview school cooks.

History
Investigate history of foodborne illness.
Report on how food "poisoning" has been diagnosed and treated in the past.

Service Learning Connections
Food Safety for Youth Pilot Project
Minnesota Department of Health

Project #1: "Sinkless in Seattle"

I. **Brainstorm and Narrow Concerns:** No sinks and no soap at the town festival
Community/School Need: The community festivals use portable bathrooms for a weekend festival that draws in 6,000 people. There are no handwashing facilities and many opportunities to eat food at the festival.

II. **Form a Plan:** Youth leaders approach the festival committee about this problem.

III. **Take Action:** Youth leaders decide to ask the local hardware store, grocery store and town council to set up permanent bathroom and sink facilities in town or determine portable hand washing festival sink areas. Youth leaders make connections between classroom work and the sink problem.

IV. **Evaluate/**Reflect (After the Plan or Action): What could be done differently next year?

Project #2: "Care and Share, but Not Your Water Bottle!"

I. **Brainstorm and Narrow Concerns:** Sharing water bottles C school sports teams in the area do not use safe and sanitary water supply systems for athletes.
Community/School Need: Poor habits or no water seem to be sport teams= options

II. **Form a Plan:** Develop an educational promotion to encourage individual athletes to be aware of safe, sanitary conditions. Ask school boards to appropriate enough money for safe water systems and procedures.

III. **Take Action:** Youth leaders do a workshop/promotional message for coaches, teams and younger athletes.

IV. **Evaluate/Reflect (After the Plan or Action):** Analyze whether conditions have changed or improved.

Project #3: "Bathroom Supplies at Low Level"

I. **Brainstorm and Narrow Concerns:** No soap and no hot water in the bathrooms C school bathrooms lack soap and hot water in the school buildings. Students do a poor job of washing hands.

II. **Form a Plan:** Collect data. Develop a plan and presentation to contact the school board and janitors. Ask for soap and a better hot water heater in school.

III. **Take Action:** Ask for adequate soap, hot water. Offer to provide an educational message to all students.

IV. **Evaluate/Reflect (After the Plan or Action):** Did the facilities improve? Did behavior of students change regarding handwashing?

Project #4: "No Place to Dry"

I. **Brainstorm and Narrow Concerns:** There are no paper towels in the school bathrooms. Students do not have sanitary ways to dry their hands. School officials are concerned that paper towels would be abused C the holders might be broken or the toilets might be stuffed with towels.

II. **Form a Plan:** Develop a plan to meet with school officials, school janitors, and others who might be concerned about this issue. Create an educational presentation about the importance of sanitary hand washing and drying.

III. **Take Action:** Ask for paper towels using the educational presentation. Create permanent bathroom signs about the importance of paper towels and respecting facilities. Ask students to address the concerns during class meetings.

IV. **Evaluate/Reflect (After the Plan or Action):** Was a paper towel system implemented? Did students treat the facilities with respect? Is there a greater awareness of the importance of sanitary conditions?

SOS Program Contact

Minnesota Department of Health Food Safety Center
P.O. Box 64975
St. Paul, Minnesota 55164-0975
651-201-4500
www.health.state.mn.us

Printed on Recycled Materials