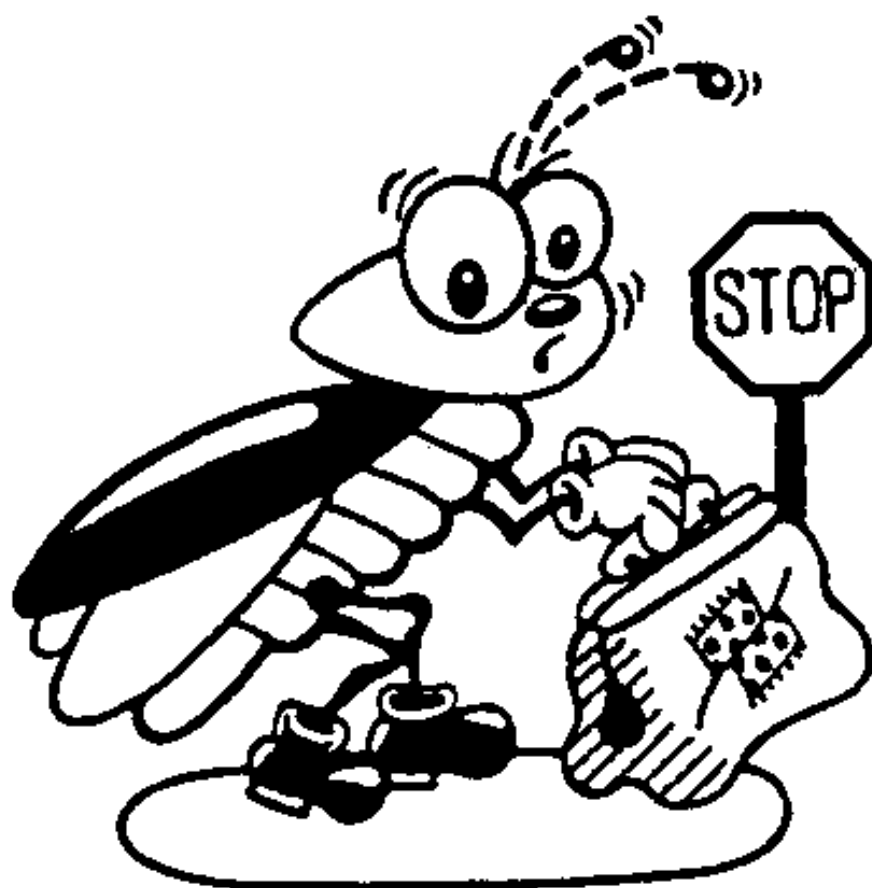


Up for the Challenge of

DON'T BUG ME!!!



Summer 2017 EFNEP and 4-H Curriculum
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Up for the Challenge of Don't Bug Me!

Lesson 1 – Bugs: The Good, The Bad, The Ugly

Audience: 8 to 12 years old

Time: 60 minutes

Materials:

- Attendance Sheet
- Pre Evaluation
- Pencils
- MyPlate Poster
- Daily food needs of 8 to 12 year old poster
- Day 1 paper food models
- Day 2 paper food models
- Day 3 paper food models
- Day 1, 2, 3 tent cards
- Breakfast, lunch, dinner, and snack signs
- The “Good Bug” Poster
- The “Bad Bug” Poster
- The “Ugly Bug” Poster
- Symptoms of Foodborne Illness Poster
- Computer and speakers or CD player
- “Path-O-gens Are On Your Path” CD
- Handwashing poster
- Hand soap or hand wipes
- Paper towels
- Plastic table cloth
- Empty clean produce bag or lid with label saying washed
- Jar or container for dressing
- Large mixing bowl
- Large spoons (2)
- Lunch bag with tasks
- Oil
- Vinegar
- Sugar
- Orange juice

- Greens (2 kinds)
- Vegetables (broccoli or cauliflower; red pepper or radishes)
- Walnuts
- Mandarin oranges
- Blue cheese
- Melba toast
- 6" Paper plates
- Plastic forks

Objectives:

- To explore food groups and amounts to consume everyday
- To look at the good, bad, and ugly roles bacteria and mold play in our food and health
- To identify microbes that cause illness
- To look at symptoms of foodborne illness

Key Concepts:

- For good health, we need to consume foods from the vegetable, fruit, grain, dairy and protein groups in the appropriate amounts.
- Microbes are so small they can't be seen by the naked eye.
- There are different kinds of microbes – bacteria, viruses, parasites, molds, yeasts.
- Some microbes produce desirable food products, some cause foods to spoil, and some make us sick.
- Bacteria need food (just like we do), moisture, warm temperature, time, right acidity, and appropriate amount of air to multiply.

Background Information:

The foods we eat supply the nutrients our body needs for energy, to build and repair itself, and to stay healthy. There are over 40 different nutrients. These nutrients are divided into groups depending on what they do in the body and are referred to as essential nutrients. These six essential nutrient groups are carbohydrates, fats, protein, vitamins, minerals, and water. Because no one food contains all the essential nutrients, we say there is no perfect food. However, many foods provide more than one essential nutrient. That is why, for overall health, we need to eat a variety of foods.

Americans enjoy one of the safest food supplies in the world. However, foods we eat can sometimes make us sick. A foodborne illness is any disease that is carried or

transmitted to humans by food. Another term for foodborne disease is food poisoning, which occurs when someone becomes ill from eating contaminated food.

One cause of food poisoning is disease-causing microorganisms (called pathogens). Microorganisms are tiny forms of life – they can't be seen with the naked eye. Because they can't be seen, food contaminated with high levels of pathogens can look good, smell good, and taste delicious!

Microbes are found everywhere in nature. They are found in the soil, on plants, in animals and animal wastes (including humans), and in water.

Microorganisms include bacteria, viruses, parasites, molds, and yeasts. As indicated above, some of these microbes (***the ugly***) cause illness while others (***the bad***) can cause foods to spoil. But, not all microorganisms are detrimental. In fact, some (***the good***) are used to produce desirable food products – we wouldn't be able to enjoy yeast bread, yogurt, sauerkraut, wine, or aged cheeses without the benefits of microbes. Additionally, there are around a trillion good bacteria that live in and on our body. They help keep us healthy by fighting off the ugly bacteria.

Bacteria

All bacteria exist as vegetative cells (capable of growing and multiplying). Some bacteria also form spores, which can be thought of as a hibernating form of the bacteria. Because spores can withstand heat, cold, and many chemicals, they are resistant to destruction. Under favorable conditions, spores are capable of becoming vegetative cells.

In some cases, it is the consumption of the actual bacteria that causes illness. Certain bacteria, however, produce toxins, which make us ill. Some of these toxins are destroyed very easily by heating (example, toxin formed by *Clostridium botulinum*). Other toxins require higher temperatures than boiling for destruction. An example is the toxin produced by *Staphylococcus aureus*, which requires a temperature of 240°F (achieved only under pressure) to destroy it.

To reproduce, bacteria need certain conditions. As a general rule, bacteria like a warm, moist, protein-rich environment that is neutral or low acid and they require time to grow.

Bacteria, just like humans, need nutrients to grow and multiply. They find these nutrients in the same foods we do, but they do not require the variety of foods we do so

they can get all of their nutrient needs met by just one kind of food. Also, because they are so small, they can survive quite nicely on food residues in dish cloths, on counters, and even on the apron or towel that we wipe our hands on after handling food.

Bacteria survive and grow well between the temperatures of 40°F and 140°F. This range is called the **DANGER ZONE**. This range spans normal room and human body temperatures. Some bacteria, however, thrive in extremes of heat and cold.

Bacteria need both time and an ideal temperature to multiply rapidly. Controlling both of these factors is one way to reduce the risk of foodborne illness.

Bacteria require a moist environment since their food must be dissolved in water. Moisture levels can be reduced by freezing, drying, or adding substances (example, sugar or salt) that tie up water. Bacterial growth is stopped at low moisture levels, but the organism can still survive so care must be still used in handling these foods. Examples of foods with low moisture content include most baked products such as bread, cakes, cookies; dried pasta; cereal; jams and jellies; cake frosting; candy; dried fruits and vegetables; jerky; and crisp cooked bacon.

Bacteria like neutral or slightly acidic surroundings to grow best. Most bacteria do not grow in acid foods (pH less than 4.6). As a general rule, the more acidic a food, the more sour it tastes. Examples of acid foods include fruits and products that have had acid, such as vinegar or lemon juice, added.

Bacteria range in their need for oxygen (air) from none to requiring free oxygen. Aerobic bacteria must have free oxygen to grow while anaerobic bacteria grow only when there is no free oxygen. Many of the bacteria associated with foodborne illness are facultative, meaning that they can grow either with or without free oxygen.

Molds

Molds are multi-cellular and grow very fast, producing fuzzy-looking growth. Mold spores are present everywhere in the environment and can grow on almost any food if conditions are right.

Mold grows best in damp, dark conditions where the spores swell with liquid and burst open their cell walls, sending out short threads or hyphae. These threads “root” into the food to provide nourishment for the mold spores. The terminal end of the thread spreads out above the surface of the food and forms globules, which break off to form new spores. As the spores on the surface of the food grow, the food develops an

unpleasant musty odor that destroys the flavor of the food. Mold spores can also become airborne and fall into food or onto preparation surfaces.

It was once thought that molds were not dangerous to humans, but it is now known that certain molds produce toxins, which may cause liver damage. Some of these toxins have caused cancer in animals. One toxin, aflatoxin, is the most potent carcinogen known to man. The mold producing aflatoxin grows on nuts, corn, wheat, and other grains. The toxin may be found on products made from these foods, including breads and peanut butter. Tests are routinely conducted on these items to determine if they meet government standards for aflatoxin.

Yeast

Yeasts are single cell organisms that convert carbohydrates in food to sugar then to alcohol and carbon dioxide. Yeast spoilage of food is recognizable by bubbles, an alcoholic taste or smell, or a slimy layer on the food surface. Yeast is very easily destroyed by heating. Although yeast is responsible for a few diseases in humans, no data shows that yeast is transmitted by food or that yeast naturally occurring in foods is harmful to humans.

Scope of the Problem

Foodborne illness is often associated with high protein foods – meats, poultry, fish, dairy products, and eggs. However, any food can cause problems. Unique examples include cooked rice, beans, potatoes, cantaloupes, cabbage made into slaw, tomatoes, cake frosting, and ice.

Common symptoms of foodborne illness are nausea, vomiting, diarrhea, malaise, abdominal pain, loss of appetite, headache, and fever. Because these symptoms are so similar to the flu, it is very possible to have food poisoning and not know it.

Each organism produces its own characteristic of symptoms. For example, *Clostridium botulinum* causes fatigue, headache, dizziness, visual disturbances, paralysis, and death if untreated. In contrast, *Clostridium perfringens* produces much milder symptoms – abdominal pain, nausea, and diarrhea.

For some microbes to cause illness, you need to ingest a large number of organisms while it takes only a few of other microbes to make you sick. For example, bacteria such as *Staphylococcus aureus* require a million or more bacteria to cause a person to

become ill. Others such as Norovirus need less than 100 viral particles to produce symptoms.

The Centers for Disease Control and the Food and Drug Administration (FDA) estimate that 48 million Americans become ill each year by eating food contaminated with pathogens. Recent research suggests that 2 to 3 percent of these cases result in long-term recurring health after effects. Chronic illnesses such as central nervous system disorders, heart complications, intestinal inflammation, kidney disease, and even certain forms of arthritis are some of the long term consequences linked with microbial foodborne illness.

Implications for medical costs due to these long-term health problems are staggering. Other costs include any long-term consequences, destroyed food, or lost wages to workers.

Approximately 3,000 people die each year in the United States as a result of foodborne illnesses due to microorganisms. Most foodborne illnesses and deaths due to microbial contamination of food are preventable.

The Centers for Disease Control, which investigates reported foodborne outbreaks, estimates that 97 percent of the outbreaks are due to mishandling of foods in either the home (20 percent) or commercial foodservice establishment (77 percent). Problems related to the food industry account for only 3 percent of the outbreaks.

Certain people are more likely to become ill if their food contains pathogens. Those individuals whose immune system may not be able to fight off the invading organisms are the most susceptible. These individuals include the

- Very young – immune system not fully developed.
- Pregnant women – not only her, but her unborn child is susceptible.
- Elderly – immune system may be weak, and stomach acids decrease with age. (Bacteria may not survive in stomach acid.)
- Immune-compromised individuals – examples include people receiving cancer therapy, diabetics, individuals who are HIV positive or have AIDS, people who have kidney disorder or other health conditions.

Order and Sequence:

1. Introduction –

Say,

- Welcome to Up for the Challenge of Don't Bug Me!
- I am _____ and joining me this week is _____, a Teen Health Ambassador.
- Each time we get together, we'll learn about microbes in our food that might cause us to get sick.
- We will talk about ways to make our food as safe as possible so the microbes don't win by making us ill.
- Before we get started, we need to take care of some things that are required for each class.

- i. Have children sign-in on the sign in sheet with their full names. Tell them they will need to check the sign in sheet each day.
- ii. Pre-evaluation

1. Pass out pre-survey; have children fill out name on cover sheet then have them turn to the first page of the pre-survey. Adult leader read the directions at the top of the survey. When finished, teen leader read each question and the response for each question. Gather up pre-surveys.
2. When you finish the session, record the code number that is on the cover sheet on the pre-survey if it does not already contain the code number. DO NOT TRANSFER NAME OF CHILD TO PRE-SURVEY.
3. Remove cover sheet from pre-survey and staple to blank post-survey. Take this survey to last class and hand it to the child. When you finish the last session, **transfer** the code number to the post-survey, remove cover sheet and destroy the cover sheet. DO NOT TRANSFER NAME OF CHILD TO POST-SURVEY.

Say,

- Thank you for filling out the survey.
- So let's get the fun started with a fun activity!

2. Anchor –

- Hold up a MyPlate Poster.

Ask,

- How many of you have seen this before?

- **What does it mean to you?**

Say,

- **MyPlate shows you all of the different kinds of foods you need to eat each day.**

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| <ul style="list-style-type: none"> ▪ Show poster of amounts needed from each food group for 8 to 12 year old youth. |
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- **Each day, anyone 9 to 13 needs 1 1/2 cups of fruit; 2 cups of cups of veggies for girls and 2 1/2 cups for boys; 5 ounce equivalents of grains for girls and 6 ounce equivalents for boys; and 5 ounce equivalents of protein for both boys and girls.**
- **Everyone over the age of 9 needs 3 cups of dairy each day.**

3. Apply –

Say,

- **I have what might be typically eaten by Jimmy, a 10 year old boy, on 3 different days.**
- **I want each of you to look at these meals for the 3 different days and decide which one is the closest to meeting his needs based on MyPlate.**

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| <ul style="list-style-type: none"> ▪ Keep poster of amounts needed from each food group for 8 to 12 year old youth up so the children can refer to it. |
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- **When you have decided, pick up a colored slip of paper (or you can have them stand by the day they pick) for that day.**

Ask,

- **How many of you picked Day 1?**
- **How many of you picked Day 2?**
- **How many of you picked Day 3?**

Say,

- **Those of you who picked Day 2 stand up (or if you have them stand by the day, ask those standing by day 1 and 3 to sit).**
- **Let's give those standing a round of applause for picking the correct choice.**

- Days 1 and 3 are low in all food groups except protein while day 2 meets all of the food group requirements and stays within the 1,800 calories needed by most 10 year old boys.

4. Anchor –

Say,

- Let's shift gears now from us to microbes.
- Microbes are so tiny that you can't see them, but you can sometimes see their good and dirty tricks.
- There are different kinds of microbes (sometimes called germs or bugs) – bacteria, viruses, parasites, molds, yeast.
- Some are considered good guys because they produce yummy foods such as sauerkraut, yogurt, cheese, yeast breads.

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| <ul style="list-style-type: none"> ▪ Show Good Bug poster. ▪ Hold up paper food models from the meals in the previous section that represent foods due to microbial action (cheese, bread, and yogurt). |
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Ask,

- Can anyone guess why we have a person on our Good Bug poster?
- Can anyone guess how many bacteria we have in and on our body?

Say,

- Each of us has about a trillion bacteria on and in our body.
- These bacteria protect us from the Ugly Bugs we'll talk about in a little while.
- They compete with the bacteria that can cause us to be sick so they are considered Good Bugs.
- We need them so that we are healthy.
- Some bugs are considered bad because they cause food to spoil like the mold on fruit or bread.
- They can even make foods turn a funny color, become slimy, and smell bad like meat.

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| <ul style="list-style-type: none"> ▪ Show Bad Bug poster with pictures of spoiled foods. |
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- We call the really, really bad microbes “ugly” because they can make us very sick and can even cause us to die.
- Some of the common kind include *Salmonella*, *Staphylococcus*, *Listeria monocytogenes*, *Campylobacter jejuni*, *Escheria coli*, *Clostridium botulium*, *Clostridium perfringens*, *Bacillus cereus*, *Hepatitis A*, Norwalk virus, *Cryptosporidium*, *Cyclospora*.

<ul style="list-style-type: none"> ▪ Show Ugly Bug poster with names of pathogens.

- When food we eat makes us sick, it is called a foodborne disease or food poisoning.
- These ugly microbes are called pathogens.

<ul style="list-style-type: none"> ▪ Hold up Symptoms of Foodborne Disease poster.

- They give us a stomach ache, fever, headache, diarrhea, cause us to vomit, and feel tired.
- You may have to go to the hospital.
- And some people even die from these foodborne pathogens.
- Let’s get up and move a little.
- I have a song about pathogens.

<ul style="list-style-type: none"> ▪ Play Pathogens are on Your Path CD. ▪ Have youth sing along. ▪ Repeat several times.
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Say,

- The song says we need to always wash our hands, use clean pots and pans, and keep temperature right.
- If we do, we’ll win the fight so the Ugly bugs don’t win.
- In the next few days, we’ll be talking about ways to win that fight.

5. Food Preparation –

Ask,

- Whenever we prepare any food, what should we do first?

Say,

- That’s right, wash our hands.

- **We are going to divide you into two groups and see how fast your group can wash your hands.**
- **The steps we will take are wet, shake, soap, move while rubbing for 20 seconds** (note – have them sing the song Twinkle, Twinkle Little Star or Happy Birthday, both of which take about 20 seconds), **rinse, and dry.**

- Show sign for handwashing.
- Divide into groups containing no more than 10 children per group.
- Turn on water and adjust until it is warm.
- Have someone available to dispense soap from a pump bottle.
- Have youth circle around from receiving soap to rinsing hands and drying. (The individual who dispensed the soap can hand out paper towels.)
- Time each group to see who wins.

- As an alternative, you may use hand wipes if it not is possible to use a sink.
- Emphasize that this does not take the place of good handwashing, but it is better than nothing.

Say,

- **Today we are going to make a really yummy salad with orange dressing.**
- **First, I'm going to have you draw a slip of paper with a task.**
- **I have measured out all of the ingredients.**
- **All we have to do is assemble the salad.**
- **First, we are going to put our salad greens in a large bowl so we can toss it.**
- **You can use one kind or use a number of different greens.**
- **Today I have _____ for our salad.**
- **What do you think the first thing we need to do to our greens?**
- **That's right, wash them unless you buy them already washed which will be indicated on the package like the one I have here.**

- Show salad package or lid with washed on it.

- **To wash the greens, run cold water over the leaves until all of the visible soil is removed.**
- **Then you want to drain the water off the leaves so that the salad dressing in not diluted.**

Ask,

- **Where would the microbes come from on the greens?**

- Soil
- Hands used to harvest or pick it out at the supermarket.
- There have been several cases of food poisoning related to eating salad greens.

Say,

- **The recipe, which you will get on the last day of class, calls for 1/4 cup of orange juice, 2 tablespoons vinegar, 2 tablespoons oil, and 1 tablespoon of sugar.**
- **When we get all of the ingredients in the jar, we can either whisk them together or put a tight fitting lid on it and shake.**
- **We're going to shake our salad dressing and each of you will have a turn making sure it is well blended.**
- **Someone has the task of pouring on the well-blended salad dressing.**
- **Now someone is going to gently toss until all of the leaves are coated with dressing. (Note: You may need to show them how to do this.)**
- **We have two different kinds of washed and diced vegetables.**

Ask,

- **Who has the task of adding a veggie?**

Say,

- **Some of these will add a nice color while others will give provide a different texture.**
- **Now someone is going to add 3/4 cups of chopped walnuts. (Note: Substitute sunflower seed if anyone is allergic to tree nuts.)**

Ask,

- **To which food group do nuts belong? (protein)**

Say,

- **To add some sweetness and more color and texture we're going to add mandarin oranges to our salad.**
- **They come in a can.**

Ask,

- **Can anyone tell me what we need to do the can before we open it?**

- Wash off the top. We don't know where the can has been or what has been crawling all over it.

Say,

- **I have already washed the can so now all I need is for someone to open the can and drain the liquid off it.** (Note: You can drain into jar used to mix dressing)
- **Now we are going to add 1/2 cup blue cheese.** (Show cheese, but don't add if you have milk allergies. You can tell the class that you are not adding the cheese because someone is allergic to dairy products.)

Ask,

- **Who is adding the cheese?**
- **What do you know about blue cheese?** (belongs to dairy group and is made with "Good Bugs" [mold])

Say,

- **Good mold (bugs) is needed to make blue cheese.**
- **Finally, we are going to gently toss all together**
- **After the salad is placed on plates and a piece of melba toast added, we will enjoy.**

Ask,

- **How many of you like the salad?**
- **Did you notice anything about our salad?**

- Contains all food groups.
- Contains one item that was possible because of a "good" bug.

6. Reflect –

Ask,

- **What did you learn about microbes today?**

7. Bridge –

Say,

- **Tomorrow, we are going to explore how bugs travel from one place to another on the bug express.**
- **I hope everyone is here.**
- **We have a real treat for tasting tomorrow.**
- **I think everyone will like it.**

Optional activity – (Health Ambassador will lead)

- Put on the Pathogens CD and form a conga line (teen lead). Continue to repeat until group has made it around the room twice or three times.

Up for the Challenge of Don't Bug Me!

Lesson 2 – The Bug Express

Audience: 8 to 12 years old

Time: 60 minutes

Materials:

- Attendance Sheet
- 4 PetriFilm™
- Sterile water
- Dropper
- Sterile swabs
- Plastic ziplock bags (quarts and a gallon)
- Black light
- Carrot or apple
- Cutting board treated with Glitterbug Powder and in a bag
- Knife
- Flip chart
- Marker
- Ball of yarn
- “What’s Wrong With This Picture” handout
- Pencils
- True and false signs
- Chopped lettuce
- Chopped tomatoes
- Grated cheddar cheese
- Whole grain tortilla chips
- Boneless chicken
- Salsa
- 2 Cutting boards
- 2 Sharp knives
- 3 Bowls
- Skillet
- Tongs
- 4 Large spoons
- Plastic gloves

- 6" plates
- Plastic forks
- Soap or hand wipes
- Paper towels
- Plastic Table Cloth
- Pictures of poses

Objectives:

- To identify ways microbes hitchhike from one place to another
- To determine ways to stop microbes from spreading

Key Concepts:

- Microbes must hitch a ride to get from one place to another.
- Keeping everything clean is one way to stop microbes from hitching a ride and thereby prevents food poisoning.

Background Information:

To get from one place to another, microbes must hitch a ride. The transferring of bacteria or viruses from one item to another is called cross contamination. Cross contamination is an important source of foodborne illness. An uncontaminated object may become contaminated when it encounters an object that contains harmful bacteria. Raw meats and poultry are often vehicles of cross contamination. A survey conducted by the FDA found that about 25% of the population only rinses or wipes their hands after handling raw meat or poultry when preparing it in their homes. In addition, approximately the same number only rinses or wipes a cutting board or knife that has been used to process raw meat or poultry.

It was mentioned in Lesson 1 that the majority of foodborne illness is contracted from food eaten in a foodservice establishment or at home. Many people are ignorant about preventing food poisoning. They are uninformed as to the many vehicles of cross contamination that exist in the kitchen. All food handlers should be encouraged to wash their hands thoroughly before handling food and after using the toilet. In addition, hair should be kept out of the way when preparing food. Other tips, recommended by USDA, to avoid cross contamination include:

- Wash EVERYTHING that has encountered raw meat or poultry with hot soapy water.

- Do not use the same plate that held raw or marinated meat or poultry for the cooked meat or poultry.
- Do not let raw meat juice drip onto other foods. Do not thaw meat on a refrigerator shelf where juices can drip onto other foods.
- Keep foods away from leaky pipes, household cleaners, pets, etc.
- Do not sneeze or cough into foods.
- Use gloves when handling foods if you have a cut or infection.
- Keep washing and drying cloths clean. Do not use a mildewed cloth or sponge.
- Use a plastic cutting board to cut meats, which can be washed in dishwasher.
- Use a solution of bleach to sanitize cutting boards, counters, etc.

Order and Sequence:

1. Bridge –

Say,

- Please check off the attendance sheet.

Ask,

- Who can tell me one thing we talked about yesterday?
- What else do you remember that we discussed?

Say,

- Today we are going to explore the bug express.
- In other words, we are going to talk about how bugs get from one place to another.
- But before we get into some specifics, we are going to start an experiment, which I will bring back in a few days.

2. Apply –

Say,

- In the next few days, we are going to concentrate on bacteria, specifically, how to stop the Ugly Bugs from growing so we don't get sick.
- Bacteria are everywhere.
- In fact, we have around a trillion bacteria in and on our body.
- Most of these are really good guys.
- We don't want to bother them, but we do want to prevent the ugly bacteria from making us sick.

- We are going to start an experiment today that will take a few days to see what happens.
- I have something called PetriFilm™.
- It has all of the nutrients that bacteria need to multiply.
- We add sterile water so the bacterium has a source of water, just like we need water.
- I have 4 pieces of PetriFilm™.
- I just added sterile water to it and nothing else.
- Now, I need to contaminate the 4 PetriFilms™.
- In other words, I am going to transfer bacteria from one place to our PetriFilm™.
- I will let you choose what we place on the PetriFilm™.
- For examples it might include touching fingers, shoe bottom, table, face, placing hair on film (be sure to get a root) , cough, etc.

Ask,

- What would you like to select?

Say,

- We need to handle the film carefully so you don't contaminate it with anything other than what is placed on the film.

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| <ul style="list-style-type: none"> ▪ Use sterilized water and dropper. Lift the film on the Petrifilm™, place 4 to 5 drops of water in the center, and then replace the film, pressing lightly. Let it sit for about 5 minutes. ▪ When ready to contaminate the Petrifilm™, lift the film and touch whatever is chosen to the moist surface (or you can roll a moistened, sterile swab over the surface of the contaminated item then carefully roll it on the Petrifilm™). ▪ The film is then gently replaced. ▪ Place the contaminated PetriFilm™ in a plastic bag. ▪ Be sure to label the PetriFilm™ with a sharpie. |
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Say,

- The Petrifilm™ needs to sit for 2 to 3 days at room temperature.
- I will bring it back in the next couple of days so you can see if we had any bacteria present on the items you selected.

3. Anchor –

Say,

- Unlike us, microbes don't have feet to get from one place to another.
- So they have to find another way to move about.
- They don't have legs to walk from one place to another so they must hitch a ride.
- They become hitchhikers on the Bug Express.
- As I indicated, we are going to look at ways that harmful microbes might make their way into your food.

Ask,

- What vehicles the hitchhikers might use?

- Use flip chart or white board to write answer (Health Ambassador writes responses).
- Possible items include: Hands. dirty utensils, cutting boards, pets, growing in dirt, clothes, drips, one food touching another.

- When microbes move from one item to another we call that cross contamination.
- Let's see how this might happen.

- Darken room.
- Using black light, show food item – carrot, apple, etc. under black light.
- Turn lights on.
- Take cutting board and knife from plastic bag, (Previously, sprinkle one shake of Glitterbug Powder on cutting board, wipe with damp cloth, and place in plastic bag.)

Ask,

- Do the cutting board and knife look clean?
- Could there be microbes present?

- Cut up food on "contaminated" cutting board and place in bowl.
- Darken room.
- Shine black light on the food, knife, cutting board and hands so children can see where contamination came from.
- Remind children that the powder is pretend bugs.

Say,

- So, we can have a cutting board and knife that look clean, but microbes can be lurking on them.
- This means that we must wash everything with soap and water after cutting up any food, but especially when we cut up meat, poultry and fish.
- We usually cook meat, poultry or fish so the microbes are killed.
- But what about the lettuce and veggies for a salad like we had yesterday.
- Did we heat them?
- Harmful pathogens from the one item might move to the salad ingredients and make us sick.
- Everything in the kitchen must be clean.

2. Apply –

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| ▪ Hand out “What’s Wrong With This Picture?” to every two children |
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Say,

- I want you to work as a pair to find everything that is a food safety problem in this picture.
- Circle each item that could be the cause of making you sick.
- Count up the number of items you identified.

Ask,

- What are some of these problems?

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| • Ask different pairs what they identified in the picture. |
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Say,

- We’re going to play a “Stop the Hitchhiking.”
- I am going to ask some questions.
- All of the questions describe a good food handling practice.
- But only some involve bugs hitchhiking from one item to another.
- If you think the answer to the question is yes, go to the side of the room with the true sign.
- If you think it is no, go to the side of the room that says false.
- You can see different way harmful microbes might get from one place to another.
- The way to eliminate those harmful microbes is to wash them away.

- Let's see how many things you need to wash to make sure that the bad bugs are not traveling on the bug express.
- We are going to play a game called "Gotta Wash, Gotta Wash Your _____?"

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| <ul style="list-style-type: none"> ▪ Divide group into 8 to 10 children. ▪ Have each group form a circle and give them a ball of yarn. |
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Say,

- One of you will be given the end of yarn.
- Everyone in the circle chants together, "Gotta' wash, gotta' wash, gotta wash your _____."
- The person holding the ball of yarn fills in the blank.
- For example, I might say "Gotta' wash, gotta' wash, gotta wash your cutting board."
- The next person could say "Gotta' wash, gotta' wash, gotta wash your fork."
- The person holding the end of the yarn will fill in the blank and then toss the ball of yarn to someone else in the group.
- Be sure to hold onto the yarn while tossing the ball of yarn.
- When you catch the ball of yarn, you fill in the blank of the chant.
- Hold on to the yarn, but toss the ball of yarn to another person.
- Continue until at least everyone is part of the web.
- If you can't name something, it has already been named or it is wrong, you must crawl under the web while still holding the yarn.
- You can no longer have the ball of yarn tossed to you.

5. Food Preparation –

Say,

- Today we are preparing Chicken Nachos.

Ask,

- What is the first thing we are going to do before starting the preparation?

Say,

- That's right, wash our hands.
- The first step is to cut up our chicken in bite size pieces.

- This works really well if the chicken is slightly frozen.
- To speed things up, I have already cut up the chicken.
- I made sure that I didn't use the cutting board for anything else until I washed it well and rinsed it in boiling water or I could have used the dishwasher.

Ask,

- Why is it important to wash the cutting board really well after cutting up the chicken?

<ul style="list-style-type: none"> ▪ We know that raw chicken probably has some type of pathogen, such as Salmonella or Campylobacter on it.

- We are going to put our chicken on to cook.
- While it is cooking, we are going to prepare our lettuce and tomato that go on top of our chicken.
- I have already chopped these items.

Ask,

- What are some things we need to make sure that we do when we are preparing our veggies that are not going to be cooked? (Use separate or clean cutting boards, wash all veggies unless prewashed, wash hands, etc.)

Say,

- That's correct.
- I washed the lettuce and tomatoes under cold running water then made sure they were dry.
- I used a clean cutting board to chop both of the veggies.

Say,

- When the chicken is cooked, we add salsa.

Ask,

- Can anyone remember what we have to do before we open the jar?

Say,

- That's correct, wash off the jar.
- After we add the salsa, we let the mixture cook until the chicken is thoroughly cooked.

- We are also adding grated cheese to the top of our Chicken Nachoes.
- To assemble, we place about 5 chips on a paper plate.
- We are going to top them with our chicken mixture, grated cheese, shredded lettuce, chopped tomatoes, and grated cheese.
- Enjoy.

6. Reflect –

Say,

- Today, we talked about how microbes hitchhike from one place to another.
- This is called cross contamination.

Ask,

- **What are some ways to stop the Ugly Bugs from hitchhiking?**

- not using cutting board to cut up chicken then veggies without washing in between or using a different one,
- washing hands after handling raw chicken.

7. Bridge –

Say,

- **Tomorrow we will explore the main way pathogens hitchhike.**

Ask,

- **Would anyone like to guess what that is? (If no one guesses correctly,)**

Say,

- **You will need to wait until tomorrow to find out.**

8. Optional Activity – (Health Ambassador will lead)

Say,

- **We are going to do some poses.**
- **I will show you a picture of each pose and describe it.**
- **We will then practice doing the pose.**

- Show pictures.
- Mountain – Stand straight with feet planted firmly on the floor. Feet should be slightly apart (about 2 fists between). This is the position to return to when you wish to restart the group. Arms should be comfortable at sides, face relaxed, shoulders back and down.
- Tree – From Mountain position lean slightly back with arms and fingers pointing behind you, bring leg up and position foot on thigh. Hold for 4-8 seconds as you feel comfortable. Return to Mountain.
- Chair – Start from standing position with arms extended at sides, raise arms overhead, and squat as if sitting. Come back up and return to Mountain pose.
- Waterfall – From Mountain position lean slight back with arms and fingers pointing behind you. Hold about 4-8 seconds as you feel comfortable. Return to Mountain.

- Windmill – Start from standing position with arms extended at sides, cross over body and go as close to a toe touch as comfortable. Come back up and cross over to other side. Repeat 8 times.
- Lobster – Squat with toes and knees pointing towards the wall. Place arms up and to side, bend at elbows and turn hands toward face. Pretend fingers are pinchers and make funny faces at your friends. Swing arms down and cross, while squatting up and down at the same time to warm up muscles. Hold the position for 8 seconds when you feel slightly out of breath.
- Bird – From Mountain position stand on tiptoes (knees slightly bent). Turn arms behind you and commence flight! Hold for 8 seconds or as long as possible.
- Rag Doll – With knees slightly bent, bend slowly towards the ground. You do not need to touch the ground, anywhere on the leg is fine. Just hang and relax for 8-16 seconds.
- Frog – From Mountain squat down with feet flat on the floor and hands flat on the floor. Youth may enjoy jumping and saying “ribbit”, having fun acting like frogs. Hold the position for 16 seconds if youth do not choose to jump.
- Gorilla – from Frog position, stand up a little taller in a gorilla-like position, swinging arms back and forth. Swing arms back and forth at least 4 times.
- Warrior – Bring body into a lunge position. The back foot should be turned away from the opposite foot, hips forward, and arms up. Hold for 8 seconds. Repeat with opposite side.

Up for the Challenge of Don't Bug Me!

Lesson 3 – Wash Those Bugs Away

Audience: 8 to 12 years old

Time: 60 minutes

Materials:

- Attendance sheet
- Glitterbug powder
- Black light
- 2 Boxes with holes
- Names of microbes on slips
- 2 boxes or containers
- Gloves with velcro
- The “Ugly Bug” poster
- Additional Ugly bugs
- Tape/glue dots
- Symptoms of food poisoning poster
- Pencils
- CD player
- “Handwashing Rap” CD
- “Handwashing Scramble” handout
- Bread (preferably white whole wheat)
- Low-fat cream cheese (Neufchatel)
- Sour cream
- Dill weed
- Garlic powder
- Lettuce leaves
- Cucumber
- Spoon
- Plastic knives
- Paper towels
- Soap or hand wipes
- Plastic gloves
- Plastic tablecloth
- Pictures of poses

- Bag or envelope with pose sets

Objectives:

- To examine good personal hygiene
- To wash hands to prevent foodborne illness

Key Concepts:

- Good handwashing is very important in preventing food poisoning.
- Hands should be washed before and after handling food, after going to the rest room, after touching an animal, after blowing your nose, after answering the phone, and any other time a contaminated item is touched.

Background Information:

Keeping food and everything that comes in contact with it clean is another key to preventing foodborne illness. Good handwashing is the primary means of protecting against viral infections. Cases of contamination of tossed salad and cake frosting have been reported as a result of workers not properly washing their hands.

Poor personal hygiene of food handlers causes up to 40 percent of all food poisonings in this country. Hands should be washed before handling food and when moving from one food preparation procedure to another. Recently, researchers found that 25 percent of respondents would only rinse or wipe their hands after handling raw meat or poultry.

Proper handwashing steps include:

1. Wet hands under hot, flowing water
2. Apply enough soap to develop a good lather.
3. Rub hands together and wash arms as far up as will make contact with food for twenty seconds.
4. Rinse hands and arms from arms and wrists down with hot, flowing water.
5. Dry hands and arms with disposable paper towels.
6. Turn off water with paper towel.

Order and Sequence:

1. Bridge –

Say,

- **Don't forget to check off the attendance sheet.**
- **Yesterday, we explored the bug express.**
- **We talked about the fact that microbes don't have feet to walk from one place to another.**
- **They have to hitch a ride.**

Ask,

- **What were some of the ways they hitch a ride?**

2. Anchor –

Say,

- **One of the best and most common ways for them to hitch a ride is our hands.**
- **Today we are going to examine what we can do to stop microbes from using our hands to get from one place to our food.**

- | |
|--|
| <ul style="list-style-type: none">▪ Have the children line up.▪ Secretly, put GlitterBug Powder on the right hand of your health ambassador (or yourself if you don't have a teen helping you). |
|--|

- **I (or the teen) am going to shake hands with the first person in line.**
- **Continue shaking hands down the line until everyone has shaken hands.**
- **Do you think microbes might have hitched a ride from my (teen's) hand to yours?**

- | |
|---|
| <ul style="list-style-type: none">▪ Darken room.▪ Use the black light to trace the transfer of pretend bugs. |
|---|

- **You can see that the pretend bugs were transferred from one person to another down the line.**
- **At the end, there were fewer pretend microbes to pass along so we didn't see as much glowing.**

Ask,

- Why is washing your hands so important?

Say,

- Hands are the perfect vehicle for microbes to hitch a ride from one place to another.
- In fact, it is estimated that 40 percent of all foodborne illness is due to no or poor handwashing.
- So if someone asks you the most common vehicle for cross contamination, what would you say?

1. Hands

- Apply –

- Divide children into two groups.
- Set up 2 stations per group (a starting point and a finish point).

Say,

- We are going to play “Dirty Hands Relay.”
- Each group has a large box containing pieces with names of microbes – the good, the bad, and the ugly.
- At the finish point there is a box (or container) for each group to place the pieces of paper that stuck to the glove.
- One of you at a time will put on a glove with strips of Velcro.
- When it is your turn, you will go to the box at the start and place your hand in the box and stir it around.
- You will then take out your hand and quickly walk to the finish point.
- You will remove all of the strips of paper and return to the start line where the next person will take the glove and repeat the process.
- The goal is to get as many bugs as possible in the least amount of time and to get as few of the Ugly bugs as possible.

- Display poster with names of bugs – The Ugly – causing food poisoning.

- Now I want you to separate out the bugs that are ugly.
- Count the number of different microbes that could make you sick.

- The team who was the fastest is the winner unless you got more Ugly bugs.

Ask,

- Do you remember what some of the symptoms of foodborne illness are?

<ul style="list-style-type: none"> ▪ Hold up sign with symptoms of foodborne illness.
--

Say,

- One way to decrease your risk of food poisoning is to wash your hands and wash them often.
- I want everyone to stand and follow my directions. .
- As I describe the activity, pretend you are doing it.
 - Turn on water and check the temperature to make sure it is hot.
 - Wet hands under hot water.
 - Apply soap to make a good lather.
 - Rub hands together making sure they get up along their arms, between their fingers, the backs of the hands, the side of the thumb.

<ul style="list-style-type: none"> ▪ Keep track for 20 seconds. Do not give any more instructions until then.
--

- Rinse hands and arms from wrist down.
- Dry hands with paper towel.
- Turn off water with paper towel.
- Discard paper towel.

Ask,

- Do you usually take that long to wash your hands?
- Did you do anything differently than you usually do when washing hands?

<ul style="list-style-type: none"> ▪ If they don't come up with ideas, ask them ▪ if they wash up their arms, ▪ if they wash the backs of their hands thoroughly or between their fingers, or ▪ if they pay special attention to their fingernails.

- When should you wash your hands?

Say,

- Let's see when you think you should wash your hands.
- We're going to play Simon Says.
- I'm going to make a statement and if you should wash your hands, stand up and mimic washing your hands then sit down.

Ask,

- Did you realize how often you should wash your hands when preparing food?
- What are some reasons we don't wash our hands?
- Do you think you wash your hands as often as you should?

- | |
|--|
| <ul style="list-style-type: none">▪ Divide children in pairs, partnering younger children with someone older.▪ Hand out "Handwashing Scramble." |
|--|

Say,

- I am handing out a "Handwashing Scramble" sheet.
- You and your partner need to unscramble each word to tell you about handwashing.

Ask,

- What was the answer to the first word?

- | |
|--|
| <ul style="list-style-type: none">▪ Continue on until you have talked about each scrambled word. |
|--|

Say,

- You have been sitting for a while.
 - I want everyone to stand up and move away from the tables.
 - I am going to play "Handwashing Rap."
 - Everyone join in on the rap.
- Food Preparation –

Say,

- Today each of you are going to prepare your own individual sushi sandwich.

- Have children wash hands or use hand wipes if handwashing facilities are not available.
- Distribute paper towel to each child.
- Give each child a square of bread.
- If they washed their hands, they can use their hands to make to sushi. If they can only use wipes, then hand out one plastic glove to each child.

Ask,

- Have any of you had sushi?
- Do any of you know what sushi is?

Say,

- Sushi is the [Japanese](#) item made with a specially prepared vinegared rice combined with varied ingredients such as seafood, which is often uncooked, vegetables, and occasionally [tropical fruits](#).
- In place of rice, we are going to use whole wheat bread.
- You are going to flatten the bread as much as you can with your hands.
- Because you have just washed your hands, you can use your hand without gloves.
- OR since we could only use wipes, you will need to put on a plastic glove to make your sandwich sushi,
- I have mixed together some low-fat cream cheese, a little sour cream, garlic powder and dill weed that you are will spread on your bread.
(Give each child a portion to use on their bread.)
- Now I have a piece of lettuce to put on top of the spread.
- You will probably want to press it into the spread so it will be easier to roll later.
- You can also use you knife to trim the lettuce to fit the slice of bread.
- Feel free to nibble on the lettuce you trimmed off.
- At one end of the bread, place 2 to 4 strips of cucumber.
- Now you are ready to roll up your sushi roll.

- Demonstrate how they should place the cucumber at the end of the bread and roll it up.

- To make sure the sushi is safe I washed all of the veggies before cutting.
- I kept them cold after cutting them up, and
- I washed my hands thoroughly.

4. Reflect –

Ask,

- **What did you learn about hands and keeping your food safe to eat?**

Say,

- **Hands are a great way for those Ugly microbes to hitch a ride to the food we eat.**
- **So washing our hand thoroughly and often is a must for safe food preparation.**

5. Bridge –

Say,

- **Tomorrow, we are going to talk about bugs on the hot seat or in the deep freeze.**
- **We will also be preparing a recipe that uses the crust trimmed from the bread we had today.**

Ask,

- **Does anyone want to guess what that might be?**

Say,

- **You will need to wait until tomorrow to see if you are right.**

6. Optional Activity – (conducted by Health Ambassador)

Say,

- **Yesterday, we went over some poses.** (Or, you can do poses if you were not able to do in lesson 2.)
- **Today, I am going to divide you 5 groups.** (Have groups pick pose sets from envelope.)
- **Each group will draw out a slip of paper that has three different poses.**
- **Your group will decide what order and how you want to demonstrate your poses.**
- **You can demonstrate once and have group do the same thing.**
- **Or, you can make up a story to go with your poses.**

Up for the Challenge of Don't Bug Me!

Lesson 4 – Bugs on the Hot Seat or in the Deep Freeze?

Audience: 8 to 12 years old

Time: 60 minutes

Materials:

- Attendance sheet
- 2 water bottles
- 2 balloons
- 2 rubber bands
- Ice
- Water
- Container for ice bath
- Yeast
- Sugar
- Petrifilm™ experiment
- The Danger Zone Temperature Chart
- Today's temperature tag
- "Starving Toni" story
- 5 plates with food and plastic beads
- Brown paper lunch bag (for every 3 children)
- Paper models of various food items
- Juice boxes
- Freezer packs
- Thermos
- Fun with Food Safety" Animated Music DVD
- Computer
- LCD projector
- Speakers
- Eggs
- Milk
- Sugar
- Salt
- Nutmeg
- (alternate to above 5 items – sugar and cinnamon)

- Whole wheat bread crusts
- Butter or margarine
- Canned peaches
- Whisk
- Skillet
- Turner
- Thermometer
- 6" Plates
- Plastic forks
- Gloves
- Plastic tablecloth
- Soap or hand wipes
- Paper towels

Objectives:

- To recognize the Danger Zone
- To control temperature to prevent the growth of microbes

Key Concepts:

- Disease-causing bacteria grow rapidly between 40°F and 140°F, a range known as the DANGER ZONE.
- Cook foods thoroughly, especially meat, poultry, and fish.
- Cool foods rapidly to prevent food poisoning microbes from growing.
- Keep food hot (above 140 °F).
- Keep food cold (below 40 °F).

Background Information:

Disease-causing bacteria grow rapidly between 40°F and 140°F. This temperature range is called the **DANGER ZONE**. Either refrigerate foods or hold in equipment that will keep the temperature above 140°F. Perishable foods should not remain at room temperature for more than 2 hours (1 hour if temperature is above 90 – 95°F).

Minimize the amount of time in the **DANGER ZONE** by heating and cooling foods as quickly as possible. To cool quickly, place foods in shallow containers or cut into small pieces so that the final temperature of 40°F is reached within 4 hours. The fastest

method of cooling is surrounding the container of food with ice water. Stirring frequently speeds the cooling further.

Food should pass through the **DANGER ZONE** as few times as possible. For example, if reheating and not all of the food is needed, take out the required portion for reheating.

Cook foods thoroughly, especially meat, poultry, fish, and egg products. Using a thermometer to measure the internal temperature is the only sure method to determine if the appropriate temperature is reached. Most cookbooks give internal temperatures for critical foods such as meat and poultry.

Special care should be used when microwaving. Check the temperature of the food in several places since the rarest part may not be the exact middle. Covering food during cooking helps promote even heating. Always follow directions carefully, including any standing time at the end of microwaving.

When preparing foods, don't interrupt cooking. All bacteria may not be killed. The temperature of the food – even if immediately refrigerated – may promote growth of bacteria. Since some bacteria produce toxins that are not destroyed by ordinary heating, illness may result. Also, heating bacterial spores appears to activate them to become vegetative cells capable of multiplying.

Thoroughly reheat leftovers if served hot. Leftovers should be reheated to 165°F or, in case of gravies and sauces, brought to a boil. This heating will help assure that harmful bacteria are destroyed.

Check temperature of food in hot-holding containers such as chafing dishes, steam tables, crock-pots, or ovens maintained at a low temperature. The temperature of the food should never fall below 140°F.

Foods should be kept cold during shopping. When doing a number of errands, always shop for groceries last. Or, if it is necessary for food to stay in the car for any length of time, use an ice chest for perishable food items. A car, even on the coldest days, can become quite warm if the sun is shining. After arriving home, put refrigerated and frozen foods away immediately.

Both refrigerator and freezer temperatures should be monitored. Refrigerators should maintain a temperature of 40°F or below. *Listeria monocytogenes*, a pathogen, can grow at 41°F.

Freezers should be maintained at 0°F or below. Freezing stops most bacterial growth, but does not kill bacteria. Therefore, care must be taken in defrosting and handling frozen products. Many people routinely defrost foods on the kitchen counter. In a recent survey, 27 percent of respondents said they thawed foods in this manner. This practice is risky since the surface of the food can get warm enough for bacteria to grow rapidly while the center is still frozen.

Three techniques can be used to defrost food safely. These methods include thawing in the refrigerator, with the food surrounded by cold water that is replaced every 30 minutes, and in the microwave oven following manufacturer's directions. If the food is defrosted in the microwave, it should be cooked immediately since parts of it may start to cook. It is also safe to cook food from the frozen state.

Finally, leftovers should be refrigerated or frozen immediately. Foods should be placed in small shallow containers or cut into small pieces so that the final internal temperature of 40°F is reached within 4 hours. A faster method of cooling than refrigerating or freezing is surrounding the container of food with ice water. Stirring frequently further speeds the cooling.

Order and Sequence:

- Bridge –

Say,

- **We have talked about the good bugs, the bad bugs and the ugly bugs.**
- **The ugly bugs are the really bad, bad microbes that make us sick.**
- **The last two days we have talked about how the pathogens can get on our food.**
- **Today, we are going to shift gears.**
- **Because the food we are preparing today needs time to sit, we are going to start the process now then cook and sample the food later in the class.**
- **We are going to use those bread crusts left over from our veggie sushi.**
- **We are making French Toast Bites.** (If anyone is allergic to eggs, do the cinnamon bites instead.)
- **The first step is to whisk together our milk and eggs until well blended.**
- **We mix together our sugar, dash of salt, and nutmeg then add to the egg mixture.**
- **We carefully add our bread crusts, making sure they are submerged in the egg mixture.**

- We will let this sit until the end of the lesson so that the bread has time to absorb the liquid ingredients.

Ask,

- How should we store our mixture?

Say,

- Because it is going to be less than 2 hours, we can let it sit at room temperature.
- However, to be safer, I am going to put it in my cooler to stay cold.

- Anchor –

Ask,

- What do you think “bugs on the hot seat or in the deep freeze” is all about?

Say,

- Bacteria have a certain temperature they like.
- This is the temperature where they are able to divide rapidly.
- Large numbers of some bacteria make us sick.
- These ugly bugs are called pathogens.
- The temperature between 40°F and 140°F is where most pathogens grow best.
- We call that the DANGER ZONE.

i. Show Danger Zone Temperature Chart and today’s temperature card.

Ask,

- What is today’s temperature?
- Do you think bacteria will grow fast or slow at this temperature?

Say,

- The answer is fast since the temperature is in the DANGER ZONE.
- This means that bacteria would divide very fast today if we left food out.

- Apply –

Say,

- Let’s do a little experiment to see how fast bacteria can grow.
- We’ll look at the experiment later.
- I have yeast, which produces carbon dioxide that makes bread rise, some sugar that will feed the yeast, and room temperature water.
- I am going to mix these together and then divide them into two bottles.
- I am going to place a balloon over each opening. (To add some stability, place an elastic band around balloon and neck of bottle.)
- If the yeast multiply and produce carbon dioxide, the balloon will expand.

- We are going to let one bottle sit out at room temperature while the second bottle will be set in a pan of ice water.
- What do you think is going to happen to both of these balloons?
- We'll come back later to see just what does happen.

▪ Anchor –

Say,

- Under the right conditions (temperature, good food, etc.) one bacterium can divide about every 20 minutes.
- We say that the bacteria grow.
- This doesn't mean they get bigger, just that more of them are produced.
- I am going to read you a story about starving Tony.
- As I read the story, I am going to show you how fast bacteria multiply.
- We are going to start with one bacterium.

Read story.

Plate 1: Chicken and 1 bean

Plate 2: Chicken and 24 beans

Plate 3: Chicken and 184 beans

Plate 4: Chicken and 552 beans

Plate 5: Chicken and 2,760 beans

Note: Under ideal conditions, bacteria can multiply every 20 minutes and rarely would we start with just one bacteria or one piece of chicken or meat patty.

Ask,

- How many beads (or beads) are in each plate?
- They represent bacteria that might be on the food.
- Knowing what you know now about the number of bacteria on chicken, would you eat the chicken if you were Toni? (No.)
- What if she had nuked it before eating it? (No. Some pathogens may survive and others produce a toxin that can't be destroyed by normal heating.)

Say,

- To prevent large numbers of bacteria, we follow the two hour rule.
- Do not keep foods in the DANGER ZONE for longer than two hours.

Ask,

- **How might Toni feel during the night or the next day?**
- **Why?**

▪ **Apply –**

- Divide participants into groups with no more than 3 to 4 children per group.
- Give each group a brown paper lunch bag and a variety of food items.

Say,

- **Each group is getting a lunch bag and pictures of foods you might eat for lunch.**
- **I want you to pack a lunch with foods that would be safe if you couldn't put it in the fridge or pack in ice.**

Ask,

- **What did you put in your lunch bag?** (Have each group go over what they put in their bag.)
- **Do you think they made good or risky choices?**

- Unsafe at room temperature
- Raw or cooked meat, poultry or fish
- Cooked plant foods
- Raw, cut up fruits and vegetables
- Dairy products (milk, yogurt, soft cheeses)
- Safe at room temperature
- Whole fruits and vegetables
- Dried fruits, vegetables and meats (jerky)
- Jams and jellies
- Breads, cereals, cookies, etc.
- Potato chips and crisp cooked bacon
- Food in unopened sealed packages (example Vienna sausage, fruit cup)
- Peanut butter
- Hard cheeses (example Cheddar, American, Swiss)

- Anchor –

Ask,

- How can you keep foods hot for lunch?

Say,

- You can use a thermos like I have here.
- You can also use it to keep food cold.
- Also, to keep food cold, you can use a commercial gel pack that you have placed in the freezer.
- You can use ice cubes in a leak-proof container.
- Another way to keep foods cold is to freeze a juice pack.
- Be sure all items are chilled before putting in lunch bag.
- Some other food safe brown bag lunch tips include packing lunch in clean container, washing hands before packing lunch, and have all of the equipment and work area clean.

- Apply –

Say,

- Before we prepare our French toast bites, I have a musical cartoon I want to show you.
- Listen carefully because will hear what can happen to you if you don't keep foods cold and cook them to the right temperature. The song is called "Don't Be a Gambler."

Ask,

- Did you enjoy the musical cartoon?

- Food Preparation –

Ask,

- What do we always do before we start food preparation and eating?

Say,

- Right, always wash your hands.
- We are now ready to cook our French Toast Bites.
- I am putting 4 tablespoons butter to melt in a skillet.
- When melted, I am going to add our bread crusts we prepared earlier.

- I want to make sure they are distributed equally.
- I am going to cook until the bottom is golden brown.
- Normally, I would turn over each slice of bread, but I need to divide the bites into sections and then turn over each one.
- To be safe, I need to cook to a temperature of 160°F.
- The only way to know if it has reached that temperature is to use a thermometer. (Demonstrate how to use.)
- Now that the French Toast Bites are cooked, I am going to put on a plate and each of you can add a spoon full of chopped peaches. (Note: You can either serve at room temperature or heat in a soup pot to serve warm.)
- Using fruit on your French toast or pancakes instead of syrup is a good way to get a serving of fruit.
- And, it tastes great.

- | |
|--|
| <ul style="list-style-type: none"> ▪ If you are doing cinnamon bites, serve a small bowl of peaches topped cinnamon bites |
|--|

- Reflect –

Ask,

- Do you remember on the second day when we used the PetriFilm™?

Say,

- I have brought them back so you can see if there were any microbes present.
- The red dots mean there are bacteria present.
- We don't know if they are good, bad, or ugly.
- We're going to treat it like they are the ugly ones so we don't get sick.

Ask,

- What do these red dots mean? (Bacteria are everywhere.)
- Were there any surprises?

Say,

- We don't know if there are any pathogens on the film, but to be safe we are not going to take them out of the individual plastic bag.
- I am going to take the PetriFilm™ home so that I can destroy all of the microbes by using a chlorine solution.

- Gather up used PetriFilm™ in plastic bag. Take home to sanitize.

SAFETY NOTE: Dispose of “used” PetriFilm™ by soaking in a strong bleach solution (1 tablespoon bleach plus 1 gallon of cold water.)

- Separate layers of Petrifilm™.
- Place both layers in chlorine solution and soak overnight.
- Discard.
- Wash hands after handling the used Petrifilm™.

- Bridge –

Say,

- Tomorrow is our last day together.
- We are going to put everything together that we have learned about harmful microbes that might get on our food.
- We also have a really nice going away package for you including all of the recipes we have sampled.

It is 3 PM and Toni just got home from school. It has been a long time since breakfast and lunch and Toni is starving.

For breakfast Toni had a bowl of oatmeal with lots of raisins, a piece of whole wheat toast, and a glass of milk. Lunch included a huge tossed salad with lots of greens, veggies, some fruit and orange vinegar dressing, a roll with butter, an apple, and water to drink.

Plans for dinner, which won't be until 8 when her little brother's baseball practice is done, include cream of tomato soup, grilled cheese sandwich, yogurt with fresh strawberries, and a glass of milk. Toni really needs something to eat right now.

Looking in the cabinet and refrigerator, Toni finds oatmeal cookies, potato chips, carrot and celery sticks, milk, and leftover cooked chicken. Based on the other foods Toni has eaten or will eat today, what should Toni choose? (Chicken) Why? (She has not had enough food from the protein food group.)

Toni decides to microwave a chicken leg. She washes her hands, takes the chicken from the refrigerator, and places it on a dish at 3:30. (Show plate #1; indicate that the one bead [or bean] represents one bacterium).

The telephone rings. Toni puts the plate of chicken on the counter and answers the phone. It is Morgan calling to tell her about the latest episode

of their favorite TV show. They talk on the phone for about an hour. It is now 4:30 PM **(Show plate #2; indicate that the one bacterium has now divided into 24 bacteria)**. Toni decides to call Fran and fill her in on the news. As she talks to Fran Toni's stomach is growling with hunger. She grabs some potato chips and starts munching. After hanging up the phone, Toni programs the microwave. She suddenly remembers she has to get a book to the library before it closes. Toni grabs her coat and the book and runs down the street to the library, leaving the chicken on the counter. It is now 5:30 PM **(Show plate #3; the number of bacteria is now 184)**.

At the library Toni meets some friends from English class and they start discussing tomorrow's exam. Toni returns home. It is now 6:30 PM. She sees the chicken on the counter and remembers she still has not eaten her snack **(Show plate #4; the count is now 552)**. Even though Toni is starving, she decides to start studying for her English exam. She hangs up her coat and then goes to her room to study. After hitting the books for forty-five minutes, Toni returns to the kitchen and decides to eat the cold chicken instead of reheating it. **(Show plate # 5; the count is now 2,760)**.

Lunch Bag Foods

Okay to pack

- Graham crackers
- Peanut
- String cheese
- Cookie
- Waffles
- Cheddar cheese
- Pudding pack
- Fruit cup
- Grape tomatoes
- Chips
- Orange
- Sunflower seeds
- Juice in a box
- Crackers
- Peanut butter and jelly sandwich
- Apple
- Barbeque chips
- Chocolate chip cookies
- Banana

Risky

- Veggies and dip
- Orange slices
- Apple slices
- Tuna salad on bagel
- Yogurt
- Egg salad sandwich
- Hot dog
- Turkey sandwich
- Salad
- Club sandwich
- Bologna sandwich
- Melon slices

French Toast Bites

Serves: 2

Ingredients:

4 tablespoons unsalted butter or margarine
2 eggs
2/3 cups milk
2 tablespoons sugar
1/4 teaspoon nutmeg
Pinch salt
2 1/2 cups whole wheat bread crust, cut into 1" squares
1 can peaches



Directions:

1. Melt butter in skillet.
2. Whisk milk and eggs until blended together.
3. Mix sugar, nutmeg, and salt together.
4. Add sugar mixture to eggs and milk.
5. Very gently submerge bread cubes in egg/milk mixture.
6. Allow bread to sit for at least 30 minutes to soak up all of the liquid.
7. Add uncooked French toast mixture to hot skillet and cook until bottom is golden brown.
8. Using a spatula, cut the mixture in pieces that are easy to turn over.
9. Turn each section and continue cooking golden brown and internal temperature reaches 160°F.
10. Portion out and top with chopped peaches.

Food Safety Tips:

- Wash hands before preparing
- Keep eggs and milk refrigerated.
- Do not let egg/milk mixture sit at room temperature for more than 2 hours.
- Wash top of canned peaches before opening.
- Use clean cutting board and utensils.

Up for the Challenge of Don't Bug Me!

Lesson 5 – A Bug Free Celebration

Audience: 8 to 12 years old

Time: 60 minutes

Materials:

- Attendance sheet
- Cape
- Hand soap
- Paper towels
- Fun with Food Safety” Animated Music DVD
- Computer
- LCD projector
- Speakers
- “Bugs, Bugs Be Gone” Poster with bugs attached
- Post evaluation
- Pencils
- Granola (without raisins)
- Vanilla yogurt
- Dried cherries (plumped)
- Spoons or scoops
- Cups
- Paper towels
- Hand soap or wipes
- Plastic tablecloth
- Take home bag with thermometer, food items, letter to parent and recipes
- Certificates

Objectives:

- To explore how parasites and viruses invade our body
- To put it all together from the week

Key Concepts:

- Viruses and parasites invade our body to reproduce and are shed from the body in feces.
- Keep food (and everything that comes in contact with it) clean.
- Keep food hot.
- Keep food cold.

Background Information:

Viruses

Another microbe that can produce illness is a virus. Viruses differ in a number of ways from bacteria. First, viruses are the smallest and most simple life form known. They are not complete cells but are genetic material wrapped in a protein coat or wrapper. Therefore, unlike bacteria, viruses need a specific host in order to live and reproduce (viruses that affect humans will not infect other animals and vice versa). In other words, viruses do not multiply and grow on food.

Less than 100 viruses may be enough to cause illness. If a human virus whose means of entry into the body is through the gastrointestinal tract is consumed in food, almost everyone eating that food will become ill. With bacteria, everyone may not exhibit symptoms.

Viral contamination of food resulting in human illness is always due to human fecal or urine contamination. This contamination is caused by poor personal hygiene or water contaminated with improperly treated human wastes. Raw or undercooked seafood taken from polluted water and ice from well water contaminated by human sewage have caused viral foodborne outbreaks.

Parasites

Until recently, the major parasite of concern in food was *Trichinella spiralis*, associated with eating undercooked or raw pork (some game species such as bear and walrus also carry the trichinosis parasite). Recent outbreaks of *Cyclospora* and *Cryptosporidium* were associated with water and fruits.

Parasites are considerably larger than bacteria. They may be waterborne, which means that we may consume them in water or beverages prepared with water. Parasites may be transferred to food by water used for irrigation, to mix pesticides, to process food, or

to wash produce. Little is known about ways (such as freezing or heating) to control these new parasites.

Food Safty Summary

There are three key things that an individual can do keep food safe. These items include keep food hot, cold, and clean. Keeping food hot or cold hinders bacterial growth. Keeping food and everything, especially hands, around it clean prevents the hitchhiking of all pathogens (bacteria, viruses, and parasites).

Finally, if there is any doubt the food is safe to eat, it should be thrown out. Food poisoning can be devastating in terms of physical well-being, loss of money through medical costs and lost income, and loss of life.

Order and Sequence:

1. Bridge –

Say,

- We have talked about the ugly bugs that can make us sick if we eat food with them in or on it.
- We've been on the bug express where microbes thumb a ride from one place to another with our hands being the main problem.
- We talked about keeping food out of the temperature DANGER ZONE.

2. Reflect –

Ask,

- Does anyone remember what the DANGER ZONE temperature range is? (40 to 140°F)
- For safety, how long can you keep food at room temperature?

Say,

- The bugs we talk about with temperature are bacteria that use food to grow just as we do.

3. Anchor –

Say,

- But we have some other pathogens that don't multiply on foods.

- I am going to read you a story called “The Tale of the Body Invaders.”

- | |
|---|
| <ul style="list-style-type: none">▪ Read story and discuss at the end of the tale.▪ After reading the story, continue on with musical cartoons and “Bugs, Bugs Be Gone!” |
|---|

4. Apply –

Say,

- Before we see how much you know about those bugs, I have two musical cartoons I want to show you.
- Listen carefully because you may hear some answers to the questions I am going to ask you.
- The first is called “We Are the Microbes” and the second one is “Don’t Get Sick with It.”
- Listen carefully because there may be information that will help you to answer the questions in “Bugs, Bugs Be Gone!”

Ask,

- Did you enjoy the musical cartoons?

Say,

- There was so much good information in these parodies that I know is going to help you answer the questions that I am going to ask each team.

- | |
|--|
| <ul style="list-style-type: none">▪ Divide youth into two teams. |
|--|

- I am going to ask each team a question.
- If you get it correct, you can take off a bug from your poster.
- The first group that removes all of their bugs is the winner.
- I will rotate from one group to the next group.

5. Reflect –

Say,

- **You remember that on the first day the first thing we did was a survey.**
- **We are now going to ask you to participate in a post-evaluation.**
- **We are handing out a survey with your name on it.**

- Pass out post-survey. (Have some extra surveys and demographic sheets in case you have children who did not do the pre-survey. Do not place any code number on these sheets, but make sure you keep the post-survey and demographic sheet together. We will do that after you turn them in to us.)
- Adult leader reads the introduction and the teen reads questions and the responses for each question.
- When finished gather up post-survey.
- After the session, if you have not already done so transfer the code number from the cover sheet to the post-survey. Note: There will be no code number on the sheets for children who were not there the first day, but be sure demographic sheet is attached.
- When the code is transferred to the post-survey, remove the cover sheet.
- Destroy the cover sheet.

6. Food Preparation –

Say,

- **Each of you are going to prepare your own parfait.**

Ask,

- **Before you start the preparation, what do you always do?**
- **Is this something you are doing at home before you handle food or eat?**

Say,

- **If you are not, just remember Mandy and Kevin and the body invaders.**
- **You are going to put a spoon full of granola in your cup.**
- **Now you will layer on a spoon full of vanilla yogurt.**

Ask,

- **Can anyone remember how yogurt fits with our bugs? (Yogurt would not be possible without good bacteria.)**

Say,

- The next layer is dried cherries.
- They are just like raisins except they made from sweet cherries, not grapes.
- We have “plumped” the cherries so they are softer.
- To plump them, I placed them in hot water and let them sit until they absorbed water.
- Before they were plumped they could be stored in the cabinet.
- Now, they must be kept cold so harmful bacteria won’t multiply on them.
- You will add another layer of vanilla yogurt and finally top your parfait with more granola.
- You can eat it as it is in layers or mix it all round.

7. Celebration –

Say,

- **It’s time to celebrate the end of the class.**
- **I have a certificate for each of you.** (If time permits, have each child come forward to receive their certificate and bag.)
- **In addition, I have a letter to your parent or guardian telling them what you did in class this week.**
- **All of the recipes you had this week are included in the bag..**
- **As an extra treat you get a refrigerator thermometer and _____**
(list food items you put in bag).

Tale of the Body Invaders

Kevin's sister was complaining while she was fixing his breakfast. She said to Kevin "I don't know why you have to have breakfast. It's too much trouble and besides you insist of having food from three different food groups."

Kevin stubbornly thought that his sister was a pain in the backside, but she was 16 and their mother had said that she was responsible for fixing him something to eat while his broken arm was mending. "You know I learned in camp last year that you do better in school if you have something to eat in the morning. You wouldn't be so grouchy if you ate something. I also learned that a good breakfast has foods from at least three different food groups. I don't see why it is so hard for you to pour me some tomato juice, boil some eggs, and toast whole wheat bread."

As Kevin was saying this, Mandy was peeling the hardboiled eggs. Kevin says, "You need to wash your hands before peeling the eggs."

Mandy replied "I wiped my hands. That's good enough." Kevin didn't think so, but he didn't pursue the issue.

As Kevin was eating his breakfast, he was also getting a dose of a body invader courtesy of Mandy.

The invader could be a parasite or a virus. These creatures have to have the human body to make copies of themselves.

There are different kinds of parasites. Some are worms that eat from the contents of your bowels or suck the blood from the intestinal wall. **(Add sound effects for eating and sucking.)** Some may invade other parts of the body, such as *Trichinella* that *burrows into the muscle where it can live for a long time. A parasite leaves the body through the feces so they can find another body to invade.*

Kevin's invader could also be a virus. Viruses that make us ill, unlike bacteria, don't divide outside the body. They prey upon us, turning us into viral copy machines.

So the virus that Kevin could have eaten with his eggs makes its way through his stomach and moves to cells in Kevin's body. The virus has information extremely important for making copies of its self, but it can't get the job done without the help of a Kevin's cell duplicating equipment to concoct more viruses.

A virus can lurk in the body for a long time lying in wait for months or even years. It can stealthily make copies at low levels, constantly producing a few new viral agents without killing the host cell. By attaching to a cell and forcing the cell to follow its

genetic orders, a virus can turn a host, for example, Kevin or Mandy, into a viral army-making machine.

So the virus that Kevin had with his eggs attacks some of the cells in Kevin's body. But Kevin, who always makes sure he is eating the right amount of food from all of the food groups and getting at least 60 minutes of physical activities every day, is healthy.

When the virus invades and attacks his cells, he produces fighters, call antibodies, to fight off the attack.

Kevin's good habits pay off because his body can fight off the invaders so he doesn't get sick. Mandy is not so lucky. She is now paying for all of her misdeeds and becomes ill because the body invader has taken over her body. One of the reasons she was so cranky was because she wasn't feeling well. Mandy's head was aching, her stomach was upset to the point she was vomiting, she had stomach cramps, her muscles were sore, her mouth was dry, and her heart was racing. All of these symptoms sound like her body was invaded by Norovirus, a very common foodborne pathogen.

But, wait Captain Don't McBug Me knows how to stop the body invaders. She swoops onto the job with her trusty weapon to stop the body invaders. What do you think her weapon is?

- Is it lots of heat to destroy the virus?
- Or, is it clean utensils?
- Or is it soap, water, and paper towels?

(Note: The captain should hide hand soap and paper towels and pull them out after the children guess.)

Because the only way you can get a foodborne virus is eating a food or drinking water that has been contaminated with human poop from someone infected with the virus. All it takes to stop the body invaders is for everyone to wash their hand really, really well after going to the bathroom.

Bugs, Bugs Be Gone!

True/False Questions for Food Safety

- 1) When purchasing deli meats, you don't need to worry about keeping them cold.
 - (F) – These items need the same care as any perishable food items.
- 2) Cutting boards should never be washed with soap and water. They need only to be wiped.
 - (F) – Cutting boards can harbor bacteria and can get into the cracks and need to be washed with hot soapy water and sanitized.
- 3) Sponges used to wash dishes may contain harmful microbes and need to be replaced to help prevent foodborne illness.
 - (T) – Sponges are wet and food from washing dirty dishes can collect in the sponge and provide a food source for microbes to multiply rapidly.
- 4) You should avoid foods with raw egg in the recipe, such as homemade ice cream and mayonnaise.
 - (T) – Cooking foods to proper temperatures is necessary to kill some of the disease-causing or ugly microbes.
- 5) The most common place people get food poisoning is when food is prepared at home or in restaurants and cafeterias.
 - (T) – Contaminated food comes mostly from restaurants and at home.
- 6) A temperature between 32°F and 40°F is okay for your refrigerator.
 - (T) – Temperatures below 40°F inhibit the growth of most, but not all bacteria. Putting a thermometer in the refrigerator helps to monitor its temperature.
- 7) You must wash your hands for 5 seconds before rinsing with clean water.
 - (F) – You must wash your hands for 20 seconds before rinsing with clean water.

- 8) Rather than using dish towels to clean up food spills, use clean paper towels, then throw them away.
 - (T) – Dish towels can become easily contaminated and can trap bacteria that can be spread to other foods. It is also best to use paper towels for drying hands each time.
- 9) Young children are at an increased risk for foodborne illness.
 - (T) – Because they don't have strong enough immune systems yet.
- 10) Because fish is very perishable, it should be stored in the coldest part of the refrigerator.
 - (T) – Fish maintains the highest quality when stored at 32-38°F.
- 11) If you find mold in a carton of cottage cheese and remove it, it's safe to eat the rest of the carton.
 - (F) – Any visibly moldy foods that are soft in texture like sour cream, hot dogs, lunch meats, and fruits and vegetables, should not be eaten.
- 12) The danger zone is between 0°F and 80°F.
 - (F) – The danger zone is between 40°F and 140°F. This is when bacteria multiply the fastest and should not be left in this range for more than 2 hrs.
- 13) There are good bacteria that exist that help make foods such as sauerkraut, wine, cheeses, and beer.
 - (T) – Not all bacteria are harmful. In fact, some are good and create the distinct flavors or a variety of foods.
- 14) Microbes are everywhere even though we can not see them.
 - (T) – They need a microscope to be seen, but they are everywhere.
- 15) Bacteria grow best in moist, dark and warm environments.
 - (T) – These are the best conditions for rapid bacterial growth.

- 16) Ground beef should never be cooked until well-done or 160°F. The meat should be pink with red juice running from it.
- (F) – Ground beef should always be cooked well-done or 160°F. The meat should be gray in color and juices should run clear.
- 17) *Salmonella* is not a disease causing bacteria.
- (F)
- 18) Salmonella bacteria are often present in animals and animal products and may be spread by animals.
- (T) – Bacteria are everywhere and you must not assume that a raw product is safe to eat. All foods should be cooked thoroughly to kill any bacteria that is in the food.
- 19) You can wait to refrigerate raw meat and poultry up to 3 hours after you take it out of the grocery meat case.
- (F) – Raw meat and poultry should not be left at danger zone temperatures of 40°F to 140°F. Grocery shopping should be the last stop before going home and perishable foods should be bought last. These foods should be refrigerated immediately upon returning home. If time from store to home is more than 1 hour, it is safest to use an ice chest to transport items.
- 20) Chili is always safe to eat and serve warm because the spices kill any bacteria.
- (F) – Spices do not kill bacteria and chili needs to be kept above 140°F.
- 21) If you wear plastic gloves during food preparation, you don't have to wash your hands and you can still keep foods safe to eat.
- (F) – Plastic gloves do not eliminate the need for hand washing. After any action with gloves that require hand washing, food handlers should throw away gloves, wash hands and then put new gloves on.
- 22) It is safe to drink raw milk from a farm.
- (F) – Raw or unpasteurized milk may contain bacteria that cause foodborne illness. It is especially important that pregnant women, young children, and the elderly not drink milk.

- 23) Using a meat thermometer is the surest way to know when you have reached the correct internal temperature of meats.
- (T) – It is the surest way and they are relatively inexpensive and when correctly used, especially in large cuts of meats, can assure that safe internal temperatures are reached. These should be washed each time they are used.
- 24) You should never wash “pet bowls” with your other dishes.
- (T) – Microbes from your pet can contaminate plates used for humans.
- 25) Once a food is cooked to the proper temperature, it is safe from bacterial growth and doesn't need to be refrigerated for 3-4 hrs.
- (F) – Even if initial cooking kills harmful bacteria in a food, food can become recontaminated from other sources such as dirty hands even after it has been cooked. For this reason, leftover foods should be refrigerated to prevent bacterial growth and should be reheated before serving.
- 26) It is important to wash and rinse all utensils between each use.
- (T) – Bacteria on the utensil can hitchhike to food.
- 27) *Staphylococcus aureus* is a pathogenic bacteria found in the nose of humans.
- (T)
- 28) It's safe to use peanut butter sandwiches and canned fruit in a paper bag lunch that will be at room temperature over 2 hours.
- (T) – These foods will remain safe at room temperatures for that period of time.
- 29) Hot foods should be allowed to cool to room temperature before refrigerating.
- (F) – The best way to handle these foods is to refrigerate in shallow covered containers so that foods cool quickly and evenly and so there is no chance of leaving it out for more than 2 hours. For large quantities of hot foods, it's also a good idea to chill them quickly in an ice bath before refrigerating.

- 30) When serving grilled meat or poultry, use a clean plate, not the one you used to carry the raw meat to the grill.
- (T) – Juices or food particles of the raw food remaining on the plate could contaminate the safe cooked meat. Always use clean platters and utensils to serve cooked meat.
- 31) Leftover foods that have been refrigerated should be reheated to 165°F or to boiling.
- (T) – Reheating foods until thoroughly hot will kill most bacteria that the food may have been recontaminated with during service or storage. However, it may not destroy any toxin produced by the dangerous bacteria *Staphylococcus aureus*.
- 32) Common symptoms of foodborne illness include nausea, vomiting, diarrhea, abdominal pain, loss of appetite, headache and fever.
- (T) – These are symptoms of foodborne diseases, however they are quite similar to flu symptoms, so it is easy to ignore these.
- 33) *Campylobacter jejuni* is not a disease causing bacteria.
- (F)
- 34) 23 billion dollars and more are spent each year in medical costs for treating persons with foodborne related illnesses.
- (T) – This does not include long-term consequences, destroyed food, or lost wages of workers.
- 35) Bugs can be transferred from person to person through hands, utensils, cutting boards, pets, and food touching other food.
- (T) – There are many ways microbes can be spread between people.
- 36) You don't have to wash your hands after handling raw meat or poultry.
- (F) – You have to wash your hands before and after handling raw meats or poultry.
- 37) You don't have to wash your hands after using the bathroom.
- (F) – You must wash hands after using the bathroom.

- 38) It is important to wash your hands before beginning any food preparation.
- (T) – This prevents the spread of microbes from other surfaces onto the food you eat and into your body.
- 39) Milk does not need to be refrigerated.
- (F) – Milk needs to be kept at or below 40°F (preferably lower) to be safe to drink.
- 40) One way to keep lunches cold and out of the danger zone is to put an ice pack in the lunch so it can stay cold.
- (T) – Having an ice pack in your lunch can keep foods cold and prevent microbe growth.
- 41) It is important to keep hot foods hot and cold foods cold.
- (T) – Keeping cold food cold (below 40°F) and hot food hot (above 140°F) to prevent microbial growth.
- 42) *Escherichia coli* is not a pathogenic bacteria.
- (F)
- 43) Foods containing bacteria that cause foodborne illness ALWAYS smell bad, taste bad, or look bad.
- (F) – Most of the bacteria that causes foodborne illness can't be seen, smelled, or tasted.
- 44) It is safe to prepare raw greens for a salad on a cutting board that was previously used to cut raw chicken if the board is rinsed off under water.
- (F) – Uncooked meat juices may contain harmful bacteria that could lead to a foodborne illness. Clean the cutting board with hot soapy water followed by a hot rinse water before cutting other foods, especially foods served raw. This prevents "cross-contamination" where bacteria are transferred from one food to another through a shared surface.
- 45) As long as ground meat is cooked brown on the outside, it is safe to eat.
- (F) – It is especially important that ground meat is cooked thoroughly (until 160°F) and brown in the middle as well. The thermometer should be stuck into the thickest part of the meat.

- 46) Refrigerators should be set at 40°F or lower.
- (T) – This is out of the temperature danger zone.
- 47) Hot foods should be held at 100°F or above.
- (F) – They should be held at 140°F and above to ensure to safety of the food.
- 48) It is safe to thaw meat on the kitchen counter.
- (F) – Do not thaw meat, poultry or fish on the counter. Plan for slow thawing in the refrigerator to prevent the food from being kept in the danger zone and for bacterial growth to occur.
- 49) Most foods that contain mold are safe to eat if all the mold is removed.
- (F) – Most moldy foods should be thrown away.
- 50) Use refrigerated ground meat within one to two days.
- (T) – For greatest safety, use within one to two days.
- 51) *Listeria monocytogenes* is a pathogenic bacteria.
- (T)
- 52) It is safe to eat perishable food, such as pizza, that has set out overnight if it is reheated.
- (F) – Some bacteria may produce a harmful, heat-resistant toxin that heating won't destroy. Never leave a perishable food out of the refrigerator more than two hours.
- 53) Melons that have been cut open and left at room temperature for more than a couple hours may cause foodborne illness.
- (T) – Bacteria from the soil may stick to the surface of the melon and be transferred to the fruit when it is cut. For greatest safety, after any fruit has been cut, it should be covered and refrigerated or kept on ice until ready to be served. Wash fruits and vegetables before cutting and eating.
- 54) Microbes include bacteria, viruses, parasites, molds, and yeasts. Some are good, bad or ugly.
- (T) – There are different kinds of germs that have different effects on humans.

- 55) Microorganisms are tiny forms of life that can't be seen with the naked eye.
- (T) – You need a microscope.
- 56) Groups at a high risk for contracting foodborne illnesses are the very young, the elderly, pregnant women, and immune-compromised individuals.
- (T) – These groups are at an increased risk for contracting foodborne illnesses.
- 57) Good handwashing is important to stop foodborne viruses from spreading.
- (T) – Foodborne viruses are spread through human feces or urine getting into the food.

58) *Bacillus cereus* is a pathogenic bacteria commonly found on cereal grains

➤ (T)

59) *Clostridium botulinum* is not a harmful bacterium.

➤ (F)

60) *Clostridium perfringens* is a pathogenic bacterium.

➤ (T)

61) Three-fourths teaspoon of bleach per quart of water is an adequate disinfectant for utensils, counters and cutting boards.

➤ (T)

62) Boiling water is an adequate disinfectant for utensils, counters and cutting boards.

➤ (T)

Up for the Challenge of Don't Bug Me!

Post Program Evaluation

2017

Dear Participant:

You are being asked these questions **because you are part of the 4-H Food Smart Families Program**, and we want to learn about your experience in the program.

This survey is voluntary. If you do not want to fill out this form, you do not need to. However, we hope you will take a few minutes to fill it out because your answers are important.

This survey is private. No one at your school, home, or 4-H program or project will see your answers. Please answer all of the questions as honestly as you can. If you are uncomfortable answering a question, you may leave it blank.

This is not a test. There are no right or wrong answers, and your answers will not affect your participation or place in the program in any way.

Thank you for your help

Section I: Healthy Choices

1. **Please indicate how hard it would be to complete the following actions.** (Select one response in each row by marking the appropriate box ☐.)

How hard would it be for you to...	<i>Not hard at all</i>	<i>A little hard</i>	<i>Very hard</i>
Eat fruit for a snack	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eat vegetables for a snack	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Choose water instead of soda pop or Kool-Aid when you are thirsty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drink 1% or skim milk instead of 2% or whole milk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Choose a small instead of a large order of French fries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eat smaller servings of high fat foods like French fries, chips, snack cakes, cookies, or ice cream	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eat a low-fat snack like pretzels instead of chips	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drink less soda pop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drink less Kool-Aid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

UNIQUE ID # _____

2. **Please indicate how often you do each of the following.** (Select one response in each row by marking the appropriate box ☐.)

	<i>Never or Almost Never</i>	<i>Some Days</i>	<i>Most Days</i>	<i>Every Day</i>
I eat vegetables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I eat fruit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I choose healthy snacks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I eat breakfast	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I do physical activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	<i>Never</i>	<i>Almost Never</i>	<i>Sometimes</i>	<i>Most of the Time</i>	<i>Always</i>
I wash my hands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. **What would you tell a friend?**

	Eat the pizza	Smell the pizza then decide if it is okay to eat	Put pizza in refrigerator	Don't eat the pizza
A pizza was left out of the refrigerator all night.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Eat the chicken and rice dish	Smell the chicken and rice dish and then decide if it is okay to eat it	Put chicken and rice dish back in the refrigerator	Don't eat the chicken and rice dish
A chicken and rice dish has been in the refrigerator for over a week.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. **Please indicate to what extent you agree or disagree that your experience in this 4-H program or project has resulted in the following outcomes.** (Select one response in each row by marking the appropriate box ☐.)

As a result of participating in a 4-H Healthy Living Program...	<i>Strongly Agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly Disagree</i>	<i>Not Applicable to my 4-H Experience</i>
I learned the foods that I should eat every day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I learned what makes up a balanced diet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I learned why it is important for me to eat a healthy diet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I learned how to make healthy food choices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. **Because of participating in the 4-H Food Smart Families program.** (Select one response in each row by marking the appropriate box ☒.)

	<i>No</i>	<i>Maybe</i>	<i>Yes</i>
Will you ask your family to buy your favorite fruit or vegetable?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Will you ask family your family to buy non-fat or 1% milk instead of regular whole milk?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Will you ask your family to have fruits in a place like a refrigerator or bowl on the table where you can reach them?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Will you ask your family to have cut-up vegetables in the refrigerator where you can reach them?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section II: Tell us about you

6. **Please indicate your agreement with the following statements:** (Select one response in each row by marking the appropriate box ☒.)

	<i>I do not agree</i>	<i>I'm not sure</i>	<i>I agree</i>
Being active is fun	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Being active is good for me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical activity will help me stay fit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. **Please tell us how often you complete the following tasks.** (Select one response in each row by marking the appropriate box ☒.)

Tell us about you...	<i>Always</i>	<i>Usually</i>	<i>Sometimes</i>	<i>Never</i>

I do moderate physical activities like
walking, helping around the house,
raking leaves, or using the stairs

☐☐☐☐

Please select the responses that best describes you.

8. How old are you?

_____ Age (in years)

9. What grade are you in?

_____ Grade

10. Which of the following best describes your gender? (Mark one box ☒)

☐ Female

☐ Male

11. Which of the following best describe your race? (Mark each box ☒ that applies to you.)

☐ American Indian or Alaskan Native

☐ Asian

☐ Black or African American

☐ Native Hawaiian or Other Pacific Islander

☐ White

12. Which of the following best describe your ethnicity? (Mark one box ☒)

☐ Hispanic or Latino

☐ Not Hispanic or Latino

13. Which of the following best describes the primary place where you live? (Mark one box ☒)

☐ Farm

☐ Rural (non-farm residence, pop. < 10,000)

☐ Town or City (pop. 10,000 – 50,000)

☐ Suburb of a City (pop. > 50,000)

☐ City (pop. > 50,000)

Section III: Tell us about your 4-H experience

Please select the responses that best describe you.

14. How many years have you been participating in 4-H? (Mark one box ☒)

☐ This is my first year

- ☐ This is my second year
- ☐ Three or more years

15. **Which one of the following best describes how many hours you typically spend in 4-H programs/projects each week?** (Mark one box ☐)

- ☐ Less than one hour
- ☐ Between one and three hours
- ☐ More than three hours

16. **Which of the following best describes how you are involved in 4-H?** (Mark each box ☐ that applies to you.)

- | | |
|--|---|
| <input type="checkbox"/> Clubs | <input type="checkbox"/> Local fairs/events |
| <input type="checkbox"/> Camps | <input type="checkbox"/> Community service projects |
| <input type="checkbox"/> After-school programs | <input type="checkbox"/> Working on my projects at home |
| <input type="checkbox"/> In-school programs | <input type="checkbox"/> Other |

THANK YOU!

Layered Parfait

Serves: 1

Ingredients:

4 tablespoon low-fat vanilla yogurt
2 teaspoons dried, plumped cherries
1 tablespoon granola cereal (without dried fruit)

Directions:

In glass, layer 1/2 tablespoon granola, 2 tablespoons yogurt, 2 teaspoons cherries, 2 tablespoons yogurt, and 1/2 tablespoon granola.

FOOD SAFETY TIPS:

- Wash hands before beginning.
- Be sure all utensils and work areas are clean.
- Keep yogurt cold.
- After dried cherries are plumped, use immediately or refrigerate.



