

# SAFE FOOD HANDLING AND NUTRITION



## INTRODUCTION

As students at the upper elementary level grow in independence, they are likely taking an interest in preparing their own snacks and helping to prepare family meals. To reduce the chances of spreading and picking up germs through food, it is important for students to know how to safely handle food and food equipment. Also, in this age of fast food and increasing childhood obesity, it is important for

students to learn to make healthy food choices.

This section covers safe food handling, followed by nutrition:

- **Safe food handling** refers to precautions taken when storing, preparing, and eating food, which reduce the risk of **food-borne illnesses**, illnesses that are caused by eating food **contaminated** by bacteria and other microorganisms. Contaminated means that a substance,

such as food, has been made impure or unsafe. Handling food safely requires clean hands, work surfaces, and equipment. It also requires taking other safety measures, such as never drinking milk straight out of the container from which other people will be pouring, and storing and cooking foods correctly.

- **Nutrition** generally has two meanings: (1) the study of how food affects the health of the human body; (2) the process by which the nourishing substances in food are taken in and used by the body for growth, repair, and overall health.

## SAFE FOOD HANDLING



### Background Information

Even the most nutritious foods can hinder good health if these foods are not handled safely. This section will provide students with information for safe food handling that will help avoid food-borne illness, which is

caused by the contamination of food by bacteria and other microorganisms. Even though bacteria may be generally thought of as the germs that contaminate food, other things can contaminate food as well, such as viruses and **parasites**. Parasites are organisms that survive by living inside another life form. One example is the **tapeworm**, which can set up home inside the human intestines.

For the sake of simplicity, this section on safe food handling will focus on bacteria, with the implicit understanding that food can also harbor viruses and parasites. Bacteria thrive in unclean, warm, moist environments. Foods that are prepared with unwashed hands or unclean utensils and work surfaces become breeding grounds for harmful bacteria. Foods that are stored at inappropriate temperatures, and foods that are cooked insufficiently also encourage the growth of harmful bacteria. Safe food handling requires cleanliness and appropriate storage and cooking methods.

### Washing hands

Bacteria are everywhere, including on the hands. Careful hand washing is the single most important thing one can do before eating or preparing food, as it washes away many of these microorganisms. Some bacteria are harmless, but others can cause illness. For example, **salmonella** (pronounced “sal-mon-ell-ah,” with the emphasis on the “ell”) is a type of bacteria often found in raw or undercooked poultry and eggs (and in other foods) that can cause **food poisoning**. Food poisoning is an irritation of the stomach and intestines caused by eating food contaminated with harmful microorganisms. The symptoms of

food poisoning usually include vomiting, stomach cramps, and diarrhea, and can range from mild to severe.

**Botulism** is a particularly deadly type of food poisoning caused by bacteria that grow in canned food that has been improperly processed — meaning that the food was not placed in sterilized containers, and/or was not cooked adequately prior to being placed in containers. **Sterilization** is the process of killing harmful microorganisms on food and food equipment through high temperatures and other methods.

Hand washing is a crucial step in protecting oneself and others from harmful bacteria. A person normally touches many objects in a day — tables, chairs, doorknobs, taps, toilets, light switches, handrails, elevator buttons, money, telephones, computer mice and keyboards, other people’s hands, and books. Other people have touched all of these things, and all these things have bacteria on them. When people prepare or eat food with unwashed hands, harmful bacteria may be transferred onto the food and into the digestive system.

Since bacteria cannot be seen with the naked eye, some students (and some adults) may find it hard to understand that bacteria are on their hands. Students may look at their hands and think that they are clean because there is no visible dirt on them. For example, a student might use the toilet and decide that her/his hands look clean, so there is no need to wash them. Of course, one of the most germ-laden environments is the bathroom. Harmful bacteria are easily spread when people eat or prepare food without washing their

## Hand washing steps

- Use warm water to wet the hands.
- Dispense soap into hands and scrub thoroughly for at least 15 to 20 seconds, right up to the wrists. Be sure to:
  - rub palms together
  - rub the palm of each hand over the back of the other hand
  - scrub the fingertips and thumbs
  - interlock the fingers and scrub in between the fingers
  - scrub under the fingernails with a soapy nailbrush, if available
- Rinse thoroughly with warm running water.
- Dry hands with a clean towel, paper towels, or an electric hand-dryer.
- Use a paper towel to turn off the taps to avoid contaminating hands with the same bacteria just washed off.
- When leaving a bathroom, use a paper towel to open the bathroom door whenever possible, or push the door open with a shoulder.

hands after using the toilet, and serious illness can result. The activities in this section will help students recognize that “dirt-free” does not necessarily mean clean or germ-free. Here are steps for effective



## ACTIVITY 1

# Discovering the Microorganisms on Everyday Objects

### Purpose

To observe that microorganisms live on objects that hands come in contact with every day.

### Material

Sterile agar plates with covers (one per student).

Sterile cotton swabs (two per student).

Objects to test (pen, coin, computer mouse, keys, doorknob, etc.).

Permanent markers.

Magnifying glass.

Health Sciences journals and pencils.

### Presentation

- Most Montessori teachers introduce this concept in Year 4, and present it in more detail in Years 5 and 6.
- Announce that students will discover that microorganisms are on everyday objects, and that these microorganisms can end up in the stomach, causing sickness.
- Discuss how microorganisms can be found on surfaces that people touch daily, such as doorknobs, keys, money, computers, toilets, and sinks.



- Discuss how harmful microorganisms can be transferred from objects to hands to food to the digestive system, where they can cause food poisoning and other illnesses.
- Remind students that the immune system is constantly protecting the body from harmful microorganisms, and that people can make the immune system's job easier by keeping their hands clean. Explain that hand washing is the single most important way to reduce chances of getting sick.

### TESTING OBJECTS FOR MICROORGANISMS

- At a worktable, give each student a sterile agar plate, and announce that students will be testing everyday objects for microorganisms.

- Ask students to each take a permanent marker and to make a line down the center of their plate cover.
- Ask students to decide on two different items they would like to test (e.g., coin, doorknob), and write each object's name on one half of the plate cover.
- Ask students to write their initials in small letters near the edge of the plate cover.
- Ask students to take a sterile cotton swab and swab one object, then take the cover off the plate and very gently streak the swab on the appropriate half of the agar plate and replace the cover promptly.
- Ask students to take another sterile cotton swab and swab the other object, then take the cover off the plate and very gently streak the swab on the appropriate half of the agar plate and replace the cover promptly.
- Ask students to place their plates on a table at room temperature undisturbed for one to two days.
- After two days, observe and discuss the microorganisms growing on the agar plates. Use the magnifying glass to see clearer. (Safety Note: do not touch or breathe in the microorganisms, as they may be harmful to health.)
- After observing the bacteria growing on the agar, remind students of the importance of washing hands when eating or preparing food to reduce the levels of microorganisms on their hands, which can cause food poisoning and other illnesses.
- Ask the students to use their journals to record their observations of the activity.

### Extension

- Repeat the activity, dividing the agar plates into four areas and testing four different objects.