LESSON 3 : GUT REACTION

OVERVIEW

In this lesson, students learn about gut health, list ways in which good and bad bacteria affect the body, and identify foods that help to maintain gut health (including kefir, yogurt, and kimchi).

TIME

One 45-minute class

OBJECTIVES

In this lesson, students will:

- Define "gut health";
- List the effects of gut bacteria on the body; and
- Identify foods that promote and maintain gut health.

STANDARDS

NGSS

MS-LS1-7.Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.

CASEL FRAMEWORK

SELF-AWARENESS: The abilities to understand one's own emotions, thoughts, and values and how they influence behavior across contexts. This includes capacities to recognize one's strengths and limitations with a well-grounded sense of confidence and purpose. Such as:

- Experiencing self-efficacy
- Having a growth mindset

SELF-MANAGEMENT:

- Setting personal and collective goals
- Using planning and organizational skills

CDC NHES

1.8.1 Analyze the relationship between healthy behaviors and personal health.

MATERIALS

In addition to common classroom materials and an Internet connection, students will need:

- Yarn (several balls for the class to share)
- Scissors

PREPARATION

- Cut a 30 foot length of yarn

© 2023 National Dairy Council.® Fuel Up is a service mark of National Dairy Council.

INTRODUCTION

Explain to students that they will be delving deeply into the digestive system and will be discussing gut health. Explain that talking about gut health is important, and that while it might also be uncomfortable and funny to talk about "poop" and "farts," it's all a part of maintaining our health. Let them know that no digestive topic is off-limits in this lesson, and that it's important to speak openly to learn fully. (Note: Middle school students are likely to react to digestive discussions with laughter. Allowing students some time to respond humorously to some of the digestive terms will increase their comfort level, but try to quickly return to the topic to maintain a positive learning environment.)

LESSON PROCEDURE

Step 1

Ask students what a "gut" is. Accept all answers. Explain that the word "gut" is really just a nickname for your full digestive system. Remind students that the digestive system's role is to turn food into building blocks and fuel for your body.

Step 2

Ask students to think about the length of the digestive tract. Tell students that they will be using yarn to represent their estimate of the length of an adult's digestive tract. Have each student cut a length of yarn equal to their estimate. Then, have students arrange themselves in order by length of yarn, from shortest to longest. Finally, show students the previously cut 30 foot length of yarn and explain that the digestive tract is up to 30 feet long from mouth to anus, and emphasize how extensive the digestive tract is and how complex digestive processes are.

Step 3

Ask students to identify parts of the digestive system, starting with the mouth and ending with the anus (answers should include: mouth, esophagus, stomach, small intestine, large intestine, rectum, anus). Allow students a few minutes to click through the Nemours Foundation **Digestive System Slideshow**.

Step 4

Explain to students that there are two ways your digestive system breaks down food. The first is called **mechanical digestion** which involves breaking down food into smaller pieces. An example of mechanical digestion is chewing with your teeth. The second is **chemical digestion** in which enzymes break down food into simpler substances that are more easily absorbed by the body. An example of chemical digestion is the enzymes in saliva starting to break down carbohydrates into sugar.

Step 5

Ask students what they know about bacteria. Accept all answers. Many students will likely associate bacteria with disease or illness. Then ask, "is bacteria good or bad?" Allow students to debate the question for a couple minutes.

Step 6

Explain to students that their bodies are full of microbiota (or small organisms living in your body) including bacteria, both good and bad. "Bad" bacteria are those that negatively affect your body and can make you sick, while "good" bacteria help to control bad bacteria and keep you healthy. Explain that your digestive tract is full of both good and bad bacteria, and that when people talk about gut health, they are referring to maintaining enough "good" bacteria in your body to bring your body

© 2023 National Dairy Council.® Fuel Up is a service mark of National Dairy Council.

back into balance. But the good bacteria do more than that! They also help to chemically digest your food so that it can be more easily absorbed.

Step 7

Ask students what can happen if you do not have enough good microbiota or bacteria in your body. According to the **National Institutes of Health**, there are many possible health issues that could be helped by the addition of certain probiotics, or foods that contain specific "good" bacteria. Discuss with students the conditions that probiotics can help:

- Skin conditions (eczema)
- Digestive conditions (diarrhea and irritable bowel syndrome)
- Heart conditions (high cholesterol)
- Weight regulation (obesity)

Step 8

Ask students to describe how they can introduce more good bacteria into their diets. Explain that certain foods contain "good" bacteria and that it's important to include those foods in their eating plans. Share with students this list of foods that contain good bacteria:

- Yogurt (be sure to find the ones with live cultures!)
- Kefir
- Buttermilk
- Certain cheeses (including mozzarella, cheddar, cottage cheese, and gouda)
- Sauerkraut
- Tempeh
- Kimchi
- Miso
- Pickles

Step 9

Finally, have students create a class cookbook where each student finds or creates a recipe that includes one or more ingredients that contain "good" bacteria. Some suggestions include:

- Yogurt and fruit smoothie
- Yogurt parfait
- Sauerkraut and relish sausage "dog"
- Miso soup with tempeh
- Probiotic Pizza with cheddar, mozzarella, and gouda

ASSESSMENT

Have students review each other's recipes to identify any ingredients that contribute to gut health.

REFLECTION

Ask students to list some of their favorite recipes or foods that contain these ingredients and challenge them to include them regularly in their food plans.

SPECIAL POPULATIONS

If you have students from other countries, this activity provides a great opportunity to highlight foods from around the world and their probiotic qualities. Take care to present these foods in a positive way.

© 2023 National Dairy Council.® Fuel Up is a service mark of National Dairy Council.