



## **Nutritional Foods that Help your Body Systems Function Properly.**

by Jackie Balmas, 2022 CTI Fellow  
Clear Creek Elementary

This curriculum unit is recommended for:  
5th Grade Science Students

**Keywords:** (Digestive System, Circulatory System, Cardiovascular System, Food, Skeletal System, Muscular System, Human Body, nutrition, Nervous System)

**Teaching Standards:** See [Appendix 1](#) for teaching standards addressed in this unit.

**Synopsis:** This unit focuses on the human body systems and how they interact along with the importance of nutrition. Each main body system, such as, the cardiovascular, respiratory, digestive, muscular, skeletal and nervous system perform a main function. These systems are connected and work together to keep our body moving. Additionally, we will explore a variety of foods and how it helps to give the human body the proper nutrition it needs to function efficiently. Food contributes to an individual's physical and mental well-being and expresses one's cultural identity through preparation, sharing, and consumption. Students will understand how each body system works and interact with each other. Food is an important part of our culture. It brings family and friends together for different occasions, or "just because." We will tie this into a culmination of the history of food, where some of them originated, how they came into the United States, and how they are important to the human body system.

*I plan to teach this unit during the coming year to (20) students in (the 5th grade Science Curriculum)*

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## **How to Pick Nutritional Foods to Help your Body Systems Function Properly**

by Jackie Balmas, 2022 CTI Fellow

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### **Rationale**

There are many systems in the human body to include the circulatory system (heart, blood, vessels), respiratory system (nose, trachea, lungs), skeletal system (bones), muscular system (muscles), digestive system (mouth, esophagus, stomach, intestines), and the nervous system (brain, spinal cord, nerves). Students will learn that each system performs a specific life process function and that the systems work simultaneously to maintain health and fitness. My goal for this curriculum unit is for the students to be able to conduct some research on the importance of health and how to keep your human body system functioning efficiently. We have a diverse population of students who also have cultural differences and traditions. Students will learn that their cultural foods can most definitely be a part of their daily diet to assist in the proper function of their human body systems. Students will learn about the function of each of the human body systems, how they are connected and work together effectively.

Making connections to the different types of foods, and how to balance a nutritious diet is key to keeping your body systems healthy and functioning to its fullest capacity. Students will understand that each food group is vital in the function of each of our body systems. Students will know that each body system performs a special life process function and that the systems that include the consumption of the right foods to maintain health and fitness. Students will explore what types of cuisine include all the food groups they can incorporate to lead a healthy balanced diet that will keep these systems working together appropriately. The students will be able to explore different types of plants, fruits, grains, and proteins and investigate how they affect our body systems. We will research and create nutritional recipes based on our investigations and research. How can we involve our families and culture? Students will contribute one to two favorite traditional family recipes. Students will create a classroom recipe book to share these favorite traditional family recipes. It's important for the students to understand the significance of nutrition and how this affects the proper function of our body systems.

### **Demographics**

I work as a fifth-grade teacher at Clear Creek Elementary. Many of the students (55%) of the Southeast Learning Community where I teach are disadvantaged. At Clear Creek Elementary, 35% of the students are White, 29% are Hispanic, and 30% are Black out of approximately 488 students. I taught math for eight years. However, because of recent circumstances, I now teach in a self-contained setting. Therefore, I was obliged to teach reading, math and science, social studies, and social and emotional learning. In my classroom this school year, I have a total of twenty students. Three of the students are EC, who receive services for reading and math, two of them are TD who receive services two days a week, and three EL students who are currently receiving services, and working to exit them by the end of fifth grade.

This year the Charlotte Mecklenburg school district's focus is on the Latin/Hispanic and black male population because based on the current data, they are performing much lower than the other subgroups. The district has established a goal for 95% of the Latin/Hispanic and black males to reach CCR (College and Career status) by the end of the 2024 school year.

## **Unit Goals**

The students will know that there are many systems of the human body and that each system performs a specific life process function working together to maintain health and fitness.

The students will explore the relationship between the body systems, and how they work together to sustain us along with food as it relates to the types of foods needed to maintain a healthy body system including the digestive system, circulatory system, nervous system, and the muscular system. What types of foods can we eat to sustain and maintain our body systems' health? How does culture play a role in the foods we, and our families choose to eat? Do some of us need to shop at different places to buy our food? Do some of us grow any of our fruits and vegetables? Where did the food originate? What is the story behind it? Many of the foods we eat originated elsewhere but ended up here in America. I want to explore this avenue and make those connections with food and culture with my students.

## **Content Research**

A healthy body starts with good nutrition, which leads to the proper function of the human body systems. Let's begin with the importance of a balanced diet. A balanced diet is important for your body system to function properly. A healthy plate is the guideline to building a healthy and balanced diet to help you make the right choices in each of the specific food groups. The healthy plate was created by experts at Harvard T.H. Chan School of Public Health and editors at Harvard Health Education.<sup>1</sup> The purpose of the healthy plate is to help people with measurement of portions in addition to making better food choices. The healthy plate was not created to replace the food pyramid but rather as an accompaniment to the food pyramid. The plate is divided into fourths. Half of the plate should be filled with colorful fruits and vegetables with the exception of potatoes because of the adverse effects on people diagnosed with diabetes as it could increase blood sugar. One fourth of the plate should contain whole grains, such as, barley, whole wheat pasta, brown rice, or quinoa. The final fourth portion of the healthy plate should include a protein of your choice, i.e., poultry, fish, beans and nuts. The following oils like olive, canola, soy, corn, sunflower and peanut should be added in moderation. Milk and dairy products should be limited to one to two servings per day. Water, coffee or tea is acceptable but stay away from sugary drinks. Healthy oils, such as olive oil, avocado oil, coconut oil, sunflower and butter are acceptable in moderation.

By using the Healthy Plate as a guideline to proper nutrition, the body system, specifically the digestive system strongly benefits from the balanced diet for children and adults alike. The digestive system includes the stomach and intestines. They work the hardest to turn our

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<sup>1</sup> <https://www.hsph.harvard.edu/nutritionsource/healthy-eating-plate/>

vegetables and proteins into the “energy” your body requires to “live an active life.” The stomach is located on the left side of your abdomen. It is a “stretchy bag” measuring about 10 inches long. It is located between the esophagus and the small intestine, and is consistently in motion. Digestion begins the moment you put food into your mouth. Hence, the significance of a healthy balanced diet because it helps the digestive system develop the energy that is provided to maintain proper functioning of the body. Your stomach and intestines are consistently working, and will be with you all of your life. Maintaining a healthy digestive system is significant to be able to lead an active healthy life.<sup>2</sup>

A balanced healthy nutritional diet helps you to achieve a healthy active, moving body versus a non-moving or sedentary body. Many years ago, adults and children used to work or complete chores around the house or farm depending on their family background. They weren't privy to such amenities, such as, all the variety of farming machines to increase production, video games, cell phones, TV's, or technology as we do now. Physical activity was a daily occurrence for children as well as adults. Children worked on their families farms, or did chores around the house, and it continued into adulthood for as long as they could until their children took over and so on. Health issues weren't as prevalent because there wasn't as much of a problem with obesity in children or adults as there are now. The big question now is how do we encourage children and adults alike to move and be more active? A German psychologist and psychoanalyst by the name of Erik Erikson (1902-1994) created stages of physical activity for the different age groups including the developmental stages.<sup>3</sup> He mentions that it starts from infancy with the mom, on through adolescence with the peers, and on through adulthood with family, friends, and a physician prescription. He also emphasized that ingraining activity beginning from a young age will then foster right into adolescent and adulthood.

More often than not, the choices of food we make involves our culture and how we were raised. I remember my mother telling me, “You will not leave that dinner table until you have eaten every last bite.” Sometimes, I would sit there for what seemed like hours (it wasn't) and purposely spill my milk because I didn't want to drink it all! I don't blame her at all. She was young and really didn't know any better. It's just the way it was with my Hispanic heritage. You eat everything on your plate. Clearly, I don't do that now, nor did I make my children go through that experience either. That was just a factor of my culture. This type of behavior leads to obesity even though this wasn't thought of at that time long ago. Our culture is a guide to the foods we eat, or don't eat. On the other hand, some cultures can adapt to or adopt new foods into their culture, and add it to their repertoire of food choices when they move or immigrate to another country.<sup>4</sup> Doing this does not always agree with their body system. Immigrants who integrate fat, processed foods, such as meats, eating in-between meals, fast foods, foods with unknown added chemicals and eat less fish, vegetables, and whole grain increase their risk for their quality of life.

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<sup>2</sup> The Stomach and Intestines in Your Body, Robert Z. Cohen and Andrea Sclarow, Rosen Publishing Group, 12/15/2014.

<sup>3</sup> The Exercise Balance: What's Too Much, What's Too Little, and What's Just Right for You!, Powers, Pauline, and Ron Thompson, Gurze Books, 2011.

<sup>4</sup> <https://www.eufic.org/en/healthy-living/article/the-determinants-of-food-choice>

“The Hmong are a refugee group with an increasing population in the US. An unhealthful dietary habit is a health risk behavior that can influence a person's quality of life and bring about premature death. Preserving their own traditional food habits may contribute to the prevention of obesity and associated health problems.” Embracing the culture of these immigrants may teach us how to eat a more healthy balanced diet therefore avoiding obesity, which is a significant problem in the U.S.<sup>5</sup>

“Rural communities are undergoing a dramatic social and economic restructuring, “dying” in the words of some Alaska Natives, as many residents move out of the ‘bush’ and into Alaska's urban centers for jobs, for cheaper food and fuel, and sometimes for healthcare.”<sup>6</sup> In Alaska many natives are developing type II diabetes, obesity, heart disease, in addition to cancer and depression. All of these illnesses may or may not be related to “changes in community food systems.” Research continues to be ongoing in this part as they try to determine whether the changes in health including physical and mental are affected by the changes in their food choices as a result of the Alaskan Natives moving from rural to urban areas. Hence, the importance of planning and eating a balanced diet to keep your body systems functioning to its full potential to hopefully live a good quality of life.

## **Appendix I: Implementing Teaching Standards**

5.L.1 Understand how structures and systems of organisms (to include the human body) perform functions necessary for life.

5.L.1.2 Compare the major systems of the human body (digestive, respiratory, circulatory, muscular, skeletal, and cardiovascular) in terms of their functions necessary for life.

### **Teaching Strategies**

- Paideia (Socratic Seminar)
- Turn and talk
- Read Alouds
- Anchor Charts
- Videos
- Think-Pair-Share
- Graphic Organizers
- Note Catchers
- Journal Prompts
- Gallery Walk
- Collaborative Group Assignments

### **Instructional Implementation**

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<sup>5</sup> <https://www.sciencedirect.com/journal/journal-of-nutrition-education-and-behavior>

<sup>6</sup> <https://www.sciencedirect.com/journal/environmental-science-and-policy>

The first week of body systems the students will learn about body systems, how they interact with each other, and their functions. The second and third week, the students will learn about nutrition, health, and the importance of nutrition to assist in the proper function of the body systems.

### **Vocabulary**

system	Cardiovascular system	Circulatory system
Respiratory system	nose	trachea
bones	Muscular system	muscles
esophagus	stomach	intestines
transport	microscope	mouth
heart	Blood vessels	Digestive System
lungs	Skeletal system	

### **Day 1**

Paideia Seminar: I will introduce the lesson with a pondering question: What are the major systems of the human body, and what are their purposes? How does nutrition tie into the performance of the human body?

<https://studyjams.scholastic.com/studyjams/jams/science/human-body/human-body.htm>

After the paideia (Socratic) seminar facilitated by the teacher, students will view a group of study jam slides regarding the human body. They will take notes in their science notebook.

### **Day 2 - Circulatory and Cardiovascular systems**

Students will be able to describe the structure and function of the circulatory and cardiovascular system.

Students will be put in groups of four. They will read *Circulatory System* by Grace Hansen.

<https://drive.google.com/file/d/1aQkHV20f9n21YjIQhBHMWDPcxd028EbF/view>

They will create a storyboard depicting the process of the circulatory/cardiovascular system. They will sketch/draw the process of how the circulatory and cardiovascular system interact. Students will include captions and color their storyboard. Below is the link to the *Circulatory System* by Grace Hansen. **(storyboard template)**

file:///C:/Users/jackie.alvarez/Downloads/Storyboard.docx.pdf

### **Day 3 - Respiratory System** - <https://www.youtube.com/watch?v=fb-7tuW5lYo>

The students will have a diagram of the respiratory system and listen to a read aloud of the *Respiratory System* by Grace Hansen. Students will work in their groups to talk about how the respiratory system and circulatory/cardiovascular system work together. They will add this to their storyboard. **(diagram of respiratory system)**

#### **Day 4 - Circulatory and Respiratory Systems**

How do the circulatory and respiratory systems work together? Students will watch a video on how the circulatory and respiratory system are related, and then fill out a graphic organizer.

<https://www.youtube.com/watch?v=1YELltnHZfl>

#### **Day 5 - Digestive System**

Students will describe the structure and function of the digestive system. The students will have a diagram of the digestive system. They will read about the *Digestive System* by Grace Hansen.

<https://drive.google.com/file/d/1YKxgxocUI6LJcY2kdTzJPZhNxpS0ycES/view>

In their groups, students will choose one student in their group to trace their body shape on a large piece of butcher paper. The students will label the human body systems and their functions.

**Day 6** - Have students bring food magazines to class for a future assignment. Teacher will also bring some from home to share with students.

#### **Skeletal System/Muscular System**

[https://drive.google.com/file/d/13gKuFNnGR4upgtmKBSqjMr9f9\\_cN8aaN/view](https://drive.google.com/file/d/13gKuFNnGR4upgtmKBSqjMr9f9_cN8aaN/view)

Read aloud to the students, *The Mighty Muscular and Skeletal Systems* by John Burstein. (link above).

<https://www.youtube.com/watch?v=RzpPBz79XR0>

After watching the video on how to create a model hand, (link above), the students will make their own model hand so that they can see for themselves how the bones and muscles in their hands work.

**Materials Needed:** Scissors, Construction paper, straws, string or yarn, tape, pencil

**Day 7** - Assign extension assignment

**Nervous System** - <https://www.youtube.com/watch?v=n-CKDfDQ88U>

The students will be able to describe the structure and function of the nervous system. After the read aloud the students will update their traced body on the butcher paper by adding and labeling the skeletal, muscular and nervous system.

**Exit Ticket:** How do the circulatory system, respiratory system, digestive system, and nervous systems work together?

**Extension: Special Assignment** - Food is an important part of our culture. It brings family and friends together for different occasions, or “just because.” Students are to interview 1-2 family

members. Discuss the connections of food and culture. We will tie this into this unit of body systems as a small project/research. This assignment is in preparation for our lessons and connections to nutrition, health, the history of food and where it comes from in addition to how it connects to our diverse cultures and family.

**Directions:** Choose one or two family members to interview. You will have a copy of questions I have provided for you to help guide you. Feel free to ask any questions that you believe will give you and your classmates any useful information. Collect one or two recipes that you are allowed to share and bring to class.

Interviewer - Student	Interviewee - person you are interviewing
1. Who are you interviewing?	
2. How is this person related to you?	
3. What were family gatherings like?	
4. What were the purposes of the gatherings?	
5. Were there any special traditions?	
6. What types of foods were and are brought to these gatherings? What type of foods were cooked?	
7. What part did family members play? For example, who brought what? Did they bring certain special foods, desserts, appetizers?	

**Day 8 - Quickwrite:** Why is nutrition important for the human body system?

**Text:** *Food for Thought The Story Behind the Things We Eat* by: Ken Robbins



**Activity:** Students will be put into groups of three and assigned one of the foods from above text to read and study. They will answer the following questions on the activity sheet provided.

**Materials:** Copy of food to read, copy of activity sheet, pencil, highlighter

**What's Your Story?**

**Names:** \_\_\_\_\_ **Food Assigned:** \_\_\_\_\_

**Directions:** Read your assigned food with your group and answer the questions provided. Be prepared to share your answers with the class.

What is the origin of your food from? Plants? Animal? Where or how was it born?	
Does it have another name? If so, what was the name? Did the name change? What did the name change to?	
What was its journey? How did it end up in America?	
Where is this food mainly grown now?	
What types of uses does it have? Do people eat it raw? Do they cook it? Do they use it in recipes?	
Add any other information that was of interest to your group and you want to share with the class.	

**Day 9**

**Nutrition:** MyPlate - How to Create a Healthy Plate

[https://www.google.com/search?q=what+is+a+healthy+plate&rlz=1C1GCEA\\_enUS995US995&oq=&aqs=chrome.69i59i450l8.1142623198j0j15&sourceid=chrome&ie=UTF-8#kpvalbx=\\_YvOLY6rcNuWKwbkPmayIsAg\\_26](https://www.google.com/search?q=what+is+a+healthy+plate&rlz=1C1GCEA_enUS995US995&oq=&aqs=chrome.69i59i450l8.1142623198j0j15&sourceid=chrome&ie=UTF-8#kpvalbx=_YvOLY6rcNuWKwbkPmayIsAg_26)

**Materials:** MyPlate mini poster, paper plate, colored pencils, copy of *Who Wants Pizza? The Kids' Guide to the history, Science & Culture of Food* by: Jan Thornhill, food magazines, pencil, scissors

Begin with studying the MyPlate mini poster. Link below:

[https://myplate-prod.azureedge.us/sites/default/files/2022-01/SSwMP%20Mini-Poster\\_English\\_Final2022.pdf](https://myplate-prod.azureedge.us/sites/default/files/2022-01/SSwMP%20Mini-Poster_English_Final2022.pdf)

Students will brainstorm what types of foods will go on each group. Students will watch a video explaining about MyPlate, which goes over all the food groups and gives examples of each food group. <https://www.youtube.com/watch?v=j7CcaUZrUoE>

The students will get into groups of three and each group will have a copy of *Who Wants Pizza? The Kids' Guide to the History, Science & Culture of Food* by: Jan Thornhill. The students will look through the above titled book to study the history, science and culture of the nutritional foods they will consider and then decide to put on their MyPlate. The students may draw the foods or cut out the food from the magazines provided by the teacher and other students.

### **Days 10 - 12- Culminating Assignment**

We will have a student-led paideia seminar so that the students can share their interview information in addition to all the great things they learned about their culture, food and family. Students will create a classroom cookbook. The cookbook will include a table of contents, students' family recipes plus background information on their culture and a short blurb about the history of the foods in the recipe. Additionally, the students will create a healthier version of their recipe. On one side of the cookbook page they will write the original recipe, and on the opposite page, they will write the healthier version of the recipe by using the MyPlate health guideline as their guide. They may draw pictures, bring pictures, or cut out any food pictures out of the magazines from the previous assignment to add or place in the cookbook. The students will brainstorm the title of their cookbook and then once we narrow it down to at least three most popular titles we will vote on a final title for our book.

## **Bibliography**

Marcie Cohen Ferris, *Edible North Carolina A Journey across a State of Flavor*, Chapel Hill, The University of North Carolina Press, 2022.

Food brings people together for different reasons, and boundless memories are made. That is the main point of gathering together. The food is a bonus! This book has a plethora of information and a variety of perspectives from different authors, chefs, fishermen, farmers to include. Ms. Ferris interviewed all of these amazing people who graciously shared their perspectives about food, recipes, culture, and family.

Kathrine E. Wright & Julie E. Lucero & Jenanne K. Ferguson & Michelle L. Granner & Paul G. Devereux & Jennifer L. Pearson & Eric Crosbie, “The impact that cultural food security has on identity and well-being in the second-generation U.S. American minority college students,” <https://link.springer.com/content/pdf/10.1007/s12571-020-01140-w.pdf>

Karen Frazier, *Nutrition Facts: The Truth About Food*, Rockridge Press, 2015.

*Nutrition Facts: The Truth About Food* by Karen Frazier. In this book, students will understand how to take care of their bodies by learning how to build healthy eating habits. They will appreciate the value of nutrition and how the body processes these foods while realizing the importance of building healthy eating habits.

E.N. Anderson, *Everyone Eats: Understanding Food and Culture*, NYU Press, 2005.

This addresses “why we eat what we eat.” It also analyzes the social and cultural reasons for our food choices and explains the nutritional reasons for why humans eat what they do, resulting in a rare cultural and biological approach to the topic.

Giada De Laurentis, *Eat Better, Feel Better: My Recipes for Wellness and Healing, Inside and Out*, Random House, LLC, New York, 2021.

Christine Taylor-Butler, *The Digestive System*, Scholastic Inc., Children’s Press, 2008.

What is digestion? What body organs are involved? In this book we explore the process of digestion and the involvement in this process. I want the students to understand the importance of good digestion including the part saliva plays on helping to break down the food. It explains how the food travels through the small intestine absorbing all the nutrients it needs followed by the large intestine picking up what the small intestine doesn’t want. Digestive tips are also available in this book along with a step by step journey the food takes the moment you take a bite of your food.

Ken Robbins, *Food For Thought: The Stories Behind the Things We Eat*, Scholastic, Inc., 2009.

This book explores the origin of different foods, such as, apples, oranges, potatoes, tomatoes, grapes, bananas, mushrooms, corn and where pomegranates first originated and how they came to be in America. We can pretty much access the above in just about any grocery store where most of us shop. The story behind the above mentioned is fascinating, and I hope the students will too, including what some of these are called in other parts of the world.

Jan Thornhill, *Who Wants Pizza? The Kids' Guide to the History, Science & Culture of Food*, Scholastic, Inc., 2010.

What is the purpose of eating? Where does our food come from? How do we know what to eat that will fuel our bodies and keep us healthy? What are some of the dilemmas of farming? What part does Global Warming play in agriculture? How does the food get to us? Students will understand that not all foods are grown here in the U.S. We must have it brought to us.

<https://link.springer.com/content/pdf/10.1007/s12571-020-01140-w.pdf>

*The impact that cultural food security has on identity and well-being in the second-generation U.S. American minority college students*

This article depicts the importance of cultural foods within college culture. Food not only brings people together but affects the well-being of these students based on what they eat. It affects their body systems in a variety of ways. However, most importantly, their mental state. These students are so dedicated to their culture and their cultural foods, it creates a deeply seeded stress when they do not have access to these foods. They feel a disconnect to their culture and it causes the students to experience depression and some anxiety.