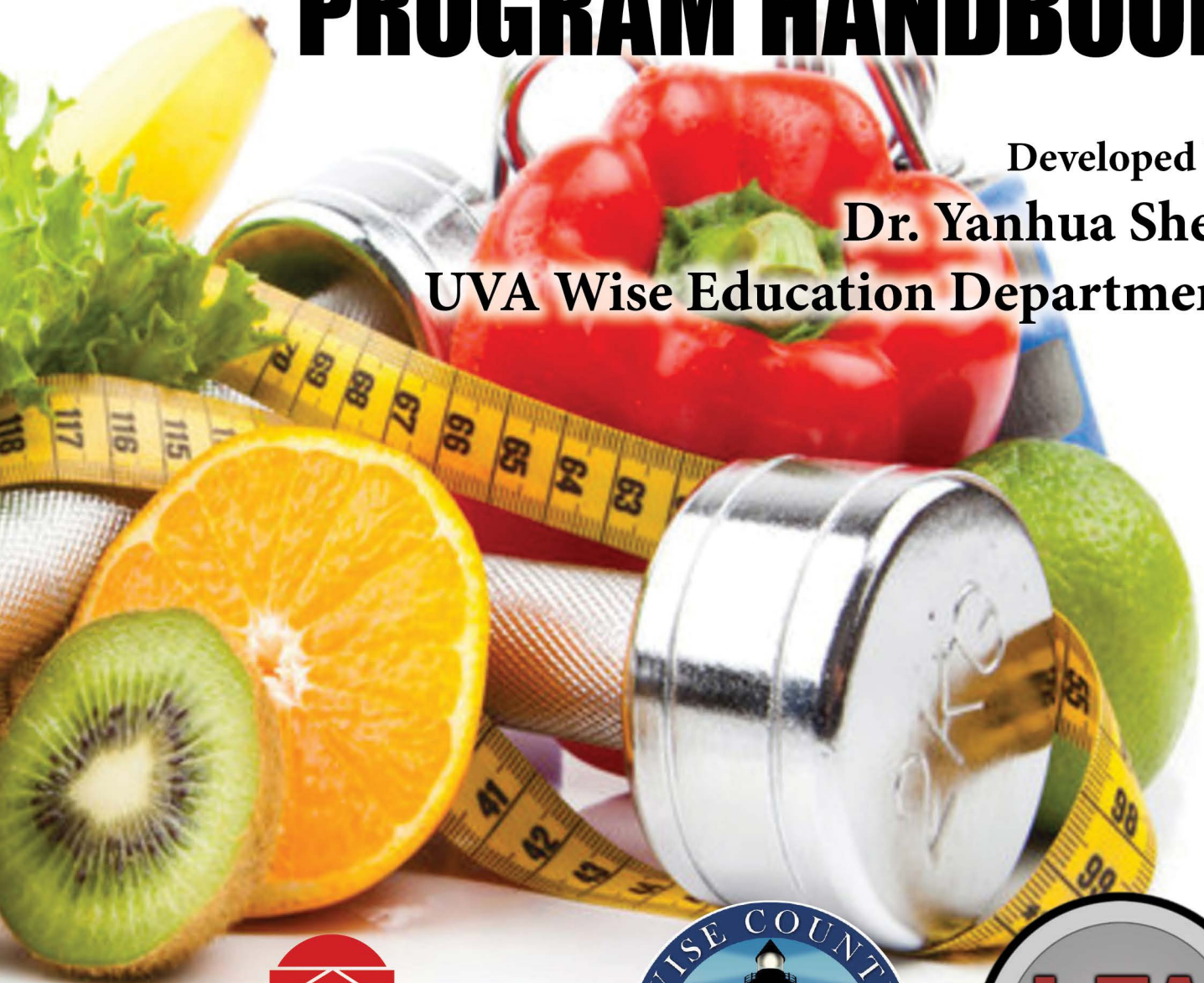
EAT SMART PLAY STRONG PROGRAM HANDBOOK



Developed by

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UVA Wise Education Department

UVA WISE

WISE COUNTY PUBLIC SCHOOLS

L.F. ADDINGTON MIDDLE SCHOOL LFA WARRIORS

FUNDED BY SOUTHWEST VIRGINIA HEALTH AUTHORITY

EAT SMART PLAY STRONG PROGRAM

Promoting Nutrition and Physical Activity for Middle School Students

Funded by

Southwest Virginia Health Authority

Developed by

Dr. Yanhua Shen and Research Team at UVA-Wise

Supported by

Education Department, University of Virginia's College at Wise

LF Addington Middle School

Wise County Public Schools

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PROGRAM INFORMATION

The Program

The *Eat Smart Play Strong* program is a collaborative initiative led by UVA Wise in partnership with LF Addington Middle School, integrating Health Education and Physical Education (PE) to align with Virginia State standards. The program is a one-year initiative designed with a universal set of lesson plans that apply across all middle school grades PE classes. Through engaging lessons and practical activities, students explore energy balance, nutrient functions, and healthy food choices while participating in fun and cooperative physical activities. By embedding Health Education into existing PE classes, the program delivers a seamless and valuable approach to fostering healthier behaviors and addressing health disparities among students.

The Grant

The Blueprint Implementation Grant, managed by the Southwest Virginia Health Authority (SVHA), supports the *Eat Smart Play Strong* program as part of the 2023–24 Blueprint for Health Improvement and Health-Enabled Prosperity. This strategic plan addresses critical health challenges in rural areas, specifically targeting underserved communities in Southwest Virginia, including Wise, Lee, Scott, Buchanan, Dickenson, Grayson, and the city of Norton. The grant supports efforts to improve health, nutrition, and exercise among residents in those local communities, addressing significant health disparities and fostering sustainable community health improvements.

The Needs

Southwest Virginia faces significant health challenges, with obesity being a critical concern. Based on the Community Health Needs Assessment published by Ballad Health Norton Community Hospital (2024), in Wise County, 40.2% of adults are obese, a rate far exceeding regional, state, and national averages. While specific obesity data for school-aged children in Wise County is unavailable, the prevalence of adult obesity underscores the urgent need for preventative measures. Early interventions, particularly through Health Education and Physical Education, are essential to establish lifelong healthy habits and address the health disparities in these underserved areas.

The Curriculum

The program's curriculum is firmly grounded in Virginia State Health and PE standards, ensuring alignment with educational requirements and relevance for middle school students. It includes ten (n=10) 90-minute lesson plans covering key topics such as nutrients, energy systems, energy balance, food choices/safety, and hydration. The lessons are designed to be interactive and practical, enabling students to connect knowledge with real-world applications.

The Pedagogy

The program's pedagogical approach is rooted in Social Constructivism Theory, emphasizing collaborative learning and shared knowledge construction. Within this framework, the Teaching Personal and Social Responsibility (TPSR) model is used as the instructional procedure. TPSR organizes lessons into structured phases such as relational time, awareness talks, physical activities, and reflection, fostering an engaging and positive learning experience. Cooperative Learning (CL) serves as the primary pedagogy for organizing physical activities. CL structures, including *Learning Teams*, *Jigsaw*, and *Pair-Share-Perform*, promote teamwork, communication, and active participation among students. This dual approach ensures that students not only learn critical health and nutrition concepts but also develop interpersonal and problem-solving skills in a supportive and engaging environment.

The Benefits

The *Eat Smart Play Strong* program integrates Health Education with Physical Education to address health disparities in rural communities like Wise County, Southwest Virginia. It aims to equip students with knowledge and skills for informed dietary and health choices while improving physical fitness. Teachers benefit from innovative resources and professional development opportunities that enhance holistic education, while schools gain a strengthened capacity to deliver comprehensive health education within existing PE frameworks. For the community, the program contributes to lasting public health improvements and sustainable positive impacts.

PROGRAM KEY PERSONNEL

Principal Investigator: Dr. Yanhua Shen

- Develop and oversee curriculum and pedagogy for the research program.
- Supervise program implementation, ensuring alignment with study objectives and protocols.
- Coordinate with school personnel, research assistants, and stakeholders.
- Ensure compliance with IRB guidelines and ethical research standards.
- Oversee data collection, analysis, and reporting.

Physical Education Teachers: Cody Bentley, Caleb Church, Kim Moore

- Implement the program's pilot lesson plans (n=10) during the pilot study period (4th 9 weeks, 2024-2025 academic year).
- Implement the revised lesson plans (n=10) during the full program roll-out (1st and 2nd 9 weeks, 2025-2026 academic year).
- Attend in-person meetings for support, training, and feedback.
- Assist and provide feedback for program curriculum and pedagogy development

Support Specialist: Dr. Cody Sanders

- Provide expert guidance on program implementation.
- Assist with the development and refinement of the curriculum to align with program goals.
- Offer ongoing support and consultation throughout the program.

Research Assistants: Sydney Fleming, Maggie Grant

- Observe classes and document fidelity of teaching using field notes and other tools.
- Assist in data collection, including administering KAN-Q surveys, managing ACTi Graph fitness trackers, and facilitating focus group interviews.
- Input and organize data for analysis.

Budget and Procurement Specialist: Lisa Lee

- Manage program budget and ensure financial compliance with grant requirements.
- Process purchases and coordinate procurement of program materials.
- Maintain financial records and provide budget updates to the Principal Investigator.

PROGRAM ACTIVITIES AND TIMELINE

November 2024 – January 20th, 2025: Curriculum Development and IRB Approval

- ***Activity:*** Develop a comprehensive curriculum that integrates Health Education with Physical Education. The curriculum will include lesson plans, instructional materials, and interactive activities focusing on the promotion of the basic knowledge of nutrients, metabolism, and healthy food choices grounded in the state standards. Submit the proposed study to UVA Institutional Review Board (IRB) for review and approval.
- ***Outcome:*** A finalized curriculum ready for implementation. Received approval from the UVA IRB.

February 3rd to March 7th, 2025: Baseline Data Collection

- ***Activity*:** Collect baseline data on students' nutrition knowledge and physical activity levels in PE classes before they enter the program.
    - Nutrition Knowledge: Administer a pre-program survey to assess students' current nutrition knowledge and dietary habits.
    - Physical Activity Levels: Use the Actigraph accelerometer to measure the length of time that students spent in MVPA during regular PE classes as a baseline.
- ***Outcome*:** Baseline data on students' nutrition knowledge and time in MVPA, providing a reference point for evaluating the program's impact.

March 11 – May 23rd, 2025: Pilot Program Rollout

- ***Activity:*** Implement the *Eat Smart Play Strong* Program as a pilot study in selected PE classes. The curriculum will focus on teaching nutrition and healthy diet knowledge through physical activities in PE, aiming to promote both students' healthy food choices and physically active time.
- ***Outcome:*** Initial feedback and data on the program's effectiveness in improving students' nutrition and diet knowledge, and time in MVPA.

May 26th – August 8th, 2025: Curriculum and Pedagogy Adjustment

- ***Activity:*** Evaluate the results from the pilot program and make necessary adjustments to the curriculum and pedagogical strategies. Gather feedback from teachers to refine the curriculum and the pedagogy.

- ***Outcome:*** An improved and more effective curriculum and pedagogy, addressing challenges identified during the pilot phase.

August 11 – December 19th, 2025: Program Implementation

- ***Activity:*** Roll out the revised program in PE classes for all the 5th, 6th, and 7th grade students at LF Addington Middle School. The focus will be the implementation of the adjusted curriculum and updated pedagogy. Comprehensive data collection will take place, tracking students' nutrition knowledge, dietary choices, learning experience, and physical activity levels.
- ***Outcome:*** Program report based on comprehensive data analysis, demonstrating the program's impact on students' nutrition knowledge, dietary choice, learning experience, and physical activity levels.

PROGRAM CURRICULUM OUTLINE

Unite One: Introduction to Nutrients

Introduction: This unit introduces the foundational role of nutrients in maintaining health and supporting physical activity. Students will explore major macronutrients, vitamins, and minerals, learning how these essential nutrients fuel the body and promote overall wellness.

Virginia Health Standards: 6.1.b, 7.1.b, 7.2.b

Virginia PE Standards: 7.5, 7.5.c

Lessons: Lesson 1 (Macronutrients), Lesson 2 (Vitamins), Lesson 3 (Minerals)

Student Learning Outcomes:

1. Identify and explain the roles and sources of macronutrients, vitamins, and minerals.
2. Understand how nutrients contribute to physical activity and overall health.
3. Collaborate to apply nutrition knowledge in group and physical activities.

Unit Two: Energy Systems and Physical Activity

Introduction: This unit delves into the body's energy systems and their role in fueling physical activities. Students will examine aerobic, phosphagen, and anaerobic systems, as well as the concept of energy balance, to understand how these systems affect daily performance, weight management, and circulatory health.

Virginia Health Standards: 7.2.a, 7.2.b

Virginia PE Standards: 7.5.b, 8.5.b

Lessons: Lesson 4 (Aerobic Energy System), Lesson 5 (Phosphagen and Anaerobic Energy Systems), Lesson 7 (Energy Balance)

Student Learning Outcomes:

1. Differentiate between the aerobic, phosphagen, and anaerobic energy systems and their roles in physical activity.
2. Differentiate between the aerobic, phosphagen, and anaerobic energy systems and their roles in physical activity.
3. Explore the concept of energy balance and its impact on body weight and circulatory health.

Unit Three: Food Choices and Hydration

Introduction: This unit emphasizes the importance of informed food and beverage choices to maintain a healthy lifestyle. It also explores strategies for proper hydration and managing food allergies. Students will learn to identify nutrient-dense foods, interpret food labels, develop hydration strategies, and understand the impact of food allergens on health and wellness.

Virginia Health Standards: 6.2.a, 6.2.c, 7.1.b, 7.1.e, 8.2.c

Virginia PE Standards: 6.5, 7.5

Lessons: Lesson 6 (Understanding Food Labels), Lesson 8 (Nutrient-Dense Foods), Lesson 9 (Hydration), Lesson 10 (Food Allergy)

Student Learning Outcomes:

1. Identify nutrient-dense foods and interpret food labels to make informed food choices.
2. Understand the importance of hydration and identify sources of hydration from water, beverages, and food.
3. Recognize common food allergens, understand their effects, and learn preventative strategies to manage allergies.
4. Apply decision-making skills to promote health and personal wellness through dietary choices, hydration practices, and allergy awareness.

PROGRAM LESSON OUTLINE

Unit	Lesson Topic	Lesson Focus	Class Activities
1	Major Macronutrients	Understanding the roles and sources of carbohydrates, proteins, and fats in energy and health.	Jigsaw Activity + Relay Game + Circuit Training
1	Major Vitamins	Exploring the benefits and food sources of vitamins A, B, C, and D.	Jigsaw Activity + Relay Game + Soccer Game
1	Major Minerals	Learning about the roles and sources of calcium, sodium, magnesium, and potassium in muscle function.	Jigsaw Activity + Relay Game + Flag Football Game
2	Aerobic Energy System	Understanding the role of the aerobic energy system in moderate-to-low-intensity activities and its fuel sources.	Learning Team Activity + Relay Game + Soccer Game
2	Phosphagen and Anaerobic Energy Systems	Exploring the phosphagen and anaerobic energy systems and their importance in high-intensity activities.	Learning Team Activity + Relay Game + Kickball Game
2	Energy Balance	Examining the relationship between calories consumed and burned, and its impact on body weight and cardiovascular health.	Learning Team Activity + Relay Game + Multi-Sports Games
3	Nutrient-Dense Foods	Identifying nutrient-dense foods and distinguishing them from empty-calorie foods for healthier eating choices.	Pair-Share-Perform Activity + Relay Game + Pickleball Game
3	Understanding Food Labels	Learning how to read food labels to evaluate nutritional content and make healthier choices.	Jigsaw Activity + Relay Game + Pickleball Game
3	Hydration for Early Adolescence	Understanding the importance of hydration, recommended daily water intake, and healthy hydration sources.	Learning Team Activity + Relay Game + Basketball Game
3	Food Allergy	Recognizing common food allergens, understanding allergic reactions, and learning prevention and treatment strategies.	Jigsaw Activity + Relay Game + Freeze Tag Game

Note: Teachers can either teach these lessons sequentially or use them individually to focus on specific topics, allowing flexibility to fit their own teaching schedules and priorities.

Lesson One: Major Macronutrients and Their Roles in Physical Activity

Grade Level: Middle School

Duration: 90 Minutes Class Size: 20 to 50+ students

Essential Virginia Health Standards: 6.1.b: Compare the Recommended Dietary Allowance (RDA) of macronutrients (i.e., carbohydrates, fat, protein) for adolescent males and females. 7.2.b: Analyze the effects of nutrition on daily performance (i.e., mind and body).

Essential Virginia PE Standards: 7.5.c: Identify the nutrients needed for optimal aerobic and anaerobic capacity and for muscle strength and endurance.

Lesson Focus: Introduce Energy-yielding Macronutrients (carbohydrates, proteins, and fats), their primary roles, and sources.

Materials Needed: L1 Food Cards, L1 Jigsaw Activity Cards, L1 Activity Cards, Student Journal, PE Equipment (cones, pinnies, agility ladder, holla hoops etc.)

Student Learning Outcomes

1. Identify carbohydrates, proteins, and fats, their sources, and their functions in the body.
2. Explain how macronutrients fuel physical activity.
3. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Macronutrients: These are nutrients your body needs in large amounts to give you energy and help your body work properly.
2. Energy-yielding Macronutrients: These nutrients in food give your body the power to move, grow, and stay healthy.
    - Carbohydrates: The main source of energy, especially for running, jumping, and other active movements.
        - Food Source Examples: grains, legumes, honey, sugar, fruits, vegetables,
    - Proteins: Help your muscles grow and heal after exercise or injuries.
        - Food Source Examples: meat, fish, eggs, dairy, beans, nuts, tofu, quinoa,
    - Fats (Lipids): Give energy for slower activities and help your body use important vitamins.
        - Food Source Examples: avocado, nuts, seeds, olive oil, fish, butter.

3. How Much Do You Need? (Recommended Daily Amounts for Ages 9-13):
    - Carbohydrates: About 130 grams (or 4.5 ounces). This is like eating about 2 cups of rice or pasta.
    - Protein: About 34 grams (or 1.2 ounces). This is like eating one small chicken breast or a cup of beans.
    - Fats: Should be 25-35% of the food you eat in a day. Try to eat healthy fats (like nuts and fish) and limit unhealthy fats (like fried foods and butter in baked goods)

Instructional Procedure

1. **Relational Time (5 mins)**
    - Greetings: Welcome students and establish positive and supportive teacher-student and student-student relationships.
    - Choice of activities include Check-Ins, High-Five or Fist-Bump Line, Musical Walk/Jog, High-Five Challenges, or Rock-Paper-Scissor Snake.

2. **Awareness Talk (10 mins)**
    - Introducing the lesson focus.
    - Warm-Up Question: e.g., "What are macronutrients?" "What nutrients give us energy?" “Who can name a food that gives you energy before or after you exercise?” and connect real-life experiences to the topic (e.g., feeling tired after skipping meals).
    - Present and discuss the Key Concepts listed in the previous section. Displaying these concepts on the whiteboard is highly recommended for clarity and engagement.

3. **Physical Activities (60 mins)**

Activity 1: Macronutrient Action Jigsaw (20 mins)

Objective: Students are able to connect physical activities to macronutrient functions.

Setup: Assign students to “Home Teams” of 3–6. Within each team, each of the following roles is assigned to one or more students.

Instructions:

- Experts move to their respective “Expert Groups” to learn about their role through movement-based activities:
    - Carb Experts: Perform a one-minute fast run around the gym while discussing quick energy and food sources for carbohydrates.
    - Fat Experts: Slow jog around the gym while discussing how fats provide energy for endurance, as well as food sources for fat.
    - Protein Experts: Perform planks and push-ups while discussing protein’s role in muscle repair, as well as food sources for protein.
- Experts return to their home teams to teach the knowledge of their nutrients.
- Teams collaboratively create a group activity sequence based on their own choices. Each expert within the team is responsible for leading the physical activity and facilitating the discussion outlined on their activity card. This ensures that every team member contributes their expertise while promoting teamwork and active learning.
- Teachers should actively check in with teams to monitor their progress and address any questions or concerns they may have.
- After the activity, invite students to debrief as a team what they accomplished in this activity, how each role contributed, and what they learned together.

Inclusive Adaptations for Students with Disabilities:

- Provide seated or low-impact alternatives (e.g., arm circles, resistance bands) for students with mobility or endurance challenges.
- Use peer support or noise-reducing options for students with cognitive or sensory needs.

Activity 2: Macronutrient Relay (15 mins)

Objective: Students are able to identify carbohydrates, proteins, and fats from common food sources.

Setup: Divide students into teams of 6–8 or keep the students in the same team as the previous activity, ensuring a mix of fitness levels and genders. Create corresponding relay lanes with cones or markers for each team. At the starting line, place Food Cards that are commonly recognized as sources of Carbs, Proteins, and Fats. At the far end of the relay, set up bins or areas with signs:

- Carbs Rich Foods
- Protein Rich Foods
- Fats Rich Foods

Instructions:

- Teams line up at the starting line. Each player picks one Food Card and runs to the finish line to place it in the corresponding bins or areas.
- Players return to the starting line and tag the next teammate. After all the Food Cards are delivered. Discuss the results as a class to clarify correct matches.

Progressions:

- If there are more teams, rotate between playing and resting, then teams compete against others with the same record (e.g., winners vs. winners, non-winners vs. non-winners) to ensure balanced and competitive matchups throughout the event.
- Introduce Barriers: Add cones or agility ladder to the relay lanes, requiring players to navigate through them as obstacles.
- Alternative Movements: Performs different locomotor movements, for example runs, walks, skips, gallops, hops through hula hoops, or lateral shuffles.

Inclusive Adaptations for Students with Disabilities:

- Allow modified movement options (e.g., walking, rolling, or passing cards) for students with mobility limitations.
- Use peer assistance for students with visual or cognitive challenges.

Activity 3: Learning Team Energy Zone Circuit (25 mins)

Objective: Students are able to explain how macronutrients fuel specific physical activities.

Setup: Create 3 stations representing macronutrient-specific activities (Activity Cards will be provided):

- Carbs Zone: High-intensity activities (high knees, cone shuttle runs, agility ladder drills).
- Fat Zone: Low-to-moderate intensity exercises (jogging, shuffles, dynamic stretching).
- Protein Zone: Strength-building exercises (squats, push-ups, planks).

Instructions:

- Divide students into 3 groups and rotate them through the stations every 5–7 minutes.
- Each station includes three different exercises, students need to read the Activity Card to complete each exercise.

Inclusive Adaptations for Students with Disabilities:

- Offer upper-body alternatives (e.g., arm raises, resistance bands) for agility or strength exercises.
- Provide clear step-by-step instructions and allow partner work for students needing additional support.

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4. **Group Meeting (5 mins):**

Get students together and discuss the following two questions:

1. How do carbohydrates, proteins, and fats differ in the way they provide energy and support physical activity?
2. During today's activities, how did the exercises in the Carb, Fat, and Protein zones help you understand the role of each macronutrient in fueling specific types of movements?

5. **Reflection Time (10 mins)**

Students should complete the journal entry for this lesson. The journal entry includes reflection questions and an individual exit quiz.

Lesson One: Major Macronutrients Journal

Essential Virginia Health Standards: 6.1.b: Compare the Recommended Dietary Allowance (RDA) of macronutrients (i.e., carbohydrates, fat, protein) for adolescent males and females. 7.2.b: Analyze the effects of nutrition on daily performance (i.e., mind and body).

Essential Virginia PE Standards: 7.5.c: Identify the nutrients needed for optimal aerobic and anaerobic capacity and for muscle strength and endurance.

Lesson Focus: Introduce Energy-yielding Macronutrients (carbohydrates, proteins, and fats), their primary roles, and sources.

Student Learning Outcomes

1. Identify carbohydrates, proteins, and fats, their sources, and their functions in the body.
2. Explain how macronutrients fuel physical activity.
3. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Macronutrients: These are nutrients your body needs in large amounts to give you energy and help your body work properly.
2. Energy-yielding Macronutrients: These nutrients in food give your body the power to move, grow, and stay healthy.
    - Carbohydrates: The main source of energy, especially for running, jumping, and other active movements.
        - Food Source Examples: grains, legumes, honey, sugar, fruits, vegetables,
    - Proteins: Help your muscles grow and heal after exercise or injuries.
        - Food Source Examples: meat, fish, eggs, dairy, beans, nuts, tofu, quinoa,
    - Fats (Lipids): Give energy for slower activities and help your body use important vitamins.
        - Food Source Examples: avocado, nuts, seeds, olive oil, fish, butter.
3. How Much Do You Need? (Recommended Daily Amounts for Ages 9-13):
    - Carbohydrates: About 130 grams (or 4.5 ounces). This is like eating about 2 cups of rice or pasta.

- Protein: About 34 grams (or 1.2 ounces). This is like eating one small chicken breast or a cup of beans.
- Fats: Should be 25-35% of the food you eat in a day. Try to eat healthy fats (like nuts and fish) and limit unhealthy fats (like fried foods and butter in baked goods)

Reflection Questions

1. *What is one new or interesting thing you learned today about nutrients that you didn't know before?*

2. *How did it feel to work with others today? Share one thing that made you happy or one thing that was a little hard?*

3. *How can you use what you learned today to make better food choices or stay healthy every day?*

Exit Quiz

1. _____ is the main nutrient your body uses for energy during fast activities like sprinting.
2. _____ helps your muscles grow and get stronger.
3. _____ gives your body long-lasting energy for activities like walking.
4. Which of these foods is a healthy source of energy from carbohydrates?
   a) Cheese
   b) Rice
   c) Chicken
   d) Butter
5. Which food helps build strong muscles because it has a lot of protein?
   a) Apples
   b) Eggs
   c) Olive oil
   d) Bread
6. Which of these foods is a healthy source of fat?
   a) Rice
   b) Pasta
   c) Fish
   d) Candy
7. What kind of nutrient is mostly found in foods like oatmeal and potatoes?
   a) Protein
   b) Fat
   c) Carbohydrate
   d) Vitamin
8. Which food has both protein and healthy fat?
   a) Nuts
   b) Pasta
   c) Rice
   d) Banana

Lesson Two: Major Vitamins and Their Roles in Physical Health

Grade Level: Middle School

Duration: 90 Minutes Class Size: 20 to 50+ students

Essential Virginia Health Standards: 7.1.b: Describe the value of nutrient-dense foods.

Essential Virginia PE Standards: 7.5: The student will describe rate of perceived exertion and nutrients (energy) needed for a variety of activities and explain the importance of sleep for energy balance.

Lesson Focus: Introduce major vitamins (A, B, C, D), their food sources, and their roles in health and exercise.

Materials Needed: L2 Food Cards, L2 Jigsaw Activity Cards, Student Journal, PE Equipment (soccer balls, tug-of-war rope, cones, pinnies, agility ladder, holla hoops, etc.)

Student Learning Outcomes

1. Identify the roles of Vitamins A, B, C, and D and their food sources.
2. Explain how vitamins support overall health and physical performance.
3. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Vitamins: Tiny but important nutrients that help your body stay healthy and work properly.
2. Vitamin A: Helps you see better, especially in the dark, and keeps your body strong to fight sickness.
    - Food Source Examples:
        - Animal Sources - liver, fish oils, eggs, dairy products (milk, yogurt, cheese).
        - Plant Sources - carrots, sweet potatoes, spinach, orange and yellow fruits.
3. Vitamin Bs: Helps your body turn food into energy and make red blood cells, which carry oxygen in your body.
    - Food Source Examples: whole Grains; legumes and seeds; vegetables; animal products - poultry, fish, eggs, and dairy products.
4. Vitamin C: Helps your body fight off sickness and heal faster when you get hurt.

- Food Source Examples: fruits - oranges, strawberries, kiwi, and pineapple; vegetables - bell peppers, broccoli, brussels sprouts, and tomatoes.

5. Vitamin D: Makes your bones strong by helping your body use calcium.
   - Food Source Examples
     - Fortified Foods: milk, orange juice, cereal.
     - Animal Sources: fatty fish (salmon, mackerel, sardines); egg yolks and mushrooms.
     - Bonus Source: Your body can also make vitamin D from sunlight!

Instructional Procedure

1. **Relational Time (5 mins)**
   - Greetings: Welcome students and establish positive and supportive teacher-student and student-student relationships.
   - Choice of activities include Check-Ins, High-Five or Fist-Bump Line, Musical Walk/Jog, High-Five Challenges, or Rock-Paper-Scissor Snake.

2. **Awareness Talk (10 mins)**
   - Check for understanding questions to LP1. “Who remembers the macronutrients that we learned about in the last lesson?” “Who can give us an example of something that you ate and the correct category?”
   - Introduce the lesson focus
   - Warm-Up Question Examples: “What do you think micronutrients mean?” “Who can give us an example of a micronutrient?”
   - Present and discuss the Key Concepts listed in the previous section. Displaying these concepts on the whiteboard is highly recommended for clarity and engagement.
     - Highlight real-life scenarios, such as the importance of Vitamin D for strong bones and Vitamin C for recovering from a cold.

3. Physical Activities (60 mins)

Activity 1: Vitamin Action Jigsaw (20 mins)

Objective: Students are able to identify vitamins to their roles and food sources.

Setup: Assign students to "Home Teams" of 4–8; Within each team, assign one or more students as "Experts" for a specific vitamin (A, Bs, C, or D).

Instructions:

- Experts move to "Expert Groups" to learn more about their vitamin through movement-based activities (Activity Cards will be provided):
    - Vitamin A Experts: Play "Red Light, Green Light" while discussing how Vitamin A supports vision and immune health, and its food sources.
    - Vitamin Bs Experts: Perform jumping jacks and obstacle drills while discussing how Vitamin Bs supports energy metabolism, and its food sources.
    - Vitamin C Experts: Play the immunity dodgeball game while discussing how Vitamin C supports immunity and recovery, and its food sources.
    - Vitamin D Experts: Play the tug-of-war game while discussing how Vitamin D supports bone health, as well as its food sources and sunlight exposure.
- Experts return to their Home Teams.
- Teams collaboratively create a group activity sequence based on their own choices. Each expert within the team is responsible for leading the physical activity and facilitating the discussion outlined on their activity card. This ensures that every team member contributes their expertise while promoting teamwork and active learning.
- Teachers should actively check in with teams to monitor their progress and address any questions or concerns they may have.
- After the activity, invite students to debrief as a team what they accomplished in this activity, how each role contributed, and what they learned together.

Inclusive Adaptations for Students with Disabilities:

- Provide seated or alternative movements (e.g., arm raises, resistance bands) for students unable to perform high-impact activities.
- Use visual aids, peer support, or simplified instructions for students with cognitive or sensory needs.

Activity 2: Vitamin Relay Race (15 mins)

Objective: Students are able to recognize major vitamins and their food sources through a fun and competitive relay race.

Setup: Divide students into teams of 6–8 or keep the students in the same team as the previous activity, ensuring a mix of fitness levels and genders. Create corresponding relay lanes with cones or markers for each team. At the starting line, place Food Cards with images and names of foods rich in Vitamins A, Bs, C, and D (e.g., carrots, oranges, milk, eggs). At the far end of the relay, set up 4 bins or areas with signs:

- Rich in Vitamin A
- Rich in Vitamin Bs
- Rich in Vitamin C
- Rich in Vitamin D

Instructions:

- Teams line up at the starting line. Each player picks one Food Card and runs to the finish line to place it in the corresponding bins or areas.
- Players return to the starting line and tag the next teammate. After all the Food Cards are delivered. Discuss the results as a class to clarify correct matches.

Progressions:

- If there are more teams, rotate between playing and resting, then teams compete against others with the same record (e.g., winners vs. winners, non-winners vs. non-winners) to ensure balanced and competitive matchups throughout the event.
- Incorporate previous lesson cards into the mix as a review.
- Introduce Barriers: Add cones or agility ladder to the relay lanes, requiring players to navigate through them as obstacles.
- Alternative Movements: Performs different locomotor movements, for example runs, walks, skips, gallops, hops through hula hoops, or lateral shuffles.

Inclusive Adaptations for Students with Disabilities:

- Allow students with mobility challenges to pass cards to a partner or use a shorter relay course.

- Provide verbal cues for students with visual or cognitive difficulties.

Activity 3: Vitamin Soccer (25 mins)

Objective: Students are able to identify vitamin-rich food sources through an active, team-based soccer game.

Setup: Divide students into teams of 6–8 players or keep them in the same teams as the previous activity. Set up 2–3 small-sided soccer fields with two soccer goals at each end of the fields (use tall cones as the goal posts). Evenly assign teams to each field. On each field, two teams will play while other teams rest and observe.

Instructions:

- Teams play for a 5-minute round with a total of 4 rounds. At the end of each round, teams rotate to ensure equal playing time.
- Each team earns 2 points for every goal scored. However, goals only count if the ball is below knee height when it enters the goal.
- If a team does not score during the 5-minute play, the team receives 1 point for participation.
- After 4 rounds, each team is given a number of Food Cards equal to their total points earned.
- Teams must discuss the food on their cards and categorize them into the correct vitamin groups:
    - Vitamin A-rich foods
    - Vitamin B-rich foods
    - Vitamin C-rich foods
    - Vitamin D-rich foods
- Teams receive their final score based on the accuracy of their Food Cards categorization.

Inclusive Adaptations for Students with Disabilities:

- Modify the game with larger balls, rolling passes, or walking soccer for students with mobility limitations.
- Assign a strategy role (e.g., tracking food card accuracy) for students who may need a lower-intensity option.

4. **Group Meeting (5 mins):**

Get students together and discuss the following two questions:

1. What do vitamins A, B, C, and D do to keep your body healthy and active? Can you give an example?
2. How did the games we played today help you learn about what vitamins do and where you can find them in food?

5. **Reflection Time (10 mins)**

Students should complete the journal entry for this lesson. The journal entry includes reflection questions and an individual exit quiz.

Lesson Two: Major Vitamins Journal

Essential Virginia Health Standards: 7.1.b: Describe the value of nutrient-dense foods.

Essential Virginia PE Standards: 7.5: The student will describe rate of perceived exertion and nutrients (energy) needed for a variety of activities and explain the importance of sleep for energy balance.

Lesson Focus: Introduce major vitamins (A, B, C, D), their food sources, and their roles in health and exercise.

Student Learning Outcomes

1. Identify the roles of Vitamins A, B, C, and D and their food sources.
2. Explain how vitamins support overall health and physical performance.
3. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Vitamins: Tiny but important nutrients that help your body stay healthy and work properly.
2. Vitamin A: Helps you see better, especially in the dark, and keeps your body strong to fight sickness.
    - Food Source Examples:
        - Animal Sources - liver, fish oils, eggs, dairy products (milk, yogurt, cheese).
        - Plant Sources - carrots, sweet potatoes, spinach, orange and yellow fruits.
3. Vitamin Bs: Helps your body turn food into energy and make red blood cells, which carry oxygen in your body.
    - Food Source Examples: whole Grains; legumes and seeds; vegetables; animal products - poultry, fish, eggs, and dairy products.
4. Vitamin C: Helps your body fight off sickness and heal faster when you get hurt.
    - Food Source Examples: fruits - oranges, strawberries, kiwi, and pineapple; vegetables - bell peppers, broccoli, brussels sprouts, and tomatoes.
5. Vitamin D: Makes your bones strong by helping your body use calcium.
    - Food Source Examples
        - Fortified Foods: milk, orange juice, cereal.

- Animal Sources: fatty fish (salmon, mackerel, sardines); egg yolks and mushrooms.
- Bonus Source: Your body can also make vitamin D from sunlight!

Reflection Questions

1. *What is one new or interesting thing you learned today about nutrients that you didn't know before?*

2. *How did it feel to work with others today? Share one thing that made you happy or one thing that was a little hard?*

3. *How can you use what you learned today to make better food choices or stay healthy every day?*

Exit Quiz

1. _____ is the vitamin that helps you see better and keeps your immune system strong.
2. _____ is the vitamin that helps your body make energy and red blood cells.
3. _____ is the vitamin that helps your body fight off sickness and heal faster.
4. _____ is the vitamin that makes your bones strong and helps your body use calcium.
5. Which of the following is a good source of Vitamin A?
   a) Bread
   b) Carrots
   c) Cheese
   d) Rice
6. Which of these foods is high in Vitamin C?
   a) Oranges
   b) Chicken
   c) Milk
   d) Pasta
7. Which food is a good source of Vitamin B?
   a) Eggs
   b) Spinach
   c) Apples
   d) Butter
8. Which of these foods is a good source of Vitamin D?
   a) Bananas
   b) Milk
   c) Potatoes
   d) Grapes

Lesson Three: Major Minerals and Their Roles in Physical Health

Grade Level: Middle School

Duration: 90 Minutes Class Size: 20 to 50+ students

Essential Virginia Health Standards: 7.1.b: Describe the value of nutrient-dense foods.

Essential Virginia PE Standards: 7.5: Describe rate of perceived exertion (RPE) and nutrients needed for a variety of activities and explain the importance of sleep for energy balance.

Lesson Focus: Introduce major minerals (Calcium, Sodium, Magnesium, Potassium), their food sources, and their roles in maintaining health and exercise.

Materials Needed: L3 Food Cards, L3 Jigsaw Activity Cards, Student Journal, PE Equipment (flag football belt with flags, cones, pinnies, agility ladder, holla hoops, etc.)

Student Learning Outcomes

1. Identify common food sources rich in Calcium, Sodium, Magnesium, and Potassium.
2. Explain how Calcium, Sodium, Magnesium, and Potassium contribute to muscle function and physical performance.
3. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Minerals: Tiny but important nutrients that help your body stay strong and work properly.
2. Calcium: Helps build strong bones and teeth, makes muscles move, and helps nerves send messages.
    - Food Source Examples: Milk, yogurt, cheese, tofu, and sardines.
3. Sodium: Helps muscles move and keeps the right amount of water in your body.
    - Food Source Examples: Table salt, canned soups, chips, bacon, and sausages (but too much sodium isn't good for you).
4. Magnesium: Helps muscles relax, keeps bones strong, and supports the nervous system.
    - Food Source Examples: Spinach, kale, almonds, cashews, black beans, chickpeas, brown rice, and quinoa.
5. Potassium: Helps muscles relax, keeps nerves working, and balances water in your body.
    - Food Source Examples: Bananas, oranges, melons, potatoes (with skin), spinach, broccoli, almonds, and pistachios.

Instructional Procedure

1. **Relational Time (5 mins)**
    - Greetings: Welcome students and establish positive and supportive teacher-student and student-student relationships.
    - Choice of activities include Check-Ins, High-Five or Fist-Bump Line, Musical Walk/Jog, High-Five Challenges, or Rock-Paper-Scissor Snake.

2. **Awareness Talk (10 mins)**
    - Check for understanding from LP2**:** "What are the vitamins we talked about in our last class?" "Who can give us an example of the function of a vitamin?"
    - Lesson Focus Introduction
    - Warm-Up Question Examples: "What happens when you get a muscle cramp? Have you heard of any minerals that help your muscles work properly?"
    - Present and discuss the Key Concepts listed in the previous section. Displaying these concepts on the whiteboard is highly recommended for clarity and engagement.
    - Highlight how minerals influence muscle functioning:
        - Sodium and Calcium work together to facilitate muscle contraction.
        - Potassium and Magnesium are key to muscle relaxation and preventing cramps.

3. **Physical Activities (60 mins)**

Activity 1: Vitamin Action Jigsaw (20 mins)

Objective: Students are able to identify minerals to their roles in muscle function and identify food sources.

Setup: Assign students to "Home Teams" of 4–8. Within each team, assign one or more students as "Experts" for a specific mineral (Calcium, Sodium, Magnesium, Potassium).

Instructions:

- Experts move to their respective "Expert Groups" to learn about their mineral through movement-based activities (Activity Cards will be provided):

- Calcium Experts: Perform wall push-ups and squats while discussing calcium's role in muscle contraction and bone health and common food sources.
- Sodium Experts: Perform plank and side bridge while discussing sodium's role in muscle contraction and fluid balance, and common food sources.
- Magnesium Experts: Perform dynamic stretching exercises while discussing magnesium's role in muscle relaxation and common food sources.
- Potassium Experts: Perform static stretching exercises while discussing potassium's role in muscle relaxation, fluid balance and common food sources.

- Experts return to their Home Teams.
- Teams collaboratively create a group activity sequence based on their own choices. Each expert within the team is responsible for leading the physical activity and facilitating the discussion outlined on their activity card. This ensures that every team member contributes their expertise while promoting teamwork and active learning.
- Teachers should actively check in with teams to monitor their progress and address any questions or concerns they may have.
- After the activity, invite students to debrief as a team what they accomplished in this activity, how each role contributed, and what they learned together.

Inclusive Adaptations for Students with Disabilities:

- Provide seated or alternative movements (e.g., arm raises, resistance bands) for students unable to perform squats or planks.
- Use visual aids, peer support, or simplified instructions for students with cognitive or sensory needs.

Activity 2: Mineral Relay Race (15 mins)

Objective: Students are able to identify minerals and their food sources through a fun and competitive relay race.

Setup: Divide students into teams of 6–8 or keep the students in the same team as the previous activity, ensuring a mix of fitness levels and genders. Create corresponding relay lanes with cones or markers for each team. At the starting line, place Food Cards with images and names of foods (e.g., milk, bananas, spinach, table salt). At the far end of the relay, set up bins or areas with signs:

- Rich in Calcium
- Rich in Sodium
- Rich in Magnesium
- Rich in Potassium

Instructions:

- Teams line up at the starting line. Each player picks one Food Label Card and reaches the finish line to place it in the corresponding bins or areas.
- Players return to the starting line and tag the next teammate. After all the Food Label Cards are delivered. Discuss the results as a class to clarify correct matches.

Progressions:

- If there are more teams, rotate between playing and resting, then teams compete against others with the same record (e.g., winners vs. winners, non-winners vs. non-winners) to ensure balanced and competitive matchups throughout the event.
- Incorporate previous lesson cards into the mix as a review.
- Introduce Barriers: Add cones or agility ladder to the relay lanes, requiring players to navigate through them as obstacles.
- Alternative Movements: Performs different locomotor movements, for example runs, walks, skips, gallops, hops through hula hoops, or lateral shuffles.

Inclusive Adaptations for Students with Disabilities:

- Allow students with mobility challenges to pass cards to a partner or use a shorter relay course.
- Use verbal cues for students with visual or cognitive difficulties.

Activity 3: Mineral Flag Grab (25 mins)

Objective: Reinforce knowledge of minerals and common food sources through an active and engaging flag grab game.

Setup: Divide students into two teams or more teams. Each student wears a flag belt with flags labeled Calcium, Sodium, Magnesium, and Potassium. Students' objective is to protect their own flags while "stealing" flags from the opposing team.

Instructions:

- Students wear flag belts with flags labeled as those four minerals.

- The teacher calls out one food (e.g., “Milk!” or “Banana!”) and progress it to a combination of multiple foods (e.g., “Salt and Milk!”)
- Students try to “steal” the appropriate mineral flags rich in the food(s) from others while protecting their own flags.
- After each round, count the flags each student steals, flag that matches the called-out food count 2 points, flag that doesn’t match the called-out food count 1 point. Student with the most points win the round.
- If the class size is large, divide the students into four teams and rotate them to play.

Progressions:

- If there are more teams, rotate between playing and resting, then teams compete against others with the same record (e.g., winners vs. winners, non-winners vs. non-winners) to ensure balanced and competitive matchups throughout the event.
- Students determine rules of the game, boundaries, or ways to guard their flags.
- Designating a student leader to call out the food.

Inclusive Adaptations for Students with Disabilities:

- Modify the game with designated safe zones for students with mobility limitations.
- Assign strategy roles (e.g., tracking scores or calling out foods) for students needing a lower-intensity option.

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4. **Group Meeting (5 mins):**

Get students together and discuss the following two questions:

1. What are calcium and sodium responsible for in muscle function?
2. What are magnesium and potassium responsible for muscle function?

5. **Reflection Time (10 mins)**

Students should complete the journal entry for this lesson. The journal entry includes reflection questions and an individual exit quiz.

Lesson Three: Major Minerals Journal

Essential Virginia Health Standards: 7.1.b: Describe the value of nutrient-dense foods.

Essential Virginia PE Standards: 7.5: Describe rate of perceived exertion (RPE) and nutrients needed for a variety of activities and explain the importance of sleep for energy balance.

Lesson Focus: Lesson Focus: Introduce major minerals (Calcium, Sodium, Magnesium, Potassium), their food sources, and their roles in maintaining health and exercise.

Student Learning Outcomes

1. Identify common food sources rich in Calcium, Sodium, Magnesium, and Potassium.
2. Explain how Calcium, Sodium, Magnesium, and Potassium contribute to muscle function and physical performance.
3. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Minerals: Tiny but important nutrients that help your body stay strong and work properly.
2. Calcium: Helps build strong bones and teeth, makes muscles move, and helps nerves send messages.
    - Food Source Examples: Milk, yogurt, cheese, tofu, and sardines.
3. Sodium: Helps muscles move and keeps the right amount of water in your body.
    - Food Source Examples: Table salt, canned soups, chips, bacon, and sausages (but too much sodium isn't good for you).
4. Magnesium: Helps muscles relax, keeps bones strong, and supports the nervous system.
    - Food Source Examples: Spinach, kale, almonds, cashews, black beans, chickpeas, brown rice, and quinoa.
5. Potassium: Helps muscles relax, keeps nerves working, and balances water in your body.
    - Food Source Examples: Bananas, oranges, melons, potatoes (with skin), spinach, broccoli, almonds, and pistachios.

Reflection Questions

1. *What is one new or interesting thing you learned today about nutrients that you didn't know before?*

2. *How did it feel to work with others today? Share one thing that made you happy or one thing that was a little hard?*

3. *How can you use what you learned today to make better food choices or stay healthy every day?*

Exit Quiz

1. _____ is a mineral that helps build strong bones and muscles and is found in milk and other dairy products.
2. _____ is a mineral that helps control water balance in your body and is found in table salt and many processed foods.
3. _____ helps muscles relax and is found in foods like bananas and potatoes.
4. _____ is important for muscle relaxation and fluid balance in our body.
5. Which of these foods is a good source of Calcium?
   a) Oranges
   b) Milk
   c) Potatoes
   d) Tomatoes
6. Which of these foods is high in Sodium?
   a) Bananas
   b) Salted pretzels
   c) Broccoli
   d) Chicken breast
7. Which food is a good source of Magnesium?
   a) Spinach
   b) Apples
   c) Candy
   d) Milk
8. Which of these foods is a good source of Potassium?
   a) Salt
   b) Bananas
   c) Cheese
   d) Rice

Lesson Four: Aerobic Energy System

Grade Level: Middle School

Duration: 90 Minutes Class Size: 20 to 50+ students

Essential Virginia Health Standards: 7.2.b: Analyze the effects of nutrition on daily performance (i.e., mind and body).

Essential Virginia PE Standards: 7.5.b: Define and describe the anaerobic and aerobic energy systems.

Lesson Focus: Introduce the aerobic energy system, its role in supporting moderate-to-low-intensity activities, the nutrients it uses, and the metabolic processes involved.

Materials Needed: L4 Task Cards, L4 Food Cards, Student Journal, PE Equipment (soccer, frisbee, cones, pinnies, agility ladder, holla hoops, etc.)

Student Learning Outcomes

1. Describe the function of the Aerobic Energy System (AES).
2. Identify carbohydrates and fats as the primary fuels for AES, with protein as a backup energy source.
3. Explain the role of oxygen in the metabolic process of AES.
4. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Aerobic Energy System: This system gives your body energy for activities that last a long time (more than 2 minutes) and use oxygen.
    - Examples: Walking, jogging, cycling, and other steady activities.
2. Fuel Sources for Aerobic Energy and Where They Come From:
    - Carbohydrates: Provide quick energy, especially during moderate to vigorous activities.
        - Food Source Examples: rice, bread, pasta, potatoes, fruits, vegetables, legumes, honey, sugar.
    - Fats: Give long-lasting energy, especially for lower-intensity activities.
        - Food Source Examples: avocado, nuts, seeds, olive oil, fish, butter.

- Protein: Used as a backup energy source when carbs and fats run out (like during extreme hunger or very long workouts).
    - Food Source Examples: meat, fish, eggs, dairy, beans, nuts, tofu.

3. How Your Body Uses This Energy:
    - Metabolic Process: Your body breaks down glucose (from carbs) and fat with oxygen inside tiny parts of your cells called mitochondria to make energy.
    - ATP (Adenosine Triphosphate): This is the fuel your body uses to move, grow, and stay alive, just like gas powers a car!

Instructional Procedure

1. **Relational Time (5 mins)**
    - Greetings: Welcome students and establish positive and supportive teacher-student and student-student relationships.
    - Choice of activities include Check-Ins, High-Five or Fist-Bump Line, Musical Walk/Jog, High-Five Challenges, or Rock-Paper-Scissor Snake.
2. **Awareness Talk (10 mins)**
    - Check for understanding from LP3: “What are the minerals we talked about in our last class?” “Can you name a mineral we learned and talk about its major function?”
    - Lesson Focus Introduction
    - Warm-Up Question: “What foods give you energy for activities like walking and jogging?” “What are the nutrients in those foods?”
    - Present and discuss the Key Concepts listed in the previous section. Displaying these concepts on the whiteboard is highly recommended for clarity and engagement.
        - Highlight that Carbs and Fats are the major fuels for the Aerobic Energy System. Protein only serves as a backup energy source since we want protein to be used for body growth and repair.

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3. Physical Activities (60 mins)

Activity 1: Learning Team Steady-State Circuit (20 mins)

Objective: Students are able to experience activities fueled by the aerobic energy system while working collaboratively in a learning team, with each student taking on a designated role.

Setup: Divide the class into teams of 4–8 students. Provide each team a Task Sheet that includes the physical activities and its related knowledge about Aerobic Energy System. Physical activities on the Task Card include:

- Jogging – Students jog around the gym or a designated area for 3 mins at a steady pace.
- Brisk Walking – Students walk briskly around the gym or a designated area for 3 mins at a steady pace.
- Frisbee Toss – Students throw and catch frisbees while moving forward steadily within a designated area for 3 mins.
- Soccer Dribbling and Shooting – Students dribble a soccer ball through cones and take a shot on a target (goal or cones) for 5 mins.

Instructions:

- Students in each team choose one of the following roles and put their names beside the roles on the Task Sheet:
    - Coach: Explains the physical activities and their connections to the Aerobic Energy System (e.g., "Jogging uses carbohydrates and fats as fuel to keep you moving steadily").
    - Nutritionist: Identify three foods from the food cards that can fuel the body for each activity.
    - Equipment Organizer: Sets up and manages equipment for each activity.
    - Timekeeper: Tracks time for each activity and ensures the team stays on schedule.
    - Stretch Leader: Leads the team in a 1-minute dynamic warm-up before starting each physical activity (e.g., arm circles, leg swings).
    - Cheerleader: Motivates the team to stay engaged and provide praise for effort.
- Students complete the physical activities described on the Task Sheet as a team and learn that those physical activities are fueled by the Aerobic Energy System.

- Upon the completion of each physical activity, the physical activity item on the Task Sheet should be checked off. Return the Task Sheet to the teacher after all the physical activities are completed.
- After the activity, invite students to debrief as a team what they accomplished in this activity, how each role contributed, and what they learned together.

Inclusive Adaptations for Students with Disabilities:

- Provide alternative exercises (e.g., seated arm movements, resistance bands) for students unable to jog or dribble.
- Use peer support or simplified task sheets for students with cognitive or sensory needs.

Activity 2: Aerobic Energy Relay (15 mins)

Objective: Students are able to identify the aerobic energy system and its fuel sources through a fun and team-based relay game.

Setup: Divide students into teams of 6–8 or keep the students in the same team as the previous activity, ensuring a mix of fitness levels and genders. Create corresponding relay lanes with cones or markers for each team. At the starting line, placing Food Cards rich in Carbs, Protein, and Fats. At the far end of the relay, set up bins or areas with signs:

- Carbs Energy Zone
- Fats Energy Zone
- Protein Energy Zone

Instructions:

- Teams line up at the starting line. Each player picks one Food Card and runs to the finish line to place it in the corresponding bins or areas.
- Players return to the starting line and tag the next teammate. After all the Food Cards are delivered. Discuss the results as a class to clarify correct matches.

Progressions:

- If there are more teams, rotate between playing and resting, then teams compete against others with the same record (e.g., winners vs. winners, non-winners vs. non-winners) to ensure balanced and competitive matchups throughout the event.
- Incorporate previous lesson cards into the mix as a review.

- Introduce Barriers: Add cones or agility ladder to the relay lanes, requiring players to navigate through them as obstacles.
- Alternative Movements: Performs different locomotor movements, for example runs, walks, skips, gallops, hops through hula hoops, or lateral shuffles.

Inclusive Adaptations for Students with Disabilities:

- Allow students with mobility challenges to pass cards to a partner or use a shorter relay course.
- Use verbal cues for students with visual or cognitive difficulties.

Activity 3: Aerobic Soccer Challenge (25 mins)

Objective: Students are able to apply knowledge of the aerobic energy system in a sports-based game that requires sustained, moderate-intensity effort.

Setup: Divide students into teams of 6–8 players or keep them in the same teams as the previous activity. Set up 2–3 small-sided soccer fields with two soccer goals at each end of the fields (use tall cones as the goal posts). Evenly assign teams to each field. On each field, two teams will play while other teams rest and observe.

Instructions:

- The goal of each team is to defend their own goal and score the opponent's goal.
- Teams play for a 5-minute round with a total of 4 rounds. At the end of each round, teams hydrate and rotate to ensure equal playing time.
- The challenge is that all the players MUST keep moving throughout the game without a complete stop or being stationary during the game (no goalkeeper for the game).
- Ensure all teams get the opportunity to compete against different opponents.
- Debrief with the following questions at the end of the game: "Were you primarily using the aerobic energy system during the game? How could you tell?" Reflect on the importance of sustaining effort over time and how foods like carbohydrates and fats provide energy for activities like this.

Variations:

- Instead of soccer, consider using other sports or games that students are familiar with, such as basketball, volleyball, frisbee, or any other activity that suits their interests and skill levels.

Inclusive Adaptations for Students with Disabilities:

- Modify the game with rolling passes, walking soccer, or a designated safe zone for students with mobility challenges.
- Assign strategy roles (e.g., scorekeeper, referee, or hydration monitor) for students needing a lower-intensity option.

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4. **Group Meeting (5 mins):**

Get students together and discuss the following three questions:

1. What are the major fuels for the Aerobic Energy System?
2. Why is protein considered a backup source?
3. What is ATP?

5. **Reflection Time (10 mins)**

Students should complete the journal entry for this lesson. The journal entry includes reflection questions and an individual exit quiz.

Lesson Four: Aerobic Energy System Journal

Essential Virginia Health Standards: 7.2.b: Analyze the effects of nutrition on daily performance (i.e., mind and body).

Essential Virginia PE Standards: 7.5.b: Define and describe anaerobic and aerobic energy systems.

Lesson Focus: Introduce the aerobic energy system, its role in supporting moderate-to-low-intensity activities, the nutrients it uses, and the metabolic processes involved.

Student Learning Outcomes

1. Describe the function of the Aerobic Energy System (AES).
2. Identify carbohydrates and fats as the primary fuels for AES, with protein as a backup energy source.
3. Explain the role of oxygen in the metabolic process of AES.
4. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Aerobic Energy System: This system gives your body energy for activities that last a long time (more than 2 minutes) and use oxygen.
    - Examples: Walking, jogging, cycling, and other steady activities.
2. Fuel Sources for Aerobic Energy and Where They Come From:
    - Carbohydrates: Provide quick energy, especially during moderate to vigorous activities.
        - Food Source Examples: rice, bread, pasta, potatoes, fruits, vegetables, legumes, honey, sugar.
    - Fats: Give long-lasting energy, especially for lower-intensity activities.
        - Food Source Examples: avocado, nuts, seeds, olive oil, fish, butter.
    - Protein: Used as a backup energy source when carbs and fats run out (like during extreme hunger or very long workouts).
        - Food Source Examples: meat, fish, eggs, dairy, beans, nuts, tofu.
3. How Your Body Uses This Energy:

- Metabolic Process: Your body breaks down glucose (from carbs) and fat with oxygen inside tiny parts of your cells called mitochondria to make energy.
- ATP (Adenosine Triphosphate): This is the fuel your body uses to move, grow, and stay alive, just like gas powers a car!

Reflection Questions

1. *What is one new or interesting thing you learned today about nutrients that you didn't know before?*

2. *How did it feel to work with others today? Share one thing that made you happy or one thing that was a little hard?*

3. *How can you use what you learned today to make better food choices or stay healthy every day?*

Exit Quiz

1. The aerobic energy system gets most of its energy from_____ and _____.
2. The aerobic energy system works best during _____ intensity activities. (low or high?)
3. Our body uses _____ to help muscles grow and heal.
4. Which activity uses the aerobic energy system the most?
   a) Sprinting
   b) Weightlifting
   c) Jogging
   d) High-jumping
5. Which one of these does NOT give the aerobic energy system energy?
   a) Carbohydrates
   b) Fats
   c) Vitamins
   d) Protein
6. Which food gives your body carbohydrates for energy when you play for a long time?
   a) Rice
   b) Chicken
   c) Cheese
   d) Avocado
7. Which food gives your body fats for long-lasting energy?
   a) Seeds and Nuts
   b) Bananas
   c) Pasta
   d) Rice
8. Which food is a good source of protein to help build muscles?
   a) Chicken breast
   b) Bread
   c) Potatoes
   d) Apples

Lesson Five: Phosphagen and Anaerobic Energy System

Grade Level: Middle School

Duration: 90 Minutes Class Size: 20 to 50+ students

Essential Virginia Health Standards: 7.2.b: Analyze the effects of nutrition on daily performance (i.e., mind and body).

Essential Virginia PE Standards: 7.5.b: Define and describe the anaerobic and aerobic energy systems.

Lesson Focus: Introduce the phosphagen and anaerobic energy systems, as well as their roles in high-intensity activities.

Materials Needed: L5 Task Cards, L5 Activity Cards, Student Journal, PE Equipment (kickball, poly spot marker, cones, pinnies, agility ladder, holla hoops, etc.)

Student Learning Outcomes

1. Identify the key characteristics of the phosphagen and anaerobic energy systems.
2. Explain how these energy systems support high-intensity activities, particularly strength and power.
3. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Phosphagen System: This is your body's fastest energy system, used for very short and powerful movements (about 5 to 10 seconds). It works like a quick energy boost by using stored ATP (Adenosine Triphosphate) and CP (Creatine Phosphate).
    - Examples: Sprinting, jumping, and lifting heavy weights.
2. Anaerobic System (Glycolysis): This system gives energy a little longer (more than 10 seconds up to 2 minutes) by breaking down glucose without using oxygen. It helps with intense activities but also creates lactic acid, which can make your muscles feel tired.
    - Examples: Fast running, circuit training, and short bursts of intense exercise.

Instructional Procedure

1. **Relational Time (5 mins)**
   - Greetings: Welcome students and establish positive and supportive teacher-student and student-student relationships.
   - Choice of activities include Check-Ins, High-Five or Fist-Bump Line, Musical Walk/Jog, High-Five Challenges, or Rock-Paper-Scissor Snake.
2. **Awareness Talk (10 mins)**
   - Check for understanding from LP4: "Which energy system is responsible for fueling low intensity activities like walking and jogging?" "What are the nutrients can be used as fuels for that system?"
   - Warm-Up Question: "What foods give you energy for activities like sprinting, lifting a heavy weight, and pitching a baseball?" "What are the nutrients in those foods?"
   - Present and discuss the Key Concepts listed in the previous section. Displaying these concepts on the whiteboard is highly recommended for clarity and engagement.
     - Highlight real-life examples of activities powered by phosphagen and anaerobic energy systems, like 100m sprint, powerlifting (1-5 rep max), 400m sprint, high-intensity interval training (HIIT)

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3. **Physical Activities (60 mins)**

Activity 1: Learning Teams and High-Intensity Challenge (20 Minutes)

Objective: Students are able to understand the phosphagen and anaerobic energy systems through high-intensity activities.

Setup: Divide the class into teams of 4–8 students. Provide each team with a Task Sheet that includes the physical activities and its related knowledge about the Phosphagen and Anaerobic Energy System.

- Activities lasting under 10 seconds to Phosphagen System Station
- Activities lasting 10 seconds to 2 minutes to Anaerobic System Station.

Physical activities on the Task Card include:

- Burpees – 35 secs continuous burpees, followed by 1 min rest. 2 sets.

- Jumping Jacks – 45 secs of continuous jumping jacks, followed by 1 min 30 secs rest. 2 sets.
- Cone Shuttle Runs – Sprinting back and forth (5-yard distance), while moving 2 cones from the finishing line to the starting line. One cone at a time. 2 sets.
- Mountain Climbers – 35 secs of mountain climbers, followed by 1 min rest. 2 sets.
- Broad Jump – 3 continuous broad jumps, followed by 40 secs rest. 2 sets

Instructions:

- Students in each team choose one of the following roles and put their names beside the roles on the Task Sheet:
    - Coach: Explains the physical activities and their connections to the Phosphagen and Anaerobic Energy System (e.g., "Broad jump is less than 10 seconds and is fueled by the Phosphagen Energy System.").
    - Equipment Organizer: Sets up and manages equipment for each activity.
    - Timekeeper: Tracks time for each activity and ensures the team stays on schedule.
    - Stretch Leader: Leads the team in a 1-minute dynamic warm-up before starting each physical activity (e.g., arm circles, leg swings).
    - Cheerleader: Motivates the team to stay engaged and provide praise for effort.
- Students complete the physical activities described on the Task Sheet as a team and learn about how the Phosphagen and Anaerobic Energy Systems fuel those physical activities.
- Upon the completion of each physical activity, the physical activity item on the Task Sheet should be checked off. Return the Task Sheet to the teacher after all the physical activities are completed.
- After the activity, invite students to debrief as a team what they accomplished in this activity, how each role contributed, and what they learned together.

Inclusive Adaptations for Students with Disabilities:

- Provide alternative movements (e.g., seated resistance band exercises, arm circles) for students unable to perform high-impact activities.
- Use visual approach and peer support for students with cognitive or sensory needs.

Activity 2: Anaerobic Energy Relay (15 mins)

Objective: Students are able to identify physical activities that use either the phosphagen energy system or the anaerobic energy system.

Setup: Divide students into teams of 6–8 or keep the students in the same team as the previous activity, ensuring a mix of fitness levels and genders. Create corresponding relay lanes with cones or markers for each team. At the starting line, place Activity Cards representing specific exercises or movements. At the far end of the relay, set up bins or areas with signs:

- Phosphagen System
- Anaerobic System

Instructions:

- Teams line up at the starting line. Each player picks one Food Label Card and runs to the finish line to place it in the corresponding bins or areas.
- Players return to the starting line and tag the next teammate. After all the Food Label Cards are delivered. Discuss the results as a class to clarify correct matches.

Progressions:

- If there are more teams, rotate between playing and resting, then teams compete against others with the same record (e.g., winners vs. winners, non-winners vs. non-winners) to ensure balanced and competitive matchups throughout the event.
- Incorporate previous lesson cards into the mix as a review.
- Introduce Barriers: Add cones or agility ladder to the relay lanes, requiring players to navigate through them as obstacles.
- Alternative Movements: Performs different locomotor movements, for example runs, walks, skips, gallops, hops through hula hoops, or lateral shuffles.

Inclusive Adaptations for Students with Disabilities:

- Allow students with mobility limitations to pass Activity Cards to a partner or use a shorter relay distance.
- Use verbal cues for students with visual or cognitive difficulties.

Activity 3: Energy Systems Kickball (25 mins)

Objective: Students are able to identify the phosphagen and anaerobic energy systems and connect those energy systems to the movements in kickball game.

Setup: Use a large indoor gym space. Divide the students into 2 or 4 teams depending on the size of the class. Teams will play kickball game within a designated area typically consists of a diamond-shaped field with four bases—home, first, second, and third—arranged 40 to 60 feet apart.

Instructions:

- Regular kickball rules apply, e.g., pitching, kicking, running bases, and scoring etc.
- A player "kicks" the ball off a pitcher's roll, runs around the bases, and scores a run if they make it back to home plate without being tagged out.
- A kicker is out if a fielder catches the kicked ball before it hits the ground, if they are tagged with the ball while running, or if they commit three fouls (kicks landing in foul territory).
- Fielders can catch fly balls, throw the ball to bases to tag runners, and directly tag runners with the ball.
- An inning ends when three outs are recorded for the kicking team, or when both teams have had a turn at bat and in the field.
- If more than 2 teams in the class, the teams that are not playing could serve as Energy Trackers, who need to observe and report moments when players use the phosphagen and anaerobic energy systems at the end of each inning.
- Rotate teams (if more than 2 teams) so that all students get a chance to play the offense, defense, and observe as Energy Trackers.
- At the end of the game, ask students the following two questions:
    - Which movements are fueled by the Phosphagen Energy System? Movements Fueled by the Phosphagen Energy System: kicking the Ball, sprinting to the Base, throwing the Ball, tagging a runner.
    - Which movements are fueled by the Anaerobic Energy System? Movements fueled by the Anaerobic Energy System: running to multiple bases, chasing the ball in the outfield, pitching for an extended time.

Inclusive Adaptations for Students with Disabilities:

- Modify the game with rolling kicks, walking bases, or a designated safe zone for students with mobility challenges.
- Assign strategic roles (e.g., scorekeeper, observer, or rule enforcer) for students needing a lower-intensity option.

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4. **Group Meeting (5 mins):**

Get students together and discuss the following two questions:

1. What are the names of the two energy systems involved in high-intensity activities?
2. Which energy system, phosphagen or anaerobic, is more dominant during a 100-meter sprint versus a 400-meter sprint, and why?

5. **Reflection Time (10 mins)**

Students should complete the journal entry for this lesson. The journal entry includes reflection questions and an individual exit quiz.

Lesson Five: Phosphagen and Anaerobic Energy System Journal

Essential Virginia Health Standards: 7.2.b: Analyze the effects of nutrition on daily performance (i.e., mind and body).

Essential Virginia PE Standards: 7.5.b: Define and describe the anaerobic and aerobic energy systems.

Lesson Focus: Introduce the phosphagen and anaerobic energy systems, as well as their roles in high-intensity activities.

Student Learning Outcomes

1. Identify the key characteristics of the phosphagen and anaerobic energy systems.
2. Explain how these energy systems support high-intensity activities, particularly strength and power.
3. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Phosphagen System: This is your body's fastest energy system, used for very short and powerful movements (about 5 to 10 seconds). It works like a quick energy boost by using stored ATP (Adenosine Triphosphate) and CP (Creatine Phosphate).
    - Examples: Sprinting, jumping, and lifting heavy weights.
2. Anaerobic System (Glycolysis): This system gives energy a little longer (more than 10 seconds up to 2 minutes) by breaking down glucose without using oxygen. It helps with intense activities but also creates lactic acid, which can make your muscles feel tired.
    - Examples: Fast running, circuit training, and short bursts of intense exercise.

Reflection Questions

1. *What is one new or interesting thing you learned today about nutrients that you didn't know before?*

2. *How did it feel to work with others today? Share one thing that made you happy or one thing that was a little hard?*

3. *How can you use what you learned today to make better food choices or stay healthy every day?*

Exit Quiz

1. The _____ system gives quick energy for short, powerful movements like sprinting and kicking.
2. The _____ system uses stored energy (glycogen) to power high-intensity activities that last up to 2 minutes.
3. The anaerobic energy system makes energy _____ (with or without) using oxygen.
4. During a 100-meter sprint, which energy system gives the most energy for this short, powerful race?
   a) Aerobic System
   b) Anaerobic System
   c) Phosphagen System
5. In a basketball game, a player sprints and moves quickly for short bursts of time (30-90 seconds). Which energy system helps with these fast movements?
   a) Aerobic System
   b) Anaerobic System
   c) Phosphagen System
6. During a broad jump, where an athlete makes one big, powerful jump, which energy system gives the energy?
   a) Aerobic System
   b) Anaerobic System
   c) Phosphagen System
7. In a 200-meter sprint, where runners push themselves at full speed for about 30-45 seconds, which energy system gives them energy?
   a) Aerobic System
   b) Anaerobic System
   c) Phosphagen System

Lesson Six: Understanding Food Label

Grade Level: Middle School

Duration: 90 Minutes Class Size: 20 to 50+ students

Essential Virginia Health Standards: 7.2.: The student will use decision-making skills to promote health and personal wellness. 6.2.c: Interpret information on a food label to identify a food product that may cause an allergic reaction.

Essential Virginia PE Standards: 6.5: Explain the relationship between energy balance and nutrition guidelines, meal planning, and exercise intensity.

Lesson Focus: Introduce key information on food labels and identify nutrients that should be limited to prevent certain types of chronic diseases.

Materials Needed: L6 Food Label Activity Cards, L6 Food Label Relay Cards, Student Journal, PE Equipment (soccer, basketball, pickleball, cones, pinnies, agility ladder, holla hoops, etc.)

Student Learning Outcomes

1. Identify key sections of a food label (serving size, calories per serving, %DV).
2. Identify foods that are high in sodium, sugar, and saturated fats.
3. Apply knowledge of food labels to make healthier food choices.
4. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Serving Size: The set amount of food (like a cup or an ounce) that helps you know how much you're eating.
2. Calories per Serving: The number of calories (energy) in one serving of the food.
3. Number of Servings: How many servings are in the whole package or container.
4. % Daily Value (DV): Shows how much of a nutrient one serving gives you compared to what you need in a whole day.
    - Low: 5% DV or less.
    - Moderate: 6–19% DV.
    - High: 20% DV or more.
5. Nutrients to Limit:
    - Sodium: Too much can raise blood pressure.

- Added Sugar: Can cause weight gain and make you feel tired later.
- Saturated Fat: Too much can lead to heart problems.

Instructional Procedure

1. **Relational Time (5 mins)**
   - Greetings: Welcome students and establish positive and supportive teacher-student and student-student relationships.
   - Choice of activities include Check-Ins, High-Five or Fist-Bump Line, Musical Walk/Jog, High-Five Challenges, or Rock-Paper-Scissor Snake.
2. **Awareness Talk (10 mins)**
   - Check for understanding from LP5: " What are the names of the two energy systems involved in high-intensity activities?" "Which energy system is more dominant during heavy weightlifting?"
   - Introduce the lesson focus.
   - Warm-Up Questions: "Who has ever looked at a food label when you eat certain snacks or packaged foods?" "What information can we learn from reading a food label?" "Do you think your French fries are low, moderate, or high in sodium and saturated fat? How about the sugar level in sweet tea?"
   - Present and discuss the Key Concepts listed in the previous section. Displaying these concepts on the whiteboard is highly recommended for clarity and engagement.
     - Use a sample food label to show the students the information of serving size, number of servings, calories per serving, and %DV on a food label.
     - Introduce the concept of low (5%), moderate (6–19%), and high (20%+) %DV.
     - Highlight the health consequences if you eat something that is high in sodium (high blood pressure), sugar (diabetes), and saturated fats (heart disease).

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3. Physical Activities (60 mins)

Activity 1: Food Label Detective Challenge (20 mins)

Objective: To explore serving size, number of servings, calories per serving, %DV, and unhealthy nutrients by working as a team.

Setup: Assign students to "Home Teams" of 5-10 depending on class size. Within each team, assign one of the five roles (serving size expert, serving number expert, calorie expert, DV expert, and nutrient expert) to one or two students.

Instructions:

- Experts move to their respective "Expert Groups" to learn about their role through movement-based activities.
    - Serving Size Experts: Perform jumping jacks equal to the total number of serving sizes shown on the Food Labels provided. Discuss the definition of serving size with the given cards.
    - Serving Number Experts: Perform push-ups equal to the total number of servings shown on the Food Labels provided. Discuss the definition of number of servings with the given cards.
    - Calorie Experts: Perform 5 walking lunges for every 50 calories per serving on the Food Labels provided. Discuss the definition of calories per serving with the given cards.
    - DV Experts: Perform 5 squats for each low nutrient (5% or less, excluding 0%) and 3 squats for each high nutrient (20% or more) shown on the Food Labels provided. Discuss the definition of calories with the given cards.
    - Nutrient Experts: Perform 10 high knees for each of the following nutrients that are recognized as moderate or high DV% on the Food Label Cards provided. The nutrients include sodium, sugar, and saturated fat.
- Experts return to their Home Teams.
- Teams collaboratively create a group activity sequence based on their own choices. Each expert within the team is responsible for leading the physical activity and facilitating the discussion outlined on their activity card. This ensures that every team member contributes their expertise while promoting teamwork and active learning.

- Teachers should actively check in with teams to monitor their progress and address any questions or concerns they may have.
- After the activity, invite students to debrief as a team what they accomplished in this activity, how each role contributed, and what they learned together.

Inclusive Adaptations for Students with Disabilities:

- Offer seated or alternative movements (e.g., arm raises, resistance bands) for students unable to perform high-impact exercises.
- Use visual aids, peer support, or simplified instructions for students with cognitive or sensory needs.

Activity 2: Food Label Relay (15 mins)

Objective: Students are able to evaluate food labels and classify foods as healthy or unhealthy based on %DV for unhealthy nutrients (sodium, sugar, and bad fats).

Setup: Divide students into teams of 6–8 or keep the students in the same team as the previous activity, ensuring a mix of fitness levels and genders. Create corresponding relay lanes with cones or markers for each team. At the starting line, place Food Label Cards showing serving size, calories per serving, and %DV for sodium, sugar, and bad fats. At the far end of the relay, set up bins or areas with signs:

- Healthy and Nutritious Food Choices (**high in protein, fiber, vitamins, and minerals**)
- Unhealthy and Non-nutritive Food Choices (**high in sodium, added sugar, and saturated fat**)

Instructions:

- Teams line up at the starting line. Each player picks one Food Label Card and runs to the finish line to place it in the corresponding bins or areas.
- Players return to the starting line and tag the next teammate. After all the Food Label Cards are delivered. Discuss the results as a class to clarify correct matches.

Progressions:

- If there are more teams, rotate between playing and resting, then teams compete against others with the same record (e.g., winners vs. winners, non-winners vs. non-winners) to ensure balanced and competitive matchups throughout the event.

- Incorporate previous lesson cards into the mix as a review.
- Introduce Barriers: Add cones or agility ladder to the relay lanes, requiring players to navigate through them as obstacles.
- Alternative Movements: Performs different locomotor movements, for example runs, walks, skips, gallops, hops through hula hoops, or lateral shuffles.

Inclusive Adaptations for Students with Disabilities:

- Allow students with mobility limitations to pass Food Label Cards to a partner or use a shorter relay course.
- Use verbal cues for students with visual or cognitive difficulties.

Activity 3: Food Label Pickleball Challenge (25 mins)

Objective: Students are able to identify healthy food choices by evaluating food labels through a modified pickleball game.

Setup: Divide the space into multiple pickleball courts. Assign students to specific courts, where they will rotate turns playing doubles pickleball. Place a pile of Food Label Cards beside each court.

Instructions:

- On each side of the court, students are paired to play doubles pickleball using simplified tennis rules (serving and scoring).
- Teams rotate in and out after a set number of points (e.g., first to 2 or 3 points).
- After a team wins, they leave the field and select a Food Label Card from the pile.
- The team evaluates the food label to decide if it represents a **healthy choice** based on:
    - Healthy Food Choices (high in protein, fiber, vitamins, and minerals)
    - Unhealthy Food Choices (high in sodium, added sugar, and saturated fat)
- After the team collects a food label card, the team returns and continues to play.
- One set of the game lasts 8-10 minutes with a 2-minute break.
- For each set, the team with the highest number of healthy and nutritious cards wins.
- During the break, all the teams return the food cards to the pile.
- After the break, students begin the second round with a new set of teammates. Teams can be formed either by the students themselves or assigned by the teacher. Ensure that each team in the second round has a balanced mix of skill levels.

- Possible variations include basketball, volleyball, soccer, or any game familiar to the students. The key idea is that after scoring a specific number of points, the winning students earn the opportunity to collect a food card as a reward. The team with the most nutrient-dense food cards at the end is declared the winner.

Inclusive Adaptations for Students with Disabilities:

- Use rolling serves (pushing the ball along the ground) or larger, slower-moving balls for students with limited upper-body movement.
- Provide structured turn-taking, visual scoring aids, and a quiet break area for students needing additional support.

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4. **Group Meeting (5 mins):**

Get students together and discuss the following two questions:

1. Why is it important to read food labels before buying or eating packaged food?
2. Which nutrients should you aim to keep low on a food label, and why are these nutrients considered unhealthy in large amounts?

5. **Reflection Time (10 mins)**

Students should complete the journal entry for this lesson. The journal entry includes reflection questions and an individual exit quiz.

Lesson Six: Understanding Food Labels Journal

Essential Virginia Health Standards: 7.2.: The student will use decision-making skills to promote health and personal wellness. 6.2.c: Interpret information on a food label to identify a food product that may cause an allergic reaction.

Essential Virginia PE Standards: 6.5: Explain the relationship between energy balance and nutrition guidelines, meal planning, and exercise intensity.

Lesson Focus: Introduce key information on food labels and identify nutrients that should be limited to prevent certain types of chronic diseases.

Student Learning Outcomes

1. Identify key sections of a food label (serving size, calories per serving, %DV).
2. Identify foods that are high in sodium, sugar, and saturated fats.
3. Apply knowledge of food labels to make healthier food choices.
4. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Serving Size: The set amount of food (like a cup or an ounce) that helps you know how much you're eating.
2. Calories per Serving: The number of calories (energy) in one serving of the food.
3. Number of Servings: How many servings are in the whole package or container.
4. % Daily Value (DV): Shows how much of a nutrient one serving gives you compared to what you need in a whole day.
    - Low: 5% DV or less.
    - Moderate: 6–19% DV.
    - High: 20% DV or more.
5. Nutrients to Limit:
    - Sodium: Too much can raise blood pressure.
    - Added Sugar: Can cause weight gain and make you feel tired later.
    - Saturated Fat: Too much can lead to heart problems.

Reflection Questions

1. *What is one new or interesting thing you learned today about nutrients that you didn't know before?*

2. *How did it feel to work with others today? Share one thing that made you happy or one thing that was a little hard?*

3. *How can you use what you learned today to make better food choices or stay healthy every day?*

Exit Quiz

1. The _____ on a food label shows how much of a nutrient is in one serving compared to what you need in a day.
2. The _____ tells you how many servings are in the whole package.
3. What does the serving size on a food label mean?
   a) The calories in the whole package.
   b) The amount of food the nutrition facts are based on.
   c) How many servings are in the package.
   d) The percentage of nutrients in the food.
4. A bag of chips has 4 servings. Each serving has 150 calories. How many calories are in the whole bag?
   a) 150 calories
   b) 300 calories
   c) 600 calories
   d) 1,000 calories
5. Which food has the most salt (sodium)?
   a) Fresh apple
   b) Canned soup
   c) Plain yogurt
   d) Unsalted almonds
6. Which food is most likely to have a lot of added sugar?
   a) Original Taste Coca Cola
   b) Fresh spinach
   c) Grilled lean beef steak
   d) Boiled eggs
7. Which of these foods has the most saturated fat?
   a) Butter
   b) Fresh strawberries
   c) Whole-grain bread
   d) Carrots

Lesson Seven: Energy Balance, Body Weight, and Circulatory Health

Grade Level: Middle School

Duration: 90 Minutes Class Size: 20-50+ students

Essential Virginia Health Standards: 7.2.a: Describe how healthy food choices and physical activity keep the circulatory system healthy.

Essential Virginia PE Standards: 8.5.b: Explain the role of energy balance in weight management and body composition .

Lesson Focus: Introduce the concept of energy balance and its influences on body weight and circulatory health.

Materials Needed: L7 Task Cards, L7 Food Cards, Student Journal, PE Equipment (soccer, basketball, pickle ball, cones, pinnies, agility ladder, holla hoops, etc.)

Student Learning Outcomes

1. Examine the concept of energy balance (calories in vs. calories out).
2. Recognize how energy balance affects body weight and circulatory health.
3. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Energy Balance: The balance between the energy you get from food and drinks (calories in) and the energy your body uses for movement, exercise, and basic functions like breathing (calories out).
   - Positive Energy Balance: Eating more calories than you burn → leads to weight gain.
   - Negative Energy Balance: Burning more calories than you eat → leads to weight loss.
   - Neutral Energy Balance: Eating and burning the same amount of calories → maintains weight.
2. Circulatory System (Cardiovascular System): The body system that includes the heart, blood vessels, and blood. It moves nutrients, oxygen, and hormones around your body.
   - Neutral Energy Balance helps maintain a healthy weight and keeps the circulatory system working well.
   - Negative Energy Balance helps people who need to lose weight, making their circulatory system healthier.

- Positive Energy Balance can lead to weight gain, which makes the heart work harder and increases the risk of health problems.

3. calories: A calorie (lower case "c") is a unit of energy. One calorie raises the temperature of 1 gram of water by 1 degree Celsius. Your body burns calories to power everything you do, from moving to thinking!
    - 1 Kcal (kilocalorie) = 1,000 small calories (scientific calories).
    - But in everyday nutrition, 1 Kcal is the same as 1 Calorie (with a capital C).

Instructional Procedure

1. **Relational Time (5 mins)**
    - Greetings: Welcome students and establish positive and supportive teacher-student and student-student relationships.
    - Choice of activities include Check-Ins, High-Five or Fist-Bump Line, Musical Walk/Jog, High-Five Challenges, or Rock-Paper-Scissor Snake.
2. **Awareness Talk (10 mins)**
    - Check for understanding from LP6: "What are the nutrients we want to be low on a food label?" "What are the nutrients we want to be high on a food label?" "How to determine whether a nutrient is considered as low or high on a food label?"
    - Lesson Focus Introduction
    - Warm-Up Questions: "What happens to your body weight when you eat more food than you burn off energy through activity?" "What happens to your body weight when you burn more energy than you eat?" "What do you think about the relationship between body weight and cardiovascular disease, like heart disease and stroke?"
    - Present and discuss the Key Concepts listed in the previous section. Displaying these concepts on the whiteboard is highly recommended for clarity and engagement.
    - Highlight some real-life examples:
        - Eating a large pizza but only walking for 10 minutes (positive balance).
        - Eating a cookie and playing a basketball game (negative balance).
        - Eating a small bag of potato chips and jogging at a light pace for about 20 minutes (neutral balance).

3. **Physical Activities (60 mins)**

Activity 1: Learning Teams with Energy Balance Challenge (20 mins)

Objective: Students will work in small teams to examine how physical activities can balance calorie intake by selecting appropriate activities to "burn" the calories represented on food cards.

Setup: Divide the class into teams of 4–8 students. Each team receives one Task Sheet listing physical activities with their energy expenditure and three Food Cards representing calorie intake to be burned. Teams must complete physical activities from the Task Sheet to burn the calories on their Food Cards. Physical activities on the Task Card include:

- Jumping Jacks: Perform for 1 minute to burn 15 kcal.
- Brisk Walking: Walk briskly for 5 minutes to burn 25 kcal.
- Jogging: Jog comfortably for 5 minutes to burn 45 kcal.
- High Knees: Perform for 1 minute to burn 12 kcal.
- Push-Ups: Perform for 1 minute to burn 10 kcal.
- Burpees: Perform for 1 minute to burn 15 kcal.
- Squats: Perform for 1 minute to burn 15 kcal.
- Mountain Climbers: Perform for 1 minute to burn 12 kcal.
- Lunges: Perform for 1 minute to burn 8 kcal.

Instructions:

- Students in each team choose one of the following roles and put their names beside the roles on the Task Sheet:
  - Coach: Explains the selected physical activities and their connection to calorie burning and energy balance. Provides instructions and strategies to meet the team's calorie-burning goal (e.g., "Jumping Jacks burn 10–15 kcal per minute, so we need 2 minutes to burn 30 kcal.").
  - Timekeeper: Tracks time for each activity and ensures the team stays on schedule.
  - Equipment Organizer: Sets up, arranges, and collects any equipment needed for the activities (e.g., basketballs, cones, frisbees).

    - Stretch Leader: Leads the team in a 1-minute dynamic warm-up before starting each physical activity (e.g., arm circles, leg swings).
    - Cheerleader: Motivates team members to stay engaged and maintain effort.
- Students work together to complete the physical activities described on the Task Sheet as a team. During each activity, they explore how energy expenditure balances calorie intake, reinforcing concepts of energy balance.
- After completing each physical activity, the corresponding item on the Task Sheet is checked off to monitor progress and ensure the team achieves the total calorie burn required to match their Food Cards. Return the Task Sheet to the teacher after all the physical activities are completed.
- After the activity, invite students to debrief as a team what they accomplished in this activity, how each role contributed, and what they learned together.

Inclusive Adaptations for Students with Disabilities:

- Provide seated or low-impact alternatives (e.g., resistance band exercises, arm raises) for students unable to perform high-impact activities.
- Use peer support for students with cognitive or sensory needs to assist with calculations.

Activity 2: Calorie Sorting Relay (15 mins)

Objective: Students are able to identify the calorie content of common foods. The teacher explains the following concepts before the relay:

- High-Energy Foods: Typically, over 250–300 calories per serving
- Moderate-Energy Foods: Approximately 100–250 calories per serving
- Low-Energy Foods: Typically, under 100 calories per serving

Setup: Divide students into teams of 6–8 or keep the students in the same team as the previous activity, ensuring a mix of fitness levels and genders. Create corresponding relay lanes with cones or markers for each team. At the starting line, place Food Cards with the information of calories per serving. At the far end of the relay, set up bins or areas with signs:

- High-Calorie Foods

- Moderate-Calorie Foods
- Low-Calorie Foods

Instructions:

- Teams line up at the starting line. Each player picks one Food Label Card and runs to the finish line to place it in the corresponding bins or areas.
- Players return to the starting line and tag the next teammate. After all the Food Label Cards are delivered. Discuss the results as a class to clarify correct matches.
- At the end of the activity, invite students to think about which type of foods are good for our circulatory health.

Progressions:

- If there are more teams, rotate between playing and resting, then teams compete against others with the same record (e.g., winners vs. winners, non-winners vs. non-winners) to ensure balanced and competitive matchups throughout the event.
- Set the neutral energy balance needs as 1,800 kcal. Students relay and select healthy food cards to build balanced meals totaling 1,800 kcal, promoting circulatory health and achieving neutral energy balance.
- Introduce Barriers: Add cones or agility ladder to the relay lanes, requiring players to navigate through them as obstacles.
- Alternative Movements: Performs different locomotor movements, for example runs, walks, skips, gallops, hops through hula hoops, or lateral shuffles.

Inclusive Adaptations for Students with Disabilities:

- Allow students with mobility limitations to pass Food Label Cards to a partner or use a shorter relay course.
- Provide verbal prompts for students with visual or cognitive difficulties.

Activity 3: Sports-based Stations (25 mins)

Objective: Students are able to examine energy balance and calculate energy expenditure through sport-based activities.

Setup: Use a large indoor gym space. Set up three distinct areas for the sports stations**:**

- **Station 1:** Soccer Game – Mark a small-sided field (e.g., 20x30 yards) with cones for boundaries and two goals as targets.

- **Station 2:** Basketball Game– Use a half-court setup with one basketball hoop for gameplay or shooting drills.
- **Station 3:** Pickleball Game – Create a designated playing area suitable for doubles or small groups.

Instructions:

- Divide the students into 3 larger groups.
- Assign each group to start at a station. Divide the group into two teams, considering skill levels to ensure fair play and engagement.
- Set a timer for 6 minutes per station.
- Prepare a whistle or loud signal to indicate when it's time to rotate.
- Allow 1-2 mins short break between each rotation to allow students to recover.
- Upon the completion of all the three games, students need to calculate and report their total energy expenditure in those three games using the student's journal.

Inclusive Adaptations for Students with Disabilities:

- Modify game rules (e.g., walking soccer, lower basketball hoop, or slower pickleball serves) for students with mobility challenges.
- Assign strategy or data-tracking roles (e.g., scorekeeper, referee, or energy expenditure recorder) for students needing a lower-intensity option.

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4. **Group Meeting (5 mins)**

Get students together and discuss the following two questions:

1. What do positive, negative, and neutral energy balances mean?
2. How do they impact your body weight and circulatory health?

5. **Reflection Time (10 mins)**

Students should complete the journal entry for this lesson. The journal entry includes reflection questions and an individual exit quiz.

Lesson Seven: Energy Balance, Body Weight, and Circulatory Health Journal

Essential Virginia Health Standards: 7.2.a: Describe how healthy food choices and physical activity keep the circulatory system healthy.

Essential Virginia PE Standards: 8.5.b: Explain the role of energy balance in weight management and body composition .

Lesson Focus: Introduce the concept of energy balance and its influences on body weight and circulatory health.

Student Learning Outcomes

1. Examine the concept of energy balance (calories in vs. calories out).
2. Recognize how energy balance affects body weight and circulatory health.
3. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Energy Balance: The balance between the energy you get from food and drinks (calories in) and the energy your body uses for movement, exercise, and basic functions like breathing (calories out).
   - Positive Energy Balance: Eating more calories than you burn → leads to weight gain.
   - Negative Energy Balance: Burning more calories than you eat → leads to weight loss.
   - Neutral Energy Balance: Eating and burning the same amount of calories → maintains weight.
2. Circulatory System (Cardiovascular System): The body system that includes the heart, blood vessels, and blood. It moves nutrients, oxygen, and hormones around your body.
   - Neutral Energy Balance helps maintain a healthy weight and keeps the circulatory system working well.
   - Negative Energy Balance helps people who need to lose weight, making their circulatory system healthier.
   - Positive Energy Balance can lead to weight gain, which makes the heart work harder and increases the risk of health problems.

3. calories: A calorie (lower case “c”) is a unit of energy. One calorie raises the temperature of 1 gram of water by 1 degree Celsius. Your body burns calories to power everything you do, from moving to thinking!
    - 1 Kcal (kilocalorie) = 1,000 small calories (scientific calories).
    - But in everyday nutrition, 1 Kcal is the same as 1 Calorie (with a capital C).

Calculating Your Energy Expenditure

After completing the three sports stations (soccer, basketball, and pickleball), figure out how many calories you burned in total!

Instructions:

- Look at the reference table to find how many calories you burn per minute for each sport.
- Write down how many minutes you played each sport (for example, 8 minutes per station).
- Multiply the number of minutes by the calories burned per minute for each sport.
- Add up the total calories burned from all three sports to find your total energy expenditure.

Example:

- If soccer burns 6 kcal per minute and you play for 8 minutes, then:

  6 kcal/min × 8 min = 48 kcal
- Repeat for basketball and pickleball, then add up all three!

Sport	**Duration (minutes)**	**Average Calories Burned/Minute**	**Total Calories Burned**
Soccer		6 kcal/min	
Basketball		7 kcal/min	
Pickleball		4 kcal/min	
Total			

Reflection Questions

1. *What is one new or interesting thing you learned today about nutrients that you didn't know before?*

2. *How did it feel to work with others today? Share one thing that made you happy or one thing that was a little hard?*

3. *How can you use what you learned today to make better food choices or stay healthy every day?*

Exit Quiz

1. If you eat more calories than you burn, you have a _____ energy balance. (positive, negative, neutral).
2. If you eat the same number of calories as you burn, you have a _____ energy balance. (positive, negative, neutral).
3. If you eat fewer calories than you burn, you have a _____ energy balance. (positive, negative, neutral).
4. Which food gives you the most energy (highest in calories)?
   a) Apple: ~95 calories (medium size)
   b) Salad with no dressing: ~15–20 calories (1 cup of mixed greens)
   c) Candy bar: ~250–300 calories (standard size, e.g., chocolate bar)
   d) Grilled chicken breast: ~165 calories (3-ounce serving)
5. Which food is low in calories but still healthy?
   a) Carrot sticks**:** ~25 calories (1 cup, raw)
   b) Cheeseburger: ~300–500 calories (depending on size and ingredients)
   c) Bag of chips: ~150–200 calories (1 ounce or about 15 chips)
   d) Ice cream: ~200–300 calories (single scoop with cone)
6. Which activity burns the most calories in 10 minutes?
   a) Walking at a slow pace
   b) Playing a competitive soccer game
   c) Standing still
   d) Stretching
7. If you want to lose weight (burn more calories than you eat), which is the best choice?
   a) Eat more food and exercise less
   b) Eat the same amount of food and reduce exercise
   c) Eat less food and increase exercise
   d) Eat more food and increase exercise

Lesson Eight: Nutrient-Dense Foods

Grade Level: Middle School

Duration: 90 Minutes Class Size: 20 to 50+ students

Essential Virginia Health Standards: 7.1.b: Describe the value of nutrient-dense foods.

Essential Virginia PE Standards: 7.5: Describe rate of perceived exertion (RPE) and nutrients needed for a variety of activities and explain the importance of sleep for energy balance.

Lesson Focus: Introduce the concept of nutrient-dense foods and compare it with calorie-dense foods.

Materials Needed: L4 Task Cards, L4 Food Cards, Student Journal, PE Equipment (dodgeball, cones, pinnies, agility ladder, holla hoops, etc.).

Student Learning Outcomes

1. Identify the characteristics of nutrient-dense foods and empty-calorie foods.
2. Explain why nutrient-dense foods are important for health and energy.
3. Apply knowledge by categorizing foods and reflecting on healthy food choices.
4. Demonstrate respect, effort, caring, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Nutrient-Dense Foods: Foods that give your body lots of important nutrients (protein, fiber, healthy fats, vitamins, and minerals) without too many extra calories.
   - Food Source Examples: Vegetables, fruits, whole grains, lean proteins, and dairy.
2. Calorie-Dense Foods: Foods that have a lot of calories but not many important nutrients. Eating too many of these can lead to unhealthy weight gain.
   - Food Source Examples: Sugary drinks, candies, fried snacks, and pastries.

Instructional Procedure

1. **Relational Time (5 mins)**
   - Greetings: Welcome students and establish positive and supportive teacher-student and student-student relationships.
   - Choice of activities include Check-Ins, High-Five or Fist-Bump Line, Musical Walk/Jog, High-Five Challenges, or Rock-Paper-Scissor Snake.

2. **Awareness Talk (10 mins)**
    - Check for understanding from LP7: “What do positive, negative, and neutral energy balances mean?” “If your objective is to reduce body weight, which type of energy balance should you aim for?”
    - Lesson Focus Introduction
    - Warm-Up Question: "What comes to mind when you hear the term 'nutrient-dense food’? Who can name an example?" "What do you think 'calorie-dense foods' are? Who can think of any examples you’ve eaten recently?" "Which snack is considered a nutrient-dense snack, an apple or a king size Snickers bar? Why?"
    - Present and discuss the Key Concepts listed in the previous section. Displaying these concepts on the whiteboard is highly recommended for clarity and engagement.
    - Highlight Real-Life Connection, some examples include:
        - When you have a test or a big game, eating a nutrient-dense snack like a banana or Greek yogurt can give you energy and focus, while a candy bar might give you a burst of energy but make you feel tired soon after.
        - Choosing nutrient-dense foods like fruits and vegetables helps your body stay healthy and prevents problems like heart disease and obesity later in life.
        - Eating too many calorie-dense foods, like soda and fries, can lead to gaining unhealthy weight, which makes it harder for your heart to work and leads to many chronic diseases.

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3. **Physical Activities (60 mins)**

Activity 1: Pair-Share-Perform with Food Cards (20 mins)

Objective: Students are able to identify nutrient-dense vs. empty-calorie foods.

Setup: Prepare Food Cards with calorie and nutrient details (e.g., apple: 95 calories, high in fiber and vitamin C; candy bar: 250 calories, high in sugar). On the back of each card, include a corresponding physical activity (see below for examples). Divide the students in pairs or small groups.

Instructions:

- Each pair/group of students receives a shuffled stack of Food Cards.
- Students take turns drawing a Food Card.

- The student who draws the card reads its details aloud and both partners discuss whether the food is:
    - Nutrient-Dense Food: Contains essential nutrients and relatively low calories.
    - Empty-Calorie Food: High in calories but low in nutrients.
- After categorizing the food, the student who drew the card performs the physical activity on the back of the card.
- Continue drawing cards, discussing, and performing the activities until all Food Cards have been categorized and all activities completed.
- If the class size is large, divide the students into two groups.
    - Group 1: Participates in the Pair-Share-Perform activity with Food Cards.
    - Group 2: Engages in a light aerobic activity (e.g., jogging or walking) while waiting for their turn. Groups will switch halfway through the activity.
- After the activity, invite students to debrief as a team about what they accomplished in this activity, how each contributed, and what they learned together.

Inclusive Adaptations for Students with Disabilities:

- Provide seated or alternative movements (e.g., arm raises, resistance bands) for students unable to perform high-impact exercises.
- Allow verbal responses for students with visual or cognitive difficulties.

Activity 2: Nutrient-Dense Food Relay (15 mins)

Objective: Students are able to identify common nutrient-dense foods through a fun relay.

Setup: Divide students into teams of 6–8 or keep the students in the same team as the previous activity, ensuring a mix of fitness levels and genders. Create corresponding relay lanes with cones or markers for each team. At the starting line, place Food Cards with calorie counts and nutrient profiles (e.g., vegetables, chips, whole-grain bread). At the far end of the relay, set up bins or areas with signs:

- Nutrient-Dense Foods
- Empty-Calorie Foods

Instructions:

- Teams line up at the starting line. Each player picks one Food Card and runs to the finish line to place it in the corresponding Nutrient Station.
- Players return to the starting line and tag the next teammate. After all the Food Cards are delivered. Discuss the results as a class to clarify correct matches.

Progressions:

- If there are more teams, rotate between playing and resting, then teams compete against others with the same record (e.g., winners vs. winners, non-winners vs. non-winners) to ensure balanced and competitive matchups throughout the event.
- Incorporate previous lesson cards into the mix as a review.
- Introduce Barriers: Add cones or agility ladder to the relay lanes, requiring players to navigate through them as obstacles.
- Alternative Movements: Performs different locomotor movements, for example runs, walks, skips, gallops, hops through hula hoops, or lateral shuffles.

Inclusive Adaptations for Students with Disabilities:

- Allow students with mobility limitations to pass Food Cards to a partner or use a shorter relay course.
- Offer multiple movement options (e.g., walking, rolling, or hopping in place) for students with different abilities.

Activity 3: Nutrient Pickleball (25 mins)

Objective: Students are able to identify nutrient-dense and empty-calorie foods through a modified pickleball game.

Setup: Divide the space into multiple pickleball courts. Assign students to specific courts, where they will rotate turns playing doubles pickleball. Place a pile of Food Cards beside each court.

Instructions:

- On each side of the court, students are paired to play doubles pickleball using simplified tennis rules (serving and scoring).
- Teams rotate in and out after a set number of points (e.g., first to 2 or 3 points).
- After a team wins the targeted points, they leave the field and select a nutrient-dense Food Card from the pile.

- The winning team returns to the court and continues to play.
- One set of the game lasts 8-10 minutes with a 2-minute break.
- For each set, the team with the highest number of nutrient-dense Food Cards wins.
- During the break, all the teams return the food cards to the pile.
- After the break, students begin the second round with a new set of teammates. Teams can be formed either by the students themselves or assigned by the teacher. Ensure that each team in the second round has a balanced mix of skill levels.
- Possible variations include basketball, volleyball, soccer, or any game familiar to the students. The key idea is that after scoring a specific number of points, the winning students earn the opportunity to collect a food card as a reward. The team with the most nutrient-dense food cards at the end is declared the winner.

Inclusive Adaptations for Students with Disabilities:

- Modify the game with rolling serves (pushing the ball along the ground) or larger, slower-moving balls for students with mobility challenges.
- Assign strategy or scoring roles (e.g., scorekeeper, referee, or food card organizer) for students needing a lower-intensity option.

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4. **Group Meeting (5 mins):**

Get students together and discuss the following two questions:

1. What does it mean for a food to be nutrient-dense, and why are these foods important for your health and energy?
2. How do calorie-dense foods differ from nutrient-dense foods, and what impact can eat too many calorie-dense foods have on your body?

5. **Reflection Time (10 mins)**

Students should complete the journal entry for this lesson. The journal entry includes reflection questions and an individual exit quiz.

Lesson Eight: Nutrient-Dense Food Journal

Essential Virginia Health Standards: 7.1.b: Describe the value of nutrient-dense foods.

Essential Virginia PE Standards: 7.5: Describe rate of perceived exertion (RPE) and nutrients needed for a variety of activities and explain the importance of sleep for energy balance.

Lesson Focus: Introduce the concept of nutrient-dense foods and compare it with calorie-dense foods.

Student Learning Outcomes

1. Identify the characteristics of nutrient-dense foods and empty-calorie foods.
2. Explain why nutrient-dense foods are important for health and energy.
3. Apply knowledge by categorizing foods and reflecting on healthy food choices.
4. Demonstrate respect, effort, caring, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Nutrient-Dense Foods: Foods that give your body lots of important nutrients (protein, fiber, healthy fats, vitamins, and minerals) without too many extra calories.
    - Food Source Examples: Vegetables, fruits, whole grains, lean proteins, and dairy.
2. Calorie-Dense Foods: Foods that have a lot of calories but not many important nutrients. Eating too many of these can lead to unhealthy weight gain.
    - Food Source Examples: Sugary drinks, candies, fried snacks, and pastries.

Reflection Questions

1. *What is one new or interesting thing you learned today about nutrients that you didn't know before?*

2. *How did it feel to work with others today? Share one thing that made you happy or one thing that was a little hard?*

3. *How can you use what you learned today to make better food choices or stay healthy every day?*

Exit Quiz

1. Foods that have lots of vitamins, minerals, and other important nutrients but not too many calories are called _____ foods.
2. Foods that have a lot of calories but not many important nutrients are called _____ foods.
3. Which of these is a nutrient-dense food?
   a) Soda
   b) Whole-grain bread
   c) Candy bar
   d) French Fries
4. Which food has a lot of calories but not many nutrients?
   a) Apple
   b) Spinach salad
   c) Donut
   d) Oatmeal
5. Which snack gives you the most nutrients for the calories you eat?
   a) Cup of fresh strawberries
   b) Slice of cake
   c) Bag of chips
   d) Ice cream cone
6. Why are nutrient-dense foods better for your health?
   a) They are cheaper and taste better.
   b) They provide essential nutrients your body needs to function.
   c) They are easier to cook and eat.
   d) They have more calories to give you energy.

Lesson Nine: Hydration

Grade Level: Middle School

Duration: 90 Minutes Class Size: 20 to 50+ students

Essential Virginia Health Standards: 6.2.a: Describe the importance of proper hydration to support renal function.

Essential Virginia PE Standards: 6.5.a: Create a one-day meal and snack plan based on Recommended Dietary Allowance (RDA), portions, hydration, and sugar.

Lesson Focus: Introduce the recommended daily water intake for children (9-13 years old) and understanding that hydration includes plain water, beverages, and water from food.

Materials Needed: L9 Task Cards, L9 Food Cards, Student Journal, PE Equipment (basketball, cones, pinnies, agility ladder, holla hoops, etc.)

Student Learning Outcomes

1. Identify the recommended daily water intake for children (9-13 years old) in cups/ounces/liters.
2. Explain the concept of total hydration, which includes water from plain water, beverages, and food.
3. Identify healthier hydration choices to meet daily needs.
4. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. How Much Water Do Kids Need?
    - Children aged 9–13 years need 8 cups (64 ounces or 1.9 liters) of water each day to stay hydrated.
2. Ways to Stay Hydrated:
    - Plain Water: The best and most important way to stay hydrated.
    - Beverages: Drinks that are 90–99% water are great for hydration.
        - Poor choices: Avoid drinks with added sugars, salt (sodium), or caffeine (like soda or energy drinks).
    - Foods: Some foods have a lot of water and help with hydration.

- Examples: Watermelon: 92% water; Tomatoes: 94% water; Oranges: 87% water; Cucumbers: 96% water.

Instructional Procedure

1. **Relational Time (5 mins)**
   - Greetings: Welcome students and establish positive and supportive teacher-student and student-student relationships.
   - Choice of activities include Check-Ins, High-Five or Fist-Bump Line, Musical Walk/Jog, High-Five Challenges, or Rock-Paper-Scissor Snake.
2. **Awareness Talk (10 mins)**
   - Check for understanding from LP8: "What does a nutrient-dense food mean? Who can name an example?" "What does a calorie-dense food mean? Who can name an example?"
   - Lesson focus introduction.
   - Warm-Up Questions: “Do we need to drink a glass of water when we first wake up?”, “Imagine it’s a hot day, and you’ve only had one glass of water so far. How would your body feel after playing outside?” “What else could help hydrate you besides water?”
   - Present and discuss the Key Concepts listed in the previous section. Displaying these concepts on the whiteboard is highly recommended for clarity and engagement.
     - Explain the recommended daily water intake for children 9-13 years old using an 8-oz cup.
   - Explain the reasons why we should stay well hydrated:
     - Supports Physical Performance: Hydration regulates body temperature and helps muscles work efficiently.
     - Maintains Body Functions: Essential for digestion, circulation, and transportation of nutrients. Keeps kidneys healthy by flushing toxins from the body.
     - Enhances Cognitive Function: Prevents mental fatigue, improves focus and supports alertness.

- Regulate Body Temperature: Helps dissipate heat through sweating and respiration.

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3. Physical Activities (60 Minutes)

Activity 1: Hydration Learning Teams (20 Minutes)

Objective: Students will be able to calculate water intake from food, beverages, and plain water to match the recommended daily water intake, while incorporating physical activities for engagement.

Setup: Divide the class into teams of 4–8 students. Provide each team a Task Sheet. One side of the Task Sheet lists various foods and beverages along with their water content and corresponding physical activities. The other side features a table for students to track their 'water intake' based on the listed foods and beverages. Examples of foods/beverages and physical activities include:

- One Medium Watermelon (5 oz water): Do 10 lunges.
- One Bottle of Water (16 oz water): Jog in place for 2 mins.
- One Medium Orange (4 oz water): Perform four lateral shuffles over 10-yard distance.

Instructions:

- Students in each team choose one of the following roles and put their names beside the roles on the Task Sheet:
  - Coach: Explains the physical activities and their connection to hydration presented on the Task Sheet (e.g., “Hydration supports muscle performance during lunges.” “Hydration helps us maintain our body temperature during and after the 2-min jogging.”).
  - Timekeeper: Tracks time for each activity and ensures the team stays on schedule.
  - Equipment Organizer: Sets up and manages equipment for each activity.
  - Stretch Leader: Leads the team in a 1-minute dynamic warm-up before starting each physical activity (e.g., arm circles, leg swings).
  - Cheerleader: Motivates team members to stay engaged and maintain effort.
- Teams select cards, aiming to combine items that total their daily water intake (64 oz)

- Students choose the foods/beverages and complete the physical activities, aiming to combine items that meet the total daily water intake.
- After completing each physical activity, the corresponding item on the Task Sheet is checked off to monitor the progress. Return the Task Sheet to the teacher after all the physical activities are completed.
- After the activity, invite students to debrief as a team what they accomplished in this activity, how each role contributed, and what they learned together.

Inclusive Adaptations for Students with Disabilities:

- Provide seated or low-impact alternatives (e.g., arm raises, resistance band exercises) for students unable to perform high-impact movements.
- Use peer support and modeling for students with cognitive or sensory needs.

Activity 2: Hydration Choice Relay (15 mins)

Objective: Students are able to identify daily water intake and hydration sources through a fun relay race.

Setup: Divide students into teams of 6–8 or keep the students in the same team as the previous activity, ensuring a mix of fitness levels and genders. Create corresponding relay lanes with cones or markers for each team. At the starting line, place Food Cards with their water content in percentage and ounces (e.g., "Soda Can with Added Sugar, 12 oz, 99%", "One Medium Cucumber, 7 oz, 96%", or "One Slice of Bread, 0.35 oz, 35%). At the far end of the relay, set up bins or areas with signs:

- Good Hydration Choices (**a water content of 80% or higher, added sugars, sodium, or caffeine should be avoided**)
- Poor Hydration Choices (**a water content below 80%**)

Instructions:

- Teams line up at the starting line. Each player picks one Item Card and runs to the finish line to place it in the corresponding bins or areas.
- Players return to the starting line and tag the next teammate. After all the Item Cards are delivered. Discuss the results as a class to clarify correct matches.

Progressions:

- If there are more teams, rotate between playing and resting, then teams compete against others with the same record (e.g., winners vs. winners, non-winners vs. non-winners) to ensure balanced and competitive matchups throughout the event.
- Incorporate previous lesson cards into the mix as a review.
- Introduce Barriers: Add cones or agility ladder to the relay lanes, requiring players to navigate through them as obstacles.
- Alternative Movements: Performs different locomotor movements, for example runs, walks, skips, gallops, hops through hula hoops, or lateral shuffles.

Inclusive Adaptations for Students with Disabilities:

- Allow students with mobility limitations to pass Food Cards to a partner or use a shorter relay course.
- Provide verbal prompts for students with visual or cognitive difficulties.

Activity 3: Water Intake Basketball Challenge (25 mins)

Objective: Students are able to reinforce their understanding of daily water intake needs through a fun, small-sided basketball game where teams collect hydration item cards to match the simulated water intake need for an early adolescent (65 oz/day).

Setup: Divide the space into multiple small-sided basketball courts. Assign students to teams of 3-5 players (or keep using the teams from the previous activity) and provide a pile of Food Cards at a designated spot near each court. Assign at least 3 teams to each court.

Instructions:

- Teams compete in small-sided basketball games and a time limit of 5 mins for each round. Allow 1-2 minutes break between each round.
- The team with the highest score at the end of each round wins a chance to collect a Food Card with water content information (in percentage and ounces) from the pile.
- If the score is a tie, both teams win a chance to collect a Food Card.
- After each round, teams rotate to play and rest.
- Teams aim to collect food cards, when combined, match the daily water intake need for the simulated individual (65 oz).

- The team successfully matches the daily water intake need wins the challenge, or the team closest to the target at the end wins the challenge.

Inclusive Adaptations for Students with Disabilities:

- Modify the game with bounce passes, a lower hoop, or walking basketball for students with mobility challenges.
- Assign strategy roles (e.g., scorekeeper, hydration tracker, or card organizer) for students needing a lower-intensity option.

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4. **Group Meeting (5 mins):**

Get students together and discuss the following two questions:

1. What is the recommended daily water intake for children aged 9-13 years old? Why is it important to drink enough water?
2. What are some common sources of water in our diet, and which ones are the healthiest for hydration?

5. **Reflection Time (10 mins)**

Students should complete the journal entry for this lesson. The journal entry includes reflection questions and an individual exit quiz.

Lesson Nine: Hydration Journal

Essential Virginia Health Standards: 6.2.a: Describe the importance of proper hydration to support renal function.

Essential Virginia PE Standards: 6.5.a: Create a one-day meal and snack plan based on Recommended Dietary Allowance (RDA), portions, hydration, and sugar.

Lesson Focus: Introduce the recommended daily water intake for children (9-13 years old) and understanding that hydration includes plain water, beverages, and water from food.

Student Learning Outcomes

1. Identify the recommended daily water intake for children (9-13 years old) in cups/ounces/liters.
2. Explain the concept of total hydration, which includes water from plain water, beverages, and food.
3. Identify healthier hydration choices to meet daily needs.
4. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. How Much Water Do Kids Need?
    - Children aged 9–13 years need 8 cups (64 ounces or 1.9 liters) of water each day to stay hydrated.
2. Ways to Stay Hydrated:
    - Plain Water: The best and most important way to stay hydrated.
    - Beverages: Drinks that are 90–99% water are great for hydration.
        - Poor choices: Avoid drinks with added sugars, salt (sodium), or caffeine (like soda or energy drinks).
    - Foods: Some foods have a lot of water and help with hydration.
        - Examples: Watermelon: 92% water; Tomatoes: 94% water; Oranges: 87% water; Cucumbers: 96% water.

Reflection Questions

1. *What is one new or interesting thing you learned today about nutrients that you didn't know before?*

2. *How did it feel to work with others today? Share one thing that made you happy or one thing that was a little hard?*

3. *How can you use what you learned today to make better food choices or stay healthy every day?*

Exit Quiz

1. Kids aged 9–13 should drink about _____ ounces of water every day, which is about _____ cups (each cup is 8 ounces).
2. We get water from three main sources: _____, _____, and _____.
3. Which food has the most water in it?
   a) Pasta
   b) Cucumber
   c) Bread
   d) Cheese
4. Which drink helps with hydration but should be limited because of added sugar?
   a) Plain water
   b) Sweet tea
   c) Spring water
   d) Plain sparkling water
5. Which of these foods contains the least amount of water?
   a) Watermelon
   b) Crackers
   c) Lettuce
   d) Grapes

Lesson Ten: Food Allergy

Grade Level: Middle School

Duration: 90 Minutes Class Size: 20 to 50+ students

Essential Virginia Health Standards: 6.2.c: Interpret information on a food label to identify a food product that may cause an allergic reaction. 7.1.e: Explain how allergens cause an allergic reaction. 8.2.c: Describe food safety techniques (e.g., hand washing, food washing, cross contamination, proper handling and storing of foods).

Lesson Focus: Introduce common food allergens, allergic reactions, and preventative strategies.

Materials Needed: L10 Jigsaw Activity Cards, L10 Food Cards, Student Journal, PE Equipment (cones, pinnies, agility ladder, holla hoops, etc.)

Student Learning Outcomes

1. Identify common food allergens and their potential sources.
2. Examine the symptoms of allergic reactions.
3. Explain preventative strategies and basic treatment methods for allergic reactions.
4. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Allergen: A substance (usually a protein) that can cause an allergic reaction in some people.
    - Common foods that contain allergens: Peanuts, tree nuts, milk, eggs, soy, wheat, fish, shellfish, and sesame.
2. Allergic Reaction: When the body reacts to an allergen, causing mild or serious symptoms.
    - Mild symptoms: Itchy skin, hives, swelling.
    - Severe symptoms: Trouble breathing, chest tightness, feeling dizzy or fainting.
3. Prevention: To avoid allergic reactions, wash your hands before and after eating, don't share food, read food labels, and stay away from foods that cause allergies.
4. Treatment: If a reaction happens, take antihistamines (allergy medicine for mild symptoms); for a severe reaction, use an EpiPen (a special shot that helps with serious allergic reactions) and get emergency help immediately.

Instructional Procedure

1. **Relational Time (5 mins)**
   - Greetings: Welcome students and establish positive and supportive teacher-student and student-student relationships.
   - Choice of activities include Check-Ins, High-Five or Fist-Bump Line, Musical Walk/Jog, High-Five Challenges, or Rock-Paper-Scissor Snake.
2. **Awareness Talk (10 mins)**
   - Check for understanding from LP9: "What is the recommended daily water intake for children aged 9-13 years old?" "What are some common sources of water in our diet?"
   - Lesson focus introduction.
   - Warm-Up Questions: e.g.., “Does anyone know someone with a food allergy?” “What are the foods that might cause an allergic reaction?” “What do you know about prevention or treatment?”
   - Present and discuss the Key Concepts listed in the previous section. Displaying these concepts on the whiteboard is highly recommended for clarity and engagement.

3. **Physical Activities (60 mins)**

Activity 1: Allergy Expert Jigsaw (20 mins)

Objective: Students are able to identify common allergens, allergic reactions, preventative strategies, and treatments through collaborative learning and physical activity.

Setup: Assign students to “Home Teams” of 5-10. Within each team, assign one or two students as “Experts” for a specific concept.

Instructions:

- Experts move to their respective “Expert Groups” to learn about their role through movement-based activities.

- Allergen Experts: Perform jumping jacks equal to the number of common allergens shown on the Fact Card provided. Discuss the definition of allergen and common snacks that might contain those allergens with the given Fact Card.
- Allergic Reaction Experts: Perform walking lunges equal to the number of common allergic symptoms on the Fact Card provided. Discuss the definition of allergic reaction and common symptoms with the given Fact Card.
- Detection Experts: Perform 10 push-ups for each way to detect allergens listed on the Fact Card provided. Discuss common ways to detect allergens with the given Fact Card.
- Prevention Experts: Perform 5 squats for each prevention method listed on the Fact Card. Discuss common preventative strategies with the given Fact Card.
- Treatment Experts: Perform 5 burpees for each treatment shown on the Fact Card provided. Discuss common allergy treatments with the given Fact Card.

- Experts return to their Home Teams.
- Teams collaboratively create a group activity sequence based on their own choices. Each expert within the team is responsible for leading the physical activity and facilitating the discussion outlined on their activity card. This ensures that every team member contributes their expertise while promoting teamwork and active learning.
- Teachers should actively check in with teams to monitor their progress and address any questions or concerns they may have.
- After the activity, invite students to debrief as a team what they accomplished in this activity, how each role contributed, and what they learned together.

Inclusive Adaptations for Students with Disabilities:

- Offer seated or alternative exercises (e.g., arm raises, resistance band work) for students unable to perform high-impact movements.
- Use peer assistance to support students with cognitive or sensory needs.

Activity 2: Allergen Sorting Relay (15 mins)

Objective: Students are able to differentiate between allergenic and non-allergenic foods.

Setup: Divide students into teams of 6–8 or keep the students in the same team as the previous activity, ensuring a mix of fitness levels and genders. Create corresponding relay

lanes with cones or markers for each team. At the starting line, place Food Cards showing ingredients information. At the far end of the relay, set up bins or areas with signs:

- Foods Contain Allergens
- Foods Don't Contain Allergens

Instructions:

- Teams line up at the starting line. Each player picks one Food Card and runs to the finish line to place it in the corresponding bins or areas.
- Players return to the starting line and tag the next teammate. After all the Food Cards are delivered. Discuss the results as a class to clarify correct matches.

Progression Options (optional):

- If there are more teams, rotate between playing and resting, then teams compete against others with the same record (e.g., winners vs. winners, non-winners vs. non-winners) to ensure balanced and competitive matchups throughout the event.
- Incorporate previous lesson cards into the mix as a review.
- Introduce Barriers: Add cones or agility ladder to the relay lanes, requiring players to navigate through them as obstacles.
- Alternative Movements: Performs different locomotor movements, for example runs, walks, skips, gallops, hops through hula hoops, or lateral shuffles.

Inclusive Adaptations for Students with Disabilities:

- Allow students with mobility challenges to pass Food Cards to a partner or use a shorter relay path.
- Provide verbal guidance for students with visual or cognitive difficulties.

Activity 3: Food Allergy Freeze Tag (25 mins)

Objective: Teach students to recognize foods containing allergens while promoting strategic thinking and physical activity.

Setup: Students can stay in the teams as they did in the previous activity. If there are more than 4 teams, rotate between playing and resting to provide equal participation opportunities for all teams. Mark a Tag Zone in the gym or field using cones. Place Card Zones at one end with 4 piles of Food Cards, including foods containing allergens (e.g.,

peanuts, milk, eggs, etc.) and foods don't contain allergens (e.g., apples, carrots, rice, etc.). Place Score Zone at the other end with bins or areas for card collection.

Instructions:

- One team starts as taggers in the Tag Zone, while other team(s) are runners starting at the Score Zone.
- Taggers must pair up, hold hands, and move together while tagging.
- The teacher announces one allergen for the round (e.g., "Peanuts" or "Milk").
- Runners cross the Tag Zone without being tagged to reach the Card Zone and collect a Food Card.
- They return to their starting side through the Tag Zone with the card. Tagged runners must return to their starting side empty-handed.
- Each round lasts 3-5 minutes. Rotate tagger teams after each round.
- Teams score points by collecting cards that don't contain that round's allergens.
- The team with the most non-allergen cards wins.

Progression Options (optional):

- Announce two more allergens.
- Allow tagged runners to join the taggers.
- Introduce a time limit for runners to cross the Tag Zone and return with a card.
- Adjust the size of the Tag Zone to vary difficulty.
- Increase or decrease the size of the Tag Zone.

Inclusive Adaptations for Students with Disabilities:

- Modify the game with walking taggers, larger tag zones, or designated safe zones for students with mobility limitations.
- Assign strategy roles (e.g., scorekeeper, allergen announcer, or food card sorter) for students needing a lower-intensity option.

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4. **Group Meeting (5 mins):**

Get students together and discuss the following three questions:

1. What are some common foods that can cause allergic reactions?

2. What are the symptoms of an allergic reaction?
3. What steps can we take to prevent allergic reactions, especially for those with known food allergies.

5. Reflection Time (10 mins)

Students should complete the journal entry for this lesson. The journal entry includes reflection questions and an individual exit quiz.

Lesson Ten: Food Allergy Journal

Essential Virginia Health Standards: 6.2.c: Interpret information on a food label to identify a food product that may cause an allergic reaction. 7.1.e: Explain how allergens cause an allergic reaction. 8.2.c: Describe food safety techniques (e.g., hand washing, food washing, cross contamination, proper handling and storing of foods).

Lesson Focus: Introduce common food allergens, allergic reactions, and preventative strategies.

Student Learning Outcomes

1. Identify common food allergens and their potential sources.
2. Examine the symptoms of allergic reactions.
3. Explain preventative strategies and basic treatment methods for allergic reactions.
4. Demonstrate respect, effort, care, leadership, and teamwork through active participation in group activities.

Key Concepts

1. Allergen: A substance (usually a protein) that can cause an allergic reaction in some people.
    - Common foods that contain allergens: Peanuts, tree nuts, milk, eggs, soy, wheat, fish, shellfish, and sesame.
2. Allergic Reaction: When the body reacts to an allergen, causing mild or serious symptoms.
    - Mild symptoms: Itchy skin, hives, swelling.
    - Severe symptoms: Trouble breathing, chest tightness, feeling dizzy or fainting.
3. Prevention: To avoid allergic reactions, wash your hands before and after eating, don't share food, read food labels, and stay away from foods that cause allergies.
4. Treatment: If a reaction happens, take antihistamines (allergy medicine for mild symptoms); for a severe reaction, use an EpiPen (a special shot that helps with serious allergic reactions) and get emergency help immediately.

Reflection Questions

1. *What is one new or interesting thing you learned today about nutrients that you didn't know before?*

2. *How did it feel to work with others today? Share one thing that made you happy or one thing that was a little hard?*

3. *How can you use what you learned today to make better food choices or stay healthy every day?*

Exit Quiz:

1. A substance that makes some people's immune system react, sometimes causing swelling or trouble breathing, is called _____.
2. When someone's body reacts in a bad way to an allergen, it is called an _____.
3. If a person is allergic to milk, which food should they avoid?
   a) Yogurt
   b) Rice cakes
   c) Apples
   d) Carrots
4. If a person has a peanut allergy, which snack should they not eat?
   a) Pretzels
   b) Peanut butter cookies
   c) Popcorn
   d) Fruit salad
5. How do doctors confirm a food allergy?
   a) Based on a person's food preferences
   b) Through proper diagnosis by a healthcare professional
   c) By experimenting with various foods
   d) By asking friends or family for advice
6. What should you do if someone is having a severe allergic reaction?
   a) Ignore it and wait for the symptoms to pass
   b) Immediately seek medical treatment
   c) Diagnose the problem yourself
   d) Drink water to reduce symptoms
7. Which is a good way to prevent allergic reactions?
   a) Sharing food with friends
   b) Washing hands before and after eating
   c) Ignoring food labels
   d) Eating foods with unknown ingredients