

Subject: Making a Healthy Sandwich by Shopping at the Grocery Store Using Computational Thinking

Title	Making a Healthy Sandwich by Shopping at the Grocery Store Using Computational Thinking	Time	2 hours
Subject:	Biology, Science,		
Aims	Students will learn how to make a healthy sandwich by selecting ingredients from the market, and in the process, they will research and decide on their budget and healthy foods.		
Key CS elements:	Decomposition; Pattern recognition; Abstraction; Algorithm design.		
Age group :	12-14 year old		
Learning situations:	They will learn how to prepare a healthy sandwich and realize at a young age that it is important to combat obesity, which has emerged in recent years.	Activity type:	in-class activity for science and biology
Resources:	<ul style="list-style-type: none"> • A nutritionist will be invited to our school and will tell students about which food groups and how much of them they should consume. • Ingredients list (whole grains, vegetables, proteins, spreads) • Visual aids for nutritional guidelines 		

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- Paper, pencils, or devices for planning
- Recipe template

Learning development:

Introduction

Students should be given some background information about healthy eating. This information should be provided by a nutritionist or by the teacher discussing it with the students.

Proteins: "This helps your muscles grow. It can be chicken, turkey, cheese or even peanut butter!"

Vegetables: "Vegetables like lettuce, tomatoes, cucumbers or peppers make your sandwich crunchy and give you vitamins."

Whole Grains: "Whole wheat bread or wraps are better for your body because they give you long-lasting energy."

Healthy Fats: "Avocado or a little olive oil is good for your brain and heart!"

Limit Sugary and Processed Foods. Some things are delicious but they are not good for us if we eat them all the time. Things like white bread, sugary sauces or too much mayonnaise are not good for our bodies."

Variety is Important. "Trying different things makes it fun! You don't have to eat the same sandwich every day. Mixing up the vegetables or using different spreads can keep your sandwich exciting." Portion Control "We don't want too much or too little. The right amount of everything makes our sandwich just the right consistency." Some controls on our diet should be given as a preliminary information about what is needed to be healthier.

Four Principles of Computational Thinking:

Decomposition: Breaking down the sandwich-making process into parts.

Pattern Recognition: Identifying common patterns in sandwich recipes.

Abstraction: Focusing on relevant components for health (nutritional value, ingredient quality).

Algorithmic Thinking: Designing a step-by-step guide to making the sandwich.

1. Decomposition (10 minutes):

Break down the sandwich-making process into smaller steps. Students will:

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- Identify ingredients (bread, protein, veggies, spreads).
- Identify kitchen tools (knife, cutting board, etc.).
- Identify steps (preparation of ingredients, assembly).
- In groups, students list all the components required for a healthy sandwich and group similar items together (e.g., all vegetables, all spreads, etc.).

2. Pattern Recognition (10 minutes):

Compare different sandwich recipes and identify common elements (e.g., every sandwich has a base like bread or a wrap, a protein source, and some form of veggies or toppings).

- Students examine 3-4 sandwich recipes and highlight similarities. This can help them understand the "template" for creating new sandwiches.
- Discuss patterns they recognize in healthier food choices (e.g., high fiber, low fat, low sugar).
- Example: Notice that whole grain bread is consistently a healthier option compared to white bread.

3. Abstraction (10 minutes):

- Ask students to identify which ingredients are most important for making the sandwich healthy (e.g., whole grain bread vs. white bread, lean protein vs. processed meats).

Focus on these key components:

- Whole grains (for fiber and energy).
- Protein (for muscle and tissue repair).
- Vegetables (for vitamins and minerals).
- Healthy fats (e.g., avocado, olive oil) for overall health.
- Leave out extraneous details such as overly processed spreads or sugary condiments.

4. Algorithm Design (10 minutes):

Step 1: Choose the Bread

Step 2: Select the Spread

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Step 3: Prepare the Fillings

Step 4: Layer the Ingredients

Step 5: Add Seasoning or Condiments (Optional)

Step 6: Assemble the Sandwich

Step 7: Cut and Serve

5. Activity (15 minutes):

- Take students to a market to shop. Make sure there is a wide variety of products in the market
- Ask students to choose the foods they want to use to make their sandwiches. You can do this activity as a group or individually.
- Help them prepare sandwiches by showing them the selected foods.

6. Tasting and Reflection (10 minutes):

Step 1: Individual Reflection:

Ask students to think about their favorite sandwich and why they liked it.

Encourage them to reflect on which sandwich they think is the healthiest and why.

Step 2: Group Discussion:

Have each student share which sandwich they liked best and what they learned about healthy eating.

Discuss how they might recreate their favorite sandwich at home or make it even healthier.

Reflection Prompts:

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"What new ingredients did you try today that you hadn't eaten before?"

"How would you change the sandwich to make it even healthier?"

"What did you learn about how to make a balanced, healthy sandwich?"

7. Conclusion (5 minutes):

- Improved Understanding of Nutrition
- Increased Awareness of Healthy Eating Habits
- Engagement and Creativity
- Development of Practical Cooking Skills
- Enhanced Decision-Making Abilities
- Increased Confidence in Healthy Food Choices

Homework:

Family Sandwich Challenge

Encourage students to make a healthy sandwich for a family member and explain why it is nutritious.

Directions: Have them make a sandwich for each family member. After the family members eat the sandwiches, they can talk about how their family members reacted, what changes they would make next time, and think about how fun it is to share healthy habits.

Assessment:

- Have students reflect on their sandwich-making process and write down how they used decomposition, pattern recognition, abstraction, and algorithm design.
- Evaluate their sandwiches based on the nutritional balance and the effectiveness of their planning process.

Expected results:

- To teach students how to apply computational thinking to plan, shop, and prepare a healthy sandwich.
- Students will learn how to break down a task into smaller parts, recognize patterns in food choices, and abstract nutritional needs into a healthy recipe.
- To develop critical thinking skills by using a step-by-step approach to making informed, nutritious food decisions.

Notes:

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Have students purchase all sandwich ingredients from a suitable grocery store. You can get help from their families during this process. Families can help students with grocery shopping. Students will make the decisions.

Examples and ingredients of sandwiches:

1. Classic Veggie Sandwich

Ingredients:

Whole grain bread

Hummus or low-fat cream cheese

Sliced cucumber, tomato, and bell peppers

Spinach or lettuce

Optional: Avocado slices

Instructions:

Spread hummus or cream cheese on both slices of bread.

Layer the vegetables, starting with leafy greens, and then add cucumber, tomato, and bell peppers.

Add avocado if desired, and close the sandwich.

2. Turkey and Avocado Sandwich

Ingredients:

Whole wheat bread or a whole grain wrap

Sliced turkey breast (lean, low-sodium)

Avocado slices

Lettuce or spinach

Mustard or light mayo

Optional: Tomato and cucumber slices

Instructions:

Spread mustard or light mayo on the bread.

Layer the turkey, avocado, lettuce, and optional veggies.

Close and enjoy!

3. Tuna Salad Sandwich

Ingredients:

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Whole grain bread or a whole wheat wrap

Canned tuna in water (drained)

Greek yogurt (for a lighter tuna salad)

Celery, chopped

Salt, pepper, and a bit of lemon juice

Lettuce or baby spinach

Instructions:

Mix tuna, Greek yogurt, chopped celery, salt, pepper, and lemon juice to make the tuna salad.

Spread the tuna salad onto the bread.

Add lettuce or spinach and close the sandwich.