

# The “Ideal” Meal

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**Grade Levels:** 4-5

**Objectives:**

Students will be able to:

- Design a meal and identify all of its components
- Compare the nutrition, sustainability, and affordability of a meal and revise a meal plan according to these 3 criteria
- Understand how to use computational thinking skills of parallelization and decomposition

**Subject Areas:** Science, Computer Science

**Computational Thinking Skills:**

- Problem Decomposition
- Parallelization

**Standards:**

Next Generation Science Standards

- 3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

**Materials:**

- Download various charts and worksheet materials from:  
<http://teacherstryscience.org/lp/design-challenge-ideal-meal>

**Resources:**

- Teachers Try Science: <http://teacherstryscience.org/lp/design-challenge-ideal-meal>

**Outline**

- CT connection: During this lesson the groups will be engaged in parallelization-considering multiple parameters at the same time. Brainstorm strategies for doing this effectively. Guide students to ideas such as making each group member an “expert”

on one of the 3 criteria to assess the meal and help the team make adjustments as necessary. Students are also using problem decomposition to break down a meal into its parts. The engage for this lesson helps students practice decomposing a meal, for example bacon macaroni and cheese with green beans, into smaller components- vegetable (green beans), grain (pasta), dairy (cheese, milk, butter), and protein (bacon).

- Engage: Ask students to describe their favorite meal. As a class decompose the components of each meal- dairy, protein, grains, fruits, and vegetables. Discuss reasons that make something your favorite meal- taste, good ingredients, emotional connection, cheap or easy to make, etc.
- Set up for activity: Explain to students that today they will be working as food engineers to design the “perfect” meal. They will need to consider 3 criteria when assessing how good their meal is: the nutrition of their meal, the sustainability of the ingredients they choose, and the affordability of how they select their ingredients. They will work in groups of 3 to create a meal and then use the criteria guidelines to assess and revise it.
- Activity: Have groups create a first draft of their ideal meal. Then give each group a My Plate worksheet and Nutrition scorecard worksheet. The nutrition expert will grade their meal and then the team will revise the plan until their meal’s nutrition score is high enough to move on. Then the sustainability expert will grade the meal based on the energy ratio of their ingredients by using the Energy and Agriculture worksheet. The team will revise the plan until their meal’s sustainability score is high enough to move on. Finally, the affordability expert will use the scorecard to interview the group members on their shopping habits. The team will write out a shopping plan to go with their ideal meal that reflects responsible shopping habits.
- Discussion: Groups will present their ideal meals and share how they revised their meal and shopping plan based on learning about the different criteria. Other groups should comment on how successful each meal plan is and compare and contrast the plan with their own.
- CT Reflection: Students should write or discuss about strategies that will be helpful for their group in designing a solution with multiple parameters. They should create a list of “best practices” for other students around computational thinking and a parallelization activity. As further practice, students can also be given a different meal and asked to decompose it into its components or to run an assessment individually on the new meal using all 3 criteria simultaneously.

## **Assessment**

Criteria	4	3	2	1
Decomposition of Meal	Group accurately identifies all of the components in their meal.	Group accurately identifies most ( $\frac{3}{4}$ ) of the components in their meal.	Group accurately identifies some ( $\frac{1}{2}$ ) of the components in their meal.	Group accurately identifies little or none (less than $\frac{1}{2}$ ) of the components in their meal.
Parallel Assessment	Group accurately uses all 3 criteria to revise their meal plan <b>and</b> has a clear explanation how they revised their original meal based on the constraints.	Group accurately uses 2 of the 3 criteria to revise their meal plan <b>and/or</b> has a vague explanation of how they revised their original meal based on the constraints.	Group accurately uses 1 of the 3 criteria to revise their meal plan <b>and/or</b> has a confusing explanation of how they revised their original meal based on the constraints.	Group accurately uses none of the 3 criteria to revise their meal plan <b>and/or</b> has no explanation of how they revised their original meal based on the constraints.
Reflection	Individual student has a clear explanation (written or oral) of best practices for decomposition and parallelization.	Individual student has a vague explanation (written or oral) of best practices for decomposition and parallelization.	Individual student has a confusing explanation (written or oral) of best practices for decomposition and parallelization.	Individual student cannot explain (written or oral) best practices for decomposition and parallelization.