



Family Consumer Science

What are Vitamins, Minerals, and Phytochemicals

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Overview: This lesson will challenge students to learn about the vitamins, minerals, and phytochemicals found in foods and how they are impacted by preparation and preservation. Students will create an interactive notebook that outlines vitamins, minerals, and phytochemicals. They will also learn process that reduce these nutrients in food, such as cooking and preservation, and how to retain the highest nutrient content possible. Recipes will be included that focus on these principles.

Time Needed: 2-3 class periods with option to do additional work outside of class.

Standards:

- FCS-FS-9 Students will discuss why vitamins, minerals, and phytochemicals are important food components impacted by food preparation and preservation.
 - List the vitamins and minerals and the eight groups of phytochemicals present in food.
 - Explain the impact of food preparation, processing, and preservation methods on vitamin and mineral content.
 - Explain the impact food preparation, processing, and preservation methods have on phytochemicals.

Objectives:

- Students will understand vitamins, minerals, and phytonutrients.
- Students will explain the impact on food preparation, processing, and preservation on vitamins, minerals, and phytonutrients.
- Students will create an interactive notebook with recipe resources.



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Materials:

- Micronutrition Pt. 1: Vitamins and Minerals Video:
<https://www.youtube.com/watch?v=7WnpSB14nDM>
- Micronutrition Pt. 2: Antioxidants and Phytochemicals Video -
<https://www.youtube.com/watch?v=PGd6Xz9FZ28&t=15s>
- Phytochemicals in plant based diets fight disease:
http://www.youtube.com/watch?v=1J6_b338kag&feature=player_embedde
- UGA Extension Family and Consumer Sciences website:
<http://www.fcs.uga.edu/ext/pubs/>
- FDA Vitamin and Minerals Chart -
https://www.accessdata.fda.gov/scripts/InteractiveNutritionFactsLabel/factsheets/Vitamin_and_Mineral_Chart.pdf (Print four to a page)
- National University Hospital-
https://www.nuh.com.sg/wbn/slot/u1753/Patients%20and%20Visitors/Specialities/Pharmacy/Health%20Supplements/HSL_VitaminMineral.pdf
- UC Davis Integrative Medicine: Why Phytochemicals are Important:
<https://ucdintegrativemedicine.com/2015/06/why-phytochemicals-are-important/#gs.yIHUFEY>
- Oregon State University Phytochemicals Research:
<http://pi.oregonstate.edu/mic/dietary-factors/phytochemicals>
- Fruit and Veggie Connection, Produce for Better Health Foundation
https://pbhfoundation.org/sites/default/files/pdf/FVConn_Issue3_finalWEB_1409930945.PDF
- How does Cooking Affect Nutrients (Video)-
<https://www.youtube.com/watch?v=6hFxSJcq-KU>
- Kale-sadilla Recipe -
https://www.simplyrecipes.com/recipes/kalesadilla/#_a5y_p=2552192

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Rubric Outline:

- Engage: Students will identify words as either vitamins, minerals, or phytochemicals.
- Explore: Students will explore vitamins, minerals and phytochemicals and their effect on the body.
- Explain: Teacher will explain the requirements of the interactive notebook and the rubric that will be used to grade it. This notebook will be a resource for students when choosing healthy food options and determining preparation method.
- Extend: Students can find a recipe that highlights each vitamin, mineral, and phytochemical in the notebook. Students can also color code fruits and vegetables with markers to show which colors are associated with which phytonutrients.

Lesson Plan:

- Engage: As students enter the classroom, hand each student one or two cards with different vitamins, minerals, and phytochemicals on each one (a list of vitamins and minerals can be found using [this FDA chart](#) and a list of phytochemicals can be found on the [Oregon State Website](#)). On the wall or board, create three columns with groups above. Have students stick their cards under the group they think there's belongs.
- Explore: Show the Micronutrition Pt. 1, Micronutrition Pt. 1, and Phytochemicals in Plant Based Diets videos. Have students quietly get up and move their cards if they see they had originally put them in the wrong categories. Give students a printed version of the FDA Vitamins and Minerals Chart and point them to the UC Davis Integrative Medicine website and Oregon State University websites to research phytochemicals. Students can also create their own charts if they prefer. Have students identify how colors of fruits and veggies can indicate phytonutrient content. Visualize this with markers, discuss the slogan "eat a rainbow", and discuss how this slogan pertains to phytochemicals.
- Explain: Teacher will explain that processing foods can change the amount of nutrients in a food and/or our body's ability to absorb the nutrients. Using the Kale-sadilla recipe, teacher will cook and demonstrate how using fat while sauteing the kale will make the Vitamin K more bioavailable. Students will get to sample the quesadilla.



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- **Extend:** Students can research other ways to make the nutrients in foods, especially kale, most bioavailable for their bodies. They will add recipes to their interactive notebook, one for a vitamin, one for a mineral, and one for a phytonutrient.
- **Evaluate:** Use the Interactive Notebook rubric (below) to check the interactive notebook for all necessary components.



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Name: _____

Interactive Notebook Rubric

Title: 5 pts. _____
 Logical Layout: 10 pts. _____
 Definitions of vitamins,
 minerals, and
 phytochemicals: 15 pts. _____

 Vitamins Chart: 10 pts. _____
 Minerals Chart: 10 pts. _____
 Phytochemicals Chart: 10 pts. _____
 3 Recipes (explain how it
 increases bioavailability)
 Three Total: 15 pts. _____

Appropriate, colorful,
 Creative, shows interaction
 with content: 5 pts. _____
 Work is neat & organized: 5 pts. _____

*Extra Credit Color Labels
 for Fruits and Vegetables: 5 pts. _____
 *Extra Recipes each 3 pts. _____

Total points: _____/85

Teacher Comments:

Name: _____

Interactive Notebook Rubric

Title: 5 pts. _____
 Logical Layout: 10 pts. _____
 Definitions of vitamins,
 minerals, and
 phytochemicals: 15 pts. _____

 Vitamins Chart: 10 pts. _____
 Minerals Chart: 10 pts. _____
 Phytochemicals Chart: 10 pts. _____
 3 Recipes (explain how it
 increases bioavailability)
 Three Total: 15 pts. _____

Appropriate, colorful,
 Creative, shows interaction
 with content: 5 pts. _____
 Work is neat & organized: 5 pts. _____

*Extra Credit Color Labels
 for Fruits and Vegetables: 5 pts. _____
 *Extra Recipes each 3 pts. _____

Total points: _____/85

Teacher Comments: