

Colorful Produce Educator’s Guide

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Core Concepts Addressed

- Nutrition and plant chemistry; disease prevention; research skills; science communication; gardening

Anchor Phenomenon

- Fruits and vegetables come in a rainbow of colors and hues, as shown in two photos.

Essential Questions

- What is the relationship between the various colors of fruits and vegetables and the nutrition and health benefits they provide?
- Why do nutritionists (and parents) recommend that we “eat the rainbow”?
- What gives fruits and vegetables their different colors?
- How do micronutrients help our bodies become or stay healthy?

Standards

Next Generation Science Standards

This activity can be used to work toward the following performance expectations:

- [MS-LS1-4.](#) Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures
- [MS-LS1-7.](#) Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.
- [MS-LS2-3.](#) Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

Science and Engineering Practices conducted in this activity:

SEP 6:

Constructing explanations

SEP 7: Engaging in argument from evidence

SEP 8: Obtaining, evaluating and communicating information

National Health Education Standards

- [1.8.1](#) Analyze the relationship between healthy behaviors and personal health.
- [3.8.2](#) Access valid health information from home, school, and community.
- [4.8.1](#) Apply effective verbal and nonverbal communication skills to enhance health.
- [7.8.2](#) Demonstrate healthy practices and behaviors that will maintain or improve the health of self and others.
- [8.8.1](#) State a health-enhancing position on a topic and support it with accurate information.
- [8.8.2](#) Demonstrate how to influence and support others to make positive health choices.

Objective(s)

- Students will practice online research skills to critically assess health information sources.
- Students will draw connections between the colors of fruits and vegetables and various nutrients.
- Students will draw conclusions about what fruits and vegetables will provide appropriate nutrients to help prevent a disease or provide healthy benefits for a person or animal dealing with a disease or illness.
- Students will communicate healthy diet recommendations based on their research and conclusions.

Background Information Needed

(What information, terms, or concepts will learners need *in advance* in order to grasp this activity?)

Students will need to know the following in advance in order to successfully complete the activities:

- What are micronutrients
- Plants produce a variety of chemicals that help them to survive and reproduce

ACTIVITY OUTLINE

Timing	Activity Description & Teacher Considerations	Student Output/Deliverables
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10 minutes	<u>Introduction to the Phenomenon</u> : Teacher shows the images and introduces the advice to “eat the rainbow”. Students view the photographs and pair-share or journal what they notice and what they wonder about the images and the advice.	Pair-share discussion or Notice & Wonder journal
10 minutes	<u>Class Discussion</u> : Students share out their journal writing or pair-share discussion with the class and create a class K-W-L (or <u>K-L-E-W-S</u>) chart.	Full class K-W-L chart
10 minutes	<u>Nutrition Investigation Intro</u> : Students view the video “ <u>Eat the Rainbow</u> ” and add any additional observations or wonderings to the KWL chart as a class.	Additions to -KW-L chart
45 minutes	<u>Online Nutrition Investigation</u> : Students choose 6 of their favorite fruits and/or vegetables and conduct research online to learn what micronutrients each of these foods provide and in what quantities. Findings should be recorded in the provided <u>worksheet</u> , or in a chart of their own design. Students should look for patterns in their findings and attempt to make conclusions about how the colors of fruits and vegetables are related to nutrition. <ul style="list-style-type: none"> Students will need access to online devices. If resources are limited, students could work in pairs. 	Chart of research findings
10 minutes	<u>Discussion Diamond</u> : In table groups (3-4 students), students complete a discussion diamond for the question, “Does your research support the recommendation to “eat the rainbow”?” In a discussion diamond four lines are drawn on a sheet of paper to divide off each of the corners and create a large diamond. Each student writes their own answer to the question in one corner of a single sheet of paper. Students then discuss their responses and work together to come up with and write a group response in the center of the diamond. Students should use evidence from their research and explain their reasoning for their response to the question (their claim). <i>*For more information on the discussion diamond student talk protocol, see this <u>explanation</u> from STEMTeachingTools.com.</i>	Discussion Diamond written paper and small group discussion.
5 minutes	<u>Full Class Reflections</u> : Students return to the class KWL chart and add Learnings, as well as any additional wonderings	Additions to K-W-L chart
30 minutes	<u>Optional Homework</u> : Students listen to the Science Friday episode <u>Eating ‘Wilder’ Foods for a Healthier Diet</u> and write a	Short reflection paragraph

	short reflection (50-100 words) answering the question: How would you change your original claim about eating a rainbow (if at all) based on this new information?	
45 minutes	<p><u>Disease and Nutrition Research</u>: Students choose an illness or disease to research online and find out what nutrients and/or foods may have a positive health impact on people who have the disease. Alternatively students may research nutrients that could help prevent or minimize risk of the disease in the first place.</p> <ul style="list-style-type: none"> • Students should maintain a list of research sources that they can cite during their public health campaign • While students may be motivated to choose illnesses that friends or family have experienced, some students may want to avoid researching illnesses that are related to previous or current trauma - especially if the student or a close family member has suffered tremendously from an illness. Teachers will want to work with students to help them choose illnesses and projects that will feel empowering and exciting. 	Research notes and citations
15 minutes	<p><u>Conclusions Write-up</u>: Students write a short paragraph, synthesizing their findings that includes one to three recommendations about healthy foods for preventing or resolving a disease.</p>	Conclusion paragraph
30 minutes	<p><u>Develop Public Health Campaign</u>: Students begin work on their own or in small groups to develop public health campaigns.</p> <ul style="list-style-type: none"> • Clarify which formats are available for students to choose from depending upon resource availability and provide checklist to students of required elements from the online activity description • Exit ticket: 1-3 key dietary recommendations that the public health campaign will share and format student/group will use to carry out the campaign • Students who need additional tools such as cameras, recording devices, etc. should be advised to plan for what they will need and to request materials by the end of the class or plan to bring materials to the next class. • Students planning visual campaigns may be directed to online resources such as Canva for creating or editing their work. • Students may need guidance in best practices for health communication, and may need time in class to review reading. 	Exit Ticket

90 minutes	<p><u>Public Health Campaign Continued</u>: Students continue to work on developing their public health campaigns, including creating recipes to accompany the campaign.</p> <ul style="list-style-type: none"> • Students may need additional space and/or tools to record videos or podcasts. 	
10 minutes	<p><u>Share Out Preparation</u>: Give students 10 minutes at the beginning of the class period to make last minute preparations to share their public health campaigns.</p>	
80 minutes	<p><u>Public Health Campaign Presentations</u>: Individuals and/or groups present their public health campaigns.</p> <ul style="list-style-type: none"> • 4-5 minutes per campaign (adjust for more/fewer presentations and allow more time if video or podcast is longer than the allotted time) • Include time after each presentation for classmates to ask questions and provide kudos and constructive feedback. 	Final campaign products, 1-page campaign plan, list of cited sources, one or two recipes
10 minutes	<p><u>Pair-share reflections</u>: Students discuss in pairs what they have learned over the course of the lessons. What did they find the most interesting and how will they use what they learned in their own lives?</p>	
15 minutes	<p><u>Full class reflections</u>: Students return to full class K-W-L chart</p> <p><u>Optional recipe share</u>: Students could be invited to bring in food from their recipes to share with the class in a festive atmosphere as they discuss final reflections.</p> <ul style="list-style-type: none"> • Give special consideration to typical allergens such as nuts and dairy. • Go over safety and healthy food preparation guidelines. • If asking students to provide food, be sure to account for families who may not be able to contribute and offer multiple ways for students to participate. • This is an opportunity for students to share family traditions and cultural foods. • Selected recipes should be simple and require no refrigeration, unless there is available food storage space. 	Additions to K-W-L chart
Varies	<p><u>Optional: Make the Campaigns Public</u>: Students use class time to share their campaigns with other classes or the entire school in an assembly format or by printing and posting posters and/or</p>	Public messages

	flyers around the school.	
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Reality Checks

How Much Time Will This Take: 5-6 classes

Planned Differentiation + Accommodations:

Some students may need additional coaching in research skills, including how to identify reliable online sources. If students have not practiced these skills, it may be prudent to commit additional class time for a tutorial or practice session.

Allow students to choose the format for their Public Health Campaign and provide resources for quickly learning new tools, if necessary.

Boosts to Social-Emotional Learning + Belonging:

Encourage students to choose fruits or vegetables that are a part of their family's cooking traditions and suggest that students use traditional family recipes or foods from their family's culture as starting points for creating recipes for the Public Health Campaign.

If students work in groups to create Public Health Campaigns, include time at the beginning for team members to share out with one another what strengths they will bring to the project and discuss how they will work as a team.

Provide time for students to give positive feedback (kudos) in addition to constructive criticism to their peers' Public Health Campaigns after each presentation.

STEM Careers + Representation Nuggets:

Throughout curriculum, teacher can highlight the following careers:

- Health communication careers

- Nutrition and health careers
- Agricultural careers

Assessment (Explain how students will demonstrate learning.)

Formative Assessments:

- K-W-L chart - student understanding can be assessed throughout the lessons as the class adds to the K-W-L chart
- Argumentation discussions or writing to demonstrate understanding of relationship between food color and nutrition

Summative Assessment:

- Final Public Health Campaign can be assessed against the checklist provided in the online resource.

Science Notebook (Which activities will be captured in student science notebooks, how?)

Notebooks will be used to record research, reflections and brainstorming.

Refined Learning Statement

Students will explore the relationship between brightly colored fruits and vegetables and their nutritional values and apply that knowledge to determine which fruits or vegetables may help prevent a disease or promote better health in a person or pet with a particular disease. In this activity, students will utilize online research to develop healthy recipes and create a public health campaign that encourages the adoption of healthy dietary recommendations to prevent or address a specific disease or illness. Students will share their campaigns with their classmates and will be encouraged to share their new understanding with friends and family or even the school and larger community.