

# Project-Based Learning

## Farmers Market Educational Campaign

High School  
Chemistry



# Farmers Market Educational Campaign

## High School

## Chemistry

### Overview

The local farmers market has released a Request for Submissions for educational campaigns that provide models and information regarding the structure and health benefits of the natural chemicals that make up spices and herbs. While designing their products, students will explore the relationship between the structure and properties of matter. Students must demonstrate understanding by meeting the design requirements and effectively marketing the information to the community.

### Guiding Questions

What are the differences between physical and chemical changes and properties?

How are polyatomic ions, ionic compounds, covalent compounds, acids, and bases named?

How can you write the chemical formulas of common polyatomic ions, ionic compounds containing main group or transition metals, covalent compounds, acids, and bases?

What differences occur among acid-base reactions, precipitation reactions, and oxidation-reduction reactions?

How can you predict the structure of molecules with linear, trigonal planar, or tetrahedral electron pair geometries?

## Farmers Market Educational Campaign

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## Farmers Market Educational Campaign

### PBL Project Guide

#### Timeframe

This project will take approximately twelve 50 minute class periods.

#### Step-by-Step Overview

- Introduce Launch Video.
- Introduce Entry Document.
- Facilitate Know/Need to Know activity.
- Students engage in an exploration activity.
- Groups brainstorm initial design products and assign roles/responsibilities.
- Groups alternate between facilitated content experiences and design time.
- During design time, groups integrate new content into design and re-evaluate product(s).
- Groups finalize product(s) and presentation.
- Groups present according to project guidelines.
- Content Debrief.
- Summative Assessment.

## Farmers Market Educational Campaign

### PBL Resources

#### Project Resources

- Launch Video:  
<https://www.youtube.com/watch?v=KPZUQGXGO8Q>
- Entry Document text
- Anticipated Knows/Need to Knows
- Strategies/considerations for implementation

#### Resources to Assemble/Prepare

You will need to prepare the following resource(s) ahead of time:

- Format Entry Document to local context
- Sample authentic products similar to project expectations
- Informational resources about nutrition and spices and herbs

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## Entry Event Guide

### Launch Video

“What’s in Your Food?”: <https://www.youtube.com/watch?v=KPZUQGXGO8Q>

Purpose: Engages and introduces students to think about what is in the food we eat. Use video to solicit student responses to the following question: *What is the importance of knowing what’s in the food you eat?* Post student responses.

### Entry Document

Format: Request for Submission for an educational campaign for a local farmers market. Edit document to include logistics such as submission dates and presentation requirements.

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### Entry Event Guide *continued*

#### Entry Document

##### **Food Market Educational Campaign**

At the local farmers market, our mission is to provide quality products and educate the public about how to have a healthier lifestyle. We believe in being honest, transparent, and responsible to the members of our community. In an effort that aligns with our mission and generates more business for our local farmers, we are launching a year-long educational campaign for the community. We are currently accepting submissions for next month's focus which will be spices and herbs. Our goal is to provide models and information regarding the structure and health benefits of the natural chemicals that make our products. Effective educational campaigns provide accurate information and are marketable to the community.

##### **Submission must include the following guidelines:**

Model of a spice molecule that is structurally accurate and has all parts labeled

Scientific research on the benefits of the spice or herb

Results from an experiment you designed that tests one benefit of the spice or herb

Evaluation of health claims based on your experiment and others

Reasoning for how the benefit relates to the molecule

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## Entry Event Guide *continued*

### Entry Document

#### **Presentation Requirements:**

Groups will provide a 5-minute persuasive presentation of their educational materials on the due date. Additional consideration will be given to submissions that demonstrate creativity and are aligned with our mission.



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### What do we KNOW about the project?

#### Content

- Make a structurally accurate molecule model with all parts labelled
- Research the benefits of spices and herbs
- Design and conduct an experiment to test the a benefit of spices and herbs
- Evaluate health claims based on research
- Provide reasoning for how the benefit relates to the molecule

#### Product

- Educational Campaign with a focus on spices and herbs
- 5-minute persuasive presentation of educational materials on due date

Additional responses will vary

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### What do we NEED to know about the project?

#### Content

- What is the structure and parts of a molecule?
- What are the benefits of spices and herbs?
- How can we conduct an experiment to test the benefits of spices and herbs?
- What does research say about spice and herb health claims?
- How are molecules related to the benefits?

#### Product

- What is an educational campaign?
- What materials or technology can we use?

Additional responses will vary

## Farmers Market Educational Campaign

### Implementation Guide

#### Websites

Nutrition Data:

<http://nutritiondata.self.com/>

Simulations for Building Atoms and Molecules:

<https://phet.colorado.edu/en/simulations/category/chemistry/general>

Design Process:

<http://www.sciencebuddies.org/engineering-design-process/engineering-design-process-steps.shtml>

#### Teaching Strategies/Considerations

Consider the guiding questions for the project when selecting content workshops. A combination of research and hands-on activities should be included.

Have students develop an understanding of nutrition and molecule structure before designing products.

Consider having students use science notebooks or journals to meet the project expectations of recording their design process, design revisions, etc. Have them create rough drafts of their design.

## Farmers Market Educational Campaign

### Assessment/Presentation

#### Final Group Product

- Educational campaign that meets submission requirements
- 5-minute persuasive presentation that meets guidelines

#### Rubric

- Students will use the entry document as a real world rubric to meet expectations of the project.

#### Individual

- Individual assignments as they pertain to each content workshop
- Journal entries documenting what the individual has contributed to the product(s)
- Summative assessment

# The University of Texas at Dallas Project-Based Learning

## The University of Texas at Dallas Project-Based Learning

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