

Leapfrog Program

Week 2

Course Title: Kitchen Kaboom!

Course Description

Why do apples turn brown when they lose their skin? Which is easier for the human body to digest, a carrot or a cookie? Our food scientists delve into the basics of chemistry as they write and test hypotheses, produce and record reactions and create and observe combinations of ingredients. Students learn the difference between physical and chemical changes, how these changes happen, and how they affect our food and bodies.

Essential Questions

- How can science help us make choices about food?
- How do chemical changes enhance the taste of food?
- How does learning about digestion affect the choices we make about what we eat?
- How does knowing about chemistry help you be a good cook?

Outcomes

Upon successful completion of this course, students will have:

- a. Defined *chemical change*
- b. Researched and discussed the chemical changes that occur in food both before and during digestion
- c. Conducted experiments and cooking projects that demonstrate chemical changes in food
- d. Recorded data and observations about chemical changes in food through writing, dictation, drawing, and creating charts and tables
- e. Written a job description for a professional cook, baker, or chef, describing what they need to know in order to do their jobs
- f. Created a final project that demonstrates how chemistry concepts are used in cooking

Instructional Strategies

Following a pre-assessment of skills and knowledge, activities and assignments may be tiered, curriculum may be compacted, and flexible grouping will be introduced to allow students to work at their own pace and academic level.

Resources and Materials

Books

- Bardhan-Quallen, Sudipta, *Kitchen Science Experiments: How Does Your Mold Garden Grow?*, 2010, ISBN: 9781402724138.
- Cobb, Vickie, *Junk Food*, 2006, ISBN-13: 9780761327738.
- Hewitt, Sally, *My Digestive System*, 2008, ISBN: 9781595665553.
- Holub, Joan, *I Have a Weird Brother Who Digested a Fly*, ISBN: 0807535060,
- Koellhoffer, Tara, *Food and Nutrition*, 2006, ISBN: 079109121X.
- Oxlade, Chris, *Changing Materials: Mixing and Separating*, 2009, ISBN: 9781432932794.
- Parker, Steve, *Break it Down*, 2007, ISBN: 1410926583.
- Royston, Angela, *Digestion: How We Fuel the Body*, 1998, ISBN: 0717292657.

- Showers, Paul, *What Happens to a Hamburger?*, 1985, ISBN: 0060279478.
- Solheim, James, *It's Disgusting and We Ate It!*, 1998, ISBN: 0689806752.
- Stewart, Melissa, *It's Spit-acular: The Secrets of Saliva*, 2010, ISBN: 9780761441632.
- Summerville, Barbara, *Food Scientist*, 2010, ISBN-13: 9781602795051.
- Thornhill, Jan, *Who Wants Pizza?*, 2010, ISBN: 9781897349960.

Websites

- <http://www.pbs.org/teachers/> An interview with dairy food scientist, Phillip Wong.
- <http://foodscience.psu.edu/public/kitchen-chemistry> A resource for food science and nutrition.
- <http://kidshealth.org/> A website with information about maintaining a healthy body.

Materials Needed for Class

- Pencils
- Calculator

Student Assessment

- **Pre-Assessment**
Prior knowledge of the students' math and science skills will be assessed by observation, small group work, and one-on-one interaction with the instructor.
- **Documentation of Learning**
Daily documentation of learning will be used to assess learning throughout the course. Assessment will include assignments completed as well as participation in group activities and contribution to class discussions. Additionally, the instructor will keep a daily log of anecdotal notes about each student's academic performance.
- **Post-Assessment**
Learning will be documented daily through observation of student participation in activities as well as completion of projects/assignments. On the final day students will share what they have learned at the *EXPO!* through activities that show how chemistry concepts are used in cooking.

Schedule

Date	Topic(s)	In-class Activities	How will you document learning for assessment?
Monday, July 18	Food: The Body's Fuel The Digestion Machine	- Food Smarts: My Pyramid - Measuring Calories - It's Spit-O-Matic - Food's Journey - Water In, Water Out	Students will list better food choices for a healthy body, use the food pyramid guidelines to create a balanced menu, measure servings and compare calories in foods, summarize the process of digestion including the chemical processes that take place.
Tuesday, July 19	Making Sense: Smell, Taste and Texture	- Mouth Map - The Nose Knows - Senses Shut Down	Students will explore and document how our senses and body chemistry influence our food choices.

Date	Topic(s)	In-class Activities	How will you document learning for assessment?
Wednesday, July 20	Junk Food	<ul style="list-style-type: none"> - Mapping the Food Environment - Fat and Sugar Investigations - French Fry Visualization - Dissection of a Popcorn Package - You Are What You Eat 	Students will describe the relationship between biology and food preferences, compare the amount of fat and sugar in various foods and beverages to the daily recommended level, define the parts of a food label, and apply what they have learned by creating a comparison chart of better food choices.
Thursday, July 21	Kitchen Chemistry	<ul style="list-style-type: none"> - Acids and Bases - Active Enzymes - Multiplying Yeast - Pretzel Chemistry - Heat and Jiggling Atoms 	Students will use a pH scale to determine how acidic or basic a substance is, observe and record how temperature and acid affect enzymes in foods, observe and record how carbon dioxide gas causes dough to rise, and test various kitchen utensils to determine if they are heat conductors or insulators.
Friday, July 22	Cooking and the Phases of Matter	<ul style="list-style-type: none"> - Homemade Ice Cream - Charles Law and The Great Growing Marshmallow - EXPO! 	Students will identify the 4 important components involved in making ice cream and participate in experiments that demonstrate Charles' Law. - EXPO! Parents will have the opportunity to participate in an experiment demonstrating chemical changes in food.

CTD Statement on Third-Party Web Sites

Instructors are required to thoroughly review any third-party web sites they intend to use in their courses for inappropriate content. However, because web content continuously changes, CTD disclaims any responsibility for any of the content contained on third-party web sites used in course materials. If you become aware of anything that may be inappropriate, please notify CTD staff immediately.