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Text Set: Food Chemistry

This text set is focused on the area of Food Chemistry. It will provide high school chemistry students with readings on a focus area of chemistry, allow them to see current research, how research is affecting their lives and the food they eat, and possible career opportunities in the field of chemistry. The text set contains a variety of reading levels, so students will be challenged to read professional level journal articles, and also have readings they can easily understand.

1. Chemistry of Popcorn. Journal article.
Sampson, M. (2005, April 15). The chemistry of popcorn: it's all about pop-ability. *Science Daily*. p. 15.
Flesch-Kincaid reading level: 12.0

This article is at a high reading level, but is still written to a general audience and requires only general science background knowledge. The content and main ideas of the article are achievable by all students, but because of the long complex sentences and large words, it may take struggling readers longer to read and comprehend. Using the reading strategies to guide student would be useful for this reading. The article is included in the text set because of it discusses how popcorn kernels pop, and how the cellulose structure in the popcorn kernel can affect its ability to pop. Current research at Purdue University on maximizing "pop-ability" by studying possible ways of modifying the structure of the cellulose is discussed.

2. Chemistry of Vanilla. Journal article.
Haines, G. (2003, December). Vanilla! It's Everywhere! *Chem Matters.* P. 3-5.
Flesch-Kincaid reading level: 10.6

Chem Matters Magazine is written and published by the American Chemical Society for first-year high school chemistry students. The articles are written to provide an application of chemistry learned in the classroom. The article on vanilla discusses where vanilla comes from, how it was discovered, how it is used in flavoring today, medicinal use, and the structure of the compound. Since the audience of the article is high school chemistry students, it is accessible to all students (although it may take struggling readers longer to read). The background knowledge required for understanding is at the level of basic high school chemistry. I like the article because it includes many interesting facts and pictures to keep students interest.

3. Chinese fish-sauce research. Professional journal article.
Jiang, J., Zeng, Q., Zhang, L. (2007). Chemical and sensory changes associated Yu-lu fermentation process – A traditional Chinese fish sauce. *Food Chemistry,* 4, P. 1629-1634.
Flesch Kincaid grade level: 12.0

This article is written in a professional journal article that publishes original research around the chemistry of food. While accessible by readers with a background knowledge of chemistry, the audience is intended to be researchers in the field. This article is written in standard journal format, with an abstract, introduction, methods, results, discussion, and conclusions section. I like this article because, with some guidance, students should be able to understand the methods the researchers use and the how professionals write their discussion and conclusions. It also provides students a peek at what they could be doing if they enter the field of food chemistry. The most difficult thing to understand in this article is the scientific terms, so with guidance, readers should be able to pull the main ideas out of the article.

4. Science Chef book.

D'Amico, J. (1995). *The Science Chef: 100 Fun Food Experiments and Recipes for Kids*. New York. John Wiley and Sons, Inc.
Flesch-Kincaid Grade level: 4.8

This book includes information on how different chemicals work in food, and then provides several experiments to illustrate how these chemicals work. It is written towards a child audience, so the chemical explanations are very simple, but still teach a concept. This book would be very easy for all high school chemistry students to understand, and the experiments are very short and easy to complete as well. These readings and experiments would be very simple and fun for students to do, and they can help teach important concepts. Topics covered in the book include baking powder, the process of browning, popcorn popping, nutrition, and thickening agents. Additional articles can supplement any one of the topics covered in the book to provide even more information.

5. Food Chemist career website

Connecting Classroom Content with Careers: Food/Flavor Chemist. http://www.umsl.edu/~econed/career/chemistry/FlavorChemist.htm. University of Missouri—St. Louis: College of Education.
Flesch Kincaid Grade level: 12.0

This website provides information to students interested in becoming a food chemist. Information is provided on what a food chemist does, where they work, what education they need, and salary information. Although the article was written at a high grade level, it is written to a general audience so there is minimal scientific terminology required to understand the article. It provides valuable information on possible careers students can explore beyond high school.

6. Carbohydrate Food Chemistry Experiment Introduction

Watkins, B. (2001). *Food Chemistry Experiments Student Activity Guide: Carbohydrates*. Institute of Food Technologists Experiments in Food Science Series. Chicago, IL
Flesch Kincaid Grade Level: 12.0

This series of food chemistry experiments published by the Institute of food technologists is written for high school chemistry classrooms. The student activity guide provides information on the structure of carbohydrates, how they are used in food, and other background information required for the experiment on how sugar and pectin affects gelling. The article, although at a high reading level, should be accessible to all students because difficult words or ideas are in bold. This helps point out important ideas to struggling readers. Additionally, there are questions after they reading to help students summarize the important points in their own words. The activity with the reading gives students a chance to test what they have learned in lab.

7. Chemistry of Chocolate website

The Chemistry of Chocolate. http://www.chocolate-chemistry.com (2005).
Flesch-Kincaid Grade Level: 9.4

This website provides general information in short articles on the chemistry of chocolate. The various chemicals in chocolate that have been identified and the ways the chemicals react in the body are discussed. Information is available on the subtopics of Sugar and Fat, Theobromide, Antioxidants, Caffeine, Phenylethylamine, and Anandamine. This article is written to a general audience with some background knowledge of beginning chemistry and biology. I like this article because it ties chemistry with biology (how the chemicals react with receptors in the brain) and with food science. This article is at a reading level that is attainable by all students, although some students may require guiding questions to help them focus and understand the content.

8. Chemistry of Dessert Newspaper Article

Ganster, K. *Cooking with Kids: Chef shows children the chemistry of dessert* (2000, November 16). Pittsburgh Post-Gazette.
Flesch-Kincaide Grade Level: 7.6

This newspaper article discussed a presentation by a Pennsylvania chef at the Carnagie Science Center. Processes such as carmelization, separation, and chemical properties were discussed as the chef made crème brulee with students. I like this article because it is easy to understand, written to a very general audience, talks about processes students observe in their own cooking, and gives them things to observe and try at home if they want to try the recipe.