

# Explore a Linking Lesson – Part 2: Dissect a Lesson

## Linking Lesson 4

- **Divide into partners at your table**
- **Each pair review one section of the lesson**
- **Prepare a 2 minute share-out for your table group**
  - Teacher Overview and Preparation
  - Linking Lesson and Nutrition Lesson
  - Act and Assess
  - Guidance Section





# 4th Grade

**Students explore the energy and nutrient contents of foods that are whole compared to foods that are processed, and investigate the amount of packaging waste that is generated by processed foods compared to fresh foods.**

***The more the food is processed the fewer nutrients it contains . . . it dilutes the remaining nutrients by adding cheap fillers: water, fats, starches and sugars***

**—Joan Gussow**

## **Background and Purpose**

Choosing food includes considering not only what to eat, but how it is grown, prepared, and packaged... should the choice be low fat, fresh, processed, organic, packaged, bulk, pre-prepared? Food decisions may be made based on both the impact on personal health and the consequences to the environment.

Research has compared diets rich in whole and unrefined foods (e.g., whole grains, dark green and yellow/orange vegetables and fruits, legumes, nuts and seeds) with diets of refined or processed foods (white bread, fast and convenient foods). Findings indicate that diets abundant in whole foods may decrease risk of cardiovascular disease and improve digestive system function.

In addition, processed foods typically have more packaging that can impact the environment. Food waste can add up fast; food is consumed three times per day by almost everyone. Studies have found that 31 percent of all municipal solid waste is from packaging materials. Instruction and school wide programs can encourage students to reduce, reuse, recycle, and compost to decrease waste and its detrimental effects on the environment.

Bruce, B., Spiller, G., Klevay, L., Gallagher, S. (2000). *A Diet High in Whole and Unrefined Foods Favorably Alters Lipids, Antioxidant Defenses, and Colon Function.* Journal of the American College of Nutrition, 19 (1), 61-67.

Marsh, K. and Bugusu, B. (2007). *Food Packaging and Its Environmental Impact.* Food Technology, April 2007, [www.ift.org](http://www.ift.org)



# 4th Grade



## Linking Lesson #4

### Whole or Processed: What's Better for Me?

#### Summary:

Students make predictions, then compare and contrast the nutrients (calories, total fat, carbohydrates, sodium) in the "whole" versus "processed" forms of tomatoes and oranges. Through this activity, they are able to explain why whole foods are healthier choices.

#### Stimulating Questions:

- Is there a difference between foods in their "whole" state and foods that have been processed?
- What is in a processed food besides the "whole" food ingredients? *Preservatives, "fillers" etc.*
- Where do "whole foods" come from? Plants and animals

#### Goal:

- Students will understand how whole foods and processed foods differ and why whole foods are a healthier option.

#### Students will reach this goal by:

- Reading and interpreting food labels and information on whole foods provided in the lesson handout.
- Comparing and contrasting the data on whole foods with the data on processed foods.
- Comparing their predictions with the actual amounts of energy (calories), total fat, carbohydrates and sodium content in processed foods and whole foods.

#### Standards Covered in this Lesson:

##### California Science Standards

Standard 2: All organisms need energy and matter to live and grow.

- a. Students know plants are the primary source of matter and energy entering most food chains.

Standard 6: Investigation and Experimentation:

- a. Differentiate observation from inference (interpretation) and know scientist's explanations come partly from what they observe and partly from how they interpret their observations.
- b. Measure and estimate the weight, length, volume of objects.
- c. Formulate and justify predictions based on cause-and-effect relationships.

##### Draft California Health Standards (August 2006)

Core Concepts: Students will comprehend concepts related to health promotion and disease prevention.

Assessing Information: All students will demonstrate and ability to access and analyze health information, products, and services.

## Lesson Highlights

#### Time Needed

- 20 minutes to introduce the lesson
- 30 minutes for hands-on activity
- 15 minutes to discuss the results


#### Nutrition Lessons

Healthy Foods from Healthy Soils  
(CHKRC #7305)

Lesson—What are "Whole Foods?"

- See *Guidance Section 7* for ordering the complete curriculum.

#### Materials Needed

- Review the  **Nutrition Lesson** from *Healthy Foods from Healthy Soils* —What are Whole Foods? (see the yellow pages in this section).
- Overhead transparency of Nutrition Facts/ Ingredient Label (from Penn State College of Agricultural Sciences—in this section)
- An orange and a tomato (or other fresh and processed food for comparison)
- Labels from processed foods (e.g., tomato sauce, juice, soup, ketchup, orange soda, orange drinks, etc.)
- Student worksheets Tomatoes: from Seed to Soup and Oranges: from Grove to Grocery from the **Nutrition Lesson: What are Whole Foods?** from *Healthy Foods from Healthy Soils* (see the yellow pages in this section).



#### Vocabulary (See definitions in Guidance Section 8—Glossary)

Calories	Total fat	Whole food
Energy	Carbohydrates	Processed food
Grams	Sodium	Preservatives

#### Procedures

##### 1) Warming Up with Inquiry

- Demonstration: Show the movie clip of an apple and an apple pie that are dropped into a clear water tank. Optional: conduct this demonstration for the class.
- Focus-Setting Question: **Why does the apple float while the apple pie sinks?**
- Teacher-Led Inquiry: The teacher leads the students in an inquiry discussion to stimulate their thinking about how foods that are processed differ from natural foods.

##### 2) Before the Investigation

- Pose the following questions to the class in order to review material from the adopted science texts:
  - What is energy?
  - How does energy move from plants to the animals that eat plants, and then to the animals that eat other animals? (food web, energy is in the calories of the foods that animals eat, plants make energy through photosynthesis)
  - What kinds of foods do you eat for energy?
- Explain that the class will be comparing whole and processed foods by looking at the calories (energy), total fat, carbohydrates, and sodium in these foods.
- Review the Nutrition Facts Label Overhead (in this section) to go over where the information on calories, total fat, carbohydrates and sodium is found on food labels.

##### 3) Class Plans the Investigation

- Show students the whole foods (tomato, orange) and processed foods (soup, ketchup, juice) that will be compared.
- Ask students to predict which of the foods will have the highest amount of calories, total fat, carbohydrates, and sodium.
- Invite students to describe how they can investigate their prediction/hypothesis.
- Ask them to list steps for Student Scientist Teams to follow to gather data and test their prediction.

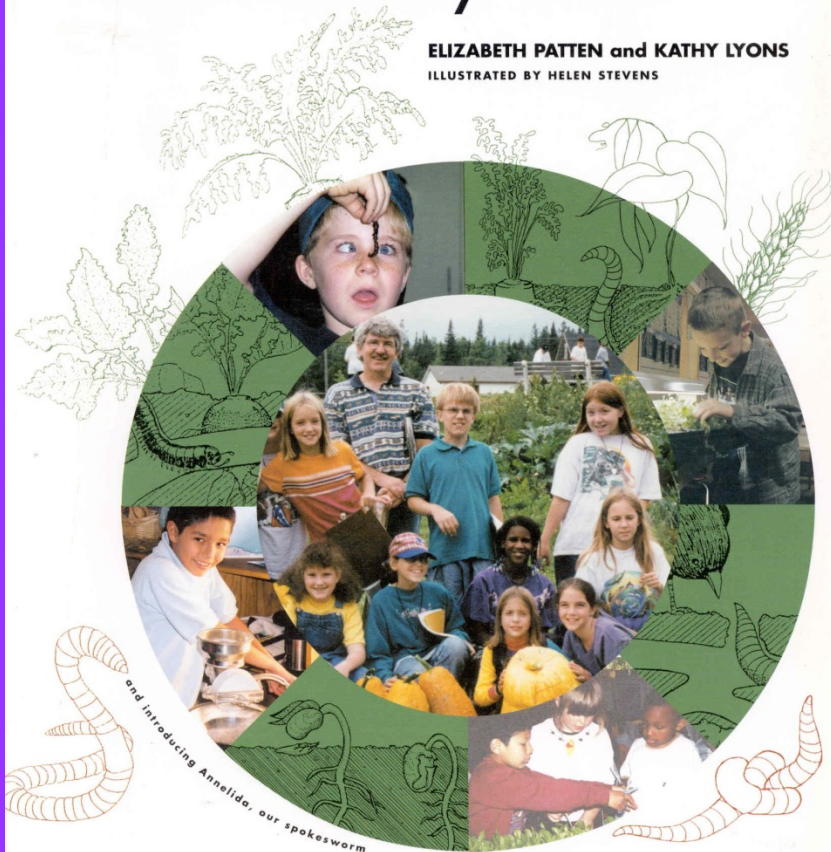


# healthy foods

a hands-on resource for educators

# from healthy soils

ELIZABETH PATTEN and KATHY LYONS  
ILLUSTRATED BY HELEN STEVENS



## Nutrition Lesson

This lesson is reprinted from *Healthy Foods from Healthy Soils* with permission from Tilbury House Publishers. Patten, E. and Lyons, K. (2003). *What are "Whole Foods"?* Tilbury House Publishers, Gardner, Maine: 71-74.



## What are "Whole Foods"?

*Differentiate between processed and unprocessed foods*

Recommended Grades: 3-6

- Language Arts
- Health
- Math
- Life Skills

### Goals

Discover that processed foods generally have more sugar, salt, and fat than their unprocessed cousins.

### Key Points

- There is a difference between foods in their fresh (unprocessed, whole) state and once they've been changed somehow (processed).
- Differences can include nutrition, amount of additives and preservatives, and quantities of sugar, salt, and fat.
- The Nutrition Facts label and ingredients list on a food package can help you learn how processed or how healthful it is.

### Background

"... it is a fair generality that the more a food is processed, the fewer nutrients it contains. Processing has this overall degrading effect because it eliminates vitamins and minerals—by removal as in refining, or by destruction as in high-heat processing—and because it dilutes the remaining nutrients by adding

cheap fillers: water, fats, starches, sugars."<sup>1</sup>  
—Joan Gussow, Professor Emeritus, Columbia Teacher's College, New York, NY

For centuries humans have processed food through methods such as cooking, milling, pounding, salting, smoking, canning, drying and freezing. There are pros and cons to any method. Modern methods of producing food often rely on processing techniques such as oil refining, high heat treatment, and high-volume grain refining that reduce important minerals, fiber, vitamins, and flavor in our food supply. Some foods are enriched or fortified to replace or add nutrients. Many modern processed foods have altered nutritional value compared to their "whole" counterparts. Processed foods require increased packaging, and the food processing industry is among the nation's renowned polluters.<sup>2</sup> Yet consumers routinely choose processed foods because they find them easier to prepare, readily available, they can be eaten in any season, they do not necessarily need refrigeration, and they can be transported around the globe. (That's why they are called convenience foods!) Such products are usually heavily advertised.

Sound nutrition depends on a foundation of whole foods—ones that come directly from nature

<sup>1</sup> "Agriculture, Food and Nutrition" by Joan Dye Gussow, in *Progress as if Survival Mattered* (as excerpted in *Earthfriends* manual).

<sup>2</sup> Pacific Northwest Pollution Prevention Resource Center, 513 First Ave. West, Seattle, WA 98119; 206-352-2050, fax: 206-352-2049; e-mail: office@pprc.org; <http://www.pprc.org>

# Science and Nutrition Linking Lessons

## Warming-Up with Inquiry



# Teacher-led Inquiry

## What is it?

*Teacher -led Inquiry is...*

- a way that teachers can entice students to think about the connections between science and nutrition.
- a method of looking at problems and seeking their solutions.



# Structuring for a Focus Setting Question

- *Today we are going to work on a problem that has a solution or explanation.*
- *I'll pose a problem with a demonstration. Your job is to solve it, to build an explanation or solution that makes sense to you.*
- *You don't have to agree on one solution. If you have a solution, we would like you to share it but it will be up to you to decide if your solution is a good one or not.*
- *If you want some information, ask for it and I will try to get it for you.*
- *Remember that only one person speaks at a time. If you want a conference, you can ask me and we will take time for small group discussions.*



# Focus-Setting Question

Why does the duck dunk?

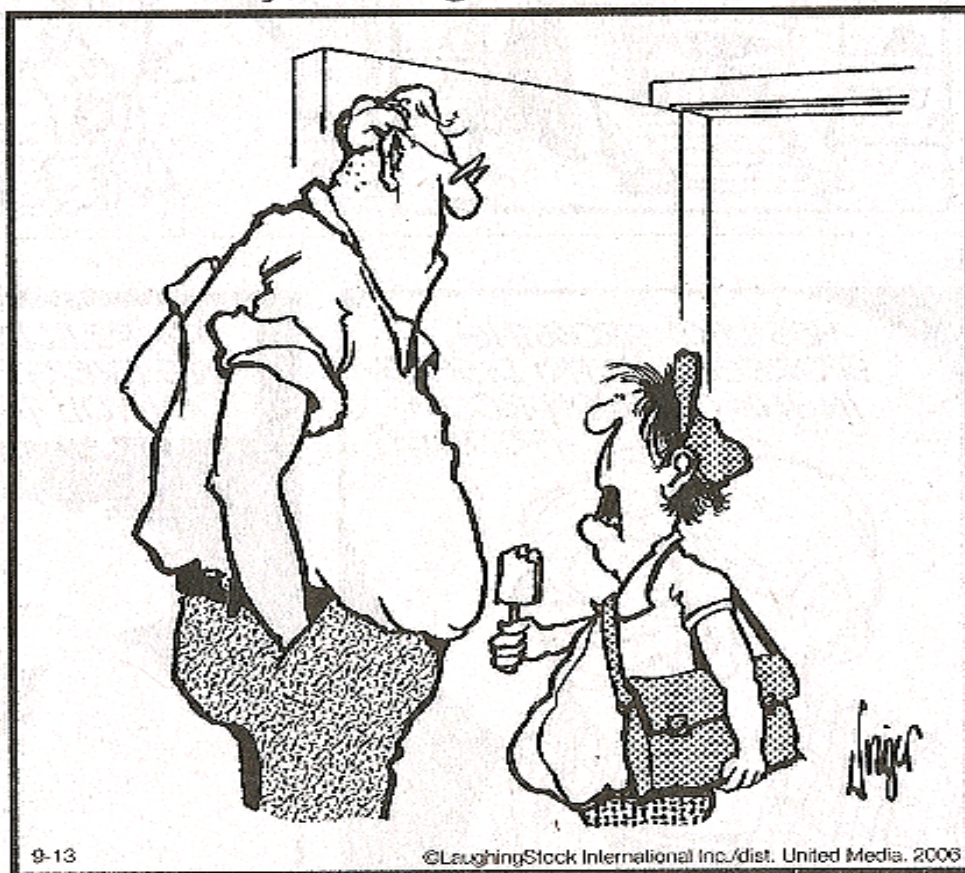




**How are these strategies different  
than what you expected?**

# Teacher Silence

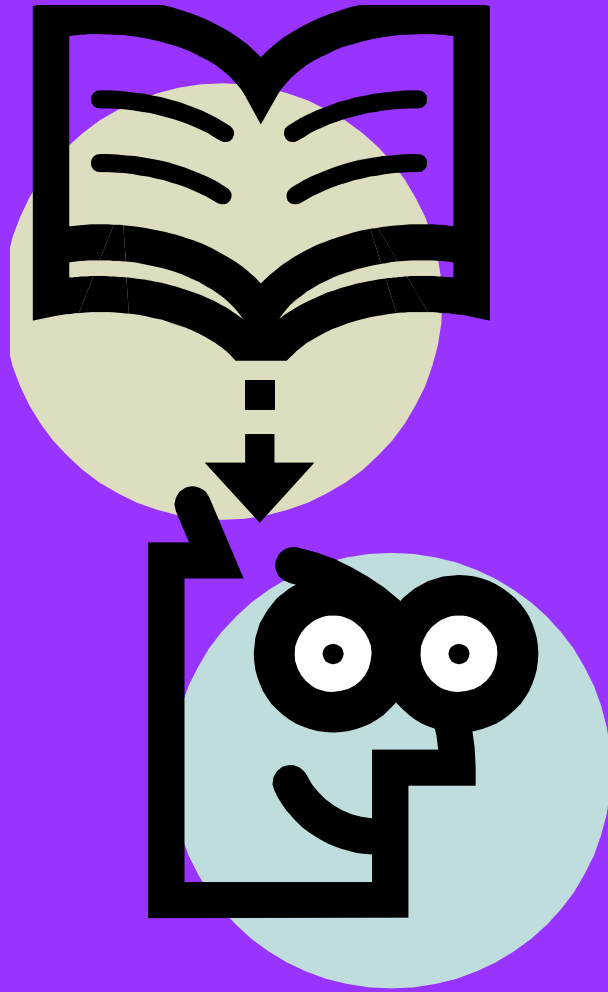
**HERMAN** By Jim Unger



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**“They don’t give us time to learn anything in school; we have to listen to the teacher all day.”**



**When students know the answer.....  
They stop thinking!**

Kids are drowning in information  
but starving for meaning



THOMAS LOHNES/AP/Getty Images



# Teacher-led Inquiry

## How is used in Science and Nutrition Links?

- a focus-setting question is provided to stimulate inquiry for each of the Linking Lessons .
- we prepare teachers by demonstrating the skills needed to conduct effective teacher led inquiry activities.

# Explore a Linking Lesson – Part 2: Demonstration

## Linking Lesson 4

Whole or Processed – What's  
Better for Me?





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# Food Label

**Nutrition Facts**  
 Serving Size 1/2 cup (114g)  
 Serving Per Container 4

Amount Per Serving		0% Daily Value*	
<b>Calories</b> 90	Calories from Fat 30		
<b>Total Fat</b> 3g		<b>5%</b>	
Saturated Fat 0g		<b>0%</b>	
<b>Cholesterol</b> 0mg		<b>0%</b>	
<b>Sodium</b> 300mg		<b>13%</b>	
<b>Total Carbohydrate</b> 13g		<b>4%</b>	
Dietary Fiber 3g		<b>12%</b>	
Sugars 3g			
<b>Protein</b> 3g			
Vitamin A 80%	Vitamin C 60%		
Calcium 4%	Iron 4%		

\* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories: 2,000:	2,500:
Total Fat	Less than 65g	80g
Sat Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g

Calories per gram:  
 Fat 9 • Carbohydrate 4 • Protein 4

**Pay close attention to serving sizes.**

**Look for foods with lower levels of saturated fats.**

This tells you how much salt is in food.

**Calcium is important for bones and teeth.**


**Use this section as a guide for daily planning.**

The amount of calories a person needs each day depends on many factors, including exercise.

Products labeled "light" or "lite" must have 1/3 fewer calories or 1/2 the fat of the foods to which they are compared. "Light" also can mean that salt has been reduced by 1/2.

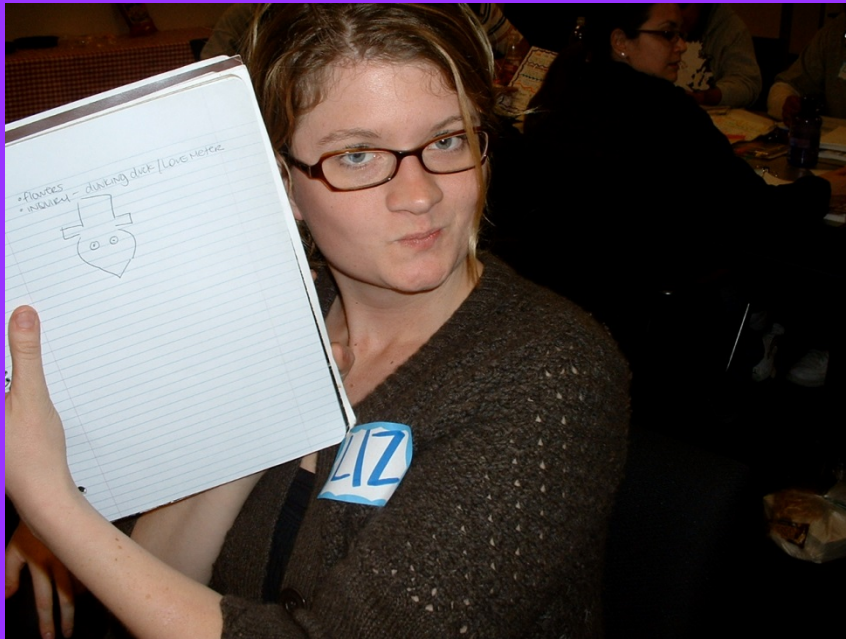
Look for products that have more fiber and less sugar.

Vitamins and minerals help your body function properly.



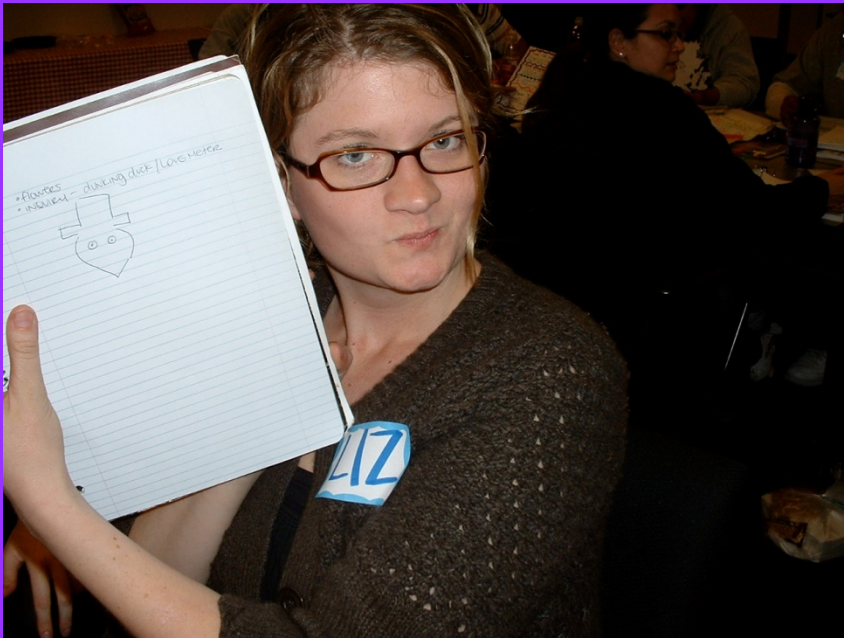



# Before we go to the Reflection Wall...



*Let's see how  
one teacher  
candidate  
Takes us  
through the  
steps  
of the lesson...*

# Liz Coleman



*“I introduced Linking Lesson #4 with a short video about nutrition labels from the FDA. The teacher instructional guide has a great interactive lesson for students.”*

<http://www.cfsan.fda.gov/~dms/foodlab.html>

Pre-Service Candidate  
Pepperdine University  
Los Angeles Unified  
School District

# Before the Investigation



***“I held up a tomato and the ketchup. I ask my students. What is the difference Between these items?”***

***I then ask them, “What do they share In common?”***

# Before the Investigation



***“Everything was well organized in sequential order.”***

***“Perhaps, more emphasis on vocabulary building. Some of the terms, like Calories/Energy are somewhat difficult to explain to elementary school students.”***



# Investigation



***“I used the tomato chart to model and then they would complete the same chart for their specific whole food family and some additional questions.”***

# Investigation



*“I had each investigative team working on different whole v. processed foods.” (orange and orange products, rice and rice products, flour, corn, and apple products)*

# Investigation



*“My students really got into the lesson and concentrated on their investigations”*

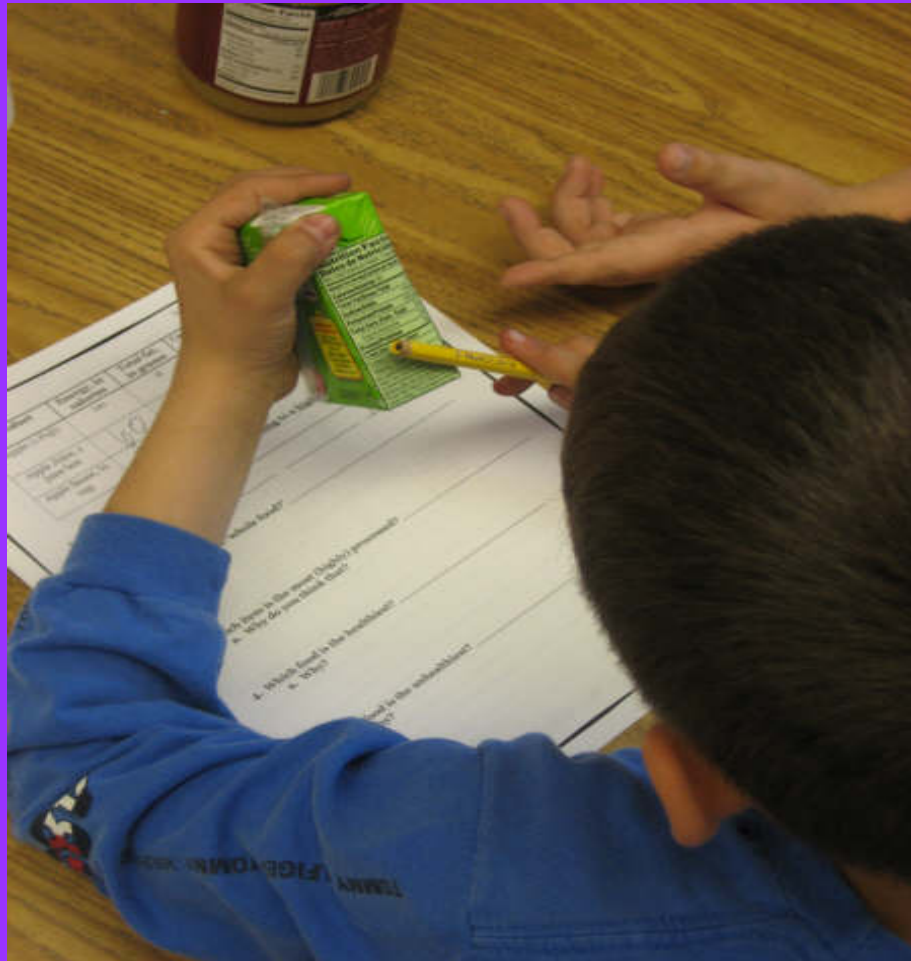
# Investigation



*“My students enjoyed the lesson a great deal and today I had each group share their findings with the class in a semi-presentation.”*



# Extend the Links



*“This weekend, for extra credit, they are going to fill out Food Journals and record nutrition label information.”*

# Act and Assess



***“We will make a class cookbook with whole food 'healthy' recipes and have a cooking day in class. This lesson was a perfect way to motivate them and introduce them to healthy choices.”***

# Integration Benefits



*“My master teacher was raving about the lesson’s incorporation of nutrition and science to other teachers in the lounge today.”*



# The California Healthy Kids Resource Center (CHKRC) Web Site

## www.californiahealthykids.org



To support California schools in creating safe and caring school environments and delivering effective instruction and services for students' health and safety.

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About the Center	Health Education Library	Research-Validated Programs	School Health Laws
Online Trainings	Coordinated School Health	Health and Academic Achievement	Health Data and Funders

### About the Center

The California Healthy Kids Resource Center (CHKRC).

### Health Education Library

Borrow reviewed materials for a free four-week loan.

### Research-Validated Programs

Learn about the selection and implementation of evidence-based programs.

### School Health Laws

Search for California education codes and other school health-related laws.

### Online Trainings

Free professional development online training modules.

### Coordinated School Health

Find tools to plan and implement coordinated school health programs.

### Health and Academic Achievement

Access research, tools, and reports that support the importance of student health to academic achievement.

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Access surveys, reports, and resources for specific health content areas.

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Learn about the center's funders.

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### What's New


#### Highlighted Trainings and Programs

Check out the centers' five new free online trainings on School-Based Health Education. Available 24 hours a day, these trainings are a great way to brush up on health topics or to enhance your staff trainings. Completion certificates are e-mailed after passing a five-question quiz. Try a training on [Essential Concepts and Analyze Health Influences](#), [Decision Making and Goal Setting](#), or choose from [many other free trainings](#).

#### Childhood Obesity Conference

The nation's largest conference of professionals dedicated to combating pediatric obesity.

#### FRESHMeals@Schools



Access online and peer-to-peer training and technical assistance brought to you by the Fresh, Regional, Education-Supportive, Healthy Meals at Schools (FRESHMeals@Schools).

#### SHAPE (Shaping Health As Partners in Education) Newsletter - June 2013




The SHAPE bimonthly newsletter focuses on after school snack and supper. It also offers information about training and funding opportunities, initiatives, useful resources, research, and policies.

#### Team California for Healthy After Schools



TCHAS focuses on training and coaching strategies for after school teams to develop healthy after school environments and mentoring skills.

#### Recommended Resources



[Adolescent Sexual Health Education: An Activity Sourcebook \(2008\)](#)

This resource is a compilation of activities from evidence-based sexual health education programs. Activity types include role plays, group discussions, homework, and group activities.