

# Classroom Ideas for Teaching about Limiting Added Sugars

By D. Pauline Williams, PhD, RDN, CD

*Concept: Making the Shift -- Eating Less Added Sugar*

**Learning Objective:** Students will practice making desserts with limited added sugars.

**Activity:** Grilling fruit

## Grilled Fruit

Apples  
Bananas  
Grapes  
Kiwi  
Lemons  
Peaches  
Pineapple  
Plums  
Strawberries  
Watermelon



### Skewer version

- Cut fruit into 1-inch cubes
- Spear fruit onto a metal or wooden skewer. If using wood, soak skewer in water for 30 minutes prior to using.
- Place fruit skewers on low-heat grill. Grill until warm and fruit starts to brown.

### Sliced or half fruit version

- Cut round fruits such as apples, peaches, or pears into halves. Cut long fruits such as bananas into slices.
- Place cut side down on low-heat grill. Grill until fruit starts to show brown grill marks.

### Teaching Notes:

- Select fruits in season to reduce cost.
- Try adding spices such as cinnamon, ginger, cloves, or nutmeg to fruit while grilling
- Use indoor grill pan if outdoor grill facilities unavailable
- Have students think of other ways fruits or other non-sugar added foods can be used as “desserts”

## Concept: Understanding Sugar Sources

**Learning Objective:** Student will be able to classify types of sugar (natural and added) in a recipe and identify sugar on a nutrition facts label.

**Activity #1.** Have students look at the Gingerbread Cake recipe and answer the following

1. Which ingredients have naturally occurring sugar  
A: applesauce  
Discuss what would happen if you used sweetened applesauce
2. Which ingredients contribute to added sugar  
A: Molasses  
Discuss that Splenda (aka sucralose) is not an added sugar, but a non-nutritive sweetener, that provides sweetness, but not other properties of sugars

**Activity #2.** Have students look at the nutrition facts label for the Gingerbread Cake and identify the following

1. How much sugar is in one serving of cake, in gram? In teaspoons?  
A: 13 g and 3.25 tsp (3 is probably close enough)
2. Is the sugar natural or added?  
A: The label amount includes both natural and added sugar. You can't identify the amount of sugar from natural sugar ingredients and the amount from added sugar ingredients. Of the 13 g of sugar in a serving some is from applesauce (natural) and some from molasses (added.)

Note: Beginning July 2016 labels will show amount of added sugars. Manufacturers must comply with the new rule within two years (by 2018)

**Activity #2a.** Collect various food labels and have students identify sources of sugar in the ingredient list and amounts of sugar on the nutrition facts label. Have students determine if sugar sources are natural or added.

**Activity #3.** Beverage Labels

1. Select a variety of sugar sweetened beverages to display. Ideas -- soda pop, vitamin waters, energy drinks, sports drinks, flavored milk, white milk, 100% juice, juice drinks, punch, etc.
2. Place clear plastic cups in front of each beverage
3. Measure the amount of sugar in the beverage and place in cup
  - a. Find grams of sugar on the label
  - b. Find the number of servings on the label
  - c. If there is more than one serving in a bottle and someone would commonly drink the entire bottle, multiply the amount of sugar in grams by servings per container. For example a 20 oz. bottle of Soda may say 2-1/2 servings per container (serving size 8 oz.). However, most people will drink the entire bottle, thus it is more reflective to measure the amount of sugar in the bottle, not per serving.

- d. Determine the teaspoons of sugar in a serving/container.
  - i. Divide the number of sugar grams in a serving/container by 4. (Note: there are 4 grams of sugar in a teaspoon.)
  - ii. Scoop the corresponding teaspoon amounts into the clear cup to show the amount of sugar in the beverage.
- e. Example. Soda pop label for 20 oz. container. Serving size 8 oz., servings per container 2-1/2, grams sugar per serving 26 g.
  - i.  $26 \text{ g sugar} \times 2\text{-}1/2 \text{ servings} = 26 \times 2.5 = 65 \text{ g sugar in bottle}$
  - ii.  $65 \text{ g} \div 4 \text{ g/tsp} = 16.25 \text{ tsp sugar per bottle}$
- 4. Have student identify if the beverage has natural or added sugar
  - a. The sugar in white milk will all be naturally occurring (about 12 g sugar per 8 oz. milk)
    - i. Flavored milk will have added sugar. For example 8 oz. of chocolate milk may have 24 g sugar. About 12 g will be natural and 13 g added. The dietary guidelines set a limit on added sugars, but not natural sugars.
  - b. 100% juice is all naturally occurring sugar
    - i. For juice blends it is almost impossible to determine the amount of added sugar and the amount of natural sugar. You can discuss how to identify naturally and added sugars by looking at the label's ingredient list.
  - c. Soda pop, vitamin water, energy drinks, sports drinks contain all added sugar (no natural.)

## Gingerbread Cake

Recipe from Splenda.com

### INGREDIENTS:

2 cups unsweetened applesauce  
 3/4 cup molasses  
 1/3 cup vegetable oil  
 3 eggs  
 3 cups all-purpose flour  
 1 1/3 cups SLENDA® No Calorie Sweetener, Granulated  
 2 teaspoons baking soda

1 teaspoon baking powder  
 1/2 teaspoon salt  
 2 teaspoons ground ginger  
 1 1/2 teaspoons cinnamon  
 1/2 teaspoon ground cloves



### DIRECTIONS:

1. Preheat oven to 350 degrees F. Spray Bundt pan with butter-flavored cooking spray. Set aside.
2. Pour applesauce, molasses, and vegetable oil into a large mixing bowl. Add eggs. Stir well.
3. Blend remaining dry ingredients in a separate bowl. Mix well.
4. Add dry ingredients to the applesauce mixture. Stir well.
5. Pour cake batter into prepared pan. Bake in preheated 350 degrees F oven 50 to 60 minutes, or until a toothpick inserted in the center comes out clean. Remove from oven. Cool cake in pan on a wire rack approximately 20 minutes. Invert cake onto serving plate. Serve warm or cool.

## Nutrition Facts Gingerbread Cake

18 servings, Serving Size: 1 slice (1/18 of cake)

Amount per Serving

Calories 180

Calories from Fat 45

Total Fat 5 g

Saturated Fat 1 g

Cholesterol 35 mg

Sodium 240 mg

Total Carbs 30 g

Dietary Fiber 1 g

Sugars 13 g

### *Concept: Understanding the Functions of Sugar in Baking*

**Learning Objective:** Students will analyze the properties and functions of sugar (taste, color, moistness, texture) in baked goods.

**Activity:** Bake cookies using sugar and sugar substitutes. Compare recipes for properties of sugar

### Discussion Questions:

1. Taste cookies rate the following topics on a five point scale 1=Unacceptable, 2=Slightly Unacceptable, 3=Neutral, 4=Slightly Acceptance, 5=Acceptable. Have students discuss ratings and differences in two cookies. Discuss how sugar has more properties than sweet flavor. The sugar association's Sugar's Functional Roles in Cooking and Food Preparation booklet has great information for covering this topic (see resources below)
  - a. Taste
  - b. Texture
  - c. Color
  - d. Aroma
  - e. Moistness
2. Discuss Nutrition facts label
  - a. How many grams of sugar in the Splenda cookie? The regular cookie?  
A: Splenda 16 g per cookies; Regular 10 g per cookie
  - b. Why is there a difference in the amount of sugar?  
A: bring out the regular cookie has less sugar than the Splenda cookie even though there is more added sugar by ingredients (3/4 cup granulated plus 3/4 cup brown sugar) in the regular cookie. Have students determine why this is.  
A: the difference has to do with serving size. The Splenda recipe makes 30 cookies, the regular recipe 60 cookies. The amount of ingredients are almost identical suggesting the regular cookies are much smaller, probably half the size of the Splenda cookie.
  - c. If you doubled the "size" of the regular cookies how much sugar would be in 1 cookie  
A: 20 grams/cookies (30 cookies per batch)  
  
Making the size of each cookie more equal allows a more accurate comparison of the two cookie's sugar content.

## **Chocolate Chip Cookies** with Sugar Substitute (Splenda)

Recipe Splenda.com

### INGREDIENTS:

2 cups all-purpose flour	1 cup SPLENDA® Brown Sugar Blend
1 teaspoon baking powder	2 large eggs
1 teaspoon baking soda	1 tablespoon vanilla
1/4 teaspoon salt	2 cups semi-sweet chocolate chips
1 cup melted butter	

### DIRECTIONS:

1. Preheat oven to 375 degrees F. Line cookie sheets with parchment paper.
2. Combine flour, baking powder, baking soda and salt in small bowl. Set aside.
3. Mix butter and SPLENDA® Brown Sugar Blend in a large bowl. Stir in eggs one at a time. Add vanilla and mix. Stir in flour mixture. Fold in chocolate chips.
4. Drop dough by rounded tablespoons onto cookie sheets. Bake for 11-13 minutes. Allow cookies to cool for 2 minutes before moving to wire racks to cool completely.

## **Chocolate Chip Cookies** regular

Recipe verybestbaking.com (Nestle Toll House)

### INGREDIENTS:

2 1/4 cups all-purpose flour	¾ cup packed brown sugar
1 teaspoon baking powder	2 large eggs
1 teaspoon salt	1 tablespoon vanilla
1 cup butter, softened	2 cups semi-sweet chocolate chips
¾ cup granulated sugar	

### DIRECTIONS:

1. Preheat oven to 375 degrees F.
2. Combine flour, baking powder and salt in small bowl.
3. Beat butter, granulated sugar, brown sugar and vanilla extract in large mixer bowl until creamy. Add eggs one at a time, beating well after each addition. Add vanilla and mix. Gradually beat in flour mixture. Stir in chocolate chips.
4. Drop dough by rounded tablespoons onto ungreased baking sheets. Bake for 9-11 minutes or until golden brown. Cool on baking sheets for 2 minutes remove to wire racks to cool completely.

## Nutrition Facts for Cookie Recipes

NUTRITION FACTS Cookies with Splenda 30 servings, Serving Size: 1 cookie	NUTRITION FACTS Regular 60 servings, Serving Size: 1 cookie
Amount Per Serving Calories 170 Calories From Fat 100 Total Fat 11 g Saturated Fat 7 g Cholesterol 30 mg Sodium 140 mg Total Carbs 20 g Dietary Fiber 0 g Sugars 16 g	Amount Per Serving Calories 110 Calories from fat 60 Total fat 7 g Saturated Fat 3.5 g Cholesterol 15 mg Sodium 85 mg Total Carbs 14 g Dietary Fiber 1 g Sugars 10 g

### Resources:

Dietary Guidelines for Americans 2015-2020 8<sup>th</sup> edition

<http://health.gov/dietaryguidelines/2015/guidelines/>

Sugar's Functional Roles in Cooking and Food Preparation (pdf download)

<https://www.sugar.org/images/docs/sugar-functional-roles.pdf>

Splenda downloadable cookbook <https://www.splenda.com/recipes> (click on "download cookbook" top right)

Splenda cooking and baking tips <https://www.splenda.com/cooking-baking>



# SUGAR AND CHRONIC DISEASE



# Healthy Eating Pattern

## Includes

- Variety of vegetables
- Fruits, especially whole
- Grains, half whole
- Fat-free or low-fat dairy
- Variety of protein foods
- Oils

## Limits

- Saturated and Trans fats
- Added sugars
- Sodium



# Eating patterns and health outcomes

- Strong evidence for healthy eating patterns and
  - Reduced risk heart disease
- Moderate evidence reduced risk
  - Type 2 diabetes
  - Certain cancers (colorectal, postmenopausal breast)
  - Overweight and obesity
- Emerging evidence for relationship between eating patterns and
  - Some neurocognitive disorders
  - Congenital anomalies

# Evidence for components in eating patterns

- Consistent evidence for
  - Vegetables
  - Fruits
  - Whole grains (slightly less consistency than f/v)
- Less consistent evidence for
  - Fat-free/low-fat dairy
  - Seafood
  - Legumes
  - Nuts
- Characteristics often defined
  - Decreased meat (including processed meat, processed poultry)
  - Sugar-sweetened foods – particularly beverages
  - Refined grains

# Evidence for Sugar Guidelines

- Still developing
- Eating pattern research (cohort and randomized controlled trials) show
- Strong evidence of added sugars for
  - ↓ risk CVD
- Moderate evidence for
  - ↓ risk obesity
  - ↓ risk type 2 diabetes
  - ↓ risk some types cancer
  - ↓ dental caries

# Added Sugar Statement

“Moderate evidence from prospective cohort studies indicates that higher intake of **added sugars**, especially in the form of **sugar-sweetened beverages**, is consistently associated with increase risk of **hypertension, stroke, and coronary heart disease in adults**. Observational and intervention studies indicate a consistent relationship between higher added sugars intake and higher blood pressure and serum triglycerides.”

# Food are not consumed in isolation

- Eating patterns consist of multiple interacting food components
- Relationships to health exist for the overall eating pattern, not to an isolated aspect of the diet

# Sugar Guidelines

- Consumes less than 10% of calories per day from added sugars

Quick check.  
Name some added sugars.

# Added Sugars

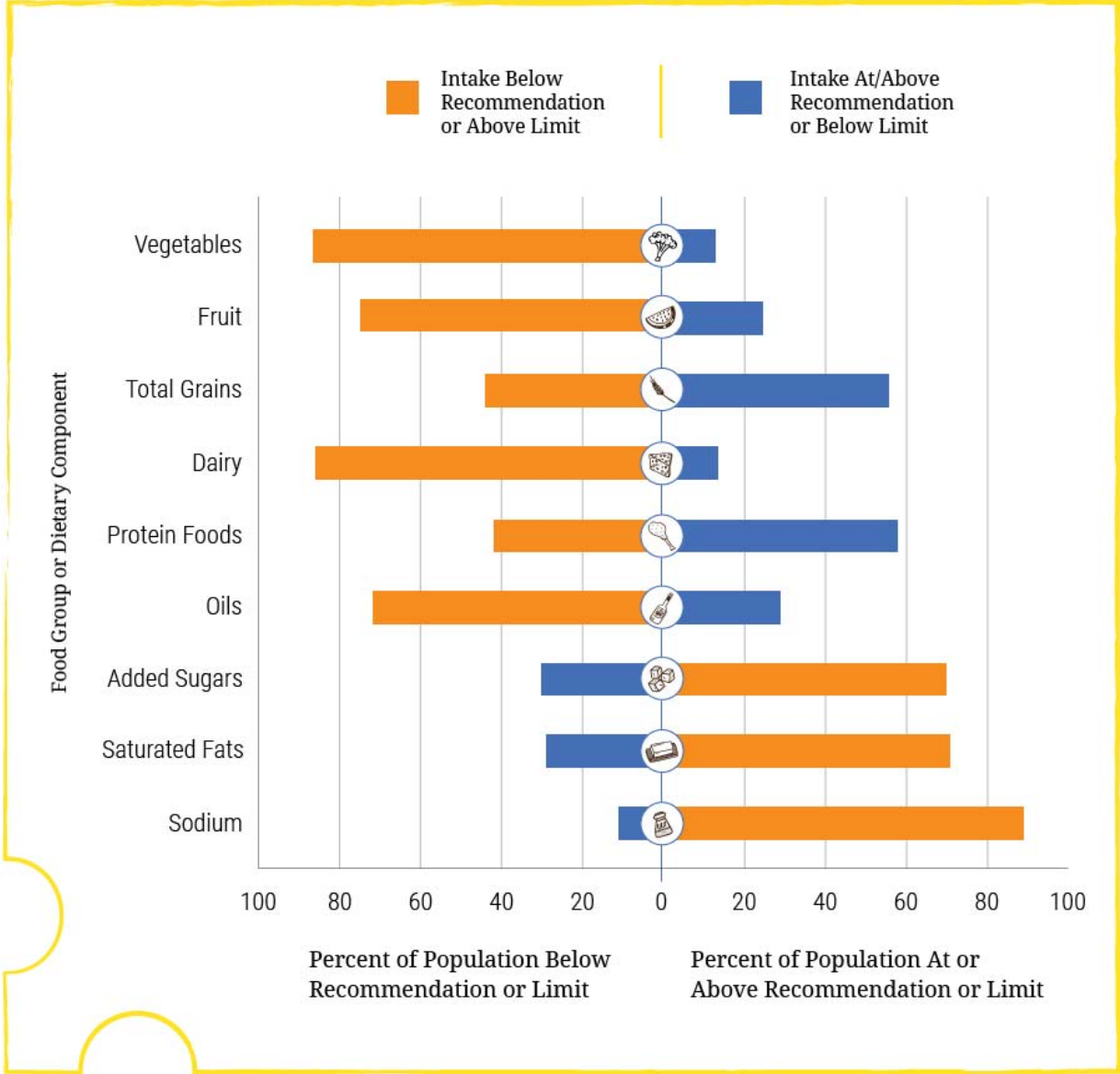
- Brown sugar
- Corn sweetener
- Corn syrup
- Dextrose
- Fructose
- Glucose
- High glucose corn syrup
- Honey
- Invert sugar
- Lactose
- Malt syrup
- Maltose
- Molasses
- Ray sugar
- Sucrose
- Trehalose
- Turbinado sugar



# Added vs Natural

- Added sugar limit does NOT include naturally occurring sugar
- Fruit
- Milk

# A look at added sugar intake in the US

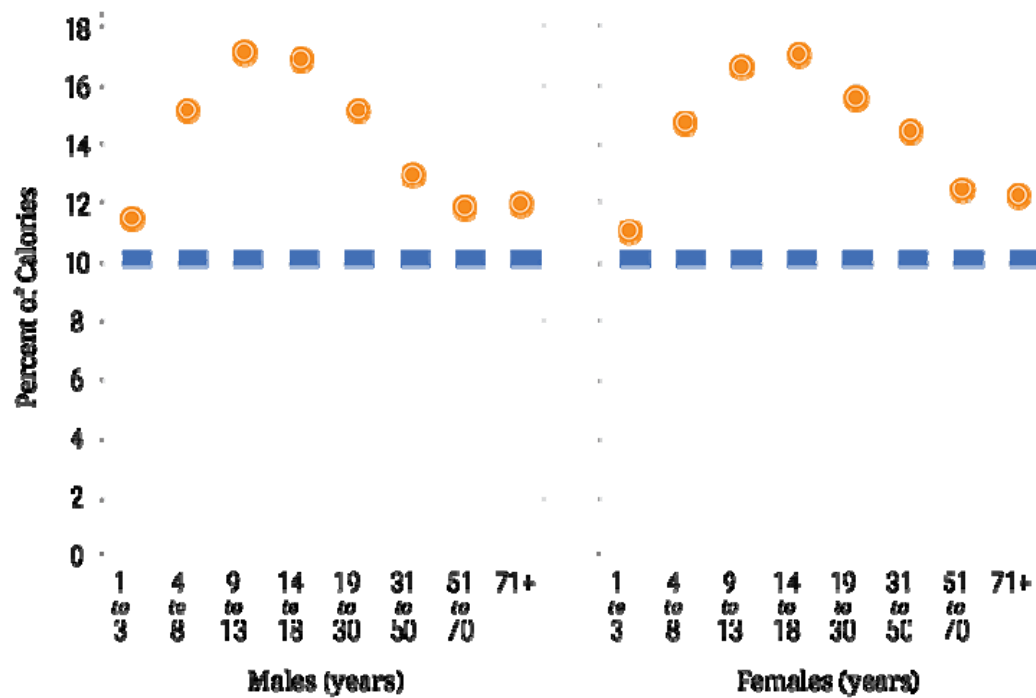


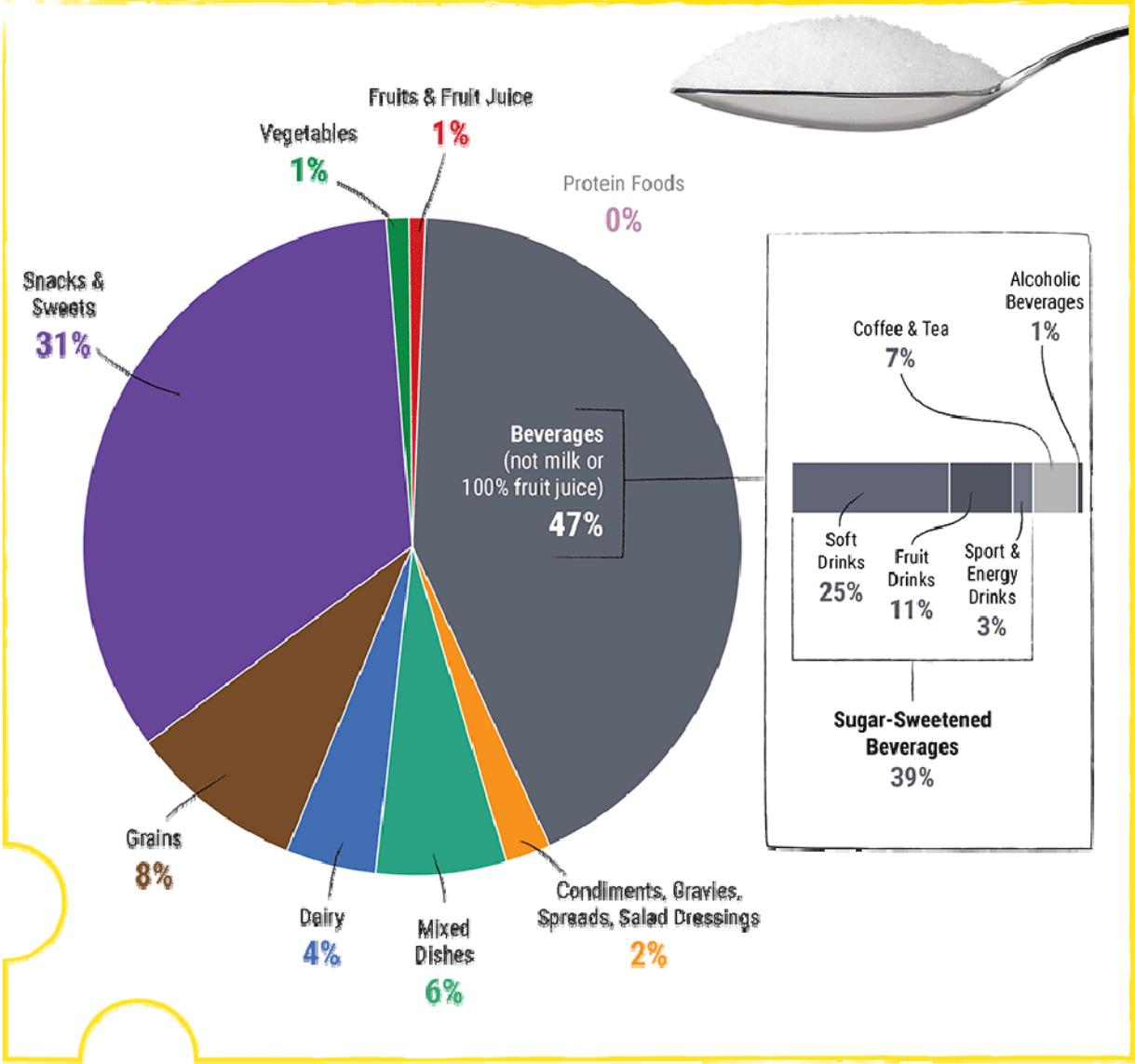
■ Recommended Maximum Limit

○ Average Intake



## Added Sugars





# Current Added Sugar Intake

- 270 calories
- 13% of calories per day
- Especially high in children, adolescents, and young adults
- Major source – beverages
  - Other sources snacks and sweets

# 10% of Calories a perspective

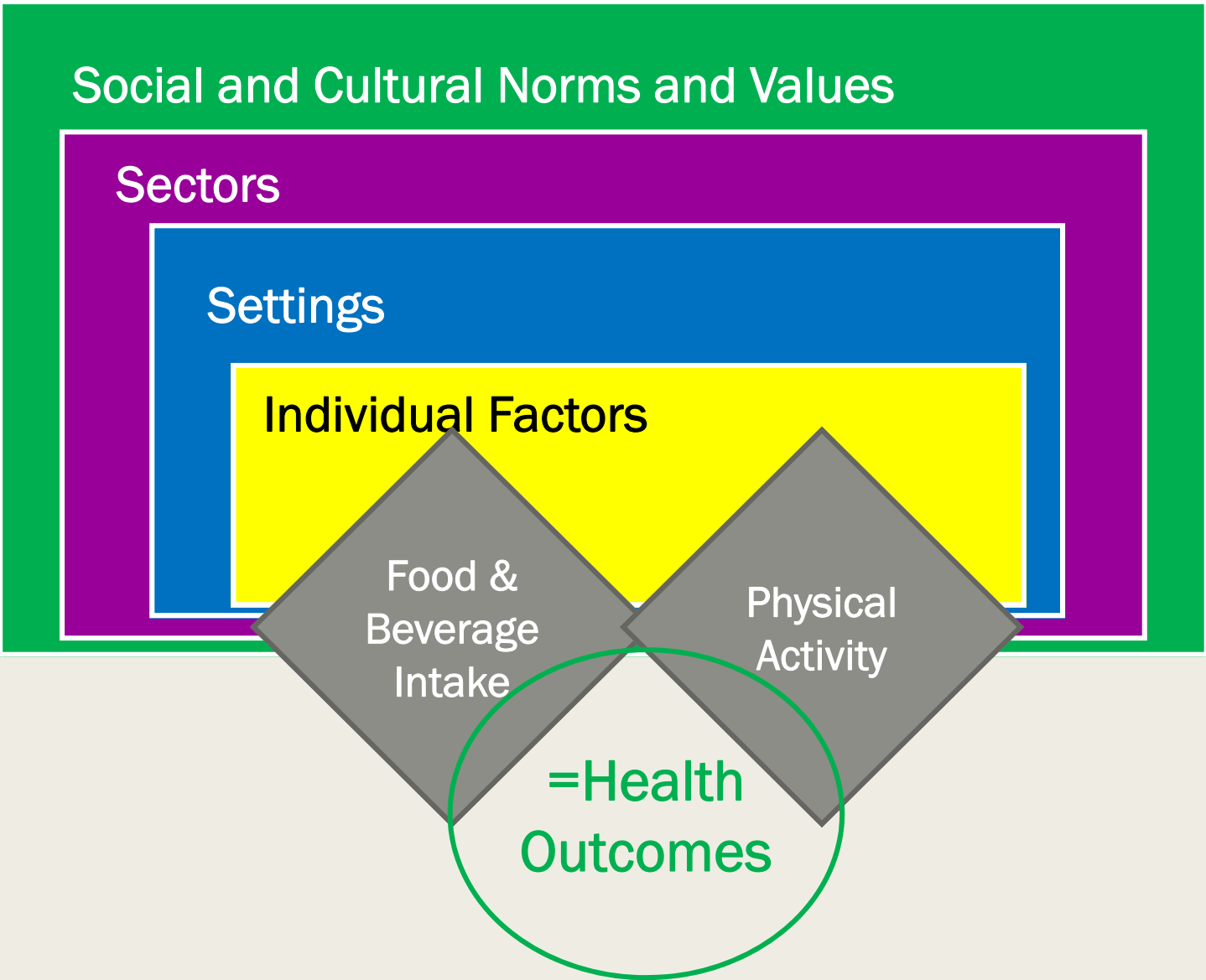
- Difficult to achieve healthy eating pattern if intake higher than 10%

Calorie Level	Other calorie limit	Percent total calories
1200	150	15%
1600	130	8%
2200	280	13%
3200	610	19%

# Making a Shift

- Beverages Choices
- Portion size dessert





# Making Healthy Shifts



TYPICAL

In Syrup



# Peaches



NUTRIENT-DENSE

Fresh or frozen  
without added  
sugars

# Teaching ideas things to consider

- Sugar more than sweetness
- High intensity sweeteners (aka non-nutritive sweeteners)

# Sugar more than sweetness

- Palatability
- Preservation
- Functional attributes (texture, body color, browning capability)

# What about high intensity sweeteners

- Saccharin, aspartame acesulfame potassium, sucralose
- May reduce calorie intake in short-term
- Questionable effectiveness for weight management

# Ideas for the classroom

# SUGAR AND CHRONIC DISEASE

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## Healthy Eating Pattern

<b>Includes</b>	<b>Limits</b>
<ul style="list-style-type: none"><li>■ Variety of vegetables</li><li>■ Fruits, especially whole</li><li>■ Grains, half whole</li><li>■ Fat-free or low-fat dairy</li><li>■ Variety of protein foods</li><li>■ Oils</li></ul>	<ul style="list-style-type: none"><li>■ Saturated and Trans fats</li><li>■ Added sugars</li><li>■ Sodium</li></ul>

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### Added Sugars

- Brown sugar
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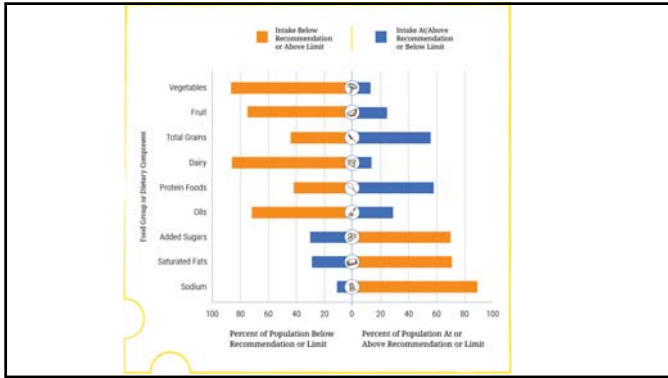
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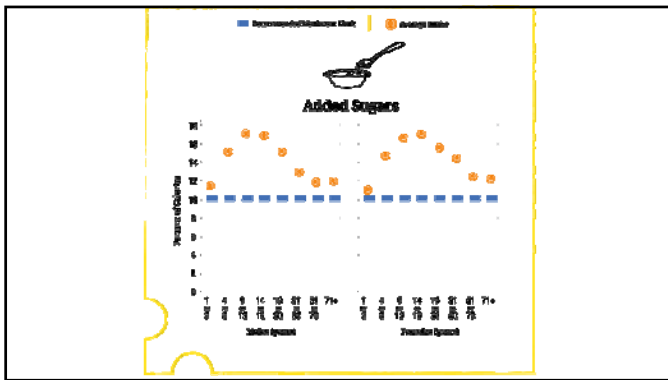
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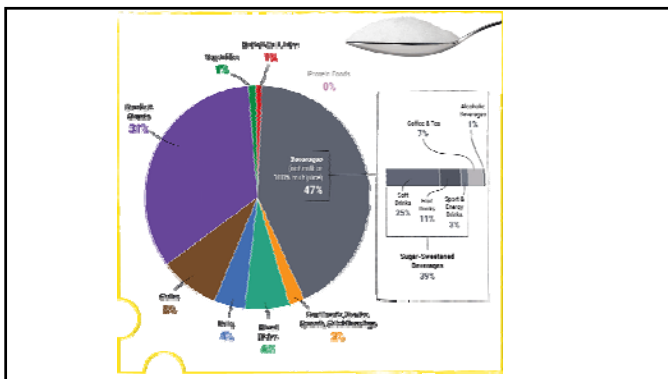
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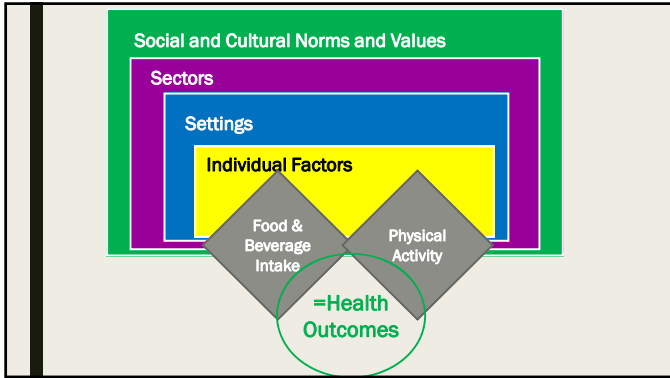
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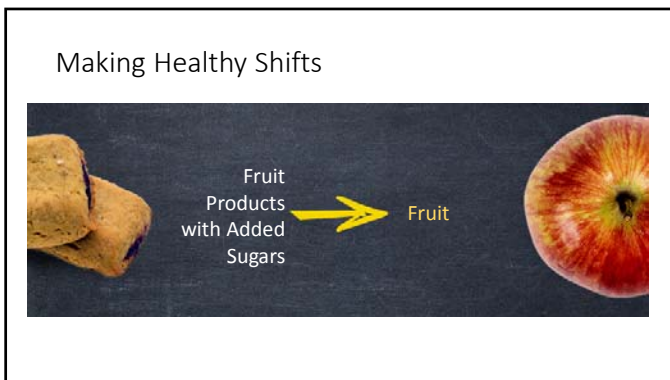
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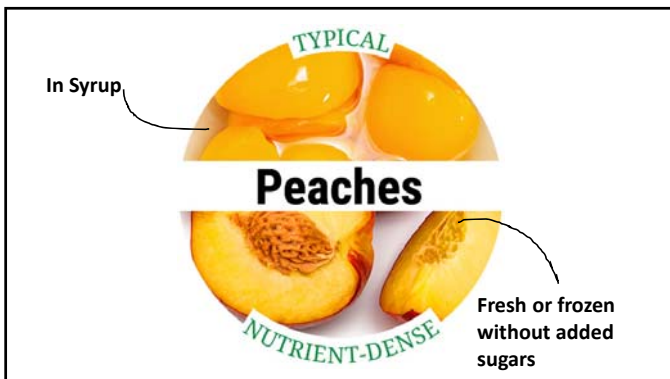
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Ideas for the classroom

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