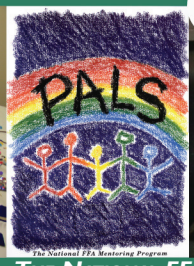
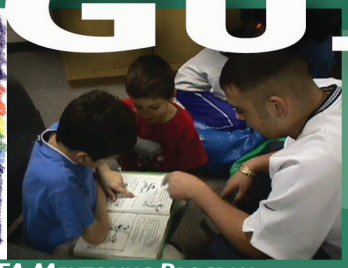
Grow Your PALS Program Guide





The National FFA Mentoring Program

Sponsored by Campbell's

Lesson 1.34

Sweet Tooth: Measuring Sugar in Foods

Unit: Mathematical Applications

Precepts

G. Physical Growth
- G1. Practice healthy eating habits
- G2. Respect one's body

Lesson Type:
One-on-One

National Standards

CS.11.01.01.a. Formulate a testable hypothesis.
FPP.03.01.04.a. Discuss common food constituents (e.g., proteins, carbohydrates, fats, vitamins, minerals).
NM-MEA.PK-2.1 Understand Measurable Attributes of Objects and the Units, Systems, and Processes of Measurement
NM-DATA.PK-2.1 Formulate Questions That Can Be Addressed With Data and Collect, Organize, and Display Relevant Data to Answer

Student Learning Objectives

As a result of this lesson, the student will …
- Formulate a ***hypothesis*** based on a given set of information.
- Properly measure ***weight*** using micro-scales.
- Record pertinent ***data*** gathered during an experiment.
- Identify three foods that are high in ***sugar.***

Time

Instruction time for this lesson: **50 minutes.**

Resources

National Dairy Council: Food Pyramid Games, Information and Links
http://www.nutritionexplorations.org/kids/main.asp

Holistic Pediatric Association:
http://www.hpakids.org/holistic-health/articles/27/1/Children&%2339%3Bs-Sugar-Intake

National FFA Organization. (2003). LifeKnowledge Precepts and Signs of Success.

Tools, Equipment and Supplies

- **PALS1.34.ONE.ASSESS.A**- one per student
- **PALS1.34.ONE. AS.A**
- **Computer with Internet access**
  (if you plan on using website for games)
- **Various food items containing different amounts of sugar**
- **Bag of sugar**
- **Measuring cups**
- **Wax paper**
- **Gum that contains sugar** *(and sugar free, if you want to compare)*

Key Terms

The following terms are presented in this lesson and appear in ***bold italics***:

Weight
Sugar
Hypothesis
Data

Content Outline

I. What is a ***hypothesis?***
   A. An educated guess made by scientists
   B. A scientist creates an experiment to test the ***hypothesis***
II. Design and conduct a ***sugar*** experiment
   A. Describe what tool a scientist needs to ***weigh*** items
   B. Practice using the digital scales
   C. Student creates a ***hypothesis***
   D. Student conducts the ***sugar*** in gum experiment
   E. Student and teacher discuss the food pyramid and major food groups:

1. Grains
2. Meats and beans
3. Vegetables
4. Fruits
5. Milk
6. Oils

F. Student compares ***hypothesis*** to ***data*** collected

III. Products and their ***sugar*** content

A. Certain food products contain more ***sugar*** than other foods

B. We can't always see or know the ***sugar*** that is in foods

C. Must read the food labels

Interest Approach

*Before the lesson, have the various foods in a bag so that you can use them with the student or students. Also, have a cup of **sugar** in a bag or container.*

Today we are going to talk about what we eat and how important it is that we eat good food. Let's start by talking about you what you ate today. Let's start with breakfast. What did you have?

Allow the student to share, and you can respond by sharing what you had.

What about lunch? What did you eat?

Share.

Did you have any snacks during the day? What were they?

Share and discuss the food options.

What we eat every day is important. We are going to play a game. I will pull out a kind of food, and you tell me if you think it is healthy for you or unhealthy for you. You may not know – sometimes it is hard to tell. Here is the first one.

*Pull various food items from a bag. These could be just the packages of food from your own kitchen or house. Make sure you include some healthy choices and also some that are not healthy. Tricky choices like Pop Tarts and breakfast bars will also provide good discussion. Let the student respond after each choice is shown. Help the student talk through the choice, which could include looking at the food label. Highlight the **sugar** content in some of the foods.*

Sometimes it is hard to know if food is healthy or unhealthy for you. What did we find in a lot of the unhealthy foods? That is right – ***sugar***. Most people eat a lot of ***sugar***, which can be pretty unhealthy for us. How much ***sugar*** do you think most people eat a day?

*Have a bag of **sugar** and some measuring cups. Let the student guess.*

Most kids your age today eat about a cup of ***sugar*** a day! That is a lot of ***sugar*** in our food. Some ***sugar*** is fine, but if we eat too much ***sugar*** it can make our teeth decay, make us unhealthy, and can cause our bodies not to work right.

Today we are going to do an experiment to see how much ***sugar*** is in our food.

Summary of Content and Teaching Strategies

Objective 1. | Formulate a *hypothesis*, based on a given set of information.

We are going to look at how much ***sugar*** is in gum. Do you think this gum has a lot of ***sugar***? Why do you think that? What does the food label tell us about the gum?

Let's make a ***hypothesis***, or a guess, about how much ***sugar*** is in this gum. How much ***sugar*** do you think is in this piece of gum?

*Talk the student through his or her ideas. Help them draw a conclusion or **hypothesis** through discussion. You may actually cut the gum into pieces to signify how much of it is **sugar**.*

Let's write down our ***hypothesis*** on our science sheet so we can remember it!

Use PALS1.34.ONE.AS.A.

Scientists call your guess a ***hypothesis***. Now we get to test your ***hypothesis*** to see if you were right! That means we get to chew some gum!

OBJECTIVE 2 & 3. | Properly measure *weight* using micro-scales. Record pertinent *data* gathered during an experiment.

Start by getting out a set of digital micro-scales.

This is a tool that we use to measure how much something ***weighs***. Scientists must use tools like this to conduct their experiments. We are going to use this tool to do our experiment today on ***sugar*** in gum. Do you know what this machine does?

Elicit answers from student.

Let's try it out. Put something on the machine and see what it does.

*Have the student choose any object around to see the scales begin to measure **weight**. Do this with a number of items.*

Each time you put an item on the scale, it told you how much the item ***weighed*** in grams. We can use that to measure how much our gum ***weighs***!

Let's start our experiment! When you put gum in your mouth, what does it taste like? It is delicious isn't it? What happens after you've chewed gum for a long time?

Let student share their ideas.

You want to spit it out because it isn't sweet anymore. What causes the gum to lose its sweet flavor over time?

Students respond.

Correct. Your body absorbs all the ***sugar*** out of the gum. So, if we ***weigh*** our gum *(demonstrate by putting it on the scales)* and then chew the gum – my favorite part – and then ***weigh*** it again, we can figure out how much ***sugar*** was in the gum!

Let's get started. First, we should both take a piece of wax paper to protect the scales. They are expensive and we want to keep them clean, and we want to make sure we don't introduce germs into our bodies by chewing the gum placed on the bare scales.

Put the wax paper on the scales and zero the scales.

By pushing this button, it makes sure we don't include the paper in the final gum ***weight***. You ***weigh*** your gum first. How much does it ***weigh***?

Help the student say and write down the number on their science sheet.

Exactly right! Great job! Now, you can help me ***weigh*** my piece of gum. Excellent. Let's make sure we put that ***weight*** on our science sheet. It is important that scientists take good notes when they do experiments.

*Continue to add the **data** to PALS.1.34.AS.A as you complete the experiment.*

Now for the fun part! We are going to chew the gum while we talk about healthy and unhealthy foods. Let's start chewing our gum on the count of three. Ready? One…two…three! Chew!

This gum is so good. It is very sweet when we first put it in our mouth! We're talking about good food. There is a really cool pyramid that helps us choose healthy foods. Let's see where gum is on that chart.

Utilize the "My Pyramid" document from the U.S. Department of Agriculture (USDA) in order to discuss the various food groups and ways that kids can be healthier through eating right and exercising.

Are you still chewing? Good. What kinds of food do you see on the chart?

Help the student look through the foods shown under the pyramid.

Do you see ***sugar*** or gum on the list? I don't either. Why do you think that is? This is food that makes us grow and be healthy. Does this mean we cannot eat sweets at all? Absolutely not. Look at the fats and oils section. As long as we are enjoying ***sugars*** in moderation it can be OK. The first group is grains. What is your favorite food in each of the food groups?

Let the student share.

All of those foods are very good, and they are healthy. How much of each food should we have?

Show the student the size of the slice above each food group.

Keep chewing! Here are some ways we can eat healthy.

Read the seven tips on eating healthy.

The last one mentioned trying to reduce our ***sugar***! What about exercise?

Read the seven tips for exercising listed in the "My Pyramid" Document from the USDA.

Exercising can be a lot of fun and can help us be healthy!

Let's get back to our gum. Is your gum as sweet as it was when we started? Mine isn't either. What happened?

Students respond with ideas.

We swallowed a lot of the ***sugar*** that was in the gum. Let's see how much ***sugar*** we swallowed by using our scales. Remember we knew how much the gum ***weighed*** before we chewed it. Now we will ***weigh*** it after chewing it for a while.

Put your gum on the scales first. Great! Let's record how much it ***weighed*** on our science sheet.

*Help the student collect the **data** in the correct place.*

Did it ***weigh*** more or less? Less is right. Now we will ***weigh*** my gum. Will you help me read the scale?

*Have the student tell you the **weight**.*

Very good. Now we get to do some math to see how much ***sugar*** was in our gum.

You can help me subtract one number from the other to figure out how much the ***weight*** changed.

Coach the student through basic subtraction. They will struggle to do this level of subtraction but should be able to help with each step of the subtraction. Use this as a chance to reinforce their subtraction rules.

Thanks for your help! Now we can see how much ***sugar*** was in the gum! There was over _____ grams of ***sugar*** in each of our pieces of gum. That is a lot of ***sugar*** in that little piece of gum. ***Sugar*** is in our foods and sometimes we don't even know it!

As scientists, now we have to see if our ***hypothesis*** was correct.

*Discuss the original **hypothesis** and compare it to your actual results. Help the student use mathematical concepts to compare the **hypothesis** to the **data** collected.*

You are an excellent scientist! We now know how much ***sugar*** is in the gum. We have to be careful when we choose foods to make sure we aren't eating too much ***sugar***!

Review/Summary

Let's look at the food again that we talked about at the beginning of our experiment. Now that we know how much ***sugar*** can be in foods, let's work together to rank the foods from the least amount of ***sugar*** to the most. Let's start with the most ***sugar***. Which food item do you think has the most ***sugar*** in it? Great!

*Go through each of the foods used in the beginning of the lesson and have the student arrange them from most to least amount of **sugar**.*

Excellent job! See how easy it is to choose foods that do not have too much ***sugar***? When we get home today, we should share with our families how important it is not to eat too much ***sugar***!

Application

Small Group Idea

For a small group, you could have each student take a different kind of gum, including sugar-free *gum, to see which gum has the most **sugar**. Each student could do their own experiment using their type of gum.*

Large Group Idea

For the large group, additional instructors should be included to help run experiments in groups of less than three. Each group can then compare their results to the rest of the class. A large group could also utilize the website a great deal to help teach the food pyramid and healthy choices. (http://www.nutritionexplorations.org/kids/main.asp).

PALS1.34.ONE.ASSES.A | Evaluation Answer Key

1. Toast and eggs
2. Fruit
3. Water
4. Sugar-free gum
5. Vegetable
6. Student should circle the digital scales

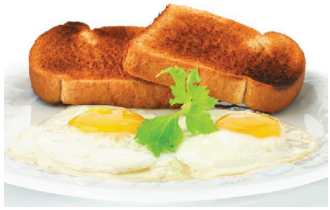
PALS1.34.ONE.ASSES.A

Name:_____

Choose the food that is the healthiest choice**:**

1. 

Pop Tarts



Toast and Eggs

2. 

Candy Bar

Fruit

3. 

Water

Soda Drink

4. 

Normal Gum

Sugar-free Gum

5. 

Vegetable

French Fries

PALS1.34.ONE.ASSES.A *(continued)*

Circle the tool that scientists use to measure how much something weighs:

6.

Microscope

Digital Set of Scales

Beaker

Science Tongs

PALS1.34.ONE.AS.A

Name:_____

Scientists Data Sheet

Hypothesis:

Sugar Data:

Student	Teacher
Gum weight before being chewed	Gum weight before being chewed
Gum weight after being chewed	Gum weight after being chewed
Gum weight difference	Gum weight difference
Weight of Sugar	Weight of Sugar

Conclusion – Was your hypothesis correct?