# Yogurt Is Alive!
# 5th Grade

## Nutrition Objectives:

- Students will learn that dairy foods fit in the Milk Group of MyPyramid and that they provide a significant amount of calcium, protein, vitamins and other minerals for strong bones, strong teeth and healthy bodies.
- Students will learn that yogurt fits in the Milk Group and eating it helps contribute to healthy bones and teeth.
- Students will learn we need to eat **3-A-Day** of dairy from the Milk Group every day to keep our bones healthy.
- Students will learn about the scientific method by conducting an experiment with milk and yogurt.
- Students will learn how to make a healthy yogurt fruit salad.

| Colorado Content Standards | Application of Standard |
|---|---|
| **Science Standard 1:**<br>Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations. | Students will:<br>▪ ask questions and state predictions about yogurt and milk;<br>▪ conduct a simple experiment with litmus paper;<br>▪ use the results of the experiment (data) to conduct a reasonable explanation;<br>▪ communicate in oral and written form the results of the experiment. |
| **Science Standard 3:**<br>Life Science: Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment. | Students will:<br>▪ understand that foods from the Milk group are a good source of calcium, protein, vitamins and other minerals and they are part of a healthy diet. |

## WHAT TEACHERS NEED TO KNOW

All fluid milk products and many foods made from milk are considered part of the Milk Group. Foods made from milk that retain their calcium content such as milk, yogurt and cheese are part of the group, while foods made from milk that have very little or no calcium, such as cream cheese, cream, and butter, are not (information from www.MyPyramid.gov).

### What is Yogurt?

Yogurt is nutritious, like other dairy foods, it provides protein, calcium, vitamins and other minerals. Numerous health benefits beyond it's nutritional value have been associated with consuming yogurt. Scientists have found that the intake of yogurt with active cultures may aid digestion, ease diarrhea, boost immunity, fight infection and protect against cancer.

Yogurt is a mixture of milk (whole, reduced-fat, lowfat or nonfat) and cream fermented (a controlled enzymatic transformation of a product) by a culture of lactic acid-producing bacteria. Sweeteners (e.g., sugar, honey, aspartame), flavorings (e.g., vanilla, coffee) and other ingredients (e.g., fruits, preserves, stabilizers such as gelatin) may also be added. The mixture of dairy products and optional ingredients, except bulky flavorings, must be pasteurized or ultrapasteurized. The milk in most yogurts is also homogenized. Some yogurts carry a seal on the label indicating that the yogurt contains significant level of live, active cultures.

Other cultured dairy foods, buttermilk and acidophilus milk, are made by adding lactic acid-producing bacteria or active cultures to pasteurized milk. These products are produced under highly controlled conditions which allow the "good bacteria" to generate the desired results and creating a wholesome product.

The students will use the scientific method in this experiment.

**1. *Problem or question*** *- define specific problem-usually phrased as a question. What are you curious about, or what have you seen that makes you wonder?"*

***2. Write a hypothesis/make predictions*** *- What do you think is the answer to your question or the reason for your observation?*

***3. Perform tests or experiments*** *- What will you do to test your predictions? Your hypothesis may not have been correct. That's okay!*

***4. State your conclusions*** *- What did your experiment show? Did the experiment confirm your hypothesis? What did you find out from your data that was unexpected, interesting, or new?*

The students will use blue litmus paper to test whether or not milk and yogurt are acids. Litmus paper is a frequently used indicator. In the presence of an acid, blue litmus paper changes to a pink color. When a neutral solution is tested, the litmus will appear not to have changed color.

Acids, or foods that contain acids, such as lemon juice and vinegar, taste sour.

## MATERIALS, INGREDIENTS and TEACHER PREPARATION

| Equipment and Ingredients | Teacher Preparation | Food Preparation |
|---|---|---|
| ▪ chef knife (teacher only)<br>▪ cutting board<br>▪ mixing bowl<br>▪ large spoon<br>▪ portion cups*<br>▪ plastic spoons*<br>▪ napkins*<br>▪ can opener<br>▪ 32 oz low-fat vanilla yogurt<br>▪ 15 oz can mandarin<br>▪ oranges<br>▪ 15 oz can bing cherries<br>▪ 4 bananas<br><br>Experiment:<br>▪ chef knife (teacher only)<br>▪ cutting board<br>▪ small bowl<br>▪ blue litmus paper (3 per student)<br>▪ 1 oz portion cups (2 per student)<br>▪ 1 lemon<br>▪ 1 8 oz plain yogurt<br>▪ 1 pint milk<br>▪ napkins*<br>▪ small wood stir sticks (to taste yogurt) | ▪ MyPyramid Poster<br>▪ activity sheet copies*<br>▪ recipe copies*<br>▪ transparencies (optional) | ▪ Have bananas ready to cut up when making the salad. You may do this ahead of time but bananas will turn brown. This will be fine as you will be adding yogurt to the salad.<br>▪ Open and drain canned bing cherries and mandarin oranges.<br>▪ Have yogurt fruit salad ingredients ready for making salad in front of the class.<br>▪ Have 4 oz portion cups, spoons and napkins ready to pass out. |

*one per student

## SET-UP

**Work area:**

- Students will work individually at their desks.
- Have nutrition table ready for lesson materials and ingredients.

**Other-prep:**

- Cut up lemon into small pieces (one for each student). The lemon is for the litmus paper demonstration. Have napkins ready to pass out with lemons.
- Each student will get 2 one ounce portion cups. One will contain milk and the other plain yogurt. Fill small portion cups less than half way. Have stir sticks ready to pass out for students to use for tasting the plain yogurt during the experiment.
- The blue litmus paper sticks together. Take time to separate the litmus paper before the lesson.
- Have MyPyramid poster displayed.

## INTRODUCTION WITH STUDENTS

**"We will be conducting a scientific experiment and making a healthy yogurt snack. We are going to discuss the health attributes of yogurt and why it is a healthy food for our bodies."**

**"Yogurt contains mineral called calcium and calcium helps our ones and teeth grow strong. Can you locate the Milk Group on the MyPyramid graphic? What other foods belong to this food group?"**

**"In addition to having lots of calcium, yogurt and dairy products provide other essential nutrients, all necessary for good bone health and development:**

- phosphorus, magnesium, potassium, B-complex vitamins, protein, Vitamin A,
- When fortified, vitamin D (usually milk is fortified with both vitamin A and D).

Other sources of calcium include dark green, leafy vegetables, broccoli, soybeans, tofu processed with calcium, orange juice with calcium added, and other calcium-fortified foods.

**"Scientists study what kids eat. scientists have found that kids are not eating enough foods from the Milk group and that they are drinking soda pop instead of milk."**

**"What is 3-A-Day of Dairy? Research shows that most of us are eating only half the recommended 3 servings of dairy each day. 3-A-Day of Dairy was created as a simple reminder for families to get three daily servings of milk, cheese or yogurt for stronger bones and healthy bodies. Have you had your 3 today?"**

Ask the students if they have had any dairy products today. Take time to discuss what they have eaten. Ask the students if any of them think they need to eat more foods from the Milk group. Ask them how they could add more milk products to their diet (in the lunchroom, a yogurt snack after school).

### *Nutrition Behavior Focus*

***Tell students what healthy behavior you want them to practice outside of the classroom.***

*"Choose yogurt as part of 3 A Day of dairy."*

## PROCESS

Step 1: Pass out the “There are Bacteria in my Yogurt” text and read it aloud with the class. Ask the students if they have any questions about the reading.

Step 2: Tell students that they will be conducting a science experiment to test for acid in milk and yogurt. Ask students to tell you how to look for signs of acid in yogurt (thickening and sour taste). Have them refer to their information sheet.

Step 3: Tell the students that while they are conducting their science experiment, they will need to act like scientists. Ask them to tell you what scientists do.

Step 4: Tell them scientists use the scientific method. Go over it with them.

**1. *Problem or question*** *- define specific problem-usually phrased as a question. What are you curious about, or what have you seen that makes you wonder?”*
***2. Write a hypothesis/make predictions*** *- What do you think is the answer to your question or the reason for your observation?*
***3. Perform tests or experiments*** *- What will you do to test your predictions? Your hypothesis may not have been correct. That’s okay!*
***4. State your conclusions*** *- What did your experiment show? Did the experiment confirm your hypothesis? What did you find out from your data that was unexpected, interesting, or new?*

Step 5: Tell the students that they will be using blue litmus paper during this experiment. Tell them that if a substance is acidic the blue litmus paper will turn pink. Tell them that acids taste sour.

Step 6: Tell the students that we are going to prove that blue litmus paper turns pink in the presence of an acid. Pass out the lemon and one piece of litmus paper to each student. Ask the students if they think a lemon is an acid. Have the students smell the lemon and then taste the lemon. Tell them that they will test the lemon, which we know is an acid, with the litmus paper, to prove that the litmus paper turns pink in the presence of acid. On the count of three have each student test the lemon with the litmus paper.
**Important:** Once the students have tested the lemon with the litmus paper, ask them not to put the lemon in their mouth.

Step 7: Pass out the “Yogurt is Alive” activity sheet. Complete the activity sheet as a class by going over it step by step. Have students complete the first page before passing out the experiment materials.

Step 8: Once the students have filled in the steps for doing their experiment explain how to conduct the experiment. Have students look at the table for recording their observations. Tell students that one thing scientists do is write down their observations. Ask students to tell you again what the signs of acid are (thickening, sour taste and smell, litmus paper changing to pink). Now tell students that as they look for those signs they must write them down in the table.

Step 9: Pass out the experiment materials to each student. Tell students they may work together as they conduct their experiment. Make sure the students taste the yogurt and milk before performing the litmus paper test. **Important:** Ask the students not to taste the milk or yogurt after they have performed the litmus test. **Tell the students not to taste the blue litmus paper!**

Step 10: After the students complete the experiment, ask them to record their results and write their conclusions. Have a class discussion about their findings. Remind students that it is important to include all of the information from the results table of the experiment in their conclusions**. Important:** The milk may contain some acid and the litmus paper may change color. If it does it will be a slight change. If this does happen you can use this as a teaching opportunity. Ask the students what this means. It means that there can be a trace amount of acid in milk. Discuss with students that when a scientist makes an incorrect prediction they can also learn valuable information from this.

Step 11: Clean up the experiment area. Have the students wash their hands with soap and warm water.

Step 12: Tell the students that they are going to eat a healthy yogurt fruit salad. Pass out the recipe and demonstrate making the salad in front of the class.

Step 13: Serve salad in cups with spoon and napkins. Eat and enjoy!!

Step 14: Remind students to take their recipe home to share with their family.

### *Make it Happen!*

**Affirm that students know how to choose yogurt as part of 3 A Day of dairy.**

*"Who liked the fruit yogurt snack? Was it easy to make? Could you make and eat it at home? Did you know lots of kids don't get enough calcium in their diet? What other ways can you choose to eat yogurt?*

# There are Bacteria in My Yogurt!

Did you know that when you eat yogurt you are eating live bacteria? Yogurt is made by adding live bacteria to milk (*lactobacillus bulgaricus* or *streptococcus thermophilus).* The milk is kept warm so the bacteria can grow. The bacteria eagerly feed on the milk's natural sugars, producing acid in the process. This process is called **fermentation.** During fermentation several changes take place. The milk thickens into yogurt and the acid gives it a sour or tangy taste.

The live bacteria in yogurt are good for your body. Scientists have found that eating yogurt may help digestion, ease diarrhea, boost immunity, fight infection and protect against cancer. Not only does yogurt provide these additional benefits, it also gives us the protein, calcium, vitamins and other minerals our bodies need every day.

# ¡Hay Bacteria en mi Yogur!

¿Sabía usted que cuando usted come yogur usted come bacterias vivas? El yogur se hace agregando bacterias vivas a la leche (*lactobacillus bulgaricus* or *streptococcus thermophilus).* La leche se mantiene tibia para que las bacterias puedan crecer. Las bacterias se alimentan con ansia de los azúcares naturales de la leche, produciendo el ácido en el proceso. Este proceso se llama **fermentación.** Durante la fermentación varios cambios suceden. La leche se espesa y se convierte en yogur y el ácido le da un sabor agrio.

Las bacterias vivas en el yogur son buenas para su cuerpo. Los científicos han descubierto que el comer yogur puede ayudar la digestión, aliviar la diarrea, mejorar el sistema inmunológico, a combatir infecciones y proteger contra el cáncer. El yogur no sólo proporciona estos beneficios adicionales, también nos da la proteína, el calcio, las vitaminas y otros minerales que nuestros cuerpos necesitan cada día.

# Yogurt Fruit Salad

**Ingredients:** **Yield: 6 – 8 servings**

1 32 ounce container low-fat vanilla yogurt
1 15 ounce can mandarin oranges
1 15 ounce can bing cherries
4 bananas

Directions:

1. Open yogurt and put in a bowl.
2. Open mandarin oranges, drain. Add to the yogurt.
3. Open bing cherries, drain. Add to the yogurt.
4. Cut bananas into slices and add to the yogurt.
5. Mix the fruit and yogurt together.
6. Eat and enjoy!

**What's 3-A-Day of Dairy? 3-A-Day of Dairy was created as a simple reminder for families to get 3 daily servings of milk, cheese or yogurt for stronger bones and healthier bodies. Have you had your 3 today?**

This material was funded by USDA's Food Stamp Program. The Food Stamp Program provides nutrition assistance to people with low income. It can help you buy nutritious foods for a better diet. To find out more, contact your county social services office. This institution is an equal opportunity provider and employer.

# Ensalada de Yogur de Frutas

**Ingredientes:** **Porciones: 6 – 8**

1 contenedor de 32 onzas de yogur de vainilla bajo en grasa
1 lata de 15 onzas de mandarinas
1 lata de 15 onzas de cerezas
4 plátanos

Direcciones:

1. Abra el yogur y póngalo en un tazón.
2. Abra la lata de mandarinas, escúrralas. Agregue al yogur.
3. Abra la lata de cerezas, escúrralas. Agregue al yogur.
4. Corte los plátanos en rebanadas y agréguelos al yogur.
5. Mezcle la fruta y el yogur.
6. ¡Coma y disfrute!

**¿Que es 3-Al-Día de lácteos? 3-Al-Día de lácteos fue creado como un recordatorio sencillo para que las familias obtengan 3 porciones diarias de leche, queso o yogur para tener huesos más fuertes y cuerpos más sanos. ¿Ha tenido usted sus 3 hoy?**

Este material fue fundado por el Programa de Cupones para Alimentos del USDA. El Programa de Cupones para Alimentos provee asistencia nutritiva a gente con bajos recursos. Le puede ayudar a comprar comida mas nutritiva para una mejor dieta. Para obtener mas información, contacte a su oficina de servicios sociales.Esta institución ofrece oportunidad y empleo equitativo para todos.

# Yogurt Is Alive! (5th grade)

Name: _____ Date: _____

**Questions:** ***Does yogurt contain acid? Does milk contain acid?***
To answer these questions you can design and conduct an experiment. Before running any experiment scientists try to predict the outcome. In science we call this a **hypothesis**.

In order to make your hypothesis, answer the following questions.

1. We predict that yogurt has acid _____ yes _____ no

2. We predict that milk has acid _____ yes _____ no

An **experiment** is a way to test your hypothesis. To plan your experiment, you need **materials** and **steps**.

**Materials** we will use for the experiment:
*2 pieces of blue litmus paper*
*1 oz cup with plain yogurt*
*1 oz cup with plain milk*

**In this experiment we will test for signs of acid in:**
*milk*
*yogurt*

**The signs of acid are:**
*substance looks thick* *substance smells sour*
*substance tastes sour* *substance changes blue litmus paper to pink*

**Steps** we will follow for the experiment:
1. We will look for thickness in milk and yogurt.

2. We will smell for _____ in milk and yogurt.

3. We will _____ for sourness in milk and yogurt.

4. We will dip _____ in milk and yogurt to look for color change (blue=no acid / pink=acid).

**Conduct the experiment and record your results in the table below.**

| Test Liquid: | It looks: (thin/thick) | It smells: (sour/sweet) | It tastes (sour/sweet) | Litmus test (color) |
|---|---|---|---|---|
| Milk | | | | |
| Yogurt | | | | |

**Conclusions** are based on the results of your experiment and help determine if your hypothesis was correct or incorrect. Therefore, you can answer your original questions.

Write your conclusions. Use **all** the results of your experiment to explain if acid is present in milk or yogurt (use complete sentences). Were your predictions correct? Do you have any other questions about yogurt or milk?

# ¡El Yogur esta Vivo! (5$^{to}$ grado)

Nombre: _____ Fecha: _____

**Preguntas**: ¿Contiene el yogur ácido? ¿Contiene la leche ácido? Para contestar estas preguntas usted puede diseñar y realizar un experimento. Antes realizar un experimento los científicos tratan de predecir el resultado. En la ciencia nosotros le llamamos una **hipótesis**.

Para formular una hipótesis, conteste las siguientes preguntas.

1. Nosotros predecimos que el yogur tiene ácido ____ sí ___ no

2. Nosotros predecimos que la leche tiene ácido ____ sí ___ no

Un **experimento** es una manera de probar su hipótesis. Para planear su experimento, usted necesita los **materiales** y los **pasos**.

Los **Materiales** que usaremos pare este experimento:
*2 pedazos de papel azul de tornasol*
*1 tacita de una onza con yogur natural*
*1 tacita de una onza con leche natural*

**En este experimento probaremos los signos de ácido en:**
leche
yogur

**Los signos de ácido son:**
*La sustancia se ve espesa* *la sustancia huele agria*
*La sustancia sabe agria* *la sustancia cambia el papel de azul a rosa*

Los **pasos** que seguiremos para el experimento:

1. Veremos si hay algo espeso en la leche y el yogur.

2. Oleremos algo _____ en la leche y el yogur.

3. Nosotros _____ la acidez en la leche y el yogur.

5. Mojaremos _____ en la leche y el yogur para ver si hay cambio de color (azul = no ácido/rosa = ácido).

**Realice el experimento y registre sus resultados en la cuadricula de abajo.**

| Test Liquid: | It looks: (thin/thick) | It smells: (sour/sweet) | It tastes (sour/sweet) | Litmus test (color) |
|---|---|---|---|---|
| Milk | | | | |
| Yogurt | | | | |

Las **conclusiones** se basan en los resultados de su experimento y ayudan a determinar si su hipótesis era correcta o incorrecta. Por lo tanto, usted puede contestar sus preguntas originales.

Escriba sus conclusiones. Utilice **todos** los resultados de su experimento para explicar si el ácido esta presente en la leche o el yogur (use oraciones completas). ¿Eran sus predicciones correctas? ¿Tiene usted otras preguntas acerca del yogur o de la leche?