

GROW YOUR PALS PROGRAM GUIDE



THE NATIONAL FFA MENTORING PROGRAM

Sponsored by



LESSON 1.24

Make Your Own Cheese

Unit:
FIELD TO FORK

PRECEPTS

A. Action

- A1. Work independently and in groups
to get things done



Lesson Type:
Small Group

NATIONAL STANDARDS

- CS.01.01.01.c. Work independently and in group settings to accomplish a task.
FPP.03.01.02.a. Explain the application of chemistry and physics to food science.
FPP.03.01.05.a. Identify common food additives (e.g., preservatives, antioxidants, buffers, stabilizers, colors, flavors).
FPP.04.03.01.a. Identify and describe foods derived from meat, egg, poultry, fish and dairy products.
NL-ENG.K-12.12 – Applying Language Skills
NM-MEA.PK-2.1 Understand Measurable Attributes of Objects and the Units, Systems, and Processes of Measurement
NM-MEA.PK-2.2 Apply Appropriate Techniques, Tools and Formulas to Determine Measurements
NS.K-4.1 Science as Inquiry

STUDENT LEARNING OBJECTIVES

As a result of this lesson, the student will ...

- List the ingredient needed to make cheese.
- Describe the steps in the basic cheese-making process.





TIME

Instruction time for this lesson: **45 minutes**.



RESOURCES

“How Cheese Is Made”- Video found at: <http://www.wisdairy.com/AllAboutCheese/Cheesemaking/MakingCheese.aspx>

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



TOOLS, EQUIPMENT AND SUPPLIES

- ✓ Cheesecloth about 12” square
- ✓ Stove or hotplate
- ✓ Saucepan
- ✓ Cooking thermometer
- ✓ One quart of milk
- ✓ Six plastic cups, 16 oz. size
- ✓ Salt
- ✓ Rennin
- ✓ Napkins, forks and plates
- ✓ PALS1.24.SG.AS.A - one per student
- ✓ PALS1.24.SG.AS.B - one per student
- ✓ Audio/visual equipment for clip in large group idea

KEY TERMS



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

Whey

Curd



CONTENT OUTLINE

- I. Ingredients in cheese
 - A. Milk- the primary ingredient in all cheeses is milk. The milk in cheese may be collected from a variety of animals including: cows, goats and sheep
 - B. Rennin- rennin is an enzyme that is found naturally in young animal stomachs.
 1. Rennin is added in the cheese-making process to separate the milk
 2. The milk is separated into solids (***curds***) and the remaining liquids (***whey***)

C. Salt- salt is added in the cheese-making process for three reasons:

1. Prevents bacteria growth
2. Hardens the **curds**
3. Adds flavor

II. Cheese-making process

- A. Measure one quart of cold milk and pour into a saucepan
- B. Heat the milk to a temperature between 80-90 degrees Fahrenheit
- C. Add 12 drops of rennin to the heated milk. Rennin is an enzyme that helps separate the **curds** from the **whey**
- D. Fill three plastic 16 oz. cups about two-thirds full
- E. Allow time for the separation process, the separation of the **curds** from the **whey**. This may take several minutes
- F. Fold the cheese cloth in half and place it over the cup
- G. Tip the cup over and strain the **whey** through the cloth into another plastic cup. Repeat this process with all three cups
- H. Add a dash of salt to each cup of cheese and press any remaining liquid
- I. Cut and serve the finished cheese

INTEREST APPROACH

Prepare for today's lesson by organizing all of the ingredients and equipment needed for the cheese-making project. Be sure to have plenty of napkins and cloths ready for any accidental spills. Also, have copies of PALS1.24.SG.AS.A made for each of your PALS team members. It is very important to discuss any food allergies the students may have before beginning the lesson. Provide alternative snacks or ingredients for those students with allergies. To ensure food safety, have students wash their hands or use hand sanitizer as they enter the room or at the very beginning of the lesson.



Let's start off today with a little snack that might just get us on the right track.

Share small cubes of different types of cheeses with your PALS.



Isn't this cheese delicious? I did not make this cheese, I bought it from the store but I have always been curious about how cheese is made. Who has helped their parents cook? What are some fun foods you have cooked at home?

Allow time for students to share their experiences making foods (such as cookies, cake, pasta) at home with the group.



Mmmm. . .those all sound delicious. I hope we have as much fun in class making cheese as you do at home making those delicious treats. Let's get started and discover how this delicious snack was made.

SUMMARY OF CONTENT AND TEACHING STRATEGIES

OBJECTIVE 1. | List the ingredients needed to make cheese.



The first step in making cheese is to gather all of the important ingredients. What do you think is the most important?

Allow your PALS time to respond.



Milk is the most important ingredient in cheese. Guess where we get our milk from.

Allow your PALS time to respond.



Well, the milk we have here today is milk that came from a cow. But did you know cheese can be made from the milk of lots of different animals such as goats, sheep and even camels!

The other two ingredients we will need are rennin and salt. Salt is added to keep bacteria that might make you sick from growing in the cheese. The salt also adds special flavor to the cheese. Rennin is an enzyme that helps separate the milk into liquid parts and solid parts. The liquid part is called the **whey** and the solid part is called the **curd**. Remember the poem about Little Miss Muphet?

Review the lyrics to the Little Miss Muffet nursery rhyme using PALS1.24.SG.TM.A.



Little Miss Muffet sat on a tuffet eating her **curds** and **whey**, along came a spider, who sat down beside her, and scared little Miss Muffet away!

Besides these three main ingredients, we will also need several tools. We have a pan, a measuring cup, spoons and plastic cups. We will also need cheese cloth to separate the **curds** from the **whey**. Also, we need a hot plate to heat the milk to make the cheese.

As you describe the equipment needed, allow the students to hold and feel the cheese cloth. Also, be sure to make your PALS aware of the danger of touching the hot plate or any food or pans on the hot plate.



Please be very careful and do not touch the hot plate or the hot milk as we make the cheese. Safety is always important.

I. Ingredients in cheese

D. Milk- the primary ingredient in all cheeses is milk. The milk in cheese may be collected from a variety of animals including: cows, goats and sheep

E. Rennin- rennin is an enzyme that is found naturally in young animal stomachs. Rennin is added in the cheese-making process to separate the milk into solids (**curds**) and the remaining liquids (**whey**)

F. Salt- salt is added in the cheese-making process for three reasons:

4. Prevents bacteria growth
5. Hardens the **curds**
6. Adds flavor



OBJECTIVE 2. | Describe the steps in the basic cheese-making process.



Now that we have gathered all of our ingredients and equipment, let's get started making our cheese. We will need each of you to be my cheese chefs today. Are you ready?

Great! Just like every good chef, we have a recipe to follow right here.

Show your group PALS1.24.SG.AS.A.



We will start with step one: Measure one quart of milk into the saucepan.

Allow your PALS to measure the milk and pour one quart into the saucepan. Then, continue through steps 1-5 on PALS1.24.SG.AS.A, allowing students to complete the steps themselves. Encourage your PALS to measure accurately and to act safely around the hot plate.



Very good! Step two: Heat the saucepan on the hot plate until the milk reaches a temperature between 80 and 90 degrees Fahrenheit. Use the thermometer to measure the temperature. Remember to be especially careful because the milk is very hot.

Now that our milk has reached 80 degrees, we will need to add 12 drops of rennin to the milk. Count with me as we add the drops. 1-2-3-4-5-6-7-8-9-10-11-12. Very Good!

Now, I will carefully pour the hot milk into three plastic cups. As the milk cools, it will separate into the solids and the liquids. Do you remember what we call the solids?

Allow your PALS to respond.



Great! The solid part of the milk is called the **curd**, and the liquid part is called the **whey**.

The separation process may take several minutes so we have to be very patient. As we wait, let's review what we have already done. On this worksheet (*provide group with PALS1.24.SG.AS.AS.B*), we will make cheese making guides. In your guide, be sure to list all of the ingredients and equipment that are needed. Then, provide step by-step directions that describe how to make cheese. Make sure that your directions are very clear. Also, add pictures and color to your guide to help your reader understand what to do.

*Monitor student progress as they complete the assignment. Allow the students to view copies of PALS1.24.SG.AS.A to assist them in completing this activity. Also, keep an eye on the three boils of milk. When at least half of the milk in each cup has separated into chunky **curds**, move on to the next step.*



It looks like it is time to finish making our cheese. Let's put down our crayons and pencils and get back to being cheese chefs. Step five says to fold the cheese cloth in half and place it on top of the cup filled with **curds** and **whey**. Then, strain the **whey** through the cheese cloth to leave only the solid parts in the cup. We will do this with all three cups.

Allow your PALS to complete steps five and six.



Now, squish the **curds** together and drain off any leftover liquid. Then, we will add salt. Just a dash for each cup will do.

Allow your PALS to complete steps seven and eight.



Very good! You have all been such great cheese chefs today. Do you know what step is next?

Allow PALS to respond.



That's right! It is time to taste the cheese you worked so hard to make.



Cut the cheese into small pieces and serve these to your PALS. You may wish to serve the cheese with snack crackers if available.



REVIEW / SUMMARY

Modified Go-With-the-Flow e-Moment®



Yummy! Thank you for working so hard to make this delicious cheese. Let's review how we made our cheese. When I call on you, tell me the next step in the cheese making process. I will start us off with the first step: First we poured the milk into our saucepan.

What is the next step?

Call on group members one at a time to share the next step in the cheese-making process.



Now, we will work together to finish our cheese-making guides. Remember to show all steps from one to nine and to draw pictures showing how we completed each step.

Continue to monitor students progress as they eat their homemade cheese and complete the cheese-making guides.

APPLICATION



Large Group Idea

Allow your PALS to watch the sample video titled "How Cheese is Made," which will show the students how cheese is made on a large scale in factories. This video is found at: <http://www.wisdairy.com/AllAboutCheese/Cheesemaking/MakingCheese.aspx>.



One-on-One Idea

Experiment making cheese with different types of milk, such as 2%, heavy whipping cream, goat milk and condensed milk. Discuss why the cheeses made from each milk taste and feel different than the others.



PALS1.24.SG.AS.A | EVALUATION ANSWER KEY

Students will be evaluated based on their performance on the Cheese-Making Guide activity. Students will use PALS1.24.SG.AS.B to design a guide to making cheese, which will include a list of equipment and ingredients as well as picture depictions of the nine basic steps of cheese-making.

The students will be evaluated using PALS1.24.SG.RUBRIC.A.

PALS1.24.SG.AS.A

Cheese-Making Process

1. Measure one quart of cold milk and pour into a saucepan
2. Heat the milk to a temperature between 80-90 degrees Fahrenheit.
3. Add 12 drops of rennin to the heated milk. Rennin is an enzyme that helps separate the curds from the whey.
4. Fill three plastic 16 oz. cups about two-thirds full.
5. Allow time for the separation process, the separation of the curds from the whey. This may take several minutes.
6. Fold the cheese cloth in half and place it over the cup.
7. Tip the cup over and strain the whey through the cloth into another plastic cup. Repeat this process with all three cups.
8. Add a dash of salt to each cup of cheese and press any remaining liquid.
9. Cut and serve the finished cheese.

PALS1.24.SG.TM.A

*Little Miss Muffet sat on a tuffet,
Eating her curds and whey,
Along came a spider,
Who sat down beside her,
And scared little Miss Muffet away!*

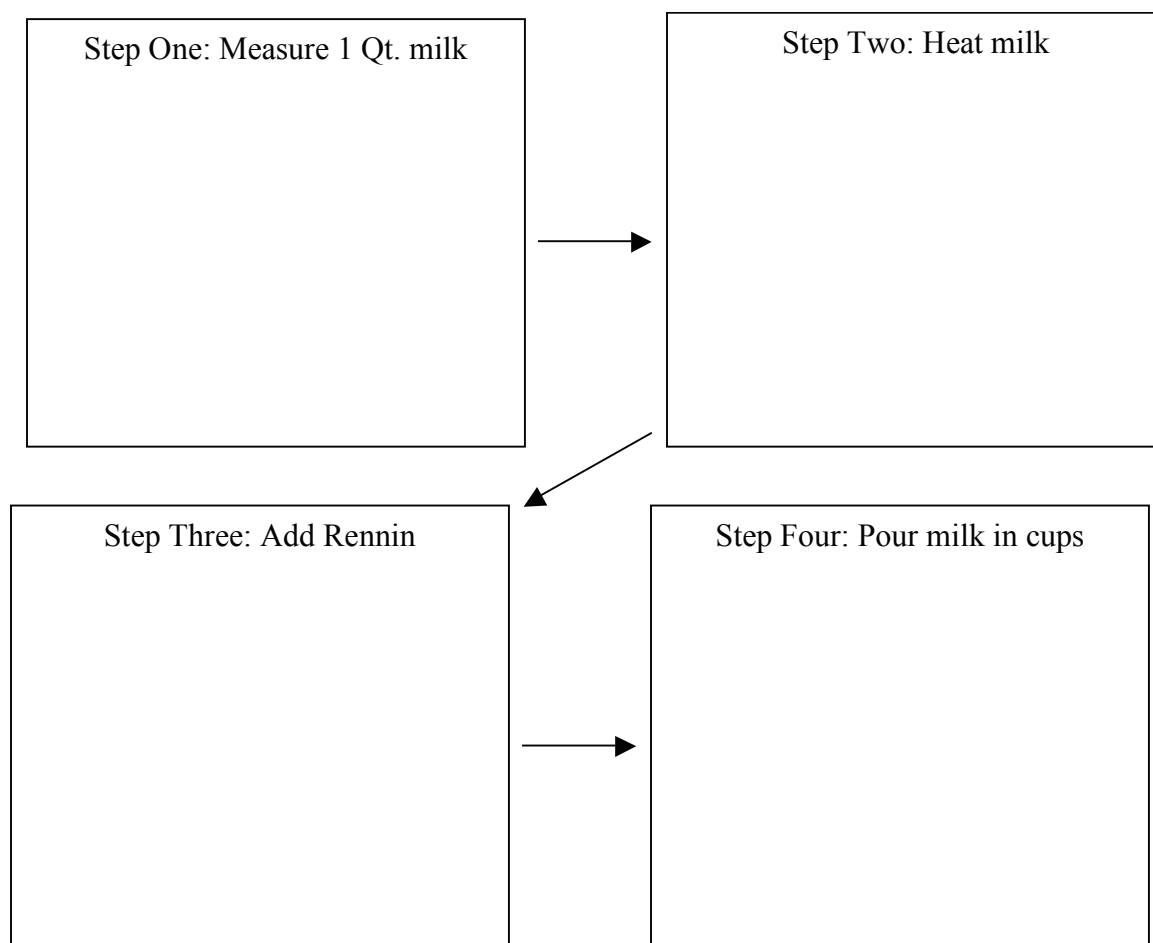
PALS1.24.SG.AS.B

How to Make Cheese

A Recipe Guide Created by: _____

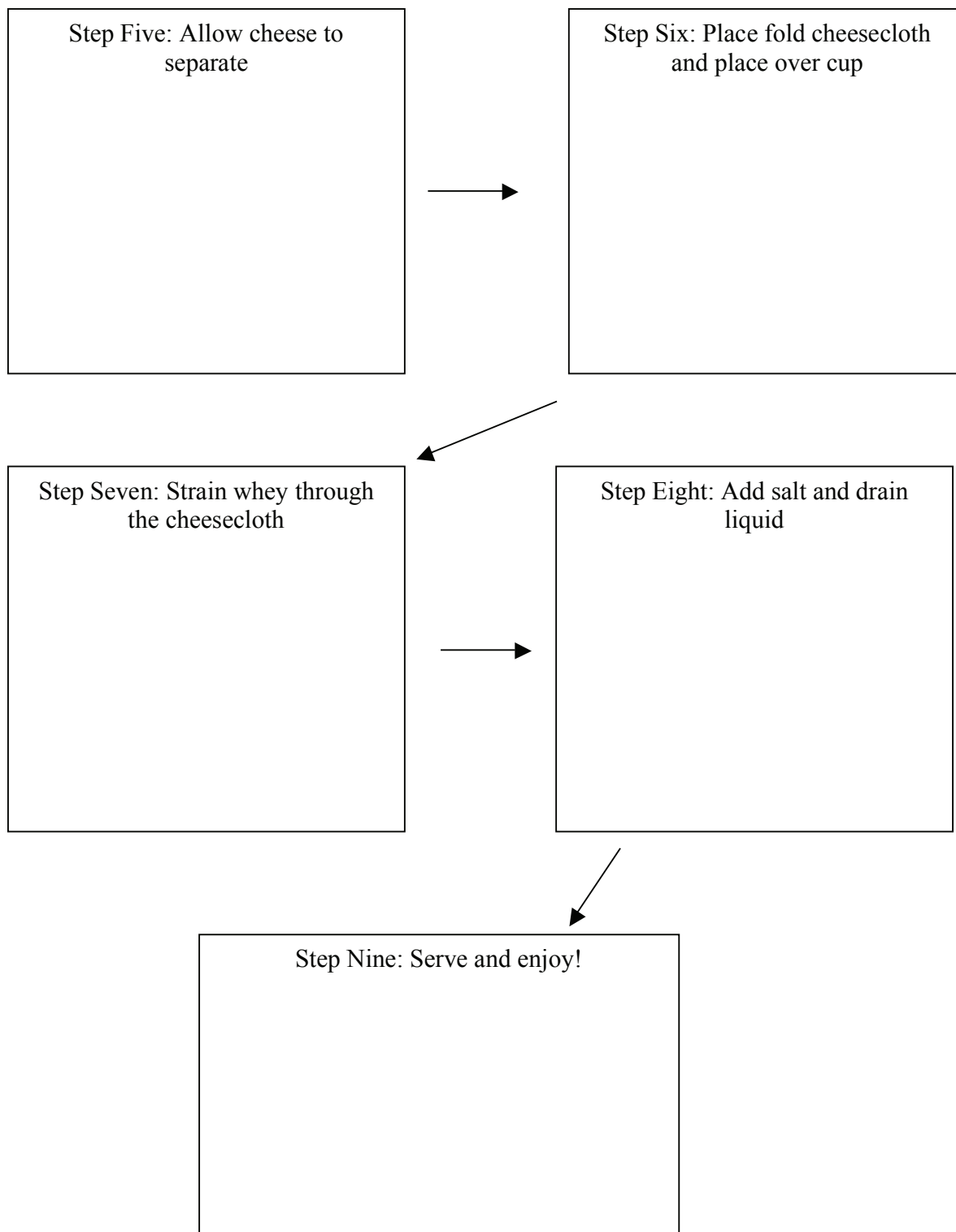
Equipment and Ingredients Needed:

Steps to Make Cheese: Draw pictures to describe how to make cheese.



PALS1.24.SG.AS.B

Continue Cheese-Making Process Below



PALS1.24.SG.RUBRIC.A

	1-2 points	3-4 points	5 points
Equipment and Ingredients	Some equipment and ingredients are listed.	Most of the equipment and ingredients are listed.	All of the needed equipment and ingredients are listed.
Step #1	The picture attempts to depict the appropriate step of the cheese-making process.	The picture adequately depicts the appropriate step of the cheese-making process.	The picture is colorful and neat and clearly depicts the appropriate step of the cheese-making process.
Step #2	The picture attempts to depict the appropriate step of the cheese-making process.	The picture adequately depicts the appropriate step of the cheese-making process.	The picture is colorful and neat and clearly depicts the appropriate step of the cheese-making process.
Step #3	The picture attempts to depict the appropriate step of the cheese-making process.	The picture adequately depicts the appropriate step of the cheese-making process.	The picture is colorful and neat and clearly depicts the appropriate step of the cheese-making process.
Step #4	The picture attempts to depict the appropriate step of the cheese-making process.	The picture adequately depicts the appropriate step of the cheese-making process.	The picture is colorful and neat and clearly depicts the appropriate step of the cheese-making process.
Step #5	The picture attempts to depict the appropriate step of the cheese-making process.	The picture adequately depicts the appropriate step of the cheese-making process.	The picture is colorful and neat and clearly depicts the appropriate step of the cheese-making process.
Step #6	The picture attempts to depict the appropriate step of the cheese-making process.	The picture adequately depicts the appropriate step of the cheese-making process.	The picture is colorful and neat and clearly depicts the appropriate step of the cheese-making process.
Step #7	The picture attempts to depict the appropriate step of the cheese-making process.	The picture adequately depicts the appropriate step of the cheese-making process.	The picture is colorful and neat and clearly depicts the appropriate step of the cheese-making process.
Step #8	The picture attempts to depict the appropriate step of the cheese-making process.	The picture adequately depicts the appropriate step of the cheese-making process.	The picture is colorful and neat and clearly depicts the appropriate step of the cheese-making process.
Step #9	The picture attempts to depict the appropriate step of the cheese-making process.	The picture adequately depicts the appropriate step of the cheese-making process.	The picture is colorful and neat and clearly depicts the appropriate step of the cheese-making process.