



Constructing the Process

Middle School Food and Agricultural Literacy Curriculum

Precepts:

- D. Character
- D3. Accept Responsibility for Personal Actions.

National Standards

- FPP 04.03.02.a. Explain methods and materials for processing foods for sale as fresh-food products.
- FPP 04.03.05.a Explain materials and methods of food packaging and presentation.
- NL-ENG.K-12.5 - Communication Strategies
- NL-ENG.K-12.12 - Applying Language Skills

Student Learning Objectives

- As a result of this **unit**, the student will be able to...
 - Examine processes involved in food science.
- As a result of this **lesson**, the student will be able to...
 - Identify the difference between a raw material and a finished product.

Content Outline

- I. **Identify the difference between a raw material and a finished product.**
 - A. Separation. Separation is an important process that separates food from non-food items, for example:
 - 1. Shell from nuts
 - 2. Skin from potatoes
 - 3. Water from vegetables
 - B. Disintegration. Disintegration is making small pieces out of larger pieces of food. For example:
 - 1. Grinding (ground beef)
 - 2. Cutting (fresh cut lettuce)
 - 3. Shredding (cheese)
 - C. Mixing.
 - 1. Mixing dry ingredients together
 - 2. Mixing ice cream to create new flavors
 - 3. Mixing seasoning with meat to add flavor

Time

Instruction time for this lesson: 45 minutes.

Resources

Hayes, K. Introduction to Food Science, Purdue University CopyMat, 2005.
National FFA Organization. (2009). LifeKnowledge Online. Retrieved September 1, 2009 from <http://agedlearning.org>

Tools, Equipment, and Supplies

Overhead projector/transparencies
Canister of modeling material – one per student
Materials for a gingerbread house: *graham crackers, M&M's, bubble gum, sprinkles, and any other items*
Writing surface
Writing utensil
MS.FS.2.7.TM.A – one per teacher
MS.FS.2.7.AS.1 – one per student
MS.FS.2.7.ASSESS.A – one per student

Key Terms

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

Raw material

Finished product

- D. Drying. — Drying is removing water with minimum damage from the food.
 - 1. Evaporation using the sun or a heat dehydrator, like beef jerky
 - 2. Boil off water such as boiling sugar syrup to make hard candy
 - 3. Freeze Dry – freeze food then dehydrate to create frozen juice products.
- E. Forming – Forming foods into a certain shape or thickness helps establish uniformity.
 - 1. Hamburger patties
 - 2. Candy
 - 3. Breakfast cereals and snack foods
- F. Packaging. — Packaging is used to preserve, protect, and make the food product easy to use. Common packaging types are:
 - 1. Paperboard – cardboard boxes
 - 2. Metal Cans – soup, vegetables, fruits
 - 3. Glass – mayonnaise, salad dressing
 - 4. Plastics – meat, ketchup, TV dinners



Lesson Number: MS.FS.2.7

Middle School Food and Agricultural Literacy Curriculum

The Importance of Processing

Interest Approach

Before class, place stacks of supplies to build a small gingerbread house on tables. Graham crackers, bubble gum, M and M's, sprinkles, and any other items that could be used are appropriate. Give students very few directions about how to build the gingerbread house or which materials should go on the house. Let students take the "**raw materials**" and turn them into "**finished products**." Let their creativity drive the end result. They might create something different, which is okay too. If you would rather provide materials for a different project other than building a gingerbread house, try that! A different project might be appropriate for the room, the time of year, or the particular group of students.

Welcome to class today! As you look around at the tables that are occupied with various supplies I want you to begin to think like a construction worker or an architect. A construction worker and an architect approach building a structure very similarly. Who can tell me the similarities among these two professions?

Similarities might include: start with a plan/blueprint, ensure they have all the materials or tools they need, have the right team to build the structure, must complete a project within a time limit, etc.

I couldn't agree more with your thoughts. Now that we have a greater understanding about these professions, let's pretend we are construction workers or architects. Let's divide up into crews and start using these supplies.

Divide students into groups with no more than five students per group. For this activity, it might be best to let students choose their own groups.

Now that we've established our crews, let's begin working. When you hear me say BUILD, we will have six minutes to create a **finished product** with only the supplies that are the table. As your foreman, I'm leaving the idea, the planning and the constructing up to you. The task is to use our imaginations. What questions are there? BUILD!

Gauge student progress and provide more time if it is necessary.

Let's see our **finished products**. What did we create?

Solicit student answers.

Why did we create those things?

Solicit student answers.

What steps or ideas did we use to turn the **raw materials**, or supplies, and make **finished products**?

Solicit student answers.

Who will identify some of the **raw materials** we used to create the product?

Solicit student answers.

Today, we will be learning how each of those supplies that you used were derived from **raw materials**. It's important that we are able to differentiate between a raw product and a finished on product! Be prepared to take notes and work diligently throughout today's lesson.

Summary of Content and Teaching Strategies

Objective 1. Identify the difference between a **raw material** and a **finished product**.

Use the Michelangelo e-Moment®. This activity supports students as they sculpt their understanding of each term and assists students in physically experiencing a new model, process, or event they just learned.

Before we begin, let's discover processes used to turn **raw materials** into **finished products**.

Distribute **MS.FS.2.7.AS.A** to each student.

On the sheet of paper in front of us, we will find the different types of processes that food must go through to be completed.

Using student input, briefly summarize the content on the handout, reviewing any steps that need clarification.



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The Importance of Processing

To demonstrate each process, we will be creating sculptures with our molding clay to represent the process that is described for each **raw material**. When you hear PLAN, you will have three minutes to read through each process and write down your thoughts or ideas next to each item. What questions are there? PLAN!

Provide three minutes for students to read. When time has expired, check for understanding; then, move to the next set of directions for the activity.

Now that everyone understands, let's move forward. We are going to use the ideas that we have created to build a sculpture that represents each process. Take extreme care of the molding materials. No mixing of colors, no inappropriate art, and all materials must remain on the desks. I will know when you are finished when the sculptures are lined up in the order they appear on your handouts. Once we complete our sculptures, remain quietly in your seats because we follow up with a gallery walk.

Check for understanding and distribute molding clay.

When you hear SCULPT, you will have 10 minutes to pair up with someone and build together. SCULPT!

Provide students 10 minutes to complete the sculptures.

Artists, prepare to reveal your finest work! Everyone stand up walk quietly around to each set of sculptures. Return to your seats once you have viewed all sculptures. Everyone up! Let's walk!

Move around the room with the students then write this question on the writing surface: What is the difference between a **raw material** and **finished product**?

Let's give everyone a round of applause.

Lead applause.

Let's look at the question. Based on the activities and the information we have, let's answer this.

Lead discussion, write their responses on the writing surface.

Great conclusions! Let's capture these definitions at the bottom of our processing sheets:

A **raw material** is any food that is uncooked, unprocessed, and often natural.

A **finished product** is a completely processed food product which is ready for sale and delivery to the marketplace.

Have students clean up their area.

Review/Summary

We've finally crossed the finish line! We have been very productive today! We built two sculptures and learn how **raw materials** move to finished goods at the same time! One more round of applause for finishing our food products!



The Importance of Processing

Application

Extended classroom activity:

Finish your own food product by taking meat, separating it from the bone, forming it or shredding it into strips, mixing in ingredients, and then drying and packaging the product. This will be the students' opportunity to create homemade beef jerky. Recipes can be found at www.beefjerkyrecipes.com

FFA activity:

Students can create their own packaging for a finished food product. This is a portion of the Food Science CDE and will allow students to explore and discover this CDE as a potential opportunity to be competitive in during high school.

SAE activity:

As middle school students, throughout SAE activities, students should be developing an SAE on an exploratory basis. Have students explore potential SAEs in the Ag Processing Proficiency Award area. Each student can choose a topic based on this description: Ag Processing involves students working in assembling, transporting, processing, fabricating, mixing, packaging, and storing food and nonfood agricultural products. Programs may include processing meat, milk, honey, cheese, raisins and other dried fruits, maple syrup and/or other food processing. Non-food products could include byproducts processing such as meat, bone, fish and blood meal, tallow, making compost, hides, processing of wool and cotton, cubing and pelleting of forages, producing bird seed and other pet foods.

Evaluation

MS.FS.2.7.ASSESS.A

Answers to Evaluation

1. A
2. A
3. B
4. Cans, Paperboard, Plastics, Glass (one-half point each)
5. A raw material is any food that is uncooked, unprocessed, and often organic.

A finished product is a completely processed food product which is ready for sale and delivery to the marketplace. (one-half point each)



Separation — Separation is an important process that separates food from non-food items, for example:

- Shell from nuts
- Skin from potatoes
- Water from vegetables

Disintegration — Disintegration is making small pieces out of larger pieces of food. For example:

- Grinding (ground beef)
- Cutting (fresh cut lettuce)
- Shredding (cheese)

Mixing — Mixing is to create or form by combining ingredients.

- Mixing dry ingredients together
- Mixing ice cream to create new flavors
- Mixing seasoning with meat to add flavor

Drying — Drying is removing water with minimum damage from the food.

- Evaporation using the sun or a heat dehydrator, like beef jerky
- Boil off water such as boiling sugar syrup to make hard candy
- Freeze Dry – freeze food then dehydrate to create frozen juice products.

Forming — Forming foods into a certain shape or thickness helps establish uniformity.

- Hamburger patties
- Candy
- Breakfast cereals and snack foods

Packaging — Packaging is used to preserve, protect, and make the food product easy to use. Common packaging types are:

- Paperboard – cardboard boxes
- Metal Cans – soup, vegetables, fruits
- Glass – mayonnaise, salad dressing
- Plastics – meat, ketchup, TV dinners

Define:

Raw Material:

Finished Product:



Identify the difference between a raw material and a finished product. A raw material is any food that is uncooked, unprocessed, and often natural. A finished product is a completely processed food product which is ready for sale and delivery to the marketplace.

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Name _____

Directions: Read each statement and circle the letter next to the correct answer.

1. ____ **Mixing is to create or form by mixing ingredients.**
A. True
B. False
2. ____ **An example of disintegration is grinding.**
A. True
B. False
3. ____ **Which process separates food from non-food items?**
A. Freezing
B. Separating
C. Mixing
D. Forming

Short Answer.

4. **List four types of packaging.**

A. _____
B. _____
C. _____
D. _____

5. **Define the following:**

Raw Product _____

Finished Product _____