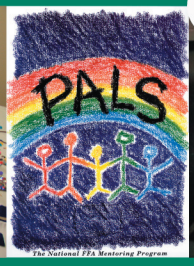
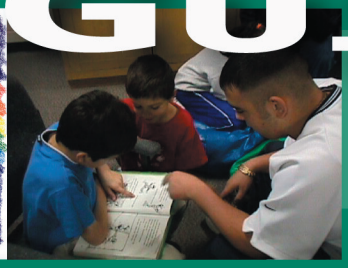
Grow Your PALS Program Guide





The National FFA Mentoring Program

Sponsored by Campbell's

Lesson 42

Water, Water Everywhere

Unit: Food Science

Precepts

A. Action

A8. Evaluate and reflect on actions taken and make appropriate modifications

Lesson Type:
Small Group

National Standards

NS.K-4.2 Physical Science
NL-ENG.K-12.3 Evaluation Strategies

Student Learning Objectives

As a result of this lesson, the student will …

1. Define dehydrate and reconstitute.
2. Observe and measure the differences between dehydrated and reconstituted foods.

Time

Instruction time for this lesson: **25 minutes.**

Resources

http://www.budget101.com/dehydrated_foods.htm
http://www.recipelink.com/mf/20/7760

Tools, Equipment and Supplies

- **kitchen or scientific scale that measures in ounces or grams**
- **dried fruits** (apples, apricots or prunes)
- **fresh fruits** (same kind as the dried)
- **bowl or pan and warm water**
- **slice of fresh bread**
- **paper towels or a tablecloth**

Optional supplies may include:

- **food dehydrator**
- **fresh fruit** (to dehydrate)

Key Terms

The following term is presented in this lesson and appears in ***bold italics***:

dehydrate

reconstitute

Interest Approach

With this interest approach we want to get the students curious about today's activity. So set up the table with the fresh and dried fruits under a tablecloth or paper towel, so they cannot see them. Then act as if you are going on a pretend camping trip and you are preparing your food sack to take along.

Let's pretend that we are going to pack our snacks for the trip. What kind of snacks would be good to take on our camping trip?

Allow time for students' responses. Try to lead answers toward snack descriptions such as healthy, lightweight, portable (easy-to-take-along items), and simple.

We need snacks that are nutritious, lightweight and small. What could we pack? (*Pause.)* What should we take

Allow students to come up with a few ideas, and then unveil your table of fruit snacks.

Underneath this tablecloth here, we have some snacks. Let's take a look. *Remove the tablecloth or paper towels.* Wow! What all do we have here? *You may introduce the items or have students name the various fruits.*

It looks like we have some healthy snacks but something is different. What is the difference between this _____(*fresh fruit*) and this _____(*dried fruit item*)?

They look different. What could have happened to them? *Allow students to respond*.

Today we are going to discover what happens when the water is removed from food and why it is important for food storage.

Summary of Content and Teaching Strategies

Objective 1. | Define dehydrate and reconstitute.

Definitions may be written on the board for students or handed out on paper.

What was the first thing you noticed about our fruit on the table? Yes, the water was taken out of them.

This is called ***dehydrating.*** *To* ***dehydrate*** is to remove the water from an object.

Why would you remove the water?

Wait for students' answers and lead them to the following ideas: to store or keep smaller packaging.

What kinds of foods are usually ***dehydrate***d?

Common dehydrated foods include: fruits, raisins, dry milk and others.
Now that you know water can be removed from food, do you think it can be added back into the food? *Pause, giving students a chance to ponder the concept*. Yes, it can.

That process is called reconstitution.

Reconstitute means to add water back into a ***dehydrate***d food.
Some common dehydrated foods are ***reconstituted***, before they can be consumed. The best example is frozen concentrated orange juice. Before you can drink it, you must add water to it.

Wow, this is good stuff. But which way will be the best for our trip? Now let's check out the weight of the different items.

OBJECTIVE 2. | Observe and measure the differences between dehydrated and reconstituted foods.

Which item weighs the most the ***dehydrate***d or ***reconstitute***d food? Let's take a look.

Have a couple of students hold food up and guess the weight. Then weigh the food on the scale. Have one student record the information.

What made the difference in the weights? That's right, the water content. Taking the water out of foods is one way to make them last a little longer and become much lighter. So, which type do we want to pack for our snack bags? You got that right, the ***dehydrate***d foods.

Let's review.

Review/Summary/Evaluation

Use the Go-With-the-Flow Moment to show how the fruits become ***dehydrated****.*

The standard method of dehydrating vegetables and spices is to place the items on a conveyor belt and run them through an oven at a high temperature for a relatively short time. Between 90 and 95percent of the moisture is removed this way.

Some vegetables are more suited to this form of drying than others. This means that with the addition of water, the product rehydrates back to its original state more easily. Preferable items include: onions, bell peppers, tomatoes, celery, carrots and mushrooms. Dehydrated items such as peas, corn and green beans do not rehydrate as well as their freeze-dried versions.

Application

Continued Discussion/Activity: *Continue to work in small groups of mentors/mentees to determine why water is important to all living things. Discuss the different kinds of packaging and their importance.*

One-on-One Suggestion: *Review with your PALS what dehydrating and reconstitution is and why we use both methods in food science.*

Large Group: *Using the food scale, weigh the various fresh fruits and have students record the figures. Then put those fruits in the food dehydrator to* ***dehydrate*** *them. When they are done, remove them and let the students re-weigh them (also recording their new, leaner digits.) As an exercise in mathematics and as a reinforcement of this lesson's key terms, students can subtract the dehydrated weight from the fruits' original weight to discover the amount of moisture content of the various fruits. Next, let students taste the differences between the fresh and dehydrated versions.*