

DRAFT 1

Lesson Title: The Dehydrated Garden

Grade Level: 4

Subject Area: Social Studies

Setting: Classroom and garden

Instructional Time:?

Grade Level Expectations:

4-H3.0.4 Draw upon stories, photos, artifacts, and other primary sources to compare the life of people in towns and cities in Michigan and in the Great Lakes region during a variety of time periods from 1837 to the present(e.g., 1837–1900, 1900-1950, 1950-2000).(G)

MMN Behavioral Outcome:

Eat fruit and vegetables, whole grains, and fat-free or low-free milk products.

SNAP-Ed Core nutrition Messages:

- Eat smart to play hard. Eat fruits and veggies at meals and as snacks.
- Fuel up with fruits and veggies; and soar through your day like a rocket ship.

Goal:

Students will explore gardening and food preservation methods such as drying as an important way of preserving food.

Learning Objectives:

Students will:

- Understand why drying was and is important in Native American history to preserve food and preventing food poisoning.
- Taste dried foods from the school garden and other sources.

Background:

Drying, canning and food preservation: <http://www.fcs.uga.edu/ext/food/safety.php>

- Main Entry: ²**hydrate**
- Function: *verb*
- Inflected Form(s): **hy-drat-ed; hy-drat-ing**
- Date: 1846

transitive verb 1 : to cause to take up or combine with water or the elements of water

2 : to supply with ample fluid or moisture <*hydrates* and softens the skin>*intransitive*

verb : to become a hydrate

— **hy-dra-tion** \hī-□drā-shən\ *noun*

— **hy-dra-tor** \□hī-□drā-tər\ *noun*

de·hy·drate [dee-hahy-dreyt] verb, -drat·ed, -drat·ing.

–verb (used with object)

1. to deprive (a chemical compound) of water or the elements of water.
2. to free (fruit, vegetables, etc.) from moisture for preservation; dry.
3. to remove water from (the body or a tissue).
4. to deprive of spirit, force, or meaning; render less interesting or effectual.

–verb (used without object)

5. to lose water or moisture: Milk dehydrates easily.

When food is placed in a dehydrator, the water in the food is removed. Drying removes the moisture, so that bacteria, yeasts and molds cannot grow and spoil the food. It also slows down the action of enzymes, but does not inactivate them. Because the moisture is removed, food becomes smaller and lighter in weight, and becomes easier and less messy to transport. Some foods such as jerky, fruit leathers and dried fruits can be eaten in their dried form, others, such as vegetables, can have the water added back to them when time to eat. Foods can be dried in the sun, in an oven or in a food dehydrator by using the right combination of warm temperatures, low humidity and air current.

It should be noted that with the moisture removed, calories are concentrated. Serving size is affected as a result. Note 1/2 cup of dried fruit is considered a serving, verses a cup of whole fruit. Compare raisins with grapes. Raisins are energy dense as compared to grapes, so a little goes a long way, especially if weight control is an issue.

Vocabulary:

Dehydration, canning, preservation, spoiling

Advanced Preparation:

Supplies

- School garden with fruits/vegetables/grains/beans that are ready to be harvested.
OR donations from home gardens of school staff and parents.
- A food dehydrator
- Paper plates to use as cutting boards.
- Knives or other kitchen tools to prepare items for drying.
- Venn Diagram

Procedures:

Step 1

Hold up an ice pack and ask how many students have one in their lunch box. Ask the students to identify the purpose of the ice pack. (To keep the food from spoiling.) Ask students how people kept their food from spoiling before refrigerators?

Step 2

Review MyPyramid for Kids. Ask students when these foods grow? (Spring, summer, fall, not winter.) Discuss the fact that now we have access to healthy fruits, vegetables, etc. at the grocery store as these items are shipped, and trucked in from other regions. Ask how they think people in Michigan got the nutrients they needed before this? Discuss what families do with left-over foods that they have. Ask students to think of how people might have dealt with excess food that they had during harvest/growing seasons prior to refrigeration, and how they might have kept the excess for a later time. Remind students that left-over food would have been very valuable to people who did not have access to grocery stores and abundant food like we have today. This would be a good opportunity to discuss subsistence farming (growing food to feed your family and perhaps to trade/barter small amounts with others).

Step 3

Discuss canning, drying, curing and other methods of food preservation. Show old pictures of getting ice from frozen great lakes for ice boxes, and other old MI food preservation photos. Discuss that sun-drying was a common method of food preservation for Native Americans.

Step 4

Give students a piece of dried fruit, either something like “Fruit by the foot” or dried apples or bananas. Ask students what they think of the taste and texture of the fruits they have been given, then ask them how they think the fruits were prepared. (Is it fresh? How is it different than fresh? How does it taste, or what does it taste like?, etc.)

Step 5

Explain that the class will preserve their own harvest from the garden through drying. Each student will help to pick, clean, cut, dry and stack a fruit or vegetable onto a food dehydrator. Each student will also help taste test!

Step 6

If there is a school garden:

Have students select an item they wish to dry and harvest it.

If there is not a school garden;

Send a parent letter home asking for fruit and vegetable donations from the home garden. Have students bring in donations.

If there is not a school garden, consider starting one if possible.

Pass out information on container gardening to students to share with their parents.

Step 7

Have students wash their hands with soap and water. Assist the class with washing, drying, sorting and slicing each item to be dried. Have students work in groups of 4 to 6.

Step 7A

Be sure to document these processes with pictures both so that students can use the visual reminders to do a journal entry about their findings, and because it is fun to have the pictures to look at later!

Step 8

Have each group prepare a tray of items to be dried in the food dehydrator. Remember that apples and bananas will brown (oxidize) after cut if they are not treated in some manner. They can be treated with “fruit fresh” or another commercial product, or a more natural method is to squeeze citrus juice (lemon/orange/grapefruit) over the fruit after it is cut.

Step 9

After the food is dried, have a taste test. Have students create Venn diagrams of one item of their choice. They should include taste and appearance characteristics as well as how fresh versus dried affects the serving size according to MyPyramid for Kids.

Step 10

Have students compare the texture and moisture content of dried fruits and vegetables with fresh fruits and vegetables. Have students think of the way Michiganders lived 200 years ago (limited transportation, small communities, and limited resources). Have them consider which type of food is easier to move? More easily stored? What are the advantages and disadvantages of dried fruits and vegetables? Is it necessary to consume more water while eating dehydrated foods than it is with fresh fruits and vegetables?

Step 11

Write a journal entry about the experience of preparing and storing foods for later consumption. In the entry include reasons for preserving fruits and vegetables, the student’s favorite method of preserving food, alternative methods, and what food the student found to be the most appetizing. In the journal entry, have students speculate as to how difficult or easy it might be for people to have met the MYPyramid dietary requirements before they had refrigeration. Have students consider what impact drying foods might have on meeting dietary requirements as recommended by MyPyramid.

Assessment:

Venn Diagrams and Journal Entry

Answer Key or Scoring Rubric:

Student Pages:

Visual Aids:

Extensions:

- Compare to other ways of preserving, such as canning, freezing (ice), drying, curing, smoking, fermentation, cold cellars, etc.
- Go to the school garden and select a fruit or vegetable to can. Find the directions for canning your particular product. Canning can be done with the students or they can fill the jars and the actual canning can be done by the teacher at home, if necessary. Store jars in the classroom. Open them up several months later and enjoy!
- Explore the Native American technique of sun-drying foods.
- Invite families who practice other forms of food preservation to come in and discuss their methods. Taste test and share recipes.

Have students create posters that explain other methods of food preservation used in Michigan.

Above and Beyond

Have students research and build a solar oven and make comparisons on the following:

- Time it takes to dry food without electricity
- Is the final result the same? Do solar oven and electric dehydrator dried foods taste the same?
- How much energy is consumed by using an electric dehydrator (the manufacturer should be able to supply this information)?

What is the difference in dried fruit and fruit leather? Some fruits are easily dried by just slicing them. Others require other treatment. Research, using a computer or books, what foods are easily dehydrated in their original form and what foods need to be made into "leathers." Or, allow students to simply experiment with different foods and combinations to find what foods can be dried alone and what foods need to be mixed to make a suitable substance.

Have students research the nutritional value of fruits, dried and fresh. Is there a difference in fiber content? Sugar content? Vitamin content?

Have students find other dehydrated foods that are in use today (camping supplies, astronaut food, military rations) and have them compare their dried foods and experience drying foods with those that are packaged for commercial use. Students could contact manufacturers of dried foods and find out what methods are used to produce commercially available dehydrated foods (likely going to be freeze dried!) Astronaut food is available in many stores. Astronaut Ice Cream is especially good for comparison.

GOING GREEN

Eating locally grown produce is beneficial to the environment and the local economy, and in general it is fresher and just tastes better. Have students list ways that they can obtain local fruits and vegetables and preserve them for later use, including gardening at their own homes. Have students outline a plan for planting a vegetable or salad garden at their home utilizing container gardening if necessary.

Websites: <http://pickyourown.org/canningjars.htm>

National Center for Home Food Preservation: <http://www.uga.edu/nchfp/>
http://www.ehow.com/how_2083_make-solar-oven.html

Information on how to dry food: <http://www.uga.edu/nchfp/how/dry.html>