



Food Preservation for Youth



Brought to you by the
National Center for Home Food Processing and Preservation,
University of Georgia Cooperative Extension and Clemson Cooperative Extension

Credits and Acknowledgments

Written by:

Kasey A. Christian, M.Ed., Project Assistant, National Center for Home Food Processing and Preservation (NCHFP), University of Georgia

Susan Barefoot, Ph.D., Extension Food Safety and Nutrition Program Team Leader, Clemson University

Edited by:

Elizabeth L. Andress, Ph.D., Director, NCHFP and Extension Food Safety Specialist, University of Georgia

Judy A. Harrison, Ph.D., Extension Foods Specialist, University of Georgia

Designed by:

Kasey A. Christian, M.Ed., Project Assistant, NCHFP, University of Georgia

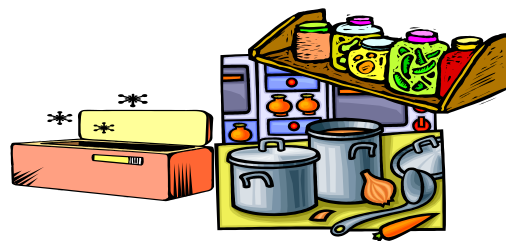
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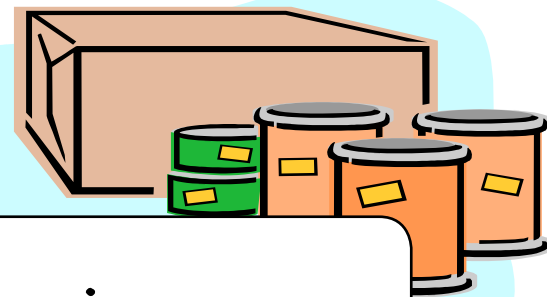
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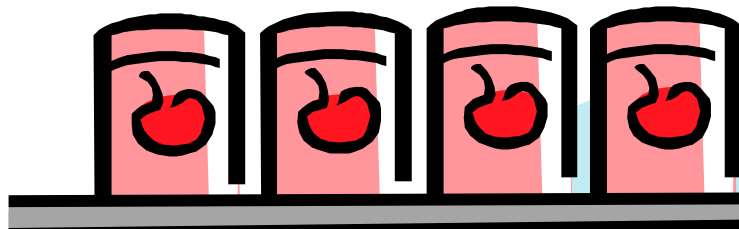


Curriculum Overview

The history of home food preservation dates back to the origins of humankind. Knowledge and skills of home food preservation have been passed from family members and communities from one generation to the next. Yet the industrialization of agriculture and manufacturing lessened the need for preparing and preserving food at home. High-fat, calorie-dense foods became widely available and affordable, and simultaneously age-old lessons were not experientially handed down to much of the modern youth population. Disconnected from sources of fruits, vegetables, and other nutrient-rich, low-fat foods, many children do not know where food comes from and regularly consume less healthy foods. Fortunately, gardens still grow and food preservation procedures are still here, ready to be learned.

PUT IT UP! Food Preservation for Youth curriculum is a series of informal educational lessons that guide youth to explore and understand the science of safe food preservation. The hands-on food preparation activities are designed for middle school ages, but could also be appropriate for the age range from 4th- to 12th-graders. Settings such as 4-H programs, after-schools, other youth groups, and camps are ideal for leading the activities. Classrooms are also a great fit, as the content provides instruction for practical experiences with scientific and mathematical concepts, helping students to achieve state and/or national performance standards.

The series is composed of six different food preservation methods: boiling water canning, making jam, pickling, freezing, drying, and pressure canning. Each method is divided into a beginning hands-on activity and an advanced hands-on activity. Activities may stand alone or be sequenced for cumulative learning. In addition to step-by-step procedures, reflection questions, and ideas for experimentation, each method also includes additional activities: a science-based fill-in-the blank challenge, a history-based word search, a glossary, a resource list, a knowledge test, and more.



ARE YOU READY TO PUT IT UP!?

This guide is here to support your leadership of *Put It Up! Food Preservation for Youth* activities.

In the following pages, you will find:

Applicable Science and Math Standards..... p. 5

PLAN AND PREPARE

Planning Your Instructional Flow..... p. 6-7

Facility Checklist and Purchasing Information..... p. 8

ADVICE AND ACTIVITIES

Teaching Tips..... p. 9

Introductory Icebreakers and Class-Over Closers..... p. 10

What to Do During Wait-time?..... p. 11

Canner and Jar Anatomy I.D. Cards..... p. 12

Get Moving!..... p. 13

Answer Keys..... p. 14

Activity Record Sheet..... p. 15

Certificates of Completion..... p. 16-21

WANT TO LEARN MORE ABOUT HOME FOOD PRESERVATION?

Consult these resources:

Andress, E.L., Harrison, J.A., eds. (2014). *So Easy to Preserve*, 6th ed. Athens, GA: University of Georgia Cooperative Extension.

National Center for Home Food Preservation, University of Georgia.
<http://nchfp.uga.edu/> or www.homefoodpreservation.com.

USDA. (2009). *Complete Guide to Home Canning*. Agriculture Information Bulletin No. 539. Washington, DC: USDA National Institute of Food and Agriculture.

Clemson University Home and Garden Information Center food preservation factsheets. http://www.clemson.edu/extension/hgic/food/food_safety/preservation/.

Your state Cooperative Extension factsheets about home food preservation.

Hands-on experiences in home food preservation activities help students gain practical knowledge and guide them in developing deeper understandings of scientific and mathematical concepts.

Home Food Preservation = Science and Math Education

Grade-level performance expectations from **NEXT GENERATION SCIENCE STANDARDS™** that can be developed through this curriculum include these specific expectations in Physical Sciences (PS), Life Sciences (LS) and Engineering, Technology, and Applications of Science (ETS):

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

4th grade:
4-PS3-2

5th grade:
5-PS1-1, 5-PS1-3, 5-PS1-4,
3-5-ETS1-1

Middle School:
MS-PS1-2, MS-PS1-4, MS-
PS3-3, MS-PS3-4, MS-LS1-1,
MS-ETS1-2

High School:
HS-PS3-1, HS-PS3-4

These lessons also help youth across all grade levels continue to develop these **COMMON CORE STATE STANDARDS**® for Mathematical Practices:

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® 2012 Common Core State Standards Initiative

National Governors Association Center for Best Practices, Council of Chief State School Officers. (2010). Common Core State Standards (Mathematics Standards). National Governors Association Center for Best Practices, Council of Chief State School Officers, Washington D.C.



First things first. Ask yourself these questions before choosing an activity:

Do I have enough experience with the preservation method to be a confident leader?
Carefully read the procedure, and do it yourself if you haven't already.

Is the lesson appropriate for the age-range of my audience?
Middle school aged youth are the target audience for all activities except for the pressure canning lessons, which are better suited to high school aged youth. However, all lessons are appropriate and/or adaptable for ages 8-18 (grades 4 to 12).

Do I have a location, equipment, and supplies that will work?
See the *Facility Checklist* and *Purchasing Information* on the following page. Make reservations, if needed. Read manufacturer's instructions for your particular equipment.

How much time do I need?
Review the time requirements listed at the start of each procedure. To let products finish cooling, freezing, or drying, you might need to meet a second day.

Will I lead one stand-alone activity, or multiple activities as a series?
If you plan to lead more than one activity, consider copying and distributing the Activity Checklist on page 15 to keep track of youth progress.

Got it! Once you've picked a lesson, you'll want to prepare...

Do you have enough assistance?
For food preservation activities, a ratio of one adult to four youth is ideal. What is your adult to youth ratio? Remember that experienced youth may also be able to help.

Plan ahead for how you will use down-time.
Choose pages from each method's Additional Activities and/or select from suggestions in this guide. Make copies and gather materials as needed. Make multiple copies of *What Do You Know About...* (the last page of Additional Activities) if you want to use it as a pre-test before the lesson and as a post-test afterwards to assess learning.

Do you have all the ingredients and materials you will need?
In addition to gathering needed ingredients and equipment, read *Want to Experiment?* for ideas about sampling the final product; get these ingredients/serving utensils too.

Decide your activity flow and have a plan to get finished products home.

Planning Your Instructional Flow

Here are a couple of examples to help you structure the order of activities for your class:



Suggested Instructional Flow (shorter meeting time):

1. Initiate an *Icebreaker*.....15 minutes
2. Guide step-by-step *Procedure &*
hand out copies of "What's the Story..."
word search during wait-time.....45 minutes
3. Ask youth to write responses to *Time to Reflect*10 minutes
4. Let everybody sample food
while talking about the ideas in *Want to Experiment?*.....15 minutes
5. As they leave for the day, tell youth when to return for
taking home the finished product.....5 minutes

Total class time = 1½ hours

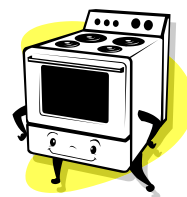


Suggested Instructional Flow (longer meeting time):

1. Initiate an *Icebreaker*.....15 minutes
2. Distribute then collect *What Do You Know About...*
as a pre-test.....5 minutes
3. Lead group discussion of *FUNDamentals*.....15 minutes
4. Teach about equipment through *Canner and Jar Anatomy*....10 minutes
5. Guide step-by-step *Procedure &* during wait-time:.....75 minutes
 - Ask youth to Complete *pH Power*, as a group
 - Get Moving! with a Tag game...or a Dance Party!
 - Encourage individual reading/completing activity pages
6. Let everyone sample food and compare to other products....15 minutes
7. Ask youth to write responses to *Time to Reflect*.....10 minutes
8. Distribute and collect a clean copy of
*What Do You Know About...*as a post-test.....5 minutes

Total class time = 2½ hours

Facility Checklist



To conduct a food preservation lesson, your setting needs to have certain qualities:

- tables** for reading, writing, and discussion
 - chairs** for youth, helpers, and yourself
 - prep area** for peeling, slicing, etc.
 - deep sink(s)** for washing, rinsing, filling pots, etc.
 - refrigerator** for short-term storage of fresh ingredients
- For canning, pickling, advanced jam making, and advanced freezing:
- an electric coil or gas **stovetop range**
- For beginning jam and freezing:
- a **freezer** set to -10°F for lesson
- For drying:
- a **dehydrator** or an **oven** that registers as low as 140°F



Purchasing Information

Equipment and supplies for preserving food at home can be purchased from most discount retail stores or "big box superstores", as well as numerous housewares stores, hardware stores, kitchen stores, and grocery stores. Online ordering is widely available.

Or, you may order pressure canners directly from their manufacturers, which include, but are not limited to:

- Presto: 1-800-877-0441, www.gopresto.com
- All-American: 1-920-682-8286, www.wafco.com
- Mirro: 1-800-527-7727, www.wearever.com

Jars, ring bands, lids, pectin, ascorbic acid, spice mixtures, and other canning supplies can also be ordered from manufacturers. Some representative brands include, but are not limited to:

- Jarden Home Brands: 1-800-240-3340, www.freshpreserving.com
- Mrs. Wages: 1-800-647-8170, www.mrs wages.com (pectin and spice mixtures)
- Kraft Foods: 1-800-323-0768, www.surejell.com (pectin)
- Pomona Pectin: 413-772-6816, www.pomonapectin.com (no-sugar needed pectin)
- Morton Salt: 1-800-789-7258, www.mortonsalt.com (canning salt)
- McCormick: 1-800-632-5847, www.mccormick.com (spices)

Dehydrators are available from several companies, including, but not limited to:

- Nesco: <http://www.nesco.com/products/Dehydrators/>
- Excalibur: 1-800-875-4254, <http://www.excaliburdehydrator.com/>
- Presto: 1-800-877-0441, www.gopresto.com

Teaching Tips



Advice and suggestions from experienced Extension educators

"We went to a berry farm to pick berries first."

Take a field trip to a pick-your-own farm, or look for produce that is grown locally.

"Set up stations for the kids to move through. Each station could have an adult/teen volunteer to assist the kids. Then everyone gets to experience all steps."

If individual stations do not work with your circumstances, then consider these other approaches: arrange youth into groups to proceed through stations or giving each group a complete set of all needed materials. Or, designate specific roles for each individual to help everyone remain engaged in working together. Examples include "washer", "chopper", "peeler", "mixer", and "jar filler". Provide name-tag labels of the roles. Also, recruit plenty of help from parents, youth and others with experience preserving.

"It's hard for kids to stay focused during processing. Have lots of games or activities."

Use the resources in this Leader's Guide and Additional Activities, or make up your own games. For example, "I made up a verbal quiz using the Fun Facts."

"Chopping skills were very different among participants."

A leader demonstration of knife skills is indicated at times in the procedures. Steps which require a sharp utensil or close contact with heat are marked with ★. You may want to oversee these steps closely, require adult permission to do them, or do them yourself. Establish and enforce safety norms at all times.

"Adapt lessons for youth with disabilities."

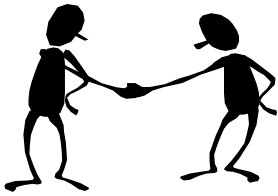
Youth with physical limitations can be assigned roles well-suited to their abilities, such as reading the procedure aloud, labeling, timing, or monitoring safety. Using specialized equipment may add options, such as Ball® Sure Tight Band Tool and wide-grip kitchen tools. Look at your location with an eye on accessibility, for example, heights of sinks and width of aisle space. For youth with language limitations, demonstrate tasks for them to follow by example. If the social scene is problematic, then rearrange small groups, assign a task, or allow independent work such as completing a page from Additional Activities.

"Keep classes small and manageable."

Set a capacity on the number of participants. A class size of four to twelve youth is suggested, with a 4:1 youth to adult ratio.

"While waiting for berries to freeze for one hour, we made smoothies with previously frozen berries."

So that youth can taste samples of freshly prepared food, think about purchasing extra in addition to the amounts called for in the recipe. Look over the "Want to Experiment?" page and try one or two ideas...*"it is eye-opening for them."*



Introductory Icebreakers

"What kind of food are you?"

Ask all participants to think (silently) of a fresh fruit or vegetable that starts with the same letter as their first name. After giving them a few moments to think, ask everyone in the group to take turns introducing themselves by their new food name. Go first, setting an example like "Hi, I'm Rachel Rutabaga." To take it one step further, ask them to think of a dish they could make with their food in it, such as "I'm Pablo Pepper and I could be added to stir-fry", or ask them how their chosen food could be preserved.

Ask about Experiences with Food Preservation

To learn about your participants and for them to get to know each other better, ask: "Have you ever made _____ (jam, pickles, canned vegetables, etc.)?" "What steps of the procedure do you remember?" "Does anyone in your family preserve food at home?"

"What foods do they preserve?" "Turn to the person next to you and share your favorite type of _____ (jam, frozen treat, canned vegetable, etc.)." "Tell your neighbor your favorite way to eat _____ (tomatoes, corn, apples, etc.)."

Pre-Test

Make a copy of the page *What Do You Know About...* for each participant. Distribute with pencils and give youth a few minutes to complete and turn in. Explain that they are not expected to know all the answers yet...but by the end of the activities they will!

Class-Over Closers

"Could you be safely _____ (dried, canned, pickled, jammed, frozen)?"

Ask youth to recall their food name from the introductory activity then decide if their food could be preserved using the method they just practiced. For example, "I'm Eddie Elderberry and I could be made into jam." If not, then is there another method of food preservation that might work better?

Post-Test

Again, copy, distribute, and collect the *What Do You Know About...* page. These tests are a great way for both you and the participants to realize what they have learned.

Time to Reflect

Encourage youth to thoughtfully complete the page called *Time to Reflect*.



What to Do During "Wait Time"?

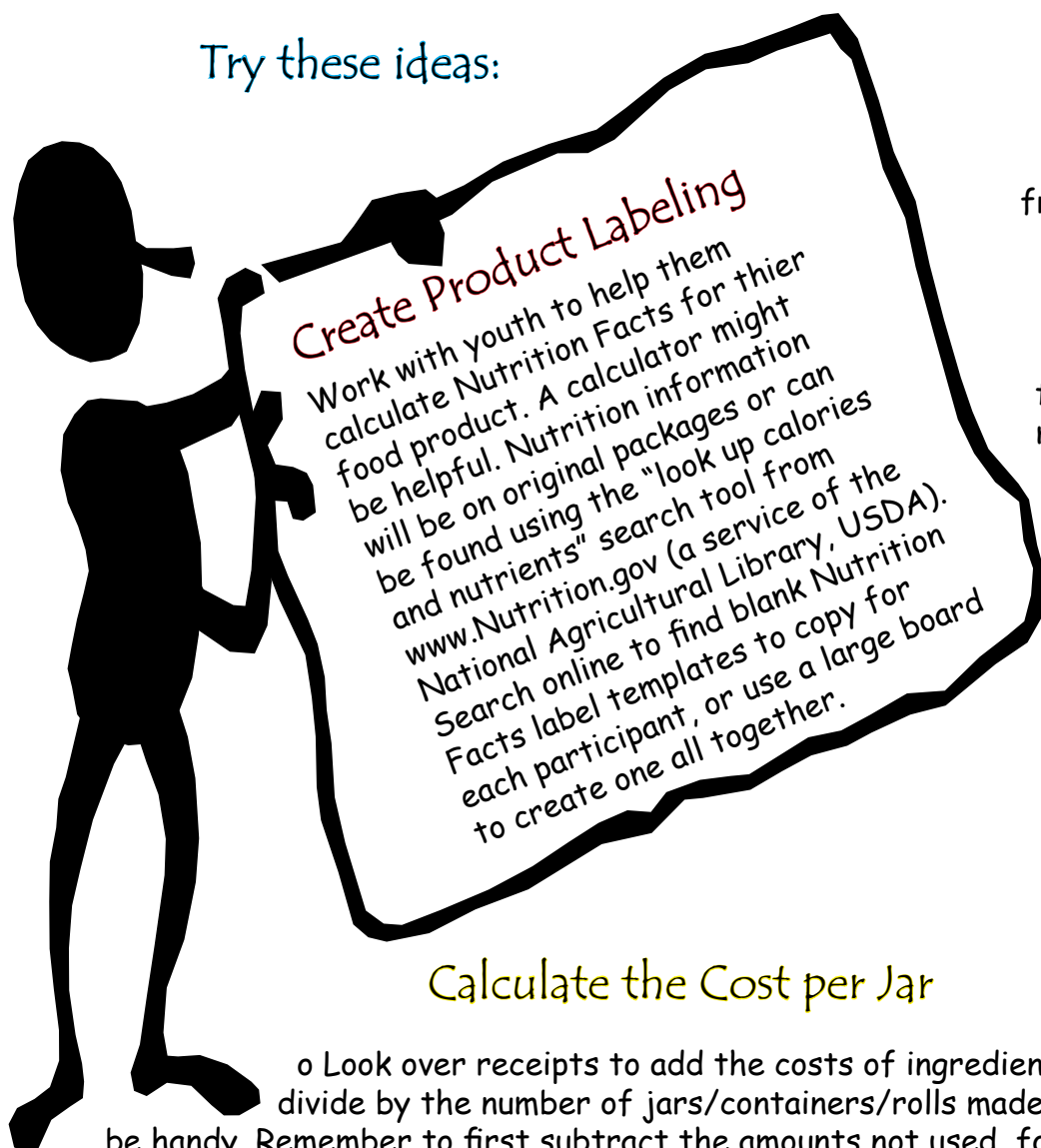
Ask youth to complete pages from *Additional Activities*, individually or in pairs.

Lead *group conversation* using pages like *FUNdamentals* and *pH Power*.

Copy and cut out cards on the next page for youth to label canners and jars.

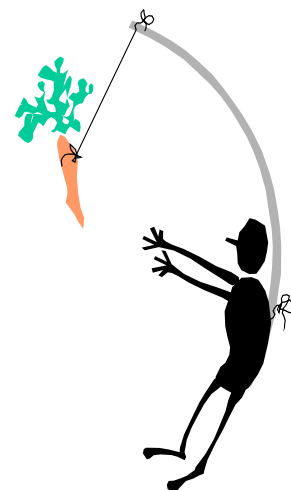
Get Moving! with a tag game or dance party going using rules and steps on page 13.

Try these ideas:



Taste!

Compare fresh to frozen, store-bought to homemade, or experiment with different ways of serving. See *Want to Experiment?* for more tasting ideas.



Calculate the Cost per Jar

- o Look over receipts to add the costs of ingredients, and then divide by the number of jars/containers/rolls made. A calculator will be handy. Remember to first subtract the amounts not used, for example if you used less than the purchased amount of green beans.

- o Research the cost of a similar store-bought item. Which costs less per serving, the home-preserved product or the store-bought product?

- o To take this idea further, challenge youth to think of "hidden costs" of production (such as labor, electricity, and transportation).



Canner and Jar Anatomy Identification Cards

Copy this page, then cut out the words, all of which identify parts of canners and mason-style jars. Provide tape for youth to attach terms to their location on an actual canner and jar.

Canner Parts

PRESSURE CANNER LID

GAUGE RACK VENT PORT

SAFETY FUSE AIRSPACE

VENTCOVER LOCK WATER

BOILING WATER CANNER

Mason-Style Jar Parts

RING BAND

JAR

LID

SEALING COMPOUND

THREADS



Get Moving!

Tag Games (and a Dance Party)



The Canned Food Versions

If you are canning tomatoes or salsa, then each player is a tomato, except for one player who is Lemon Juice (or Vinegar or Citric Acid). If Lemon Juice tags you, then you pucker, stuck in place by the strength of the acid. You are now ready to be canned, so you just need two players to hold hands in a circle around you and count to 10 to free you (aka boiling water canning).

If you are canning green beans or soup, then you'll play the pressure canning version: Each player is a Green Bean except for one player who is "It", also known as Botulinum Bacteria! If Botulinum Bacteria tags you then you are paralyzed in place. But there is hope...if two other players hold hands in a circle around you and count to 10 then you are safely freed (they just pressure canned you).

The Jam Version

In this version of tag, whoever is "It" is Pectin, and everyone else is a berry. Pectin instantly turns anyone they touch into Jam -- not running, gelled in place. To keep that Jam in the game, it needs to be properly canned or frozen, which is done by two other players holding hands around a Jammed player and counting to 10. Then that player is free to start over as a fresh berry.

The Pickled Food Version

Whoever is "It" is a bottle of Vinegar (5%, of course). Everyone else is a Cucumber. If the Vinegar tags a Cucumber, then that cuke is pickled and ready to be canned. To set a Pickled Cuke free, two other players must form a Canner shape by holding hands around the pickled player and count to 10 while the "water boils". For refrigerator pickles, a fridge is made instead of a canner, and 10 seconds are needed for the temperature to drop below the danger zone (below 40 degrees F).

The Frozen Food Version

One person is chosen to be a "Freezer" (usually called "It"). When the Freezer tags you, he or she will also say aloud a fruit or vegetable. You are now this said Frozen Food. Other players can thaw Frozen Foods using one of two methods: 1. two people hold hands around the frozen player and count to 30, symbolizing the time it takes to thaw in the fridge. 2. one player runs in circles around the frozen player for 20 seconds, just like running water takes for effort but is quicker than thawing in the fridge. (You could also mention that in real life there are two other options for thawing: using a microwave and cooking without thawing).

The Dehydrated Food Version

One person is "It", also know as the Dehydrator. Everyone else is a Fruit. When the "Dehydrator" tags another player, that person dries into a delicious Dried Fruit -- stuck in place. In order to un-stick, the Dried Fruit must either rehydrate by catching a ball (or other object) that represents water, or by burning off those concentrated sugars with 10 jumping jacks and 5 push-ups.

Salsa Dance

To set the salsa-making mood, play salsa music and dance! Spine straight, chin up, shoulders back...look up the steps to a traditional salsa dance or let everyone make their own moves.



Answer Keys

Additional Activities

Boiling Water Canning

FUNdamentals: boiling water canning, acidity, lemon juice, acid foods, vacuum, spoil, heat, USDA

Boiling Water Canner Anatomy: 1. airspace, 2. water, 3. cover, 4. canner or stockpot, 5. rack

Mason-Style Jar Anatomy: jar, threads, metal ring band, metal lid, sealing compound

pH Power: acid, acid, borderline, low-acid, low-acid

Making Jam

FUNdamentals: freezing, boiling water canning, spoil, water, microorganisms, pectin, USDA

Boiling Water Canner Anatomy: 1. airspace, 2. water, 3. cover, 4. canner or stockpot, 5. rack

Mason-Style Jar Anatomy: jar, threads, metal ring band, metal lid, sealing compound

Freezing

FUNdamentals: freezing, spoil, microorganisms, expands, quickly, oxygen, USDA

Pickling

FUNdamentals: pickling, acidity, botulism, vinegar, spoil, microorganisms, USDA

Boiling Water Canner Anatomy: 1. airspace, 2. water, 3. cover, 4. canner or stockpot, 5. rack

Mason-Style Jar Anatomy: jar, threads, metal ring band, metal lid, sealing compound

pH Power: Vinegar = acid, boiling water canner; Dill Pickles & Sauerkraut = acidified & boiling water canner; Carrots, Cucumbers, Peppers, Cabbage, Okra = low-acid, pressure canner

Drying

FUNdamentals: dehydration, evaporation, microorganisms, hot air, oxidation, USDA

Pressure Canning

FUNdamentals: pressure canning, acidity, botulism, boiling water canning, vacuum, heat, USDA

Pressure Canner Anatomy: 1. safety fuse, 2. vent port, 3. gauge, 4. ventcover lock, 5. rack

Mason-Style Jar Anatomy: jar, threads, metal ring band, metal lid, sealing compound

pH Power: Lemon Juice & Blueberries = Acid, Boiling Water Canner; Tomatoes = Borderline; Beans, Carrots, Onions, Celery, Corn = Low Acid, Pressure Canner

What Do You Know About...

Located on the last page of the Additional Activities are tests/evaluations with a knowledge section and an attitude & behavior section. They can be copied and distributed as a Pre-Test and Post-Test to gauge learning.

There are no correct answers to the second section about attitude & behavior.
The correct answers to the knowledge section are as follows:

True, True, False, False, True, False



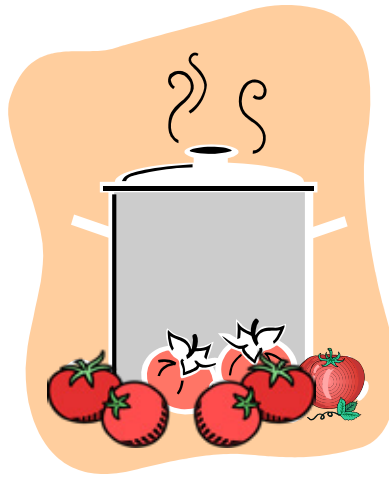
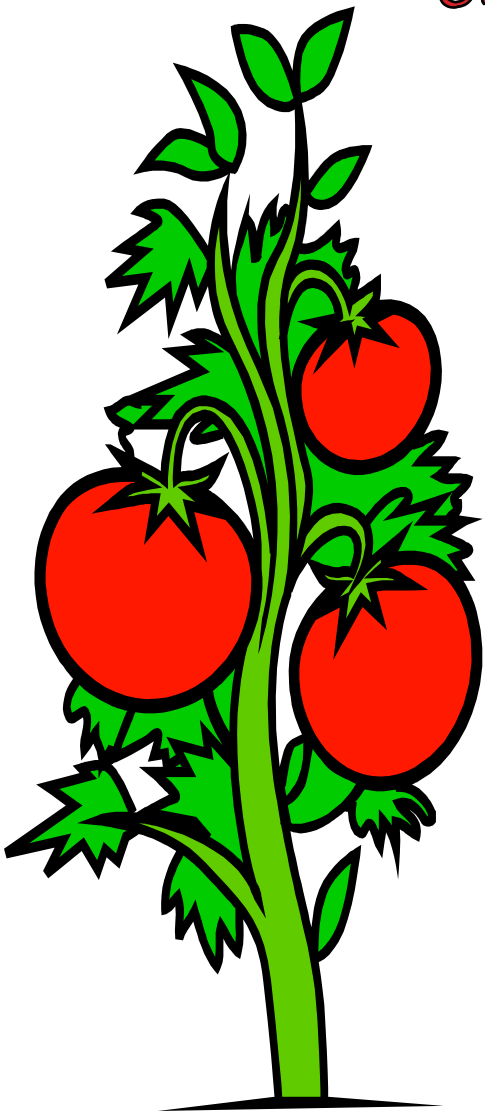


Certificate
of Success

Congratulations!

_____ has completed
the _____ level

of Can My Tomatoes



Date: _____

Leader Signature: _____

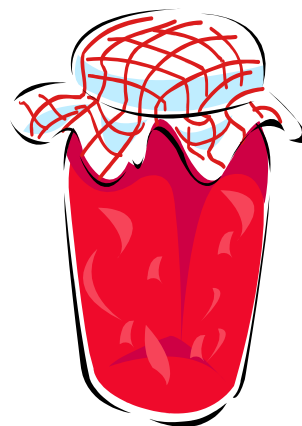


Certificate
of Success

Congratulations!

_____ has completed
the _____ level

of Make My Jam



Date: _____

Leader Signature: _____





Certificate
of Success

Congratulations!

_____ has completed

the _____ level

of Make My Pickles!



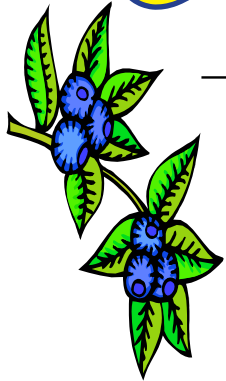
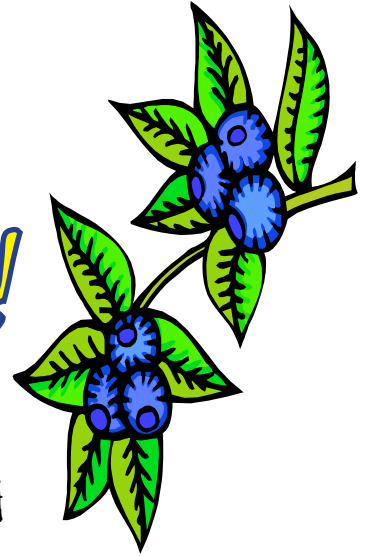
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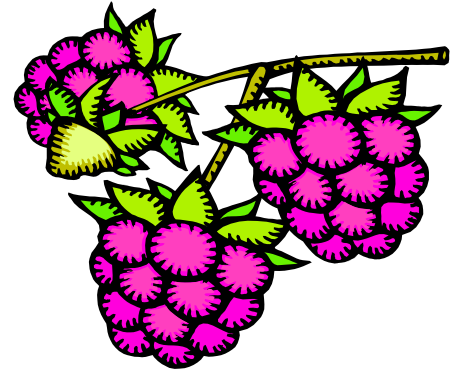
Congratulations!



_____ has completed

the _____ level

of Freeze My Fruits and Veggies



Date:

Leader Signature:

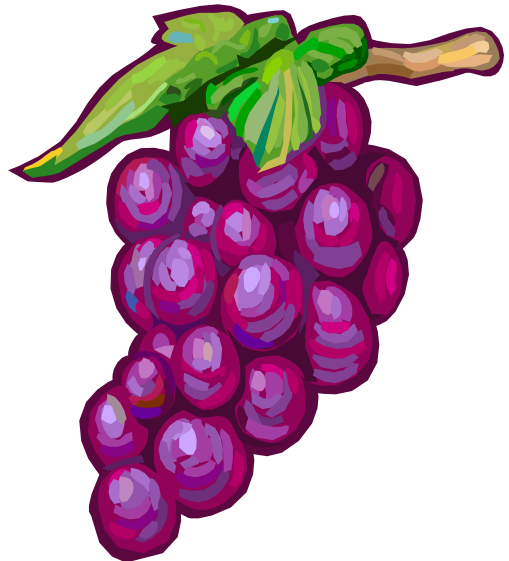
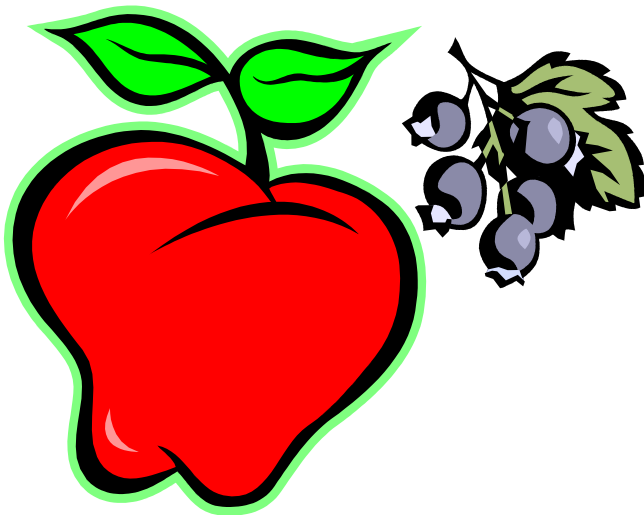


Certificate
of Success

Congratulations!

_____ has completed
the _____ level

of Dry My Fruits



Date: _____

Leader Signature: _____



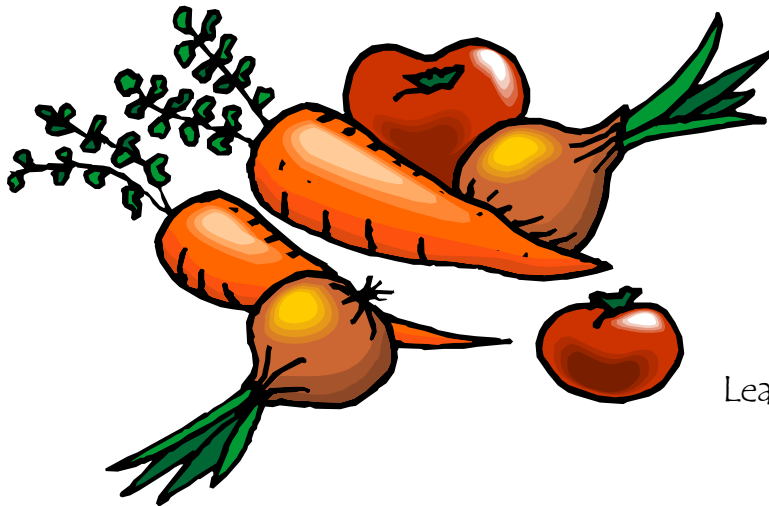
Certificate
of Success

Congratulations!

_____ has completed

the _____ level

of Can My Vegetables



Date:

Leader Signature:
