



### SKILLS :

- Increase food science vocabulary
- Complete a food science service project
- Improve technology skills
- Discover careers in food science
- Gain knowledge about food preservation
- Explore food photography
- Develop leadership skills



**Life Skills:** Healthy Lifestyle Choices

# FOOD SCIENCE

Learning about how foods work in our bodies, food preservation methods and careers in the food industry are just a few of the skills that you can learn in the 4-H Food Science project. Look at the skills to your left. Check your favorites. Then work with your 4-H leaders and parents to make a 4-H project plan of what you want to learn and do this year.

## FOOD FIND

Look at the word list below. Find the word in the puzzle to the right. The words may be horizontal, vertical, diagonal or backwards. Then, read the definitions on the left. Place the correct word in the blank. Again, use the words from the Word List.

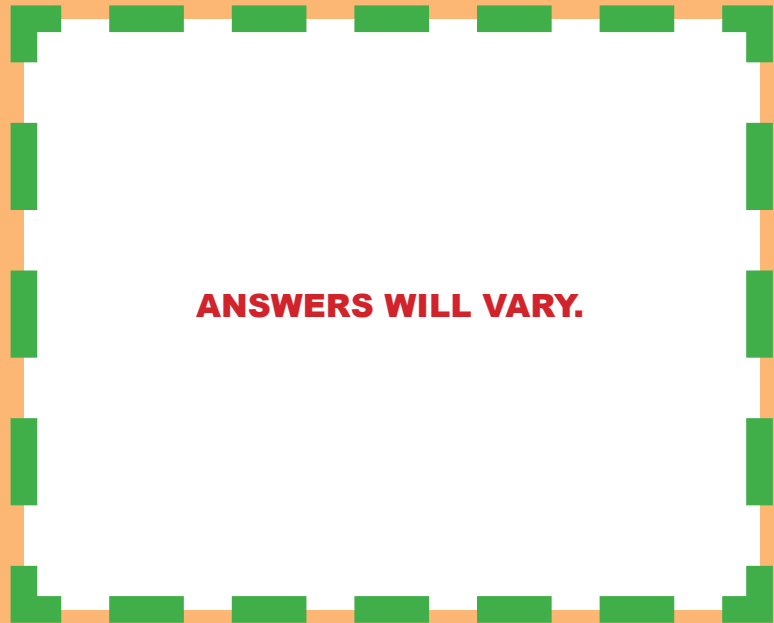
1. A preservation method of freezing fruit by using sugar. <b>SUGAR PACK</b>	P	R	C	F	E	R	M	E	N	T
2. A chemical added to food during processing. <b>ADDITIVE</b>	T	F	E	R	M	E	N	T	O	L
3. Substances in foods that cause or speed up chemical reactions. <b>ENZYMES</b>	I	M	G	E	G	N	W	A	C	J
4. Refers to how air is removed from within a jar of processed food. <b>VACUUM</b>	P	T	S	E	N	B	S	D	T	S
5. A method of food preservation that involves heating vacuum-sealed containers. <b>CANNING</b>	I	I	J	Z	I	U	U	D	P	T
6. The process of working dough into a ball to cause the dough to rise. <b>KNEAD</b>	C	X	T	E	N	I	G	I	E	N
7. Changes in food caused by the intentional growth of bacteria, yeast or mold. <b>FERMENT</b>	K	Z	E	R	N	K	A	T	C	E
8. The loss of moisture from food during freezing that results in changes in the appearance and taste of the food. <b>FREEZER BURN</b>	L	D	L	B	A	M	R	I	T	I
9. A substance found in ripe fruits that forms a gel when mixed with sugar and acid. <b>PECTIN</b>	A	V	U	C	S	P	V	I	R	
10. The process of adding vinegar or lemon juice to low-acid foods to make them more acidic. <b>PICKLING</b>	N	E	E	R	O	T	A	E	N	T
	G	N	D	N	V	A	C	U	U	M
	E	K	B	T	R	O	K	M	L	N
	N	C	E	N	Z	Y	M	E	C	A

WORD LIST	ENZYME	PECTIN
ADDITIVE	FERMENT	PICKLING
CANNING	FREEZER BURN	SUGAR PACK
	KNEAD	VACUUM

# FOOD PHOTOGRAPHY

Food photography is just one of the many careers in food science. What does a food photographer do? Let's pretend that your school has just decided to remove all of the soda machines from the cafeteria. The soda machines will be replaced with a variety of milk and juice beverage options. Your classmates are not excited about this change. You have been asked by your principal to create a marketing campaign to promote the benefits of this change.

1. What kind of foods would you include in your photograph? Create the photograph that will be used in your promotional materials. Draw or tape it inside the box.
2. Printing materials costs money. You have a budget of \$250 for this project. What types of promotional materials would you develop? Write the number that corresponds to the quantity you wish to order in each of the boxes. Use as much of the \$250 budget as possible without going over.



- Posters (half sheet) - \$5 each or 12 posters for \$50
- Posters (full sheet) - \$10 each or 6 posters for \$50
- Flyers (11" x 17") - \$35 for 50 flyers
- Brochures (tri-fold) - \$40 for 100 brochures
- Banners (vinyl; 3' x 6') - \$200 per banner

3. Where would you place these promotional materials at your school?

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## ACTIVITIES

Collect recipes and create a recipe book to give as a gift.

Plan, cook and serve meals to your family.

Organize the grocery list and shop for your family.

Teach a cooking class to younger 4-H members or siblings.

Enroll in a cooking class.

## SERVICE IDEAS

Design and create "food preparation safety posters" for your school's cafeteria.

Plan, cook and serve meals to your family.

Work with a local homeless shelter to assist in preparing meals.

Teach a cooking class to younger 4-H members or siblings.

## RESOURCES

- School and public libraries
  - Chefs, farmers, butchers
  - 4-H project leader/group
- The following Websites were used to create this activity sheet. To learn more, visit:
- [www.utextension.utk.edu/4H/projects/foodscience.htm](http://www.utextension.utk.edu/4H/projects/foodscience.htm)
  - [www.n4hccs.org](http://www.n4hccs.org)
  - [www.cdc.gov](http://www.cdc.gov)
  - [www.youthlearningnet.org](http://www.youthlearningnet.org)
- Don't forget! For more ideas and info, contact your 4-H office.

# THE TRUTH ABOUT FOOD PRESERVATION

Food preservation methods enable us to store foods for long periods of time. The different methods ensure that the foods maintain their nutrients, quality, look, taste, etc. Packing, freezing and canning are forms of food preservation. Read the statements below. Circle **true** if you think the statement is correct. Circle **False** if you think the statement is incorrect. Visit [www.youthlearningnet.org](http://www.youthlearningnet.org) and click on **fantastic foods** to learn more.



Most fruits retain their texture and flavor better when packed in sugar rather than the dry packing method.

**TRUE**

**FALSE**



Vegetables should not be frozen for 10 to 14 days after purchasing or harvesting. **VEGETABLES SHOULD BE FROZEN AS SOON AS POSSIBLE AFTER PURCHASING/HARVESTING TO RETAIN FLAVOR AND NUTRIENTS.**

**TRUE**

**FALSE**



Blanching or scalding vegetables stops the enzymes that allow them to ripen naturally.

**TRUE**

**FALSE**



Lettuce, cucumbers and radishes should not be frozen because of the high amount of water they contain.

**TRUE**

**FALSE**



Potatoes are the perfect vegetable for freezing. **POTATOES ARE NOT RECOMMENDED FOR FREEZING AS THE PROCESS CAUSES THEM TO LOSE THEIR TEXTURE AND BECOME GRAINY.**

**TRUE**

**FALSE**



The amount of natural acid in a food determines whether or not a food should be processed in a pressure canner or a boiling water canner.

**TRUE**

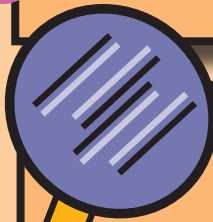
**FALSE**



The best choice for preserving fruit is to pack it in water. **THE BEST CHOICE FOR PRESERVING FRUIT IS TO PACK IT IN ITS OWN JUICE.**

**TRUE**

**FALSE**



## CAREER SEARCH

1. Find a person in your community or a family member who uses food science in his or her profession. Set up an interview. Create a list of questions that you would like to ask. A few examples are as follows:

What do you like best about your job?  
What kind of training or education do you have?  
What is the most challenging part of your profession?

What other questions would you like to ask? Think about it and write the questions on the lines below.

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2. How will you record the interview? Will you write or tape the responses? Will you videotape it?

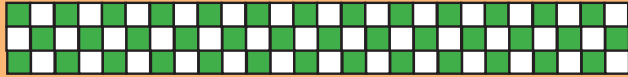
3. How are you going to share the interview with others? Will you write a report? Create a news article? Design a video, Power Point™ or DVD presentation? Whatever the format, make sure that it is okay with the interviewee! Your 4-H food science project leader can help.

4. What did you learn with this project? List below three new skills you developed.

- 1.
- 2.
- 3.

# REFLECTION

As an advanced food science project member, you have gained many useful skills. Reflect on some of the things that you have learned. Think about how working in food science makes you feel. Using the letters below, highlight your new skill set and feelings. An example has been provided.



	What I've learned ...	How I feel ...
F	<i>Food Preservation</i>	<i>Fantastic</i>
O		
O		
D		
S		
C		
I		
E		
N		
C		
E		



# LEARNING TO LEAD

As a 4-H project leader, you should be able to share your skills, knowledge and experiences with younger 4-H members. Here is a group activity idea that you can use as you plan your project group meeting. Can you think of others? How can this activity be used with other 4-H projects?

## THE NUTRIENT GAME

### Materials Needed:

- 13 shoe boxes
- Paint and paint brush
- Permanent Marker
- Magazines
- Card stock
- Scissors

### Directions:

1. Paint the shoe boxes. You may paint them all different colors or the same color.

2. Using the permanent marker, Label the shoe boxes with the following words (One word per box):

- |           |               |
|-----------|---------------|
| Protein   | Riboflavin    |
| Calcium   | Niacin        |
| Iron      | Vitamin D     |
| Iodine    | Carbohydrates |
| Vitamin A | Fats          |
| Thiamine  | Water         |
| Vitamin C |               |

3. Cut out pictures of foods from magazines and glue them to card stock, Or simply write the name of the foods on card stock and cut them out. As a third option, your project members could find pictures of foods from magazines as part of this activity.

4. Provide an explanation of what each nutrient contributes to the body before beginning the next part of the activity.

5. Have the project members then place the picture or ì food wordî in the shoebox that corresponds to the nutrient that the food contains.

6. A complete list of the nutrients, their functions and the foods in which these nutrients are found is located on the next page.



## IRON

USES:  
Combines with protein to make hemoglobin  
Helps cells use oxygen properly

Sources:  
Liver, oysters, meats, egg yolk, dry beans,  
dark, leafy green vegetables, whole-grain  
breads and cereals

## IODINE

USES:  
Maintains proper function  
of the thyroid

Sources:  
fish and seafoods

## NIACIN

USES:  
Helps cells of the body use oxygen to  
produce energy  
Maintains health of skin, tongue, digestive  
tract and nervous system

Sources:  
Liver, meat, poultry, fish, leafy greens,  
peanut butter, beans, peas, whole  
grain breads and cereals

## VITAMIN C

USES:  
Assists in tooth and bone formation  
Promotes healing of wounds  
Maintains cells and blood vessel health

Sources:  
fruits, broccoli, brussel sprouts,  
cabbage, peppers, mustard greens,  
turnip greens, potatoes (skins) and  
tomatoes

## RIBOFLAVIN

USES:  
Helps cells use oxygen to release  
energy from food  
Keeps eyes healthy

Sources:  
Milk, liver, meats, eggs and  
dark, leafy greens

## CALCIUM

USES:  
Build bones and teeth  
Helps to clot blood  
Helps nerves, muscles,  
including the heart, to function

Sources:  
Milk, cheese, ice cream,  
collard greens, mustard  
greens and turnip greens

## PROTEIN

USES:  
Builds and maintains tissue  
Supplies energy  
Part of enzymes, hormones and body fluids

Sources:  
Meat, poultry, fish, seafood, eggs, milk,  
cheese, dry beans, peas and nuts

## CARBOHYDRATES

USES:  
Supplies food energy  
Helps body use fat efficiently  
Works with proteins to build and repair the  
body

Sources:  
breads, cereals, corn, potatoes, rice,  
pasta, honey, molasses, syrups,  
sugar, sweets

## VITAMIN A

USES:  
Promotes healthy eyesight  
Maintains smooth skin  
Keeps lining of mouth, nose,  
throat and digestive tract  
healthy and resistant to infections  
Helps body to grow

Sources:  
Liver, dark green and dark yellow  
vegetables, carrots, pumpkin, sweet  
potatoes, squash, apricots,  
cantaloupe and butter

## VITAMIN D

USES:  
Builds bones and teeth

Sources:  
Milk, sunlight, fish liver oil

## THIAMINE

USES:  
Helps body cells obtain energy  
from food  
Keeps nerve cells healthy  
Promotes appetite and digestion

Sources:  
Pork, liver, dry beans and peas,  
whole-grain bread and  
cereals and nuts

## FATS

USES:  
Provides food energy  
Supplies essential fatty acid  
Helps body properly use  
other nutrients

Sources:  
Oils, butter, margarine,  
salad dressings

## WATER

Important to all cells and fluids  
Carries nutrients to body cells  
Carries waste from body cells  
Aids in digestion and food absorption  
Regulates body temperature

Sources:  
Water, beverages, soups, fruits and  
vegetables. Most foods contain  
some water.