

Cooks and Books

**Integrating
Agriculture
and Food
Science
Through
Literature**



Illinois
AGRICULTURE
in the ClassroomSM

<http://www.agintheclassroom.org>





Welcome to the IAITC CAFÉ: Cultivating Agricultural Food Experiences! Come let your students participate in activities that are intended to help them explore the sciences involved in the creation of their food. Where does their food come from, how is it made and what outside factors play a role in the quality of their food. All activities have a literature connection that will provide a wonderful opportunity for classroom teachers to encourage students to read and learn about agriculture and its importance in today's society.

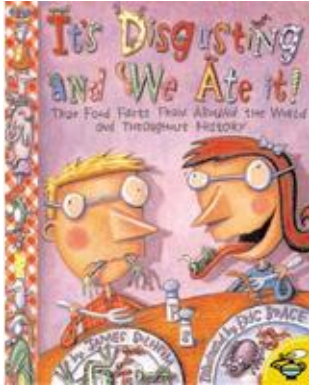
This booklet is designed with the student audience in mind. These activities are intended to be used in the classroom as supplemental learning material. Each lesson is correlated to the Illinois State Learning Standards and Assessment Framework. The answer sheet for each activity is provided at the end of this booklet.

Books that Cook!

Below is the list of books that are used throughout this lesson booklet:

- *A Cow, a Bee, a Cookie and Me* by Meredith Hooper ISBN:0-7534-5067-4
- *A Song for Lena* by Hilary Horder Hippely ISBN: 0-689-80763-5
- *All in Just One Cookie* by Susan E. Goodman ISBN: 978-0-06-009092
- *Clarabelle: Making Milk and So Much More* by Cris Peterson ISBN-10: 1-59078-310-7
- *Cook-A-Doodle-Do* by Janet Stevens and Susan Stevens Crummel ISBN: 0-15-205658-0
- *Extra Cheese, Please! Mozzarella's Journey from Cow to Pizza* by Cris Peterson ISBN: 1-56397-177-1
- *How to Make an Apple Pie and See the World* by Marjorie Priceman ISBN: 0-679-93705
- *It's Disgusting and We Ate It!* by James Solheim ISBN: 0-439-05660-8
- *Science Experiments You Can Eat* by David Cain ISBN-10: 0-06-446002-9
- *The Hungry Planet: What the World Eats* by Faith D'Aluisio and Peter Menzel ISBN-10: 0-9840-7442-2
- *The Little Red Hen Makes a Pizza* by Philemon Sturges ISBN:0-14-230189-2
- *The United States Cookbook* by Joan D'Amico and Karen Drummand ISBN: 978-0-471-35839-8





It's Disgusting and We Ate it!

Grade Level: 2-6 Reading

Objective: Upon completion of this activity, students will compose their own acrostic poem and understand the proper way to compose the poem.

Illinois Learning Standards: 1.C.2a; 1.C.2c; 2.A.2a

Assessment Framework: 1.3.14; 1.3.15; 1.3.23

Suggested Reading Materials:

It's Disgusting and We Ate it! True Food Facts from Around the World and Throughout History by James Solheim

ISBN: 0-439-05660-8

IAITC Nutrition Ag Mag

Introduction: Acrostic poems are created by using a subject specific word or names. Once the word is chosen, the poem is formed by using the letters in the word or name as the first letter in that sentence. Sentences are then created that tell readers about the chosen word or the topic. Use this exercise to test students' recall from the reading of It's Disgusting and We Ate It!

Materials:

Pen and paper Scrap magazines Scissors Glue

Directions:

1. Select a food from the book that you found interesting or disgusting!
2. Once the word is selected write it horizontally on the paper.
3. Now form sentences that describe the food. See sample below:
 Fried in butter they are just finger lickin!
 Roll them in egg and flour.
 Oven or a deep fryer is the best way to cook.
 Great tasting!
 Live in most of the world's countries.
 Exactly like eating chicken they say.
 Greasy they are not.
4. Now decorate your page with magazine pictures that help describe your poem.



It's Disgusting and We Ate it!

Grade Level: 2-6 Science & Reading

Objective: Upon completion of this activity, students will be able to address factors that are involved with food spoilage, food preparation and food preservation.

Illinois Learning Standards: 11.A.1d; 11.B.1a; 11.B.2f

Assessment Framework: 11.4.01; 11.4.02; 11.4.03

Suggested Reading Materials:

It's Disgusting and We Ate it! True Food Facts from Around the World and Throughout History by James Solheim

ISBN: 0-439-05660-8

Hungry Planet: What The World Eats by Peter Menzel & Faith D'Aluisio

ISBN-10: 1580088694

IAITC Nutrition Ag Mag

IAITC Dairy Ag Mag

IAITC Soybean Ag Mag

Introduction: It's disgusting and we ate it! If you had your choice of a juicy hamburger with all the fixings, a bowl of African bugs, or maybe dried jellyfish, which one would you choose? It is pretty safe to guess most of us in the United States would probably rather eat the hamburger. However, the hamburger would not be the first choice for many people in other parts of the world. Completion of this lesson will allow students to learn what other cultures are eating and how different factors can effect the quality of food.

In the United States, we are very privileged to have ample, high quality food that is monitored throughout it's growth and production. The United States Department of Agriculture has strict guidelines on requirements for how food is harvested, handled and produced into the products we find on our grocery store shelves. Complete the following exercise to learn what factors can change the quality of a soybean.

Materials:

Soybeans or dried beans (soak all beans overnight, leaving out 10 beans per group that are not soaked to serve as the control)

Ziploc bags

Water

White Vinegar

Sugar

Salt



Directions:

1. First label your Ziploc bags with the following terms: Control, Cool, Sunlight, Dark, Salt, Sugar and Vinegar.
2. Fill the control bag with 10 un-soaked soybeans, squeeze out air and seal. These soybeans are your *control*. A scientific control is the factor in the science experiment that is being kept in its natural state so it can be used to compare with the other soybeans that you are altering.
3. In the remaining bags (cool, sunlight, dark, salt, sugar and vinegar) put 10 pre-soaked beans per bag. Remove the air from the sunlight and dark labeled bags and seal.
4. Next put 4 tablespoons of sugar in the bag labeled sugar. Remove the air from the bag and seal. Once the bag is securely sealed shake the bag to spread the sugar over the soybeans. Make sure that each soybean is covered with a light dusting of sugar. Repeat this step with the salt bag. Use 4 tablespoons of salt.
5. In the bag labeled vinegar pour 1/4 cup of white vinegar. 1/4 cup is equivalent to 4 tablespoons. Remove the air and tightly seal the bag.
6. Now place the bags labeled control, salt, sugar and vinegar in the area designated by your teacher. Location should not be in direct sun, just a nice warm location in the classroom.
7. Now place the sunlight bags in the area designated by your teacher that receives ample amounts of sunlight throughout the day. Also place the bag labeled dark in a location that will receive no sunlight or cold air.
8. Create a graph or journal to track the changes in your soybeans.

Discussion Questions:

1. Describe how the beans changed during the week.
2. Which test bag decayed faster? Which bag decayed slower?
3. From this experiment, which way was the best way to preserve food? Why?
4. List at least two different test methods you could add to your experiment.

Lesson Extenders!

1. Move the control to each location and monitor if anything happens to them. Record you answers.
2. Investigate labels of your favorite food. Find out what ingredients are natural ingredients and which ones are preservatives.
3. Link to this YouTube video to see food decay of your favorite fast food. http://www.diet-blog.com/08/do_mcdonalds_burgers_decompose.php





The Hungry Planet

Grade Level: 4-6

Objective: After completing this activity, students will have explored the nutritional habit of families all around the world. Students will be able to compare and contrast these countries with the United States and each other. They will also be able to investigate how weather, landscape and soil types affect agriculture all around the world.

Illinois Learning Standards: 3.A.2; 3.B.2b; 3.C.2a; 4.B.2a; 5.A.2b; 5.C.2b; 15.A.2a; 17.A.2a; 23.C.2a; 23.C.3 **Assessment Standards:** 3.5.03; 3.5.06; 3.5.19; 3.5.28

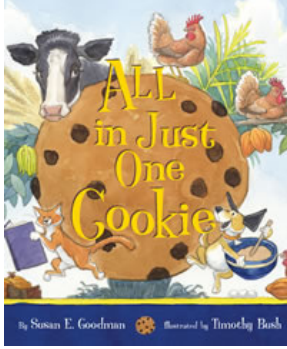
Suggested Reading Materials:

Hungry Planet: What The World Eats by Peter Menzel & Faith D'Aluisio
ISBN-10: 1580088694

Activity Instructions:

1. Discuss the book, Hungry Planet: What The World Eats.
2. Have the students pick one of the countries in the book (any country but the United States). Have students read the chapter pertaining to the country they selected paying close attention to the following: source of food (hunted, grown or purchased), living situation, availability to dairy and food consumed.
3. Students should investigate the country using the internet, books, encyclopedias, etc.
4. Have the students write a report on their country including what items were purchased and how much money was spent. Have them include agricultural aspects such as weather/climate, topography/landscape, soil types, etc. Each student should use these findings in their discussion of why the people of their assigned country can grow specific foods and why they can't grow other types of food. Information on food availability, storage and access to markets should be mentioned. Students should also discuss nutritional aspects. Does the food purchased fulfill all of the nutritional needs of the people in that country?
5. After writing their report, have the students prepare a short presentation about their country. This could be done with a PowerPoint presentation or just a general sharing session.
6. After all students have shared their findings, discuss how the United States differs from other countries. What kind of land and climate do we have? What types of food do we buy? How much money do American families spend on food? What ways is our food preserved, packaged and marketed?





All in Just One Cookie

Grade Level: 4-6 Science & Reading

Objective: After completing this activity, students will understand the process by which milk becomes butter.

Illinois Learning Standards: 11.A.1d; 11.B.1a; 11.B.2f

Assessment Framework: 11.4.01; 11.4.02; 11.4.03

Suggested Reading Materials:

IAITC Dairy Ag Mag

All in Just One Cookie by Susan E. Goodman ISBN: 978-0-06-009092

Extra Cheese, Please! Mozzarella's Journey from Cow to Pizza by Cris Peterson
ISBN: 1-56397-177-1

Introduction:

Milk is often referred to as the most complete food. One simple glass of milk contains water, carbohydrates, vitamins, minerals, proteins and fat. From milk we make several tasty treats, such as cheese, ice cream and even butter. Butter is made by extracting the fat from the other parts of milk. Cream contains more butterfat than whole milk. Cream in the science world falls in the category of an *emulsion*. The word *emulsion* comes from a Latin work that means “to milk out.” Emulsions have a milky or cloudy appearance. Make your own butter and learn more about liquids and how emulsions perform.

Materials:

8 oz. carton or whipping cream

Salt Plastic container with lid. Ziploc containers with screw-on lids are the best.

Marble (optional) Child safe knife for spreading

Bread or crackers

Directions:

1. Direct students to pour the whipping cream into the plastic container. (If you choose, have students place 1 or 2 marbles in the plastic container as well.)
2. Have students close the lid securely.
3. Have students shake the container. Vigorous shaking is not needed, use long hard thrust downward with a pause in-between thrust.
4. After a few minutes a lump should appear. This the butter!
5. Once the butter is formed, have students strain off the excess liquid and rinse the butter with water.. Add of few sprinkles of salt (optional).
6. Allow students to spread the butter on to the bread or crackers. Eat!



All in Just One Cookie

Grade Level: 4-6 Science & Reading

Objective: After completing this activity, students will understand the steps that are required to grow the ingredients that go into a basic chocolate chip cookie.

Illinois Learning Standards: 11.A.1d; 11.B.1a; 11.B.2f

Assessment Framework: 11.4.01; 11.4.02; 11.4.03

Suggested Reading Materials:

IAITC Specialty Crop and Dairy Ag Mags

All in Just One Cookie by Susan E. Goodman ISBN: 978-0-06-009092

Introduction: Have you ever stopped to think about how long it took to grow and produce all the ingredients that go into your chocolate chip cookie? Not only will your students learn how long it takes to produce the ingredients involved in their chocolate chip cookie, they will learn where the products are grown and how they are produced. The following activities will provide students with a hands on experience with cookie ingredients.

Materials:

Wheat stems or wheat kernels

Baby food jars

Pepper grinder (empty)

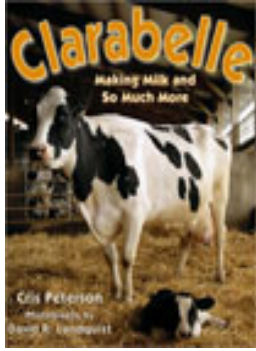
Directions:

1. Divide wheat stalks among the groups. Teach them how to harvest the wheat kernels from the wheat plant. Skip this step and go to the next step if you are using the wheat kernels.
2. Have each group of students measure out 1/2 cup of wheat kernels.
3. Fill grinder with wheat kernels and allow each student the opportunity to mill their own wheat.
4. Discuss what product is made from wheat.

Lesson Extender!

1. Investigate as a class where most of the wheat in the United States is grown. Also learn the different types of wheat and what they are used for.





Clarabelle: Making Milk and So Much More

Grade Level: 4-6 Science & Reading

Objective: After completing this activity, students will understand how sensitive fats and proteins are to new substances and how this sensitivity helps control the molecules in milk so different products can be made from milk.

Illinois Learning Standards: 11.A.1d; 11.B.1a; 11.B.2f

Assessment Framework: 11.4.01; 11.4.02; 11.4.03

Suggested Reading Materials:

IAITC Specialty Crop and Dairy Ag Mags

[A Cow, a Bee, a Cookie and Me](#) by Meredith Hooper ISBN:0-7534-5067-4

[Clarabelle: Making Milk and So Much More](#) by Cris Peterson ISBN-10: 1-59078-310-7

Introduction:

Milk is mostly water but it also contains vitamins, minerals, proteins and tiny droplets of fat suspended in solution. Fats and proteins are sensitive to changes in the surrounding solution (the milk).

When you add soap, the weak chemical bonds that hold the proteins in the solution are altered. It becomes a free-for-all! The molecules of protein and fat bend, roll, twist and contort in all directions. The food coloring molecules are bumped and shoved everywhere, providing an easy way to observe all the invisible activity.

At the same time, soap molecules combine to form a *micelle*, or cluster of soap molecules. These micelles distribute the fat in the milk. This rapidly mixing fat and soap causes swirling and churning where a micelle meets a fat droplet.

Milk is mostly water, it has surface tension like water. The drops of food coloring floating on the surface tend to stay put. Liquid soap wrecks the surface tension by breaking the cohesive bonds between water molecules and allowing the colors to zing throughout the milk. What a party!



Materials:

Milk (whole or 2%)

Dinner plate

Cotton swabs

Food coloring (red, yellow, green, blue)

Dish-washing soap (Dawn brand works well)

Directions:

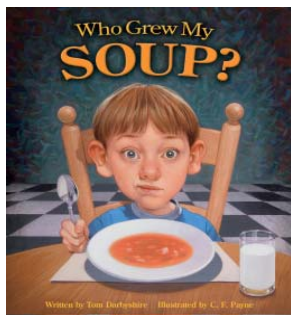
1. Pour enough milk in the dinner plate to completely cover the bottom. Allow the milk to settle. There should be no ripples in the milk before starting this activity.
2. Add one drop of each of the four colors of food coloring - red, yellow, blue, and green - to the milk. Keep the drops close together in the center of the plate of milk.
3. Find a clean cotton swab for the next part of the experiment. Predict what will happen when you touch the tip of the cotton swab to the center of the milk. It's important not to stir the mix. Just touch it with the tip of the cotton swab.
4. Now place a drop of liquid dish soap on the other end of the cotton swab. Place the soapy end of the cotton swab back in the middle of the milk and hold it there for 10 to 15 seconds.
5. Add another drop of soap to the tip of the cotton swab and try it again. Experiment with placing the cotton swab at different places in the milk.

Review

1. Describe how the milk reacted when you first added the food coloring drops (step number 2).
2. What did you predict would happen when you touched the cotton swab to the center of the milk, why (step number 3)? Explain what actually happened.
3. Explain what happened when the soapy cotton swab was held on the surface of the milk.
4. What happened when you placed the soapy cotton swab in different locations of the plate? Would this work with the plain cotton swab, why or why not?
5. What makes the food coloring in the milk move?
6. Explain why this activity would or would not work with regular tap water.

*Exercise adapted from Kitchen Chemistry:
<http://www.stevespanglerscience.com>*





Who Grew My Soup?

Grades: 3-5 Science

Learning Standards: 11.A.2a, 11.A.3a, 12.A.1b, 12.A.2b

Assessment Framework: 11.4.01, 11.4.02, 12.7.02

Objective: At the end of this experiment, students will master procedure for extracting color pigments from food. Students will also understand how different pigments combine to make different colored vegetables.

Materials:

Variety of leaves with a variety of colors. Spinach, Chard, Cabbage.

White vinegar

Clear plastic container with a clear lid. A drinking cup with a lid works the best.

White coffee filters.

Permanent marker and pencil

Penny or nickel (one per student or group)

Directions:

1. Cut coffee filters into $\frac{1}{2}$ inch wide strips and a little longer than the height of the cup with the lid on it.
2. With a black permanent marker label each cup with the plant that is being tested. After labeling, pour $\frac{1}{2}$ inch of white vinegar into each cup.
3. With the pencil, label one end of the coffee filter with the name of the plant.
4. Lay the leaf on top of filter strip. Using the edge of the penny or nickel, press a line of pigment from the leaf onto the filter strip. Leave 1 inch of the filter strip **without** leaf pigment.
5. Poke the labeled end of the strip **up through** the bottom of the lid's "x". Adjust the paper so that when you place the lid on the cup the lower end of the strip is in the vinegar.
6. Record observations.

Questions to think about:

1. How many different plant pigments do you observe? Are the observed pigments different than the color of your leaf?
2. Is there a pigment that all leaves have in common?



Who Grew My Soup?

Grade Level: 2-4

Objective: After completing this activity, students will have a better understanding of how vegetables grow and why they are an important part of any diet.

Illinois Learning Standards: 1.A1a; 1.A1b; 2.B.1c; 4.A.1c; 11.B.1a; 11.B.1c; 12.A.1a; 12.A.1b; 12.B.1a

Assessment Framework: 1.3.01; 1.3.06; 1.3.07; 1.3.13; 2.3.02; 2.3.10; 12.4.03; 12.4.04; 12.4.05

Suggested Reading Materials:

IAITC's Specialty Crop Ag Mag

Who Grew My Soup By Tom Darbyshire ISBN-13: 978-1-4127-4544-4

What You Will Need:

1 brad 1 small white dessert plate pencil ruler (optional)
1 red dinner plate or a regular white plate they can color
Color pencils or crayons Glue Scissors
Stem template from www.agintheclassroom.org or have students draw their own

Activity Instructions:

1. Have the students divide the small dessert plate into eighths by drawing with a pencil and using the ruler as a straight line guide. Plain white paper can be substituted for the small white dessert plates.. Just have students trace the large paper plate on a regular sheet of paper and cut it out.
2. Have the students write an Illinois specialty crop fact or facts about vegetables learned from the reading of the Illinois Specialty Crop Ag Mag or Who Grew My Soup on each one eighth section.
3. Have the students cut a triangle out of the large plate. It should be 1/8th of the plate in size. It should look like a pie slice and line up with the lines drawn on the small dessert plate.
4. Have the students attach the red plate to the front of the divided fact plate with a brad.
5. Have the students glue the tomato stem to the top of the tomato.
6. Now the students can turn their tomato spinner and review the facts about vegetables, especially tomatoes!



Who Grew My Soup?

Grades: 2-12 Science

Objective: Students will develop technical competence and personal initiative in food science and technology occupations. Students will also understand the important role human senses play in the science of food and food perception.

Illinois Learning Standards: 1.A1a; 1.A1b; 2.B.1c; 4.A.1c; 11.B.1a; 11.B.1c; 12.A.1a; 12.A.1b; 12.B.1a

Assessment Framework: 1.3.01; 1.3.06; 1.3.07; 1.3.13; 2.3.02; 2.3.10; 12.4.03; 12.4.04; 12.4.05

Introduction:

"Sensory" is derived from the Latin "sensus" (= sense) and therefore, "sensory evaluation" is the description and evaluation of food products using the human senses. Our sense of smell is connected really well to our memory. How accurate is your sense of smell? After discussing with students the role that their olfactory sense plays in identifying food and its taste, perform the following activities.

Materials:

Cotton swabs

Index cards or small paper plates

Variety of spices and cooking oils. Suggestions: Anise, cinnamon, oregano, basil, thyme, garlic, banana, cherry, raspberry, strawberry, vanilla, lime, orange, clove, butter, almond, wintergreen, chocolate and nutmeg.

~The baking aisle is a great location for the artificial fruit oils.

Aroma Test

1. Place scents on a cotton ball and then place on a labeled plate or index card. Provide no visual cues for students to identify the scent.
2. Allow students one minute or less at each station. Have them record answers and rotate to next scent.

Triangle Test ~ taste or smell

1. Create a reference sample and two comparison samples for each station. Students should be told to determine which comparison sample resembles the reference sample the closest. At each station, tell students which senses they are allowed to use. Example smell, taste, sight.

