The Future In Plants

PURPOSE:
• To become familiar with the need to become involved with plant science as a field of study, and a career choice.

OBJECTIVES:
For youth to:
• give examples of technological advances in agriculture.
• list the advantages and disadvantages of hydroponics.
• construct a terrarium.
• debate the advantages and disadvantages of organic/inorganic gardening.
• identify occupational opportunities in horticulture.
• discover the types of jobs involved with food production and distribution.

LESSON TIME:
• Lesson time may vary based upon learning activities selected. Most activities are approximately 30 minutes.

ADVANCE PREPARATION:
• Read the BACKGROUND BASICS on The Future In Plants.
• Review activities and choose appropriate one(s) to use.
• Collect and prepare materials for appropriate activities.

LEARNING ACTIVITIES
1. KEEPING UP TO DATE
2. TEST THE WATERS
3. INTERIORSCAPES
4. THE DEBATE
5. WHAT DO YOU WANT TO BE?
6. HOW DOES IT GO?

DO
The following are suggestions for using the activities in Lesson 6. The materials needed for each are listed within the activity.

• Identify ways that technology has helped farmers increase food production in KEEPING UP TO DATE.
• Construct a hydroponic vegetable garden in TEST THE WATERS.
• Construct a terrarium in INTERIORSCAPES.
• List gardening techniques used in THE DEBATE.
• Define careers in the horticulture industry in WHAT DO YOU WANT TO BE?
• Discover career opportunities in the field of plant science in HOW DOES IT GO?
REFLECT

After completing the activities in this lesson, help youth reflect on what they have learned with these questions:

What are some advances in agricultural technology that have helped people?
   new varieties, fertilizer, pesticides, plant breeding, improved equipment

What are the advantages of hydroponics?
   higher yields, control plant nutrients, no threat of soil borne diseases, controlled conditions

What is interiorscaping?
   the use of foliage plants to create attractive indoor environments

What are some unique features of an organic garden?
   absence of synthetic chemicals, pesticides or fertilizers

What does a person need in order to make a wise choice about a horticultural career?
   research, education, experience, hard work

Where could you look for information about plant related jobs?
   library, teachers, counselors, career placement agencies, companies

APPLY

Help youth learn to apply what they have learned.

- Have youth research and prepare a speech on the question: How did the development of agriculture make civilization possible?
- Design your own hydroponic growing system. Have youth research hydroponics and set up an alternative growing system based on the information collected.
- Invite an interiorscaper to visit your group. Find out more about job opportunities in this field.
- Compare the production of commercially grown organic and inorganic crops. Are more people needed to grow organic or inorganic produce?
- Interview someone who works in a horticultural occupation. Determine the nature of their work and the requirements needed to obtain that type of job.
- Prepare a poster or bulletin board that depicts plant related occupations in your area. Create job descriptions for each occupation.
BACKGROUND BASICS ... The Future In Plants

Contrary to the image portrayed on television, the lives of American pioneers were not filled with adventure and romance. Until the mid 1600's day to day life in colonial America centered around survival. Old World agricultural techniques did not work in the New World. New crops and methods of production were learned from native Indians. It wasn't until the 1700's that American farmers produced a notable surplus of food. Farmers learned how and what plants to grow. The demand for draft (working) animals lead to advances in livestock management practices like selective breeding. During the 1800's animal powered machines improved farm productivity. By the 1850's John Deere invented a wrought iron plow with a moldboard bottom and a replaceable steel cutting edge. American agriculture was expanding at a frantic rate. Farm mechanization and an improved transportation system encouraged more extensive agriculture.

Mechanization of farm equipment continued to dominate technological innovations between 1900 and 1930. The development of the gasoline powered tractor replaced animal powered machines. By 1940 farmers had completely converted from animal to mechanical power. In addition to mechanization, farmers adopted biological innovations. Hybridization improved crop yields with varieties resistant to disease and drought. Chemical fertilizers and pesticides gained wide acceptance. Chemical fertilizers probably increased yield more than any other single innovation. During the 1950's and 1960's farmers began to use advanced management techniques. Most farmers began to keep accurate records and employ computerized information systems to help make decisions.

Farmers who use mechanical, chemical, biological, and managerial advances are more productive. New technologies such as genetic engineering and computers will continue to improve yields and efficiency in agriculture.

Agricultural choices....

Gardening is the number one hobby in the United States. Americans make choices based on accumulated knowledge and methods in agriculture. For example, many gardeners choose to garden without the aid of chemical fertilizers or pesticides but instead rely on cultural methods and pest resistant plant varieties.

Organic gardening differs from inorganic gardening mainly in the areas of fertilization and pest control. Organic gardeners apply generous quantities of organic material to the soil. These materials include plant trimmings, compost, animal manures, and cover crops. The benefits of adding organic matter include: improved structure and condition of the soil, increased ability to hold nutrients and water, and a slow release of nutrients. Organic gardeners also use natural methods to control pest...
infestations. Gardeners plant pest resistant varieties, rotate crops, dispose of diseased plants before they contaminate others, hand-pick insects, and use mulch to keep insect populations low. Although inorganic gardeners generally use a combination of natural materials and methods they also apply synthetic materials to fertilize plants and control pests.

**Hydroponics**

*Hydroponics* is a method of growing plants in which the nutrients needed by the plant are supplied by a nutrient solution (water and soluble fertilizer). Since roots cannot anchor plants in solution, other methods of anchoring must be used. Placing plants in styrofoam materials which float on the surface is one method of support.

Hydroponic growing systems offer several advantages over soil culture: plant nutrition is completely controlled through prepared nutrient solutions; yield per unit area is greater since plants may be placed closer together; the need for weed, disease, and insect control is greatly reduced due to absence of soil. Hydroponics is also used commercially to grow high-value crops in greenhouses during the winter. This allows production at a time when the crops can not survive outside. Commercial producers grow lettuce, tomatoes, peppers, and cucumbers hydroponically in large greenhouse complexes. Some growers use these crops to supplement other agricultural operations. The disadvantage of using hydroponics to grow plants are construction, cost of production, maintenance of hydroponic facilities, and demand in the marketplace.

The field of hydroponics is rapidly expanding and will continue to grow as scientists look for new ways to grow plants without soil. Various career opportunities exist in the field of hydroponics:

- **Producers or growers** own and operate hydroponic greenhouses
- **Truck drivers** transport hydroponically grown produce to supermarkets
- **Produce managers** order and receive fresh produce from farms and greenhouses
- **Plant pathologists** provide information about diseases and pests affecting their produce
- **Agricultural scientists** work to find new ways to grow plants hydroponically

**Interiorscaping**

Growing foliage plants inside office buildings and shopping malls is big business. *Interiorscaping* uses foliage plants to create attractive interior environments. Plants give people the feeling of the outdoors when inside. Interiorscapers maintain foliage plants under conditions that may not be the best for plant growth.

Terrariums are one method of bringing the outdoors inside. A terrarium or bottle garden is a miniature landscape growing in a covered glass or plastic container. The terrarium originated in the 1850's as a way of transporting living plants to different parts of the world. Today, terrariums are more decorative in nature.
Common misconceptions about terrariums are that they require no care and that just about any kind of plant will thrive in a bottle. Plant selection is very important when starting a terrarium. Cactus and succulent type plants will not do well in the terrarium environment. Instead pick plants that thrive under high humidity and low light.

Any number of containers can be used as terrariums, as long as the material is either clear glass or plastic. Large-necked bottles and fish tanks make good terrarium containers because it's easier to reach inside when positioning the plants. Terrariums do best in bright, but not direct, sunlight. If the sun shines directly into the container, the plants inside are likely to burn. Covered terrariums will not require additional water, but moisture can condense on the inner glass surface destroying the beauty of your mini garden.

**Agricultural Career Choices**

Horticulture deals with the development, improvement, growth, distribution, and use of fruits, vegetables, and ornamental plants. Many different careers are available in the horticulture industry. Every local community in North America has plant related career opportunities. Education, experience, and hard work are needed to advance in these careers. Examples of some plant related careers include:

**Agronomists** are concerned with field crop production and soil management.

**Botanists** study or investigate plant structure, function, and evolution.

**Ecologists** study the interrelationships between organisms and their environment.

**Floriculturists** are involved in the production, transportation, and use of flower and foliage products.

**Horticulture Extension Agents** are employed by the Extension Service, with offices in local communities and on college campuses. Agents work with a variety of audiences including: 4-H youth clubs, home gardeners, commercial growers, processors and distributors. Agents disseminate research based information and recommendations on horticultural practices to the public.

**Landscapers** plant and maintain home and commercial landscapes.

**Interiorscapers** use foliage plants to create pleasing and comfortable areas inside buildings.

**Olericulturists** deal with the production, storage, processing, and marketing of vegetables.

**Pomologists** are involved in the growing, harvesting, storing, processing, and marketing of fruits and nuts.

**Plant pathologists** provide plant growers with information about disease pests affecting plants.

**Plant Physiologists** study processes that take place within a plant. They are interested in plant nutrition, the influence of the environment on plants, the products of plant activities, and the sequence of events that result in the growth and development of plants.
Activity 1: Keeping Up to Date

INTRODUCTION

It wasn't that long ago our great grandfathers used draft horses to plow their fields, now they use computers and motorized machinery. From 1930 to 1970, American agriculture experienced a technological revolution. Farmers started to use mechanical, chemical, and biological advances to tend their crops. Can you give me an example of a mechanical, chemical, or biological advance that a farmer might use today? Over the years, technology has increased the production and quality of the food we produce. Today, we are going to investigate advances in technology.

OBJECTIVES:
For youth to:
• give examples of some technological advancements in agriculture.
• identify ways that technology has helped farmers to increase food production.

LIFE SKILL:
• Acquiring, analyzing, and using information.

MATERIALS:
• journals, books, magazines, and bulletins on agriculture and technology
• pens/pencils
• Paper

TIME:
• 30 - 60 minutes

SETTING:
• A comfortable room with tables and chairs.

DO

• Divide youth into 4 groups.
• Have groups research a technological advance in the history of agriculture. Examples include: improved seed through genetic engineering, ripening techniques, or pesticide and fertilizer treatments.
• Have groups write a brief report and present their findings.

REFLECT

What are some ways that advances in agricultural technology have helped people?

new varieties, fertilizers, pesticides, selective plant breeding, specialization of equipment
REFLECT (continued)

Based on your research, what types of problems (if any) arose from the technological advances you investigated?

*answers will vary based on technology researched*

How do you think technology will change over the next few years?

*answers will vary*

How do you think the United States compares to other countries in production efficiency of agricultural crops?

*farmers in the United States are among the world's most efficient*

APPLY

- Visit a local farm or nursery and find out how they have changed over the years. What new technologies are they using?
- Research and prepare a speech for county events on the question: How did the development of agriculture make civilization possible?
- Have youth research the history of American agriculture. Have them select a significant event in the history of agriculture and share it with the group.
- Have youth investigate the agricultural regions of the United States and tell what agricultural products are grown there.
Activity 2: Test The Waters

INTRODUCTION

Hydroponics is the method of growing plants where the nutrients needed by the plant are supplied by a nutrient solution of water and soluble fertilizer. There are several advantages to growing plants hydroponically rather than in soil. For instance, plant nutrition is controlled through preparation of the nutrient solution, yield is greater since the plants can be placed closer together, the produce stays cleaner and the need for weed, disease, and insect control is reduced due to the absence of soil. Another advantage is that hydroponics is often used to grow high-value crops during the winter. This allows production at a time when the crop would not normally survive outside. Can you think of any disadvantages of using hydroponics to grow plants? (cost of production is higher, labor, construction, and maintenance of hydroponic facilities, establishing a need in the market) Today, we're going to test the waters and start our own hydroponic experiment. Let's get started!

DO

- Give each youth a copy of the HYDROPONICS Activity sheet.
- Review the instructions aloud with youth.
- Divide youth into four groups.
- Give each group a basil or lettuce seedling.
- Have groups follow the instructions on the HYDROPONICS Activity sheet.
- Have groups record their observations of plant growth and development over several weeks.
REFLECT

What is hydroponics?

method of growing plants in a nutrient solution

What are the advantages of hydroponics?

higher yields
control of plant nutrients
grow valuable crops all year
no threat of soil borne diseases

What are some of the disadvantages of hydroponics?

expensive
need to establish a place in the market
complex facilities

Is it important to find ways to grow plants without using soil?

answers will vary

What other kinds of plants could grow hydroponically? Could you grow trees? Flowers?

answers will vary

APPLY

• Visit a greenhouse or nursery that grows hydroponic vegetables. Ask your guide about the jobs associated with hydroponics.

• Plants can be hydroponically grown in a wide variety of containers and growing systems. Have youth research hydroponics and set up an alternative growing system based on the information collected.

• Design your own hydroponic growing system. Combine elements of existing systems or design a totally new system. Make a poster illustrating your design and share it with the group.

• Take a behind the scenes tour of EPCOT. Their scientists may conduct research on the latest hydroponic technology. They could also supply the surrounding restaurants with fruits and vegetables.
Hydroponics

Materials:
- Styrofoam panels (3/4 to 1 inch thick) cut to fit in the pan or plastic tub (6 to 8 inches deep)
- knife
- soluble fertilizer or hydroponic mix
- tomato and pepper seedlings
- small Styrofoam cups (unless your seedlings are in a small container that the bottom can be removed)
- permanent marker

Instructions:
- Mix the nutrient solution according to the package directions and pour into a pan. If you are using an aquarium or clear pan, cover the sides with dark paper to prevent algal growth.
- Cut a small hole cup in the Styrofoam panel to fit each Styrofoam plant cup. It is recommended that plants are usually six inches apart.
- Cut slits in the bottom of the Styrofoam cups to let roots pass through. You may also need to cut off some of the top of the cup to make it shorter for your seedlings. Gently wash the soil from the roots then put them in your Styrofoam cups. Place them in the holes in your Styrofoam panel.
- Using a permanent marker label your plant. Place the Styrofoam panel in the nutrient solution. It is important to keep the roots moist during the process, you may need to dunk them into the nutrient solution from time to time.
- Add extra water and nutrient solution to keep a minimum of 4-5 inches of solution if needed.

Archival copy: for current recommendations see http://edis.ifas.ufl.edu or your local extension office.
## Record Your Observations

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<tr>
<th>Plant Label</th>
<th>Height (cm)</th>
<th>Number of Leaves</th>
<th>Length of Roots (cm)</th>
<th>General Appearance of the Plant</th>
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Activity 3:
Interiorscapes

INTRODUCTION

Have you ever heard the term interiorscaping? Interiorscaping is the use of live foliage plants to create attractive interior environments. Can you think of a business that interiorscapes? (restaurant, shopping mall, dentist office) In addition to making an area more attractive, businesses use plants to convey an overall mood or feeling. For example, shopping malls use interiorscaping to create a pleasant, relaxed environment so their customers feel comfortable spending the whole day indoors. What message would a dentist want to convey to his/her patients? Today we're going to build our own interiorscapes. Let's get started!

DO

- Pass out copies of the TERRARIUMS Workbook activity pages 17-19.
- Review the instructions with youth.
- Choose a clear container big enough to hold two or more plants.
- Cover the container with gravel, small rocks, charcoal.
- Select and arrange plants in the terrarium. Plant the plants only as deep as they were growing in their pots.
- Gently water until water can be seen draining into the bottom of the terrarium. Wash the soil from the sides while watering.
- Place a glass or plastic lid on the terrarium and place in a well light spot (avoid direct sunlight).
- Have youth take their terrariums home.
- To maintain the terrariums, water when soil feels dry to the touch (about once a month).
- If water droplets form on the terrarium surface remove the lid to evaporate the moisture.
- Remove dead or diseased leaves and prune overgrown plants.

REFLECT
What is interiorscaping?
the use of foliage plants to create attractive indoor environments

What kind of mood will your terrarium convey?
answers will vary

What types of businesses interiorscape?
malls, doctors offices, nursing homes

Do you think plants affect the way you feel?
answers will vary

What is it about plants that might make a person change their mood or attitude?
smell, color, taste

APPLY
- Invite an interiorscaper to visit your class. Find out more about job opportunities in this field.
- Interiorscaping is a specialty in the broad and diverse science of horticulture. Select another area of horticulture and investigate how it is practiced. Examples include: landscaping, floriculture, floristry, oliviculture, pomology.
- Help a friend or family member create their own terrarium.
Terrariums

Build your own interiorscape!

To make your interiorscape you will need:
- newspaper
- clear container (large enough for 2 or more plants)
- gravel, small rocks, charcoal
- potting soil
- foliage plants (ivy, peperonia, begonias, ferns, etc.)
- clear lid to fit over container opening

WHAT YOU DO:

1. This is a terrarium:
   a mini-garden in a clear container.

2. To build one, choose a container big enough to hold two or more plants, such as a...

[Diagram of terrarium with plants and lid]

continued…
3. Terrariums have solid bottoms and drainage must be provided so any excess water will not cause root rot.

4. Now, to build a garden in the container...
   Place 1 inch of the drainage material on the bottom.
   Put 2 - 4 inches of soil in next.

5. Place the plants in the soil of the terrarium in scooped-out holes. Plant only as deep as they have been growing.

6. Plant narrow-necked bottles with tweezers, tongs, and scoops made from thin sticks, spoons, or other handy materials.

Add plastic or ceramic figures for an accent.

continued…
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<th>Step</th>
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<td>Water carefully and only until some water can be seen in the bottom of the terrarium. Wash soil bits from the sides while watering.</td>
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<td>8.</td>
<td>Cover the terrarium with glass or plastic and place in a well-lit area, but not in direct sun.</td>
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<td>9.</td>
<td>If a large amount of water droplets condense on the lid and sides, open the top a little, or uncover for a short while. Do this also if the terrarium is accidentally over-watered.</td>
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<tr>
<td>10.</td>
<td>Watch for diseased leaves and insects - remove at once. Prune or remove any overgrown plants.</td>
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With a little care, your terrarium will reward you with natural beauty and hours of enjoyment!!
Activity 4: The Debate

INTRODUCTION

Throughout the years, horticulturists have debated organic versus inorganic gardening methods. As with any issue, there are advantages and disadvantages of each method. Today we are going to research the organic versus inorganic controversy and hold our own gardening debate.

DO

- Give each youth a copy of the GARDEN DEBATE Activity sheet.
- Divide youth into two groups: ORGANIC and INORGANIC.
- Have groups research the advantages and disadvantages of their assigned gardening method. Make sure groups answer the questions on the activity sheet.
- Seat groups facing each other.
- Have one member of each group present a short informative presentation on their gardening topic.
- Start the debate by asking each group questions from the activity sheet. Ask youth to raise their hands when answering a question.
- After groups have responded to the GARDEN DEBATE questions, have them form questions of their own to ask the opposing group.
REFLECT

What are some unique features of an organic garden?
  absence of synthetic pesticides or fertilizers

What are some unique features of an inorganic garden?
  use of synthetic chemical pesticides and fertilizers

What are the advantages of organic/inorganic gardening?
  answers will vary based on the information presented in the debate

What are the disadvantages of organic/inorganic gardening?
  answers will vary based on the information presented in the debate

What type of gardening method would you choose?
  answers will vary

APPLY

• Compare the production of commercially grown organic and inorganic crops. Are more people needed to grow organic or inorganic vegetables?

• Grow an organic vegetable garden. Be sure to keep a journal of your experiences. Hypothesize what you might have done if you were growing an inorganic garden.

• Visit an organic grower. Ask the grower questions from the GARDEN DEBATE activity sheet.

• See for yourself!! Experiment with organic and inorganic gardening.
Garden Debate

QUESTIONS

1. What is organic/inorganic gardening?

2. What are the benefits of your gardening method?

3. Are there any disadvantages of your gardening method?

4. What methods of pest control do you use?

5. What do you fertilize your plants with?

6. How would you convince an inorganic gardener to become an organic gardener?

7. How would you convince an organic gardener to become an inorganic gardener?
Activity 5: What Do You Want to Be?

INTRODUCTION

If I told you that I work in the horticulture industry, what would you guess I do for a living? Since, the horticulture industry includes all of the activities that meet the needs of consumers for horticultural products, I could have any number of jobs, including supply, maintenance, grower, entomologist, extension agent, production specialist, and marketing representative. Can you think of any other careers involved in the horticulture industry? Choosing a career in horticulture takes research, education, experience, and hard work. Today we're going to learn more about some plant related career opportunities.

DO

- Divide youth into groups of four.
- Copy and cut the WHAT'S YOUR OCCUPATION Activity sheets and give each player in each group an occupation.
- If several groups are playing simultaneously, separate them so they cannot hear the groups' definitions.
- Have youth look up the definition, duties, and responsibilities of their occupation. **Do not let the players share their information.**
- When the occupation definitions are completed, youth are ready to play WHAT'S YOUR OCCUPATION.
Read the instructions aloud to the groups:

The object of the game is to choose the correct definition for a given occupation.

Player 1 will read the name of his/her occupation.

Each player (including player 1) will write a definition for that occupation on a piece of paper.

All the definitions are passed to player 1 where he/she will read each definition aloud.

Players 2 through 4 will try to choose the correct definition for the occupation of the first player.

Player 1 then reads the correct definition aloud to the group.

**Scoring:** Player 1 gets 5 points for each wrong definition chosen (meaning that he/she has stumped the other players) and each player that chooses the correct definition wins 5 points.

Repeat with each player.

Hint: Rewrite the correct dictionary definition in your own words.

**REFLECT**

If you were to pick an area of plant science to study, which one would it be?

*answers will vary*

How and where would you begin to look for information about jobs in this field?

*counselors, university, library, journals*

Can you think of any other plant science fields that were not included in the game? What are they?

*answers will vary*

Which occupations were you familiar with before you played the game?

*answers will vary*

How many of you knew what a pomologist and an olericulturist was before you played the game?

*answers will vary*

What does a person need in order to make a wise choice about a horticultural career?

*research, education, information, experience, hard work*
APPLY

- Select an individual who made important contributions in the development of horticulture. Conduct library or computer research to collect details about their work. Give an oral report to the group.

- Investigate educational opportunities in horticulture. Contact a local college or university and request information on majors in plant science. Prepare a poster or bulletin board that reports your findings.

- Interview a person who works in horticulture. Determine the nature of their work and the requirements needed for entry. If possible, go to work with them for a day. Find out what goes on during "a typical day at the office".

Archival copy: for current recommendations see http://edis.ifas.ufl.edu or your local extension office.
What's Your Occupation?

1. Pomologist

2. Agronomist

3. Plant Pathologist

4. Botanist

5. Olericulturist
What’s Your Occupation?

6. Horticultural Extension Agent

7. Ecologist

8. Floriculturist

9. Interiorscaper

10. Plant Physiologist

Archival copy: for current recommendations see http://edis.ifas.ufl.edu or your local extension office.
What’s Your Occupation?

11. Landscaper

12. Arborist

13. Pest Control Technician

14.

15.
Activity 6: How Does It Go?

INTRODUCTION

Have you ever thought about where food comes from? It's easy to forget when all you have to do is open the refrigerator or drive to the nearest grocery store. How would your life change if you didn't have a refrigerator or a nearby grocery store? The advances in agriculture and technology have enabled farmers in the United States to provide us with a dependable food supply. Today, we're going to use a simple cookie recipe to look at where our food comes from and the diversity of jobs involved in cookie production.

OBJECTIVES:
For youth to:
• discover the types of jobs involved with food production and distribution.
• discover several career opportunities in the field of plant science.

LIFE SKILL:
• Problem solving and decision making.
• Teamwork.
• Critical thinking.

MATERIALS:
• Copies of the COOKIE FACTORY activity for each youth.
• poster paper
• telephone directory
• pens and pencils
• ingredients for cookies (optional)

TIME:
30 minutes

SETTING:
A comfortable room with tables and chairs.

DO

• Give each youth a copy of the COOKIE FACTORY activity.
• Divide youth into groups and have them work together to answer the questions on the activity sheet.
• Review the activity sheet with groups.
• Have each group develop a concept map of different jobs involved in making cookies.
REFLECT

What ingredients directly and indirectly came from plants?

- **directly:**
  - flour -> wheat
  - walnuts -> walnut tree
  - vanilla -> vanilla bean
  - chocolate -> coco plant
  - sugar -> sugar cane

- **indirectly:**
  - margarine -> cow -> grass
  - eggs -> chicken -> chicken feed (corn)

What jobs were involved in making cookies?

- farmers, seed distributors, fertilizer and pesticide distributors, food processors, packing plant supervisors, sales and marketing, transportation (truck drivers, pilots), researchers, teachers, chemists, food brokers, poultry and dairy producers...

Do you know anyone who does one of these jobs? If so what do they do?

- answers will vary

Did any of these jobs interest you?

- answers will vary

Where could you get more information about these jobs?

- library, counselors, career placement agencies, companies, job corps conditions

APPLY

- Visit a local farm or processing plant. Find out how the crop is grown or processed and ask your guide for a description of the types of employment available.

- Use a telephone directory to list the plant related businesses in your area. Categorize each business into one of the following career areas: landscape horticulture, research, extension, agriculture, floriculture, fruits and vegetables, education, and science. Create your own classification for jobs that do not fit into one of the above categories.

- Prepare a poster or bulletin board that depicts plant related occupations in your area. Create job descriptions for each occupation.

- In the 1800's one farmer produced enough food to feed only five people. Today, in the United States, one farmer produces enough food to feed about 100 people. How is this possible? Research and report on the history of agriculture.
Cookie Factory

To make your cookie you will need these ingredients:

- 1 cup butter or margarine
- 1 tsp. baking soda
- 3/4 cup packed light brown sugar
- 3/4 cup granulated sugar
- 2 pkg. semi-sweet chocolate
- 2 1/4 cups all-purpose flour
- 2 eggs beaten
- 1 tsp. salt
- 1 tsp. hot water
- 1 tsp. vanilla extract
- 1 cup chopped nuts

and you will need these materials:

- Oven (preheated to 375°F)
- 2 large bowls
- Flour sifter
- Cookie sheet

WHAT YOU DO:
1. Preheat oven to 375°F.
2. Mix eggs, butter, sugar, vanilla, walnuts and chocolate in a large bowl.
3. In another bowl sift flour and salt.
4. Dissolve baking soda in hot water and add to flour mixture. Mix well.
5. Add flour mixture to butter mixture.
6. Place teaspoon sized balls on greased cookie sheet, cook 10 to 12 minutes.

WHAT DID YOU LEARN?

- Which ingredients come directly from plants?
- Which ingredients come indirectly from plants?
- What plants do the ingredients come from?
- What people are involved with growing these plants?
- How are these plants processed to form the ingredients?
- Where are the ingredients sold?
- How do they get to the stores?


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