



# Tri-County 4-H Potato Project



## *Potato Project Activity Guide*

Name \_\_\_\_\_

4-H Age (Sept 1) \_\_\_\_\_

County \_\_\_\_\_



# Potato Project Activity Guide

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### ACKNOWLEDGEMENTS

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## Potato Project Information

### *Are you ready to learn more about potatoes and the agriculture industry?*

There are several fun and interesting facts and activities ahead of you in the 4-H Tri-County Potato Project Activity Guide. Growing plants which will become food for yourself and/or others is a very rewarding experience. In this activity guide, you will gain hands on experience in science, mathematics, nutrition, and much more through planning, planting, watering, record-keeping, and harvesting your crop of potatoes!

### Materials

For this project, you will be provided this activity guide, a 3 gallon pot, a growing medium, and seed potatoes to grow your own potato plant at home. You will be responsible for providing your own watering source, fertilizer, and pesticide (as necessary). UF/IFAS Agents and Master Gardeners at your county extension office will be available to assist you through the development of your project plant.

### Potato Growing Instructions

1. Select a location for your plant where it will receive 6 hours of sunlight or more each day and is near a water source.
2. Prepare your container to be planted by placing growing medium into your container until it is approximately 10” deep and add water. The growing medium will release water and nutrients to the potato plants that are needed for it to grow.
3. Prepare seed potatoes. Seed potatoes smaller than 2” should be planted whole. If you have larger seed potatoes, cut into 2-3 pieces with each piece having a minimum of 2 eyes. Plant with the cut side placing down and place 1” of soil over the top of your seed.

### Care and Maintenance

Record keeping is a very important part of your potato project. Follow along with the activities in this guide to accurately record the development of your potato plant. Be sure to water your plant daily and ensure that it receives 6 hours of sunlight per day. Green stems should appear above the growing medium by day 10. If no growth is seen by day 14, dig up the seed for examination. If there are no roots, call your 4-H agent for a replacement potato seed. If roots are forming, gently replant the sprouting seed.



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## Potato Project Goals

What is a goal? A goal is the end result that you want to achieve and direct your effort towards. Setting personal goals and a plan of action to achieve those goals is very important before starting a project.



In the space below, you will set 4 goals for yourself to accomplish during this potato project. Two goals will be things that you want to do and two goals will be things that you want to learn.

During my 4-H Potato Project, I want to **DO**:

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

During my 4-H Potato Project, I want to **LEARN**:

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_



# Chapter

# 1

## Growing Your Potatoes



**1. Stages of Development:** Draw your seed potato on the day you begin the project, then draw your potato plant on each day specified in the square.

First Day of Project	Day 15
Day 30	Day 45
Day 60	Harvest Day



**2. Potato Plant Parts - Fill in the Blank.** Each plant has several different parts and they all have a very important job. All of the plant parts must work together to have a healthy and growing plant. Use the word bank on the left to identify as many plant parts as you can in the potato plant diagram below.

WORD BANK

Flower

Terminal Leaflet

Leaf Stipules

Adventitious Roots

Scale Leaf on Rhizome

Lenticels

Distal End

Stem of Proximal End

Young Tuber

True Roots

Old "Deed" Piece

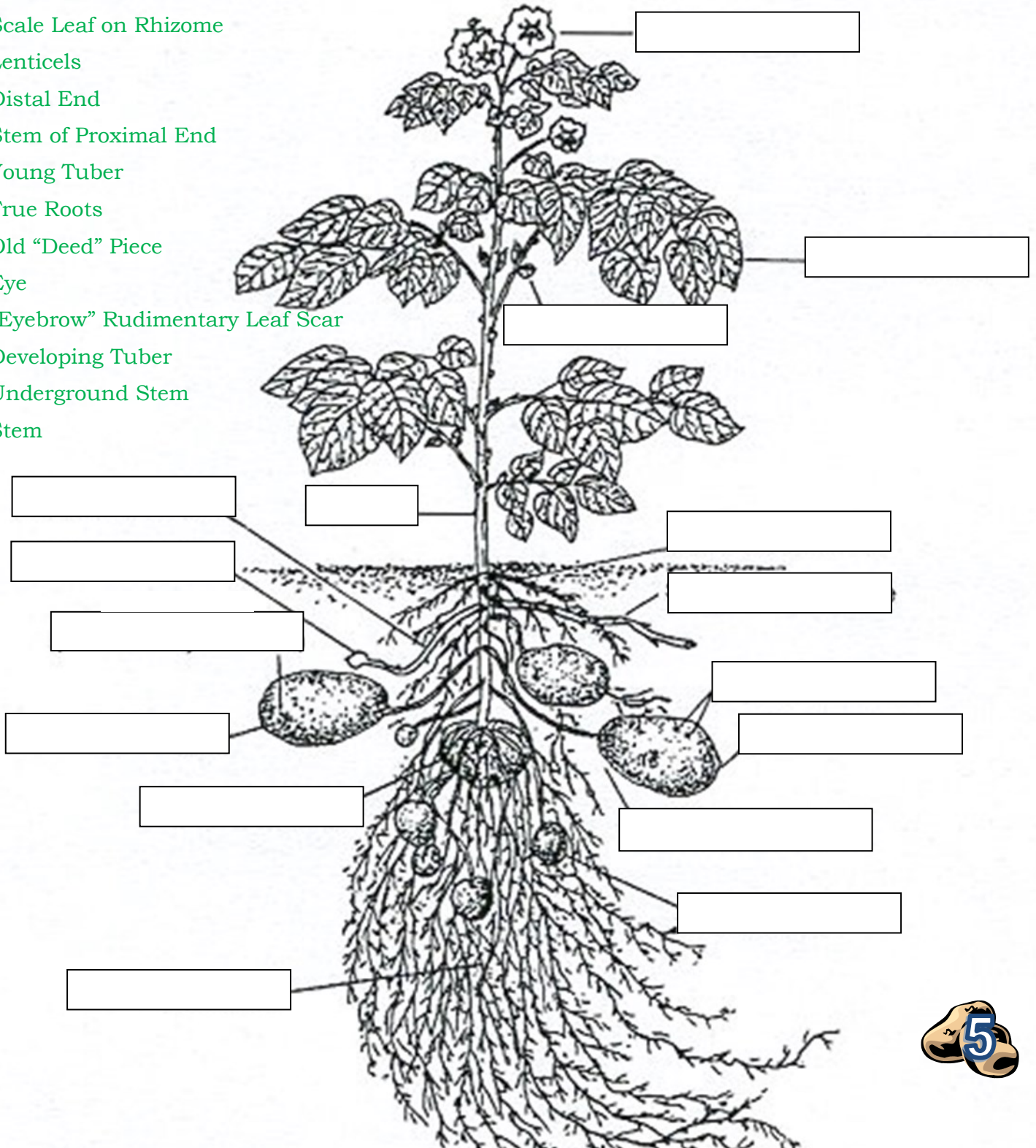
Eye

"Eyebrow" Rudimentary Leaf Scar

Developing Tuber

Underground Stem

Stem







**4. Measurements and Memories!** Take measurements of your plant **once a week** to note the changes in its growth. You will need to measure the height and width of the stem and count the number of leaves you see. Record the measurements and observations below that you think are important.

<b>Date of Measurement</b>	<b>Height of Plant, in inches</b>	<b>Width of Plant, in inches</b>	<b>Number of Visible Leaves</b>	<b>Other Observations</b>

**5. Short Story.** Write a short story about a memorable experience you had while growing your potato plant below:

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# Chapter

# 2

## Harvesting and Marketing Your Potatoes



**6. Potato Handling Food Safety:** Did you know that there can be germs on your hands even if you cannot see them? Those germs can be transferred from your hands to your potatoes at harvest and make the people who eat them sick! Proper hand-washing is very important to keep germs on the outside of our bodies.

⇒ Follow the steps in the activity below to demonstrate how germs can move from your hands to your food.

Supplies: 4 plastic Ziploc bags, 4 potatoes, hand sanitizer, hand washing facility

Step 1. Have a parent peel the potatoes and scrub with soap and water for 30 seconds.

Step 2. Place one potato in a bag and label it “control”.

Step 3. Choose one of the remaining potatoes and rub hands all around the potato. Place it in a plastic bag and label it “Dirty Potato”

Step 4. Wash your hands for 30 seconds. Choose one of the remaining potatoes and rub your hands all around the potato. Place it in a plastic bag and label it “Washed Hands”.

Step 5. Use hand sanitizer and rub it all over your hands. Take the remaining potato and rub your hands all around it. Place it in a plastic bag and label it “Hand-Sanitizer”

Step 6. Observe the bag of potatoes over the course of 1 week to discover the importance of hand washing to remove germs prior to handling food.

### Record Observations:

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**7. Tri-County Agriculture History:** Do you know about the agricultural history in your county? Read the stories below about the beginnings of potato production in Flagler, Putnam, and St. Johns Counties and then match the story to the correct county. Answers are at the bottom of the page.

Flagler \_\_\_\_\_

Putnam \_\_\_\_\_

St. Johns \_\_\_\_\_

**1.** Following the civil war, this county began to be used as winter resorts for people from the Northern United States. In 1890, Thomas H. Hastings established a farm known a Prairie Garden where he grew vegetables for hotels in the area. The Florida East Coast Railroad was extended to Prairie Garden and called “Hastings Station” which permitted the shipping of potatoes north and the development of the potato industry. By 1901, this county had become known as the “Potato Capitol of Florida”.

**2.** The coming of the Florida East Coast Railway shaped the chapter in history for this county. Rail transportation brought tremendous growth to the cattle, timber, and turpentine industry. As rail transportation opened markets to the north and tourists to the south, potato farming grew in importance. In 1885, Henry Flagler purchased the railway and converted it into a more usable means of transportation which increased the demand for cattle, timber, turpentine, potato, and citrus. The County is named in his honor.

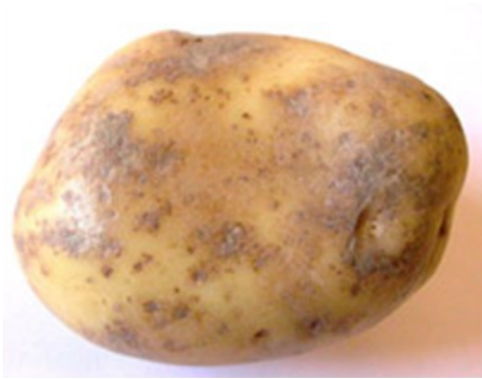


**3.** The year 1865 began the “Golden Age” for this county. There were seven steam boat lines, new railways, and a booming agriculture industry including mostly citrus and timber. By the 1890s, the county had 8 first class hotels which even hosted a U.S. President for winter visits. Currently, the county reported growing 3,797 acres of potatoes. Each acre can produce about 25,000 lbs of potatoes which means that this county produced 94,925,000 lbs of potatoes in one year!



**8. Diagnose Edible Skin Defects—Matching** Using the word bank at the bottom of the page, match each term to the correct potato photo showing an edible potato skin defect.

1



4



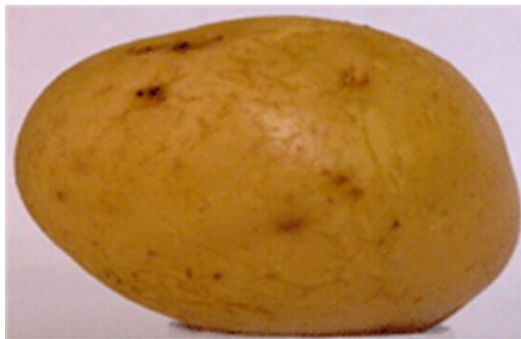
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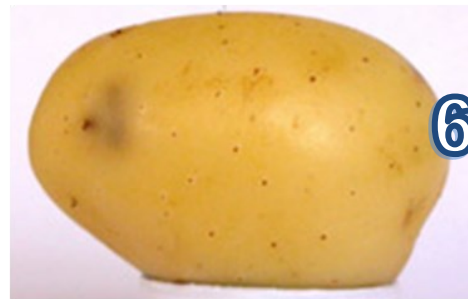
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3



6



**Word Bank**

- |                |             |                       |
|----------------|-------------|-----------------------|
| a) Black Scurf | b) Bruising | c) Enlarged Lenticels |
| d) Netting     | e) Scab     | f) Silver Scurf       |



## 9. Edible Skin Defects Described!

Black Scurf: The black marks on the potato that sometimes look like soot is known as Black Scurf. They are marks that are sometimes left from the potato growing against a root or stem of the potato plant. The Black Scurf can be removed by washing or scraping.

Bruising: Potatoes can bruise much like people. The bruises are black or gray marks under the skin that are more noticeable when peeled. How much moisture there is and how warm it is when the potatoes are harvested will determine if potatoes bruise. Bruised portions of potatoes do not taste different from other portions, but you may choose to remove the area.

Enlarged Lenticels: The spotty appearance of this potato is caused by the lenticels (or pores) that all potatoes have on their skin. If the soil is wet when the potato is growing the pores open to help the potato breathe. When it is harvested, the pores stay open, giving the potato a spotty appearance.

Netting: The rough, netted skin on this potato is caused by having been grown in sandy soil with a lack of moisture. This makes the soil act like sandpaper against the potato's skin, causing it to be rough when harvested.

Scab: These brown spots are known as Scab. If there is not enough rain when the potatoes begin to grow under the ground, they can get these raised brown bumps on the skin.

Silver Scurf: The silver-grey patches on the potato skin are called Silver Scurf. They are caused by the potato getting too much rain during a growing season. Some people say that the Silver Scurf makes the potatoes more crispy when baked!



## 10. Marketing: Finding the Entrepreneur in YOU to Market Your Potatoes.

Once your potatoes are planted, it is time to get started on creating a marketing plan for your produce. When marketing your produce, you want to consider the following:

- ⇒ How will you reach your intended buyer?
- ⇒ Who is your intended buyer and what selling points do you have to meet their preferences?
- ⇒ How will you package your produce and how much will this cost?
- ⇒ What customer service skills do you have or need to develop?

### Marketing

Marketing a product can include a variety of methods that include by are not limited to T. V., newspaper, radio, phone book, website, business flyers, post cards, word of mouth, or on location marketing. Another key element regarding marketing is to consider the amount of money you have in your budget for marketing expenses.

**What are your marketing ideas and how much money do you have budgeted for marketing your potatoes?**

### Who is your Consumer?

The key is to find the marketing strategy that taps in to the audience you are trying to attract. When determining your marketing methods, think about the audience's preferences, their lifestyles, interests and culture. Some consumers prefer to buy locally, some people look for top quality and some people are more swayed with low prices. The type of cooking methods are also important for consumers. It is also important to know what cooking method best fits the variety of potatoes you are selling.

**Describe your intended consumer and identify what their preferences might be?**



## Packaging

Part of your marketing plan will include how you want to package your potatoes. You will need to consider the cost of the packaging, the amount of potatoes per package, cleanliness of the product, and required information that you need and want to include on the package. For packaging options, you will want to contact your local paper supply company or do some research on the computer to find some possible packing products. To evaluate the amount of potatoes per package, you may want to take a trip to the local grocery store to observe the most popular package sizes. To help you prepare the potatoes for packaging, you may want to talk with some local potato farmers to see what they do to prepare their produce for packaging.

**How will you package your produce and how much will this cost?**

## Labels, Business Names and Slogans

Labeling on your package should be attractive and accurate. When creating your packaging label, business name or slogan for marketing materials, you want to use a “catchy” name or slogan. Try to choose something that will be easy to remember. Be sure to check the name with the local tax collector’s office, to be sure you do not duplicate a name already taken. It could be a costly mistake to print out information and then find that the name chosen is not available. Experts recommend that a business name include two or more of the following types of words: noun (person, place or thing), adjective (describes the noun), verb (action word to tell what the business will do) or adverb (describes the verb).

**How will you label your package? What information is important to include?**



**SOLD!**



**ACTIVITY!**

**Draw a line to match these popular slogans with one of these nationally known products.**

**SLOGANS:**

- "The quicker picker-upper."
- "Nothing runs like a Deere"
- "When you care enough to send the very best"
- "Finger lickin' good"
- "Betcha can't eat just one."
- "Tastes so good cats ask for it by name"
- "Just do it."
- "Be all you can be."
- "Making the Best Better"
- "Can you hear me now?"
- "Don't get mad! Get Glad!"
- "Melts in your mouth, not in your hand"

**PRODUCTS:**

- Lays
- Meow Mix
- M&Ms
- US Army
- Bounty
- Glad Trash Bags
- KFC
- John Deere
- 4-H
- Hallmark
- Nike
- Verizon Wireless

**What ideas do you have for your business slogan and name?**

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## First Impressions

When marketing your product and dealing with consumers, it is important that you make a good first impression and are prepared to talk positively about your product. A sharp and clean appearance and engaging social skills are important in making a good first impression.

**What kind of attire will be appropriate when selling your potatoes?**

**What social skills do you already have? What skills do you need help developing?**

## PRODUCT PRICING

When selling fresh potatoes, the market price will vary, depending on the demand, season and quality of the product. To ensure quality, limit mechanical damage, bruising, and infection by bacterial and fungal organisms, it is important that care is given to the product during the harvesting and marketing of the product. Tuber appearance is very important and markets are more dependent on washed potatoes.

When determining a fair price for a product, it is necessary to consider your expenses in addition to the price that competitors in your area are charging. Expenses might include raw materials, equipment, supplies, shipping, and packaging.

### Cost of Product and Selling Price

List of Expenses	Cost of Materials for ONE UNIT/PACK
List Materials Used:	\$
	\$
	\$
Cost of Equipment	\$
Shipping Cost	\$
Time	\$
Other:	\$
Total Cost for One Product	\$
Fair Selling Price	\$



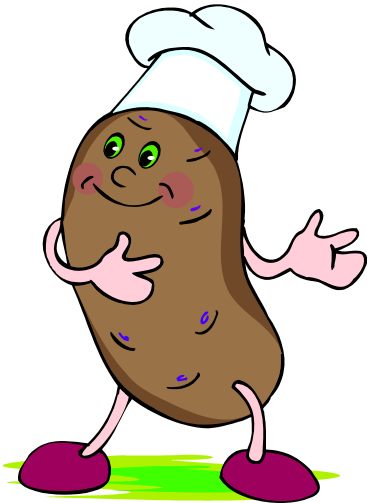
# Chapter

# 3

## Potato Nutrition and Recipes








**11. Potato Nutrition.** Potatoes come in a variety of shapes, sizes, and colors. They can have brown skin, red skin, and even blue skin! Potatoes can be large and round or long and slim. There are also many different ways to eat potatoes and they are packed with nutrients. According to the National Potato Council, a medium sized potato contains 110 calories and is fat, sodium, and cholesterol free. You may also be shocked to learn the nutritious benefits a potato holds:



- ⇒ 45% of the daily value of Vitamin C
- ⇒ More potassium (620 mg) than bananas, spinach, or broccoli
- ⇒ 10% of the daily value of vitamin B6
- ⇒ 26 grams of carbohydrates
- ⇒ 2 grams of fiber

Below is a chart to show how the potato nutritionally stacks up against other food items. Use an internet search to complete the chart for the other food items.

	Carbs	Fiber	Vitamin C	Potassium	Calories
Potato 	26g	2g	45%	620 mg	110
Apple 					
Rice 					
Pasta 					
Banana 					

**12. Proper Preparation.** Read carefully through the following information and discover how to store and prepare your delicious and nutritious potatoes. Do not forget the food safety lesson you learned on page 8!

### **Storage**

After your potatoes have been harvested, they need to be stored in a dark, cool, dry place. If potatoes get too warm (higher than 40 degrees F), they may sprout and are not able to be eaten. Potatoes will remain good for eating for 2-3 weeks.

### **Cleaning**

Potatoes should be scrubbed under cool, running water. Try cooking them with the skins still in tact—that is where most of the nutrients are held!

### **Baking**

Using a fork, carefully poke holes into the potato. Bake at 425 degrees for 50-60 minutes. It will be done when it can be easily poked with a fork.

### **Microwaving**

Follow same process as baking by carefully poking holes into the potato with a fork. Cook the potato on high for 3-4 minutes. Turn one time half way through cooking. Let stand for 5 minutes before eating.

### **Boiling**

Try leaving the skin on since there are so many good nutrients in the skin! You can either boil potatoes whole or cut into thick slices. Place potatoes in a pot and cover with water. Bring water to a boil and cook whole potatoes for 30-40 minutes or cut potatoes for 20 minutes.



**13. Recipe—From the Farm to Your Table.** The recipes below were provided by a University of Florida faculty member, Chef David Bearl. They are delicious!

**Old Fashioned Potato Rolls** (recipe from the 1992 Hastings Potato and Cabbage Festival)

Hot mashed potatoes 1 1/2 cups      Sugar 1 cup      Butter 6 oz  
Salt 1 tsp

Combine the mashed potatoes, butter, sugar, and salt together. When it cools, add:

Eggs 2      Yeast 2 packets dissolved in 1/2 cup warm water  
Milk 1/2 cup warm      Flour 4 3/4 cups

Knead the mixture into a dough ball. Cover the dough and let it go through 2 risings. Shape the dough into rolls and let them rise again. Bake at 375 until browned.

**Roasted Hastings Potatoes**

Fresh Potatoes 6 cups medium diced      olive oil 1 cup      Salt/Pepper to taste

Wash and dice the potatoes, toss them in olive oil. Season with salt and pepper then roast at 400 degrees. Toss them during the roasting process and cook until browned

You can use a variety of different potatoes to add color!

**Anna Potatoes**

Potatoes 5 lbs      Onions 2-3 lbs      Parmesan Cheese 1 lb  
Melted Butter 8 oz      Salt/Pepper to taste

Using the butter, oil the sides and bottom of a baking pan; slice the potatoes very thin and make a layer of potatoes (slightly overlapping each slice) on the bottom of the pan. Slice the onions very thin; spread a layer of onions over the first potato layer. Sprinkle parmesan cheese on top of the onions. Continue making layers of potatoes and onions until have a total of 4 layers of potatoes and 3 layers of onions and Parmesan cheese. Top the last potato layer with Parmesan cheese and bake the casserole at 400 degrees until it is browned on top and the potatoes are tender.





## Fun Potato Facts

- A. The potato is a tuber. A tuber is a short, thick, fleshy, underground stem of a plant that usually has buds or 'eyes.'
- B. Potato 'eyes' are really buds! Each 'eye' will grow into a new potato plant given the opportunity!
- C. Potatoes are the tubers of the potato plant: the Latin name of the potato is *Solanum tuberosum*.
- D. Fertilizers are classified by the three numbers on the package which refers to the relative amounts of N-P-K, or nitrogen, phosphorous and potassium. In the USA, by law, the numbers are expressed as percentages by weight of nitrogen (N), phosphate (P<sub>2</sub>O<sub>5</sub>), and potash (K<sub>2</sub>O). A 100-pound bag of fertilizer labeled 5-5-5, there are 5 pounds of N, 5 pounds of P<sub>2</sub>O<sub>5</sub>, and 5 pounds of K<sub>2</sub>O. To convert P<sub>2</sub>O<sub>5</sub> to actual phosphorous content, multiply the given weight by 0.43. To convert K<sub>2</sub>O to potassium content, multiply the given weight by 0.83.
- E. Potatoes will not form tubers when the media temperature is over 80 degrees Fahrenheit. Use cool water to change the temperature of the system if you believe the temperature may be higher than 80.
- F. A great opportunity for an art project is to draw the plant throughout the stages of life, from a seed potato to a tuber! Potatoes are unusual... pay particular attention to the eyes, flowers, and root system. Potato 'stamps' are also a fun art project... cut a potato in half and carefully carve a design into the flat (cut) side. Place the carved potato in finger paint or dip in an ink pad, then stamp!
- G. Growing potatoes is a great science project... students learn where a common vegetable comes from and how it develops through life stages, the requirements of a plant for growth and development, how to set goals, keep records, and much more! For another fun science project, classrooms can grow their very own Potato Head by selecting a large potato, cutting the top off and removing some of the flesh to create a cavity about 1" deep, fill with potting soil, and sprinkle grass seeds on top. Keep moist (not wet) by sprinkling with water daily. Grass should sprout in less than 7 days!
- H. There are over 3,400 varieties of potatoes grown throughout the world. They differ in color, taste, size, growing environment and cooking abilities. Potato skins can be red, tan, dark brown, or blue. The inside or flesh of the potato may be white, yellow or cream colored and the taste and texture of the potato varies with each variety. The growing season for each type of potato will be determined by climate, rainfall and soil content. Potatoes can be baked, boiled, roasted, fried, microwaved, mashed, wedged, or chipped depending upon the variety and what cooking method is best for that type of potato. The Vivaldi variety is very versatile and can be prepared using any cooking method.
- I. The easiest way to see a potato grow is to put three or four toothpicks in one and rest it on top of a glass of water so a little of the potato is in the water. Leave it to sprout roots and shoots. This method won't produce potatoes in the glass of water, but you can transplant into soil or another rooting medium to grow potatoes!

# Answer Key

## PARTS OF POTATO



# Answer Key

## Diagnose Edible Skin Defects

1. F 2. A 3.D  
4. E 5. C 6.B

## Tri-County Ag History

Answer: Flagler-2; Putnam-3; St. Johns-1

## Answer Key

Draw a line to match these popular slogans with one of these nationally known products.

### SLOGANS:

- "The quicker picker-upper."  
"Nothing runs like a Deere"  
"When you care enough to send the very best"  
"Finger lickin' good"  
"Betcha can't eat just one."  
"Tastes so good cats ask for it by name"  
"Just do it."  
"Be all you can be."  
"Making the Best Better"  
"Can you hear me now?"  
"Don't get mad! Get Glad!"  
"Melts in your mouth, not in your hand"

### PRODUCTS:

- Lays  
Meow Mix  
M&Ms  
US Army  
Bounty  
Glad Trash Bags  
KFC  
John Deere  
4-H  
Hallmark  
Nike  
Verizon Wireless



The UF/IFAS Extension 4-H Youth Development Program uses a learn-by-doing approach to help youth gain the knowledge and skills they need to be responsible, productive citizens. This mission is accomplished by creating safe and inclusive learning environments, involving caring adults, and utilizing the expertise and resources of the University of Florida and the nationwide land grant university system.

## Our Vision

Florida 4-H aspires to be the leading youth development program that creates positive change in youth, families, and communities.

## Our Motto

To make the Best Better.

## Our Slogan

Learn by Doing.

## Our Pledge

I pledge my head to clearer thinking, my heart to greater loyalty,  
my hands to larger service,  
and my health to better living.  
For my club, my community,  
my country, and my world.



The Tri-County 4-H Potato Project Activity guide was created by Amy Warwick Hedstrom, Crystal McCazzio, and Geralyn Sachs, 4-H Agents for Flagler, Putnam, and St Johns Counties respectively and David A. Dinkins, Tri-County Sustainable Agriculture Extension Agent IV.

Sources for this activity guide include:

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8. Recipes provided by Chef David Bearl, University of Florida Visiting Associate in Regional Food Systems/Economics

