



One Potato, Two Potato

Objective: Students will learn that potato-growing was a part of the local history.

Summary: Students will explore potatoes and then, through discussion, learn of the history of potato farming in Marin County.

Time: 1½ hours

Student Grouping: Groups of five to six for the great potato exploration, whole class for discussion of potato history.

Materials: One copy of each activity guide for each group. See individual activity guides (following pages) for other materials.

Background Information: Potatoes are interesting plants that grow their edible portion underground. The roots form what are called *rhizomes* which swell into tubers which we call potatoes. Potatoes are part of a plant family called the nightshades. This family group includes tomatoes and eggplants; in fact, the potato is more closely related to an eggplant than it is to a sweet potato! The green growing and flowering parts of the potato are toxic and can sicken and even kill people.

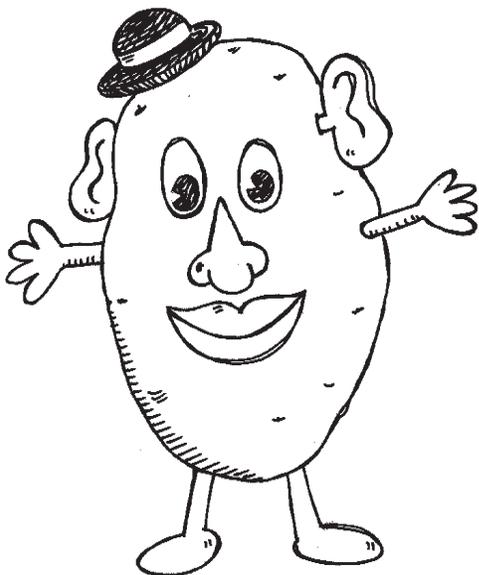
Potatoes were first grown in the high Andes mountains in South America. These hardy products of the high, cold mountains were small, funny-shaped and very nutritious. When the Spaniards came looking for gold they were introduced to potatoes. They took them back to Europe. At first, Europeans thought potatoes were evil, ugly things and fed them only to their livestock. Then the ruler of Prussia (now Germany) in the 1740s made a law that people had to eat potatoes or have their ears cut off! It worked. Soon people

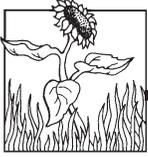
learned how healthful and palatable the potato is, and potatoes have become the world's most popular vegetable. North America got potatoes by way of Europe. They were brought by Scottish and Irish pioneers in the early 1700s.

The potato is very nutritious. It contains protein, carbohydrates, fats, roughage, and many vitamins and minerals in a form that keeps well and can be cooked in many ways.

To grow a few potato plants you can simply bury a piece of potato with a couple of "eyes" on it in a pot full of soil. "Seed" potatoes from a nursery work best and are easy to find in late winter and early spring. If you have some old potatoes that have started to grow, they will work well also. Keep the soil moist (though not soggy) and set the pot in the sun. In around three weeks you'll have a little potato plant.

Marin Ag. Facts: In the 1850s immigrants started cultivation of this nutritious vegetable in earnest. Potatoes were grown from 1850 to 1900 in the Tomales area of the county. For a while they produced well. Unfortunately, the location chosen to grow them was not a good one. The soil tilling and then digging of the crop left the earth loosened and exposed to rains. The soil ran off the hillsides with the rains. Gradually at first, then more dramatically, the soil was washed into creeks and carried off to the bay and ocean. Soon only poor soil was left, and it became obvious that this area was not destined to be a potato-growing region. The soil over thousands of acres was washed away, lowering the surface by a foot or more. Today the old plow marks can still be seen on the steep slopes around Tomales. To learn more about erosion try out the "Run-off Race" activity on page 112.





Preparation:

1. Set up each potato activity at an activity station. Student groups will rotate through the stations trying out the activity described there. Decide how many students per group and select activity sheets for the correct number of class groups. If you are going to include Station #5, you will need growing potato plants. See background info for directions.
2. Make copies of the activity station guides (if you laminate or cover them with clear contact paper, they will be ready for future use). Make sure you have enough materials for everyone to do the activities.

Procedure:

1. Set up the activity stations.
2. Tell students they are going to have fun with spuds today. They are to stay with their groups, do the activity at their station and make notes on their observations. They are to stay at each station until you tell them to move to the next.
3. Have the groups move through as many stations as you have time for. As they do the activities, move through the room to help them.
4. Have each group read their observation notes/results on one of the activity stations. Have other groups discuss whether or not they had similar observations/results.
5. Give a brief lecture on the history and cultivation of potatoes in Marin County.
6. Use the questions below for a class discussion to conclude the activity.

Questions for Discussion:

- Which potato floated the best? Why?
- Where is the starch in a potato?
- Why did Marin County farmers quit growing potatoes in the hills?
- How many things can we list that are made from potatoes?

Extensions:

- Find some potato recipes to send home with students. Bring in potato chips to munch on during the discussion.
- Plant a row of potatoes outside in early spring and use these plants and potatoes for the activities.
- In groups, research the origin of potatoes and their migration from the Andes to Europe and the U.S.



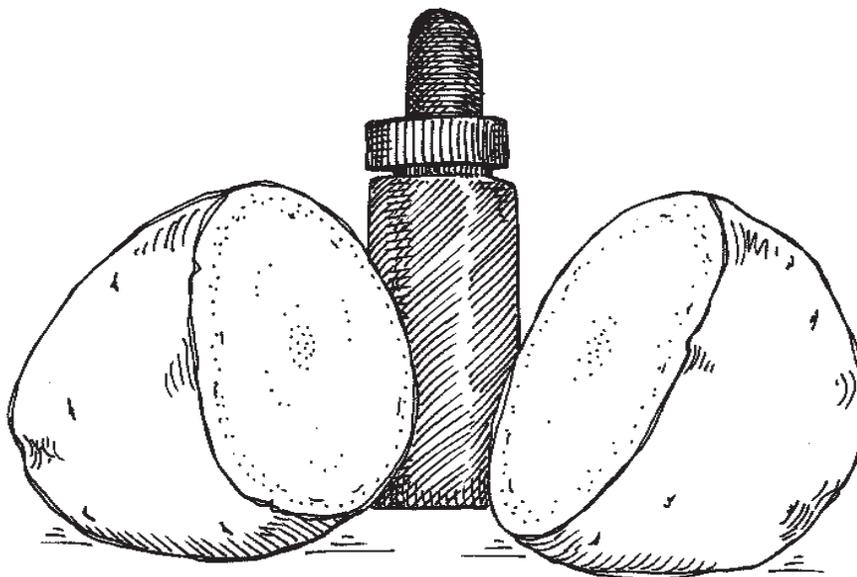


Activity Station #1

Materials:

Small bottle brown tincture of iodine (from drugstore), a small brush, table knife, paper towels, and $\frac{1}{2}$ potato per group

1. Have a different group member do each step. One can do the procedure and another can take notes. Everyone in the group should observe and share their ideas.
2. Cut a potato in half and use one half for this exercise.
Look at the knife. What do you see? Write down your group's observations.
3. Brush the freshly cut surface of the potato with the iodine.
What happens? Write down your group's observations.
4. Wherever there is starch, the potato turns purple. Is there more starch in different parts of the potato? Write down your group's observations. Draw a picture of the results.
5. Rinse off the knife and clean up any spills.





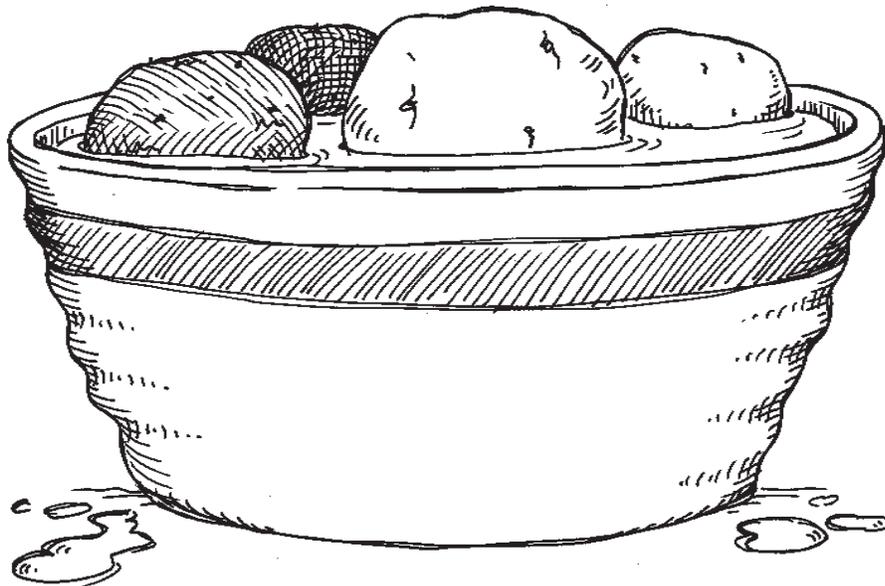
Activity Station #2

Materials: One each of three types of potatoes (e.g., red, yellow, white, russet), a 1-quart bowl, 3 cups water with 1 cup salt dissolved in it, paper towels.

1. Have a different group member do each step. One can do the procedure and another can take notes. Everyone in the group should observe and share their ideas.

There are many types of potatoes, but all of them fit into one of two groups. Some are high starch and some are low starch. High-starch potatoes contain lots of starch. When cooked they get “fluffy” like a baked potato. Low-starch potatoes contain less starch. These potatoes stay firm when boiled for potato salad, soups or stews. You can tell which are the high-starch potatoes and which are the low-starch potatoes by floating them in this bowl.

2. Float each type of potato. Make notes on how well each floats.
3. Guess which ones have a high starch content and which ones are low in starch content. Write down your group’s guesses.
4. The potatoes that sink have a “high specific gravity.” That is a way scientists say how much things weigh when they are in water. High-starch potatoes have a higher specific gravity than low-starch potatoes. Can you figure out which potato has the highest specific gravity? Which potato has the lowest specific gravity?
5. Clean up the station.

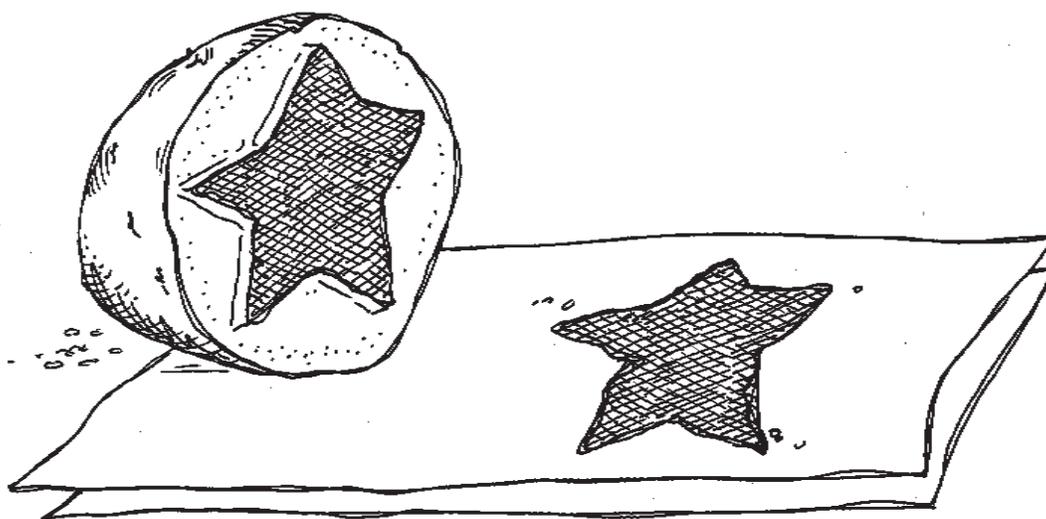




Activity Station #3

Materials: 2 kitchen knives, tempera or poster paint in a pan, paper to print on, paper towels, one potato per group

1. Have a different group member do each step. One can do the procedure and another can take notes. Everyone in the group should observe and share their ideas.
2. Slice a potato in half. Dry the cut surfaces with a paper towel.
3. Put the cut end of one half in the paint, let the drips run back into the paint pan and use it like a stamp to print its shape on a piece of paper.
4. Carve off a little bit of potato from the cut surface and do another print.
5. Carve a design in the cut surface of both halves of the potato and see how they print on the paper. Cover the paper with potato-print stamps.
6. Set aside the printed paper to dry, and clean up the bits of potato you carved and any paint drips.

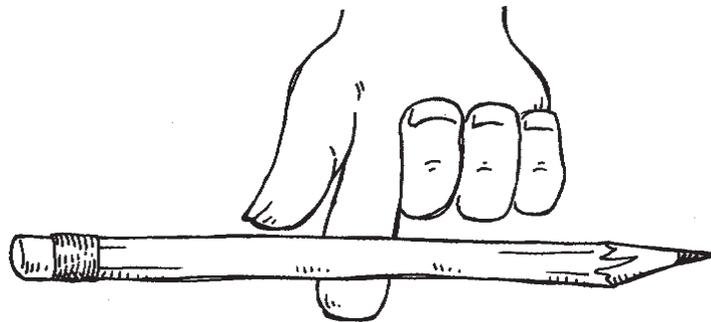


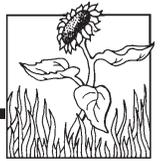


Activity Station #4

Materials: Per group: 2 potatoes, 6 toothpicks, 5" piece of coat-hanger wire.

1. Have a different group member do each step. One can do the procedure and another can take notes. Everyone in the group should observe and share their ideas.
2. Stick the toothpicks in the potato as arms and legs. Try to sit your potato up. Write your observations.
3. Bend the wire into a "C" shape. Put one end in the belly of your potato person and the other in another potato.
4. Now put the potato on the edge of the table and see if the potato will sit without rolling over.
5. A scientist would say that by adding the other potato you have changed the "center of gravity." Try balancing a pencil on your finger by putting the tip or eraser on the tip of your finger. Is it easy or hard to balance? Now rest it on your finger sideways in the middle (see the picture). Where is the center of gravity on the pencil?





Activity Station #5

Materials: One each of russet, round white, red, and yellow-fleshed (Yukon gold, bintje, yellow fin) potatoes, each one labeled with a number 1–4.

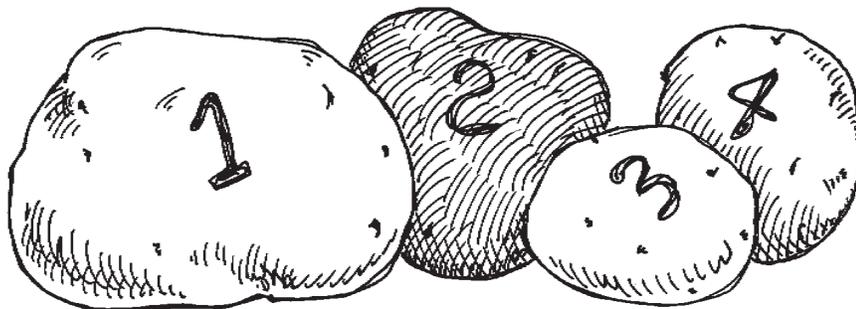
1. Have a different group member read each paragraph. Everyone should discuss the questions and agree on what answer will be written down.

In South America there are hundreds of different types of potatoes grown and eaten. They are different colors, shapes and sizes. There are “U”-shaped ones, purple ones, knobby ones and some shaped like green peppers. In Peru there is one that is so bumpy and wrinkled that it would be very difficult to peel. It is called a “Lumchipamundana.” In English that means “potato makes young wife weep.”

Here in North America there are only eight types of potatoes grown on big farms. The farmers want to grow only the kinds that are easy to sell. Big companies that make potato chips, French fries, instant potatoes and hash-browns buy most of the potatoes grown here. The big long potato called a “russet” is what is used to make French fries. It is high in starch, a quality that keeps it from turning brown. The russet also absorbs less oil when cooking than a low-starch potato would.

Common types of potatoes you might see in the grocery store are: russet, round white, red and yellow.

2. Look at the picture of these types of potatoes. Have you seen them before? Compare them to the potatoes at this station.
3. Can you name the different types of potatoes? Guess here:
 #1 is a _____
 #2 is a _____
 #3 is a _____
 #4 is a _____
4. What happens to most of the potatoes grown in the U.S.?
5. Who grows more types of potatoes, Peru or the U.S.?

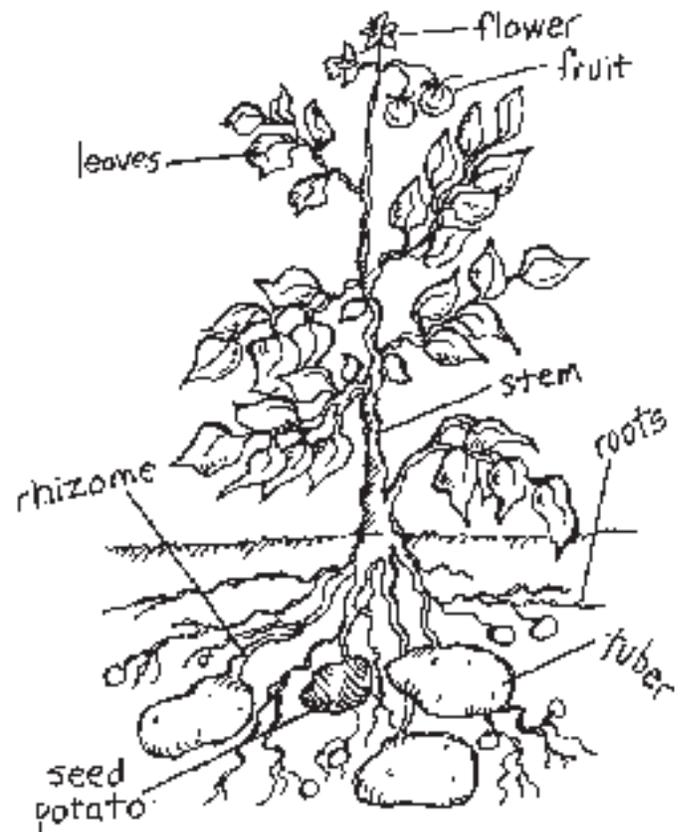
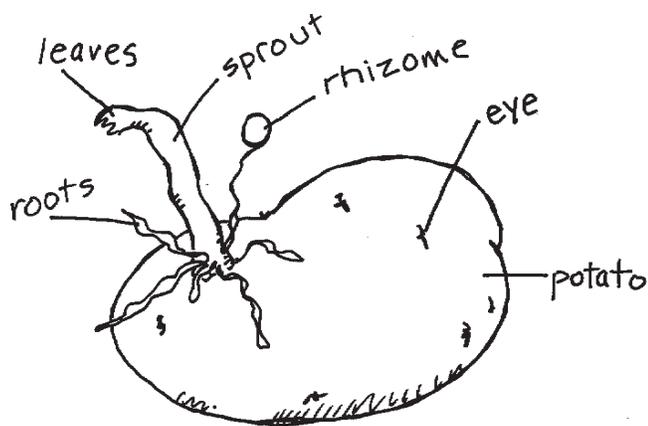




Activity Station #6

Materials: One potato plant or growing potato per group, a pan to unearth the plant into and contain the mess, newspaper to cover the area and ease clean-up.

1. Have a different group member do each step. One can do the procedure and another can take notes. Everyone in the group should observe and share their ideas.
2. If you have a potato with funny things growing out of it, but it is not a plant, go to step #3. If you have a plant to work with, take it carefully out of the pot and lay it in the pan. Try not to break off roots as you do this.
3. Brush away some of the dirt so the roots show clearly.
4. Make a drawing of your plant. If you have been given a growing potato, draw it.
5. Look at the drawings below. See if you can find all the labeled parts on your group's potato/plant.
6. Label your drawing of the potato/plant.
7. What do you think each part does?





Activity Station #7

Materials: One potato per group, a plastic drinking straw (NOT the flex type) per student.

1. Have each group member try this one. Everyone in the group should observe, give their ideas and contribute to the group's answer to the questions that follow.
2. Hold the potato in one hand and attempt to stab the straw into it.
3. Try again. This time hold a finger over the end of the straw as you plunge it into the spud.
4. Discuss the different results with your group.
5. Write down a group answer to these questions:

What happened when the straw was stabbed into the potato without covering the end of the straw?

What happened when the end of the straw was held and then the straw was plunged into the potato?

Did it work differently? Why?

Idea from The Amazing Potato Book

