



LESSON:

Growing Great Garlic

GRADE LEVEL: K-6

OBJECTIVES:

- Identify what bulb are and learn about their unique characteristics
- Discuss how and why plants store nutrients
- Create a delicious garlicky garden snack
- Plant garlic for summer harvest

KEYWORDS:

- Bulb
- Tuber
- Rhizome
- Clove

SKILLS:

- Identifying parts of plants
- Making comparisons
- Harvesting properly
- Safely handling food

OVERVIEW:

Garlic is a perennial herb native to Central Asia in the onion, or *Alliaceae* plant family. There are approximately 300 varieties of **garlic** worldwide, with even more cousins including all varieties of onions, leeks, chives, and shallots. **Garlic** has long been a staple in the cuisine of the northern shores of the Mediterranean, as well as a common seasoning found across Asia and Africa.

Garlic grows underground as a **bulb** and is composed of numerous individual cloves. Corms are rounded with a swollen stem and have a bud on top that produces leaves and flowers. Tuberos roots such as potatoes are swollen, fleshy roots and have a pointed bud on top and roots on the bottom. Rhizomes are another type of **bulb** distinguished by thick, horizontal stems that sprout roots on the bottom. True **bulbs**, like garlic, have layers of food storing scales surrounding stem. **Garlic**, like many flower **bulbs**, is planted mainly in the fall and stores **nutrients** over winter. It is normally harvested in the summer months, but can be cured and stored for use throughout the fall and into the winter.

While **garlic** is commonly used for adding flavor to foods, the herb has a number of nutritional and medicinal properties. It has been reported that **garlic** stimulates our immune systems through antibiotic properties. In addition, these beautiful bulbs have been studied for their positive effects in fighting cancer. Most importantly, **garlic** can be used as a flavoring to make healthy vegetable dishes even more delicious. In this lesson we will identify **bulbs** and learn about what makes these plants unique through a planting activity. In addition, we will prepare and taste a healthy, garlicky snack with spinach from the garden to boost our health and immune systems.

QUESTIONS TO CONSIDER:

- What do we need to live a healthy life?
- What happens to our bodies when we eat too much of the same thing?
- Why are some foods good for our health?
- How do our bodies use the healthy parts of the foods we eat?



MATERIALS:

PART 1 (ALL):

- Garlic (bulb)
- Onion (bulb)
- Jerusalem artichoke (tuber)
- Potatoes (tuber)
- Bindweed (rhizome)
- Ginger (rhizome)
- Diagram of a bulb
- Incandescent light bulb

PART 2 (3-6):

- 1 set of poker chips

PART 3 (ALL):

- Garlic cloves for each student
- Compost
- Trowels
- String for marking straight rows

PART 4 (ALL):

- 1 Head of garlic
- 15 Spinach leaves
- 15 oz Can of chickpeas
- Olive oil
- Lemon juice or fresh lemons
- Salt, pepper, paprika, za'taar or other desired spices
- Food processor
- Cutting board
- Kitchen knife
- Hand sanitizer
- Large Bowl

PART I: A BULB IS A SEED

PROCEDURE (K-2) :

1. Pass around a garlic bulb. Discuss their shapes. Do they look like anything else they've seen? Show the class a light bulb and ask if they see the comparison.
2. Explain that bulbs are like large seeds and are planted into the ground to produce plants like garlic, onions and flowers.
3. Pass around an onion bulb to compare and contrast how this bulb smells, feels and looks compared with the previous bulb. What are some of the differences? What are the similarities?

PROCEDURE (3-6):

1. Show students types of bulbs (i.e. garlic, onions), rhizomes (i.e. crabgrass, bindweed, ginger), and tubers (potatoes, Jerusalem artichoke) growing in the garden.
2. Explain that bulbs are like large seeds and are planted into the ground to produce plants like garlic, onions, potatoes, and flowers.
3. Show students the diagram of the parts of a bulb. What parts do we eat?
4. Discuss what happens to these plants over winter. How do the bulbs survive without any additional food? Ask if they can think of anything else that stores food over the winter (i.e. hibernating animals).

PART II: RESOURCE COMPETITION GAME!

PROCEDURE (ALL):

1. Discuss what plants need in order to grow (**nutrients**, water, and light). Explain and elaborate on the three most important resources. What happens when one is missing?
2. Define the word **nutrient** (another word for food) to students. Ask if it sound like any other word they know (nutrition).
3. Have the students spread out in a large space where they will stand in place. When they reach out their arms they should just be able to touch their classmates. Explain the rules of the "Resource Competition Game."
 - a. Once "planted" in place, they are not allowed to move. Ask what happens if you pull a plant out of the ground. (It dies!)
 - b. They are allowed to bend, kneel, and reach around with their hands.
 - c. Explain that just like us, plants need essential nutrients in their diets. Tell students that each poker chip used in the game represents a part of a plant's diet, the blue chip represents water, the red chip represents food, and the white chip represents light.

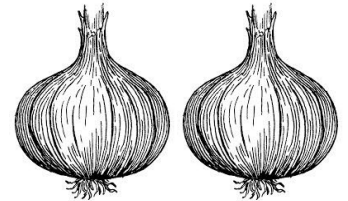
4. Tell the students to wait for your command. Spread the poker chips around the room. When you say "go", students should gather as many chips as possible without uprooting themselves (they cannot move from their planted position).
5. After all the chips have been collected ask three volunteers how many of each color they were able to collect. What happens to a plant that has a lot of air but not a lot of water?
6. Explain to students that it is important for our plants like the garlic we are planting today to get enough nutrients, water, and sun to grow. How do we 'feed' plants in the garden? With compost!
7. Explain to students that it is also important to make sure that we don't get too little or too much of one thing. What happens when we eat too much of one kind of food? What happens when we don't eat enough fresh fruits and vegetables? What are ways we can make sure we're eating a balanced diet?
8. *For older grades: What are some other things that living beings need besides nutrients (safety, love, shelter...)? What happens to us if we don't get enough of the resources we need?*

PART II: GET YOUR PLANT ON!



PROCEDURE (ALL)

1. Ask students to spread out compost. Explain to students that compost is like a multi-vitamin for soil. It helps give plants nutrients to grow strong and healthy.
2. Mark where students should dig by putting trowels in the ground, about 4-8 inches between each plant. Show students the garlic bulb and demonstrate the proper way to plant garlic. Cloves should be planted individually, about an inch under ground, with the pointed tip facing up.
3. Explain that the garlic will remain dormant or inactive throughout the winter (like when bears hibernate). In the spring our garlic will come up in the spring and be ready for harvest in the summer when the first five leaves turn brown.



PART III: LET'S MAKE VAMPIRE PROOF HUMMUS

PROCEDURE (ALL):

1. Ask students to recall some of the things we can put in our food to make it taste good (i.e. salt, pepper). Explain that these ingredients that are primarily used to give dishes flavor are generally called **seasonings**. Garlic is a tasty and healthy seasoning for food with a very pungent (pungent) taste. Although it can be eaten alone and raw, it is usually cooked first. Garlic is mainly used in combinations with other foods like salsa or *hummus*.
2. Tell students to smell a clove of de-skinned garlic.
3. Ask if there are any courageous students who would like to taste a slice of raw (uncooked) garlic. Explain to students that besides being a great seasoning for our food, garlic is also great for our bodies. Garlic contains allicin which works like a natural antibiotic, helping our bodies fight disease and sickness. The spinach we are using in this recipe is a super food that is especially rich in vitamins A and K, as well as iron.
4. Let students know that it is now time to taste a healthy, garlicky snack. Show them the prepped ingredients for hummus. Ask a few volunteers to add the garlic, spinach, tahini, olive oil, salt, pepper and za'atar to the ground chickpeas. *If you have time before the class, roast the garlic cloves in order to change the flavor from strong and harsh to soft and delicious.* Pass the bowl around for the students to mix.
5. Taste hummus on a slice of pita. What are some adjectives we could use to describe the taste of the garlicky hummus?

RECIPE: Garlicky Hummus

Ingredients:

- 1 16 oz can of chickpeas or garbanzo beans
- 15 leaves of spinach
- 1/4 cup liquid from can of chickpeas
- 3-5 tablespoons lemon juice (depending on taste)
- 1 1/2 tablespoons tahini paste
- 2-3 cloves garlic, crushed (if possible roast cloves at 350F)
- 1 tsp of za'atar
- Salt and pepper to taste

Preparation:

1. Drain chickpeas and set aside liquid from can.
2. Combine remaining ingredients in blender or food processor. Add 1/4 cup of liquid from chickpeas. Blend for 3-5 minutes on low until thoroughly mixed and smooth.
3. Place in serving bowl, and create a shallow well in the center of the hummus. Add a small amount (1-2 Tbsp) of olive oil in the well. Garnish with parsley (optional). Serve immediately with fresh, warm or toasted pita bread, or cover and refrigerate. *For a spicier hummus, add a sliced red chile or a dash of cayenne pepper. Combine.



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