

# BROCCOLI

## INTRODUCTION

Broccoli is a vegetable that brings out extremes: people either love it or hate it. Grown primarily for its florets (unopened flower buds), broccoli, like all cabbage family crops, grows best during cool weather and is traditionally grown as a spring or fall crop. In areas with mild winters, hardy varieties are planted in fall for a late winter/early spring harvest. Most gardeners avoid growing broccoli during summer months when the heat causes maturing heads to bolt (produce flowers and set seed).

To extend the harvest, you can choose varieties known to develop side shoots after the main central floret is harvested. These side shoots can continue to produce smaller florets for weeks.

## ORIGIN AND BRIEF HISTORY

Broccoli was first cultivated in the eastern Mediterranean region and Asia Minor. Broccoli gets its name from the Latin word brachium, meaning an arm or branch. This ancient vegetable was introduced to Rome sometime in the second century AD, and has been popular in Italy since that time. Catherine de Medici, an Italian noblewoman who ruled France during the mid-16th century, is given credit with introducing broccoli to the rest of Europe, and originally it was dubbed "Italian asparagus." Its popularity has grown in the last few decades with the discovery of the health benefits it offers. Broccoli contains good amounts of vitamins C and K, along with antioxidants such as sulforaphane that may help prevent cancer.

Nutrition Facts			
Serving Size 1 medium stalk (148g)			
Amount Per Serving			
Calories 45	Calories from Fat 0		
% Daily Value*			
<b>Total Fat</b> 0.5g	1%		
Saturated Fat 0g	0%		
Trans Fat 0g	0%		
<b>Cholesterol</b> 0mg	0%		
<b>Sodium</b> 80mg	3%		
<b>Total Carbohydrate</b> 8g	3%		
Dietary Fiber 3g	12%		
Sugars 2g			
<b>Protein</b> 4g			
Vitamin A 6%	Vitamin C 220%		
Calcium 6%	Iron 6%		
* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:			
	Calories	2,000	2,500
Total Fat	Less Than	65g	80g
Saturated Fat	Less Than	20g	25g
Cholesterol	Less Than	300mg	300mg
Sodium	Less Than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g
Calories per gram:			
Fat	9	Carbohydrate	4
		Protein	4



### FUN FACT:

When you are eating broccoli heads, you are munching on flower buds. Broccoli stems, leaves and sprouts are also edible.



# PLANTING

## PLANNING

- Both spring and fall crops are possible in many locations. In many parts of the country, fall crops are the most successful because plants are maturing when the weather is cool.
- Start spring transplants indoors 5 to 7 weeks before the last spring frost date, or buy nursery transplants 2-3 weeks before the last spring frost date.
- Plan to start fall crops 10-12 weeks before your average first fall frost date.
- Where the weather is warm, select a variety that is bolt-resistant.

## PREPARATION

- Select a site with full sun and well-drained soil. Prepare the garden bed by using a garden fork or tiller to loosen the soil to a depth of 12 to 15 inches, then mix in a 2- to 4-inch layer of compost.
- Add 3 to 4 pounds of 5-10-10 or its equivalent per 100 square feet before planting.

## PLANTING

- Set out transplants 2 weeks before your last spring frost.
- Set the transplants 15 to 18 inches apart, with 20 to 36 inches between rows, depending on the fertility of the soil.
- Protect transplants from late hard frosts with row covers (use multiple layers if really cold temperatures are in the forecast). Provide a windbreak to reduce transplant shock and moisture loss.
- For fall crops, direct seed the broccoli in the garden. Sow the seeds 1/4 inch deep, 2 to 4 seeds per foot of row, leaving at least 20 to 36 inches between rows, depending on soil fertility. Or start seeds indoors and set out transplants 4-5 weeks later.

## CARE

- Thin direct-seeded seedlings when they are 4 inches tall to 15 to 18 inches apart.
- Mulch plants to help keep soil moist, and water plants if rainfall is less than 1 inch per week.



## PESTS

- Cover plants with floating row covers to protect them from common broccoli pests such as flea beetles, cabbageworms, and cabbage loopers. Check under covers occasionally for aphids. If you do not use covers, handpick worms as needed.
- Buttoning, which causes tiny heads to emerging prematurely, occurs when broccoli seedlings are exposed to several days of temperatures below 50 degrees F. Excessive heat or drought can cause broccoli to bolt.

## HARVESTING

- Harvest for peak quality when the buds of the head are firm and tight. If buds start to separate and the yellow petals inside start to show, harvest immediately.
- Once you pick the first head, the plant responds by producing more side shoots for you to eat. Leave 2 to 3 inches of stem on the plant; the second, lateral heads will branch out from there. Harvest these smaller spears on a daily basis, breaking or cutting them off the plant close to the main stem.



# LESSON IDEAS

## FOLLOW THE LEADER: APICAL DOMINANCE

Many plants exhibit what's known as apical dominance. One shoot becomes the "leader," or tallest stem. Surrounding branches seem to magically defer to this leader, and remain less vigorous. The plant growth regulator auxin is responsible for this phenomenon. Auxin is present in highest concentrations in the apical, or uppermost, bud. The presence of this high concentration of auxin has a growth-inhibiting effect on lower buds and branches. If you remove this apical bud, however, you remove the source of auxin, freeing the axillary buds (located on the stem nodes) to sprout and/or lower branches to grow more vigorously.

Use your broccoli plants to demonstrate this principle. After harvesting the primary broccoli head, keep plants in the garden and watch new development in lower branches.

## BROCCOLI PR

Broccoli often gets a bad rap for taste, but its many health benefits make it an excellent addition to any diet. Challenge your students to develop a PR campaign that will encourage their friends and family to eat more broccoli. They may want to devise a slogan, research health benefits, or find fun recipes to share. They can present their ideas by making brochures, hosting an educational program, creating radio ads or TV infomercials to share with the school or maybe creating a video to post online.

## BROCCOLI ART

Who says you can't play with your food? Bring in an assortment of fruits and vegetables like broccoli florets to represent trees or carrot coins and pepper pieces to make flowers, and let students create mini landscapes on plates. Sunflower seeds and dressing can add "stones" and "ponds" to their designs. Depending on the age of your students, you may want to pre-cut the vegetables. When finished, take pictures of their creations to put on a display and then enjoy your tasty creations.

## BROCCOLI SAMPLING EVENT

Prepare the Bring Home the Fun Recipe with your class. By demonstrating preparation methods and sampling the final product in the classroom, students will be ready to share the recipe with their family.

### FUN FACT:

Broccoli is very high in vitamin C (one serving provides 220% of the recommended daily value... that's more than an orange) and is a good source of potassium, vitamin A, folate, fiber, and calcium.



# BRING HOME THE FUN WITH BROCCOLI

Packing a powerful nutritional punch, broccoli contains high amounts of vitamin C and is a good source of potassium, vitamin A, folate, fiber, and calcium. A great plant for fall and spring gardens, broccoli thrives in cool temperatures and can even be a winter crop in mild climates. Although its flower buds or florets are most commonly consumed, its stems, leaves, and sprouts are also edible.

To prepare broccoli, you need to get to the hidden nooks where the stalk and florets meet. Cut the head of florets off at the point where they begin to grow away from the stalk; then trim off each end of the stalk. Using a paring knife or by hand, separate the florets. Peel and chop or slice the stalk. Wash all of the trimmed and peeled pieces in warm water and a produce wash, according to manufacturer's directions.

Broccoli often gets a bad rap with kids and adults alike, making this a challenging vegetable to sample. Part of this may be due to genetics. We have a gene that affects our perception of bitterness; for people with a particular variant of this gene, the bitter compounds naturally found in broccoli taste particularly unappealing.

The Brocamole recipe below uses avocado and olive oil to smooth out the taste in broccoli that some find bitter and adds the crunch of corn chips to seal the deal.

## Brocamole

Serving Size: 2 Tbsp Dip, Makes 32 Servings

1 large or 2-3 small heads broccoli, prepared as above

3 ripe avocados

$\frac{3}{4}$  cup olive oil

1 cup grated parmesan cheese

$\frac{1}{2}$  tsp salt

Baked corn chips (preferably low in salt)

1. Chop broccoli roughly and blend with half of olive oil in the bowl of a food processor until very smooth.
2. Add avocado, remaining oil, and salt and pulse until smooth but not liquefied.
3. Serve in individual portion cups with corn chips.

