HARVEST LESSONS

THIS MONTH'S THEME:

BROCCOLI & CAULIFLOWER

Lesson Plan

HARVEST LESSONS ARE A FUN WAY FOR K-4 CLASSROOMS TO EXPLORE, TASTE AND LEARN ABOUT EATING MORE FRUITS AND VEGETABLES EVERY DAY.

ACTIVITIES

ACTIVITY	GRADE LEVEL	CURRICULUM CONNECTION	TIME
#1: Intro to Broccoli	**all**	**Health:** nutrition **Science:** classification	**10 min.**
#2: Observe & Draw Broccoli	**all**	**Science:** classification	**10 min.**
#3: Book & Discussion	**K-2**	**Literacy**: listening comprehension **Health**: nutrition	**15 min.**
#4: Plant Parts We Eat	**all**	**Science:** classification	**15 min.**
#5: Matching Game	**3-4**	**Science:** classification **Literacy:** reading comprehension	**20 min.**
#6: Where Does Broccoli Come From?	**3-4**	**Social Studies:** mapping, economics **Math:** measuring, graphical representation of distance	**20 min.**
#7A: Taste Test (raw vs. cooked)	**all**	**Health:** nutrition **Math:** graphing/tallying	**10 min.**
#7B: Make Ranch & Roasted Veggies	**all**	**Math:** measurement, graphing/tallying responses	**20 min.**

FOCUSING QUESTIONS

Grades K-2: What parts of the broccoli plant do we eat? What does broccoli do for our bodies?
Grades 3-4: What parts of the broccoli plant do we eat? What does broccoli do for our bodies? Where does broccoli come from? What is broccoli's family and what does that mean?

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OVERVIEW

This lesson offers a variety of options for exploring the vegetables broccoli and cauliflower.

GRADES K–2: Students may observe the structure of the broccoli and cauliflower plants and do an activity to discuss the six parts of the plant we eat. They may read and discuss "The Boy Who Loved Broccoli" by Sarah A. Creighton. They will make and taste test broccoli salad or taste and compare broccoli and cauliflower prepared different ways.

GRADES 3–4: Students may do a mapping activity to discuss the origins of the broccoli plant and/or a matching activity to identify other foods in the brassica family. They will make and taste test broccoli salad or taste and compare broccoli and cauliflower prepared different ways.

ACTIVITY #1 (10 MINUTES) ALL GRADES

INTRO TO BROCCOLI + CAULIFLOWER

Students will watch a short clip of a farmer introducing broccoli, cauliflower, and the brassica family. The YouTube video may be found at http://bit.ly/1atzO46 or on our website (see link in footer). Following the clip, ask students the following series of true or false questions. Some answers may be found in the film, so tell them to listen closely. If they think a statement is true, then they should stand up. If they think it is false, then they should sit down.

TRUE/FALSE GAME

1. True or false?
Broccoli and cauliflower can grow in different colors including purple.

2. True or false?
One cup of cooked broccoli contains as much Vitamin C as an orange.

3. True or false?
Broccoli and cauliflower actually are flowers.

4. True or false?
Broccoli and cauliflower are both members of the lily family.

5. True or false?
The name "cauliflower" means "cabbage flower."

(activity #1 continued)

6. True or false?
The word "broccoli" comes from the Latin word for "green giant."

7. True or false?
Broccoli has as much calcium ounce for ounce as a glass of milk

8. True or false?
The United States is the biggest producer of cauliflower in the world.

9. Tricky Question:
Why is cauliflower white?

Answer Key:
1) True
2) True
3) True
4) False, they are both members of the cabbage family, brassicaceae
5) True
6) False, the word broccoli comes from the Latin word "brachium" which means "branch" or "arm.
7) True
8) False, China is the largest producer in the world
9) While the cauliflower plant is growing, the head is surrounded by heavy green leaves that shield it from sunlight. Without exposure to sunlight, the process called "photosynthesis" in which sunlight produces a green pigment called "chlorophyll" cannot happen.

ACTIVITY #2 (10 MINUTES) ALL GRADES

OBSERVE & DRAW BROCCOLI

Have children wash their hands, then observe one stem of broccoli. Use the following questions as prompts:

GRADES K–2: What color is this? How is it good for you? (How does it help our body). What part of this plant are we eating? Review that plant part's job.

GRADE 2: What color is this? How is it good for you? (How does it help our body?)What parts of this plant can we eat? Review that plant part's job. Where does this food grow?

GRADES 3–4: How many parts of the plant can we observe, and how many parts do we eat? How is this food good for you? Students may write observations in full sentences.

ACTIVITY #3 (15 MINUTES) GRADES K–2

BOOK & DISCUSSION

Read *The Boy Loved Broccoli* by Sarah A. Creighton, which tells the story of a boy who discovers super powers after eating broccoli.

DISCUSSION QUESTIONS: Did the boy really have super powers? Does broccoli give us powers? What does it do for our bodies and brains?

ACTIVITY #4 (15 MINUTES) ALL GRADES

PLANT PARTS WE EAT

OPTION #1: ACTIVITY

What parts of the broccoli plant do we eat? The "Dress up a Plant" activity from Shelburne Farms or "Plant Parts We Eat" can be found in our introductory lesson as a lead-in to talking about the parts of the plant that we eat.

OPTION #2: BOOK

The Vegetables We Eat by Gail Gibbons describes the different kinds of vegetables we eat, with pages dividing them into the parts of the plant we eat. In the book, we heard about six different parts of the plant. What were they and what are the part's jobs?

OPTION #3: SONG

Either activity can be followed by the song "ROOTS, STEMS, LEAVES" by the Banana Slug String Band. Listen at: http://bananaslugs.bandcamp.com/track/roots-stems-leaves Share motions to go along with each word in the chorus to help remember "roots stems, leaves, flowers, fruits and seeds."

Chorus:
Roots, stems, leaves, flowers,
Fruits and seeds
Roots, stems, leaves, flowers,
Fruits and seeds
Roots, stems, leaves, flowers,
Fruits and seeds
Roots, stems, leaves, flowers,
Fruits and seeds
That's six parts, six parts, six plant parts
that plants and people need.

(activity #4 continued)

Verse:
The roots hold the plant
in the ground.
They gather up the water
that falls around.
And there's a root inside of me,
because a carrot is a root that I eat.
That's six parts, six parts, six plant parts
that plants and people need.

A stem is an elevator growing up from
the ground.
The water goes up and the
sugar back down.
And there's a stem inside of me
because celery is a stem that I eat.

The leaves are the kitchens
where the food is done.
They breath the air and
catch rays form the sun.
And there's a leaf inside of me
because lettuce is a leaf that I eat.
Sing chorus here...

The flowers are dressed so colorfully.
They hold the pollen and
attract the bees.
And there's a flower inside of me
because cauliflower is a flower I eat.

The fruit gets ripe, then falls on down.
It holds the seeds and feeds the ground.
And there's a fruit inside of me
because an apple is a fruit that I eat.
Sing chorus here...

Now you know what this
whole world needs.
It's roots, stems, leaves, flowers,
fruits and seeds.
There's six plant parts inside of me
because a garden salad is what I eat.
Sing chorus here...

ACTIVITY #5 (20 MINUTES) GRADES 3-4

MATCHING GAME

Introduce other kinds of brassicas to the class, through pictures or actual examples. Match the description of the vegetable with the plant or picture. Plants are part of a family and they are grouped into families based on similarities in their structures.

Broccoli and cauliflower are examples of brassicas and are part of the mustard family. Other brassicas include kale, romanesco, purple cabbage, napa cabbage, cauliflower, orange/purple cauliflower, brussels sprouts, kohlrabi, mustard greens.

See the attached worksheets on pages 9 and 10.

ACTIVITY #6 (20 MINUTES) GRADES 3-4

WHERE DOES BROCCOLI COME FROM?

Following instructions on the provided sheet, students will read some facts about broccoli's history and production, and will follow instructions to map and graph broccoli's origins.

See the attached map worksheet on pages 11 and 12.

ACTIVITY #7A (10 MINUTES) ALL GRADES

TASTE TEST: RAW VS. COOKED

MATERIALS

- Poster board
- Markers
- Stickers

PROCEDURE

Conduct a taste test comparing broccoli and cauliflower prepared in different ways. Serve the vegetables raw, steamed and roasted with homemade ranch dip (see recipe on next page). Create a bar graph with categories for *liked it*, *loved it*, or *no thank you*. Have students compare the different tastes and textures and record their observations on their individual tasting chart using stickers. What is some vocabulary that describes the flavor and texture?

ACTIVITY #7B (20 MINUTES) ALL GRADES

MAKE RANCH & ROASTED VEGGIES

Dressings and dipping sauces are great ways to introduce veggies to kids. Try this recipe with raw, lightly steamed or roasted broccoli and cauliflower. Making ranch at home helps to avoid the artificial preservatives and flavors found in store bought varieties. It's fun and easy, and kids love ranch!

YUMMY HOMEMADE RANCH DIP

INGREDIENTS

½ to ¾ cup plain full-fat yogurt or Greek yogurt
1 tsp (or more to taste) dried dill weed
Sprinkle of salt and pepper to taste
1 small clove of garlic
6 Tbsp olive oil
2 Tbsp parmesan cheese, grated

DIRECTIONS

Put yogurt, garlic and spices in a blender or food processor and blend until smooth. Very slowly, add the oil so that it emulsifies. Use immediately or store in the fridge for up to one week.

ROASTED BROCCOLI & CAULIFLOWER

INGREDIENTS

6 cups small, bite-size fresh broccoli and cauliflower florets, mixed
2 to 3 Tbsp extra virgin olive oil
½ tsp salt
¼ tsp ground black pepper
2 garlic cloves, finely minced

DIRECTIONS

Preheat to 425 degrees. Toss broccoli and cauliflower in a large bowl with olive oil, salt and black pepper. Add garlic and toss well to thoroughly coat all pieces.

Arrange veggies in a single layer on a shallow baking pan. Roast 10 to 20 or until slightly tender and beginning to brown but not burn (cooking time will vary based on the size you cut the veggies). Stir all vegetables once during cooking time. Serve immediately.

Recipe adapted from FarmFlavor.com

EXTENSIONS

OPTION #1: VEGGIE STAMPS
If you have broccoli that is past and not good for eating, it can make great stamps when sliced long-ways… create a broccoli forest!

OPTION #2: COLORING SHEETS
Provide students with broccoli and cauliflower coloring sheets. See page 13 for an example.

OPTION #3: MATH
Ninety percent of the broccoli eaten in the US is grown in California. Using graph paper, color in 90 out of 100 squares to represent this.

OPTION #4: MAPPING
Using a map with a scale, use a ruler to map how far it is from California's capital Sacramento to your state. How do you think that broccoli is transported to us?

OPTION #5: POSY POETRY
Have children each take three pieces of paper and write adjectives or nouns to describe the color, texture and taste of different foods at different tasting stations. Break into groups to create poetry using the words.

CLOSINGS

ACKNOWLEDGEMENTS
Shelburne Farms' Project Seasons (Iowans for a Fit Life and "Pick a Better Snack" lesson plan)

BACKGROUND INFORMATION
http://homecooking.about.com/od/foodhistory/a/broccolihistory.htm
www.whatcomfarmtoschool.org/posts/harvest_of_the_month/october-2011-broccoli-cauliflower/

APPENDIX SEE WORKSHEETS THAT FOLLOW

BRASSICA MATCHING GAME

Students will be given a description of a vegetable in the cabbage family to read, and must match it with pictures of the vegetable on the following page. Cut out each description and pass them out around the classroom.

KALE: I am a green leaf and grow on a stalk. My leaves can be curly, or flat with scales that look like a dinosaur. One serving of me has a lot of vitamin C and A.	ROMANESCO: I am a very strange looking vegetable, a light green bud grows in spirals in a repeating pattern called a fractal. Sometimes I am called Romanesco broccoli and sometimes roman cauliflower, and if you taste me, I taste somewhere in between the two.
RED CABBAGE: I'm often called red, but you might say I'm more of a purple. My leaves grow in a tight "head" in a round ball. My dark color tells you that I'm full of antioxidants, and good to keep you healthy.	NAPA CABBAGE: Also known as "celery cabbage" I am a kind of Chinese cabbage, and I am commonly used in Asian cuisine. My shape is longer, and my "head" is much more loosely formed than my siblings, red and green cabbage.
CAULIFLOWER: People usually think of me as white, though I come in fun colors such as purple and orange. I am a flower forming a dense head. I am chock full of vitamin C.	BROCCOLI: A green plant that looks like a tree. I am also full of vitamin C. My name is Italian, and comes from Latin meaning "little branch."
BRUSSELS SPROUTS: I grow on a tall stalk, covered with small buds that look like miniature cabbages.	KOHLRABI: My stem makes a big bulb, in green or purple, and inside my flesh is white. I may look a little funny, but try me, raw or cooked, and I'm quite crispy, juicy, and delicious.
MUSTARD GREENS: My spicy green leaves are full of vitamins and minerals, and can be eaten cooked or raw. My seeds are used to make oil, and as a spice.	

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MAPPING BROCCOLI

BACKGROUND

Broccoli has an edible flower, stem and leaves, and is part of the family of plants called ***brassica***, also known as the ***cabbage*** family. Broccoli was actually developed by ancient farmers in the Mediterranean from the cabbage plant.

The ancient Rasenna people, also known as Etruscans, migrated from Asia Minor (Modern Turkey) and lived on the Italian peninsula around 700 BCE. Broccoli was loved by Ancient Romans and remains popular today in Italy.

INSTRUCTIONS

Using colored pencils, color Turkey and Italy green, and color the Mediterranean Sea blue.

BACKGROUND

We know from Thomas Jefferson's garden records that he grew broccoli in his garden in Virginia, however, broccoli did not become popular until the 20th Century (the 1900's) in the United States.

Today the top five producers of broccoli and cauliflower are listed below in tons. (One ton is 2,000 pounds... now that's a lot of vegetables!)

PEOPLE'S REPUBLIC OF CHINA: 8,585,000 (EIGHT MILLION, FIVE HUNDRED EIGHTY FIVE THOUSAND TONS)

INDIA: 5,014,500

UNITED STATES: 1,240,710

SPAIN: 450,000

ITALY: 433,252

INSTRUCTIONS

1. Can you read aloud each number? (hint, the first comma reads million, and the second reads thousand)

2. Next, find and label each country on the map.

3. In the United States, 90% of the broccoli is grown in California. Draw the borders of California onto your map.

4. To represent 90%, divide the US into 10 parts, and fill in 9/10.

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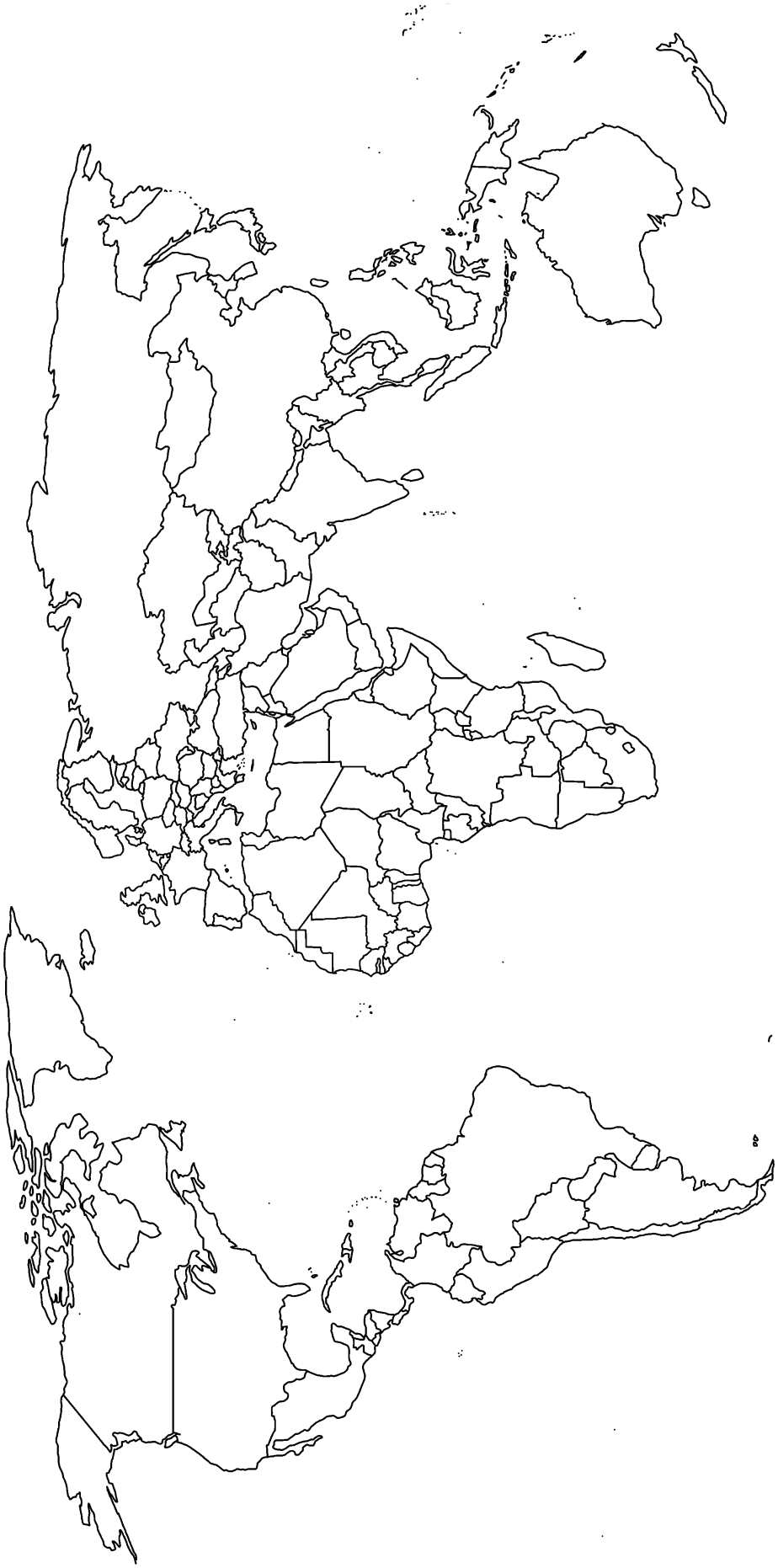
THIS MONTH'S FOOD:



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CAULIFLOWER
KALE
BROCCOLI
* Cat Burton 2010 Cedar Circle Farm *