



Big Crunch Quickies

Grade Level: all

Objectives: to explore more about carrots

Materials: as noted

Time Allotment: 5 - 20 minutes

Advance Preparation: collect materials

Laying the Groundwork:

Explorations: see directions below; modify to suit your students and outcomes

60 Second Physical Activity Energizers Gardening is tough work, and we need to prepare and stretch our muscles the same way students may need an energizing break in the classroom. Here are some garden-themed ideas: Weather Stretch – This growing season has been an odd mix of weather, but carrots are content in rain or shine. Clouds - Stand with your knees relaxed and hands in front of you. Inhale and raise your arms over your head, inverting hands to "push the clouds away".

Rain - Exhale and lower your arms in an arc to your sides.

Rainbow - Clasp your hands together behind your back and lift your arms as you inhale. Exhale and bend forward with your arms extended behind to form a rainbow. Inhale once more, then exhale and lower your arms to your side.

Sunshine - Inhale as you turn your palms upward and lift your arms in an arc over your head. As you exhale, lower your arms to make a circle of sunshine in front of you. Inhale and draw the sunshine in. Then exhale and enjoy the sun's warmth.

Soil Test - Bend down to pick up some soil from your garden. Place it in the palm of one hand. Make a fist with the other hand and grind up that soil. Is it good loam with lots of compost, or heavy clay, like most of my soil? Vary the position of the fist so the knuckles are used to massage the palm. Switch hands.

Over Under Pass - Stand sideways besides your desk with everyone in the row facing the same direction. Each person gets a package of seeds/garden glove/etc. At the signal, the first person passes the item over her head to the person behind, who passes it under her legs to the next person. Continue in this fashion, alternating over and under. When the item reaches the back of the row, the last person yells "turn" and then begins to pass it back down the row. First group to be finished and sit down, wins!

Pitchfork Run – Sometimes when it's time to harvest carrots, the soil is so dry that you can't pull them out by hand and you have to use a garden fork! It's hard work – plant the fork, put your foot on the top of the tines and then push down with your foot while moving the fork back and forth to loosen the soil. Ah, success! Bend down and pull out those carrots with one hand. Enough work! Stand up, plant that pitchfork. Run around it 3 times, then change direction and repeat.

Garden Tools - Stand up. Reach up to get those tools that you hung up in the garage. Reach up once to get the rake, set it down on the floor. Reach up for the spade, set it on the floor - oh, oh forgot to clean it off before you put it away last week. So, bend down on one knee and take that steel wool and rotate your wrist as you work away that rust. Change knees and hands and scrub again - good job, time to put those tools away for the winter!

Root, Fruit, Leaf or Stem? On our website www.chep.org there is a colouring page and activity to help you introduce the concept that carrots are a root that we eat. Begin by brainstorming some plants that your students eat. Do they eat the whole plant or part of it? Make a list of edible plant parts (root, flower, fruit, seed, leaf, stem, bark) as a heading on the black board or use page 2 of the activity; under each column ask students to place the appropriate foods. You may need to bring in a few samples of each – don't forget nuts (a seed) and spices (a leaf or bark or seed) as well as fruits and vegetables. Remember to include ethnic choices. Potatoes are mistakenly identified as a root, but they are a stem. Alternatively, gather some coloured pictures of edible plant parts and have the children sort them into the columns. Ask students to describe their lunch in terms of plant parts. For example, a peanut butter and jelly sandwich would be ground-up seeds (peanut butter) and crushed fruit (jelly). Plan to make a dip with your class (see *Big Crunch Recipes*) for the day you are enjoying the Big Crunch carrots.

Seed Guessing Game How many seeds do you think are in a 10 gram packet of carrot seeds? It is astonishing! We will have a picture of a seed packet on the website if you cannot access a new packet from one of the garden centres in addition to some photos of carrots in bloom. Carrot seeds are some of the smallest vegetable seeds we use; one ounce of carrot seed contains 18,750 – 25,000 seeds – can you convert it to metric? Early's varieties such as Emperor Long and Nantes Coreless contain 2500 – 3000 seeds per 10 gram packet, Bow Seeds say their Chantenay Red Core carrot packets have 1500 seeds which cost \$1.75! Newer hybrid seeds tend to have less seeds per packet (400 – 500) and sell for more. Sounds like an instant math lesson!

How do you decide which carrots would grow best in Saskatchewan? (type of soil and 'days to maturity' are two important facts to consider: Saskatoon has approximately 117 frost free days and the soil is generally loamy in texture. Around Saskatoon there can be differing soil conditions. If your carrot grew in sandy soil, what might it look like? What about if the soil was full of stones? When you see a misshapen carrot, speculate why it became crooked, branched, twirled around another carrot, etc. Do you think the soil condition has something to do with it? Older students could research a definition for 'days to maturity' and our growing conditions as well as seed varieties. Some websites: www.prseeds.ca; www.seeds.ca; www.mckenzieseeds.com ; www.gardenersweb.ca. For additional information on carrot cultivation, see the activity *Digging Deeper*.

Rain: all living things need it! This activity simulates the natural rain and thunderstorms we often experience during a prairie summer. It replenishes the soil, the animals, and our souls. Ask students to stand in a circle or arrange chairs in a circle. Explain that when you start the motion, the student on your left should imitate your motion and each person on their left should pick up the motion as it comes to them. That is, the motion is going around the circle similar to a “wave”. Do not wait until the first motion has come back to you (the beginning) before you start the next motion. Return to the first student and start the second motion. This will create a crescendo as the sounds produced move from one end to the other. Using this strategy, lead students through the following series of motions:

- rub your hands together
- snap your fingers
- snap your fingers faster
- clap your hands together in an irregular cadence
- slap your hands on your legs
- (Optional: At this time, a student flicks a light switch on and off to represent lightning, while another beats a drum to symbolize thunder.)
- stomp your feet
- slap your hands on your legs and stomp your feet (represents height of the storm)
- stomp your feet
- slap your hands on your legs
- clap your hands together in an irregular cadence
- snap your fingers fast
- snap your fingers
- rub your hands together
- open palms (quiet)

When all students are standing with open palms, have them remain silent for a minute to think about the exercise and to catch their breath.

Scrub a Dub Dub This is a good activity for the day you have lots of different carrots in the classroom. You will need some vegetable peelers, a vegetable scrub brush, a clean dish cloth, access to wash water. Do this as a demonstration or divide the class into small groups. Each group can have a different carrot (colour, size, etc). Have the students wash their hands. Ask each group to prepare the carrot for eating raw. Some carrots will only need a slight scrub with a cloth or brush; others will need to be peeled. Investigate: which type of carrot requires the least cleaning? (the mini carrot) Was there a carrot that only needed to be washed? (generally the home grown one) Which carrot needed to be peeled? (the largest, oldest carrot) If you peel a coloured carrot does the colour peel away? (maybe, ‘purple haze’ has an orange core) What other questions can you pose?

Serving Size in Hand Canada's Food Guide recommends that children between the ages of 4 and 8 eat five servings of fruit and vegetables per day; ages 9 – 13 should eat six servings per day; teens 7 – 8; at least one serving should be a dark green/orange vegetable. For carrots, that is 125 ml (½ cup) cooked or raw, chopped. We don't measure out our food and snacks with a measuring cup, so how can we ensure we are meeting these guidelines? An easy way is to use a hand. A child's fist or cupped hand may be close to 125 ml, or ½ cup. Provide your students with 125 ml (½ cup) measuring cups and raw carrots cut into coins. Have the children practice using their hands to determine how that 125 ml (½ cup) fits into their hands. What other common objects could be used to identify specific serving sizes? Try something that your students bring in their lunches such as a yogurt or fruit cup, a box of raisins, and have them measure out the ½ cup of carrots to become familiar with a 'serving size'. A hockey puck is also the equivalent to 125 ml (½ cup) of chopped raw vegetables. Brainstorm ways your students could get more vegetables into their diet. **Note: don't eat the carrots you have used for this activity!**

Canada's Food Guide

www.hc-sc.gc.ca/nutrition

Serving Sizes: It's in Your Hand from **Colour Me Healthy**

www.colourmehealthy.com



The Big Crunch Rap Here's a creative language arts activity. Use the information provided in *Carrot Facts* to have your students compose a rap or poem about carrots using 3 – 5 facts. If the class has done research on the different kinds of carrot varieties as suggested in the activity *Digging Deeper*, have them use this information in their rap. Research will help the students find adjectives and rhyming words. Some websites: www.prseeds.ca; www.seeds.ca; www.mckenzienseeds.com; www.gardenersweb.ca. Students should rehearse their rap songs to ensure a smooth flow – sometimes rhythm instruments or background rap music can help keep the beat. Present the rap songs to the entire class, or even the school. If possible, videotape the performances to share – CHEP would love to see them!

A Little Scientific Exploration (for older students) *Carrot Facts* and the activity *Are Mini Carrots Real Carrots?* contain nutritional information so your students may be familiar with these labels already. If not, go over the role of nutrients in the body. Among other things, carrots contain carbohydrates. Carbohydrates are the main energy source for our bodies. There are three types of carbohydrates: complex, simple and fibre. They are known as ‘quick energy’ because they are the first nutrients from the food we eat that is made available as energy for our bodies. This is especially true of simple carbohydrates. Complex carbohydrates (starches) provide our bodies with steady energy. Simple carbohydrates are the sugars that provide our bodies with the energy rushes and energy let downs. Therefore they are not as healthy for us as complex carbohydrates. In some cases (carrots are an example), the sugar is occurring naturally and is accompanied by healthy supplies of vitamins, trace minerals and fibre. We can test for these nutrients with iodine (complex) and Glucose Meter Test Strips (simple). You will need a cutting board, paring knives, raw carrots and the material for testing – cornstarch, 2 glass beakers, a ½ tsp, iodine, an eye dropper and Glucose Meter Test Strips. Handle iodine carefully as it will stain clothing. Decide whether you are going to do this as a class demonstration or in small groups. To demonstrate how iodine reacts with starch, fill one glass cup/beaker ¼ full with water and ½ tsp of cornstarch; fill a second beaker ¼ full with water to act as the control. Add 2 drops of iodine to each cup. What happens? (the one containing starch turns blue-black). Have students (or demonstrate) what happens when iodine is placed on a cut raw carrot. Does it turn black to indicate the presence of starch? What happens when the Glucose Meter Test Strip is placed on a piece of cut raw carrot? What conclusions can the students make? Brainstorm other foods that contain complex and simple carbohydrates. How can we tell if we are eating foods high in sugar? (taste the sweetness or by reading the package labelling) Test a few other foods.
Note: Glucose Meter Test Strips are available from a pharmacy, but cost approximately \$45 - \$50 for a box of 50. Perhaps someone who uses them would be willing to donate a few for your investigations.

Testing the Waters If you have access to a stove this is an excellent activity to determine the most nutritious way of preparing cooked carrots. Students should wash their hands and receive instruction on the safe use of knives before conducting this exercise. You will need carrots, cutting board, paring knives, stove, steamer, two pots and 2 clear glasses. Slice up the carrots. Boil half the carrots for 3 – 5 minutes. Steam the other half by using a steamer basket with about an inch of water in the bottom of the pot, and the carrots in the steamer. Bring to a boil for the same amount of time as the boiled carrots. When fully cooked, pour the water from the boiled carrots and the steamed carrots into separate clear glasses. CAUTION: let boiling liquid cool for several minutes. Which is darker? The orange-yellow colouring of the water is actually the vitamins that have been boiled out of the carrots. Which glass contains more vitamins – the boiled carrot or the steamed carrot? How about the raw ones? NOTE: The deeper orange the water is coloured, the fewer vitamins remain in the vegetables that you are to eat!

Are Mini Carrots Real Carrots? A common sight in our schools, we are divided about the benefits of this convenient food. These commercial growers plant carrots that are the same diameter through the carrot's length. Each carrot is cut in three, tumbled and washed in a machine somewhat like a rock polishing/washing machine, which takes off the outer peel, then packaged. This process chips off some of the sweeter outside flesh which is then sold for use in dried soup mixes. Purchase a package of mini carrots, preferably one with nutrient labelling or use the one provided below. Compare it to the nutrient sheet in *Carrot Facts*; conduct a taste test; make your own judgement. For a math component, compare the cost per carrot of the convenient food and other carrots available for sale at the grocery store or market. We can see that the invention of pre-cleaned and packaged mini carrots makes them ready to use, eliminates the steps in cleaning so that you can just pop them into your lunch kit or your mouth – are they better than no fresh carrot at all?

Mini Carrots, raw	
Nutritional value per 85 g (3/4 cup)	
Calories 35 kcal	
Carbohydrate	8 g 3%
s	
- Sugars	5 g
- Dietary fibre	2 g 8%
Fat	0 g
Protein	1 g
Vitamin A	120%
- beta-carotene	Incl.
Thiamine (Vit. B1)	Not specified
Riboflavin (Vit. B2)	Not specified
Niacin (Vit. B3)	Not specified
Vitamin B6	Not specified
Vitamin C	10%
Calcium	2%
Iron	2%
Magnesium	Not specified
Phosphorus	Not specified
Potassium	8%
Sodium	3%

The nutrients in foods give us energy, help us grow, maintain our bodies and regulate the body's processes. These nutrients are grouped into six categories: carbohydrates, water, fats, minerals, vitamins, and protein. The first letter of each word in the sentence "Cats wait for mice very patiently" might help students remember these categories. Each nutrient has a special job and to be healthy we should eat a variety of foods as no one food contains all the nutrients.

Information on the nutritional value of mini carrots came from Bolthouse Farms mini carrots produced in California, Michigan, Washington and Georgia which are sold in Saskatchewan. www.bolthouse.com Although the nutritional percentages are based on U.S.A. standards, this allows you to compare the mini carrots to the regular packaged carrots that is listed in *Carrot Facts*, also U.S.A. packaging. Note that there is a 15 gram difference in the weights being compared.

The only Canada-produced mini carrots found were sold in Ontario by Derewlany MiniCarrots Ltd, R.R. #2 Thorndale Ontario, distributed by Bayshore Vegetable Shippers Ltd. They do not have a website, but 'googling' their name can lead to a product article.



Carrot True or False Running Game This is an easy activity to set up and perfect if you are looking for something to build up the student's appetites before the Big Crunch while testing the student's knowledge of carrot trivia. You will need a safe space for running back and forth; 2 markers such as flags or signs representing TRUE and FALSE. Set up the TRUE and FALSE signs on opposite side of the gymnasium, classroom or outdoor space. Have students stand directly in between the TRUE and FALSE signs. Call out a carrot fact. Students run to one of the signs – TRUE if they think the statement is correct or FALSE if they do not believe the statement. Once students have chosen their answer reveal the truth and start again. Use information in *Carrot Facts* for your statements.

Creative Carrots – spinning tops, stamp prints, leaf rubbings Time for some creative arts fun! For this you will need fresh carrots, some with green leafy growth, paring knives, cutting board, poster/tempra paints, paper and brushes; crayons/paper for leaf rubbings; toothpicks with the round ends for the tops. After the carrots are cut, spread a small amount of paint in a shallow dish such as a Styrofoam meat tray; use pieces of the raw carrots cut in coins and dipped into paints to make designs. The larger the stub of the carrot, the easier it will be for little hands. Try cutting the carrots into sticks to give older students more options for printing. Leaf rubbings can be made by placing lightweight paper over the carrot tops on a hard surface and rubbing with an unwrapped crayon. To make the spinning top choose carrots about 17 – 23 mm (3/4 – 1 inch) in diameter; cut round carrot slices about 3 mm (3/16 inch) thick. Eyeball the centre of each coin – the ring marking of the carrot might help; push a toothpick through the centre slowly, allowing about 1/2 cm (1/4 inch) to protrude below the carrot slice. You can also break off about 1 cm (1/2 inch) from the long end of the toothpick, which will help the carrot top spin smoothly. To launch the top, twist the long end of the toothpick between thumb and forefinger, simultaneously dropping the point gently onto a smooth surface. Well launched on a china plate, the carrot top will amaze you with how long it spins. When the top has been twirled a number of times, the toothpick will work loose. You will need to cut a new piece of carrot. It is not recommended that you eat the carrot slices you have been playing with! Make several tops at once, and set them all spinning together to see which one twirls the longest. Experiment with different diameter of carrot and settings of the toothpick.

Keep a Good Thing Going As a class, brainstorm all the ways that students could incorporate more vegetables into their daily lunch, dinner and snacks? Make a list on the board. Establish a class goal to increase the number of servings of vegetables for a set time period. Predict the probability that the class will reach its goal; plot it during the time period. You may choose to send home a letter to parents to tell them of your class challenge.