



green thumbs
growing kids



Kinder-GARDEN!

Lesson plans for the Ontario Curriculum

by Sunday Harrison

Thank you to the

Community Environment Fund



We are very grateful to

the Toronto District School Board

for providing release time for the teachers in the pilot to meet for the two half-day workshops. The interaction was key to the success of the project.

Production credits:

Lesson Plan development: Sunday Harrison, Jakub Kaspeski, Catherine Vant Erve, Sonya Willson

Photos contributed by: Elizabeth Coelho, Kim Atwill-Bradbury, Sunday Harrison, David Kruger, Erin Temple, Lara Mrosovsky

Illustrations: Sunday Harrison, Lara Mrosovsky

Graphic design: Lara Mrosovsky



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Table of Contents

Introduction to the pilot project 2

Introduction to the lesson plans 3

Curriculum Notes 4

Snack Growing in a Cup 5

Garden Visit 8

R is for Radish/ R est pour Radis 9

Pretend worms 13

Wiggly worms 15

Recycling: add the worm compost to the garden 19

Carrots and Parsley 20

Potatoes and Tomatoes 21

Five Senses Plus a Sense of Wonder 24

From seed to pickle 28

Host a Master Gardener / Ask Questions &
Share Tasting 33

Summer 35

Introduction to the Fall Lesson Plans 36

Tomatoes are Ready! 37

Soil Discovery 41

Fall Spinach Planting 43

Garlic Planting 46

Harvesting Dill Seeds 47

Making Tabbouleh From Garden Produce 49

Fall Speckled Pea Planting 52

Teacher Feedback: Working Sessions 56

Spring workshop 57

Fall workshop 57

Key learnings 61

Afterword 62

Today In The Garden We.... 63

Plants We Love To Grow With Kids 64



FH Miller, Before



Elizabeth Coelho and assistant with class at FH Miller

Kinder-GARDEN!

Introduction to the pilot project

Green Thumbs Growing Kids initiated a pilot project involving five schools starting in Spring 2013 and continuing in fall. The project introduced 301 children to gardening at their school. Their 8 teachers were engaged in a process of trying out each lesson plan in their respective schools. The lesson plans were written as generically as possible, with attention paid to timing and seasonal planting, assuming that the garden beds were essentially vacant and available. In reality, a considerable amount of work was required to get each garden to this stage of readiness to plant. Two classes in the pilot were French Immersion SK.

Schools - Toronto District School Board	Teacher
F.H. Miller	Elizabeth Coelho
Rawlinson	Sanjukta Roy
	Manuela Godinho
Rose Avenue	Alorani Martin
	Yvette Flunder
Winchester	Kim Atwill-Bradbury
Queen Victoria	David Kruger
	Nathan Goold

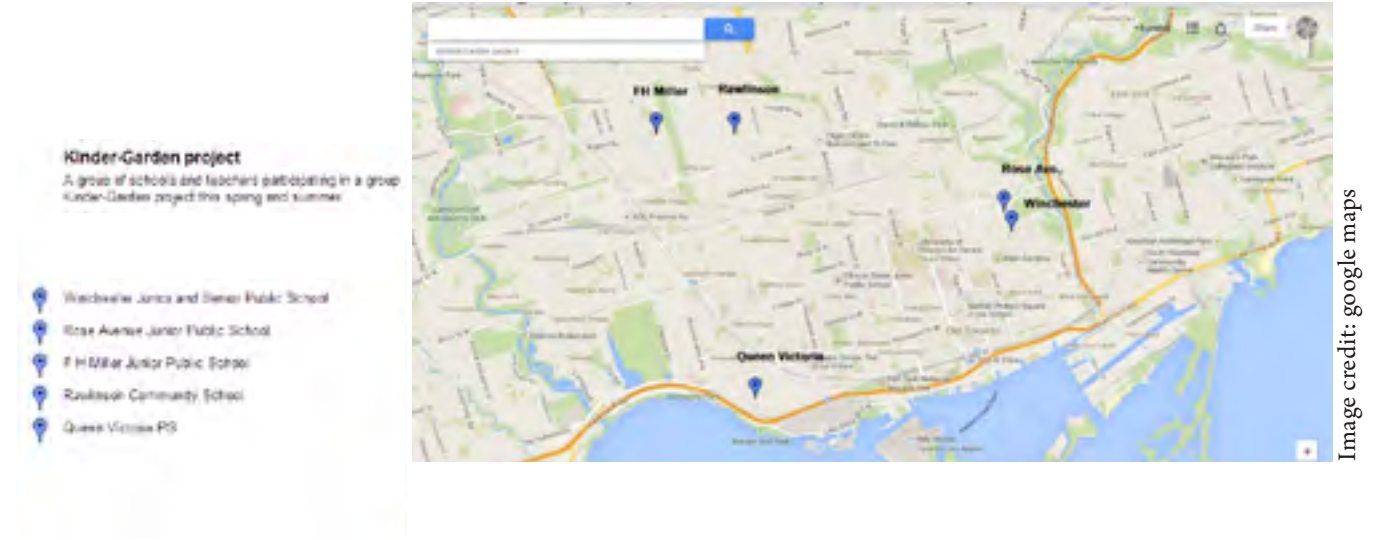
Introduction to the lesson plans

Green Thumbs Growing Kids (GTGK) developed the lesson plans with help from post-secondary student interns Jakub Kasperski (OISE/University of Toronto Teacher Candidate) and Catherine Vant Erve and Sonya Willson (Ryerson University Early Childhood Studies). Additionally, Erin Temple from the Ryerson University Masters in Health Science Nutrition Communications program helped with the Spring teacher workshop.

GTGK has been working closely with four schools over 13 years, and is looking for ways to expand our programming to more schools while continuing our engagement with the students and the land at the four schools. The Kinder-GARDEN project was a way for us to test the mobility of our programming and to work at a bit of a distance to support teachers to create healthy learning gardens at their schools. The project thus engaged us in five schools, three of which were new for GTGK. The choice of schools was based on the following criteria:

- An available garden space, with enough room for the class to gather around
- A supportive principal/caretaking staff
- Willingness to share contact information of parent volunteers, for summer care
- Willingness to engage in an iterative process with supplied lesson plans
- Schools chosen must be among a cluster of schools known as Model Schools for Inner Cities, which included the top 100 high-needs schools.

Two half-day workshops with the teachers reviewed the project at two phases –on June 19 and again at the end of the season on November 21. What follows is a second iteration of the lesson plans, based on teacher feedback and further reflection.



Curriculum Notes

We have used the Draft Full-Day Kindergarten curriculum (<http://www.edu.gov.on.ca/eng/curriculum/elementary/kindergarten.html>, downloaded May 30, 2014) to construct the links in the sidebars. The following passages are relevant to our guide.

“Full-Day Early Learning–Kindergarten programs based on the learning expectations must take into consideration the widest possible range of children’s life experiences and situations. *The expectations are not meant to be a set of discrete skills to be developed.* They represent a range of ways of thinking at certain stages in young children’s development, and they contain a continuum of concepts and skills that are appropriate for children in the early years, including critical thinking skills.”

Under the heading of Environmental Education, the front matter reiterates the goals outlined in *Acting Today, Shaping Tomorrow: A Policy Framework for Environmental Education in Ontario Schools* (2009).

Ontario’s education system will prepare students with the knowledge, skills, perspectives, and practices they need to be environmentally responsible citizens. Students will understand our fundamental connections to each other and to the world around us through our relationship to food, water, energy, air, and land, and our interaction with all living things. The education system will provide opportunities within the classroom and the community for students to engage in actions that deepen this understanding.

Acting Today, Shaping Tomorrow: A Policy Framework for Environmental Education in Ontario Schools (2009), p. 6

“...The three goals outlined in *Acting Today, Shaping Tomorrow* are organized around the themes of teaching and learning, student engagement and community connections, and environmental leadership.

“The first goal is to promote learning about environmental issues and solutions. The second is to engage students in practising and promoting environmental stewardship, both in the school and in the community. The third stresses the importance of providing leadership by implementing and



promoting responsible environmental practices throughout the education system so that staff, parents, community members, and students become dedicated to living more sustainably.

“The Full-Day Early Learning–Kindergarten program offers many opportunities for accomplishing these goals. The learning environments for early learning include **the school yard**, fields and

trails in the vicinity of the school, and various other outdoor venues. Teaching children to appreciate and respect the environment is an integral part of being active in these spaces. **Appreciating the value of fresh air and outdoor spaces, understanding the environmental benefits of healthy practices** such as active transportation (walking, biking) and the environmental implications of various food choices, being aware of the impact of using trails, and understanding the health risks associated with environmental factors such as sun exposure and air pollution are all components of environmental education that can be integrated with learning in Full-Day Early Learning–Kindergarten programs. To facilitate these connections, Early Learning–Kindergarten teams are encouraged to take children **out of the classroom and into the world** beyond the school to help them observe, explore, and appreciate nature.” (Emphasis added).

Kinder-GARDEN!

Snack Growing in a Cup

Season: Winter/Early spring

Total time: 30-40 minutes

Planting Activity time: 15 mins.

Reflection/discussion time: 10 mins.

Time to grow: 7-10 days

Materials

Plain white paper cups

NOTE: paper is better than Styrofoam for the environment, and easier to draw on. You can often get them from coffee shops.

Crayons

Two pencils

1 bag soilless mix, emptied into a container (eg. standard rectangular plastic box used for toys & supplies in class).

NOTE: Soilless mix MUST be moist in order to soak up the new water after planting.



Tarp or plastic sheet

Pea seed – use seed sold for sprouting eg. Mumm’s, a handful per student

Scissors to cut nibbles

4 watering cans, either filled in advance or have a hose on hand and an adult in charge of the hose.

A few example cups of sprouted peas for tasting, created in advance. Plant these a week to ten days ahead of time for sprouts to grow.

Kindergarten Curriculum Expectations

Science & Technology

3.3 identify ways in which they can care for and show respect for the environment: eg. *learn to grow food that can be grown in school or home, so that energy is not consumed transporting and refrigerating it*

3.4 participate in environmentally friendly activities in the classroom and the schoolyard

4.3 make predictions and observations throughout the design process: *what will happen to our pea seeds?*

Health & Physical Activity

1.1 begin to demonstrate an understanding of the effects of healthy, active living on the mind and body

1.2 investigate the benefits of nutritious foods (eg *sprouts*) and explore ways of ensuring healthy eating (*growing your own*)

Arts

V2.2 explore different elements of design (eg., colour, line, shape, texture, form) in visual arts

Conduct tasting in the classroom, while children’s hands are clean. Show children the sample planted sprouts in cups which you have decorated.

Tasting

Show the cup of growing sprouts to the children. Show them the seeds in the jar. Explain that seed will grow a pea shoot that tastes good. Leaves and stems are both edible. Invite students to taste sample by cutting a small portion for each. Teachers should also taste and model their enjoyment of the flavour.



Invite children to name the flavour, with hints if required like “salad”, “fresh”, “crunchy”, “sweet”. Make sure all children get a chance to taste and to use a word to describe the flavour.

Once they have tasted the sprouts, ask who would like to grow their very own.

Give a cup to each child. Cups are turned upside down, and a pencil is driven through the bottom of the cup to make a hole for drainage. Explain that the extra water needs to get out of the cup through the bottom.

Each child designs their cup with crayons, and writes their name if desired, with assistance if needed. Crayons (not markers) must be used because the wax will repel water. The goal is for each child to be able to recognize their own cup as it grows. Spend adequate time on this. One idea might be to draw a face and pretend that the shoots will be the hair growing, or an animal’s face, or anything else they like, to keep them drawing for 5-10 minutes. Drawing on the inside of the cup is also fine, although you might show them the finished cup and ask what they think will happen to the drawing once the cup is full. Will they still be able to see the drawing on the inside of the cup?

Once they have finished their drawings, ask them what will come next. Soil is the correct answer. Show them the soilless mix. Explain that the soil (soilless mix) is a special kind that is made just for containers like cups. (The little white bits are not Styrofoam, they are a mineral which helps with drainage.) Explain that there are no bugs or worms in this type of soil. It is not the same as garden soil. Explain that garden soil should contain bugs & worms, because it is better to have a larger place for little animals to live; they would not be happy in a small cup.

Allow each child to fill their cup with soilless mix loosely to the top. Children may use their hands or small trowels. Have the children place the filled cup down in front of him/her. Have children hold their hands out together with the sides touching to form a bowl with their two hands.

Teacher now place a handful of seed in the child’s hands and instruct them to place all of the seeds on top of the soil. These seeds do not need to be buried in the soil. You can look at the sample sprouts and see that the seed is visible on top of the soil.

It is important that the children handle the seed themselves and try to land it into the cup. Use a tarp or newspaper under the work area to catch spilled seed. Make sure that each cup has at least a good thick layer of seed on top, in order to produce a “meal” of sprouts. Put all seed packets away before watering.

Ask children to guess what comes next. Water is the correct answer. Children may need help if the watering can is heavy for them. Make sure all planted cups stay upright and that when children water, they have enough assistance to get every seed wet. When water comes out the bottom hole, that is good and shows that there is adequate water in the cup.

Set the planted cups aside, and cover loosely with newspaper until they sprout. They will sprout in a few days, and be edible in a week to 10 days. Once they are cut, they will regrow, but the second flush will not be as vigorous or tender as the first.

You can keep the sprouts in the classroom where children can observe their growth as a group, measuring and describing the growth. They may take them home after a few days and share the eating with their families. Keep a few cups for outdoor planting, however, this variety is best for sprouts. Plant your favourite fresh-eating pea variety in your garden.

NOTE: these are speckled peas, which are bred for sprouting. You can do the same activity with other regular-type pea seeds, but the shoots are not as tender and will quickly produce tendrils which are not pleasant eating. Save those for garden peas.

Extension

David Kruger used the sprouted peas to stimulate writing about the sensory experience.





Garden Visit

Season: Early Spring

Time: 20-30 minutes

Activity: In the garden

Take the children out to the garden and have them space themselves out around the garden bed. Make sure every child has enough space. The goal is to touch the soil and have a bit of quiet reflection.

Garden awareness and think/pair/share

Ask children to place their hands on the soil in front of them. Ask them to keep their hand flat on the soil surface and not to wiggle their fingers or dig their fingers into the soil yet.

Ask them to turn to their neighbour and think of a word to describe the soil. You can supply prompts such as temperature, texture, colour, sound. Ask them to pretend that the soil is the skin of a living creature and ask them to imagine what might be happening below their hands. Are there worms and

bugs moving about? Are there little spaces for air and water to flow through? What is the temperature, and how might things change as the soil gets warmer? Discuss with your neighbour.

Discuss with the children any fears they may have. Let them know that most soil critters are not harmful to humans (exception = biting ants, usually small and reddish. Large black ants don't bite. Scout the garden ahead of time and do not do this activity if you believe there are biting ants). Ask them to pretend to be one of the soil inhabitants. What might one soil creature say to another? What might the soil creature say to the child above if they could feel their hand on the soil surface?

Have children close their eyes, keeping their hands on the soil. What do they hear, when everyone is quiet? Count to 20 silently. Have them open their eyes and discuss with their neighbour what they heard.



Discuss the use of their five senses. Ask them what they saw, heard, felt (touched), smelled.

Kindergarten Curriculum Expectations

Science & Technology

3.3 identify ways in which they can care for and show respect for the environment

3.4 participate in environmentally friendly activities in the classroom and the schoolyard

4.3 make predictions and observations



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R is for Radish/ R est pour Radis

Season: Spring or fall in new garden beds

Time: 40-50 minutes

Materials

China Rose (or similar) Radish Seed: package sold for sprouting, eg. Mumm's. Available in natural foods stores.

Forks (1 per child)

Tags (1 per child)

"Sharpie" brand permanent marker (2 – 1 for teacher, 1 for helper)

Laminated picture of Radishes (what to expect)

Hose nozzle (1/garden)

Watering cans (filled ahead of time)

Garden fork (adult tool)

Vocabulary: Cultivate/Fr. Cultiver
Introduce this word ahead of time.

Lesson overview

This lesson takes place around the garden bed. Using a garden fork, cultivate the soil ahead of time roughly, to give the children experience without hardship. The children can break up clumps with a dinner fork, and remove grass or weeds.



Each child should have an area that matches the width of their body. Children can stand close together but not touching. They need a bit of elbow room, a concept which can be explored by having each child put their hands on their hips and when their elbows touch their neighbour's elbows, stand still.



Kindergarten Curriculum Expectations

Language Development

Overall expectations

2. demonstrate understanding and critical awareness of a variety of written materials that are read by and with the ELK team;

3. use reading strategies that are appropriate for beginning readers in order to make sense of a variety of written materials;

Specific expectations

2.8 demonstrate knowledge of most letters of the alphabet in different contexts (e.g., use a variety of capital and lower-case manipulative letters in letter play; identify letters by name on signs and labels at learning centres, in chart stories, in poems, in big books, on traffic signs; identify the sound that is represented by a letter; identify a word that begins with the letter)

Activity: In the garden

The first objective is to cultivate (loosen, aerate, clumps of soil are broken up). They may wish to dig holes, which should be allowed on condition that each hole must be filled, and the goal is to cultivate the whole little patch, not just a part of it.

You can mark each child’s “land” with sticks and string if you wish - see Fall Spinach Planting Lesson Plan for photo/how-to. If there are perennials (eg. fall-planted garlic, early greens such as sorrel, kale, orach, mint etc.), work around them, if there are weeds or grasses, pull them up. Make sure to get the roots, removing them with the fork.

They can spend 5-10 minutes exploring their “land”. The next step requires having it be flat “like a lake”. Use the fork to level it off, and pat down gently with the palms of the hands (not too hard – once cultivated, we want to keep those air spaces in the soil.)

Now, show them the picture of radishes.



Radishes will grow to maturity in 30-40 days. The young leaves, as sprouts, can be eaten also.

You can make a worksheet ahead of time or afterwards, to explore the three words, their number of letters, etc. (Great opportunity for French pronunciation lesson!)

For the planting, each child makes the letter R in the soil in front of her/him. You can choose if you want letters to be capital or lower case or you can let the children choose. With their fingers, make the letter in the soil, as large as the piece of paper (letter-size paper). Make the furrow (Fr: sillon) 1-2 cm deep, about the depth of the child’s index finger from tip to first knuckle. Use this as the measurement.

June harvest of China Rose Radish at Winchester PS



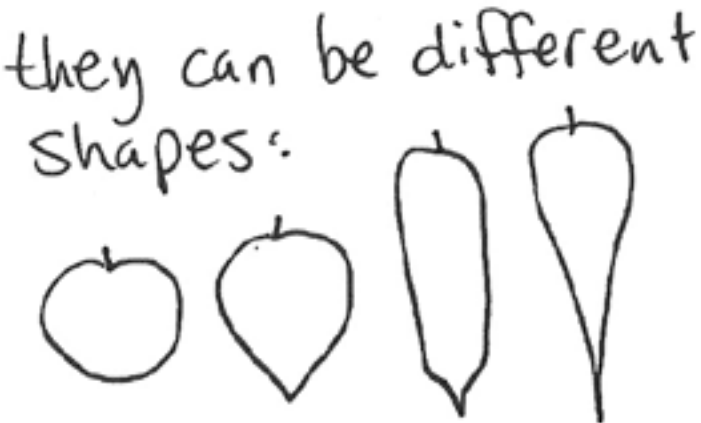
Team Alternative

Put children into teams of three; each team can name themselves eg. “red team” “root team” “radish team” etc. One member of the team will create each part of the letter: the stem, the half-circle, and the diagonal stroke.

Have the children sprinkle the seeds evenly along the furrow shaped as the letter R. Thinnings, the extra plants, can be pulled up in a week to 10 days and eaten as sprouts. The later goal will be to have a distance of 4-6 cm between plants, but you’ll want to see the letter’s shape when the seeds come up!

Have tags ready to insert with each team’s name near their letter. You must use a Sharpie pen or it will wash off. Each team will plant part of the letter R. The first child plants the initial stem, the second plants the curve, and the third plants the leg.

When seeds are planted, “put them to bed” by covering over the seed and making the land flat again.



Kindergarten Curriculum Expectations

Science & Technology

2.4 communicate results and findings from individual and group investigations (how did each group’s “R” grow? What happens after the sprouts are eaten and the plants start to grow?)

4.2 state problems and pose questions as part of the design process (Are the radish plants too close together to grow big roots? How will we give them enough space to grow into radishes?)

4.5 communicate and record results and findings after constructing things either individually or in groups (how big can our radishes get in 6 weeks?)

Health & Physical Activity

2.2 demonstrate persistence while engaged in activities that require the use of both large and small muscles (e.g., planting in small groups)

4.1 begin to demonstrate control of small muscles in activities at a variety of learning centres (e.g., seeds and soils) and when using a variety of materials or equipment (e.g., planting and watering tools)

4.2 demonstrate spatial awareness by doing activities that require the use of small muscles

Watering

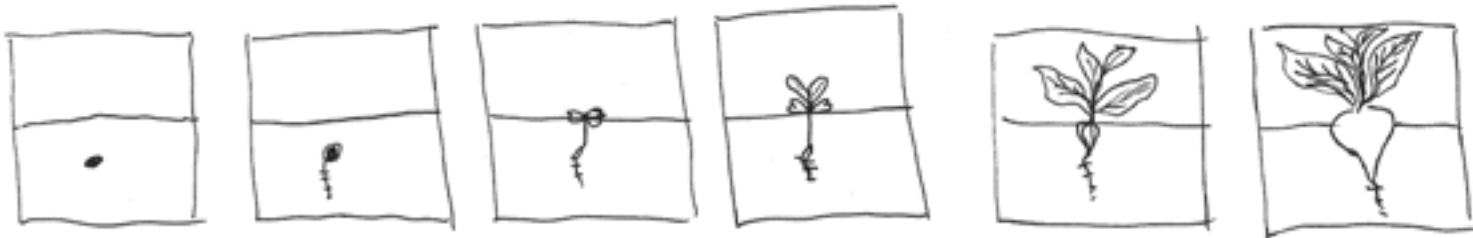
Water well with the hose. The best watering will actually be a complete soaking with the garden hose, set on a mist or fine spray setting. Discuss why the fine mist is better than pouring it out of the watering can. (The strong flow can unearth the seeds and flood the seeded area.) If children are able and time permits, a strategy might be for each child to be allowed to hold the hose for a count of ten to make sure “their” land is watered. Children need to line up to get their turn, and be reminded to go to the back of the line so nobody gets sprayed.



Children use watering cans for hand watering after seeds are sprouted

Predicting what will happen next

Children can verbally predict the next steps, and then draw them, back in the classroom, eg.



NOTE: While it was fun to try, the teachers agreed that this activity was difficult for first-time gardeners. Decide for yourself if you are comfortable with having everyone try to make the letter R. Alternatively, you can follow the Spinach planting lesson plan for evenly spaced plants. We caution, however, that children will have a hard time handling radish seed as it is such a small seed and placing it evenly along a row. Thinning the plants and - if still young - eating the sprouts may be easier overall - just make sure to visit the garden one week from planting. The sprouts are deliciously spicy!

Kinder-GARDEN!

Pretend worms

Time: 20 minutes

Season: anytime

Materials: clay, natural terra cotta available from art/craft supply

Teacher talk

While we are waiting for our garden to grow, we’re going to think more about the soil that plants are growing in, and what kinds of things are in the soil that help plants grow. Good rich soil, which is made by worms, is called castings. This is what worms make in nature. We’re going to make our own pretend worms out of clay and let them go free onto the garden, and pretend that they are real worms.

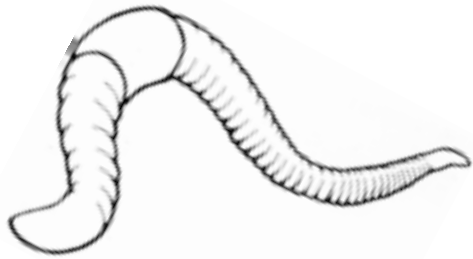
Activity: In the classroom

Distribute clay to each child, and let them play with it freely. Ask, what is clay? Explain that clay comes out of the ground, and it is itself a component part of soil. The particles of clay are so tiny that they stick together very well. Inside soil, there is clay (tiny particles) and sand (larger particles). The clay we are working with comes from the ground. The name for it is Terra Cotta. Terra means Earth.



Looking at our clay worms, let’s think about how the worm’s body works. Does anyone have any guesses how the worm gets its food? What happens next?

Ask for ideas on how to make a clay worm. Why is the shape long and thin? Demonstrate making a clay worm by rolling the clay between your hands and fingers or on a hard surface. You can do this at the garden with preparation, if your garden has hard surfaces nearby, or complete this step indoors and then bring the clay worms out to the garden. Use the spray bottle to keep the clay supple. Talk about the fact that worms need just enough water around their bodies to move through the soil and their shape helps them move through soil by wiggling.



Kindergarten Curriculum Expectations

Math

G3.4 build three-dimensional structures using a variety of materials and begin to recognize the three-dimensional figures their structure contains.

Language

2.8 demonstrate knowledge of most letters of the alphabet in different contexts

Science and Technology

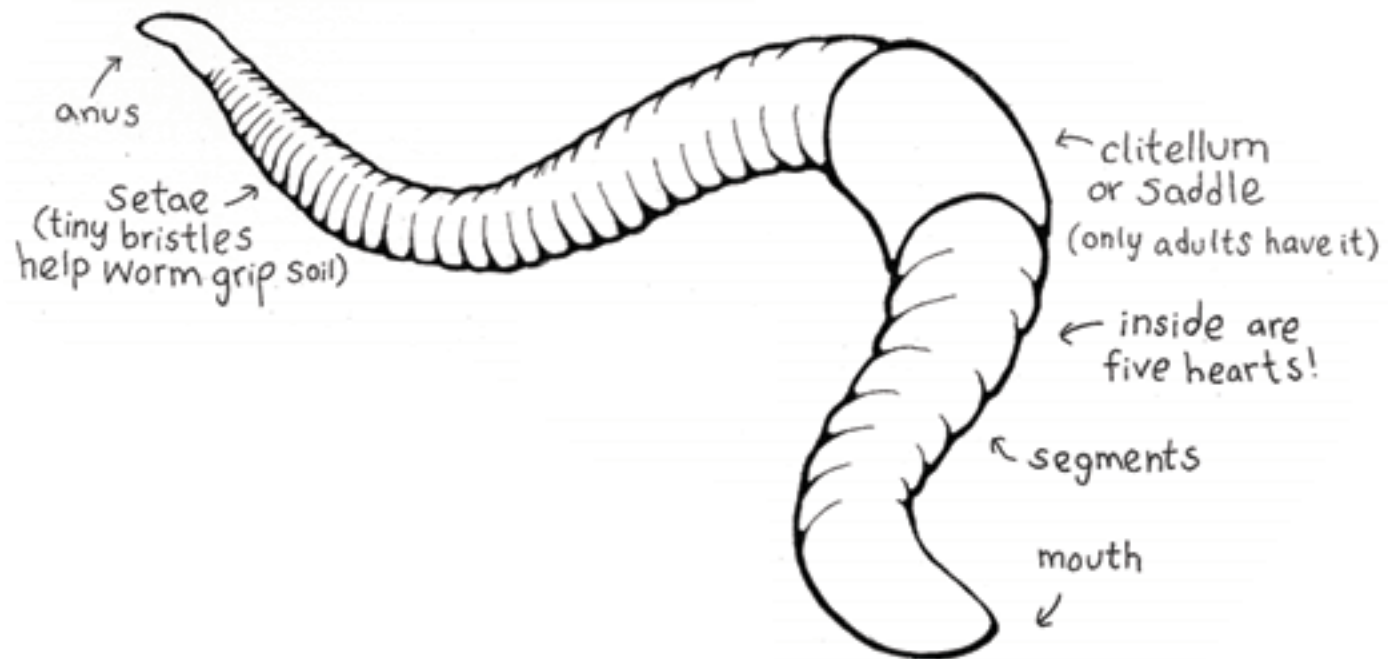
1. demonstrate an awareness of the natural and built environment through hands-on investigations, observations, questions, and representations of their findings;

Health & Physical Activity

4. develop control of small muscles (fine-motor control) in a variety of contexts.

Constructive play

development of ability to connect symbols and shapes with letters and numbers in print



There are two ends. One end has the mouth and the other end is where the castings come out.

Did you ever hear that if we cut a worm in half we could get two worms? Once we learn about how the worm's body works, we know that this is not true. The head of the worm might live but the tail would die. That's because just behind the head, there are five hearts. The hearts keep the worm alive.

Make the clay worms and then set them free into the garden.

Children can make them shaped like a letter, wrapped up into a knot, made into a spiral, etc. You may leave them in the garden or return them to the classroom.

Kinder-GARDEN!

Wiggly worms

Season: Anytime

Time: 40 minutes or more

Materials

Bug boxes (large magnifiers), containing red wiggler worms and their habitat. Start with a worm bin, available from Cathy's Crawly Composters. www.cathyscomposters.com. Add shredded newspaper for bedding. Divide the box temporarily into 10 bug boxes, available from Dollarama and pictured here.

Snack scraps (apple cores, banana peels, melon rinds)
-do not use citrus fruit peels

Spray bottle



Bug box with worms and habitat

Lesson overview

This lesson will expose the children to worms that live in compost, called red wigglers. They are decomposers. They eat germs! Their mouths are very small, and they have no teeth. They like to eat the little "germs" (bacteria) that grow on parts of our food that people would not want to eat, like apple cores and banana peels. This is how food plants, which come from the soil, can be recycled back into the soil, giving back some of the special nutrients that they take out when they grow.

Healthy soil contains lots of living things, some big enough to see, like worms, and some that we cannot see without a very strong magnifying glass called a microscope.

Kindergarten Curriculum Expectations

Science & Technology

Overall expectations

1. demonstrate an awareness of the natural and built environment through hands-on investigations, observation, questioning, and representation of their findings;
2. conduct simple investigations through free exploration, focused exploration, and guided activity, using inquiry skills (questioning, planning, predicting, observing, and communicating findings);
3. demonstrate an understanding of the natural world, and the need to care for and respect the environment;
4. use technological problem-solving skills (questioning, planning, predicting, constructing, observing, communicating) in free exploration, focused exploration, and guided activity.

Observe real worms in the viewers in small groups

Observe how the worms move through the soil. Move the containers from darkness into light and watch the worms disappear away from light.

If children want to handle them, they can wet their hands with the spray bottle, which helps the worm stay calm. Worms breathe through their skin, and they need to be kept moist.

Keep in mind that the worms do not really like handling, so if children wish to do this, they should be very gentle and careful, and not stress the worms. The worms will try to find darkness, because light means danger from predators – birds and rodents.



Children who do not want to handle or hold a worm in their hand can be offered the option to feed the worms by dropping small bits of apple core or banana peel into the viewer, or to put an apple core or banana peel on their hand and put the worm on top of it.



Let the children know that the worms will eat the food in a week or two; it takes some time for the bacteria to get active.

Then the worms will eat the bacteria that eat the food scraps.

Observe the small fellow travellers in the viewer. There might be pot worms (small white worms), sow bugs (also called potato bugs or roly-polies) and/or mites. They are all the regular bugs that join in the worm compost.



Le petit ver de terre

http://www.youtube.com/watch?v=HSJj2_Gs0xg

Qui a vu tout menu
Le petit ver de terre
Qui a vu tout menu
Le petit ver tout nu

Qui a vu dans la rue
Le petit ver de terre
Qui a vu dans la rue
Le petit ver tout nu

C'est la grue qui a vu
Le petit ver de terre
C'est la grue qui a vu
Le petit ver tout nu

Dans laitue disparu
Le petit ver de terre
Dans laitue disparu
Le petit ver tout nu

Et la grue n'a pas eu
Le petit ver de terre
Et la grue n'a pas eu
Le petit ver tout nu

If the worm starts making a yellow juice, that is a sign of stress, and a defense mechanism. It's a bitter liquid that is meant to force a predator to drop the worm. If the worm starts to make the yellow juice, it's best to return that worm to its home inside the viewer or worm bin.

We can handle worms gently and we can handle their castings. Castings are what comes out of the worm after it eats the germs that live on apple cores and banana peels, and other food waste. Castings are just like soil, so we wash our hands after handling it.

Teachers and helpers should monitor the handling carefully and not allow children to drop the worms on the ground. Make sure that if the child is going to drop the worm, they will drop it back into the viewer rather than onto the floor.



(optional, if relevant)

You might notice that a worm has a fat part around its middle. This is the part that can make new worms. A worm makes babies by making a cocoon with another worm, and the cocoon will have two or three baby worms inside that will hatch out. The parents don't stick around, they go off making new cocoons with other worms! So you can get a lot of worms in a worm bin if you feed the worms enough of your extra bits of food, because once they are happy and fed, they will make lots of babies. (A cocoon is a bit bigger than a sesame seed, and shaped like a lemon.)

The worms in the viewer, and now in the bin, are red wigglers, which are cousins to the earthworms living in the garden.

We will look at worms through a magnifying glass, and then feed them the parts of our snack that we don't eat, such as apple cores or banana peels.

After viewing worms in the bug boxes, replace them all to the larger worm bin. They require adequate space to do their decomposing work. Children may handle worms gently if they wish, but not too often as this is hard on the worms.

Background information about worms

The role of earthworms in ecosystems ("their niche") is a little different than red wigglers – the red wigglers in nature live in the leaf layer or in manure found on the surface, and do not burrow. They are social and will be found in groups, whereas earthworms (nightcrawlers) are solitary and territorial rather than social. They live through the winter by going deep, below the frost. The red wigglers, native to warmer climates, do not survive freezing temperatures. However, their cocoons might survive, and so you can have them in your outdoor compost and they will hatch in spring, or maybe even live through the winter if your compost is warm enough.



Earthworms till the soil by eating their way through it, and their castings, like the red wiggler castings, are high in bioavailable nutrients.

Don't feed your worms orange peels – there's some oils in citrus fruit peels that don't agree with worms. Also do not feed them onions or garlic.

Don't put oils or protein products into the worm bin, because although the worms would help with decomposing these things, they couldn't do it fast enough in a small ecosystem before you'd have other unwanted things like odor and maggots.

Be sure to cover the food and the worms with some shredded newspaper. This reduces the fruit fly problem. If you get fruit flies, take the bin outside and leave the lid off. (In winter, you can vacuum them instead.)

Worms need air so make sure there are air holes in whatever container you are using. They also need water. Do not let the bin get too dry. Worms breathe through their skin and require moisture to live.

Kinder-GARDEN!

Recycling: add the worm compost to the garden

Time: 20 minutes

Season: Spring, Summer, Fall

Materials

plastic trowels, wooden spoons

window screen

tarp

NOTE: You will need to allocate space in the classroom for castings to dry

After 6 to 8 weeks of regular feeding and topping off the food with shredded newspaper, your worm bin will contain finished castings near the bottom. For best results, don't disturb the worms any more than necessary. When you add food to the bin, always cover it with shredded newspaper.

Find small amounts of castings/black earth (looks like coffee grounds) in the worm compost. Gently scoop out some of this rich plant food.

Spread some of the compost onto a window screen laid flat on a table, with newspaper or tarp underneath. As the castings dry, they will fall through the screen or you can gently rub them through. Worms, worm eggs, unfinished food scraps etc. can be removed and placed back into the bin.

This activity should take place where children can see and participate.

When castings have been obtained, each child can take a small handful out to the garden and add it to their plants.



Extensions

Teachers suggested using the worms for many other centres, including science, math (measuring), art (depicting), and language.



Carrots and Parsley

Time: 30 minutes
Season: mid-Spring, when still cool at night

Materials

- Carrot Seed Tape
- Flatleaf Parsley Plants
- String
- Row markers, eg large popsicle sticks
- Carrots for snacking, parsley for garnish and tasting

Planting Procedure

Pair the children and have the pairs opposite each other the short way across the garden bed. Give each pair a string loosely attached to two row markers. The name of the carrot variety and the planting date are written on the row marker with Sharpie pen. Attach the string ends firmly to the row markers so that the string is taut across the bed (children may need help with this). When the string is in place, children can place the carrot seed tape under the string, and cut to size to fit across the row. Follow package instructions and water the row.

Parsley Planting: You will need 4 parsley plants to make Tabbouleh in the fall. Plant one in each corner of the bed and water well. They attract pollinators to your garden as well!

Kindergarten Curriculum Expectations

Science & Technology

3.4 participate in environmentally friendly activities in the classroom and the schoolyard

Health & Physical Activity

1.2 investigate the benefits of nutritious foods and explore ways of ensuring healthy eating

Mathematics: Measurement

M2.2 demonstrate awareness of non-standard measuring devices (eg. use string to measure the width of the bed, and to cut the seed tape the right length)



Potatoes and Tomatoes

Introduction time: 5-10 minutes
Plant part activity time: 10-15 minutes
Planting time: 20 minutes
Season: Spring, after all risk of frost is passed

Materials

- potato + two seed potatoes
- tomato seedlings
- trowels
- dandelion root

Introduction: hot potato game

Welcome students to the garden.

Hold up a potato and ask students what it is.

Tell them to form a circle and explain the rules of the hot potato game (Each student passes [not throwing] the potato to the student on their right, and this continues until a student drops it. At that point the student joins the teacher on the outside of the circle and sings the hot potato song or chants hot potato progressively faster, while standing on one foot and changing feet periodically or dancing to the song. There is no need to determine a winner, therefore the teacher may do this as long as they like).

When finished, ask students what part of a plant a potato is.

Kindergarten Curriculum Expectations

Science & Technology

3.4 participate in environmentally friendly activities in the classroom and the schoolyard

Health & Physical Activity

1.2 investigate the benefits of nutritious foods and explore ways of ensuring healthy eating

2.3 demonstrate strategies for engaging in cooperative play in a variety of games and activities

3.3 begin to demonstrate balance, whole-body and hand-eye coordination, and flexibility in movement

Dance & Drama

D1.1 demonstrate an awareness of personal interests and a sense of accomplishment in drama and dance



Potato harvest from raised bed garden at Queen Victoria PS

Plant Part Activity

Have students sit on the ground.

Talk about at least 3 different plant parts (roots, fruits, and maybe leaves), how roots grow in the ground, etc.

Teacher may elect to dig out a dandelion to show students the different plant parts (it might be easier than simply talking about them)

Have students repeat the plant parts as you say them.

Ask students how we could act like a root/what does a root look like? Then ask students to show what a fruit, leaf, etc might look like. Choose an action for each and rehearse with them, calling out the plant part and having the whole class do the corresponding action (can be done in a “Simon Says” format).

Then explain to the class that you will call out a plant and they have to make the shape based on what plant part this is (this must be modelled and explained thoroughly. Also, give hints to students (ie a carrot grows in the ground, what plant part grows in the ground?))

After every time (ie carrot is a root), review with students why that plant is that particular plant part (ie a carrot is a root because it grows in the ground).

Ensure that the potato and tomato are mentioned. Discuss which plant part we eat of each. Consider that both will be ready to eat in the summer and fall.



Garden design tip: although tomatoes and potatoes are in the same large family of plants, they do not grow well together. That is why we recommend planting them on opposite sides of the bed.

Potato leaves start to turn yellow and die back when ready for harvest



Planting activity - In the garden

Put students in four groups (for the two tomato seedlings and two potato seedlings which are planted at opposite ends of the bed)

Explicitly model with students what needs to be done, and how careful they must be because there are other plants growing in the garden bed.

Ask students to pick their roles: two students dig a hole, two take the plant from the pot, and one or two fill in the soil.

Once they are finished, have students water the plants.

Ask them again what they will grow into and thank them for being such a wonderful class.



During this process, ask students questions such as: Why are plants good for us? What does a plant need to grow?



David Kruger's class made latkes with their harvest of potatoes

Five Senses Plus a Sense of Wonder

“If I had influence with the good fairy ... I should ask that her gift to each child in the world be a sense of wonder so indestructible that it would last throughout life, as an unfailing antidote against the boredom and disenchantments of later years, the sterile preoccupation with things artificial, the alienation from the sources of our strength.”
- Rachel Carson, *The Sense of Wonder*

Time: 40 minutes

Season: Spring, after June 1st

Bean Planting: 5 Senses Plus a Sense of Wonder

Gather around the garden bed. Ask volunteers to support children’s listening as this game is played and the planting is done one by one. Plant them at least 1’ apart.



Preparation

Garden should have spaces for beans to grow.

Kindergarten Curriculum Expectations

Mathematics: Measurement

M2.2 demonstrate awareness of non-standard measuring devices (eg. use thumb to push seed down 3x the width of the seed)



Make observations, using all of their senses, and generate questions

Science and Technology

Overall expectations

2. Conduct simple investigations through free exploration, focused exploration, and guided activity, using inquiry skills (questioning, planning, predicting, observing, communicating)

Specific Expectations

3.4 participate in environmentally friendly activities in the classroom and the school yard

Materials

Bush bean seeds, one for each child, soaked ahead of time

Cards: 1 each of 5 senses pictured, with wonder symbol (?) on the back

Game

Teacher holds cards facing themselves so only the ? wonder sign is visible. Each child, one at a time, picks a card from the deck. They must complete a sentence for the sense they picked, eg.

- I see...
- I hear...
- I touch...
- I taste ...
- I smell ...

They can answer it in the past tense, eg. I tasted (for breakfast), I heard (a siren).

Turning the card over, they add another sentence, starting with “I wonder....”

Finish the sentence with a follow-up inquiry about the first sentence. Example: I tasted eggs for breakfast, I wonder where the farm is that they came from. I heard a siren this morning, I wonder what happened.

As each child completes the two sentences, they return the card, and they get a bean to plant. While planting the bean, they can say “I see ...” or “I wonder...” – or any of the five senses. Allow them to verbalize as much as they can within this frame about the bean planting, using one sense and adding an “I wonder...” to it. Encourage each child to pick a different sense than the child before them in this open-ended part.

Bean planting

Soak the beans ahead of time (overnight or for at least one hour). Have each child push the bean seed down about the depth of their thumb, and cover it. Water well.

Beans are bush-type and do not require staking. Water well for first 2 weeks.



From seed to pickle

Season: Late spring (nighttime temperatures above 10°C)

Indoor inquiry and tasting time: 15-20 minutes

Garden activity time: 25 minutes

Materials

- Cucumber plant(s)
- Cucumber
- Pickles, with visible dill
- Dill seed or seedling(s)
- Knife and cutting board, napkins for children to enjoy pickles and cucumber slices at their desks
- Copies of image sheets – enough copies for children to pair up with one set each of 6 images
- Watering cans/hose nozzle

? Can we plant a pickle and expect it to grow new ones? Why or why not? Investigate a pickle, a cucumber, and a cucumber plant.



Kim Atwill-Bradbury taught the pickle lesson sitting in a circle on the mulched area outdoors at Winchester PS.

Kindergarten Curriculum Expectations

Science & Technology

3.3 identify ways in which they can care for and show respect for the environment: *eg. learn to grow food that can be grown in school or home, so that energy is not consumed transporting and refrigerating it*

3.4 participate in environmentally friendly activities in the classroom and the schoolyard

4.3 make predictions and observations throughout the design process: *what will happen to our cucumber and dill plants?*

Language

1.10 orally retell events and familiar stories in proper sequence

Health & Physical Activity

1.2 investigate the benefits of nutritious foods (*eg pickles*) and explore ways of ensuring healthy eating (*growing your own*)

Inquiry and tasting inside before planting

Discuss the steps that are needed to get a pickle from a cucumber seed. Explain that the cucumber seed was already planted in the pot and grown in a greenhouse because it needed a warm start to life, like a baby being in an incubator until he or she is ready to enter the outer world. Show the cucumber. Explain that the cucumber was grown months ago in a warm place (Mexico) and brought to our grocery store in a big truck, or perhaps it was grown in a greenhouse in Ontario. Look for a label or indication of origin when you purchase the cucumber.

Remove a pickle from the jar, and cut it open. Investigate to see if you can find the seeds. Cut open a cucumber to examine its seeds.

Taste both the cucumber and the pickle. What is the difference?

If children are ready to read, write three or four ingredients from the



Show them the cucumber plant and ask them which picture is closest to the way the plant looks today. What came before? What will come next?

pickle jar on the blackboard. (Cucumbers, dill, vinegar, salt). The dill is visible inside the jar. See if you can identify it (leafy bits and seeds).

Have children pair up to put the images in order. Have them make predictions about what will be planted in the garden and what will happen, as well as how we can get from today (planting dill seed and cucumber plant) to the point where we could make our own pickles like the ones in the jar.

Ask each pair of children to identify at least one element in the drawings, eg. root, flower, stem, seed, soil, leaves, vinegar, salt, cucumber, pickles, and to give one piece of information as to how this element relates to another element, eg., which came first.

Outdoors

Take the children out to the garden. Have them surround the garden bed as before and distribute the contents of the Dill seed package - have each child receive a few dill seeds in their non-dominant hand. Ask them to rub the seeds gently with the index finger of their dominant hand, and smell the dilly fragrance. They may plant these seeds anywhere in the garden that does not have a plant growing. To plant, they push the seed gently into the soil as deep as their first knuckle, and cover the seed. (Dill does not transplant well, so let it be once it comes up. If the little plants are crowded together, not a problem.)

The teacher or other adult should identify a good place for the cucumber plant. Part shade is ideal (could be on the north side of a tomato which will shade it as it grows). Dig a hole the same size as the pot or slightly larger. Do not remove the seedlings from the pot, rather, break open the bottom of the pot before setting it in the hole.



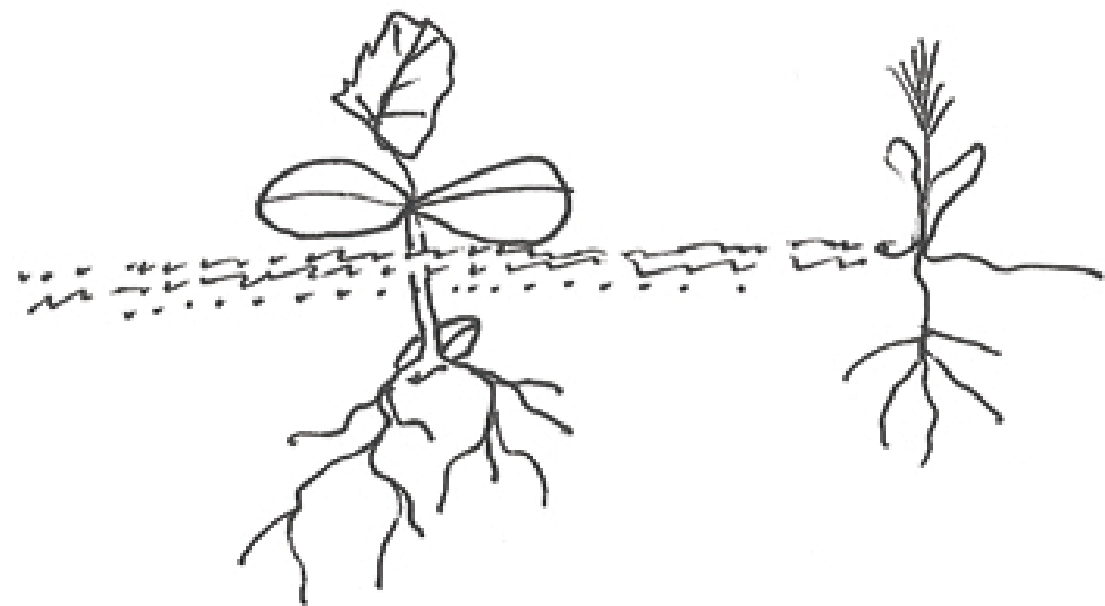
Pickle kits on their way to teachers

Cucumbers do not like transplanting and the peat pot will decompose over the season. Make sure that soil is well packed around the outside of the pot and that the soil level is the same inside and outside of the pot.

Water everything well, with watering cans and/or hose.



Remember that the garden will now need regular watering. Twice or three times a week, deeply, is better than every day shallowly.





Kinder-GARDEN!

Host a Master Gardener/ Ask Questions & Share Tasting

Season: last days of school in June

Time: 30 minutes

Materials

Colander

Hose

A vegetable brush

Garden produce, and/or supplemental produce that reflects the planting

Knife and cutting board (out of reach of children)

Lesson overview

The Master Gardeners program, run by many local Botanical Gardens, promotes education about gardening that can be accessed by teachers looking for support in garden-based instruction. For this lesson, a Master Gardener from this program will attend at your school garden on a date and time on which you agree. Contact your local Botanical Gardens early in the season to book a visit.



Master Gardener Claire Trepanier visits at Queen Victoria P.S.

Kindergarten Curriculum Expectations

Language Development

Overall Expectation: A: communicate by talking and by listening and speaking to others for a variety of purposes and in a variety of contexts;

Specific Expectation:

10. Orally retell simple events and simple familiar stories in proper sequence

19. Retell information from non-fiction materials that have been read by and with the teacher in a variety of contexts

Science & Technology

Overall Expectation: A. Demonstrate an awareness of the natural and human-made environment through hands-on investigations, observation, questioning, and sharing of their findings;

Specific expectations:

3. Describe and/or represent, using their own observations, patterns and cycles in the natural world

4. Pose questions and make predictions and observations before and during investigations

C. Demonstrate an understanding of and care for the natural world;

9. Participate in environmentally friendly activities in the classroom and the school yard

For local information visit www.mgoi.groups.html

The children should be prepared for this visit by reviewing the lessons they have done and recording questions they have for the Master Gardener. They can do this in pairs, and each pair poses one or two questions. Questions should be recorded by the teacher in advance of the visit. Questions should be considered carefully, as the Master Gardener may not have time to answer every question. When children pose the questions, ask them to think carefully about what a Master Gardener might know about that other people might not know: and how this knowledge can be best transmitted. By hosting a visitor to the garden, and showing what they have learned and are proud of, the children's questions can deepen their ownership of the knowledge they have gained to date, and also show you, their teacher, what they "got" – or not.

In the garden, there may be foods ready to taste. This is an opportunity to learn how to harvest the produce, and share it equitably, also keeping in mind the health and safety considerations of washing foods that have been in contact with the soil.



Nibbling on pea leaves (tasty!) at Winchester

Foundations for a Healthy School

The Ministry of Education's "Foundations for a Healthy School" (www.edu.gov.on.ca/eng/Healthyschools/foundations.pdf) identifies four components that together represent a comprehensive approach to creating a healthy school. This approach ensures that children learn about healthy, active living in an environment that reinforces their learning through policies and programs that promote healthy, active living. The four components are as follows:

- high-quality instruction and programs
- a healthy physical environment
- a supportive social environment
- community partnerships



Stevia leaves, a school garden favourite on tasting tours

Kinder-GARDEN!

Summer

I conducted site visits over the summer and happily engaged some of the kindergarteners who were in day care at Rawlinson Community School. They were very protective and engaged with the garden, and as soon as I arrived, they wanted to know how to help. I was amazed at how well these five-year-olds could concentrate on removing every other carrot. But their young motor skills still resulted in many carrots being removed altogether. (This is why I recommend Carrot Seed Tape for Kinder-Gardens.) C'est la vie. The care for the space was evident, and one girl exclaimed in amazement, "We can tell my mom, people can grow their own food!"

At Queen Victoria PS, a clever irrigation system was installed. We visited with the Vice Principal Eric Szonyi and his wife and children, who helped

weed the beds. Due to the rooftop location, this garden was not accessible during summer in general.

At Winchester PS and Rose Avenue PS, the regular Green Thumbs Growing Kids summer programs helped provide some support to the KinderGARDEN beds there.

At FH Miller PS, community members pitched in to keep the garden watered. Elizabeth stopped by through the summer as well.

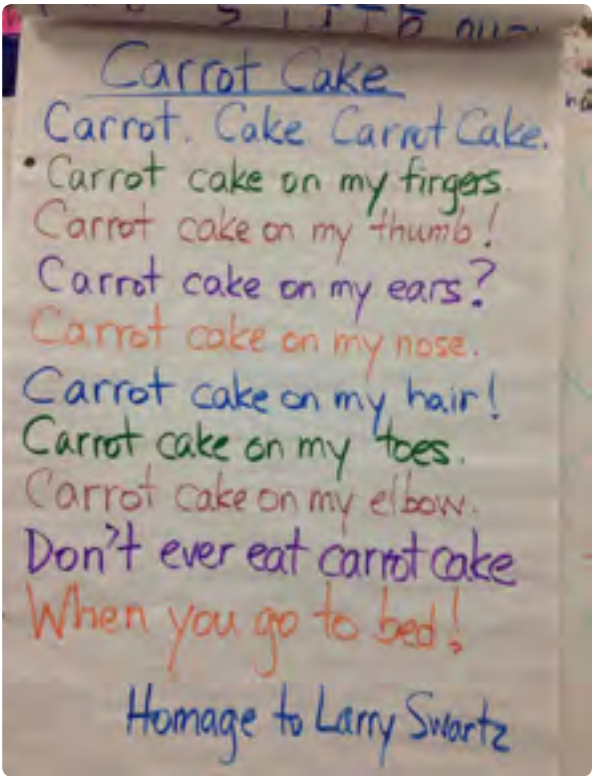


Queen Victoria PS in mid summer

FALL LESSONS

Introduction

Fall brings a new crop of children. Two of our teachers left the pilot, because they changed grade level or left the school. One simply found her fall schedule too full to continue. The remaining 5 teachers continued using their gardens and Ryerson Early Childhood Studies students, Catherine Vant Erve and Sonya Willson, were dedicated to the project. They contacted all of the teachers and began site visits as soon as they could in September. One of the difficulties of school gardens is that while the month of September is very productive in the garden, students are still getting organized into classrooms, and teachers have their hands full managing the indoor issues, let alone teaching outdoors. This is nowhere truer than in Kindergarten, where some young four-year-olds are experiencing school for the first time. Nonetheless, most of our pilot’s teachers were able to get outside and at least assess their gardens with Sonya and Catherine in time to use them in the fall. The site visits gave Sonya and Catherine



enough information to develop the fall lessons.

Some teachers created many lessons of their own from the productive garden. David Kruger and Manuela Godinho created their own recipes and engaged their students in making the recipe.



David Kruger made carrot cake from the carrots.

Tomatoes are Ready!

Season: Late Summer - Fall, before first frost

Total time: Approximately 60 minutes

Part 2 activity time: 35-40 minutes (additional time may be required for journal entries and storybook reading)

Part 1: Tomato Harvesting

Materials

- Bucket to collect tomatoes
- Bucket of water to rinse fruit and hands
- Story: Aries Hair

Introduction

As a class begin the lesson by reading the story “Arie’s Hair” by Robert Munsch.

After the story ask the group a few questions such as, “Do you think eating tomatoes will turn your hair red?” and “what else do you know about tomatoes?” as a transition from the story to the day’s lesson in the garden.

After getting an idea of what the children currently know about tomatoes introduce the plan for the day so that the children are prepared for what is expected of them. Divide the group into two so that there will be enough space around the garden for everyone to see.



Lit Link

Arie’s Hair, in Seeing Red by Robert Munsch.

Alex wants his hair to be just like his best friend Arie’s. Arie promises to teach him the secret trick for turning black hair to red... but what kind of a trick is it?”

Kindergarten Curriculum Expectations

Personal & Social Development

- 1.3 express their thoughts and share experiences
- 2.5 interact cooperatively with others in classroom events and activities

Science & Technology

- 1.1 ask questions about and describe some natural occurrences, using their own observations and representations
- 2.1 make predictions and observations before and during investigations
- 3.4 participate in environmentally friendly activities in the classroom and the schoolyard

Health & Physical Activity

- 1.2 investigate the benefits of nutritious foods and explore ways of ensuring healthy eating
- 4.1 begin to demonstrate control of small muscles in activities at a variety of learning centers and when using a variety of materials or equipment

Language

- 2. Demonstrate understanding and critical awareness of a variety of written materials that are read by and with the EL–K team



Lit Link

The Enormous Potato by Aubrey Davis

Story about an enormous potato that requires the help of an entire family to pull out.

Reflects how the children might need assistance from each other in order to pull out certain plants.

Allows a child to make connections between their experiences and the story

Activity: In the Garden

Group 1 – Divide this group into pairs giving each pair a small container to hold the tomatoes they have harvested. Allow the children to pick a couple of tomatoes but be sure to have some left over for the second group!

Group 2 – Play “Tomato, Tomato, Salsa” (same as Duck, Duck, Goose)

Once group one has harvested their tomatoes, switch the groups to allow for both groups to try the two activities.

After both groups have completed their activities, return to the big group. In the large group have each child choose a tomato to rinse and encourage them to explore the fruit with their senses – touch, try rolling the fruit between your fingers, smell, what do you think a tomato smells like? Can you think of anything else that might smell this way?, sight, what shape is the tomato? What colour is the tomato?, etc., taste, get all the children to bite off half of the tomato – what does it taste like? Revisit the other senses now that you can look into the tomato.

Part 2: Preparation of Garden for Fall Planting

Materials

Large bucket to transport tomato plants to the classroom

Twine

Secateurs (garden clippers)

Compost (worm castings or other finished compost)

Child size trowels

Fruit vs vegetable?

You may think of a tomato as a vegetable, but botanically it is a fruit. It's the part of the plant with seeds in it.



Tomatoes in a raised bed at Queen Victoria PS

Introduction

Tell the students that they will be preparing the garden beds for fall planting. Explain to them that a section of the garden needs to be cleared of older plants in order to grow new ones. Explain to students that some plants only have one growing season for instance, tomatoes, carrots, potatoes, parsley, and dill. As an example, mention to the students that some plants need to be uprooted because their life cycle is complete while others will continue to grow (perennials). As the weather cools, the tomato fruit will not be as good to eat.

You may wish to use a tree as an example of a perennial as the garden contains only annuals. Outline what plants the children will be removing from the ground (e.g. tomato plants). By removing a plant this creates space for new plants to grow. Explain to the students that plants take nutrients from the soil (their food) to grow. To ensure the new plants have enough food we need to add compost and fertilizer (both rich in nutrients) to the soil.

Activity: In the Garden

Begin by modeling to children how to uproot a plant by grabbing the base with both hands and pulling upwards. Shake out the excess dirt over the garden bed. Either working alone or in pairs have the children uproot the plants on their own. Have them place the plant in the large bucket to bring back to the classroom. You may need to loosen the soil and the plant with a spade or garden fork.

Once all of the selected plants are removed, introduce what will be added to the soil as plant food. Allow the students to mix the compost into the soil using the trowels.

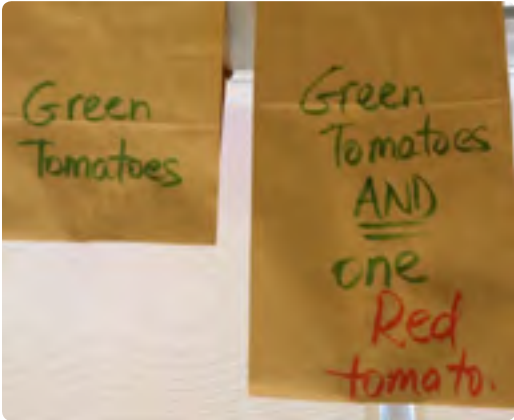
In the Classroom

For tomato plants (varieties with red fruit when ripe)

Using the twine to create a line to hang the tomato plants on, keeping it low enough for the children to observe. You may choose to either cut off the roots of the tomato plant or rinse the roots of any dirt. As an option you can have one plant with the roots still intact and the other without the roots. This will give the students an opportunity to observe any differences or changes in both plants. Hang the plants upside down on the line using the twine. Explain to students that certain plants (i.e. the tomato) continue to ripen outside of the soil. By having the plant upside down this allows nutrients to travel to the fruit helping it to mature.



Ask the class to predict what will happen to the plant and the tomatoes on it. Using their journals have the children draw and write out their predictions/observations. This activity can be revisited regularly to report any changes in the plants.



Activity Extention: Paper Bag Predictions

Gather two paper bags. In one bag place a handful of unripened green tomatoes and in the other bag place a handful of all green tomatoes with one red tomato. Label them accordingly. Check frequently the progress of the tomatoes to ensure that changes are occurring in the ripening process. Do this when children are not in the room. When changes are apparent have the children predict whether the tomatoes will be all green, both green and red, or all red. Open the bags so the children can see the final results.

Activity Extension: Informal Graphing

After bringing in the tomato vine from outdoors select a few children each day to pick the ripe tomatoes off of the vine. Organize them based on the day they were picked (refer to image below). Once all of the tomatoes are picked from the vine you can graph their ripening process on a chart using one to one correspondence.



Kinder-GARDEN!

Soil Discovery



Soil Discovery and Spinach Planting can be done simultaneously depending on class size.

Time: 20 minutes

Location: Garden

Season: Spring or Fall



Materials

Trays or large bins for soil (one tray per group of 3 children)

Three types of soil: garden soil, commercial potting soil, sandy dirt from the playground

Labels for each bin (e.g. #1, #2, #3)

Magnifying glasses

Discovery checklists (one per child)

Pencils

Clipboards or any hard surface for children to write on

Preparation

Fill each tray with one type of soil. Label each tray with a number (e.g. garden soil can be #1, potting soil #2 and schoolyard soil #3). Note there will be duplicates of each number. Emphasize to children that they will need to visit each number at least once smell, see and touch the various types of soil. Place trays in scattered formation to allow room for discovery by children. Place materials magnifying glasses beside each tray.

Kindergarten Curriculum
Expectations

Science & Technology

2.4 communicate results and findings from individual and

group investigations (e.g., explain and/or show how they made their structure; state simple conclusions from an experiment; record ideas using pictures, numbers, labels)

3.4 participate in environmentally friendly activities in the classroom and the schoolyard

Mathematics

NS1.3 begin to make use of one-to-one correspondence in counting objects and matching groups of objects







NS1.9 use, read, and represent whole numbers to 10 in a variety of meaningful contexts

DM5.1 sort, classify, and compare objects and describe the attributes used

DM5.3 respond to and pose questions about data collection and graphs



Soil Discovery Checklist

DISCOVERIES	Soil #1	Soil #2	Soil #3
<div>Rocks</div> <div></div>			
<div>Sticks</div> <div></div>			
<div>Animal life</div> <div></div>			
<div>Wet</div> <div></div>			
<div>Dry</div> <div></div>			
<div>Other</div> <div></div>			

Kinder-GARDEN!

Fall Spinach Planting

Preparation time: 20 minutes
Garden Activity time: 45 minutes
Reflection/Discussion time: 15 minutes
Season: Fall, before first frost

Materials

- Bloomsdale spinach seeds (hardy variety)
- Popsicle sticks and string for creating rows (number will vary depending on the size of your designated planting space)
- Watering cans
- Risers made from wood to be used by children to kneel on when planting in hard to reach areas (optional)
- Row Covers (using hula hoops opened to form a single arch, large 6 mil plastic covering, large bulldog/office clips). Use enough of each to cover entire planting area.

Preparation

Loosen and prepare garden soil in the designated planting area. Place Popsicle sticks along the length and width of the area 10 cm apart. Tie strings on a diagonal to create a crosshatch pattern. Fill watering cans with water.



Introduction

Explain to the children that some plants are sowed in the soil during the warm months while others are planted during the colder months. Mention that spinach is generally planted in the early spring (from April-June) however, it can be planted during the fall because it is a hardier green that can withstand cold temperatures when enclosed in ground covering. Spinach can survive a frost and temperatures down to -10°C. The row cover acts as a blanket that protects the seedlings from the outside air and keeps them warm. Note, the spinach may start to produce leaves however once the cold temperatures increase the spinach will stop its growing process (i.e. hibernate) and resume when the temperature rises again in the spring. The row covers can then be removed when soil temperatures reach 5°C.

Activity: In the Garden

In the garden begin by choosing 4 children to start the planting activity. While some children are planting the remainder of the class be will exploring the soil samples. Hand out one copy of the discovery checklist and a pencil per child. If possible have the children use clipboards or any hard surface to write on. You may want to discuss the checklist again to refresh the children’s memory. Have the children rotate between the trays making sure they have explored each variety of soil at least once. Circulate between the groups to support the children in the process.



With the children who are planting demonstrate to them how the seeds will be planted in the soil. The seeds can be planted 1-2 cm deep (i.e. one child sized fingernail) into the soil. Each child will plant one seed where the strings intersect. Have them cover the seed with soil and pat down lightly. Once complete ask them to gather another child to plant their seed. Once each child has had the opportunity to plant a seed have some students water the spinach seeds using the watering cans.

The final step is to create the Row Covers for the spinach seeds. Pictured is our design for a small row cover. You can make it as large as you want by adding more hula hoops.

NOTE: We did this at the same time as the Soil Discovery Lesson. This allowed small groups to plant while other groups explored soil.



Kindergarten Curriculum Expectations

Social Development

1.2 demonstrate the ability to take turns in activities and discussions

Emotional Development

1.3 express their thoughts and share experiences

Science & Technology

1.1 ask questions about and describe some natural occurrences, using their own observations and representations

2.2 make predictions and observations before and during investigations

2.4 communicate results and findings from individual and group investigations

3.1 identify similarities and differences between local environments

Kinder-GARDEN!

Garlic Planting

Preparation time: 30 minutes
Garden Activity time: 40 minutes
Reflection/discussion time: 5-10minutes
Season: Fall

Materials

- Garlic cloves (one per child)
- Trowels to dig trenches
- Popsicle sticks (10 cm in length)
- Watering cans

Preparation

In the garden create trenches 3x the depth of the garlic clove. The trenches need to be spaced 10 cm from the garden edge with 20 cm between each trench.

Activity: In the Garden

Have one child at a time put their clove into the trench making sure to plant it bottom side down (this is the wide tip of the garlic) into the soil. They will need to push it slightly into the soil to ensure proper contact with the soil. Try to have the children plant the clove straight up instead of on a diagonal. The next child can use a Popsicle stick to determine the distance between the cloves. Continue to repeat this step with each child until all of the students have had the opportunity to plant their garlic clove. Then have the children cover the cloves with the soil and pat down firmly. Allow children to water the garlic using the watering cans.

NOTE: Depending on the size of your garden not every child will have the opportunity to plant their own garlic clove. With the remaining students you can assign them other tasks such as filling the trenches with soil and watering the garden, so that they all have a task.

Gardening tip: In spring some of the garlic cloves will need to be thinned out to ensure full maturity of the remaining garlic cloves. This can be done by removing every other plant from the soil. Thinnings are edible. In late June, pinch off the spiral flowering top called the scape. Garlic is harvested in July.



Kindergarten Curriculum Expectations

Social Development

1.2 demonstrate the ability to take turns in activities and discussions

Science and Technology

2.2. make predictions and observations before and during investigations

Health and Physical Activity

1.2 investigate the benefits of nutritious foods and explore ways of ensuring healthy eating

*teacher can express benefits of eating garlic



Kinder-GARDEN!

Harvesting Dill Seeds

Garden activity time: 15 minutes
Classroom activity time: 45 minutes
Season: Fall
Materials

- Coloured pencils/markers/crayons
- Envelopes
- Scissors
- Newspaper
- Container to collect seeds/flowers from plants
- Seeds

Introduction

Discuss how plants have life cycles- starting with seeds, then growing to plants, then flowering and producing seeds, and how the cycle continues with new seeds. If this is a topic that has already been discussed in the class, have the children come up with the stages of the life cycle. Have the children interpret this cycle by using their bodies to represent these different stages. For example, the children might start off as little balls on the floor, the slowly extending their bodies to represent growth, etc. Explain to the children that today in the garden they will be collecting seeds from the dill plant and will be preparing them for storage over the winter so that in the spring they can plant their dill seeds in the garden.



Why do seeds turn brown (ripen) at different rates?

Kindergarten Curriculum Expectations

Emotional Development

1.3 Express their thoughts and share experiences

Language Development

1.5 Use language in various contexts to connect new experiences with what they already know

1.7 Use specialized vocabulary for a variety of purposes

4.3 Write simple messages using a combination of pictures, symbols, knowledge of the correspondence between letters and sounds (phonics), and familiar words



Yellow flowers - not ready



Brown flowers (can see seeds) - ready

In the Garden

Once the children are settled in the garden space, explain how they will be removing the dill seeds from the plants. This is done by trimming the whole flower from the plant, be sure that the flower is dried out and brown in colour. The yellow flowers mean that the seeds have yet to ripen. Refer to images below. Have children do this in supervised pairs – one to hold the plant, and one to trim the flower. Gather the flowers in a container to bring back to the classroom. Once all the flowers are collected, have the children who haven't yet done anything to pull out the dill plants. (Shake the soil off the roots). These can be used in taste tests, recipes, pickling, etc.



Is it easier to remove dry brown seeds than green ones? Why might this be true?

In the Classroom

Place the dill flowers on newspaper and place in a dry sunny place in the classroom. The flowers will need approximately one week to fully dry out before they are ready for packaging. Have the children label their envelopes with the plant name and the date the seeds were collected. They can also draw a picture of the plant on their envelopes.

Once the seeds have dried out completely (approximately one week later) – remove the dried seeds from their flowers and have the children place a few seeds each in their prepared envelopes. Store these envelopes in a cool dry place over the winter. Consider sending parents home with storage and growing instructions so that parents can plant the dill in the springtime at home. Make sure to keep some seeds at school so that you can plant them with the children next spring.

Gardening tip: Saving seed is a gardening and farming tradition. Every seed is an individual, and saving seed from healthy plants adapted to your garden conditions is a best practice.



Kinder-GARDEN!

Making Tabbouleh in the Classroom (from garden produce)

Preparation time: 1 hour (for bulgur to soak)

Activity time: 45 minutes

Reflection time: 10 minutes

Season: Fall

Materials - kitchen / classroom

2 large mixing bowls

1 medium bowl to prepare bulgar/couscous

Measuring cups and spoons

Plates and forks for eating

2 cutting boards (if preparing during experience)

Lettuce knives

2 mixing spoons

Kettle to boil water



school garden parsley, ready to harvest

Kindergarten Curriculum Expectations

Social Development

1.2 Demonstrate the ability to take turns in activities and discussions

3.3 Talk about events or retell stories that reflect their own heritage and cultural background and the heritage and cultural backgrounds of others

Emotional Development

1.3 Express their thoughts and share experiences

2.5 Interact cooperatively with others in classroom events and activities

Language Development

1.5 Use language in various contexts to connect new experiences with what they already know

1.7 Use specialized vocabulary for a variety of purposes

1.9 Describe personal experiences using vocabulary and details appropriate to the situation

Mathematics Development

M2.2 Demonstrate through investigation an awareness of non-standard and standard measuring devices and strategies for using them

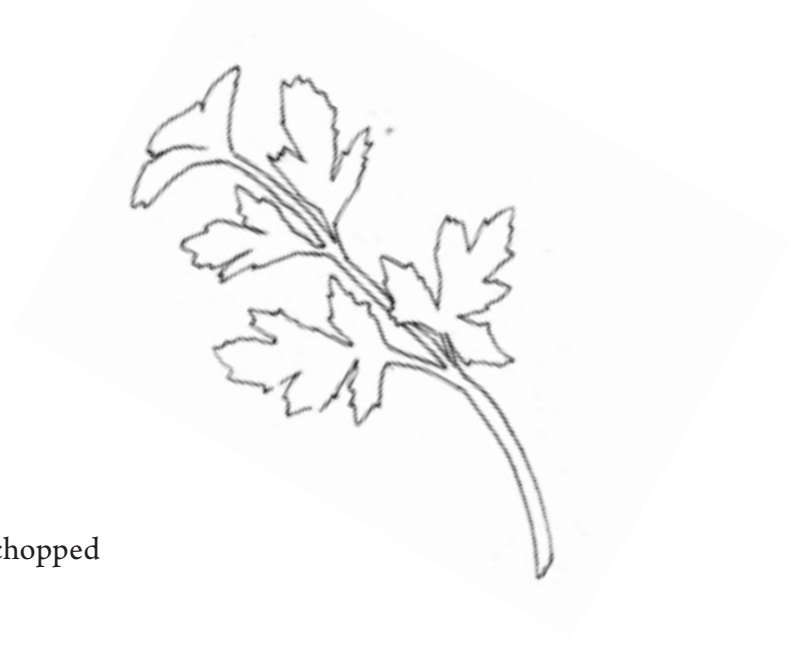
Health & Physical Activity

1.2 Investigate the benefits of nutritious foods and explore ways of ensuring healthy eating

Ingredients

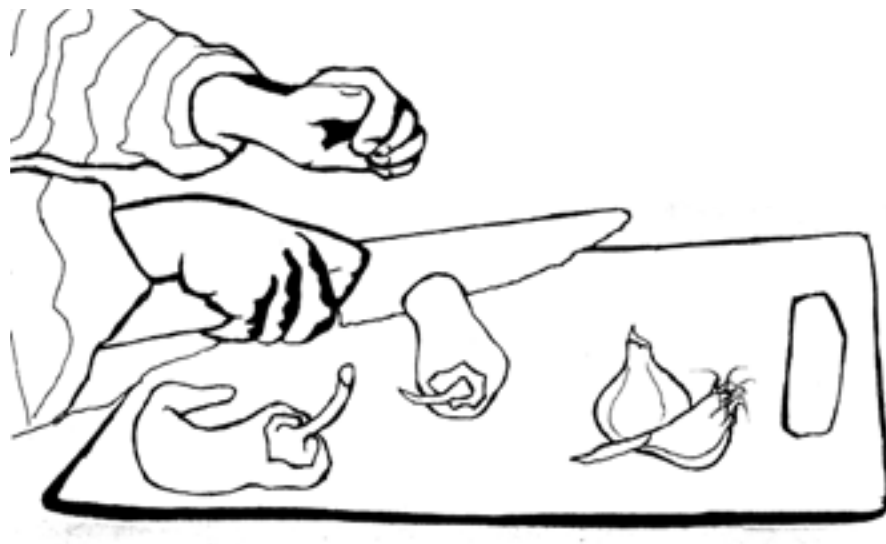
(this should be enough for one group, so can be doubled to prepare enough for class)

- ½ cup Bulgur wheat (can be replaced with couscous)
- 1 cup boiling water
- 1 cup tomatoes, cut to bite sized
- 1 cucumber, cut to bite sized
- 2-3 scallions – chopped
- 1 bunch parsley leaves - finely cut
- 2 tbsp Olive oil
- 1 tbsp fresh lemon juice
- Pinch of salt
- Optional: fresh mint leaves – 1/8 cup chopped



Preparation

Prepare the bulgur before the children arrive if possible as it takes 1 hour to soak. This can also be done before the activity begins as it will have some time to soak. Prepare the two ‘cooking’ stations so that they are ready once the children return from the garden. Have children cut ingredients with lettuce knives for cucumber and tomato, and clean scissors for parsley and mint.



Introduction

Begin the lesson by outlining the day’s activity: pulling out the parsley and using it to prepare a snack called Tabbouleh (aka Tabouli). Ask if anyone might have already tried this dish. If the children are unaware of Tabbouleh, explain to them that the word comes from tabboula, which means “Middle Eastern Cookery” in Arabic. Tabbouleh is originally from the mountains of Syria and Lebanon. (Chopchopmag.org).

Activity: In the Garden

Bring the children out to the garden to pull out the parsley, shaking off the roots to leave the soil behind. Cut the root off and compost it in your worm bin or outdoors. You may also harvest mint, cucumber and tomato, if available.

In the classroom – cooking experience

Divide the children into two groups to prepare the tabbouleh – we found this worked really well and allowed each child to have an opportunity at mixing or adding ingredients.

To prepare Tabbouleh, follow the steps below:

Put bulgur into the mixing bowl

Pour 1 cup water into the bowl. Cover and let sit until the bulgur is soft – approximately 1 hour

Have children chop up the parsley and mint using scissors

After the bulgur is soft, add the tomatoes, cucumber, scallions, parsley, mint if using, olive oil, and lemon juice. Mix everything together with a spoon

Cover the bowl and refrigerate at least 1 hour



Write the instructions for preparing tabbouleh on the board with words and pictures to illustrate that we use words to help us cook (tie to literacy). For example the words chop, mix, squeeze, pour, and other verbs tell us what to do with the ingredients.

Reflection and eating:

Over tabbouleh, discuss this cooking experience: what it was like to harvest and use homegrown ingredients in their food, what were some challenges and successes, have them make connections to other experiences or stories, cultural differences in food, and anything else the children might bring up.

Fall Speckled Pea Planting

Season: Fall - September, early October

Note: This is similar to Lesson 1, but takes place outside in the garden. Children can plant both in the garden and in cups.

Preparation time: 20 minutes

Garden Activity time: 45 minutes

Reflection/discussion time: 15 minutes

Materials

- Plain paper cups (one per child)
- Potting soil (also called soil-less mix) and a large container to hold it
- Watering cans filled with water
- Speckled pea seeds *
- Copy of song (Planting Pea Sprouts) - see page 56
- Child size trowels
- Pencils to punch holes on the bottom of cups
- Crayons or pencil crayons (to write child’s name and for adding decoration)
- Garden pegs or sticks
- String
- Scissors
- Popsicle sticks (used as markers for the planting rows)

Kindergarten Curriculum Expectations
Personal & Social Development
1.2 demonstrate the ability to take turns in activities and discussions.
Emotional Development
1.3 express their thoughts and share experiences
Language Development
1.2 listen and respond to others for a variety of purposes and in a variety of contexts
Science & Technology
1.1 Ask questions about and describe some natural occurrences, using their own observations and representations
2.4 communicate results and findings from individual and group investigations
3.4 participate in environmentally friendly activities in the classroom and the schoolyard
4.5 communicate and record results and findings after constructing things either individually or in groups
Health & Physical Activity
4.1 begin to demonstrate control of small muscles in activities at a variety of learning centers and when using a variety of materials or equipment

Preparation

The lesson will have two stations set up in the garden area. One station will be for planting the pea seeds in cups. Materials include; potting soil, trowels, watering cans and seeds. The other station will be planting pea seeds in the garden. Using sticks and string create rows in the garden bed (depending on class size). For example, for a group of 15 children have 5 rows working with 5 children at a time. Please see diagram below. Materials needed for the garden planting are pea seeds and water.

Introduction

Begin lesson by teaching children the Planting Pea Sprouts song. Ask students to think of actions that correspond with each verse (for example, wiggle fingers in a downward motion to represent the sprinkling of water). Introduce the planting activities by giving the students a general description about what they will be planting in both the garden and in their own individual cup. Hand out one cup per child and have them write their name on it. If there is sufficient time you can ask the students to decorate their cup using the crayons. After have children poke a hole into the bottom of their cup using a pencil, some children may need help with this process. This allows water to drain from the cup when you water the plant.



GARDEN TIP: Speckled peas are sold for sprouting and are tastiest as sprouts, cut when they reach a height of 10 cm. They will regrow up to three times, and make a great fast fall crop in the garden.

The best Canadian supplier we know is Mumm’s, www.sprouting.com. Pea seed for sprouting can be purchased in bulk. Once you’ve integrated this lesson with your students, you’ll be happy to have a large bag of seed.

Activity: In the Garden

Begin by dividing the class into two groups (one group will be doing planting in cups the other group will be planting in the garden). Once the first activity is complete have the two groups switch.

Cup Planting Group

Ask three children at a time to fill up their cup with potting soil using the trowels, filling loosely to the top of the cup. Prior to passing out the seeds explain to the students that once they receive their seeds they can place them in their cup and lightly press them into the soil. You may want to demonstrate this to the children using a pre-made cup.



Pass a small container with the seeds around asking each child to take a small handful and place the seeds in the soil (allow the children to observe the seeds and feel their texture). You could also come around with a bowl of seeds and pour a few into each child's hand. Once they have pressed the seeds into the soil have each child water their seeds. With the watering allow a small amount of water to settle into the soil before adding more. The soil and seeds will settle, leaving space at the top for watering later.

Garden Planting Group

Pair the children and have the pairs opposite each other the short way across the garden bed. Give each pair a string loosely attached to two row markers. The name of the pea variety and the planting date are written on the row marker with Sharpie pen. Attach the string ends firmly to the row markers so that the string is taut across the bed (children may need help with this). When the string is in place, have children make a furrow with their hands or tools. Unlike the indoor planting in cups, the seeds need to be buried a bit to prevent birds from eating them. They can be planted closely along the row.

In the Classroom (follow-up activities)

Designate an area in the classroom where students can leave their seed cups. As a large group, have the children reflect upon their experiences in the garden. Other possibilities of discussion can include; the differences in planting pea seeds in the garden and in the cups, how they will care for their seeds and predictions of what the pea plant might look like. You may wish to allow for weekly/daily observations of the pea plants growth. For example, use a growth chart to record measurements of pea plants. Compare the garden plant to the indoor plants.



Kinder-GARDEN!

Planting Pea Sprouts Song (To the tune of Peanut Butter and Jelly)

*Planting, Planting pea sprouts
Together!
Planting, Planting pea sprouts
Together!*

*First you take your cup
And you poke it, you poke it
Then you take the cup
And you fill it, you fill it.*

*Planting, Planting pea sprouts ... Together!
Planting, Planting pea sprouts ... Together!*

*Then you take the seeds
And you spread 'em, you spread 'em
Then you take the seeds
And you press 'em, you press 'em*

*Planting, Planting pea sprouts ... Together!
Planting, Planting pea sprouts ... Together!*

*Then you take your can
And you fill it, you fill it
Then you take the water
And you sprinkle, you sprinkle*

*Planting, Planting pea sprouts ... Together!
Planting, Planting pea sprouts ... Together!*

Teacher Feedback:
Working Sessions

Two half-day workshops, one in spring and one in fall, captured teachers' feedback and developed ideas for improvement.

The eight teachers in the pilot project met on June 19 to refine the lesson plans. Two taught in French and were able to share French-language supporting resources, songs and videos. All had some supplementary support from an Early Childhood Educator.

At the end of the spring season, in a half-day Professional Development workshop, each teacher was paired with another teacher in the pilot project who they did not know beforehand. Together, each pair (which was changed up a couple of times) reviewed each lesson plan and discussed

how it went for them, what they had changed, and what they would suggest be done differently in future. The result of this feedback is incorporated in the lesson plans in this guide.

All teachers agreed that the pilot project was exciting for them and for their students, and even if the lessons needed improvement, they were happy to work on this as a group, knowing the others were “out there” and that they would have a chance to get together for the debriefing session. All teachers reported that the lessons were excellent in terms of sparking inquiry among students. Two teachers agreed that the project gave their students a leadership role in the school, which normally only older children would have. They found the activities inclusive for the most part, reaching most children.

DK: *Ten years ago I was like, I don't want to do this, I don't want to get my hands dirty. But now I am like, we put tomatoes in the ground, we harvested tomatoes, we're going to make tomato sauce and then we are going to make pizza. It ties in with The Little Red Hen Makes Pizza. It ties in with TDSB Character Traits. There's literacy, there's numeracy, there's oracy, there's so many things associated with it. There's a wealth for us, but I think at the grade levels it's not as easy.*



Spring workshop

Teachers, in pairs, rated the lesson plans on three indicators: Curriculum, Student Engagement and Accessibility. A 5-point scale was used. The following results were obtained:

Eight teachers in groups of 2 rated all 7 lesson plans they had implemented at that time, resulting in 26 ratings. As a whole, the lesson plans were rated 3.99 on a scale of 1 (poor) to five (excellent). In each category, curriculum for the lesson plans as a whole was rated 3.87. Student engagement was rated 4.15. Accessibility was rated 3.96. The top-scoring lesson plans were Wiggly Worms at 4.67 overall, followed by R is for Radish at 4.38 and Snack Growing in a Cup and Quiet Garden at 4.33. As the gardens filled up with plants and

space became more dear, the engagement factor dropped, although student engagement was still highest-rated out of the three categories (4.15).

Fall workshop

On Nov. 20, the group of teachers as well as myself, Sonya Willson and Catherine Vant Erve got together for our second half-day workshop to discuss the content and implementation of the lesson plans. The following is edited from our conversation, which first focused on which plants did well and what people did with the harvest, and continued as a wide-ranging discussion on garden and program design.

DK: In the classroom, I connected our garden experience with some of my favourite stories, including Click Clack Moo,

DK...*the program has so much content, which is awesome, that it needs to be split up over the week, and rarely fits into the 30 minutes. Which is fine with me!*

Cows that Type by Doreen Cronan. The cows type messages to Farmer Brown, they say it's cold in the barn, you have to give us blankets or no more milk. Chickens agree; they will withhold eggs. The duck plays the intermediary. The story operates on different levels, socialism vs. capitalism, the middle person, and so on. So, inspired by the story, we wrote a letter to the Vice Principal saying we want soccer balls and shovels to play with outdoors. He wrote back, he had a soccer ball in his office but he didn't give us any shovels, so we wrote back, that we would keep our parsley and not give it to Michelle in the lunchroom if he did not give us shovels. But of course we gave in and gave the parsley to Michelle anyway. The point is, the kids learned that food has value. We didn't want to hold the parsley hostage.



Using the outdoor learning space at FH Miller

Kinder-GARDEN!

EC: Our garden has too much access, it is close to the playground and close to the laneway. We have the problem of the community, moving things around, animals, dogs. We're trying to figure out what to do.

SH: Sunflower was not in the planting design or lesson plans, but is certainly a good plant to include, especially for gardens that are not tended over summer. The sunflower is hardy and pretty reliable. However, you have to harvest it before the squirrels do.

***EC:** We had the most amazing sunflower, it was probably 3 metres tall. It's hung in our class. The flower starts to sink with the weight of the seed.*

MG: We had lots of parsley. We made tabouli with it, the kids loved it, and of course they helped to make it. I had parents to help.

I had the most trouble with the radishes. I think you should just seed them like the spinach lesson, regular spacing. We did not get an R.

SH: Really, the shape of the letter R was very hard to achieve. I had thought that we would treat the little sprouts as microgreens and eat them, leaving only a few, but if they were allowed to grow

at all you had a whole garden of radishes that had no space. That was not the intention! But you did see very fast growth, which might have been fun, and we'll include the lesson plan with cautionary notes in case someone else wants to try.

MG: The children and I took the habit of going throughout September to the garden. I think they are really starting to get it. They have built a relationship with the garden, and it will be nice to see them in the spring in the second cycle, it will become very meaningful because you had a group that had the first part but did not see the results.

We loved the project, it worked really really well. Today we did the lessons you suggested with the balloons, soil and seeds. That was a rainy day backup plan. I had a parent volunteer and we did that.

(Sonya explains: Clear balloon, 1/2 c soil, 1/4 c water, and seed. You have to use a funnel to get everything in there. You blow it up and hang it. The peas will sprout, and you can see the condensation, how it works.)

Queen Victoria



Sunflower - you only need one!

General discussion about putting the beds to bed - covering with a mulch layer was suggested. Straw is ideal mulch. Some hardware stores carry straw bales. One bale with cover quite a large area, at 4-6 cm depth. Leaves are also fine, and readily available. If you can, have them chopped by caretaking first. Use compost or composted manure on top of leaves (to keep them from blowing away in the fall winds).

General discussion about worm bins

There were some successes and some failures. This is common, most people lose their first bin. You need to get a feel for the ecosystem, and try again.

General discussion on the food choices

Teachers felt that lettuce should be included in the spring planting, as this is a common vegetable and would support the lunch

programs. My concern was that it is difficult to germinate, and is a delicate plant to handle as transplants. If you purchase seedlings, be sure to pick an overcast day to transplant.

Discussion on the issue of parent volunteers

While teachers are usually happy to have extra hands and eyes especially in the garden, it was sometimes difficult to organize and planning around their schedule made it difficult to find a balance. DK felt that programs were easier to run in spring with parent volunteers on his own schedule, compared with the GTGK students coming only on Friday.

The discussion turned to the ratios and role of the ECE in the classrooms. Teachers agreed that it would be ideal to have students going to the garden in smaller groups, even if the activities take longer.

Accomplishing these groupings, small groups and buddies (eg reading buddies) depends on each teacher's circumstances, and the garden spaces. This led to a comparative discussion about the various gardens. Nathan brought up the issue of proximity to play areas, and how this might support the developmental differences between the young students.

NG: For me, the program worked better when I had parents. I was lucky, I had my student teacher and other volunteers. But even with four adults it's hard, especially this time of year with high-needs and infantilized kids.

The program lends itself to be more successful if their play area is close to the garden, so that kids can access it more on their own time, just go in and taste something that is growing without it being so structured. Then the teacher can concentrate on engaging the kids who want to be



engaged. If you're really embracing the play-based model, you're not always forcing the kids to come and do an activity. You're looking at what their interest is and then interjecting numeracy and literacy into that.

KA: Yes, but we have to give ourselves a break. If you provoke the children in some way, if they don't respond, it's developmental. Maybe if more teachers were using the lessons, we would catch those children later. I think it is good to start in Kindergarten because this is the way of the future, with climate change, we need to be rethinking how we want to use our urban spaces. There will also be many opportunities for these children in their secondary and post-secondary educational careers if they have this knowledge.

MG: I think it has to become part of lived experience, like language, like part of your vocabulary, and then you're going to use it. Making it part of your

MG: *I have the feeling that many teachers see it as an add-on, and they don't have time for it. What I would like them to see is that this is a way to teach your curriculum, it's all there. This was my whole fall science lesson.*



living habits, it will come naturally to you because it's part of your environment and you're starting to create this habit by saying, you can grow your own food. It's no big deal. This is what we're stimulating, that's what we're motivating, this is a natural part of your being, this can become part of what you can do. A lot of the kids have absolutely no experience with it. A few have parents who garden but the vast majority have no idea.

It is difficult at our school now past kindergarten to get the parents and teachers out into the garden with the kids. I don't understand how they don't see the value. There's so much you can do, in math, in science... we used to have more community engagement, people who live on the street even.

At that time we would have a parent volunteer with the plants meet the children out at the garden.

DK: It needs to be school-wide, with common language and leadership.

MG: Teachers need motivating in-service Professional Development so they can see how they can actively use it and integrate their curriculum. They are doing a fantastic job in terms of ecoliteracy, studying books and thinking about conserving, but in terms of actually getting your hands dirty and talking about your ecological footprint, looking at the impact and touching the soil...

NG: We have a small group of teachers working on an unused terrace. The hope is that others will start seeing the value, by upping the communication. We need ways to prove the success with some sort of project, like a farmers' market to show the end result, what are we doing with the produce. What can be developed?

SH: Alorani (Hahn, at Rose Ave. PS) mentioned that she felt that using the Reading Buddies as part of the program design, younger and older children, might help encourage more gardening.

General discussion about summer, and the different situations at each school

This led to a reprise of the harvest that each teacher got, and what they did with it.

EC: We added in some plants that we bought at the farmers' market, including celery root and stevia. A parent watered as well as the new custodian. We harvested a lot of potatoes, tomatoes and some carrots. It was pretty good for the amount of space.



DK: We made two carrot cakes with the carrots we pulled out. Sweet, crunchy, relatively innocuous – most children will eat them.

NG: Without Sonya and Catherine I probably wouldn't be as involved. They're like, we're coming this week, when can you meet – I'm like, I guess I should do this! Good motivation.

EC: The district visit went very well. They thought we had Scientists in Schools, they loved it. We had five adults in different centres. Sonya and Catherine helped design the beet station, using it as a dye.

We had general discussion about ways to teach outdoors; we talked about singing songs, and how for

Manuela it was part of the ritual of going to the garden. Kim mentioned using the white board and sketching ideas instead. Kim and Nathan agree on the Reading Buddy model as a key strategy moving forward, especially in spring. Kim also feels that within the Model Schools framework that Outdoor Education will become

more key. Manuela agrees that something with the older grades would be good. Elizabeth agreed with bringing the books outside, some children could be reading, some doing activities in the garden, and then switch.

Sonya described her observations of how the various teachers managed with outdoor learning. She noticed that preparation indoors for the activities was key, and that when the children got outside, there needs to be a place to sit and to focus on the teacher.

The group agreed to continue to communicate ways to build on the learning we've experienced together.

Key learnings

While the Early Childhood Educators from each classroom were not included in the PD session, it was later clear that this would have been advantageous, as they had direct role in implementing the lesson plans and had strong anecdotal contributions to make. For example, by chance when I was present, an ECE mentioned how excited the children were for the gardening program in general, and how they had had to make a new "centre" in the room that was named Seeds, because of the interest level.

NG: *If people are designing spaces they should think about it being adjacent to a play area. David and I aren't really lucky in that when we're up there (on the balcony garden) it's not designed as a play area at all, although we have benefits, no-one's messing with our garden, and we had irrigation over the summer. But getting the kids to engage in it is more difficult if they don't have time to invest in it at their own pace. It seemed we lost the value of discovery, them deciding that they want to dig because they're interested in what's happening below the surface, instead we are saying, "you've got 15 minutes okay everybody plant a spinach seed, go, go, go!" It lost its authenticity.*

What became clear was that our hopes for volunteer support to be drawn from the parent body was unrealistic and in fact sometimes presented difficulties for the teachers. Teachers were constrained by a number of school-related factors in terms of when they could bring their students outside, as well as the delivery of supplies for each lesson, so working around the schedules of adult volunteers was an added complexity.

One key parent volunteer per class was ideal. If that key volunteer had a high comfort level with gardening, the result was more often positive. If the volunteers needed too much direction, some teachers felt it was difficult to integrate them.

Afterword

SH: As I put this guide together, it's now the 2014 planting season. I've been checking in with teachers to see how things are going this spring, and received these encouraging responses:

NG: I have to say that even without the support, I find that I am much more engaged in gardening than I have the previous year. After getting my hands dirty last year for the first time, I'm more confident to just give it a go and tackle gardening at a pace that works for the class. It's going great!

KA: The pilot project gave me the reason to become more engaged and to stay focussed. This year it is my program...since April...and it will be my program starting in the fall. Thank you for the opportunity.

DK: I didn't know what I was doing before, and with last year under my belt, I'm raring to go this year.

Yes, I'm planting a little late.

EC: We have our radishes coming out as well as carrots, potatoes, garlic (new batch), peas, and tomatoes. Our garden is green and thriving!

We are very excited!



Queen Victoria beds built by VP Eric Szonyi on weekend

Today in the garden we...
Ask me about...

Today in the garden we...
Ask me about...



PLANTS WE LOVE TO GROW

■ ■ ■ ■ ■ with kids ■ ■ ■ ■ ■

Veggies:

Kale: some varieties return from seed, early greens April-May, good for fall planting in September. Flavour sweetens with a frost.

Spinach: sow bloomsdale spinach in fall for April-May-June harvest.

Lettuce: sow in late April for June harvest and again in late August-early September for fall harvest. Black-seeded simpson and saladbowl do well in drought/heat.

Radish: sow in late April for June harvest

Carrot: sow in late April for June harvest. French varieties (little finger, parisian market) may transplant so could be started in classroom

Peas: do not like transplanting. Sow in late April/early May for edible shoots in May-June, fruit in July. Sow again in mid-August if weather cools, for edible shoots in Sept./October and flowers/fruit in October/November. Flowers are edible. snap varieties are kid fave!

Beans: sow in June for fall harvest. Mulch heavily once plants are 6" tall. Pole beans often produce more but require trellising; bush beans are earlier.

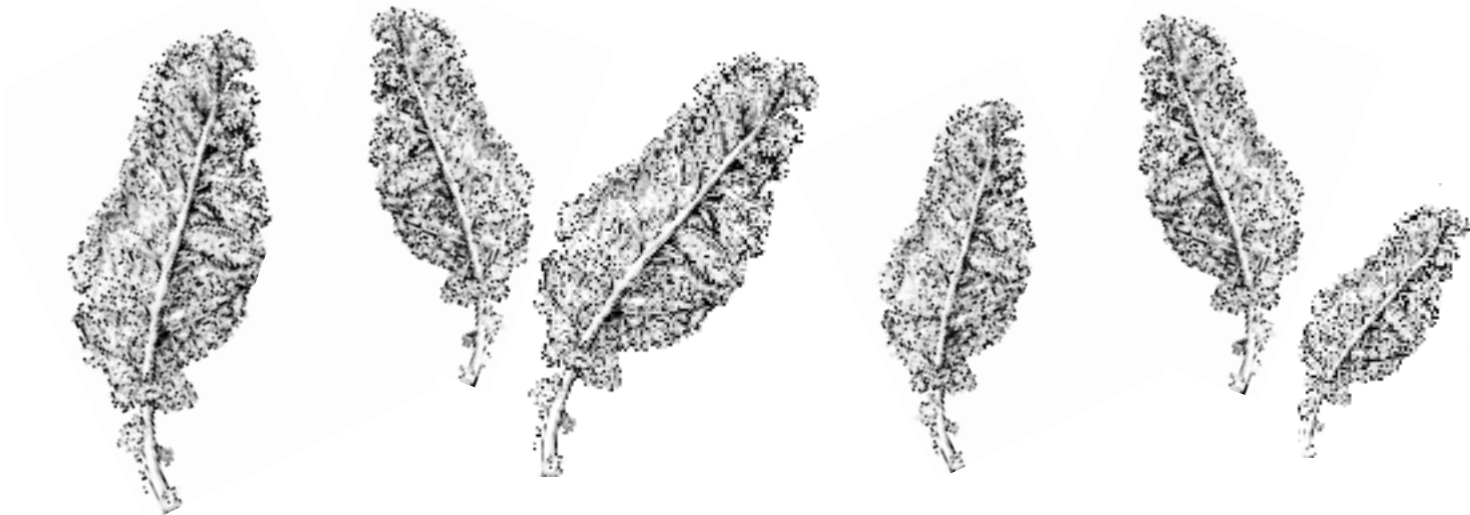
Potato: plant long-season variety in May for September harvest. Mulch heavily. Tubers are ready after tops die back.

Sweet Potato: sow slips in June for fall harvest. Mulch heavily, do not intercrop with other plants. Greens are edible in summer.

Tomato: plant in late May for August/September fruit, if summer care (watering and staking) is available. Cherry and current tomatoes are especially good for garden tastings—pop ‘em in your mouth like candy.

Mouse Melon: thumb-sized watermelon-like fruits that taste like cucumbers. Plant transplants in garden in early June for September harvest.

Ground Cherry: Best annual for kids that want fruit this season. Tiny orange fruit that grows in a lantern-like husk. Transplant in early June; harvest when the husk turns brown; protect from squirrels.





Teacher praise for KinderGARDEN!

“After getting my hands dirty last year for the first time, I’m more confident to just give it a go and tackle gardening.” - Nathan Goold, Queen Victoria P.S.

“What I would like them [other teachers] to see is that this is a way to teach your curriculum, it’s all there. This was my whole fall science lesson.”

- Manuela Godinho, Rawlinson C.S.

“I think it is good to start in Kindergarten because this is the way of the future, with climate change, we need to be rethinking how we want to use our urban spaces.”

- Kim Atwill-Bradbury, Winchester P.S.

