Trees & Plants

Big Science Little Hands II: Community Connections

Together, the Nanaimo Science and Sustainability Society (NS3) and Science World BC worked with Early Childhood Educators to complement the original *Big Science for Little Hands* activity book, with additional hands-on science resource materials. Our goal is to make science fun, hands-on, accessible to educators and to provide examples on how to link science concepts to the local community. We hope that these resource materials complement what you are already doing and offer additional ideas for making local connections.

The activities described in this book were designed with the help of nine Early Childhood Educators on Vancouver Island. Activities were tested at 54 pilot programs with 484 young children.

Support for program development was provided by the Vancouver Foundation, Woodgrove Chrysler, Nanaimo Insurance Brokers and VMAC.

Special thanks to Lorna McCrae, Barb Mjolsness, Jen Borzel, Sheila Grieve, Shawna Hassard, Odette Herr, Chris Peters, Melissa Burke, Corinne Dunn, Carly Foster, Becky Manson and the staff at Ladysmith Friends and Family, for allowing the NS3 to test 54 pilot programs at their early childhood education centres and gather student feedback! Their participation was invaluable!

For more ideas and activities check out scienceworld.ca/bslh

Introductions—Introduction activities are low-preparation, low-mess activities that can set the stage for the topic to be explored and work well for large groups.

Explorations—Explorations are an opportunity to discover, explore and get little hands dirty. Explorations involve open-ended activities that are appropriate for smaller groups and have questions associated with them for enhanced learning.

Make This—Children take their experiences home for further exploration, with this make-and-take activity.

Community Connections—Connect your explorations to the environment around you! Community Connections provide guides on how to connect these activities to the world around you.

All Together—This group activity makes a great wrap up to your topic of exploration.

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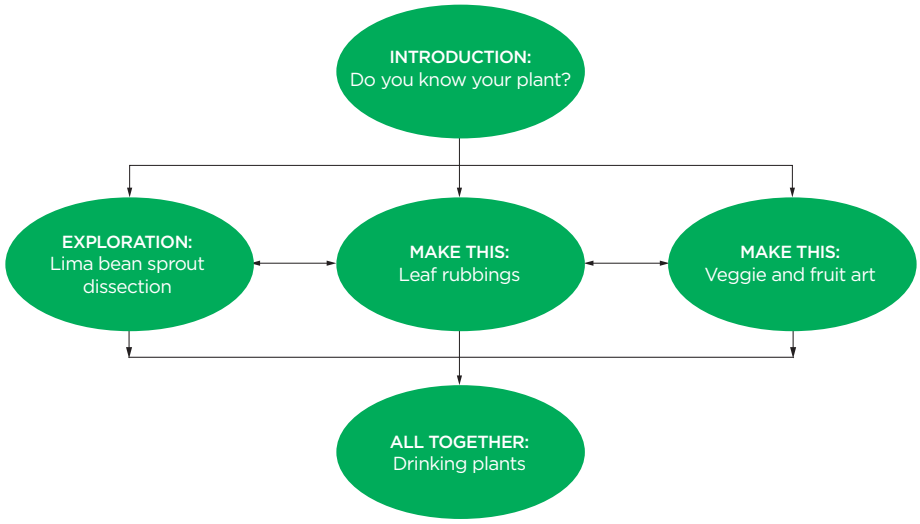
A path through Trees & Plants

Here's one possible way to put the activities in this resource together:

- Do an *Introduction* at circle time in a large group.
- Have the children try out the *Explorations* and *Make This* in smaller groups at stations around the room.
- Try *All Together* just before the end of the school day, or at the end of a few days on the topic.



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Big Science for Little Hands supports the learning goals outlined in the British Columbia Early Learning Framework, particularly those in the area of Exploration and Creativity.

To promote exploration and creativity, adults provide an environment where young children can do the following:

- Explore the world using their bodies and all their senses
- Build, create and design using different materials and techniques
- Actively explore, think and reason
- Identify and try possible solutions to problems in meaningful contexts and situations
- Be creative and expressive in various ways
- Develop a sense of wonder for natural environments
- Express a zest for living and learning

(BC Early Learning Framework: bced.gov.bc.ca/early_learning/)

Share with us!

Help us to improve Big Science for Little Hands by submitting feedback:
scienceworld.ca/bslh/feedback

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Do You Know Your Plant?

Explore and name the common parts of a plant.

What you need

- Small potted plants
- Magnifying glass
- Tarp

Hands on

1. Carefully take the plants out of their containers over a tarp.
2. Gently shake the plant to reveal its root system.
3. Using the diagram provided, identify the parts of your plant.
4. Use a magnifying glass to observe the roots, stem and leaves.

Questions to ask

1. Describe and name the different parts of the plants.
2. What does a plant need in order to grow? (e.g. water, sunlight, air, nutrients in soil)
3. Where does a plant get these things?

What's next?

- Replant your plants so that you can continue to observe and experiment with them. To get a better look at roots consider growing plants in a clear terrarium or jar.
- Build an outside garden plot to grow your plants. Make periodic observations of your plants. Record your observations by measuring growth, taking photos or by drawing what you see.

Community connection: Plant your own tree as part of a community event. Use the resources found at the Garry oak ecosystems recovery team (goert.ca) to find native species of trees to plant.

Vocabulary: photosynthesis, roots, nutrients, stem, leaves

Where to next?

INTRODUCTION
Do you know your plant?

EXPLORATION
Lima Bean
Sprout Dissection

MAKE THIS
Leaf Rubbings
Veggie and Fruit Art

ALL TOGETHER
Drinking Plants

MORE IDEAS

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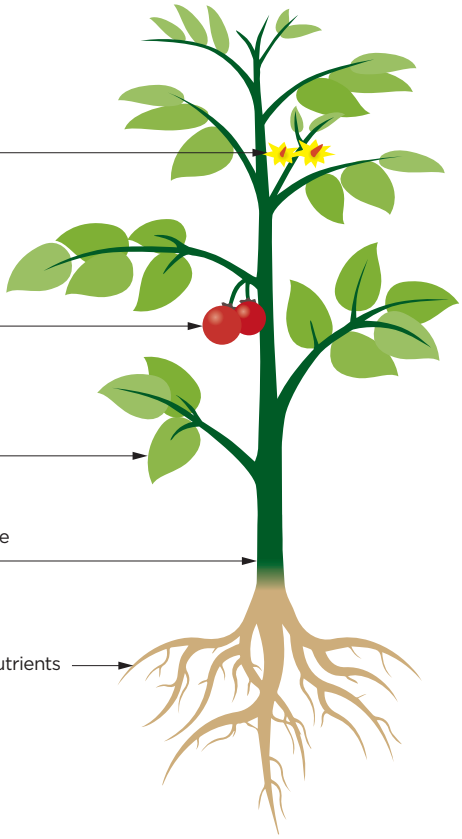
Trees & Plants
Introduction



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Lima Bean Sprout Dissection

Put your young observers to work! This activity is two experiments in one—watch a lima bean grow and then dissect it.

What you need

- Dried lima beans
- Paper towel
- Plastic sealable bag
- Toothpicks
- Water
- Markers
- Paper/journal/notebook
- Spray bottle for water

Hands on

1. Place a lima bean on a paper towel.
2. Wet the paper towel, place it inside a plastic bag and put on a window sill, so that the bean is visible
3. Each day, check the lima bean's progress. Draw pictures of how the bean changes from one day to the next.
4. After a week of observing the lima bean, remove it from the bag.
5. Use your fingers to split the bean in half.
6. Examine it with the help of a magnifying glass.
7. Use toothpicks to identify the different parts of the bean.
8. Make a drawing of your dissection.

Questions to ask

1. What do you think will happen to the lima bean when we add water and put it in sunlight?
2. What if we didn't add water, or put it in sunlight?
3. What do you think is inside the bean?
4. Where did the new green growth come from?

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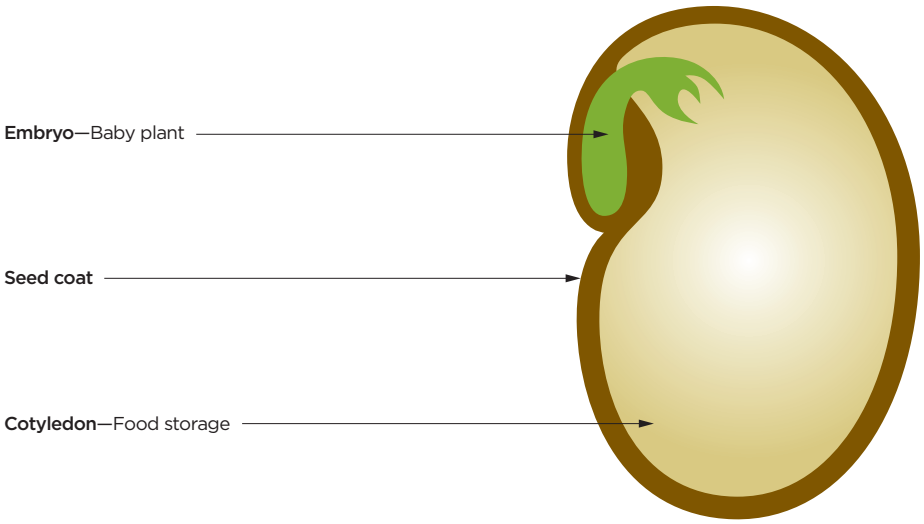
What's next?

- Try this experiment with a selection of different beans you find at the farmer's market or at the grocery store. Notice similarities and differences.
- Try Green Grass Grows from "Size Matters" in *Big Science for Little Hands* (scienceworld.ca/bslh).
- Explore other edible plants, by hosting an edible plant party with the class. Have the children bring in edible leaves to taste. Have the children describe what they liked about the taste.
- Make a tree pattern and cut some sandwiches shaped like trees.
- At home, roll your lettuce leaves with cheese in the middle to make a sandwich.
- Grow sweet peas.



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Leaf Rubbings

Use leaf rubbings to examine the structure of leaves. Make a large collection of leaves to do rubbings and other explorations.

What you need

- Collection of leaves—different sizes and shapes
- Crayons (or use Crayon Cookies!—see *Rockin' Rocks* for instructions on how to create these)
- Paper

Hands on

1. Place a leaf on a flat surface with the rough side facing up.
2. Put a piece of paper over top of the leaf.
3. Rub crayons on your paper on top of where the leaf is.

Questions to ask

1. What details from the leaf can you see in the rubbing? Do some leaves show more details than others? Why?
2. What happens when you use the other side of the leaf? Does the rubbing turn out differently?
3. Can you tell which side of the leaf faces the sun?
4. Do you know what trees the leaves came from?

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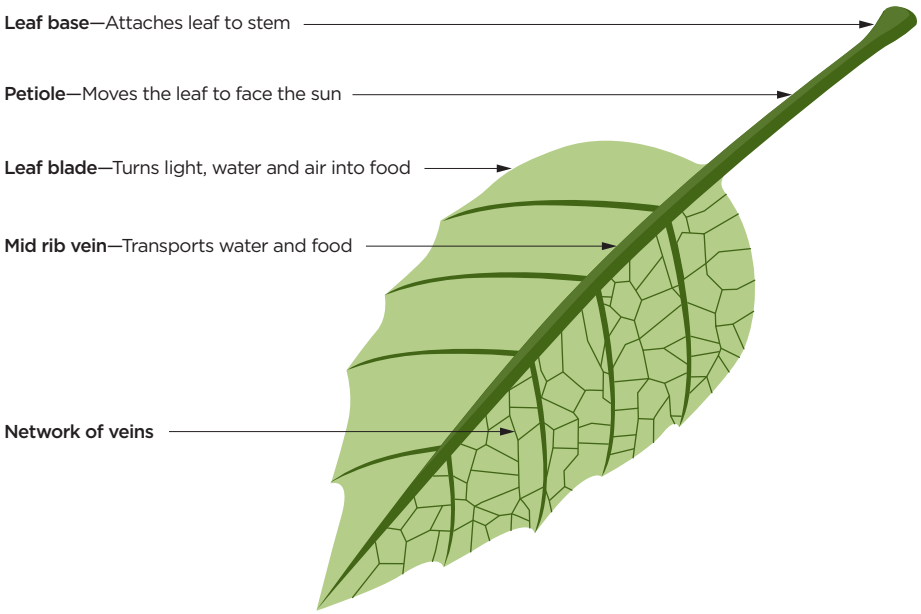
What's next?

- Use a big maple leaf to create a Canadian flag. Make a leaf rubbing in the centre for the maple leaf, then colour red bands on either side of the leaf.
- Discuss different ways to sort your leaves, like by colour or size and then sort your collection.
- Drop the leaves from up high and observe how they fall. Which leaves take the longest to fall?
- Place a small blanket under a tree, so that you can see the results of this experiment: predict what parts of the tree are most likely to fall and then shake it gently to find out.
- Paint with leaves and see what types of marks you can make.
- Long ago, people used pine needles, gathered together, to make brooms. Gather pine needles and try using them as a paint brush.

Community connections: Use the resources found at the Garry oak ecosystems recovery team (goert.ca) to find native species of trees to plant.

Vocabulary: leaf, surface, vein, ridge, colour, direction, imprint



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Veggie and Fruit Art

What is inside that plant you are eating? When you cut open vegetables and fruit you can see the yummy insides and patterns of growth. What defines a vegetable and a fruit? Although we usually call peppers and cucumbers vegetables, they are biologically the fruits of their plants. You can identify fruits because they have seeds inside them.

What you need

- Tempera paint
- Paint brushes
- Paper
- Collection of fruit (e.g. peppers, apples) and vegetables (e.g. ends of romaine lettuce, bunch of celery, carrots, Brussel sprouts, broccoli, potatoes)

Hint: Some fruits are called "seedless," but most still have small, soft seeds inside them.

Preparation

1. Set up paint trays with different colours and brushes.
2. Prepare stamps. Try cutting the fruit and vegetables in different directions. Cut the ends off lettuce and celery.

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Make This

Hands on

1. See if you can sort the fruit and vegetables before your adult cuts them open.
2. After they are cut, see if you were right by looking for the seeds in the fruits.
3. Dip vegetable and fruit stamps in paint or apply some paint with a brush. Apply small amounts of paint to see more detail.
4. Stamp it on your paper.
5. Create a picture or scene using many different stamps.

Questions to ask

1. What do you see inside the fruit or vegetable?
2. Which have seeds and which don't? The ones with seeds are fruits.
3. Describe the patterns you see on your paper. Which pattern belongs to which plant? How do you know?
4. What other vegetables or fruits would you like to try?
5. Do you grow any vegetables at home? How do they grow?

What's next?

- Use your fruit and vegetables to make observations about plant growth. Clean and rinse the peppers and carrots. Take the seeds from the peppers and place on a plate to dry out. In a few days, take the dry seeds and plant them in small pots. Cover with soil and watch the growth.
- Grow frilly greens from your cut carrot tops. Use fresh carrots with a little bit of green on the top. Cut off the top 2 inches from the crown. Place on a plate or in a container. Submerge half the carrot top in water and place in window sill. Add water occasionally to prevent them from drying out. Frilly carrot tops will take 1–2 weeks to grow.
- Use your celery in the next activity, Drinking Plants.
- Compare the sizes of different seeds.

Community connections: Where do the fruits and vegetables that you eat come from? Visit a farm, farmers' market or community garden near you. Ask them about what they grow and how they grow it. Observe the shape and texture of the vegetables and fruit in your garden and the grocery store.

Vocabulary: vegetable, stamp, print, fruit

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Drinking Plants

Use food colouring to observe how a plant uses water.

What you need

- Stalk of celery (one per child)
- Small vases or small plastic cups
- Water
- Food colouring
- Tape and permanent marker.

Hands on

1. Add water and food colouring to a clear plastic cup or vase.
2. Cut the end off the stalk of celery with a sharp knife (adults only).
3. Place your celery into the vase or cup.
4. Write your name on tape and stick it to the cup or vase.
5. Take a photo or draw the celery.
6. Let the celery sit in the coloured water for two days. Observe and record regularly.
7. Observe what parts of the celery are coloured.

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Trees & Plants
All Together

Questions to ask

1. Can plants drink water?
2. Where does the water go in a plant?
3. Why is the coloured water important in this experiment?
4. How has the celery changed after two days?
5. Why did the celery change colour?

What's next?

- Try the same experiment with a white carnation or a Sui Choy (Napa cabbage) leaf, instead of the celery.
- Try cutting the stem in half and put either end in different coloured water.
- To observe how trees use water, attach a small , dry baggie around a branch (over some leaves) and observe the amount of water that is in the bag daily.
- Directly observe the veins on a leaf by placing drops of food colouring on the back of the leaf and watch the colour travel along the veins.
- Collect pinecones and place them on the window sill. Watch each day to see how they open and close.

Community connections: Go to the florist or your local park. Notice the leaves that are on the plants. How are they alike or different?

Vocabulary: leaf, breathe, veins, absorb

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More Ideas

Teacher Resources

- *A Tree is a Plant* by Clyde T. Bulkla
- *Caillou Plants a Tree* by Sarah M. Johanson and Eric Sevigny
- *Curious George Plants a Tree* by H. A. Rey
- *How a Seed Grows* by Helene Jordan
- *Seed to Plant: National Geographic Readers* by Kristin Baird Rattini
- *The Apple Pie Tree* by Zoe Hall
- *Plant a Tree for Me! (Sesame Street)* by Naomi Kleinberg
- *I Can Read about Trees and Plants* by Elizabeth Warren
- *Plant a Tree and Watch it Grow* by Sue Ann Matinkhah
- *When the Leaf Blew In* by Steve Metzger
- *If We Could See the Air* by David Suzuki

Literature for Children

- *Caillou Plants a Tree* by Sarah M. Johanson and Eric Sevigny
- *Curious George Plants a Tree* by H. A. Rey
- *Plant a Tree for Me! (Sesame Street)* by Naomi Kleinberg
- *The Carrot Seed* by Ruth Krauss

Online Resources

- Information about the life of a tree for children from Arbor Day Foundation (arborday.org/kids/carly/lifeofatree/).
- Learn about acorns and trees. Teachers guide available (urbanext.illinois.edu/trees1/index2.html).
- Explore trees and plants in your neighborhood with instructions and a video of children explaining the activity at *Peep and the Big Wide World* (peepandthebigwideworld.com/en/parents/activities/search/). Find under “Tree Detective.”

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All The Leaves Are Falling Down

Tune: *London Bridge is Falling Down*

All the leaves are falling down, falling down, falling down,
(Imitate leaves falling down)
All the leaves are falling down, it is fall.
Take the rake and rake them up, rake them up, rake them up,
(Imitate raking leaves)
Take the rake and rake them up, it is fall.
Make a pile and jump right in, jump right in, jump right in,
(Children jump forward)
Make a pile and jump right in, it is fall.

The Leaves on The Trees

Tune: *The Wheels On The Bus*

The leaves on the trees are yellow and brown,
Yellow and brown, yellow and brown.
The leaves on the trees are yellow and brown,
All through the town.

The leaves on the trees are falling down,
Falling down, falling down.
The leaves on the trees are falling down,
All through the town.

The leaves on the trees make a crunching sound,
Crunching sound, crunching sound.
The leaves on the trees make a crunching sound
All through the town.

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I'm a Little Fir Tree

Tune: *I'm a Little Tea Pot*

I'm a little fir tree,
Short and stout.
See my bushy branches,
All spread out.
Some trees drop their leaves,
Down to the ground.
But I have needles,
All year round.

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