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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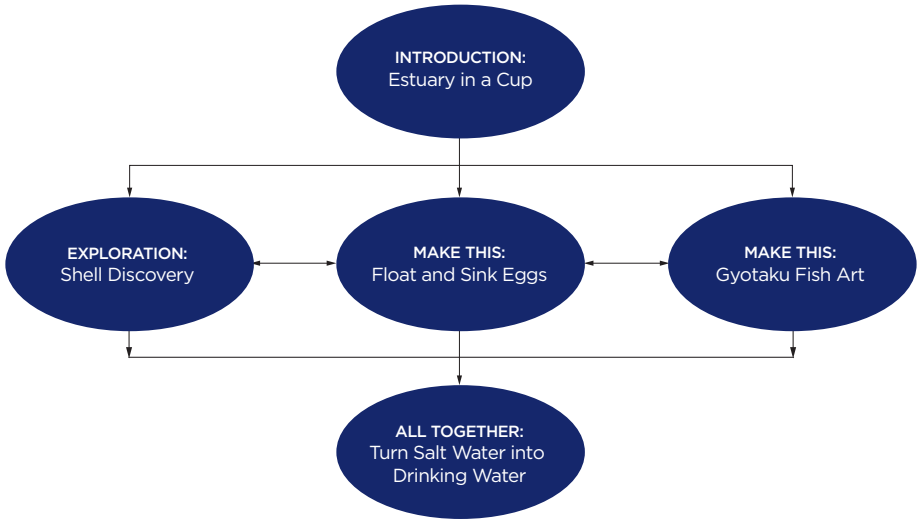
Salt & Fresh Water

A path through Salt and Fresh Water

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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Estuary in a Cup

Investigate the difference in density between salt and fresh water and simulate an estuary (the place where a river flows out into the ocean). Salt water is more dense (heavier) than fresh water, because of the salt it contains. Therefore, the river water stays on the surface until the ocean or tidal currents mix the two.

What you need

- Clear plastic cups
- Blue and red food colouring
- Salt
- Water
- Ice cube trays

Preparation

1. Add red food colouring to tap water and freeze in ice cube trays.
2. Prepare salt water by mixing 125ml of room-temperature water with 50ml of salt, in a clear plastic cup.
3. Add a drop of blue food colouring to the saltwater.

Hands on

1. Carefully place a red freshwater ice cube in the cup with the salt water.
2. Observe what happens as the ice cube melts.

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Salt & Fresh Water

Introduction

Questions to ask

1. What happens as the ice cube melts?
2. What do you see once the ice cube melts?
3. What do you think happens when fresh water from rivers meets the salty ocean?

What's next?

Try the same activity with an ice cube in fresh water. How are the results different?

Community connections: Visit an estuary in your community or a spot where a river meets the ocean. Watch the flowing water and see if you can spot any differences. Take a trip to the pet store and ask the personnel there about the animals that live in fresh or salt water.

Vocabulary: estuary, river, ocean, heavy, dense, layer, salt water, freshwater, mix, current, colour

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Shell Discovery

Test your ability to recognize shells by touch. For older children, use more shells to make the discovery game more difficult.

What you need

- Variety of shells—each shell should be unique in size, shape and texture.

Hands on

1. Either close your eyes or put your hands behind your back.
2. Have someone place a shell in your hands.
3. Feel all details of the shell's texture, without peeking!
4. Allow ample time for exploration, then return the shell to the pile with others.
5. Now, try and find your shell!

Hint: Use anywhere from 2–25 shells to increase the level of difficulty. To make it even more challenging, use several shells from the same species and have children discover the subtle differences in the small details.

Hint: If it's too difficult to not peek, put the shells in a sock and have children put their hands inside the sock, to feel the shells.

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Salt & Fresh Water
Exploration

Questions to ask

1. What does your shell feel like?
2. Is your shell smooth or rough? Does the inside feel different from the outside? What kind of ridges or bumps can you feel? Is the shell small or large? What do the edges feel like?
3. When you have found your shell, how do you know it is yours?

What's next?

- Make laminated photographs of each of your shells and have children try to identify their shells from the images.
- Using the different shells, perform a variety of art activities such as tracing, drawing and creating shell rubbings.
- Use these art pieces you have done to try to identify the different shells.
- Try a similar game but with rocks, as in the Do You Know Your Rock from "Super Sleuths" in the first edition of *Big Science for Little Hands* (scienceworld.ca/bslh).

Community connections: Explore your local community beaches. Try to find and identify different kinds of shells. Look at the difference between those in the water and near the water. Remember to not take shells from the beach, as they are part of the ecosystem. Instead, use your classroom collection to do the explorations.

Vocabulary: shell, ridge, hinge, beach, feel, touch, rough, smooth, shape, colour

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Float and Sink Eggs

Salt water has a higher density than fresh water. Therefore, objects that do not float in freshwater, may float in salt water.

What you need

- 2 clear jars or bowls
- Water
- Salt
- 2 eggs (raw or hard-boiled)
- Spoons
- Paper towels

Hint: Be sure to use fresh eggs. As eggs age, they develop an air bubble that causes them to float.

Preparation

1. Fill each bowl 2/3 full of water.
2. Mix salt into one of the bowls.

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Salt & Fresh Water

Exploration

Hands on

1. Add an egg to each bowl.
2. Observe what happens.

Questions to ask

1. In which bowl did the egg float?
2. Why didn't the egg float in the other bowl?

What's next?

- Try finding other objects that will float in one bowl and not the other.
- Substitute salt for something else, like sugar. Make a prediction as to what you think will happen and then test it out.

Vocabulary: sink, float, heavy, dense, compare

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Gyotaku Fish Art

Create art that showcases the textures and parts of a fish, using a technique that is similar to a traditional Japanese practice.

What you need

- Rubber fish printing stamps (you could also use frozen fish!)
- Washable paint (various colours)
- Paint brushes
- Construction paper or blank newsprint paper

Hint: We ordered rubber fish from store.schoolspecialty.com. Search for *gyotaku*.

Hands on

1. Paint the rubber fish stamps with a paintbrush. Use one colour or many colours!

Hint: Use a small amount of paint to see the details of the fish better.

2. Flip the stamp over and place on construction paper.
3. Roll the fish back and forth to ensure you get a print of the entire fish.
4. Remove stamp and check out your fish print.

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Hint: If working with a real fish, consider making the print by placing the paper over top of the painted fish to minimize handling. Thin, flexible paper will work best in this application.

Questions to ask

1. What parts of the fish do you notice on your print?
2. Do you know what kind of fish it is?

What's next?

- Try the Leaf Rubbings from the Trees & Plants resource.

Community connections: Explore the bodies of water in your area and find out what types of fish live in each. Locate a salmon spawning river and make a trip during the salmon run. Look at the different kinds of fish at a market.

Vocabulary: gyotaku, fish, paint, print, fish scales, stamp

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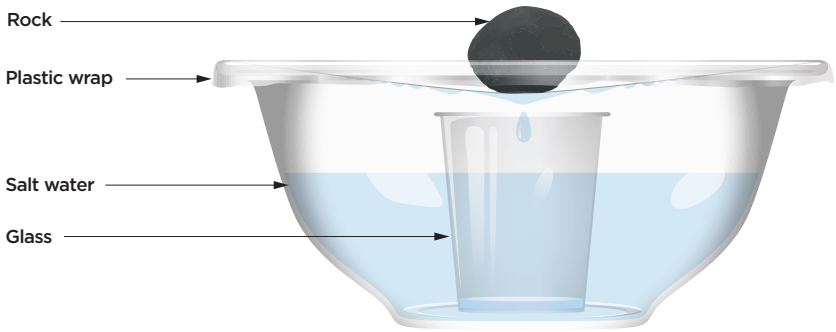

Turn Salt Water into Drinking Water

Many animals depend on fresh water to drink. Here is a simple way to make fresh water from salt water. Pure water evaporates from salt water, condenses back in to a liquid state on the plastic wrap, and is captured in a cup.

What you need

- 15ml of table salt
- 750ml of water
- Mixing bowl
- Coffee cup or small bowl
- Sturdy plastic wrap
- Small heavy object (e.g. rock)

Hands on

1. Add salt to the water in a mixing bowl.
2. Mix until the salt is fully dissolved.
3. Carefully place a smaller cup into the mixing bowl, making sure no salt water gets into it.
4. Cover the large bowl with sturdy plastic wrap and seal the edges tightly.
5. Put a small heavy object on the plastic wrap over the small cup. The object should be heavy enough to indent the wrap, but not so heavy as to break the wrap or cause it to touch the cup inside.
6. Place in the sun and wait.

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7. Observe after an hour. You should see water droplets forming on the underside of the plastic and flowing into the cup.
8. Observe after several hours. There should be a noticeable amount of water in the small cup.
9. Try tasting the water in the small cup.

Community connections: Look at the bodies of water in your community. Identify which are fresh or salt water.

Vocabulary: evaporation, condensation, droplet, vapour, state, gas, liquid, solid, heat

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More Ideas

Teacher Resources

- *Explore Water! 25 Great Projects, Activities, Experiments* by Anita Yasuda
- *From Sea to Salt* by Robin Nelson
- *Shells* by Cassie Mayer
- *Shells* by Graham Saunders
- *Spotter's Guides: Shells* by Usborne Children's Books
- *Seaweed Soup* by Stuart J. Murphy

Literature for Children

- *Water* by Frank Asch
- *Water* by Picture Window Books

Online Resources

- More water density activities from PBS kids (pbskids.org/zoom/activities/sci/waterdensity.html) and (pbskids.org/zoom/activities/sci/cauldronbubbles.html).
- Informative animated video about things that live in the ocean by Sheppard Software (sheppardsoftware.com/preschool/animals/ocean/animaloceanmovie.htm).

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Down by the Shore

Tune: *Down by the Bay*

In the sand and the sun
I like to dive and splash and run
and as the waves
roll out and in
I'll get warm in the sun
and have lots of fun
Down by the shore

Sea Shell (Rhyme)

Sea shell, sea shell,
Sing a song for me,
Sing about the ocean,
Tell me about the sea.
Sea shell, sea shell,
When I hold you near,
I can hear the ocean
Whispering in my ear.

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