Helping children

discover the world

through hands-on science

2018/2019 Annual Report
September 2019
What a wonderful year!

Our dedicated teachers and scientists collaborated to support and inspire 251 students with hands-on science. As a result, students in schools across the city explored, investigated and made discoveries about the world.

We also helped teachers “top up their science cupboards” with science equipment and supplies to use again and again.

Scientists documented the new ideas generated this year in detailed science lesson plans that will be added to our website archive for anyone to use.

Teachers told us that these were powerful learning experiences for their students, and for themselves.

Our generous Program Partners (listed on page 24) have made this possible. We thank them for their invaluable support.

In 2018/2019, the Scientist in Residence Program also achieved two very exciting milestones: including this year’s participants, we have now directly supported over 5,000 students and 200 teachers in the Vancouver School District.

“THIS PROGRAM WAS INCREDIBLE – FROM START TO FINISH!”

- Ms. Korchinski, 2018/2019 participating teacher
Together with teachers, we help children 
**discover the world**
through hands-on science because...
science can illuminate 
**a world of wonders**
and scientific thinking can help 
**every child succeed.**

“I CAN’T THINK OF ANYTHING MORE INSPIRING.”
- Parent of 2018/2019 participating student
  David Livingstone Elementary School

“CAN IT BE LIKE THIS EVERY TIME YOU COME?”
- Participating student (during this lesson)
2018/2019 at a glance...

experiences, equipment

ENERGY  biodiversity&resilience  changes of matter
habitats  PLANTS&PEOPLE  adaptations

Jeweler’s loupes  states of matter  11 field trips
sublimation  building electrical circuits
float sink  biodiversity  GALLIUM METAL
wings  feet  claws  feathers  UBC Chemistry Lab
KINETIC ENERGY  crabs
38 science lessons
comparing skulls  MELTING GLASS  musical instruments
CHEMISTRY of COOKIES  UV Light  Pepper’s Ghost Illusion
BUBBLES  wetlands  melting ice  ice cream
TUNING FORKS  birds, beavers & bleeding heart plants
Acadia Beach  germination experiments  shark teeth
Burnaby Lake  crystals  SLIME
Beaty Biodiversity Museum  Science World  dip nets
light table  whale baleen  MICROSCOPES
field guides  elephant’s toothpaste
UBC Botany Lab  flower dissections

& learning together

Teachers Ms. Nicole Rasotto and Ms. Maggie Durward
with Ingrid Sulston, Ph.D. Molecular Biology
Kindergarten, grade 1 & 2 students
Grandview zuuqin’uuh Elementary School

Teachers Ms. Nicole Grunfeld and Ms. Charlotte Berger-Bodelec
with Kate Gregory, Ph.D. Geology
Grade 4 & 5 students
Hastings Community Elementary School

Teachers Ms. Cara Laudon and Mr. Gordon Bell
with Shona Ellis, M.Sc. Botany, Professor of Teaching
Grade 2, 3 & 4 students
Edith Cavell Elementary School

Teachers Ms. Heidi Clark and Mr. Gordon Mah
with Lea Elliott, M.Sc. Ecology
Grade 3 & 4 students
Waverley Elementary School

Teachers Mr. John Cloutier and Ms. Sula Boxall
with Jonathan Kellogg, Ph.D. Oceanography
Kindergarten students
Carnarvon Community Elementary School

Teachers Ms. Jennifer Korchinski and Ms. Joanne Lau
with Ben Loosley, Ph.D. Chemistry
Grade 1 students
David Livingstone Elementary School
### Program Team

#### Management Team
Lisa Tautz  
Managing Director  
Scientist in Residence Program

Jody Langlois  
Associate Superintendent  
Vancouver School Board  
School District 39

#### Advisory Board
Paige Axelrood, Ph.D.  
Scientist, Program Founder  
Advisory Board Chair  
Scientist in Residence Program

Bruce Beairsto, Ph.D.  
Former Superintendent  
Richmond School District  
Adjunct Professor  
Simon Fraser University

Cathryn Wilson  
Executive Director  
British Columbia Achievement Foundation

#### Scientists
Lea Elliott, M.Sc.  
Author, Principal  
Naturehood Consulting

Shona Ellis, M.Sc.  
Professor of Teaching, Botany  
University of British Columbia

Kate Gregory, Ph.D.  
Geologist, Consultant

Jonathan Kellogg, Ph.D.  
Science Communications Coordinator, Hakai Institute

Ben Loosely, Ph.D.  
Occupational Hygiene Advisor  
University of British Columbia

Ingrid Sulston, Ph.D.  
Principal  
IngridScience.ca

#### Website & Lesson Plan Archive
Cintia Stela  
Stela Creative Services

### Program Design

#### Goals

**Engaged students, who...**

1. Develop positive attitudes about science and science learning
2. Gain science skills, knowledge and habits of mind
3. Feel inspired to continue learning science in the future

**Equipped teachers, with...**

1. A new repertoire of science activities and equipment
2. An increased knowledge of specific area(s) of science
3. An increased enthusiasm for science and hands-on science teaching

#### Framework

Each scientist works in **partnership** with **two teachers** at the same school. Expertise from the three professionals creates **synergy**. Together, they design and deliver a **suite of six theme-based science lessons** for students.

Planning begins at an orientation meeting in October and continues throughout the winter. The scientists and teachers co-deliver lessons over a 6-8 week period, January through May.

$1,000 flexible **funding** is provided to each partnership to offset the costs of science equipment and field trips.

Science lessons are **custom-made** to meet the needs of students. Learning focuses on **inquiry, exploration and discovering the world**. Science field trips are a highlight.

### Program Funds

All funds are held at the Vancouver School Board (VSB) School District No. 39, charity registration number: 107962359 RR0001.

**Teachers**: set learning goals; direct pedagogy; connect learning to curriculum; and ensure students’ needs are met. **Scientists**: offer content expertise; research and propose activities and experiments; help source, test and set-up equipment; co-plan and implement field trips; and share their passion for science.

For more information, please contact us:  
info@scientistinresidence.ca

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info@scientistinresidence.ca
Our scientists and teachers invested much care and many hours of planning and preparation to create the following science units for students. Here are some of the highlights:

1. “Animal Adaptations”
¿uuqinak’uuh Grandview Elementary

Ms. Durward and Ms. Rasotto’s students love animals. At the teachers’ request, scientist Dr. Ingrid Sulston helped develop a rotating station approach for this study of animal adaptations. The lessons were filled with specimens, hands-on activities and open-ended explorations. Each lesson had a theme. In this unit, kindergarten, grade 1 & 2 students:

- Tested how their eyes respond to different levels of light and learned about the diversity of animal eyes
- Compared sounds travelling through different materials (including their own jaws) and experimented with sound frequency perception
- Used tools to model bird beak adaptations; touched and examined animal skulls, teeth and jaws (specimens from Ingrid’s personal collection & an OceanWise AquaKit)
- Investigated insulation, buoyancy and waterproofing; applied the principles to fur and feathers
- Designed and flew paper “birds”; observed and sketched live fish; designed their own fish and birds using modeling clay and paper
- Tested the resistance in water of different foot shapes; wore gloves with different numbers of fingers to understand opposable thumbs
- And much more!

“INGRID WAS AN ABSOLUTE PLEASURE!”
- Ms. Durward

“IT WAS AN HONOUR TO WORK WITH THE STUDENTS AND TEACHERS AT THIS SCHOOL!”
- Dr. Ingrid Sulston
2. “Energy”
Hastings Elementary

Teachers Ms. Grunfeld and Ms. Berger-Bodelec asked to co-develop a unit on energy with scientist Dr. Kate Gregory. Each of the six lessons focused on a different type of energy and allowed students to explore and experiment with a selection of materials. In this unit, grade 4 & 5 students:

- Designed and built marble “roller coasters” to explore kinetic energy
- Answered the question: What happens when the heat energy from a mixture of cream, sugar and vanilla is transferred to a slurry of ice and salt? (Students reported that the result was cold and delicious.)
- Investigated sound energy by comparing their abilities to hear different frequencies with the adults in the room (the adults lost), and by building popsicle stick kazooos, hummers and straw oboes
- Designed and modified electric circuits to light a light bulb
- Recreated the Pepper’s Ghost Illusion and experimented with light reflection and transmission (Guests from CIBC Wood Gundy Richmond Office visited during this lesson)
- Used a variety of materials to explore the concept of energy transfer
- Visited New Brighton Beach rocky intertidal zone to observe animals adapted to live in the presence of wave energy

“I AM EXTREMELY PROUD OF THE UNIT WE CREATED TOGETHER.”  — Dr. Gregory

“I AM SO GRATEFUL FOR KATE’S WORK WITH MY CLASS THIS YEAR!”  — Ms. Berger-Bodelec
3. “Plants & People”  
Edith Cavell Elementary

Professor Shona Ellis partnered with Ms. Laudon and Mr. Bell (this group found their groove from the very start - they were heard singing “Let it Bee - a song about pollination” together at the orientation meeting). In this unit, grade 2, 3 & 4 students:

- Dissected a wide variety of flowers, learning about flower function and anatomy
- Dissected seeds to understand how plants develop
- Grew bean plants from seed to observe germination in action
- Designed experiments to investigate impacts of environment on radish seed germination
- Visited the Beaty Biodiversity Museum and examined a wide variety of specimens
- Visited Shona’s UBC Botany teaching lab and studied a huge variety of plants using microscopes (were also introduced to Shona’s biology graduate students)
- Showcased the science they learned during an evening celebration with their parents/guardians and Shona

“The opportunity to collaborate with Shona was invaluable!”

- Ms. Laudon

Below: Jeweler’s loupes are a simple and powerful tool for making scientific observations in so many areas of the curriculum. Cavell teachers invested in two class sets thanks to funding from the Scientist in Residence Program.
4. “Biodiversity & Resilience”
Waverley Elementary

The “big idea” for this unit (connecting the concepts of biodiversity and resilience) was an exciting challenge for Ecologist Lea Elliott and teachers Ms. Clark and Mr. Mah. In this unit, grade 3 & 4 students:

- Practiced wilderness observation skills at VanDusen Botanical Garden
- Researched connections between living and non-living things in wetland habitats using art, fiction, non-fiction and technology
- Observed specimens and investigated animal adaptations at UBC’s Beaty Biodiversity Museum
- Explored the relationship between biodiversity & resilience with ecosystem modeling games
- Identified and observed invertebrates living in water samples collected from (and returned to) a local pond
- Used a sensory walk, sound map and teaching train for experiential learning at Burnaby Lake Park

“I LEARNED THAT THERE IS SO MUCH IN NATURE TO LEARN ABOUT!”
- Waverley student

“Students had the opportunity to touch real specimens at the Beaty Biodiversity Museum.”

“Students discovered that pond water contains much more than first meets the eye!”

@VSB39 #Scientist in Residence is wonderful. It inspires students to extend their learning. Students are using allaboutbirds.org to research birds we’ll see on our upcoming field trip. @mrhead @vsblearns #STEM #ecology

Add another Tweet
5. “Habitats from Land to Sea”
Carnarvon Elementary

Teachers Mr. Cloutier and Ms. Sula were excited to move their kindergarten students’ learning outdoors as much as possible this year. Biologist Dr. Kellogg worked with the teachers to introduce the idea of habitats as homes. In this unit, students:

- Explored a Pacific Spirit Park to experience a forest habitat
- Explored Camosun Bog to discover unique plants
- Read books and played with puppets, puzzles and other materials in the Pacific Spirit Park Society’s EcoKIT
- Observed and dissected plants (used the plant pieces to create temporary art in the school yard)
- Observed and measured barnacles feeding in their classroom
- Designed animals and habitats using clay and art supplies
- Visited Acadia Beach to explore the rocky intertidal zone habitat

“What the teachers wanted to move their students’ learning outside during this unit - so 3 of our 6 lessons were field trips!”

- Dr. Kellogg
6. “Chemical & Physical Changes”
Livingstone Elementary

This was **Dr. Loosely**’s first year with the program. Not only did he use vacation time to work with students, he also made a personal donation to the school to help the teachers invest in more science equipment. **Ms. Korchinski, Ms. Lau** and “**Scientist Ben**” offered grade 1 students many experiences, including:

- Experimenting with ways to [**melt an ice cube**](#) as quickly as possible, recording and comparing their "time to melt"
- Observing **physical changes of water** using a laboratory-grade distillation apparatus
- Testing the effects of different recipes for **“slime”**
- Visiting a **UBC Chemistry teaching lab** to see chemistry in action (e.g., dry ice sublimation, “elephant’s toothpaste”)
- Making **“frozen bubbles”** and tasting liquid nitrogen ice cream
- Learning about the **chemistry of baking powder** and “observing” a chemical change (i.e., bake and eat cookies)
- Testing the effect of changing the **rate of crystallization** on the size of salt and sugar crystals
- Observing **gallium metal melting**, playing with **baking soda volcanoes**, discovering the chemistry of cut apples turning brown, separating dyes in **Kool-aid** in columns of silica gel, and more!

“**SCIENTIST BEN**” BECAME THE MOST TALKED ABOUT PERSON AT HOME AND SCHOOL!”
— Livingstone parent
Program Legacy

This year’s work will continue to support students’ hands-on science learning in the future.

Equipment and supplies

Thanks to funding provided by the program, teachers were able to purchase much-needed science equipment and supplies: maker space materials, plant ID cards, field guides, science books, Jeweler’s loupes, magnifiers, a light table, an aquarium, pond invertebrate study kit, waterproof paper, jars, foam tubes, marbles, plexi-glass for light experiments, electrical circuit supplies, light bulbs, rubber bands and fasteners, chemistry sets, tweezers, Petri dishes, and much more! Teachers will use these materials year after year.

Lesson Plans

Scientists spent many, many hours consulting with teachers, researching and then writing science lesson plans. The write-ups will be posted on our website www.scientistinresidence.ca for all teachers to use - free of charge.

Google Analytics

WEB SITE GENERIC DATA:

- 3,247 sessions (visits)
  (2,364 users – absolute unique visitors)
- 10,118 page views
- 3.12 pages viewed per session
- 72% new sessions
- Visits came from 61 countries/territories (68.4% and 18.08% of these visits were from Canada and the USA, respectively)

SCIENCE LESSON PLANS PAGES:

- 7,829 page views
- 4,776 unique page views
- 6,287 lesson plans downloaded

We are thrilled that so many lesson plans were downloaded from our website this year!

TOP ACQUISITION TRAFFIC:

- 45% scientistinresidence.ca
- 39% google (organic search)
- 6% other (referrals)

Feedback from Teachers

“Incredible - from start to finish.”
- Ms. Korchinski, Livingstone Elementary

“Every teacher should have the opportunity to collaborate with a scientist who is enthusiastic not only about their field of study but also about sharing their enthusiasm and knowledge with young people!”
- Mr. Bell, Cavell Elementary

“Not only do I have a great toolbox of activities that I can use with my future students, I also have a greater appreciation for the wilderness”
- Mr. Mah, Waverley Elementary

“This program is amazing!”
- Ms. Grunfeld, Hastings Elementary

“I gained all that I had hoped for. I also enjoyed the whole process and have made a connection with a scientist that will last for years to come.”
- Ms. Durward, Grandview Elementary

Metrics Summary

This year, our primary beneficiaries were 251 students in 6 Vancouver schools: Cavell, Carnarvon, Grandview ḥuuquinak’uuh, Hastings, Livingstone and Waverley.

12 teachers and 6 scientists collaborated, co-developed and co-delivering a total of 38 science lessons including 11 field trips. The 12 teachers also benefitted, gaining science ideas, resources and experiences to use again and again.

A total of 18 new science lesson plan write-ups will be added to our online archive, bringing the total to 430 available lessons.

Since the program began 15 years ago, 5,021 students and 210 teachers have collaborated with our scientists, co-creating 117 science units in 67 VSB schools.
Program Partners

We are extremely grateful for the generous support received from the following organizations and individuals since 2004.

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<th>Champion Partners: Greater than $100,000</th>
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<td>Vancouver Board of Education</td>
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<td>Sustaining Partners: $50,000 to $100,000</td>
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<td>Supporting Partners: $20,000 to less than $50,000</td>
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<td>Inspiring Partners: $5,000 to less than $20,000</td>
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<td>Derek Spratt through the BC Technology Foundation</td>
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<td>West Vancouver School District (participated in the program during 2007/2008)</td>
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<td>Discovery Partners: In-kind support and donations up to $5,000</td>
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<td>Jean Marcus</td>
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<td>Lisa Tautz and Ken Kwasnicki</td>
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2018/2019 Partners

Thank you to the following, whose generous financial and/or *in-kind* contributions helped us inspire students and support teachers this year:

CIBC Wood Gundy, Richmond Office
Vancouver Board of Education
Paige Axelrood & Ned Glick
Professor Shona Ellis
Professor Sara Harris
Lisa Tautz & Ken Kwasnicki

*Vancouver Board of Education
*Beaty Biodiversity Museum
*Fasken Martineau DuMoulin LLP

“The Scientist in Residence program was an enriching experience for our students - one that they will never forget!

It is with deep gratitude that we’d like to thank everyone who made this possible.”

- Teachers Ms. Heidi Clark & Mr. Gordon Mah, Waverley Elementary School.
A Community of Support

Acknowledgements

The 2018/2019 Scientist in Residence Program was successful because of so many generous people and organizations. Our sincere gratitude to:

- Jody Langlois, Helen Yee, Maisie Louie, Donna Wong, Ellen Lin-Tong, Amanda Tseng, Cecilia Hui and Jeffrey Tong at the Vancouver School Board
- Tom Hasker, Neil Pope, Sean Mason, Susan Christie and the entire team at CIBC Wood Gundy Richmond Office, who inspire us with their dedication to supporting inner city schools
- Sara Harris for her invaluable support
- Peggy and Don Griesdale for their generous contribution this year
- Scientists-in-residence Ben Loosley and Kate Gregory who made additional financial contributions to their teachers this year
- Shona Ellis - who contributes so much year-after-year
- Jacqueline Chambers and her team who welcome our students to explore the fascinating collections both at the Beaty Biodiversity Museum and in their award-winning Beaty Boxes
- Grant Foster and Gisele Hanssens at Fasken Martineau DuMoulin LLP for their generous support
- Bruce Beairsto - for important expertise, insight and encouragement
- Our dedicated teachers and scientists - thank you, all!

Finally, this year we’d like to thank Catherine Wilson for sharing her invaluable experience, wisdom and creativity as an Advisory Board member for over a decade. Catherine is stepping down from our Board and she will be missed!

Dr. Paige Axelrood

Scientist, Program Founder, Advisory Board Chair, Program Partner

In 2001, Paige Axelrood volunteered to help with science in her daughter’s kindergarten class. The experience inspired her to pilot a “Scientist in Residence Program” at the school, collaborating with teachers and engaging students with hands-on science for three years.

Excited by the success of the pilot, Paige submitted a proposal to expand the program within the Vancouver School District. This led to an excellent collaboration with Val Overgaard, VSB Associate Superintendent. With support from the VSB, a grant from Vancouver Foundation, and with three scientists (including Paige), the Scientist in Residence Program was launched in 2004.

After 15 years as the program’s dedicated owner and faithful steward, and with great joy, Paige assigned her rights to the program to current Managing Director and grateful mentee Lisa Tautz in April 2019.

Paige continues to support the program as Founder, Advisory Board Chair, mentor and friend. She and her husband, Dr. Ned Glick, are also generous Supporting Partners of the program.

Since 2004, over 5,000 students have explored, questioned, and made discoveries about their world with the Scientist in Residence Program. Paige – on behalf of everyone who has been (and will continue to be) touched by your hard work and dedication – thank you!
We gratefully acknowledge that the Scientist in Residence Program operates in the traditional and unceded territories of the Squamish, Tsleil-Waututh and Musqueam Nations.

Please send feedback, questions & ideas to: info@scientistinresidence.ca

Visit our website: www.scientistinresidence.ca

Report prepared by Lisa Tautz (Managing Director), with help from Dr. Ingrid Sulston (Scientist in Residence), for the Vancouver School Board VSB School District 39. September 2019.

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