SCIENTIST IN RESIDENCE *Program*™

Vancouver School District

Together with teachers, we offer exceptional **hands-on science** to children in Vancouver elementary schools.

2021/2022 Annual Report

2022: Back in Action!

After two full years of being paused for the COVID-19 pandemic, the Scientist in Residence Program finally restarted in spring 2022! We are very excited and proud to share summaries of the science units delivered at three of our five schools: **Lord Strathcona**, **¿uuqinak'uuh Grandview** and **Henry Hudson**.

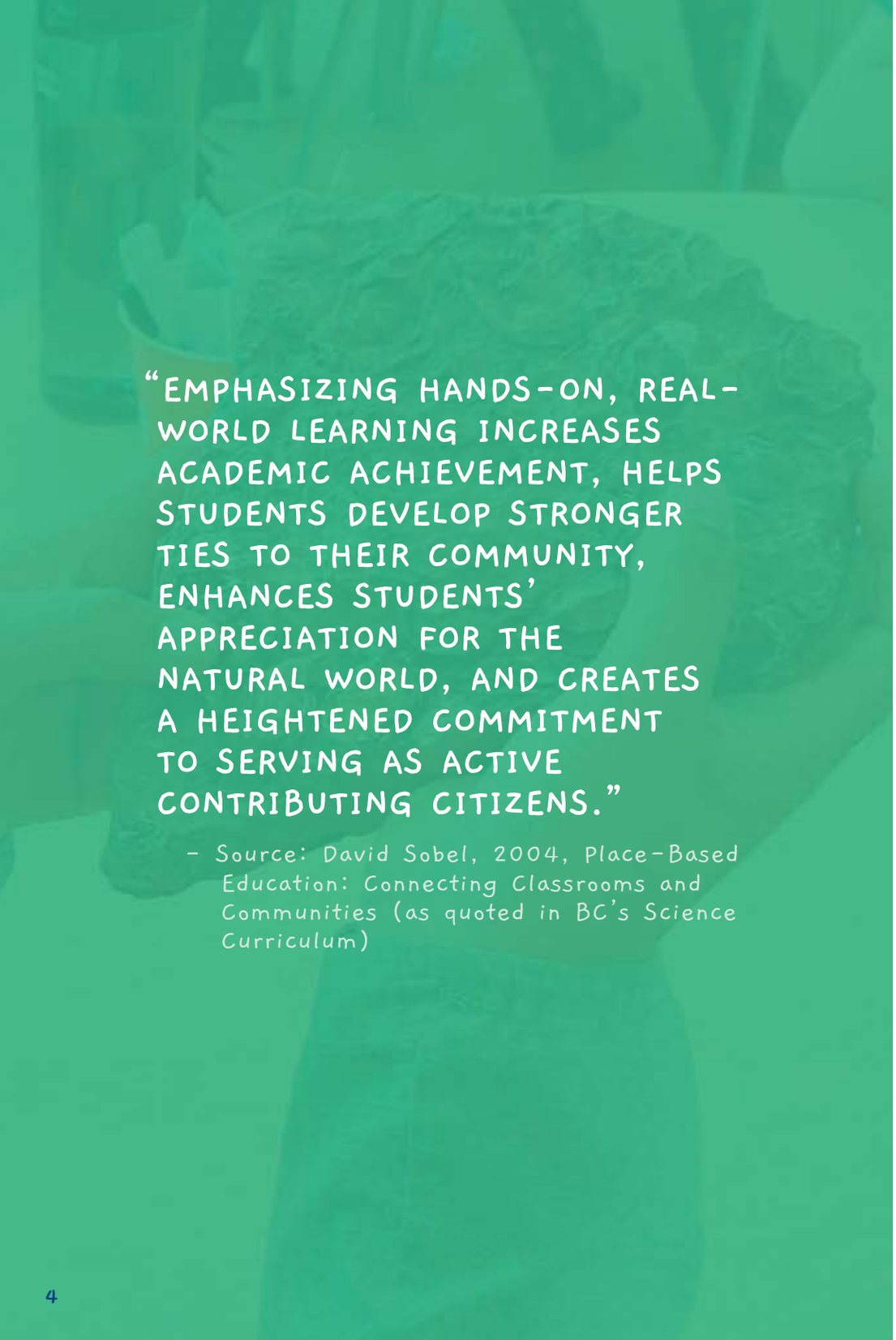
Due to the pandemic, teachers and scientists were given the option to defer their lessons at anytime throughout 2021/2022. The partnerships at two schools – **David Lloyd George** and **Southalnds** – decided to postpone to 2023. (Please see pages 20-21 for a summary of program delivery during the very unusual years of 2020-2023.)

Our 2022 participating students once again made real-world investigations alongside their scientists and teachers, including:

- behaviour of an adult chicken named Oatmeal
- forest and bog ecosystems in Pacific Spirit Park
- evolution at the Beaty Biodiversity Museum
- crystals and fossils (pictured left)
- and so much more!

As always, we also supported hands-on science by providing flexible funding for science equipment. This year, teachers chose to invest in many things, including magnifiers, buckets, nets, gardening supplies, examination trays, pipettes, rock samples, supplies for wind turbines and electric circuits, and so much more. The teachers were very excited and incredibly grateful.

To our wonderful Program Partners: All of the exclamations of "*Wow*!" and "*Whoa*!" and "Look at *THIS*!" and "Thank you!" that sounded out during lessons this year were made possible by *your* generous support. *We can't thank you enough!*



"EMPHASIZING HANDS-ON, REAL-WORLD LEARNING INCREASES ACADEMIC ACHIEVEMENT, HELPS STUDENTS DEVELOP STRONGER TIES TO THEIR COMMUNITY, ENHANCES STUDENTS' APPRECIATION FOR THE NATURAL WORLD, AND CREATES A HEIGHTENED COMMITMENT TO SERVING AS ACTIVE CONTRIBUTING CITIZENS."

– Source: David Sobel, 2004, Place-Based Education: Connecting Classrooms and Communities (as quoted in BC's Science Curriculum)

The Scientist in Residence Program is...

hands-on

teacher-and-scientist-designed

see-it-with-their-own-eyes

experiment-lab-fieldwork-style

equipment-infused

curriculum-driven

real-world

place-based

custom-made

collaboration-filled

ah-ha moment-fueled

science

2021/2022 Partnerships

DELIVERED IN 2022

1. Lord Strathcona Elementary
Teachers Judah Kong & Reeghan Carroll
planned in 2020 with Kate Gregory, Ph.D. Geology
delivered in 2022 by Ingrid Sulston, Ph.D. Molecular Biology
Grade 4, 5 & 6 students
"Natural Resources"

2. Henry Hudson Elementary
Teachers Nancy Morehose & Para Demosten
planned in 2020 with Lea Elliott, M.Sc. Ecology
delivered in 2022 by Ingrid Sulston, Ph.D. Molecular Biology
Grade 2 & 3 students
"Plant and Animal Life Cycles"

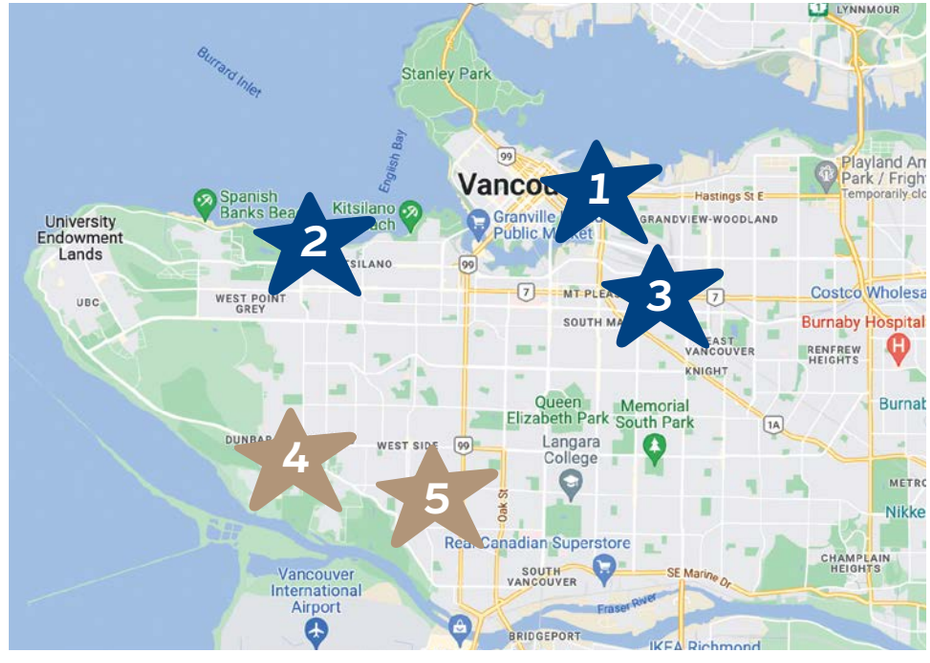
3. ¿uuqinak'uuh Grandview Elementary
Teachers Fiona LaPorte and Shirley Huang
with Ingrid Sulston, Ph.D. Molecular Biology
Grade 3, 4 & 5 students
"Earth Materials & Carbon Cycles"

DEFERRED

4. David Lloyd George Elementary
Teachers Susan Heywood & Nathan Moes
with Jonathan Kellogg, Ph.D. Oceanography
Grade 6 & 7 students
"Evolution"

5. Southlands Elementary
Teachers Sanjini Mudaliar & Michelle Kim
with Shona Ellis, M.Sc., UBC Professor of Teaching, Botany
Grade 1 students
"Plants in our Neighbourhood"

Map of 2021/2022 Participating Schools



2022 Program Deliverables

In 2021/2022, the primary beneficiaries of the Scientist in Residence Program were **113 students** in three VSB elementary schools: **Lord Strathcona**, **Henry Hudson** and **¿uuqinak'uuh Grandview**.

Three units were delivered to students in 2022, totaling **20 lessons, each delivered twice** (plus two "bonus" lessons at David Lloyd George.) Two additional units were *planned* and are scheduled for delivery in 2022/2023.

Ten participating teachers – two at each of our five schools – also benefited from the program. They collaborated with their scientist and each other, gaining new ideas and expertise about science teaching and learning.

Unit Summaries

The following section contains summaries of the science units planned by teachers and scientists during the 2021/2022 school year. The teachers and scientists spent many, many hours collaborating and planning together. We thank them all for their creativity, hard work and dedication.

Note: *You may notice that some of the students' faces are intentionally blurred in this section. This is to honour the requests of some parents and teachers who are reluctant to publish images of children's faces, especially when the publication will appear online. We believe the photos are still a helpful way to report on the lessons. Enjoy!*

1. Southlands "Plants & Animals Around Us"

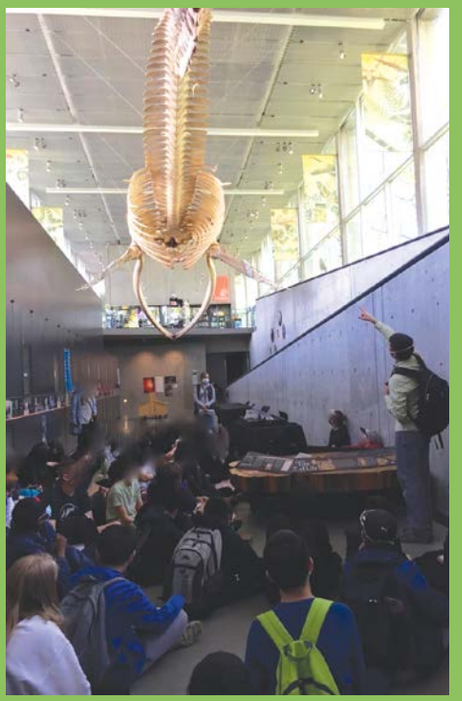
Delivery planned for 2022/2023

Teachers Sanjini Mudaliar and Michelle Kim planned a unit with Professor Shona Ellis exploring local plants with grade one students at Southlands Elementary this year. Everyone was very excited! However, all planning was put on hold from December-March during the OMICRON wave of the COVID-19 pandemic. In the end, they decided to defer delivery to 2022/2023. The teachers and Shona are looking forward to working together next year.

2. David Lloyd George "Evolution"

Delivery planned for 2022/2023

Dr. Jonathan Kellogg and teachers Susan Heywood and Nathan Moes have been planning their evolution unit together on-and-off since October 2019! They were *so close* to delivering the lessons to grade six and seven students in May and June, however, they decided it was best to defer the full program to 2023. Jonathan still wanted the 2022 students to have a few science experiences with him, so he set up one lesson in their classrooms and also organized a field trip to the Beaty Biodiversity Museum. Jonathan, Sue and Nathan are excited to *finally* implement the full unit with students in 2023.



3. ¿uuqinak'uuh Grandview
"Earth Materials & Carbon Cycles"

Delivered spring 2022

Teachers Shirley Huang and Fiona LaPorte collaborated with Scientist Ingrid Sulston to create a unit exploring Earth Sciences with a focus on carbon. They worked inside their classrooms and in the school's onsite Longhouse.

Lessons in this unit:

1. **Carbon in our classroom**: Students set-up an indoor worm composter to observe during the unit and conducted an experiment to test if bean plants will grow in sealed habitats without added CO_2.

2. **Carbon & water**: Students tested the pH of water from the ocean, a local pond, and a fish tank and investigated how CO_2 is connected to ocean acidification.

3. **Carbon in shells and rocks**: Students made "shells"; tested oyster shells for CO_2 using the vinegar bubble test; examined fossils of marine shells; and investigated the components of soil.

4. **Rocks & crystals**: Students used Epsom salts to observe crystal formation and layered sand and sugar to model sedimentary rock formation, uplift and folding.

5. **Weathering**: Students explored weathering using a rock tumbler; modeled erosion using sand and water; explored the school grounds for signs of weathering.

6. **Carbon cycles**: Students checked the worm composter, bean seed experiment, and rocks in the tumbler; discussed fossil fuels and built wind turbines as alternative energy source; tied all of the lessons together into one diagram.









4. Lord Strathcona "Natural Resources"

Delivered spring 2022

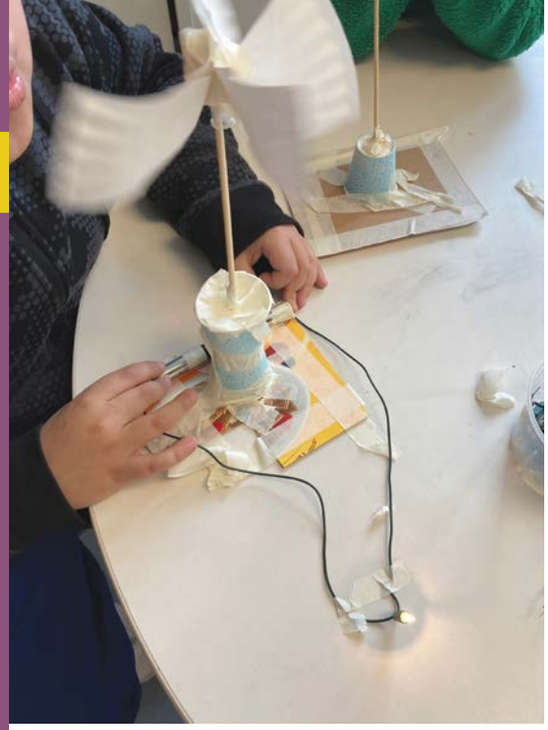
The teachers' goals for this unit were to explore the Earth's resources during both indoor lab-style lessons and outside in natural spaces across the city.

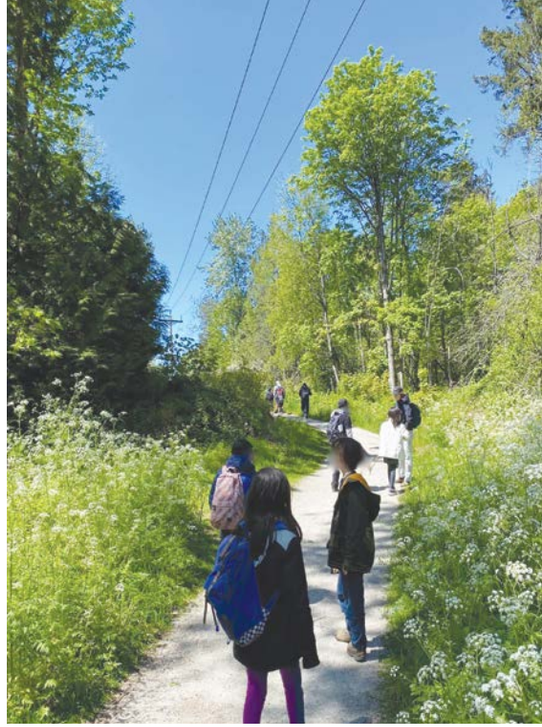
Lessons in this unit:

1. **Water & energy**: Students built working water wheels during a get-to-know you lesson.
2. **Rocks:** Students made Borax crystal ornaments to hang in the classroom and crystal paintings with Epsom salt solution; found copper in bornite rocks and discussed the use of copper in electronics, solar panels and electric cars; each choose a quartz crystal to take home.
3. **Wind & electricity**: Students used cardboard, skewers and tape to design a device that turns in the wind; explored the key parts of a wind turbine; built simple electric circuits; played with a model wind turbine (a mini fan connected to a hobby motor, which lights an LED bulb).
4. **Crab Park Field Trip**: Students explored the shoreline to find beach rocks and play with sand; discovered animals that live in the intertidal zone; watched an optional clam and mussel dissection.
5. **Water filters**: Students designed, built and tested their own water filters using their choice of filter materials.
6. **Pacific Spirit Park Field Trip**: Students observed the unique plant life and properties of Camosun Bog and explored the forest trails.
7. **Second Beach Field Trip**: Students explored rocky and sandy intertidal shoreline habitats.

"I HAVE NOTHING BUT AMAZING THINGS TO SAY ABOUT THIS PROGRAM."

– Reeghan Carrol





"INGRID HAS BEEN INCREDIBLE!"

– Judah Kong

5. Henry Hudson
"Life Cycles of Plants & Animals"

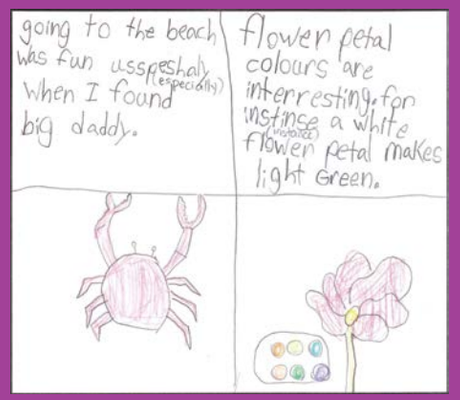
Teachers Para Demonsten and Nancy Morehouse and scientist Lea Elliott decided to use nearby shoreline, forest and pond habitats to study life cycles with grade 2 and 3 students in two classrooms. This unit was originally planned with scientist Lea Elliott for April and May 2020 but was paused for the pandemic. Lea had to step down from the Scientist in Residence Program in 2021 so Ingrid Sulston was thrilled to step up and implement the unit with Para and Nancy (with just a few changes, including a visit from her pet chicken).

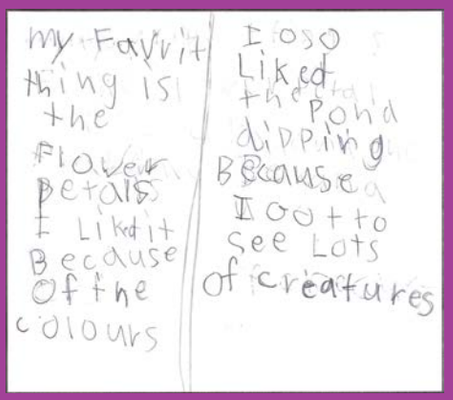
1. **What is a cocoon?** Students observed mason bee cocoons and learned the difference between oviparous and metamorphic life cycles. They placed the cocoons in the nesting box and planted flowering plants for the bees in their school garden.
2. **Where do adult wood bugs like to live?** Students adopted wood bugs and built habitats to keep them safely in their classroom for one month of observation.
3. **What is an egg? What is a chicken?** Students dissected eggs to understand how baby birds are nourished inside an egg. Ingrid brought her pet chicken name Oatmeal into the classroom for a visit.

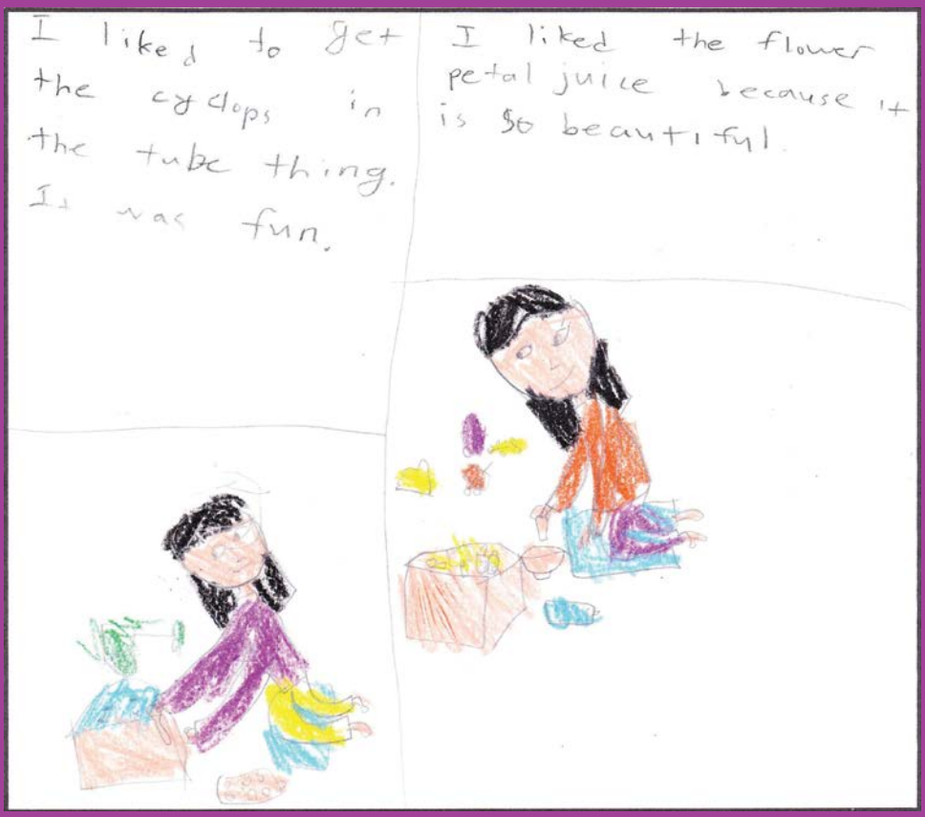
4. **What lives at the beach?** Students visited the rocky intertidal zone at Kitsilano Beach and discovered shore crabs and many other adult invertebrates.
5. **What lives in a pond?** Students explored a pond ecosystem in Vanier Park, first observing birds, plants and trees in the area. They then used nets, trays and magnifiers to catch and observe aquatic invertebrates in various stages of life cycles.
6. **What happened in our wood bug habitats?** Students observed how their wood bug habitats had changed over the month (many grew new plants and mushrooms) and released their wood bugs back into the schoolyard.
7. **Stanley Park Field Trip**: Students observed flowering plants in Stanley Park. They used acid and base chemistry to explore how flower petal colours can change under different conditions and learned how insect and plant life cycles are connected.

Student Reflections

We asked participating grade 2 students to reflect on their experiences during the program and describe their “favourite” memories with pictures and/or words. Here are some examples…







Program Design

Goals

ENGAGED STUDENTS, WHO...

- Develop positive attitudes about science, about learning science, and about themselves as science learners.
- Build science skills, gain an understanding of science concepts, and develop scientific habits of mind.
- Feel encouraged, supported and compelled to continue learning science in the future.

EQUIPPED TEACHERS, WITH...

- A new repertoire of hands-on, real-world science activities and equipment.
- An increased knowledge of a specific area(s) of science.
- An increased enthusiasm for science and science teaching.

Since the program began, **5,232 students** and **224 teachers** have participated. Teachers and scientists have collaborated to deliver **122 science units** in **68 elementary schools** across Vancouver School District.

Framework

Each scientist in residence 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 science lessons for students designed to support a "big idea" in the science curriculum.

Lessons focus on hands-on, real-world experiences. Teachers: set learning goals, direct pedagogy, connect learning to curriculum, and ensure students' learning needs are met. Scientists: offer content expertise, research and propose activities and experiments, help source and set-up equipment, co-plan and implement field trips, and share their passion for science.

Program planning begins at the beginning of the school year and continues throughout the winter. The scientists and teachers offer lessons to students over a 6-8 week period of their choice.

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

Continued...

Science lessons are documented in lesson plans written by the scientist and posted on our website for anyone to use, free of charge: www.scientistinresidence.ca.

Scientists receive an honorarium to offset expenses including travel and police information checks, and to acknowledge their yearlong commitment to the program.

Management Team

Lisa Tautz
Managing Director
Scientist in Residence Program

Jody Langlois
Associate Superintendent
Vancouver School District

Advisory Board

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

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

The Scientist in Residence Program was made possible this year by a community of support:

Jody Langlois, Helen Yee, Shamirah Khan, Jeff Tong, Pammie Yeung and many others at the Vancouver School District

Tom Hasker, Neil Pope, Sean Mason and the whole team at CIBC Wood Gundy Richmond Office

Our generous Program Partners, past and present

Jacqueline Chambers and the Beaty Biodiversity Museum

Cintia Stela
Raymond Nakamura
Catherine Po

The Principals and Administrative Assistants at participating schools

Paige Axelrood
Bruce Beairsto

and, of course, our creative, dedicated, and skilled teachers and scientists.

Overview of Program Delivery 2020-2023

This section is included for the record as a summary of program delivery during the very unusual years of 2020-2023. The graphic to the left lists our partnerships by funding year, along with their delivery status as of October 2022.

As a reminder, the Scientist in Residence Program was paused mid-delivery in March 2020 due to the pandemic, and effectively remained paused until April 2022. We received the greenlight to restart in October 2021 with the caveat that teachers were given the option to postpone to 2022/2023 if the pandemic caused any disruption to the year.

We excitedly began planning, however, we paused again when the OMICRON wave closed schools to visitors from December to April 2022 – our prime planning window during the year. When schools were set to open to visitors again in April 2022, we gave our teachers and scientists the choice to go ahead in 2022 or defer to 2023. Two partnerships decided to defer. This means we will still be working with two of our six 2019/2020 schools in 2023.

Due to the backlog of delivery and the need to recruit and train new scientists, we have not requested additional funds from our Program Partners.

Our 2020 scientists and teachers are *really* looking forward to offering the lessons they've been planning for so long. We also have new 2022/2023 partnerships in development and will finalize soon. Please don't hesitate to contact me if you have any questions.

Lisa Tautz
Managing Director
October, 2022

	Delivery Status	Partnership
Supported by funds received in 2019/2020	Done! (Spring 2020)	**1) Admiral Seymour Elementary** Teachers Lisa Joe and Natasha Burditt Grade 5, 6 & 7 students "Chemistry Around Us"
	Done! (Spring 2020)	**2) Dr. George M. Weir Elementary** Kamaljit Sahota & Kristine Faunt Grade 2 & 3 students "Chemical & Physical Changes"
	Done! (Spring 2022)	**3) Lord Strathcona Elementary** Teachers Judah Kong & Reeghan Carroll Grade 4 & 5 students "Natural Resources"
	Done! (Spring 2022)	**4) Henry Hudson Elementary** Teachers Nancy Morehose & Para Demosten Grade 2 & 3 students "Life Cycles"
	Underway...	**5) Southlands Elementary** Teachers: Sanjini Mudaliar & Michelle Kim Grade 1/2 students "Plants all around us"
	Underway...	**6) David Lloyd George Elementary** Teachers Susan Heywood & Nathan Moes Grade 6 & 7 students "Evolution"
2020/2021 Funding	Done! (Spring 2022)	**1) ¿uuqinak'uuh Grandview Elementary #1** Teachers Fiona LaPorte and Shirley Huang Grade 3, 4 & 5 students "Earth Materials & Carbon Cycles"
	New!	**2) ¿uuqinak'uuh Grandview Elementary #2** Teachers Margo Hrennikoff & Keith Jones Kindergarten, Grade 1 & 2 students
	New!	**3) Lord Strathcona Elementary** Teachers Luey McQuaid and Rachel Vanstone Grade 4 Students
	TBD	Additional school(s) TBD

Program Partners

The following individuals, organizations and businesses have been our Program Partners at some point along the road since the program began in 2004. We thank them for their generous support.

Champion Partners:
Greater than $100,000

CIBC Wood Gundy, Richmond Office, Miracle Day
Vancouver Board of Education
RBC Foundation

Sustaining Partners:
$50,000 to $100,000

Rix Family Foundation
Vancouver Foundation

Supporting Partners:
$20,000 to less than $50,000

Paige Axelrood and Ned Glick
Shona Ellis
TELUS Community Foundation

Inspiring Partners:
$5,000 to less than $20,000

Port of Vancouver
Sara Harris
Peggy and Donald Griesdale
Derek Spratt
BC Transmission Corporation
Centre for Drug Research and Development (CDRC)
CIBC Wood Gundy, Bentall Office, Caring for Kids Fund
Derek Spratt through the BC Technology Foundation
Fisher Foundation
Honda Canada Foundation
Mobidia Technology, Inc.
NSERC-Pacific
Pfizer Canada
West Vancouver School District
(participated in the program during 2007/2008)

Discovery Partners:
In-kind support and/or donations up to $5,000

Mario Kasapi
Jean Marcus
Lisa Tautz and Ken Kwasnicki
Kathryn Gregory Wodzicki
Xenon Pharmaceuticals Inc
Beaty Biodiversity Museum
UBC Botanical Garden
Ocean Wise Vancouver Aquarium
Fasken Martineau DuMoulin LLP
LifeSciences British Columbia
CANTEST
Skunkworks Creative Group Inc.
UBC Biodiversity Research Centre

Finally, on behalf of all of our participants, we would like to sincerely thank the Program Partners who generously supported the Scientist in Residence Program through financial and/or *in-kind* contributions from 2019-2022. We are all incredibly grateful.

CIBC Wood Gundy, Richmond Office
Champion Partner

Vancouver Board of Education
Champion Partner, Founding Partner in Science

Professor Shona Ellis
Supporting Partner

Paige Axelrood PhD & Ned Glick PhD
Supporting Partners

Peggy Griesdale BEd, MSc & Dr. Don Griesdale MD
Inspiring Partners

Professor Sara Harris
Inspiring Partner

IN-KIND CONTRIBUTIONS

Vancouver Board of Education
Champion Partner, Founding Partner in Science

Beaty Biodiversity Museum
Discovery Partner

With respect, we acknowledge that the Scientist in Residence Program operates on the unceded and ancestral territory of the **sḵwx̱wú7mesh (Squamish)**, **sel̓íl̓witulh (Tsleil-Waututh)**, and **xʷməθkʷəy̓əm (Musqueam)** Nations.

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

Visit our website:
www.scientistinresidence.ca

SCIENTIST IN RESIDENCE *Program*™

Vancouver School District

Report prepared for the Vancouver School District by Lisa Tautz, Managing Director. October 2022.