



Open minds

schoolprogram

Annual Activity Report
Sept 2016-June 2017



Donna Kipta, TELUS
Spark

*Science
School*





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TELUS Spark – Neurons Firing Daily



Cities need charging stations to power up learning. Charging stations include museums, libraries, afterschool programs and science centres. Science centres, more specifically than other types of institutions charge up STEAM learning – they are Science Technology Engineering Art and Math (STEAM) incubators. We strive to create an environment where people can strengthen their problem solving, idea generation, collaboration and risk-taking skills- all components of innovation.

Just as people need real-world experiences using a language to become fluent, children need to be immersed in hands-on STEAM learning to master the subjects. Spending time at a science centre, and thinking with your hands help build fluency in STEAM concepts.

We all care about a better future for Alberta. Building STEAM fluency enhances the collective prosperity of Albertans. We are building the skills that are required for innovation so the next generation will be prepared for a future we can't even imagine yet. TELUS Spark is for your Alberta.

Introduction



The mission of the Campus Calgary/Open Minds program is to transform teaching and learning by increasing student engagement through community, funder and educational partnerships. The program strives to achieve this by providing authentic learning experiences in educationally rich environments that engage students in hands-on discovery, exploration and reflection. These experiences make learning meaningful for students by engaging students in authentic educational learning opportunities that allow them to make personal connections. We strive to create an inquiry driven environment that allows teachers to gain a deeper understanding of student's prior skills, knowledge and aptitudes. This enhances critical thinking, literacy, and problem solving skills and facilitates a deeper understanding of community stewardship, responsibility, cultural awareness and civic pride.

Chevron Open Minds Science School at TELUS Spark is one of five Open Minds Program Sites supported by Chevron Canada. Teachers apply for their class to spend one week at TELUS Spark experiencing a wide range of exhibits, live demonstrations, HD Digital Dome shows, and customized classroom experiences. Each of the teachers accepted to the program has a unique group of students, individual goals, and a vision of creating an engaging and meaningful experience that meets the needs of his/her students. To achieve this the week-long programs are collaboratively designed by the school teacher and the Science School team.

Chevron Open Minds Science School is a place to get neurons firing. Collaborate to solve problems and spark a passion for learning through STEAM. Students can explore the design process and discover the connections between engineering, innovation, technology and art through collaborative design experiences. Students engage in meaningful experiences that spark a passion for STEAM through risk taking in a safe environment with opportunities designed to build courage, fuel creativity and learning through play.

This report provides an overview of programs and experiences for Science School for the period of September 2016 – June 2017.

TELUS SPARK



Mission

We bring people together to play, learn and create with science, technology, engineering, art and math.

Core Values

COLLABORATION We believe that encouraging debate and dialogue, embracing diverse perspectives, and that partnership with our communities result in better ideas and outcomes.

COMMITMENT We are passionate about our mission and pursue it in everything we do and how we do it.

CURIOSITY We are always wondering, always questioning, always seeking to learn.

COURAGE We believe in innovative thinking and taking risks. We embrace change. Our courage to fail gives us the confidence to succeed.

The photos, anecdotes, comments and examples of student work in this report reflect how the Open Minds Program has best exemplified the core values of TELUS Spark and the Chevron Open Minds Program.

Program Highlights



From September 2016-June 2017, the Chevron Open Minds Science School Program involved 27 classes from 16 different schools and 690 students.

Collaboration: March 2017 Light House Award

The Calgary Board of Education's (CBE) Lighthouse Awards program recognizes an organization's contributions to the CBE, its schools and its programs. TELUS Spark has been a valued Calgary Board of Education (CBE) partner for more than 20 years. The partnership began when the science centre became one of the first Campus Calgary/Open Minds program sites. Since 1997, more than 12,000 CBE students and teachers have participated in the program at TELUS Spark, which allows teachers and their students to experience a wide range of exhibits, live demonstrations, programs and workshops.

Courage and Commitment:

Commitment to the Community for 50 Years:

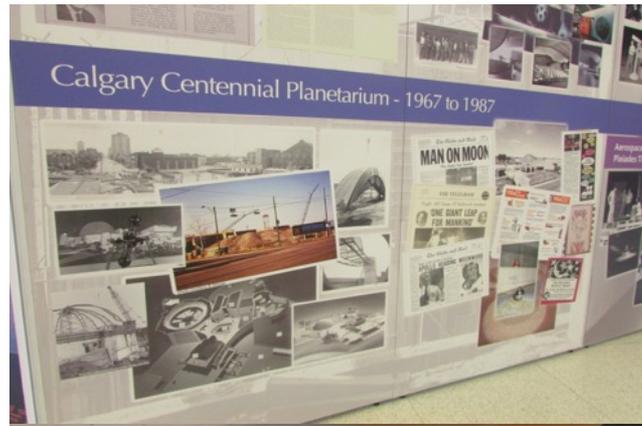
The year was 1967 and Calgarians (all 335,000 of them!) prepared to mark the Centenary of Canadian Confederation, otherwise known as Canada's 100th birthday, with the opening of the city's Centennial Planetarium. Fast-forward 50 years, six names and one new building later. The Centennial Planetarium is now TELUS Spark and we're looking forward to celebrating our 50th birthday.

This year also marked the 20th Anniversary of the Chevron Open Minds Science School Program with the program starting at the then Calgary Science Centre in 1997. July 1997 marked the beginning of the Chevron Open Minds Science School, the third site for the Chevron Open Minds School Program.

Curiosity:

Lifelong learning is paramount to a successful program. Site staff participated in various professional development opportunities to gain new ideas and strategies to enrich learning and teaching.

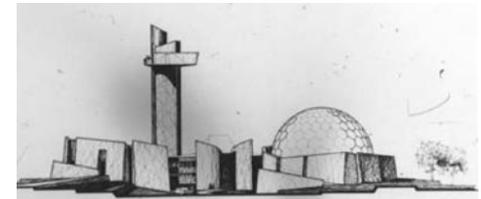
TELUS Spark turns 50...



In July 1967, TELUS Spark was born as the Calgary Centennial Planetarium. Now, 50 years and one new location later, we have evolved to be a community hub for science, technology, engineering, art and math.

Through the years, our visitors have experienced more than award-winning planetarium shows, interactive exhibits and educational programming. You may be surprised to discover that we were once home to a theatre company, scale-model trains and full-sized airplanes.

Take a journey with us through 50 years of TELUS Spark's history. Uncover memories from the past before starting your new adventures today.



City of Calgary Archives CaIA CR-92-029-043



TELUS Spark turns 50...

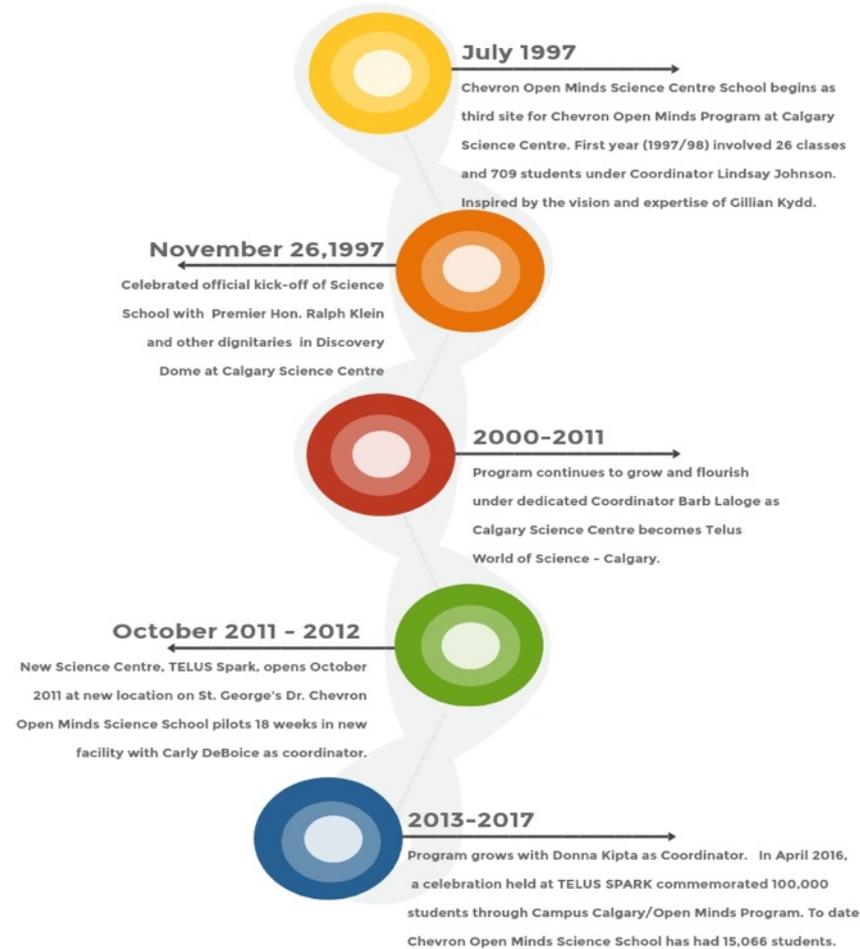


What will the next 50 look like...?



Chevron Open Minds Science School turns 20...

Chevron Open Minds Science School

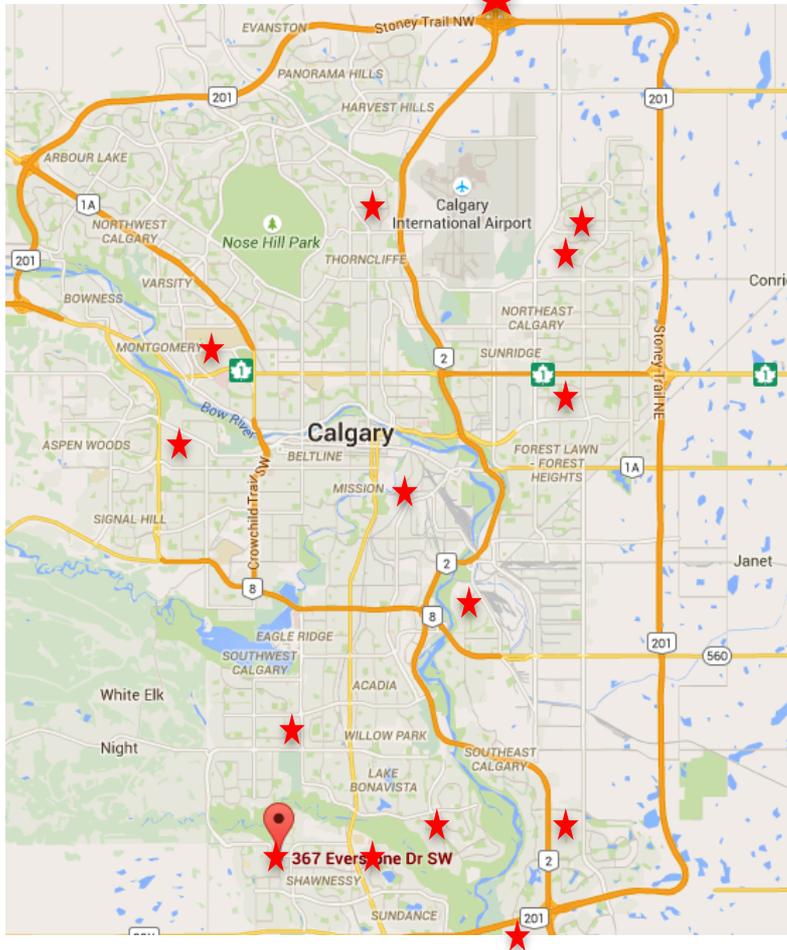


RESOURCES
<https://www.officetimeline.com/blog/timeline-templates-for-teachers>
CREATED BY
Donna Kipta / TELUS Spark



Program Overview

School Demographics



★ participating schools
(one of the school was located in Airdrie but part of CCSD)

One of the goals of Science School is to offer the opportunity to students and teachers all over Calgary. Priority is given to teachers who have not yet participated in the program.

Map of Schools who participated Science School
September 2016 - June 2017

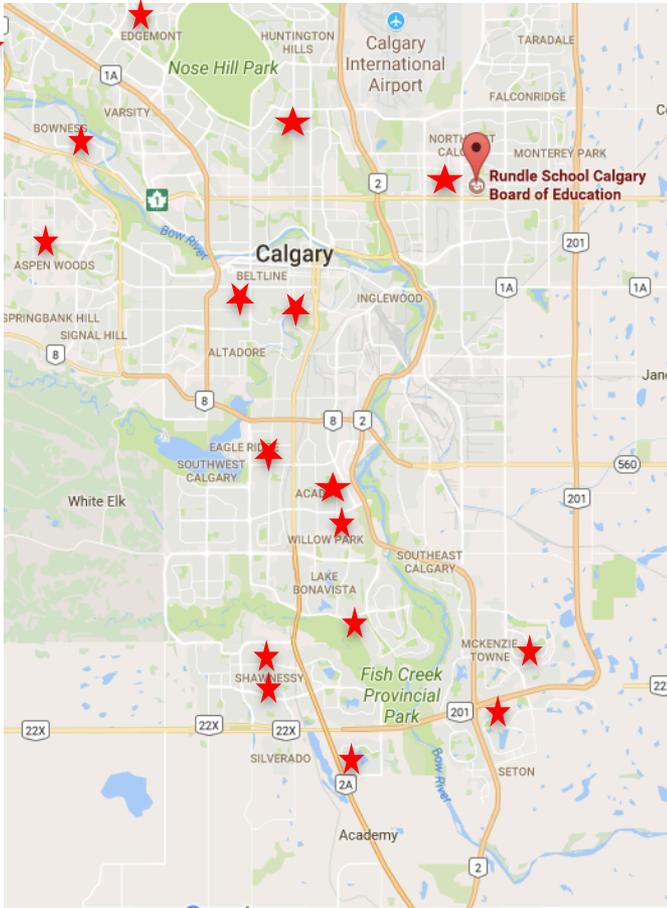
Program Overview

School Demographics



One of the goals of Science School is to offer the opportunity to students and teachers all over Calgary. Priority is given to teachers who have not yet participated in the program.

Map of Schools Who will be participating in Science School September 2017 - June 2018



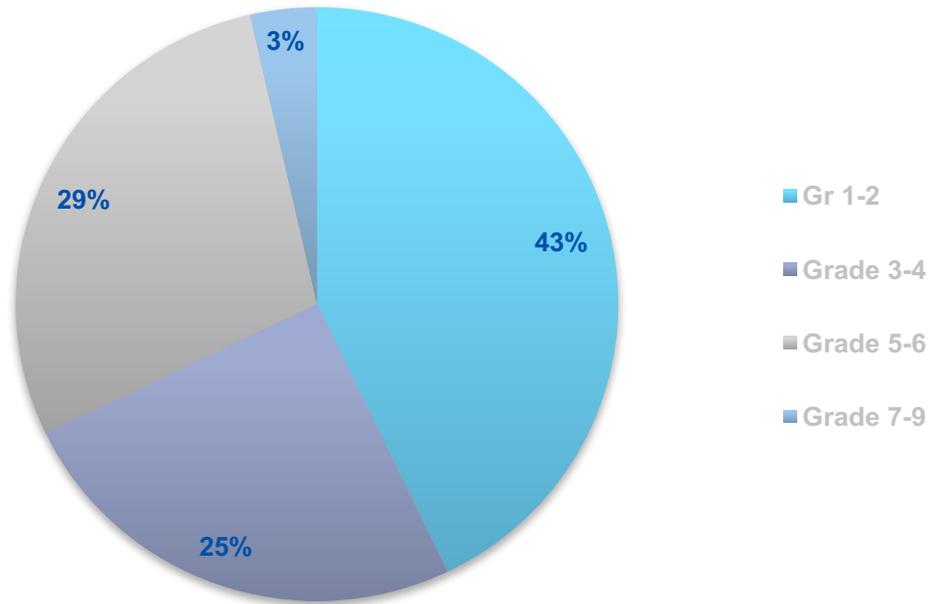
★ participating schools

Program Overview

Grade Distribution



Number of Classes



For 2016-17, there are more classes enrolled for grades 1/2 and Grade 5/6 than last year. Grade distribution varies from year to year depending on applications received. There were also more team applications for 2016-17 involving multiple weeks.

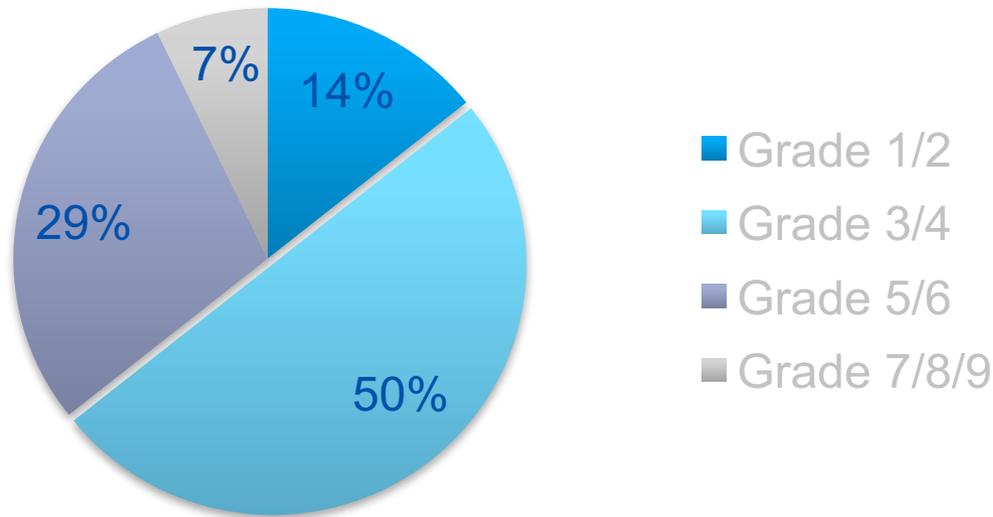
Grade Distribution for Open Minds Science School Classes September 2016-June 2017
*based on accepted applications at the writing of this report may change slightly in September

Program Overview

Grade Distribution



Grade Distribution



In 2017-18, there were significantly fewer grade 1/2 classes who applied and were accepted to Science School. There were 25% more applicants and successful proposals from grade 3/4. Grade 5/6 remained the same. Successful Junior High applicants doubled from last year.

Grade Distribution for Open Minds Science School Classes September 2017-June 2018



Program Overview

Statistics



By The Numbers

690 Students

**675 Chaperone
Volunteer Days**

366 Volunteer Hours

Students spent 5 days participating in Science School at TELUS Spark

Parent volunteers typically come for a day, and their support of the program was overwhelming

TELUS Spark volunteers came weekly to the program

Between September 2016 - June 2017, 27 classes from 16 different schools participated in Science School. This involved 690 students, chaperone volunteers, TELUS Spark volunteers, staff and community experts who made the experience possible.

The impact of this program was far beyond the 690 students involved. Buses were shared with additional classes 38 times during 2016-2017. This allowed many more students in engage in learning experiences at TELUS Spark.

Program Overview

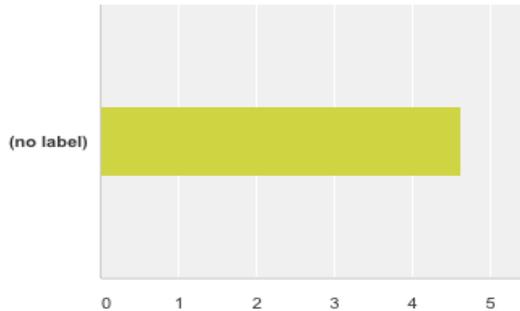
Statistics



What follows on the next few pages is a snapshot of the newly developed SROI Teacher Survey Results.

My students have a greater appreciation of STEAM (Science Technology Engineering Art Math) in their daily lives and the skills necessary to be scientists in the 21st century (creativity, collaboration, innovation, commitment, courage).

Answered: 19 Skipped: 0



	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree	Total	Weighted Average
(no label)	0.00% 0	0.00% 0	0.00% 0	36.84% 7	63.16% 12	19	4.63

“Daily talks include -"courage to take new risks" e.g. story writing "collaboration" - group work in science "creativity" - they love this word and think they can be and often are scientists when doing experiments, observations, and discoveries.”

“They independently choose to plan things in their journals sometimes before beginning tasks. They continue to learn how to work collaboratively and effectively, and as mentioned before, their commitment to work has improved.”

“They greatly enjoy hands-on learning, and for many of them, this is how they learn best. The science centre was a perfect environment for my students as many had very diverse learning needs, and were able to be successful on a variety of levels.”

“My students definitely had a great appreciation of STEAM after this experience. They are creative thinkers and learners who enjoy learning through building, art, science, etc.”

“I believe they do. They saw how important each of the "C's" are and how the real world applications require it. It made it real.”

“Students definitely have an open mind to what happens in the world around them. They ask more questions because they are very curious to know what is happening in their environment/community.”

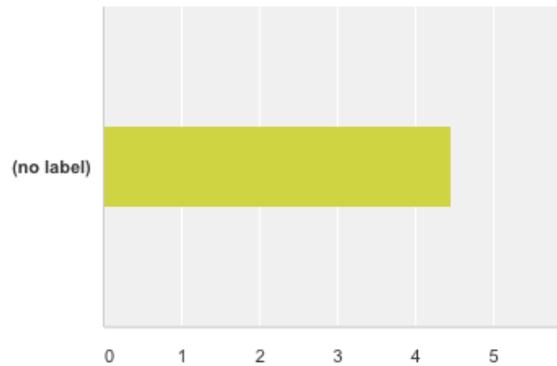
Program Overview

Statistics



My students have gained confidence as learners.

Answered: 19 Skipped: 0



	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree	Total	Weighted Average
(no label)	0.00% 0	0.00% 0	5.26% 1	42.11% 8	52.63% 10	19	4.47

“The exploration and discovery aspects of the program allowed students at all levels to engage and develop their own capabilities and learning. Their excitement was evident every time students called me over to share their latest discoveries and creations.”

“Students felt very important that they got to spend the week at the Science Centre. it gave them confidence and a sense of independence.”

“They were given opportunities to listen to inventors who had to fail before reaching their goals. The more they participated in the program, the more they could transfer skills in their learning.”

“Sharing together (people who normally would not verbally share or show work to class). Now it is daily practice all students seem more confident learners and planners.”

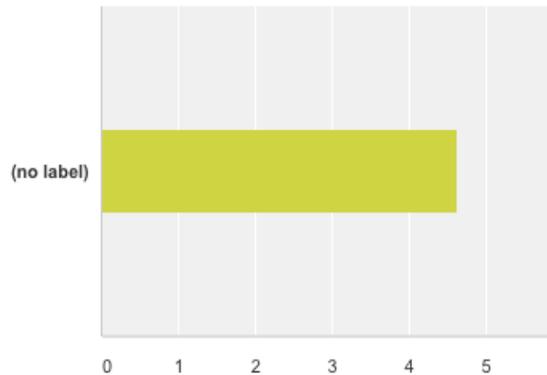
“They know its okay to try something and not succeed the first time. Some of them have developed some perseverance in accomplishing tasks at school more so than before our open minds week.”

Program Overview

Statistics



My students are likely to apply the knowledge and skills acquired across all academic disciplines.



	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree	Total	Weighted Average
(no label)	0.00% 0	0.00% 0	5.26% 1	26.32% 5	68.42% 13	19	4.63

“They are more willing to connect their learning to different disciplines especially with their technology use.”

“They already apply it all the time, by using the language that was used during the program. Such as empathy, prototyping, testing.”

“Since returning from TELUS SPARK my students really grabbed on to the 4 Cs and have been using that language consistently. When we began our mini research project on owls more than one student said to me “if we collaborate with each other I bet we will learn more about them.”

“Asking questions and reflecting is a skill they all will use in all subjects.”

“Many tasks required group collaboration which is a skill they can use in any subject area. After learning so much about modern day structures it gives a good foundation of knowledge for them to compare structure types of the Blackfoot and pioneer people to. It will help them when learning about shapes (e.g. strong shapes for bases) Journalling was good observation practice and writing practice.”

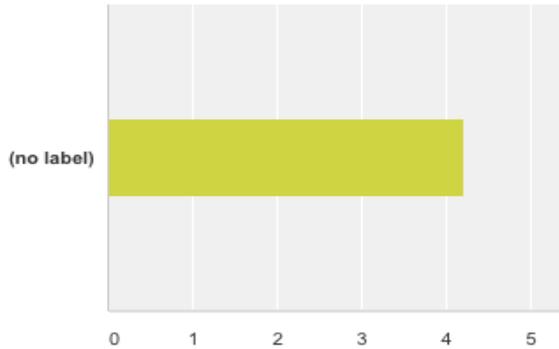
Program Overview

Statistics



My students are more engaged as demonstrated by taking responsibility for their own learning.

Answered: 19 Skipped: 0



	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree	Total	Weighted Average
(no label)	0.00% 0	0.00% 0	10.53% 2	57.89% 11	31.58% 6	19	4.21

“Especially during Science School itself this was seen. Students who struggle with being in a classroom were able to take a lot of their energy and apply it to the environment they were in at Science School. Most were then able to apply more of this learning at school.”

“My students continue to experience great motivation when doing hands on activities. They transferred some of the knowledge that they gained while at the Science Center toward their Martindale community building project. I hope that they will continue to do so in the future.”

“They are so motivated to learn new things and have gained a lot of independence in their learning. They want to be able to research, build and write on their own and have shown great growth in pushing themselves to try first on their own.”

“A lot of students' light bulb went off during the week. They applied their knowledge afterwards in the classroom.”

Program Overview

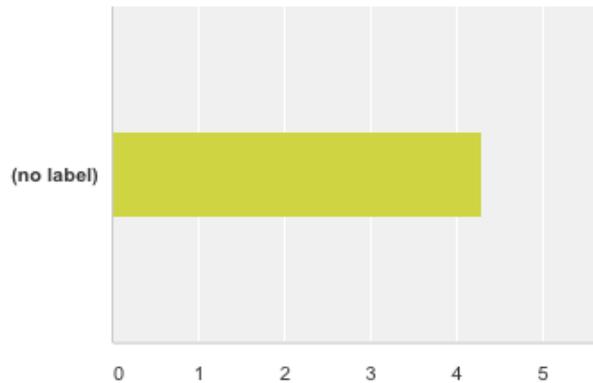
Statistics



SROI Parent Survey Snapshots

I have an increased awareness of what TELUS SPARK is all about.

Answered: 35 Skipped: 0



	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree	Total	Weighted Average
(no label)	0.00% 0	0.00% 0	8.57% 3	51.43% 18	40.00% 14	35	4.31

“I wasn't aware that TELUS Spark offered such in depth science school. I was quite impressed to see the classrooms and teachers dedicated from TELUS Spark.”

“When we've gone in the past, its been too busy to spend any amount of time at a single location. It was nice to be there when it was more open.”

“I was impressed to find out that there was alot of collaboration to create the week at TELUS Spark and to have a theme that was being built on during the week.”

“The behind the scenes scavenger hunt in particular did a great job tying in the exhibits with the different elements that run the science centre itself. Great real life application.”

“It was nice to spend extended amounts of time in the activities.”

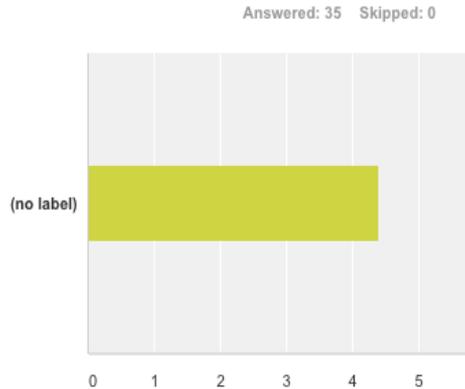
Program Overview

Statistics



SROI Parent Survey Snapshots

I will visit TELUS SPARK in the future.



	extremely unlikely	unlikely	neutral	likely	extremely likely	Total	Weighted Average
(no label)	0.00% 0	0.00% 0	11.43% 4	37.14% 13	51.43% 18	35	4.40

“My kids enjoy the science centre and we occasionally bring friends and/or family from out of town to the science centre as well.”

“There is a large variety of exhibits that allow interaction for a large range of age groups. I also enjoy the special exhibits.”

“My daughter is enrolled in a summer camp there.”

“Yes, my son is so interested in science and this week has really sparked his interest.”

“I think, yes because I think I didn't complete all the places on it. I was also judge this place carefully. I am excited also to know more and more.”

Program Overview

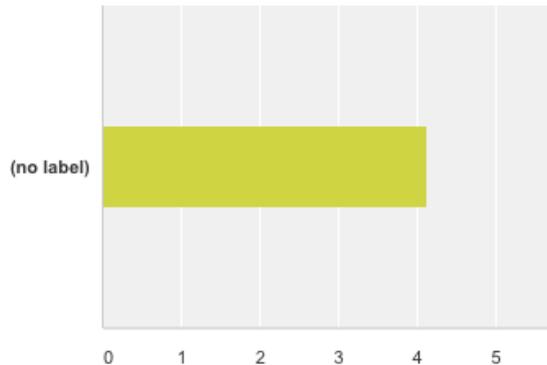
Statistics



SROI Parent Survey Snapshots

I see my child (the children) learning in new ways.

Answered: 35 Skipped: 0



	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree	Total	Weighted Average
(no label)	0.00% 0	0.00% 0	8.57% 3	68.57% 24	22.86% 8	35	4.14

“Not necessarily new ways of learning from a school perspective - but from the learning we approach at home, I'd agree.”

“I am confident the experience at TELUS SPARK had positive impacts on his learning - I just haven't seen evidence yet. There were too many first-time experiences (little bits, 3D printing, makey-makey, Space Next movie, etc.) for him not to have been influenced in new and exciting ways.”

“Being exposed to new experiences with a large group of people offered him opportunities to learn in new ways, see things from new perspectives.”

“Every experience as a child has, especially one as significant as a week at TELUS SPARK, plays into their learning and how they relate to the people, things and happenings around them. It's great to see the experiences show up in the day to day conversations and play.”

Program Overview

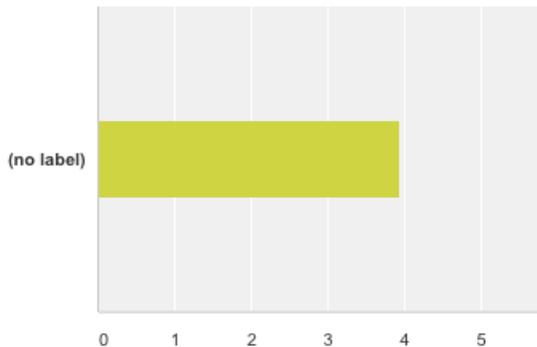
Statistics



SROI Parent Survey Snapshots

I have an increased knowledge of my child and his/her way of learning.

Answered: 35 Skipped: 0



	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree	Total	Weighted Average
(no label)	0.00% 0	0.00% 0	20.00% 7	65.71% 23	14.29% 5	35	3.94

"I must try to combine between the knowledge and the fun. I'll try to make my child to looking for the knowledge and how to use it practically in her life."

"I feel I already had a lot of knowledge about my child's way of learning. However, it was great to see how my child interacts with his classmates while working on group projects."

"In the open studio, it showed me what really interested my child."

"Love the hands on learning. Way more fun than just reading about things in a book."

Program Overview

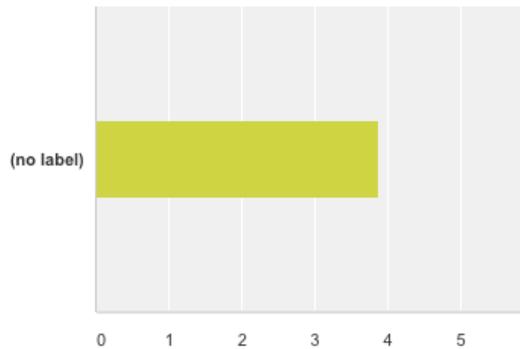
Statistics



SROI Parent Survey Snapshots

I have new strategies to support my child's (the children's) learning.

Answered: 34 Skipped: 1



	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree	Total	Weighted Average
(no label)	0.00% 0	0.00% 0	23.53% 8	64.71% 22	11.76% 4	34	3.88

“Really like the idea of drawing your ideas then finding materials to build those ideas.”

“I feel I can be more helpful with students learning in group situations/projects.”

“I liked the question chart that was provided to help us prompt questions to the kids and to help them clarify the story/project.”

“Hands on and allowing my son to come up with ideas and how to test them.”

“It's nice to be able to talk about the shared experience and use it to reference back to in other situations.”

Program Overview

Statistics



SROI Parent Survey Snapshots: What was the highlight for you at Science School

"My son was excited for this opportunity all year. The learning experience was so fun and engaging that he considered it a "vacation". It was brilliant to have the kids journal throughout the week to truly solidify new ideas. The variety of activities and hands-on opportunities will definitely live on as a highlight of the grade 5 year."

"The fact that its a 5 day course is so fun! We will be talking about this for ages. It's so much more than a field trip."

"I loved how the theme of legacy was incorporated into the activities. Especially the concept of looking at life through the eyes of a scientist- focusing on observation, viewing things from multiple perspectives, being curious and brave (but safe!) and how that applies universally to all areas of life."

"Being with my son all day and watching his excitement for learning build as the week went on."

"Watching the staff engage and challenge the students, as well as stimulate their creativity."

"I enjoyed the morning discussion on the build of TELUS Spark and defining what a LEED building is. I was part of the Design Team for the Calgary Water Centre about 6 years ago and they are also LEED certified. It was neat to see kids today learn the new language."

"I thoroughly enjoyed watching the students brainstorm ideas and seeing them turn those ideas into prototypes. I loved their creativity and team work. I also found the COOs presentation to be highly informative."

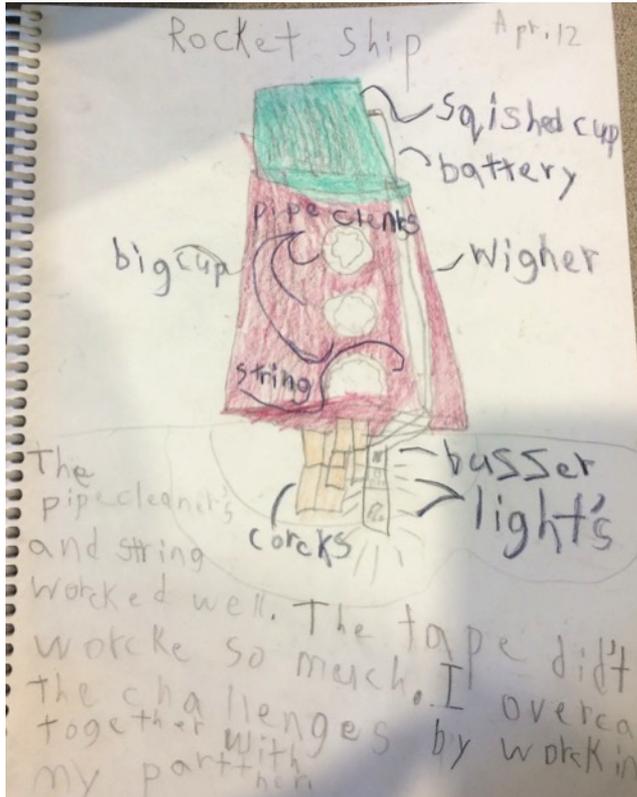
"The dome show Seeing how excited my child was and it carried over to home as well."

"Watching the kids explore and climb in the outdoor space - watching the enthusiasm of each child as they explored different exhibits."

"Loved how the volunteers made an extra effort with my son, as he is special needs. Really appreciated it. Would highly recommend this to any class in the future (age appropriate)."

STUDENT OUTCOMES Collaboration

My amazing partner helped me overcome the challenges.



① You should work with other people that know something you don't know, but you want to know. Collaboration is important because if you're good at one point, and someone else is good at another point, then if you work together you will get more done and it would be better.

Collaboration is a skill that Science School students practice through interacting with exhibits or by engaging in collaborative design tasks.

STUDENT OUTCOMES

Courage

Confronting fear. Trying something new.
Persevering through a new and challenging task.



Developing a Growth Mindset...

Understanding that making mistakes is part of learning...

② If you fail, you should try again. The more you try, the more you learn because you learn from your mistakes. Every time you fail, you learn something that doesn't work so then you change it. For example; if one gear is too big and it's causing a problem, you can tell it's too big because it's not working. Then, you learn that the gear is too big and you would need a smaller gear.

I loved how Kath said if you fail try again because how will you know it will work if you don't try again. It reminded me of when I was little I did not want to take off my training wheels. I did and I fell off my two wheeler I didn't want to ride it again, but my grandpa said you have to try again. So I hopped on the bike and I never fell off again.

Not to give up when you fail. Everybody fails so just keep trying you don't have to be the best to follow your dreams. She said that she wasn't the best at math as you try or everything as long as you try.

-This made me feel more confident and be able to keep trying till it works, rather than giving up.

① This week definitely opened my mind. It taught has to be creative, and think outside the box. It showed me that it's ok to have ideas that don't work, it just means that something else bigger, and better will come to you. It taught me that it's okay to...



#2 It's okay to fail and try again...

STUDENT OUTCOMES

Curiosity:

Immersion in unique science experiences



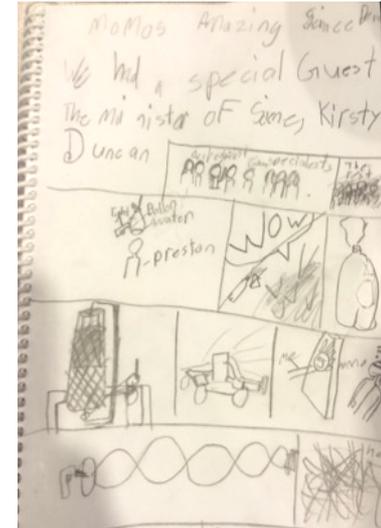
Live demonstrations connect students to exciting phenomena, explorations and experiments that could not happen in the classroom.



What does it mean to be a scientist? Journals and impactful science demonstrations await as Science Minister Hon. Kirsty Duncan and Science School learners share experiences from an entire week at TELUS Spark. TELUS Spark's President and CEO, Jennifer Martin, listens in.

I know more stuff about science and my mind has improved from Open minds a Telus Spark program for schools. What really opened my mind was Momo's amazing science demo because Momo is a scientist and she did a pretty long science demo with lighters, a water balloon, a wooden toy car and alot of other stuff too.

The fifth and final day of the Science School week was an especially memorable day for considering this big idea, meeting an inspiring fellow scientist. Hon. Kirsty Duncan Federal Minister of Science was pleased to join the class conversation, and to invite TELUS Spark CEO Jennifer Martin in too. Together, the group discussed science, Science School, and our shared responsibilities for the natural world in which we live. Grade 4 learners were proud to work alongside such a notable expert and were pleased to connect their big idea to Hon. Duncan's invitation to simulate an arctic exploration. The group used the experience to begin to tackle the challenges associated with climate change and greenhouse gas emissions. The class asked meaningful questions and shared their dynamic experiences throughout the week: seeing behind the scenes what makes TELUS Spark a LEED (Leadership in Energy and Environmental Design) facility, connecting exhibits and galleries to their big idea, and considering potential innovations to protect our natural world. Like these Midnapore Grade 4's, classes are excited to get neurons firing at [Chevron Open Minds Science School](#). Journals in hand, learners reflect and collaborate to solve authentic problems and spark a passion for learning through science, technology, engineering, art, and math (STEAM). Experiences provide students with the opportunity to explore while also developing new skills while inspiring ownership and stewardship.



Above, excerpt from Campus Calgary/ Open Minds blog post Oct 12, 2016 posted by Travis Robertson.

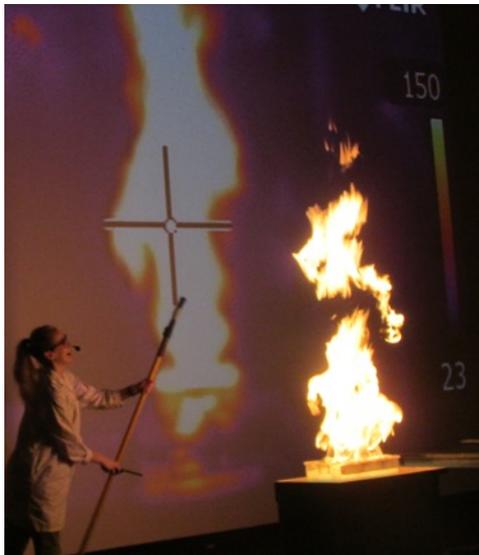
STUDENT OUTCOMES

Curiosity:

Immersion in unique science experiences



Live demonstrations connect students to exciting phenomena, explorations and experiments that could not happen in the classroom. These pique curiosity and wonder.



Gummy Bears

Picture

What is it?
Mo mo, dropped a gummy bear into potassium chlorate to show how much energy 1 gummy bear held. First she melted the potassium chlorate then she dropped the gummy bear in. I could hear sizzling and I could see a lot of sparks.

Bottle Rocket Show

Before

After

I wonder why the Bottle rocket white up to the roof?
I wonder why the trak was a string?
I wonder why the rocket went to the roof?
I wonder why it was made of a bottle?

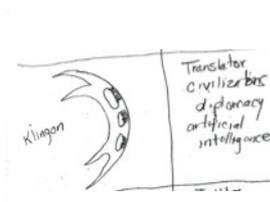
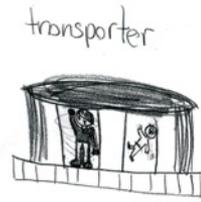
I wonder... how many years of post secondary education it takes to get this job! So Fun!

Questions
How did the energy and the potassium chlorate do that?
What was the chemical reaction that made the sparks?

STUDENT OUTCOMES

Curiosity:

Immersion in unique science experiences



Stark Trek: The Starfleet Academy Experience

Classes explored the Star Fleet Academy to learn about exciting career opportunities and discover how they can best serve the federation. The exhibit was divided into several key areas/fields: Communication, Medicine, Science, Engineering, Navigation, Tactical and Command. In each area were: artifacts, information panels related to the Start Trek Series, an interactive experience, and a recruitment quiz.

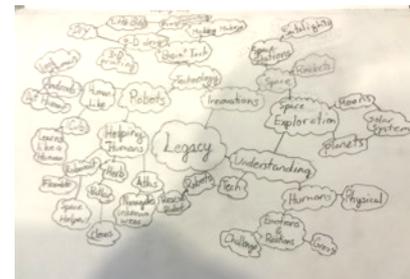
Some themes explored were:

- Legacy - What is the legacy of shows like Star Trek? What can we learn? Technology/Innovation - Could any of these technologies actually exist? What modern inventions are similar to or inspired by Star Trek or other pop culture?
- Space Exploration – Where do we stand? Where will we go next?
- Careers/Identity – Which one of the fields do you identify with the most?



It also provided students the opportunity to observe and sketch artifacts.

“Very interesting to see how far science has gone and the interest the kids have. Technology has gone far but there still are a lot of questions to be answered which in our lifetime might not see.” (parent volunteer)



STUDENT OUTCOMES

Curiosity:

Immersion in unique science experiences

HD Digital Dome Theatre shows foster a sense of wonder and curiosity

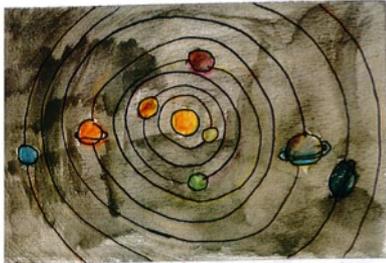
These journal entries from Grade 5/6 students illustrate information that sparked their interest from planetarium dome shows.

My experience that had the strongest impact was the "Space Next" dome show. It is something that I still remember and inspired me.



What is it

The dome theater my class and I watched looking up in wonder: our solar system. It was very interesting when we went from planet to planet learning about goldilocks zone, how the planet has to be habitable like the water, it has to be liquid water, there is also suppose to be the right



Connections:
I don't know why, but learning about planets of our solar system reminds me of National Geographic.

- How long was the earth considered flat?
- Who thought the earth was in the center of the solar system?

temperature and atmosphere, not too thick not too thin.

Questions:
 • where was the first constellation discovered?
 • Who found most of the constellations?
 • who found the first constellation?
 • What planet was discovered? (Not earth)
 • when was earth considered a planet?
 • who named the planets?

"Very interesting to see how far science has gone and the interest the kids have. Never knew the sun was white. Technology has gone far but there still are a lot of questions to be answered which in our lifetime might not see. Very interesting presentation and day." (parent volunteer)

Space Next - Dome Show Wednesday, March 1st

Space Next was a great Telus Spark dome show. This is what I thought of this presentation. Specifically what I found interesting. This show was overall very enjoyable, but only a few parts stood out to me. First there was the beginning segment where it showed the history of air technology which personally I found interesting. It's cool to see how air technology started from being myths & legends to being advanced technology like today. I also thought the story of the two countries racing to the moon. I thought it was very interesting to see the two countries against each other but knowing that they will work together in the end.

The show really interested me. I am writing about how creativity and imagination can make us think about great ideas. It is really cool that our minds came up with these ideas, and I am excited about what's next. It's also good that people can find these problems and do something innovative to fix them. (Like, how NASA found that one of their creations were going too slow and they wanted to make it go faster to not take 40 years to get that far) Space travel is very fascinating and I do want to travel to space. Maybe in the future, space travel will be more affordable and safe.

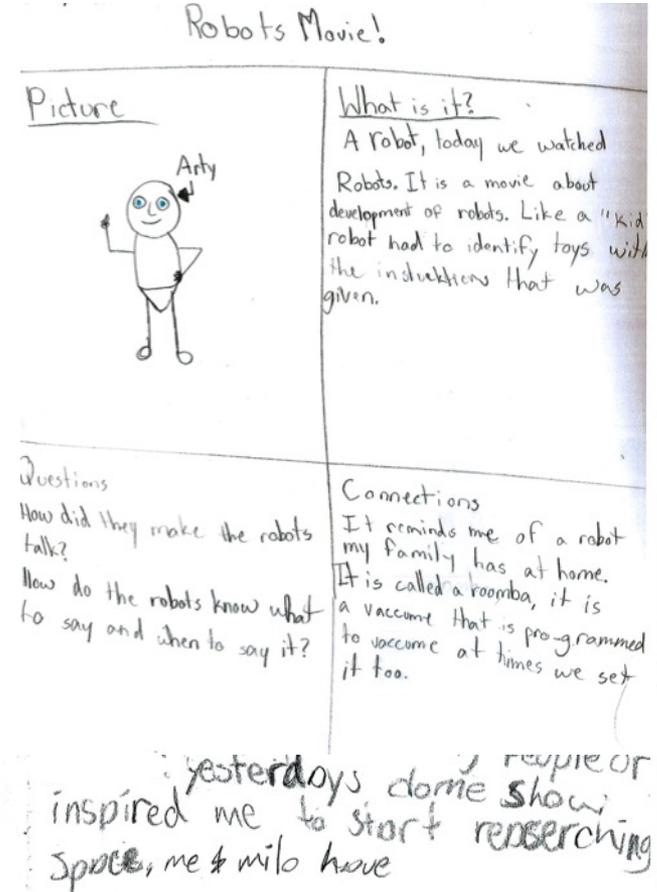
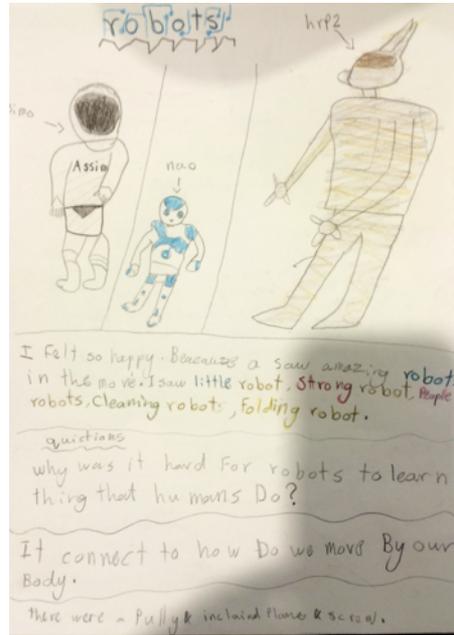
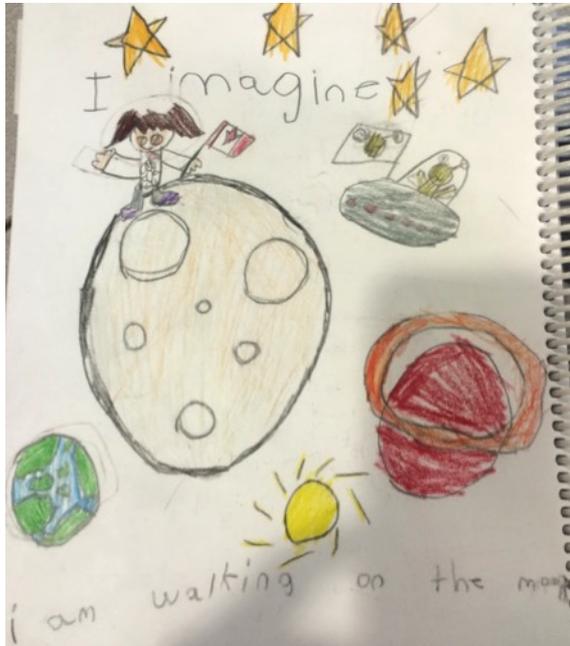
STUDENT OUTCOMES

Curiosity:

Immersion in unique science experiences

HD Digital Dome Theatre shows spark imagination and curiosity

These journal entries from students illustrate wonders and connections made following show in the dome theatre.



STUDENT OUTCOMES

Curiosity:

Immersion in unique science experiences



These journal entries from students illustrate wonders and connections made in TELUS Spark Exhibits

you were teaching me so much
my mind is looking at stuff and
I already have questions flowing
through my head. you taught me
so much and I will no
doubt, come again. It was
amazing seeing all those
thing I would not been able to do
anywhere else!

Sean and I were taking apart a DVD player. We found a little switch in it. Sean said, "Let's see what it does." I pressed it and it started the movie player. Sean was thinking we should find some parts and try to fix this. I learned doing this is a good activity to keep us focused. This is important because I think when I grow up I will be able to take apart stuff and I could put it back together and fix it for people. My question is why do people make plug ins for this and why is the box so big when there is not a lot in it? My other question is why did people make DVD players in the first place? For fun? Keep them entertained? The discovery I made was that I might sometimes need a team to do things. Sometimes having more than one is better. I found out I could make a DVD player out of the parts I found. Next time, I think I will make instead of taking things apart. I can make

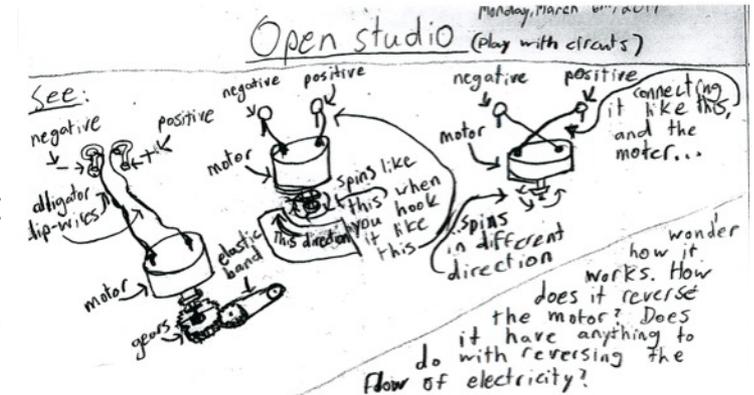
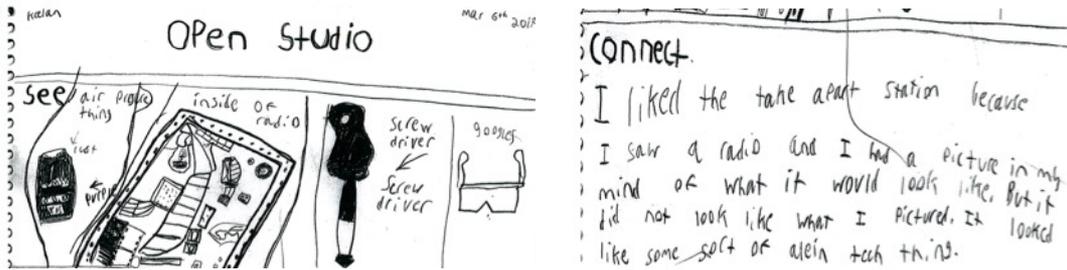
STUDENT OUTCOMES

Curiosity:

Immersion in unique science experiences



These journal entries from students illustrate wonders and connections made in TELUS Spark Exhibits



Extend:
 the skills that I had to use in this activity were some patients to try and find out what exactly to take apart. I also had to have some courage for not giving up when it was hard or a screw was hard to unscrew. one suggestion or mine is to maybe put a few more things in this centre like maybe a f.v. or something just to make it more interesting.

Connect:
 I learned that when you connect the wires differently, it changes everything. for example; I connected the wires differently on the motors and it made it spin in different directions.

Extend:
 I got interested to come to this station because I like making things that work, move, and that have reactions. I used my curiosity to explore and test if things work.

dislikes:
 I think the only reason I didn't like this station, was because there wasn't enough wires to make more connections.

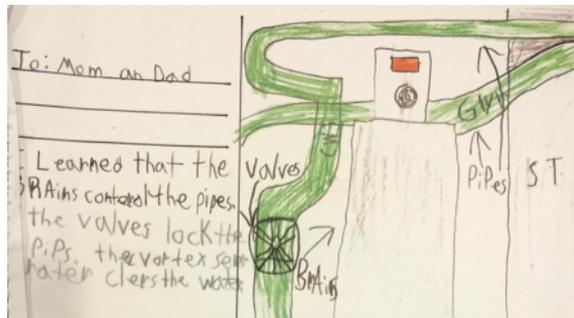
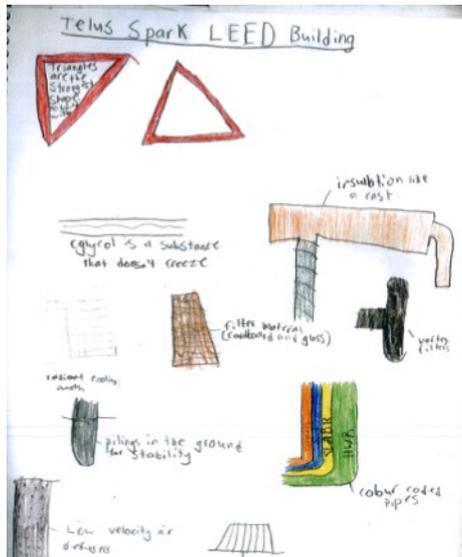
STUDENT OUTCOMES:

Curiosity:

Immersion in unique science experiences

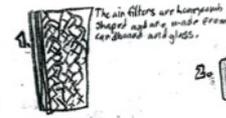


Students engaged in Behind the Scenes tours to learn more about the design of TELUS SPARK as a LEED Gold facility. These tours were customized and personalized to meet the unique needs of classes involved.



I Learned how the Telus saves energy by using rain water for toilet water. Thank you.

STUDENT OUTCOMES: Curiosity: Immersion in unique science experiences



It was inspiring to see some classes compare their school mechanical areas (e.g. boiler rooms) to that of TELUS Spark and sometimes other buildings too (e.g. leisure center in the community).

01-09-17 The Boiler

Cool Air

We walked through the little hall way and felt and 5 seconds cold air it was none other than the duct (filter air). There were thick and thin metal pipes, it was soooo cool! The best part was a boiler we get to see a sneak peek so we know how water gets heat up.

Mr. Fred - Facility Operator

How do people (the one who made it) think this through?
How many in total pipes are there?
When was this invented and how do they make this?
Where do they get water to boil?
Why would it explode when there is no water?
Do they use this in the olden days?

The boiler looks like a longhouse (because of the shapes)
The pipes look like plums (tree-thick pipe thin-plum)
The fire inside the boiler reminded me of camping
The duct got me thinking of the air conditioner
The whole thing looked like a factory

P.S. I didn't know Mr. Fred do this

Connection
It reminds me of the pipes at SouthLand because the pipes are coloured too.

Each pipe in the boiler room has letters like GRCW which means Glycol drilled water return; if it has a S it means supply and if it has a R it means return; example: HWS = Hot water supply. How did the land become stable? why did they pick a old tank, all site. The colorful pipes remind me of snakes.

STUDENT OUTCOMES

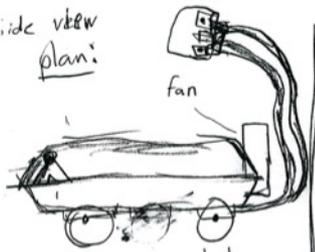
Commitment to

Engaging in Design and Problem Solving

Jan 2nd 2017

Little Bits Car Design

side view
plan:



original plan, but
didn't have enough motors

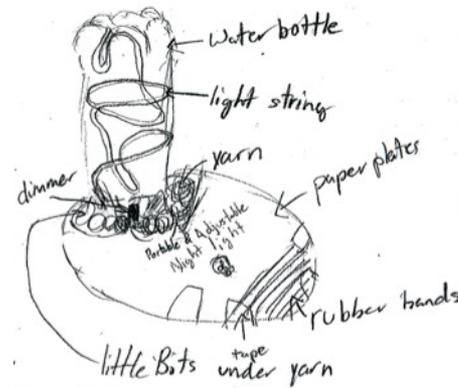
What went wrong:

- We weren't able to attach 4 wheels
- The one motor had problems
- We forgot to add the speed adjusters

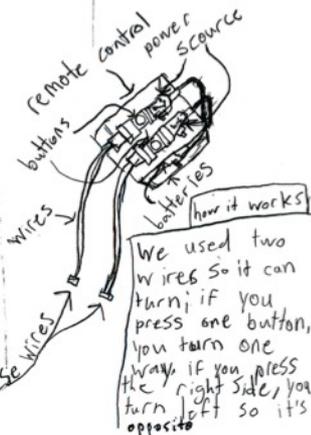
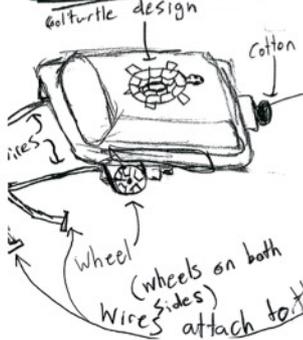
What went well:

- We fixed the motor
- We got the remote control car to work
- We got a good name for it

Portable & Adjustable Nightlight final prototype sketch



Finished:
remote-control turtle mobile!



We used two wires so it can turn; if you press one button, you turn one way; if you press the right side, you turn left so it's opposite

The Portable & Adjustable Nightlight was a fun project but encountered a couple problems. The main problem was that it wasn't comfortable and convenient enough for users, so we added a paper plate on top for better grip. Another problem was that the little bits were more exposed than we would like so yarn threads were added as cushioning. To be honest with you time was not a problem. We probably made it as good as we could make it with these materials, but if we had more materials the water bottle would be replaced with glass, the yarn would be replaced with wool, the rubber bands replaced with leather, the paper plates replaced with plastic or metal and the tape would be replaced with hot glue or super glue or something like that.

STUDENT OUTCOMES

Commitment to Creativity and Innovation

Exhibits like in Open Studio inspire creativity

OPEN STUDIO March 6, 2017

SEE

scarf, dress, belt, pins, floor, clothing, looks

CONNECT

This reminds me of art and how creative you can be with it. Matching colors and lengths for different combinations, shapes and looks.

brain

I liked the fashion place because you can let your creativity flow and make new different outfit with the cut pieces of clothing that were given.

Extend

I liked the fashion place you can spread your feelings and creativity on clothing pieces. I liked the chalk stop motion you could draw what ever you want and make it move around the chalk boards with pictures.

I was inspired by the manicins. I enjoyed this because me and anika worked really hard to get it done. I wonder if we would almost not finish but we did. This reminds me of the other times I made manicins. I also enjoyed that nobody said that I'm doing it wrong.



it made me feel creatively free like I can do anything

Get Creative

I am creating fashion with the power of fabric and pins. I learned that this makes me happy! We have to have clothes on. If I did it again, I would change the colour of the dress and the belt. I discovered that lots of people love this exhibit because you can express your feelings, get creative, and be inspired. If I did it differently, I would have more fabric. Why do you think this is in The Science Centre?

My favorite challenge was making a superhero costume because I love fashion it inspires me with different ideas!

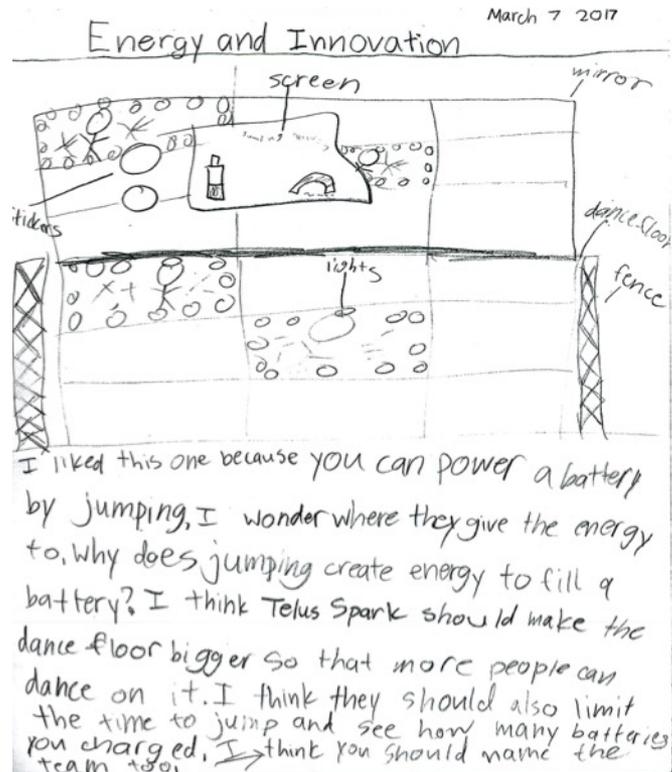
I wonder if scientists would consider manikins as science.

STUDENT OUTCOMES

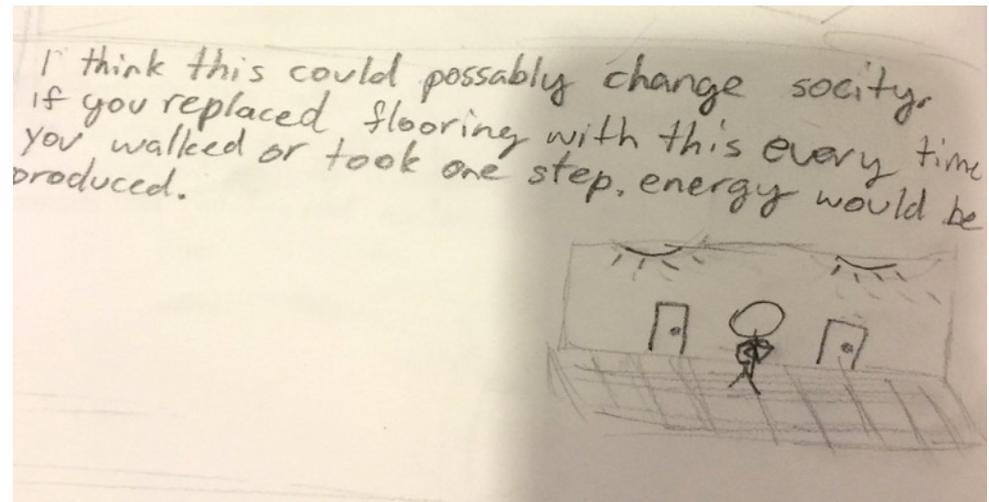
Commitment to Creativity and Innovation



With time and exposure to exhibits, like those in the Energy and Innovation Gallery, students began trying to see the applications of these concepts to impact our Society and make personal connections.



"This is important because it gives you exercise and it also produces electricity. This reminds me of morning because you have got to make the lights turn on by either connecting circuits or by motion. It also reminds me of a circus because there is all these flashing lights. I also liked the bike that produces watts. It is important to make electricity because it allows lights to turn on and fans. The bike also reminds me of a biking class I did with my hockey team. My favourite was the pump because you use your muscles to exercise and also make electricity. I also liked it because it had flashing lights and the super bright lights looked like the Aurora Borealis." (Grade 5/6 student)



STUDENT OUTCOMES

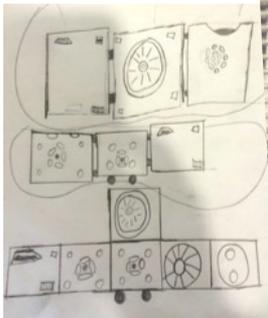
Commitment to Creativity and Innovation



Thank you donna
I think the
cubelet work
together like
a group of windows
batterizing and
the cubelet work

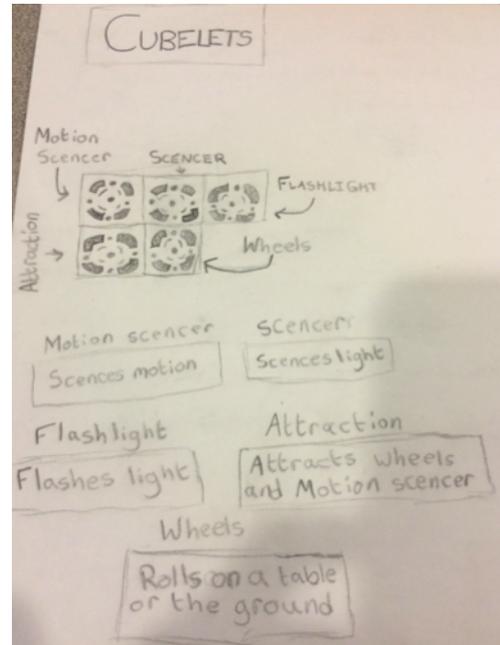
"The black cubelet turns on a light on the clear cubelet. It is just like a solar panel senses automatically. You need light to activate it. I think we made a crane. When you put your hand behind it – it will move. When you put the sensor on the side of the red cubelet and your hand on the sensor you will see that it stops."

"I wonder if this same idea could be used for trains so they don't hit cars at crossings?" (Grade 4 student)



with signals. take the
distance
cubelet for example. When
the sensor sensed
how close an object was
it would send a signal to
the working cubelet which
would send a signal to
the battery cubelet and
then start up. But this
would happen very

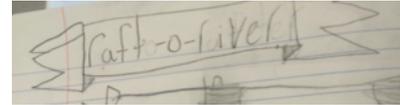
"We learned about machines and got smarter. I wonder how do cubelets work together that well? Are there moving gears in cubelets? If so, how big are they? We made a flashlight that activated in the dark this can help a lot of people because if it's dark you could see." (Gr. 4 student)



"I am drawing cubelets in my journal while looking at it. Cubelets have different blocks and they do different types of things. One has a light and one makes it move. One wheels on the bottom. Another one has a sensor on the bottom that makes it stop and move. It is important for the world because if they made a big cubelet it can help people learn and experience new things." (Gr. 4 student)

STUDENT OUTCOMES

Commitment to Creativity and Innovation



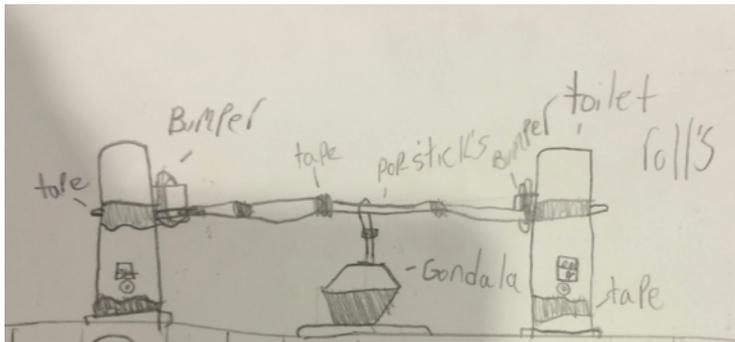
We used tape; toilet rolls; popsicle sticks; string; Cork's; Card Board; plastic; Styrofoam; Paper's

Why to Help Kid's get across river's. Some Kid's have to swim and Sit Wet in class, While some might fall of a Boat!

this will Help: it will Help them get across river's Without getting Hurt

Why Solar Panel's?: to Help the land, We used Solar panel's instead of using wires and stuff Card to power the Boat

My creation: a movable Boat that is pulled By a Zipline that is powered By a solar panel We were creative Because of all the different uses (to get across river's/canyon)



STUDENT OUTCOMES

Commitment to Personalizing Learning and Making Connections



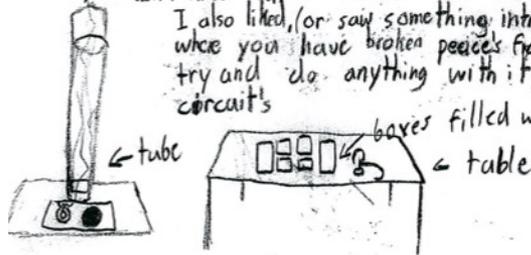
Exhibits like in Open Studio inspire students to discover their passions and make personal connections.

Science school

Mardi, 6/17

See:

I saw some interesting things like the tube thing that blows air. I don't know what it's called but here's the picture. I also liked, (or saw something interesting) the one where you have broken pieces from electronics and try and do anything with it, it called play with circuits



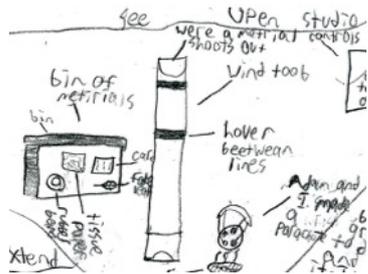
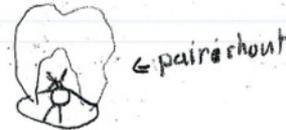
Connect:

The air thing reminds me of the time I was in top of kids summer camp and me and my friend were playing with this fan and we grabbed feathers and put it over the fan, causing the feather to float.



Extend:

The air thing it sparked my interest because you could build things to see if it would float like a parachute put some thing on it see if it would flow to the ground.



"This is important because in grade 6 we get to do aerodynamics and it applies to it. It is also important to university because I would like to take lots of courses. This exhibit reminds me of indoor skydiving because there is the giant fan that keeps you in the air. It also reminds me of Willy Wonka because they have bubbles and they start to float in the air but there is a huge fan at the top pulling them up."

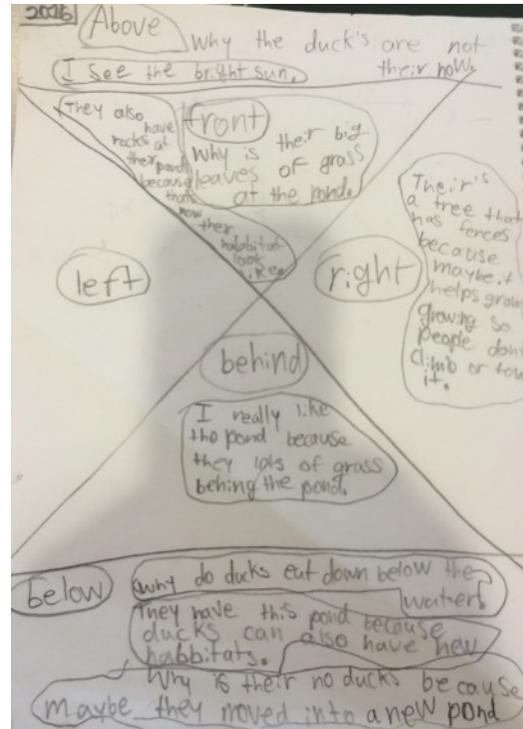
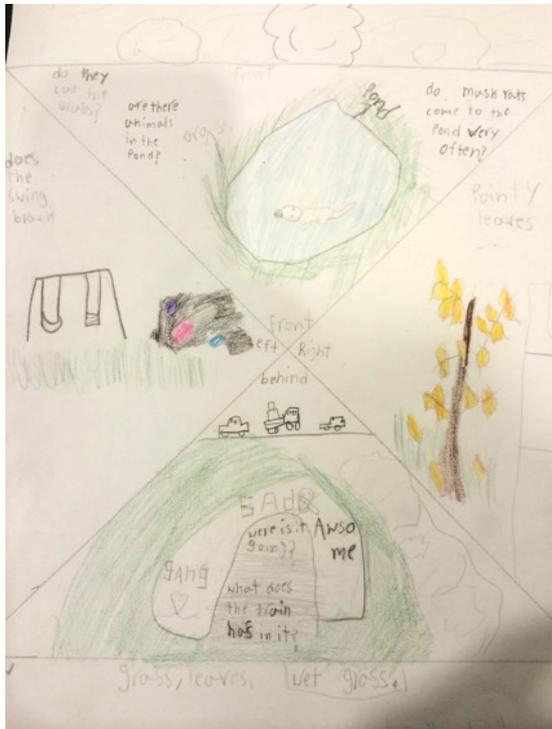
STUDENT OUTCOMES

Commitment to taking different perspectives.

Engaging students more in the natural spaces at TELUS Spark was a springboard for inquiry and understanding issues related to the environment.



The pond next to Telus Spark is used to water plants around the area. Telus Spark has its own eco-friendly pond. How long did it take to make the pond?



Creative pond

I am writing about the pond. Things I see, hear, possibly smell, and feel. I learned that a pond can have many problems and many things that live there. This is important because I want to help save our environment and learning about it will help me save it. My question is how are ponds made and what germs live in them. I discovered that the pond...

STUDENT OUTCOMES

Commitment to Innovation

Designing with empathy in mind...

-how did this activity make you feel? It made me feel like a scientist because we were in a scientist room and doing an experiment.



How does empathy drive innovation forward? Why is it important when designing something? better ways to help identify problems that need help. because when you build something you have to be careful where you put it in nature.

How did designing a water filter make you feel? it made me realize we are fortunate that we have clean water

empathy drives innovation by those more fortunate to give/help those less fortunate

It made me feel sad that others don't have access to clean water

	Filter Design #1	Filter Design #2	TEST #1	TEST #2
SKETCH				
MATERIALS	Coffee filter, sponge, limestone	Sponge, limestone, coffee filter, sand, denim		
	DIRTY WATER	CLEAN WATER	TEST #1	TEST #2
pH	5.18	8.12	5.8	7.44
Conductivity	505.3	407.5	570.8	965.3
Turbidity	DIRTY	Clear	Translucent	Clear
Other Observations	My dirty water had a bad smell, foamy, Non-Drink	Transparent, clear, less viscous	It was cloudy like milk	Like vinegar

(Use DESCRIPTIVE WORDS to explain what you SEE, FEEL AND SMELL)

Understanding How Empathy Drives Innovation – Access to Clean Water

I wonder if one day I could make a difference in the world so the whole wide world could have clean water.



STUDENT OUTCOMES

Commitment to Connecting Science and Art



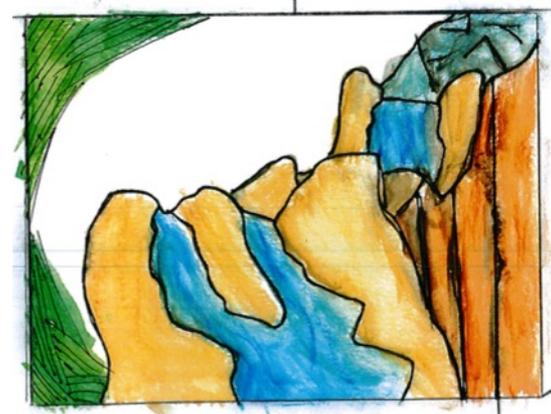
EARTH & SKY

I hear the quiet turning of the wheel

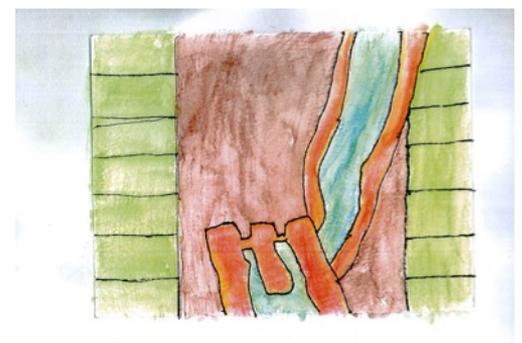
I feel the soft silky smooth screen.

I smell the scent of the streaming Pool close by

I see a quick time lapse of the landscape Day, Evening and night.



<p><u>Smell</u></p> <ul style="list-style-type: none"> -It smells like chlorine -The water smells salty and reminds me of french fries 	<p><u>Hear</u></p> <ul style="list-style-type: none"> -You can hear the water trickling -The water moving sounds like the wind and reminds me of Adrie on a windy day
<p><u>Touch</u></p> <ul style="list-style-type: none"> -The water is very smooth and goes through my fingers -This water reminds me of the ocean when I was in Vancouver 	<p><u>See</u></p> <ul style="list-style-type: none"> -It looks clear like glass -Its very calm and reminds me of a stream



I see the water slowly flowing down the stream,
 I hear the water trickling down calmly,
 I smell the beach on a hot sunny day,
 I touch grains of sand swiftly moving around the water.

Jeff Earth on SKY
 31 2017
 Do you want make wind?

Winey
 Wind Button

TELUS Spark's Earth and Sky Gallery provides a tapestry of color to inspire artwork.

STUDENT OUTCOMES

Commitment to Connecting Science and Art



Artist Adrienne Adams works with a grade 1 class sketching on ceramic tiles.

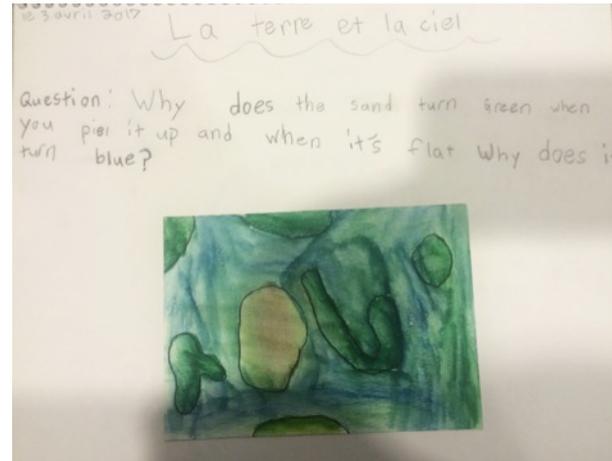


Learning to sketch in the Earth and Sky Gallery

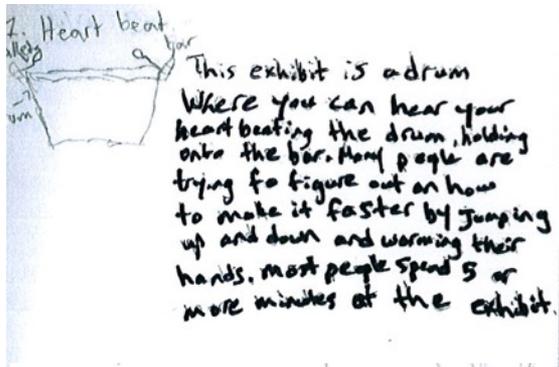


STUDENT OUTCOMES

Communication Skills

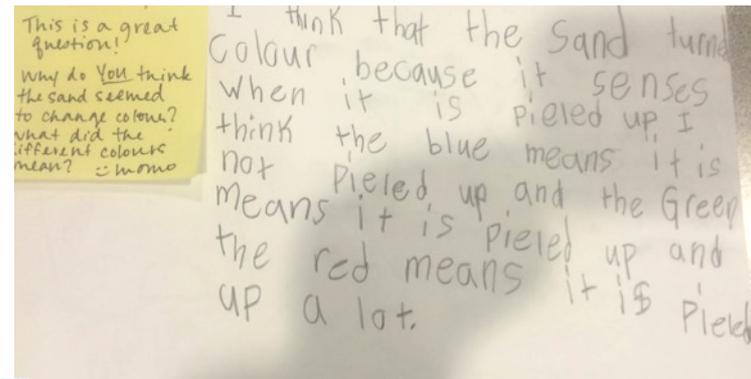


Student writing and thinking can become deeper through purposeful and constructive feedback.



Interactive Exhibits, like the interactive sand table in Earth and Sky inspire wonder and student writing.

The heart beat drum in Being Human inspires some students to provide feedback to our exhibit designers as well.



I wonder if someone ran on the spot or breathed heavily if it would change the way it worked?

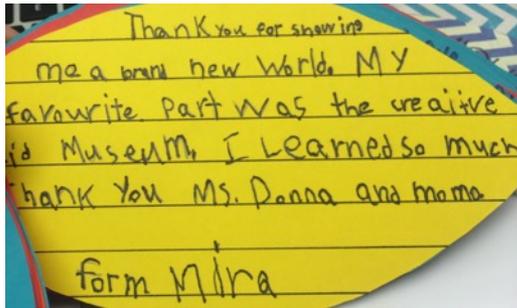
I wonder how this exhibit works and how it powers the drum?

I learned about heart rate and how it's affected by emotion and body movement.

I wish this exhibit had a scale to see how others heart beats compare to yours

I would add more mallets to the heart beat drum so there's more than 2 playing at the same time.

STUDENT OUTCOMES Communication Skills



Thank you for showing
me a brand new world. My
favourite part was the creative
and museum. I learned so much
thank you Ms. Donna and mama
from Mira



Student writing and thinking can become deeper through observation of the world around and documenting wonders.

The Willow

I am sketching the water willow at Telus SPARK Science Centre. I learned that I can make a picture using drawings as well, instead of using electronics - like when you go out hiking and you forget a camera, you can use the technique for capturing an image. It is important because the water willow is food for herbivores. How is the willow able to provide the food? I discovered the water willow is a rush and that at the base it's thick and it gets thinner at the top. I saw another plant that looked interesting to sketch, so maybe next time I would sketch that. I want to know if the willow would be used for powders - maybe gun powder, or seasoning.

ects to...
I learned that
when you spin
the bike thing,
the energy you
create goes to
the computer and
tells you how many
watts you've generated.

How does the spinning wheel
and cranker connect?
The bike generator connects to
the way a bike looks. I wonder
why they designed it like that?
I got excited at the fact that I
get to learn about how things
work.

STUDENT OUTCOMES

Commitment to Engaging in the Design Process



- Defining the design parameters.
- Understanding the needs of diverse users.



- Gaining empathy for and understanding the needs of users.
- Developing understanding through interviews and/or literature.



- Collaborating to generate as many ideas as possible to meet the needs of users.

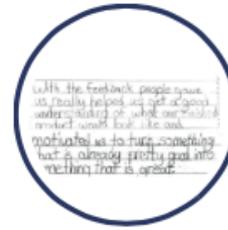
"The experience challenged students from working with unlikely partners to taking risks sharing their ideas. Students took responsibility for their work because it was "their" design, they were so much more invested in sharing and discussing the smaller details that may not have been previously addressed." (Grade 3 teacher)



- Narrowing down ideas and adding details.
- Developing and refining ideas based on feedback.



- Constructing prototypes using readily accessible materials.

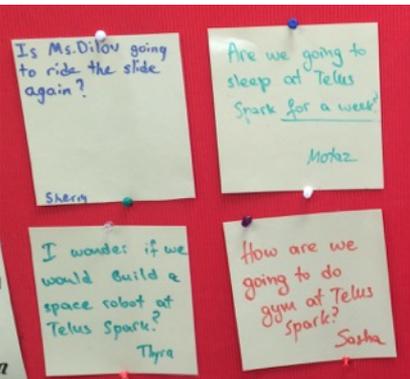
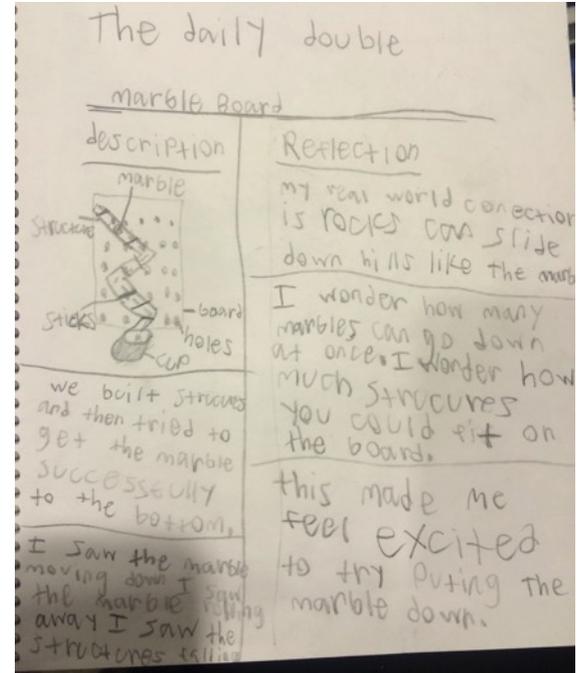
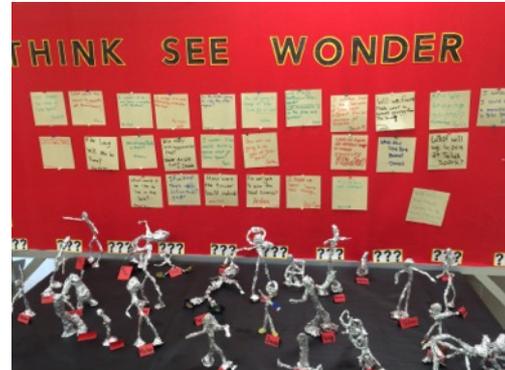


- Testing and iterating prototypes based on feedback. Reflecting on process.
- Repeat the design process.

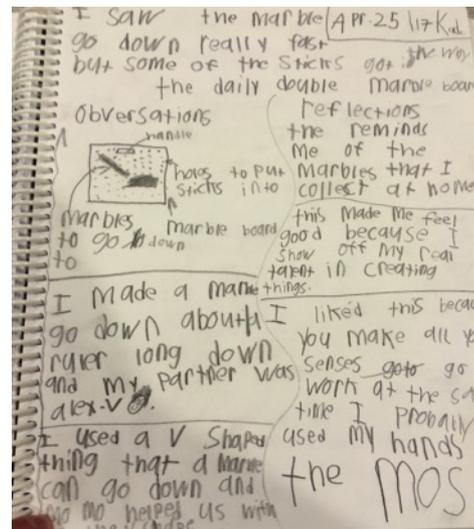
"I thoroughly enjoyed watching the students brainstorm ideas and seeing them turn those ideas into prototypes. I loved their creativity and teamwork." (parent volunteer)

STUDENT OUTCOMES

Building Excitement and Wonder Prior to Science School



Teachers foster wonder and excitement prior to Science School. Student wonders about TELUS Spark are visible in the classroom.



Chevron Open Minds Assistant, Morgane, engaged students in hands-on explorations to build excitement prior to Science School. Students reflected on the experience.

STUDENT OUTCOMES



Follow Up: Impact Post Science School



Celebrate and Share Student Work



Collaborate and share with School Community and Other Stakeholders

Build professional knowledge capacity in school through sharing of ideas.



Engage in meaningful post science school design work that impacts the community.



Students at Olympic Heights engaged in the inquiry “ How can we make a Difference in the World?” Students who attended Chevron Open Minds Science and Zoo School came together for a celebration of learning. Students engaged in the design thinking process at TELUS Spark which inspired further learning in the school learning commons/maker space. It also inspired other design work and community action initiatives related to topics such as helping refugees.

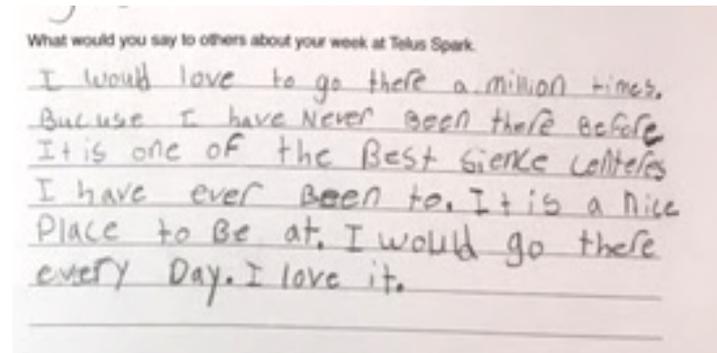
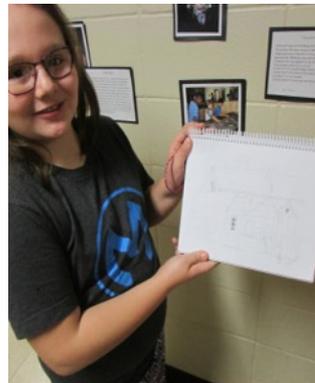
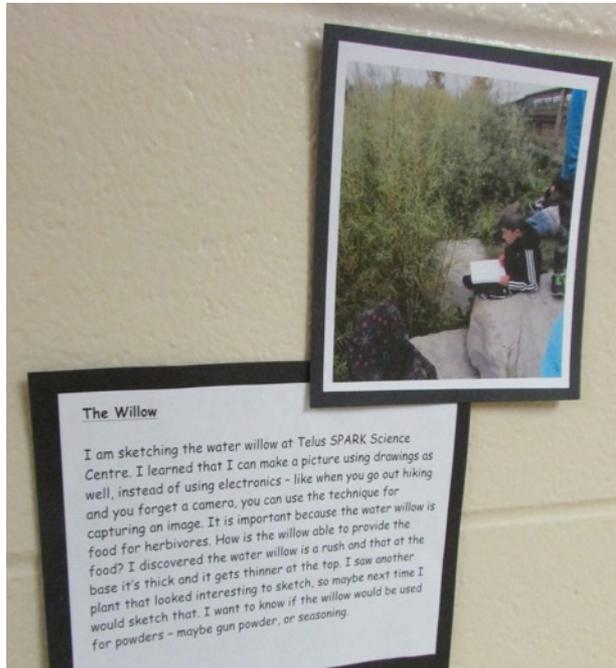
STUDENT OUTCOMES:

Follow Up: Impact Post Science School



Whole School Engagement in TELUS Spark

By bus sharing with Science School classes, an entire school was able to engage with TELUS Spark.



Students display writing and photos from their experiences at TELUS Spark.

STUDENT OUTCOMES

Follow Up: Impact Post Science School



Building School Knowledge Capacity:

"I strongly believe that our school will be learning with us through our wonderful whole school showcase and website."

"Our Principal asked what some of the best parts were and how we could incorporate some of that into our classrooms and learning commons. I thought having lots of hands on exploration, sharing of findings, and collaborative design tasks." (Gr. 1 teacher)

Building Professional Practice:

"Being part of Open Minds for the first time this year has truly changed how I connect our classroom learning to the real world. I learned a lot from the journalling sessions throughout the year and feel those practices had a great influence on the kids ability to document their learning. Science School also inspired me to become part of the summer Shift Lab Cohort."

Banting and Best Gr. 1 students explored "What can we create?" with the lens of Building Community. They designed communities of the past (before science school), and built a representation of present Calgary (during Science School), utilizing skills and ideas learned both at school and at Science School. Post Science School, the students did a lot of work on planning a "future Lynnwood" community that would meet the needs of its residents.

TEACHER OUTCOMES

Teacher Professional Development

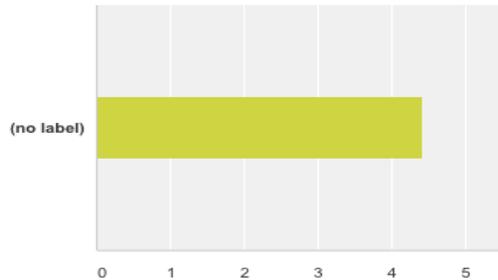


A key element of the Open Minds Program is a focus on teacher professional development. At TELUS Spark, we work with educators and parents to take learners on a journey that allows them to question, challenge, discover and grow, collaborate in new ways to solve problems, and ultimately develop a passion for learning about science, technology, engineering art and math (STEAM). The professional learning also transcends STEAM concepts to include understanding inquiry, journaling and reflective practice, and multidisciplinary community-based teaching and learning.

Below are some comments from participating teachers on how their Chevron Open Minds Science School experience has affected their teaching practice.

My participation in the Chevron Open Minds Program has given me the courage and motivation to innovate my own teaching and learning.

Answered: 19 Skipped: 0



	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree	Total	Weighted Average
(no label)	0.00% 0	0.00% 0	5.26% 1	47.37% 9	47.37% 9	19	4.42

“As an educator of older students, I have struggled at times to find ways to engage students and bring out their curiosity (which seems to be left behind as they get older and have changing focus). This experience renewed my drive to persist in designing and building opportunities for students to collaborate and create. Many of the processes were ones that I look forward to using again in my own practices.” (Jr. High teacher)

“Being part of Open Minds for the first time this year has truly changed how I connect our classroom learning to the real world. I learned a lot from the journaling sessions throughout the year and feel those practices had a great influence on the kids ability to document their learning. Science School inspired me to become part of the Shift Lab cohort for next year.”

“Our experience at TELUS Spark Open Minds has come back to life in many unexpected places this year and I know that it is one that my kids definitely valued. As a result, we have applied and been accepted to take part in the prototype project with all of our grade 7 groups next year.”

TEACHER OUTCOMES

Teacher Professional Development



A key element of the Open Minds Program is a focus on teacher professional development. At TELUS Spark, we work with educators and parents to take learners on a journey that allows them to question, challenge, discover and grow, collaborate in new ways to solve problems, and ultimately develop a passion for learning about science, technology, engineering art and math (STEAM). The professional learning also transcends STEAM concepts to include understanding inquiry, journaling and reflective practice, and multidisciplinary community-based teaching and learning.

Below are some comments from participating teachers on how their Chevron Open Minds Science School experience has affected their teaching practice.

Open Minds has been an incredible experience and truly changed my teaching practice.

Thank you for all your hard work and being so accomodating. Our week was engaging, exciting and a lot of fun!

😊 Kelby Warters

"I feel that this program aligns with my teaching program. I feel very strongly that children learn so much from being involved in hands on types of experiences. Learning should be engaging and interesting for a child to have success. This experience has reinforced what I feel about teaching and learning but has also inspired me to keep changing my teaching program to make it inspirational, motivating and exciting for my students."

"Although this is an area I can always continue to grow in I feel I do have more courage to open up the conversations with my students and allow their wonders and interests to help lead where we go in the year. Space was a particular focus one group got into in our double class and so we all were able to learn more about our Universe and connect it to other science outcomes. I feel the art gallery at the end to demonstrate all they had done was very innovative. It was a ton of work but so worth it."

"This year my PD has taken a very different shape because of Open Minds. I learned how inquiry projects can take a different direction and still keep a learning focus."

"I strongly believe that our school will be learning with us through our wonderful whole school showcase and website."

TEACHER OUTCOMES

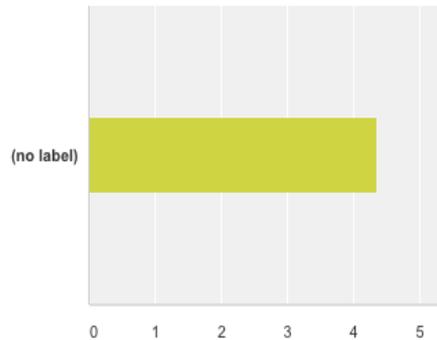
Teacher Professional Development



A key element of the Open Minds Program is a focus on teacher professional development. At TELUS Spark, we work with educators and parents to take learners on a journey that allows them to question, challenge, discover and grow, collaborate in new ways to solve problems, and ultimately develop a passion for learning about science, art and technology. Below are some comments from participating teachers on how their Chevron Open Minds Science School experience has affected their teaching practice.

My ability to identify and create relevant and authentic connections among disciplines has increased and deepened.

Answered: 19 Skipped: 0



	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree	Total	Weighted Average
(no label)	0.00% 0	0.00% 0	5.26% 1	52.63% 10	42.11% 8	19	4.37

“Why explore connected all our curriculum. We also had the opportunity to experiment with visual literacy to make these connections. Visual literacy deepened our students understanding of what they were learning. Hands on connections through inventing and a focus on Da Vinci and other artists were beneficial. Students loved the idea of exploring and learning. Science school provided this hands on opportunity and great ways to show learning through journaling.”

“This was a new grade/ curriculum area for me this year and having some authentic experiences to tie into what we were doing was very valuable.”

“I have always taught thru connecting all subjects using one topic but TELUS SPARK showed many new ways of connecting (science/math) among all other areas.”

“The application process for Science School challenged me to look for curricular connections across the curriculum. The planning sessions helped me to flesh this out so students would be able to use all exhibits at TELUS SPARK and find connections to our inquiry.”

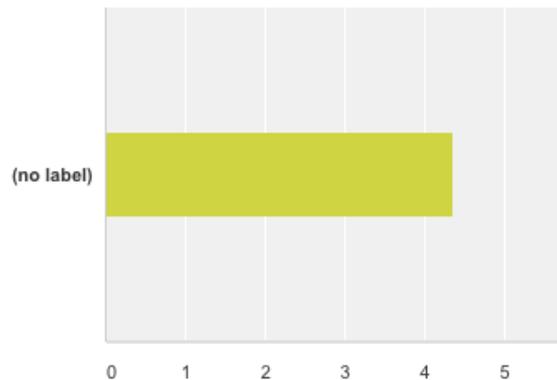
TEACHER OUTCOMES

Teacher Professional Development



I listen to student voice through journals, conversation and experiences and respond with flexibility as we co-design learning tasks.

Answered: 19 Skipped: 0



	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree	Total	Weighted Average
(no label)	0.00% 0	0.00% 0	0.00% 0	63.16% 12	36.84% 7	19	4.37

“Learning more about incorporating the “sense of wonder” has changed my teaching practice. It gives me insight on what the kids are curious about and what we should be focusing our time researching.”

“My favourite part of any learning activity is their reflections. I have started using visual journals very recently thanks to Open Minds.”

“The learning tasks were designed so each child could have their own personal success with them. The use of the visual journals for reflection was a very important part of this program. It was really great to see their feedback about how they felt about the experiences they had. This journal will be a great memory for them to refer back to in the future.”

“Each student has unique background knowledge, interests and abilities. I encourage each child to follow an area of interest, starting with their base knowledge, their expanding and exploring. One boy spent much of his time designing and planning a new robot. A couple of other students focused on designing clothing for specific purposes.”

TEACHER OUTCOMES

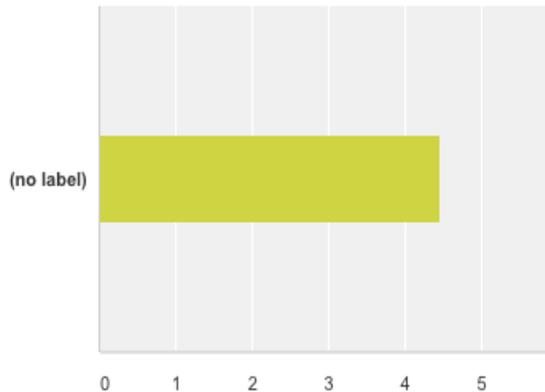
Teacher Professional Development



A key element of the Open Minds Program is a focus on teacher professional development. At TELUS Spark, we work with educators and parents to take learners on a journey that allows them to question, challenge, discover and grow.

I have a better understanding of my role in the inquiry process.

Answered: 19 Skipped: 0



	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree	Total	Weighted Average
(no label)	0.00% 0	0.00% 0	5.26% 1	42.11% 8	52.63% 10	19	4.47

"I found Donna and 'MoMo' very helpful in guiding me through the inquiry process. It was very helpful to see how they built upon each step to reach a final destination. The experience helped me to 'slow' down my own teaching in order to help students build important competencies as part of the journey."

"Inquiry has been a center in each year's plan. I love following the question at TELUS SPARK "What can we create?" because it went so much further at TELUS than it had at school and the classroom (even though we have created some awesome projects at school.)"

This was the first year I began with focus and a guiding inquiry question for the students to explore throughout the entire school year. It allowed me to continue helping the kids dig deeper in their "wonders", research and experimentation with building structures. It opened up many curriculum connections to social studies (communities) and literacy (person connections/experiences in journals)."

"I am a facilitator in my students explorations. They have come to understand how important it is to explore and what they can learn from this. Although I directed this process at the beginning, I was able to take a step back and let them observe, design and reflect.."

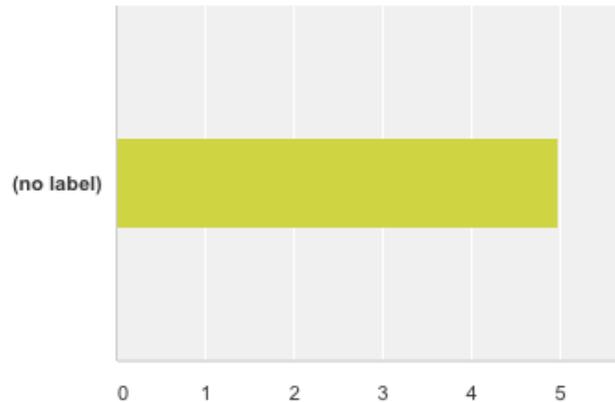
TEACHER OUTCOMES

Teacher Professional Development



I would recommend this program to a colleague.

Answered: 19 Skipped: 0



"It has changed my approach to teaching. I find myself always trying to dig deeper with my students and to create more meaningful experiences after being part of this."

"I already have! Awesome to experience learning and teaching outside of the regular classroom setting. It was something the kids were excited to work toward for 5 months. We can continue using the experience and what we have learned to build upon in class."

"I do recommend the Open Minds Programs often in conversation with other teachers. They provide unique learning opportunities!"

"A growing experience for personal learning, teaching and with the students."

"The week was very engaging to students and they spoke about it for weeks afterwards. It was a large part of our year-end celebration."

"Fabulous opportunity for collaboration and pushing my students' academic and social growth."

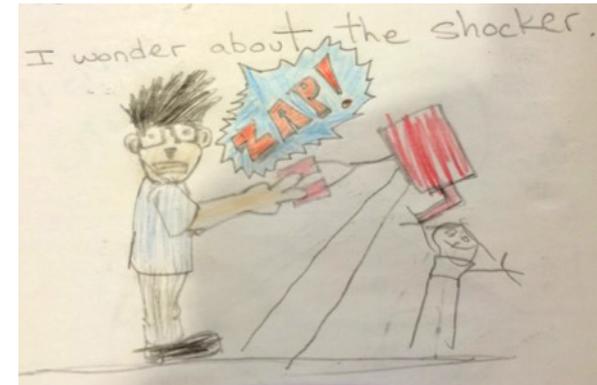
	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree	Total	Weighted Average
(no label)	0.00% 0	0.00% 0	0.00% 0	0.00% 0	100.00% 19	19	5.00

Commitment to Open Minds Philosophy

Volunteer Involvement – Parent Volunteers



A key element of the Open Minds Program is involvement of volunteers in supporting student learning. Many parent volunteers provided feedback on their experience. Participation in their child's learning and having this shared experience was a motivating factor that kept many parents volunteering throughout the week.



My First-Hand Account of the 'BEHIND THE SCENES' TOUR

Momo led us to the BOILER ROOM, where we sat on the concrete floor and looked up to the ceiling. We saw orange, green and yellow pipes and RED pumps. The pipes were labelled with black letters. GYLS GLYR HWS HWR etc. The letters R meant "RETURN"; the letters "S" meant "SUPPLY" GLY is Glycol - a substance that aids in cooling. W is "WATER" H is "HOT". The systems are computer-controlled.

COMMUNITY INVOLVEMENT Fostering Partnerships



The Calgary Board of Education (CBE), the Calgary Catholic School District (CCSD) and the Calgary Foundation support the program philosophy which provides diverse opportunities and alternative quality education for students and the professional growth of teachers. Jennifer Meredith and Travis Robertson, CBE, and Ita Kirstorma, CCSD, provide valuable support to site coordinators, teachers and students. This includes mentoring site coordinators and providing ongoing professional development to participating educators.



Calgary Board of Education



CALGARY CATHOLIC
SCHOOL DISTRICT



COMMUNITY INVOLVEMENT

TELUS Spark Volunteers



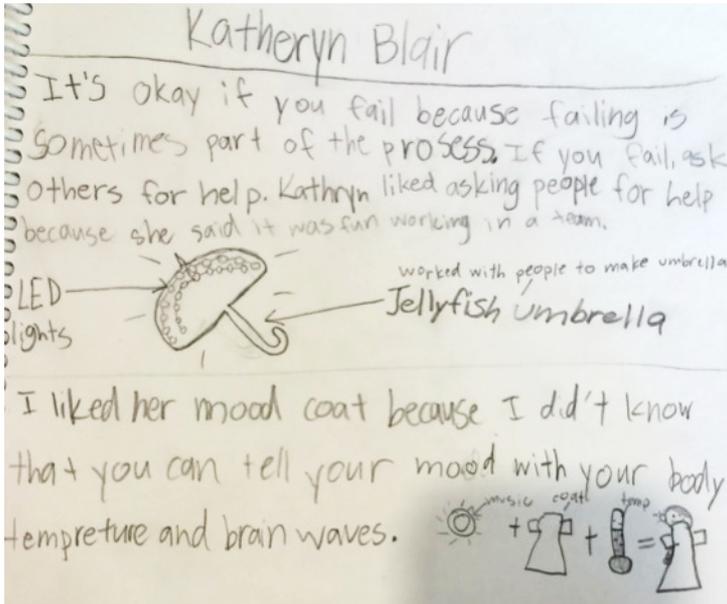
At TELUS Spark, we have a very dedicated core group of volunteers who work with the Chevron Open Minds Science School. Some have been with the organization for over 10 years. Volunteers enrich our program through supporting students, teachers, staff and parent volunteers. They lend their career knowledge and skill expertise as well. This year volunteers contributed over 360 hours to our program. A special thank you to Kyo, Saghir and Sandra for your dedication and volunteer service over the years.



Collaboration with Experts: Empowering and Engaging TELUS Spark Staff Expertise and Passion



What do a Chief Operating Officer, Fluor Champion of Engineering, business analyst, public programmer, educator, building operator, facilitator and an exhibit developer have in common? They are all TELUS Spark staff who have inspired students by sharing their career and personal expertise with Science School classes.



SITE OUTCOMES

Learning through Play:



Outdoor Exhibits: Brainasium

This permanent outdoor gallery is a place for free play and exploration that develops both bodies and brains and gets neurons firing. Through active play opportunities, outdoor exhibits and strong content connections in the Brainasium, the importance of learning through play became evident.



Working together.

In the picture, I am helping Jesse climb a rock. We learned that we can climb higher places. It is important because you need to try new things and take risks. How many and where are the highest places in the world to climb? The discoveries I made are that you can work together and make it to the top. I would do differently next time by climbing in a different direction so it is more challenging for us to climb. I would change making it a higher place for children to climb. I would still want to know how many parts are in it and what did they use to make it.

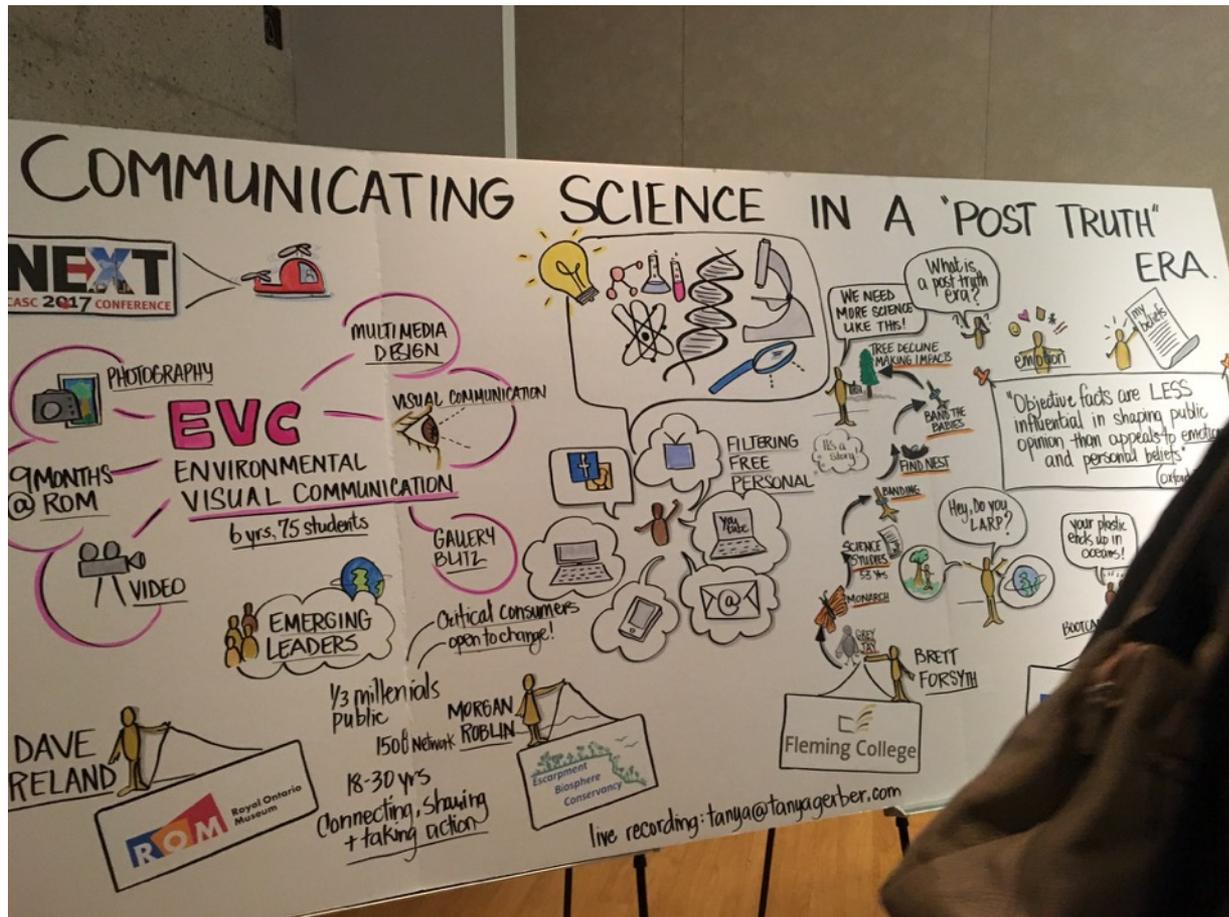


This week I want to work on Courage because the brainasium has logs that you climb and they are tricky to climb.

Reflections CASC Conference May 2017

There is a demand for Immersive Extended Science Programs at Science Centers across Canada.

Many of the discussions shed a light on the desire of students and educators alike to be a part of practical science application within their everyday lives.



Reflections CASC Conference May 2017

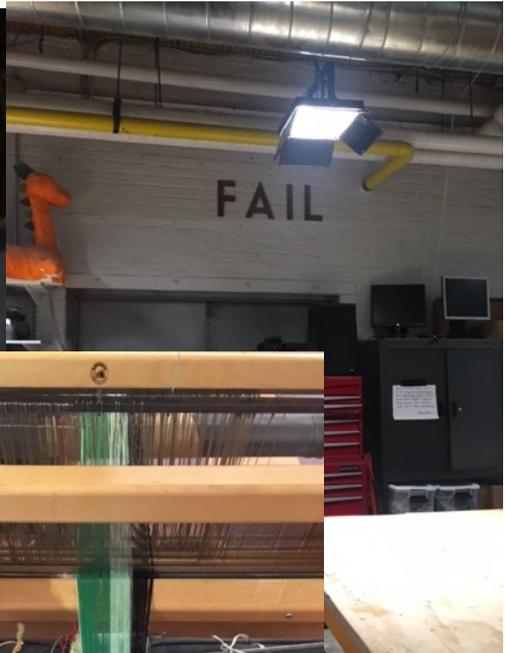
Museum and Science Center professionals have a deep appreciation for community learning.

Easily accessible skill building programs can be found at organizations across the city of Toronto.



Reflections CASC Conference May 2017

Making and tinkering are a critical component in student development of hard and soft skills. Access to tools, technical resources and experts can boost confidence among youth as well as build a sense of community.



Program Reflections

In the coming year...



- We will be operating 29 weeks of the program.
- We will provide students and teachers with access to new technologies and experiences that inspire innovation and creativity and foster collaboration and communication of ideas and knowledge.
- We will have more programming and task possibilities
 - Access to the new HD Digital Dome Theatre shows
 - Access to future traveling exhibitions
 - Collaboration with other programs and staff to offer even more unique programs and experiences for students
 - Development of new programs to include Science, Technology, Engineering, Arts and Math (STEAM)
 - Continued commitment to the core values and outcomes of TELUS Spark and the Open Minds Program
- We will continue to develop and refine processes for documenting and evaluating the program.

We are looking forward to working with the teachers, staff, volunteers and students who will be inspired at TELUS Spark. Thank you to everyone involved.

Appendix



- Comments from Teachers: Slide 71
- Letters from Teachers: Slide 72
- Comments from Parents: Slide 73
- Letters from Students: Slide 74-78
- Big Ideas/Themes 2016-2017: Slide 79
- Schedule for 2016 – 2017: Slide 80
- Application Statistics 2017 – 2018: Slide 81
- Application Data History 2006 – 2016: Slide 82
- Schedule for 2017 – 2018: Slide 83

Comments from Teachers



“I find that I think more critically about the lessons/units I plan. I want to find a way to make the lessons intellectually engaging as opposed to fun tasks. I want to find ways to connect curriculum to the world outside the school and am thinking carefully about discipline-based inquiry.”

“It is always lovely to observe the students, who may not be the highest academically, come alive at Chevron Open Minds Science School. Having the tools and opportunity to explore and discover at TELUS SPARK is truly a hear-twarming sight, especially when observing the children who struggle with traditional teaching methods. Watching their joy is motivation enough to innovate my own teaching and learn different ways to set the stage for student engagement and learning.”

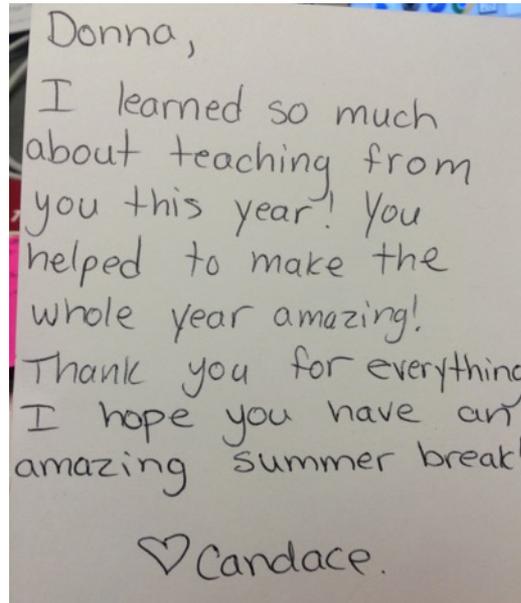
“It is evident to me that the members of the open minds team are very committed to learning. It was an excellent experience for me as a teacher and for my students as well.”

“The students and I loved our week at TELUS SPARK this year! We were able to tie our whole year together through the work we did in that one week. It was an amazing experience for us all!”

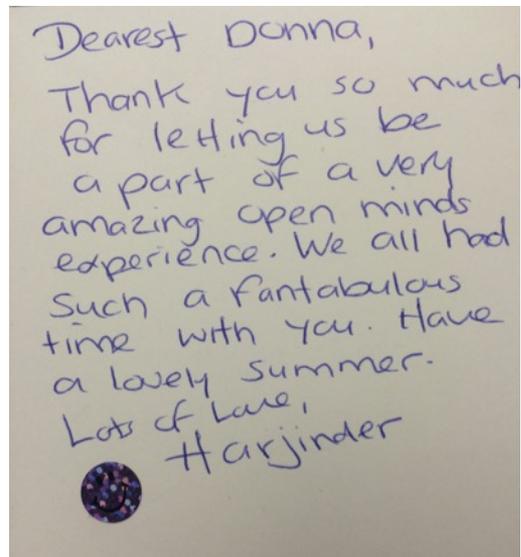
“ I had no idea what to expect and was not present for the original application process or the initial in-service last summer. Also, I had never gone to Open Minds before. Therefore I had no idea what to expect. However, the experience was awesome, and now that I have gone through the whole experience once I can’t wait to do it again.”

Letters from Teachers

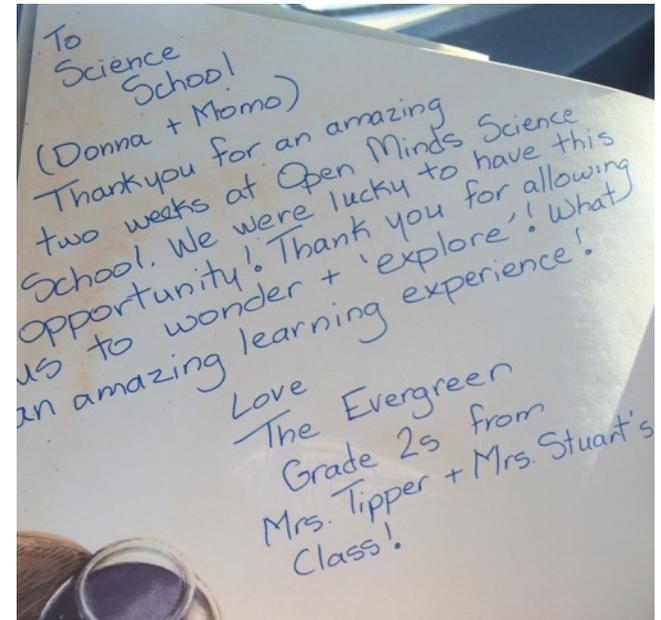
Dear Donna + Momo,
Thank-you so much for organizing our week at Science School. The kids had an absolute blast and learned so much. They are still talking about what they saw and learned while we were there.



Donna,
I learned so much about teaching from you this year! You helped to make the whole year amazing!
Thank you for everything
I hope you have an amazing summer break!
♡ Candace.



Dearest Donna,
Thank you so much for letting us be a part of a very amazing open minds experience. We all had such a fantabulous time with you. Have a lovely summer.
Lots of Love,
Harjinder



To
Science
School
(Donna + Momo)
Thank you for an amazing two weeks at Open Minds Science School. We were lucky to have this opportunity! Thank you for allowing us to wonder + 'explore'! What an amazing learning experience!
Love
The Evergreen
Grade 2s from
Mrs. Tipper + Mrs. Stuart's
Class!

Comments from Parents



“I believe from the days I volunteered that the program is extremely well run. The children’s enthusiasm and that of the staff in their way of teaching and engaging them in areas they might not think of investigating is fantastic. I know from my own child, one week was just not long enough. She hasn’t stopped talking about her experiences there.”



Letters from Students



Telus Spark  Open Minds 

"Telus Spark is the most important memory in my life and I will never forget the joy that it brought back to me." I loved my week at Telus Spark and the Open Minds program. Because I came here two years ago when I was ten years old I had one of the best feelings in my life. And every time I remember it I feel happy and not lonely any more. Thank you Open Minds for the opportunity to come not for a day but 5 days.

I will never forget the way Telus Spark changed who I was and I thank you for all the joy, laughter, smiles, memories, feelings and excitement.

Thank you Telus Spark




Letters from Students



① I think this week has opened my mind because I feel as if now I can ask and observe things better than I did before, cause now I know what to look for and what questions to ask. Not to mention I learned alot of cool things about human emotion and extinct, and alot about energy and about building and being creative.

② This week has definitely "opened my mind" because before this week I didn't have much curiosity about anything, but now I really think outside the box and wonder things.

③ This week has opened my mind and has made me ~~feel~~ feel like a really creative scientist. Thanks so much Donna and Momo!

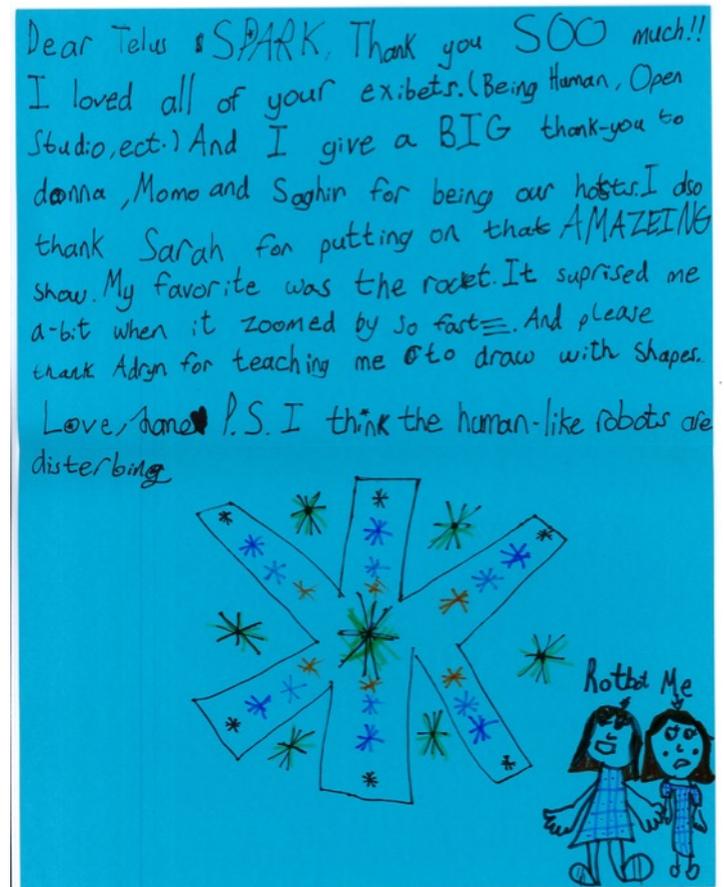
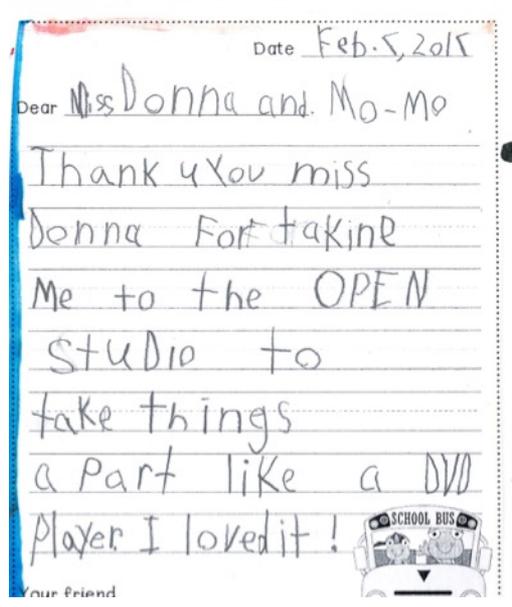
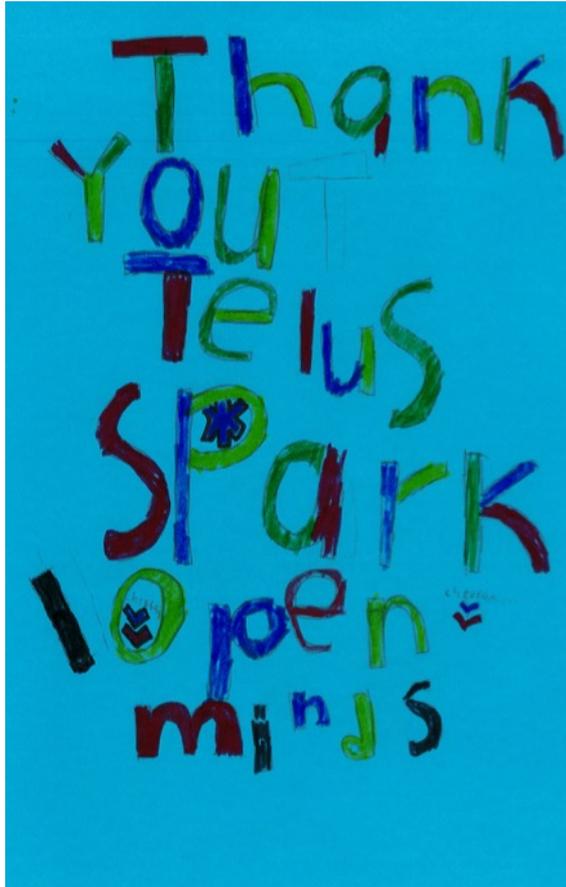
④ This week opened my mind because I got to interact with so much people and that never happened to me! This week was super interesting and fun because we went to many exhibit and learned a lot that we never knew!

⑤ I wish we could stay for another week because I want to learn more about Telus Spark, otherwise it was perfect the way how it is and a huge thanks to the staff

Open Minds Week

Yes, because I've never went there before and this is my first time at the Telus Spark also known as open minds. We had alot of fun and journaling. I've never did the work that the open minds gives us. My favourite part of this field trip is journaling and exploring new and cool stuff.

Letters from Students



Letters from Students

What would you say to Donna and Momo now that we are finished working with them?

Dear Donna,

Amazing Science stuff! I have one or two Million questions, but lets just stick to the highlights. How long have you been working here? what inspired you to do this and when did you meet Momo, because you two make a great team.

Sean

What would you say to others about your week at Telus Spark.

Go to Telus Spark. Its so cool. There is a little river were you need to build a dam to stop the flood. Donna and Momo are total EXPERTS! PS. Put on a play for the teachers in the theatre in the creative kids museum. We did it, and it totally ROCKED!

Dear Donna,

I thank you for taking us to Telus SPARK. I am still wondering how deep is the pond. I learned how the Telus saves energy by using rain water for toilet water. Thank you for letting us come to Telus SPARK.

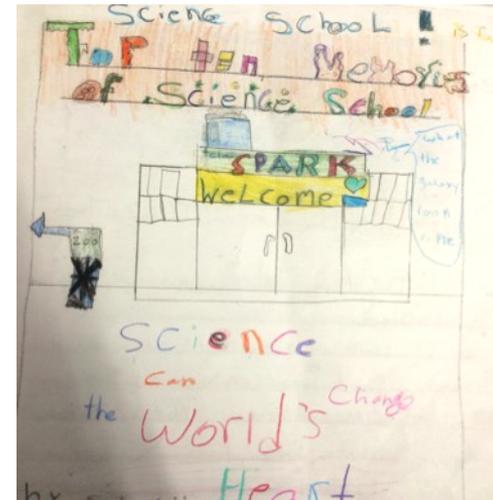
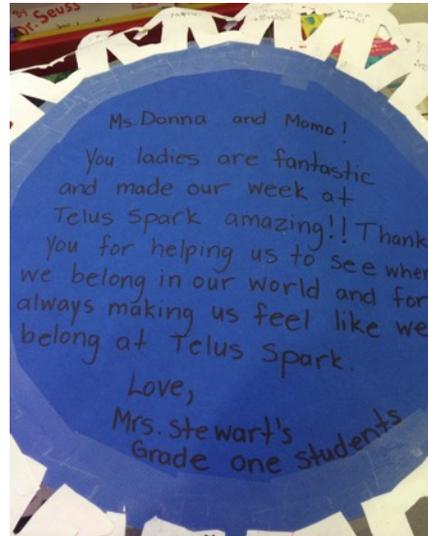
What would you say to others about your week at Telus Spark.

it was an amazing experience. My mind was flowing with ideas and questions about science. We learned about plants and animals, habitat, energy, electricity, the earth, space, and many more!

What would you say to others about your week at Telus Spark.

I would love to go there a million times. Because I have never been there before. It is one of the best science centers I have ever been to. It is a nice place to be at. I would go there every day. I love it.

Letters from Students



Key Words in Big Ideas

Sept 2016-June 2017



experience
making difference
belonging for movement
wonder the change
exploration
past the choices a
innovation relationships
future of legacy journey
in Art environment
world community
Engineering creativity

WordItOut

Schedule for 2016 - 2017



# of weeks	School	Gr	FOCUS
2	*Midnapore School	4	How Can Our Relationships with the Natural World Guide our Choices for the Future?
1	*Captain Nichola Goddard	7	What role do past experiences play on influencing the direction of our future?
1	*Ramsay	5/6	Impact Change within the World
1	*Alex Munro	4	How do we move?
2	*Olympic Heights	3	How do we make a difference in the world around us?
1	*Grant MacEwan	3	How can we ensure access to healthy food?
3	*Evergreen	2	Why Explore? Explore Creativity and Experience Wonder?
3	*Banting and Best	1	What can I create?
2	^Westmount Charter	5	Spark a Legacy: What experiences do we leave behind?
5/6	*Prince of Wales	5/6	How will you leave your mark on the world?
1	*Prince of Wales	1	How can we impact our community?
2	#Our Lady Queen of Peace	2	Environment – making positive changes to our community
2	*McKenzie Towne	2	Where will this journey take me? (Journey of learning through scientific lens)
2	*Cranston	3	The Art of Engineering
2	*Crossing Park	1	How do we belong?
1	*Braeside	Bridges Gr. 5/6	Innovation/Invention

* CBE # CSSD ^ Independent

Application Statistics for 2017-2018



CBE	Weeks	*Schools Represented	Weeks Accepted
Grade 1 - 3	15	11	10
Grade 4-6	23	7	14
Grade 7-9	1	1	1
Sub total	39	19	25
CCSD			
Grade 1 – 3	2	1	0
Grade 4 – 6	2	2	3*
Grade 7-9	1	1	1
Sub total	5	4	4
Independent			
Grade 1 – 3			
Grade 4 – 6		1	1*
Grade 7-9			
Total Weeks Applied	44		
Total Weeks Not Accepted	15		
Total #of Weeks	29		

To align with school philosophy and initiative, we accommodate multiple classes applying from one school. We recognize the value of teachers working as a team, whether it be at one grade level, across the grades, or across the curriculum.

* 1 week of Gr.6 CCSD and 1 week of Gr. 4-6 Independent accepted from Democracy School

Application Data from 2006 - 2016



Year	Weeks Requested	Weeks Not accepted	Weeks Accepted
2017	44	15	29
2016	50	22	28
2015	29	4	28
2014	44	16	28
2013	44	16	28
2012	56	26	30
2011	46	28	*18
2010	35	11	23
2009	29	3	26
2008	49	22	27
2007	44	18	26
2006	32	6	26

*The program offered only 18 weeks of classes from January to June 2012. This was the pilot year at TELUS Spark- The New Science Centre

Schedule for 2017 - 2018



# of weeks	School	Gr	FOCUS
3	*Rundle	5/6	How can we work together to accomplish our goals?
1	*Chaparral	2	How am I a maker?
1	*Twelve Mile Coulee	7	Personal and Collective Identity (multisite team -6 different sites involved)
1	*Auburn Bay	3	What do you do with a problem?
1	**#St.Philip	6	What are the building blocks of a functioning democracy
4	*Highwood School (Mandarin Immersion)	4	What is the role of the environment in our lives?
1	*Dr. Martha Cohen	5	How do things work? How do we make them better?
3	*Janet Johnstone	3	How can I ignite that Spark inside?
1	*Acadia School	5/6	What can you do to make a change in a system?
1	*Our Lady of the Assumption	7/8/9	Choose your path... (multisite many different sites involved)
1	#St. Joan of Arc	5	Science is...(Thinking Outside the Box)
2	*Chinook Park	3/4	Where do I see diversity? How do I belong?
3	*Mapleridge	1	Where are the circles in my world?
1	*Samuel W. Shaw	5	What matters..? What is the right thing..?(multisite team with 5 different sites involved)
2	#Mother Mary Greene	4	How have simple machines affected the development of human civilization?
2	*Sunalta	4	How do science and technology affect the quality of our lives?
1	***^ Montessori School of Calgary	4/5/6	Technology – To create safe and sustainable buildings in countries affected by severe weather.

* CBE # CSSD ^ Independent. ** Original Application to Democracy School