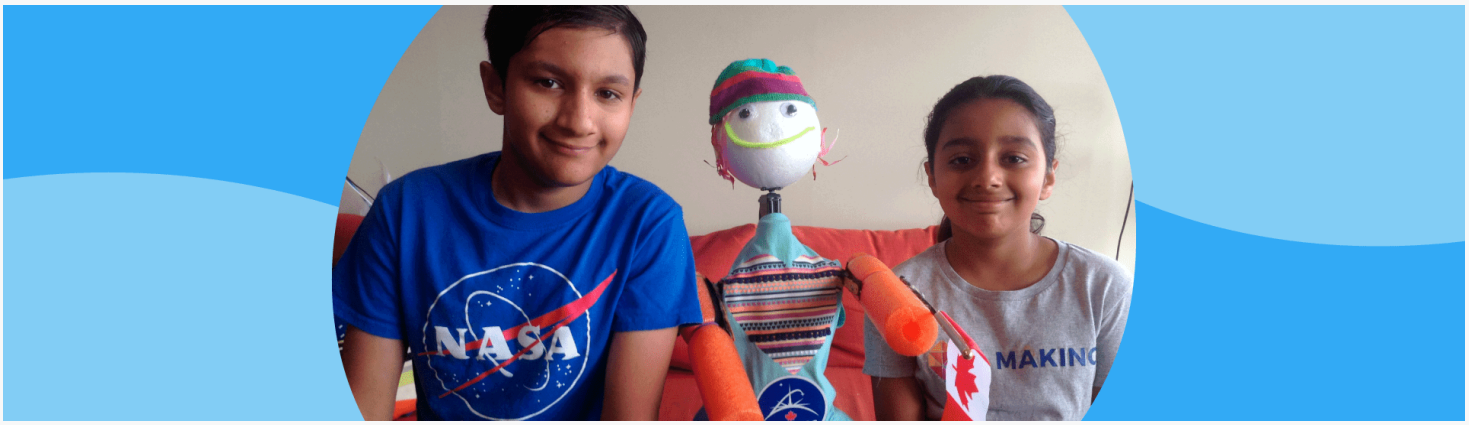
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COVID-19: Staying at home but keeping windows to learning open

What one family is doing to keep learning while schools are closed

By the Nath family (Artash, Arushi, Vikas, and Rati)
5 May 2020

Canadian families are going through unprecedented times because of the COVID-19 pandemic. Many parents are out of work, some are working from home, and others are going out everyday as a part of the essential services workforce. All of them are balancing the multiple responsibilities of putting food on the table and providing care for children, seniors, and those who are sick, or in isolation.

#StayAtHome is not a competition of the most work accomplished, new skills learned, or curriculum leapfrogs made by the children. Trying our best to emerge from this crisis with our family safe and healthy is a big enough goal.

While the doors of our home are closed, we are doing our best to keep windows of learning open. We want our kids to stay happy and mentally and physically engaged, while they possibly spend months away from school.

Here are five things we are doing to keep learning while schools are closed.



The Nath family with a robot they built.

1. Use COVID-19 as a Learning Opportunity

We had not heard the term coronavirus before. We found ourselves saying "I don't know" several times when our kids asked questions such as "what is the difference between a virus and bacteria?" or "do good viruses exist, too?". We decided to make learning about COVID-19 a family activity so that we understand viruses rather than fear them.

We now regularly share interesting articles we come across about what viruses are made of, how they spread so fast, how vaccines act against viruses, and how the coronavirus is different from other viruses. Some of the activities we have tried are:

- Virus modeling: simulating how fast the virus spreads using online software.
- Learning about the genetic code of the novel coronavirus.
- Joining a free online course on The Fundamentals of Virology, which explains DNA, RNA, and types of viruses.

2. Learn through Problem Solving

Boredom is the biggest challenge to learning. Learning must be enjoyable; there is fun in finding out about new things! As a family, we try to introduce new problems in our conversations – problems that grab our kids' attention simply because at first glance, finding the answer seems impossible!

Here are some of the questions that came from looking out the window and observing things around us:

- Can we estimate the cloud cover we are seeing outside the window?
- Can the direction of cars driving on the highway be used to create random numbers?
- How much have noise levels in our neighbourhood decreased?

We are not sure if the answers we came up with were even close to correct but they led to some interesting conversations, logical deductions, and pooling of knowledge on surface areas, radians, exponents and logarithms, and differences between random and pseudo random numbers.

We also introduced our kids to STEM visualisation software such as PhET, Mathematicas Visuales, and Geogebra so that they could appreciate the beauty of math and science in our daily lives.

3. Hack Something! Make Something Together!

Do you have any toys or broken electronics that you no longer use? Give your kids some safety glasses and a screwdriver set. Let them take the pieces apart and discover the motors, magnets, lights, springs, and other hidden parts.

Many of the projects our family has built over the years have used these scavenged parts, like bicycle wheels, neodymium magnets from computers, old motors, and solar panels from calculators.

This is engineering at its best; it helps kids understand how mechanical movements happen, the electronics inside the box, and how much effort has gone into creating and designing the product. This gives the kids the confidence to repair things, take them apart and put them back together, or hack them into a new product. This is a step towards helping kids become creators rather than just consumers.

In the past few days, our kids have disassembled an alarm clock and are hacking it to display the genetic sequence of COVID-19 and convert it into music.


NASA



Siblings Artash and Arushi with a robot they built. The robot, meant for long-term space travel, detects astronauts' facial expressions. If an astronaut is sad, the robot will give them a high five!

4. Participate in Online Conferences, Courses, or Challenges

The most significant thing that has happened in the past few weeks is that many organizations have begun offering virtual programming. We are making the best use of this.

For instance, the Ontario Science Centre has made some cool family-friendly films available free to watch online like Dinosaurs Alive!, Mummies: Secrets of the Pharaohs, and Wild Ocean. The Royal Astronomical Society of Canada are hosting their Star Parties online by bringing a tour of the night sky to your computers using their Robotic Telescope. CAGIS is bringing science challenges and experiments to your home. The Dunlap Institute and University of Toronto are streaming "Cosmos from Your Couch", and Exploring by the Seats of Your Pants is beaming science, Exploration, and Virtual Field Trips to homes.

We have given our kids the freedom to choose a few Zoom conferences, online courses, and events that interest them. Some of the events they have participated in include:

- Robotics with Raspberry Pi: an online course by the Raspberry Pi Foundation.
- COVID-19 and AI: a virtual conference by Stanford University.
- Zoom conferences on robotics organized by Silicon Valley Robotics

5. Learn by Going Offline

The pandemic is teaching us a lot, including how to find joy in the little things that can engage the entire family. Trying out innovative cooking techniques using whatever ingredients we have, playing board games, and re-reading old comic books have become popular activities in our home. They give us the opportunity to disconnect from COVID-19 news and check on each other's mental wellbeing. Sometimes, we'll switch off all the lights and look at the stars and planets (we highly recommend checking out the bright planet Venus, to the west) or listen to new sounds emerging in the quiet of the night.

Remember, this is a difficult time for kids as their lives are disrupted. They are always surrounded by adults, they are missing their friends, they have lost much of their independence, and are disconnected from their world at school. It is important not to burden kids with enforced learning or random rules, simply because they are at home and parents can monitor their activities all day. It is perfectly fine not to do anything on some days to recharge and draw mental strength. A healthy and happy mind is vital to learning during and after the pandemic. Let them open their own windows of learning and enjoy the view.

Keep learning from home with KCJ's online workshops! Choose from our weekly Code Clubs, virtual coding camps, and online events. These workshops are designed for kids aged 6-12, no coding experience is required, and parents and care-givers are welcome to join in and learn alongside their children. These online workshops are made possible thanks to funding from the federal government's CanCode program.

About the authors: *We are a Toronto-based family (Artash, 13 years old and Arushi, 10 years old) passionate about science, space exploration and robotics. In 2014 we participated as a family team in our first hackathon: the 2014 NASA SpaceApps Challenge. We ended up among the top 5 globally. Since then we have participated in 35+ hackathons. To encourage other families to become makers and creators we founded www.HotPopRobot.com. Each year we do science outreach for thousands of kids and families through our home-built rovers, robots, rockets and more. Follow our projects on Twitter @wonrobot.*

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