

# CWSF 2019 - Fredericton, New Brunswick



## Nattan Telmer

### A Flexible TEG Prototype (FlexiTEG) for Wearable Electronics

**Challenge:** Innovation

**Category:** Senior

**Region:** Vancouver Island

**City:** Victoria, BC

**School:** Mount Douglas Secondary

**Abstract:** The goal of this project is to engineer and test a prototype flexible Thermo-Electric Generator that can power wearable electronics. A Thermo-Electric Generator is a device that turns a heat difference into electricity. The final product was able to power a standard analog or digital watch and with improvements a smart watch as well.

#### Biography

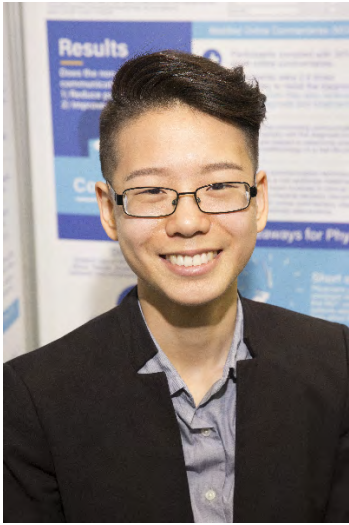
My name is Nattan Telmer. I'm a grade 11 student attending Mount Douglas Secondary School. Currently I am a competitive rower and spend a large portion of my time training. In the future I plan on entering an engineering school and becoming a material or chemical engineer. My inspiration for this years project came from my previous projects as they utilize the same devices. This experience allowed me to identify some problems which I could solve. I am very excited to continue my work and already have multiple ideas on what I can do to further improve Thermo-Electric Generators. I think that anyone who wants to work on a science fair project should start thinking about a concept long before the fair and write down all of their ideas because at least one of them will most likely be pretty good.

#### Awards

#### Value

Excellence Award - Senior - Bronze Medal Sponsor: Youth Science Canada	
University of Ottawa Entrance Scholarship Senior Bronze Medallist - \$1000 Entrance Scholarship Sponsor: University of Ottawa	\$1 000
Western University Scholarship Bronze Medallist - \$1000 Entrance Scholarship Sponsor: Western University	\$1 000
<b>Total</b>	<b>\$2 000</b>

## CWSF 2019 - Fredericton, New Brunswick



### Avril Wang

#### Communication Technique to Reduce Parent Resistance for Non-Antibiotic Treatment

**Challenge:** Health

**Category:** Senior

**Region:** Vancouver Island

**City:** Victoria, BC

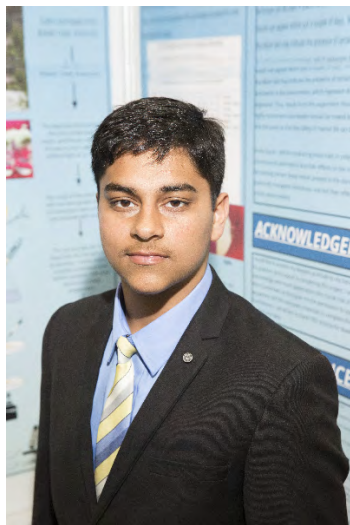
**School:** St Michaels University School - Senior

**Abstract:** I want doctors to become better communicators. Some doctors will downplay their patient's illness because they don't want to prescribe a drug. Patients often don't like that and may stop listening to the doctor because of it. This is problematic because we want patients to follow the doctor's advice so they could be healthy. So I investigated patients' reactions when doctors stop downplaying their illness.

#### Biography

My name is Avril Wang, and I am a grade 12 student at St. Michaels University School. I am a microbe enthusiast at heart and love to keep track of the spread of various diseases around the world. It's from reading countless Pro-MED reports that I developed a strong interest in our public health system, especially on the problem of antibiotic resistance. During my spare time, I cultured bacteria for fun and worked on educating youths about antimicrobial stewardship. My concern for our antibiotics in addition to my fascination with behavioural economics prompted me to investigate how doctors' communication style can affect patients' reaction to a non-antibiotic treatment. In the future, I wish to integrate Cialdini's compliance-gaining tactics into medical communication. While there will be a lot of certainties involved but I am sure it will be tons of fun!

# CWSF 2019 - Fredericton, New Brunswick



## Rohan Gupta

### Cytogenotoxic Effects of Local Stormwater on *Allium cepa* L.

**Challenge:** Environment

**Category:** Senior

**Region:** Vancouver Island

**City:** Victoria, BC

**School:** Oak Bay Secondary

**Abstract:** My project focuses on the effects of stormwater on onions root growth, and I used onions because they have a conserved genetic structure and their roots get exposed to the pollutants very easily. Currently, many places in Canada do not have a fundamental treatment plan for stormwater, so the pollutants present in the water enter the ocean having a direct effect on marine life.

#### Biography

My name is Rohan Gupta and I am a grade 11 student at Oak Bay Secondary. My inspiration for my project came from my passion for environmental sciences as I have been working immensely with my surrounding ecosystems including Bowker Creek. Presently, I am the Co-Leader of the Environmental Club, in which I actively lead in environmental activities such as Bowker Creek cleanups, invasive species pulling, and restoration projects. Therefore, doing this project I was able to further work with the effects of pollutants in stormwater on the environment, as it is not currently treated in the City of Victoria. Moreover, in the future I would like to isolate certain heavy metal ions present in the stormwater and test their effects on surrounding ecosystems. The advice I would give other students about doing science fair is that to never give up and to always stay passionate about your project. You will always face adversities while working on a project, however the sooner you can realize that it will be easier for you to overcome them. Overall, besides from science fair I am the founder of the STEM club in my school, and I love volunteering at hospitals, connecting with patients.

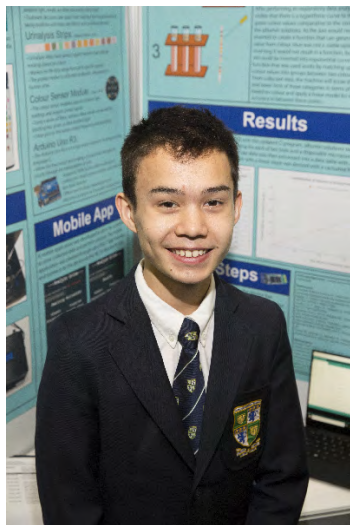
#### Awards

#### Value

Canadian Stockholm Junior Water Prize - Senior Sponsor: Canadian WEF Member Associations, the Canadian Water and Wastewater Association, and Jacobs	\$300
Excellence Award - Senior - Gold Medal Sponsor: Youth Science Canada	
Challenge Award - Environment - Senior Sponsor: Youth Science Canada	
Dalhousie University Faculty of Science Entrance Scholarship Senior Gold Medallist - \$5000 Entrance Scholarship Sponsor: Dalhousie University, Faculty of Science	\$5 000
UBC Science (Vancouver) Entrance Award Senior Gold Medallist - \$4000 Entrance Scholarship Sponsor: The University of British Columbia (Vancouver)	\$4 000
University of Manitoba Entrance Scholarship Senior Gold Medallist - \$5000 Entrance Scholarship Sponsor: University of Manitoba	\$5 000
University of New Brunswick Canada-Wide Science Fair Scholarship Gold Medallist - \$5000 Entrance Scholarship Sponsor: University of New Brunswick	\$5 000
University of Ottawa Entrance Scholarship Senior Gold Medallist - \$4,000 Entrance Scholarship Sponsor: University of Ottawa	\$4 000
Western University Scholarship Gold Medallist - \$4000 Entrance Scholarship Sponsor: Western University	\$4 000
<b>Total</b>	<b>\$27 300</b>

Youth Science Canada  
PO Box 297  
Pickering ON L1V 2R4  
www.youthscience.ca / info@youthscience.ca  
416-341-0040

# CWSF 2019 - Fredericton, New Brunswick



## Ethan Chan

### Protein Problem: A Digitized At-Home Urinalysis Device for Kidney Disease

**Challenge:** Innovation

**Category:** Intermediate

**Region:** Vancouver Island

**City:** Victoria, BC

**School:** Glenlyon Norfolk School

**Abstract:** To overcome the ambiguity of manually assessing urinalysis test strips, a cost-effective device was created to more accurately monitor and record kidney disease data. Depending on readings, treatment decisions take place from having to take medication, sometimes with toxic side effects, to hospitalized treatments. Additionally, this device automatically digitizes data, allowing for larger, more precise data sets to better research these rare kidney diseases.

#### Biography

Ethan Chan is currently a Grade 9 student at Glenlyon Norfolk School in Victoria, BC. He enjoys computer programming, learning various languages such as JS, Java, Python, and C, as well as developing electronic devices with platforms such as Arduino. Some notable achievements have been winning first place in the 2019 Sanofi Biogenius BC regional competition, 15th place nationally in the 2019 Junior Canadian Computing Competition and earning an invitation to the 2019 Junior National Debate Championships. Diagnosed with nephrotic syndrome at a young age, Ethan has been driven to aid patients with chronic kidney conditions. To achieve this he created a device through the disciplines of coding, 3D printing, and electrical engineering. In his free time Ethan enjoys network stress testing, rock climbing, and playing video games with friends. Ethan's advice is to find a project that combines your existing interests and skills so that the work won't feel like work.

#### Awards

#### Value

Engineering Innovation Award - Intermediate Sponsor: The Engineering Institute of Canada	\$750
Ted Rogers Innovation Awards - All categories Sponsor: Rogers Communications Inc.	\$2 000
Excellence Award - Intermediate - Silver Medal Sponsor: Youth Science Canada	
Western University Scholarship Silver Medallist - \$2000 Entrance Scholarship Sponsor: Western University	\$2 000
<b>Total</b>	<b>\$4 750</b>

# CWSF 2019 - Fredericton, New Brunswick



## Dana Mavrow

### Reused Christmas Trees: Creating a Biodiesel from Pine Needles

**Challenge:** Environment

**Category:** Intermediate

**Region:** Vancouver Island

**City:** Oak Bay, BC

**School:** Glenlyon Norfolk School

**Abstract:** In order to end reliance on fossil fuels and find a use for the 5-6 million Christmas trees recycled, burned, or left to decompose each year, I decided to create an alternative fuel from this plant waste. I extracted the pine oil from the needles using a sonicator, converted it to a biodiesel, and then tested the quality of the biodiesel compared to ethanol.

#### Biography

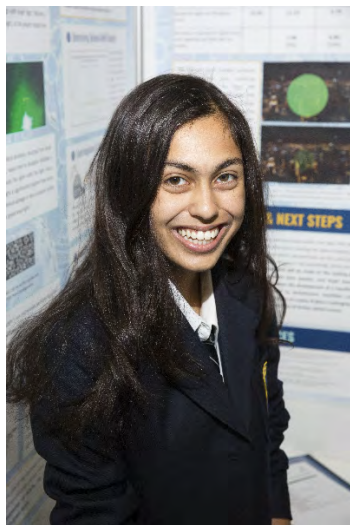
My name is Dana Mavrow and I am in grade 10 at Glenlyon Norfolk School, and for my project I created a biodiesel from pine needle plant waste. With climate change becoming a more pressing issue each year globally, I wanted to find an environmentally friendly alternative to one of the biggest contributors to global warming: fossil fuels. They power the majority of our factories and transportation, but if there was a cleaner burning type of fuel developed with green materials and processes, this would have a substantial impact on our environmental footprint. I achieved this goal by first extracting pine oil from the pine needle waste, and then using that oil to create the biodiesel. Moving forward, I would like to increase the yield of oil from the needles and also test the yields for different types of evergreen species. I would highly recommend science fair to anyone who wants to investigate a topic they are passionate and develop their curiosity in any scientific area, as it is an unforgettable experience. At my school I'm currently a member of the Model UN, debate, Team Science, and theatre clubs, and play for both the ultimate and soccer team.

#### Awards

#### Value

Excellence Award - Intermediate - Bronze Medal Sponsor: Youth Science Canada	
Western University Scholarship Bronze Medallist - \$1000 Entrance Scholarship Sponsor: Western University	\$1 000
Total	\$1 000

# CWSF 2019 - Fredericton, New Brunswick



## Shreya Gandhi

### Smarticle Particles: Laser-absorbing gold nanoparticle solution for airplanes

**Challenge:** Discovery

**Category:** Intermediate

**Region:** Vancouver Island

**City:** Victoria, BC

**School:** Glenlyon Norfolk School

**Abstract:** Even 5mW laser pointers are strong enough to reach and interfere with the operation of an aircraft when shone at the sky, blocking a pilot's view of their surroundings with bright light. 100 nm gold nanoparticles with large optical cross-sectional areas range were used for their SPR properties in a transparent coating to absorb and scatter the light of a 532 nm wavelength green laser.

#### Biography

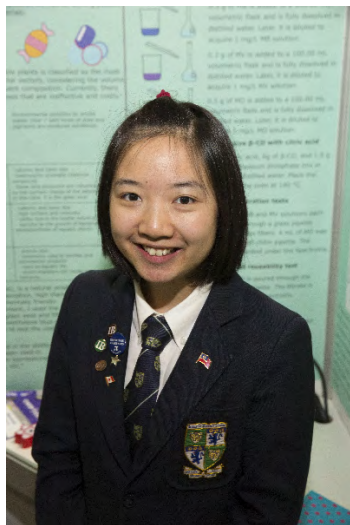
Hi! My name is Shreya Gandhi, and I am in Grade 10 at Glenlyon Norfolk School. Aside from science fair, I love to dance, debate, take photos, engage in Model UN, and play the piano. I also enjoy volunteering with an organization called Science Venture, which aims to inspire Vancouver Island youth to explore the sciences through innovative STEM experiences. Science is one of my favourite subjects in school, and I was inspired by my sister last year to pursue a project. I've had so much fun throughout this experience and would definitely recommend participating to any students considering it.

#### Awards

#### Value

Excellence Award - Intermediate - Bronze Medal Sponsor: Youth Science Canada	
Western University Scholarship Bronze Medallist - \$1000 Entrance Scholarship Sponsor: Western University	\$1 000
Total	\$1 000

## CWSF 2019 - Fredericton, New Brunswick



### Melody Cheng

#### Textile Effluent Remediation: Cationic vs. Anionic Dyes

**Challenge:** Discovery

**Category:** Senior

**Region:** Vancouver Island

**City:** Victoria, BC

**School:** Glenlyon Norfolk School

**Abstract:** For my project, I worked on filtering textile dyes out of water by using glass wool as well as chitin. This is essential because the textile industry produces a large amount of wastewater from its manufacturing processes and dye effluent from the textile plants is considered the most polluting out of all the industrial sectors based on the volume and the wastewater composition.

#### Biography

During my spare time, I love to volunteer at the City of Victoria Youth Council and the Victoria Immigrants and Refugee Center to teach children about science, technology, math, and engineering through engaging experiments. I started this project because I learned the impact fast-fashion has on the environment. I believe that it is very important to find solution to this problem. In my opinion, the essential thing when it comes to doing a science project is an open, passionate heart towards the subject. There may be failures along the way but learning how to not let these burdens pull you down will lead to you an astonishing experience.