

# CWSF 2019 - Fredericton, New Brunswick



## Milo Eirew

### The Hydrocyclic Cell ? A Novel Improved-Efficiency Fuel Cell

**Challenge:** Energy

**Category:** Senior

**Region:** Greater Vancouver

**City:** Vancouver, BC

**School:** University Hill Secondary

**Abstract:** In my project, I combined two technologies called electrolyzers (which take in electricity and convert water to hydrogen and oxygen gas.), and fuel cells (which do the opposite, turning hydrogen and oxygen gas into water and electricity), to design a device which makes the fuel cell within it more efficient, capturing the gravitational potential of water produced when the fuel cell operates at a height.

#### Biography

My name is Milo, and I am 15 and at University Hill Secondary School, Vancouver. My project involves designing and mathematically modelling a more efficient fuel cell, using the gravitational potential energy gained when you convert hydrogen and oxygen into water and electricity at a height. I was initially inspired to do this project when I heard about fuel cells and electrolyzers, and wondered how they could exist without contradicting conservation of energy (for example, if you placed an electrolyzer at the bottom of a lake, then you would think that collecting the buoyant force of the bubbles produced would give you a net gain of energy). In my project, I discovered that though you cannot have an efficiency over 100%, you can have a structure that tends towards the maximum theoretical fuel cell efficiency with height. If you are at all considering doing a project for science fair, I would absolutely recommend doing it. It is an incredible experience, and I am so, so thankful to everyone that helped me get here. I am so excited to be at the Canada Wide Science Fair, learning, sharing ideas and meeting extraordinary people.

#### 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>