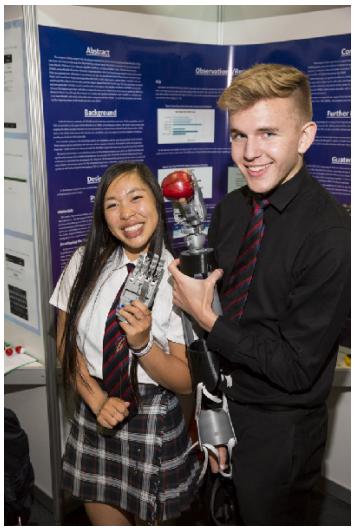
CWSF 2015 - Fredericton, New Brunswick



Andrea Chan, Matt Treble

Get a Grip: Low Cost Solutions to Improve Grip for 3D Printed Prosthetic Hands

Challenge: Innovation
Category: Senior
Region: Vancouver Island
City: Victoria, BC
School: St Michaels University School - Senior, Lambrick Park Secondary

Abstract: Prosthetic hand gloves that are ideal aesthetically, are of good quality, and well functioning can be very expensive and thus are not easily accessible to many people. The goal of this project is to test different plastics to find a cheap, improved grip, and colourable solution for improving grip for 3D printed prosthetic arms.

Biographies

Andrea - My name is Andrea Chan and I am a Grade twelve student at St. Michaels University School. The past three years, my partner Matt and I worked on projects related to psychology. This year, we were inspired to try a different area so we tackled an engineering project. Our project focuses on prosthetic hand gloves and 3D printed prosthetic arms. Because both the prosthetic glove and arm can be very expensive, the goal of this project is to test different plastics that could be used to make a glove that is inexpensive, colourable, and improves the grip strength for 3D printed prosthetic arms. Aside from getting a grip on this new project, I have b...

Matt - My name is Matt Treble and I am a Grade 12 student from Lambrick Park Secondary School in Victoria, BC. For our science project this year, my partner Andrea Chan and I investigated low-cost plastics that could be used to develop fingertip gloves with improved grip for 3D printed prosthetic hands. This will be my fourth time attending the Canada Wide Science Fair, and I am super excited to get the chance to be a part of Team Vancouver Island once again! When I'm not working on science fair projects, I am actively involved in organizing school and community events, the biggest of which being a Youth Pride Conference I co-organized for youth o...

CWSF 2015 - Fredericton, New Brunswick

Janet Dawson

Goodnight Sun!

Challenge: Discovery
Category: Junior
Region: Vancouver Island
City: Victoria, BC
School: Gordon Head Elementary
Abstract: I photographed sunsets over thirteen months and recorded sunset direction and time. During that time, I built formulae to predict sunset direction and time from the top of PKOLS, a park on Vancouver Island. My formulae are accurate within plus or minus five degrees and plus or minus five minutes. In comparison, computer algorithms predict sunset time within plus or minus one minute.

Biography

Ever since grade three I have been fascinated by astronomy, and wanted to be an astronaut. Everything about the unknown, and how everything started is just so interesting to me. People look at the stars and say it tells us about the past, so I wanted to look at the sunsets and see what they tell me. As for my further investigation, I would really like to eliminate all time errors in my formula, and look at the sunrises as well as the sunsets. My advice to other students doing a project would be to have determination. Keep at it, and don't stop until you are 100% satisfied with the results, because in the end it pays off to go the extra mile in science fair.

Awards	Value
Award for Excellence in Astronomy - Junior Sponsor: Royal Astronomical Society of Canada	$500
Challenge Award - Discovery - Junior Sponsor: Youth Science Canada	
Excellence Award - Junior - Silver Medal Sponsor: Youth Science Canada	
Western University Scholarship Silver Medallist - $2000 Entrance Scholarship Sponsor: Western University	$2 000
Total	$2 500

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Alexander Stead, David Weaver

Iron Nanoparticle Based In-Situ Anti-Coagulant Delivery

Challenge: Innovation
Category: Senior
Region: Vancouver Island
City: North Saanich, BC, Victoria, BC
School: Glenlyon Norfolk School
Abstract: The goal of this study is to determine a method for the directing of Anti-Coagulants throughout the human bloodstream. In order to do so, iron nanoparticles are created, and anti-coagulants are bonded to these nanoparticles. These nanoparticles are then directed to the area of concern via a neodymium magnet outside of the body. This shall be illustrated using synthetic substitutes for blood and blood vessels.

Biographies

Alexander - I am a Grade 11 student at Glenlyon Norfolk School in Victoria, BC. I enjoy everything aviation-related, and am working towards obtaining my private pilots licence. I also enjoy spending time reading novels and going rock climbing. I hope to attend University for a BSc, and later go on to a career in Medicine. David Weaver and I were inspired by our common interest in medicine to study the topic of magnetic drug delivery for our science fair project. There are many potential applications for this 'in the real world,' namely, the potential for this method of drug delivery with more advanced procedures, such as with chemotherapy. We hope to fur...

David - Hi, my name is David Weaver, and I'm a Grade 11 student at Glenlyon Norfolk School in Victoria, BC. Other than science fair, I am an avid member of debate in Canada, having just come back from the National championships a fortnight ago. I also play soccer with a club, and enjoy slacklining in the glimpses of spare time I get. The inspiration for this project came after doing some research on the failure of modern medicine to directly target specific locations. For further investigations, we plan to use more potent anticoagulants such as warfarin, or low-molecular weight heparin, and possibly test the efficiency with comparative testing to the...

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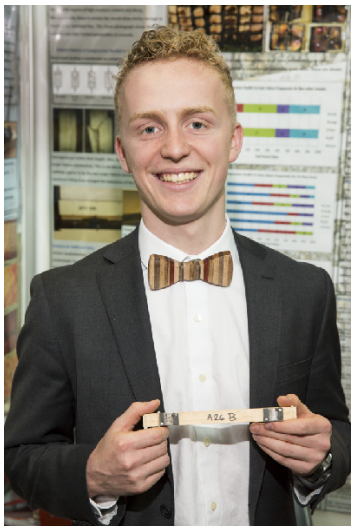

Austin Sawyer

Low Cost Solutions to Improve Tie Longevity

Challenge: Innovation
Category: Senior
Region: Vancouver Island
City: Victoria, BC
School: Lambrick Park Secondary
Abstract: I developed and investigated inexpensive treatments designed to increase wood railway tie longevity. Treatments were chosen to reduce radial splitting, maintain low moisture contents and reduce wood abrasion caused by moving grit in miniature ballast boxes. Ties endured freeze/thaw/heat/soak cycles and the repeated forces of 5 000 trains. Mechanical strength testing showed that three treatments had minimal strength loss and might improve tie longevity.

Biography
CWSF has led me into the best experiences of my life making science become my ultimate passion. Innovation will always be something I love and will be what inspires me to achieve. I plan to go into Biomedical Engineering at UVIC.

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
Total	$2 000

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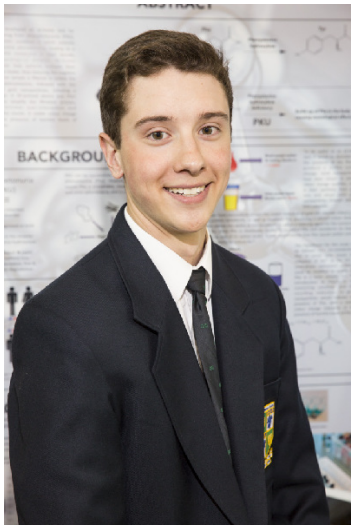

Nathan Kuehne

Phenylalanine Self-Diagnostic Test for Phenylketonuria Patients

Challenge: Health
Category: Senior
Region: Vancouver Island
City: Victoria, BC
School: Glenlyon Norfolk School

Abstract: An at-home test was developed for phenylketonuria patients, a genetic condition where phenylalanine is not metabolized. This diet-controlled disease leads to toxic buildup of phenylalanine, causing neurological defects. To identify the phenylalanine, a urine sample is filtered in a 3D-printed device, followed with the synthesis of gold nanoparticles, initiating a colour-change. This test requires minimal user-interaction and expedites the results compared to current testing methods.

Biography

I am a Grade 11 student, currently attending Glenlyon Norfolk School in Victoria, BC. I play competitive basketball, compete provincially and nationally in Ukrainian Dance, and play multiple instruments. I am honoured to have been selected to attend the Canada-Wide Science Fair (CWSF) for the third time. I travelled to CWSF in Windsor, Ontario last year where I won a gold medal for developing a urine-based test for multiple kinds of tumour-based cancers. In attempting to extend my research of last year, I became aware of a worldwide need for an at-home test for phenylketonuria (PKU) patients, and my focus shifted to filling this void in PKU management and treatment. I hope to continue working on his project, and produce a marketable device that could be sold to those with PKU, directly impacting the lives of those suffering with this condition. After high school, I plan on pursuing a career in medicine or engineering, and continue to positively impact the world.

Awards	Value
Excellence Award - Senior - Gold Medal Sponsor: Youth Science Canada	$250
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 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
University of New Brunswick Entrance Scholarship Gold Medallist - $5000 Entrance Scholarship Sponsor: University of New Brunswick	$5 000
Total	$27 250

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Youth Science Month
Mois des jeunes scientifiques

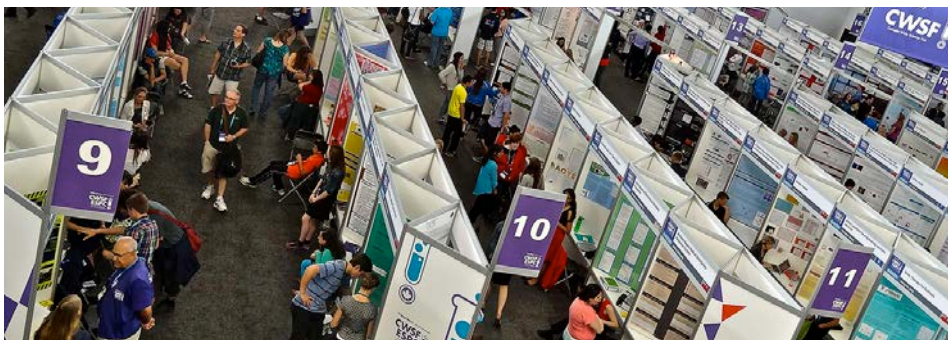
MARCH 2015

science is serious fun

Celebrate the Next Generation of Scientists, Innovators and Entrepreneurs!

Every fall, Youth Science Canada calls on youth across the country to take up the challenge of doing a science project. More than half a million will do a project this school year and about 25,000 of these will compete in one of 100 regional science fairs held across Canada this winter and spring.

Along the way, these youth develop research, communication and presentation skills; they learn to ideate and innovate; and they learn how they can have an impact on the world. They do all of this while having fun engaging in hands-on science, challenging themselves and making amazing new friends.



As March is Youth Science Month, we invite schools, teachers, students, and families to join us in celebrating the imagination, initiative and innovation of Canada's young scientists by visiting their local science fair. To find the fair closest to where you live visit youthscience.ca and click on Find Your Fair.

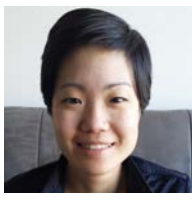
Come and be amazed by what the next generation is accomplishing!

Science In Her Words

Presented by L'Oreal Canada

Ladies, this is your time. Science has no gender, and we are thrilled to see the many women who have made great strides in science and technology over the years. We met up with a few Canada-Wide Science Fair alumni to talk about their experience as women pursuing the sciences.

Alison Thompson
Chair, Canadian Geothermal Energy Association
CWSF 1989



Vivian Pang
Ryerson University studying to become a Public Health Inspector
CWSF 2008

Q. From your experience, why do you feel it is important for women to get involved with science and technology?

VP – It is important for women to get involved with science and technology to establish a scientific community of diverse thinkers. This will expand the way science is studied and applied. In my experience, I was initially hesitant to become a Public Health Inspector (PHI) because I wasn't sure I could fit the "profile" of being one. I was worried I wouldn't be able to keep up in a career that involved science, and law enforcement; two disciplines that you wouldn't normally see women in. I got into this field to help change this view. Don't be fearful of what you want to do in life, and know that there is no "profile" in doing a particular job, or career.

Q. What first drew you to your pursuit in the sciences?

AT – There were so many contributions that led to my pursuit of science – Owl Magazine's Dr. Zed, my grade school class projects and science fairs, an excellent high school chemistry teacher and my grade 12 science fair experience. I still have a distinct memory of taking my HUGE trophy home on the Go Train the night I won. The thought never crossed my mind that I couldn't pursue a career in the sciences.

Q. What are some of the best skills you developed through participating in science fairs?

VP – Science fairs taught me to not be afraid to ask the tough questions. Instead of just asking "why", ask, "why not?", one that I like to ask is, "Why should we care?", being curious and asking questions. If you are able to articulate scientific research to someone who may not be in sciences, or is in a different research field, you will be surprised how far this can take you.

Q. Were there any challenges along the way?

AT – More scholarships were definitely needed in this area throughout my experience as a student. Securing lab time was an ongoing concern through my research. Having non-science parents didn't stop me at all. Their appreciation of taking me to science centres along with other things we did together just made science normal for me.

Q. Do you have any advice for young women interested in science and technology?

VP – Don't be afraid to find ways to follow your scientific passions. Keep an open mind, be persistent, and have confidence in yourself. Young women have the capacity to change the way science and technology is studied and applied in real life, but in order for this to happen, they have to pursue it.

Canada-Wide Youth Science Challenges

Youth Science Canada wants to engage youth in inquiry and critical thinking through science by answering a question or solving a problem that focuses on issues that are important to them, Canada's future and the world.

Discovery
Create new fundamental knowledge based on your curiousity by asking a question and using the techniques of scientific inquiry to develop an answer.

Energy
Improve our use of current energy sources, enable the transition to alternative energy sources, or reduce our energy footprint.

Environment
Reduce our impact on, improve our understanding, and ensure the quality of water, air, soil, and the diversity of living things.

Health
Increase our understanding of the human body, or apply science and technology to improve health, control disease, or support an aging population.

Information
Enhance communication and our use of information using digital and networking technologies, or applications of new media.

Innovation
Combine scientific principles with your creativity to develop a new material, structure, device, or system to solve a problem or improve an existing solution.

Resources
Develop better ways to use our natural resources that provide sustainable sources of food, products, or prosperity.

Canada-Wide Science Fair 2014 Platinum Award Winners

A week-long national event each May, the Canada-Wide Science Fair (CWSF) brings together 500 top young scientists from grades 7-12 (Sécondaire I-V and Cégep in Québec) from across the country to compete for nearly $1 million in cash, scholarships and exclusive science opportunities. These finalists are selected at the 100 regional science fairs across the country, mostly in March and April, leading up to the national competition.

Below are profiles of the three Platinum Award winners at CWSF 2014 held in Windsor, Ontario.

For more information on CWSF 2015 in Fredericton, New Brunswick, May 11-16, visit **cwsf.youthscience.ca**.

Au rythme de l'haptique

Thomas Imbeault-Nepton is a 13-year-old from St-Honore, QC whose project aimed to improve the quality of life for individuals suffering from Parkinson's disease. Thomas made this possible through a vibration system, similar to the common auditory system but with less constraints.

Thomas won a gold medal and the Platinum Award for Best Junior Project at the 2014 Canada-Wide Science Fair in Windsor. He also won the Junior Health – Challenge Award and an entrance scholarship to Western University and the University of Windsor.

Picture This!: A Novel Approach to Limb Donor Identification & Prosthetic Design

Daniel McInnis, a 16-year-old from Ottawa, ON, developed a low-budget 3D scanner that is a valid option for making comfortable prosthetic limbs that are aesthetically accurate for the users wearing them.

In 2011, Daniel won a Gold Medal and a Platinum Award for Best Junior Project at the Canada-Wide Science Fair. For this project, Daniel won his second Gold Excellence Medal and the Best Project Award along with the Manning Innovation Achievement Award, the senior level Innovation – Challenge Award and entrance scholarships to Dalhousie University, the University of British Columbia, the University of Manitoba, the University of Ottawa, Western University and the University of Windsor.

The Time-Integral of Distance: Uncovering A New Property of Fundamental Physics

Maya Burhanpurkar is a 15-year-old from Oro-Medonte, ON. Her project marks the discovery of a new fundamental property of physics, specifically the time-integral of distance.

Maya was already a Canada-Wide Science Fair Platinum Award winner, for her project at the CWSF 2012 in Charlottetown. She won her second gold medal and Platinum Award for Best Intermediate Project in Windsor along with The Actuarial Foundation of Canada Award and the Discovery – Challenge Award at the intermediate level. Maya also won an entrance scholarship to Western University and the University of Windsor.

Youth Science Month - Serious Fun!

Youth Science Canada
Sciences jeunesse Canada

is published each March by Youth Science Canada for Canadian educators.

Youth Science Canada exists so Canadian youth are engaged through science in inquiry and critical thinking. To learn more about our programs, visit youthscience.ca.

CWSF Canada-Wide Science Fair · ESPC Expo-sciences pancanadienne

May 11-16, 2015 Fredericton, NB

Youth Science Canada's
54th annual
Canada-Wide Science Fair

University of New Brunswick

School groups* and public welcome:

Thursday May 14 - 1:00pm-8:00pm
Friday May 15 - 9:00am-12:00pm
Saturday May 16 - 9:00am-12:00pm

*(Thu & Fri - advance booking required)

cwsf.youthscience.ca