The Formula

Mid-Canada Regional Section
May 31, 2016

AOAC DAY
JUST 2 WEEKS AWAY

Cover photo: This is the exhibit hall we used in June of 2015. If you have been to past AOAC DAYS, you will also recall that parking is very close, FREE and convenient. See you there!

Greetings for 2016 from your MidCanada AOAC Executive:

We are working hard on making AOAC-DAY 2016 even better than before. It is only 2 weeks away, and it looks great. More equipment vendors and lots of opportunities to visit with your peers in the industry. Please take the time to read the Courses we offer on June 16. The details are on pages 5-6-7. These courses are great opportunities for your professional development. You must write to let us know you are interested!

If you would like to spend a few hours this year, helping Mid Canada AOAC succeed into the future, please consider letting someone know. We would like to see a few fresh faces on the Executive for the next year or two.

If you can think of anything that would be of interest to your fellow members, in a newsletter article, please let any member of the AOAC Executive know.

Contributions are most welcome for next time!
Why not tell us what is new at your lab?

David Grant, Editor

All photos and text, not otherwise attributed, are by D.Grant

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We are pleased to announce the KEYNOTE SPEAKER for AOAC DAY. Please mark your planners and calendars for June 16, 2016.

Dr. Mark Torchia

Mark is the Director of the Centre for the Advancement of Teaching and Learning at the University of Manitoba, where he and his colleagues collaborate with faculty to provide leadership, expertise, and support in fulfilling the teaching and learning mission of the University of Manitoba (UM). (Pic provided by Mark T.)

Previous to that appointment, Mark had a 30 year career in the Department of Surgery with St. Boniface General Hospital, the Winnipeg Regional Health Authority, and the Health Sciences Centre. He was the Director of Advanced Technologies for the WRHA and the Director of the Medical Pre-clerkship Curriculum for UM.

Mark continues as a Professor of Surgery where his teaching activities relate to human development and his research activities are focused on minimally invasive surgery and diagnosis.

Mark has founded two successful medical device companies. He is the author of numerous academic papers, two medical textbooks, and holds many patents.

Mark was the Chair of the Committee on Drugs and Related Materials and member of the Official Methods Board for AOAC International (1991 -1998) as well as the President, Mid-Canada Section AOAC (1993-4).

There is coverage of
AOAC DAY 2015
beginning on page 11.

MANITOBA'S LARGEST ANNUAL SCIENTIFIC CONFERENCE AND TRADE SHOW

AOAC DAY 2016

AOAC MID-CANADA

THURSDAY, JUNE 16TH

VICTORIA INN HOTEL AND CONFERENCE CENTRE
WINNIPEG, MB
REGISTRATION OPENS AT 8:00 AM

REGISTER ONLINE BY JUNE 1ST FOR A CHANCE TO WIN A $100 GIFT CARD

Keynote Address:

IT ACTUALLY *IS* BRAIN SURGERY

- An Innovation Adventure

Dr. Mark Torchia

Co-winner of the Governor General Innovation Award for developing brain laser technology

Plus:
- Technical Presentations
- Annual General Meeting
- Exhibition of Scientific Equipment and Supplies from 25+ exhibitors
- Buffet Lunch Provided

Who Should Attend?

Laboratory personnel, supervisors, scientists, and managers working in the fields of:
agrology, biology, chemistry, environmental studies, food science, microbiology, toxicology, veterinary science

FREE WORKSHOPS:

- **GC method development using EZGC™** – *Chromatographic Specialties Inc.*
- **Design of experiment and chromatography method development** – *Chromatographic Specialties Inc.*
- **Challenging chromatography and mass spectrometry applications and novel solutions** – *Agilent Technologies*
- **Innovative atomic spectroscopy solutions and tips on enhancing your current elemental analysis methods** – *Agilent Technologies*
- **Demonstration and hands-on experience with spectroscopy and material characterization instrumentation** – *Perkin Elmer*
- **Near Infrared Sample Analysis Techniques for Laboratory and On-Line Applications** – *Bruker*

Registration fee: $25.00 (includes lunch) • FREE Registration for Students (First 50)

www.midcanadaaoac.org

AOAC OFFERS THESE FREE COURSES; reserve your spot today!

1)EZGC™ Method Development Tools Suite (45 minutes

Presented by Dominique Lavigne, Chromatographic Specialties Inc.

Whether you are developing a new GC method or looking to reliably optimize an application, Restek's EZGC™ method development tools will save you hours of calculations, guesswork, and trial-and-error. These free, web-based applications are easily accessible by visiting www.restek.com/ezgc — and Windows users can also download the newest component, the EZGC™ method translator and flow calculator, for offline use.

The new EZGC™ method translator and flow calculator makes it simple to switch carrier gases, change column dimensions or detectors, or to optimize a method for speed or efficiency. Simply enter your current method specifications and you will receive a full set of calculated method conditions that will provide similar chromatography. Results include oven program and run time as well as average velocity, flow rate, splitless valve time, and other control parameters—all in an easy-to-use, single-screen interface with seamless transfer between tools.

Already a favorite of analysts around the world, the EZGC™ chromatogram modeller helps you develop a new method from scratch, including the column and conditions. Simply enter your analyte list to generate a customized, interactive model chromatogram that provides a specific phase, column dimension, and conditions. Zoom in, view chemical structures, and even overlay mass spectra of coeluting compounds.

On a PC or Mac, desktop or tablet, our EZGC™ method development tools make it easy to tailor a perfect solution for your method development challenges.

2) Design of Experiment and Chromatography Method Development (1 hour)

Presented by Matt Clark, MSc., Chromatographic Specialties Inc.

Each time we develop a new method in gas or liquid chromatography we are conducting an experiment to determine the optimum conditions for separating our set of analytes in a reasonable length of time, with reasonable stability and reasonable resolution.

Neither one factor at a time and fully factorial method development schemes are entirely suitable for new method development in chromatography. With one factor at a time method development, it is very easy to miss optimal conditions generated by an interaction of two or more conditions.

Fully factorial experimental design ensures that we will capture all possible interactions between our selected variables, but the number of test runs grows as cv with c being the number of conditions in each variable, and v the number of variables. If we test 3 levels for buffer, organic modifiers, gradient profile and stationary we have 81 runs to test – before we run replicates!

Reduced factorial design is a method of testing for the most likely interactions between variables in a chromatography method (or any other experiment). It involves using generally applicable rules (the chance of requiring the interaction of three or more factors to get a result is low), and general knowledge of our analytes (if you have an acidic or basic molecules, you're likely to see pH interactions with other variables.

3) Demonstration and hands-on experience with PerkinElmer Spectroscopy and Material Characterization Instrumentation (2 hours)
Presented by Brian Wong, PerkinElmer

Bring questions about your samples, sample types and sample preparation. Demonstration and hands on experience of PerkinElmer FTIR microscope, DSC and UV/VIS instrumentation.

4) Challenging chromatography and mass spectrometry applications and novel solutions (3 hours)
Presented by Agilent Technologies

This workshop will focus on several new application areas in GC, LC, and GCMS/LCMS analysis. Hot topics such as Extractables and Leachables, 2-dimensional HPLC, and improving workflows by implementing better sample preparation and GC/LC tips will be discussed. Unique advantages using accurate mass analysis will also be discussed. Bring your difficult questions as there will also be time at the end of the day for some one-on-one and small group problem solving with our experts.

5) Innovative atomic spectroscopy solutions and tips on enhancing your current elemental analysis methods (3 hours)
Presented by Agilent Technologies

This workshop focuses on Innovations in Atomic Spectroscopy and Elemental Analysis Solutions. New applications for ICP-OES and ICP-MS, as well as unique MP-AES and ICP-QQQ solutions will be discussed. Agilent specialists and application chemists will be on-hand to present on the latest technological innovations in elemental analysis, discuss some of the newest applications, and go over helpful hardware, software, and sample prep tips & tricks to enhance your current workflows. Bring your difficult questions as there will also be time at the end of the day for some one-on-one and small group problem solving with our experts.

6) Near Infrared Sample Analysis Techniques for Laboratory and On-line Applications (1 hour) Presented by Dr. Robert Cocciardi, Bruker Ltd.

Near Infrared (NIR) spectroscopy is a powerful and rapid analytical tool for analyzing samples non-destructively giving accurate quantitative and qualitative results in seconds. Almost any type of sample can be measured by NIR Spectroscopy if the right sampling technique is used. Common measurement techniques for NIR are diffuse reflectance or diffuse transmittance for solids, transmittance for clear liquids and transflectance for emulsions and suspensions. Chemometric tools such as partial

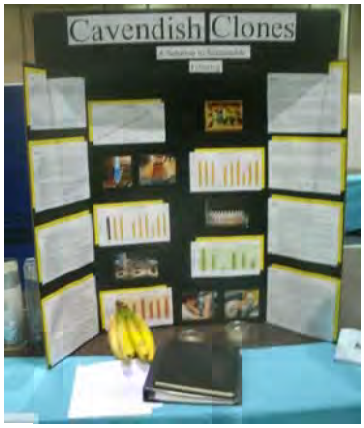
least squares (PLS) and principal component analysis (PCA) are employed to develop statistical models for qualitative and quantitative analysis of the acquired NIR data. One of the keys in getting the most precise and accurate results is in choosing the right sampling technique, as sometimes more than one measurement technique can be used, by taking into account the sample's homogeneity, distribution of particles and absorption range. For on-line continuous monitoring measurements, the same sampling techniques exist but need to be adapted in a form so as it can be interfaced to the process stream. Different probe designs, fiber options and sensor options are available for making measurements in process in diffuse reflectance, transmittance and transflectance. As with laboratory samples, the best sampling option to choose depends on the properties of the samples as well as taking into consideration which part of the stream is being measured and whether it is representative of the process. In this workshop the best NIR sample analysis techniques to use for different types of samples in order to get optimal results will be discussed.

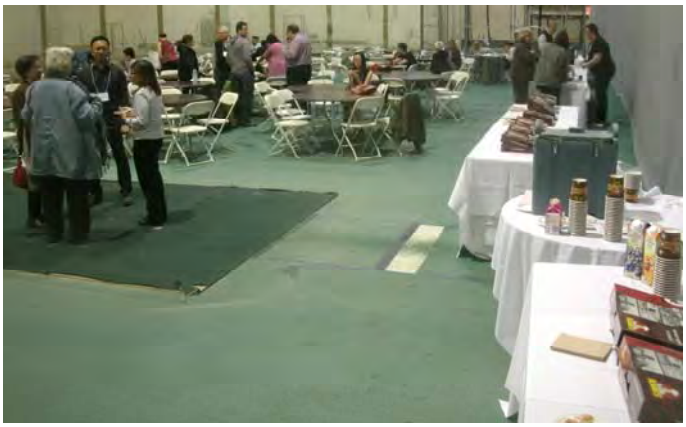
7) LC-MS Quantitation Workshop: Method Development Pitfalls and Suggestions (1.5 hours)

Presented by Dr. Xuejun Peng and Dr. Jim Kapron, Bruker Ltd.

Bring your questions and real-world problems to this practical workshop. When developing a quantitative method and faced with early evidence of variability, what actions can you take? What if the r-squared is less than 0.98, or the percent deviation is greater than 20% at the lower level of quantitation? Other common issues include but are not limited to:

a) Stability: standard solvent & matrix stability, bench top stability, reconstitution stability, batch re-injection stability, sample in-process stability, sample storage stability, sample collection procedure, light sensitive compounds, etc.
b) How to improve extraction recovery – solvent, pH and others
c) LC peak shape, mobile additives & pH selection
d) Carryover from one sample to the next
e) How to improve method sensitivity
f) LLOQ/ULOQ – regulatory requirements, accuracy & precision
g) Chiral or isomer/isobaric component quantification
h) How to quantify endogenous components – matrix selection and parallel test
i) Matrix effect – variability observed including when using stable isotope labelled internal standards
j) Hemolysis effect if handing biological matrix (blood, serum, plasma)
k) How to get the simplest regression model vs. weighting selection, including discussion about regression coefficient
l) Validation – partial validation, cross-validation and full validation
m) How to handle outlier data





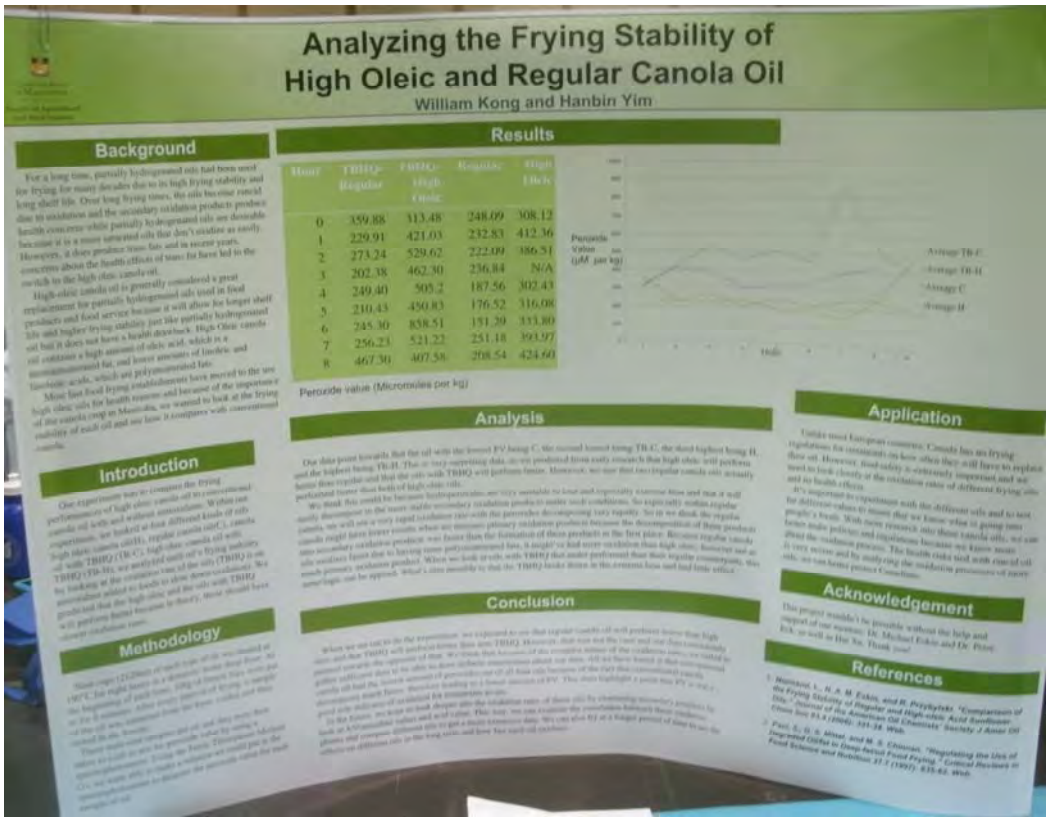
Every year, MC-AOAC Recognizes the best Analytical Work at the Manitoba Schools Science Symposium. For a very long time, your AOAC volunteers have taken part in the Annual Province-wide science fair. We awarded a plaque and a check to 4 students

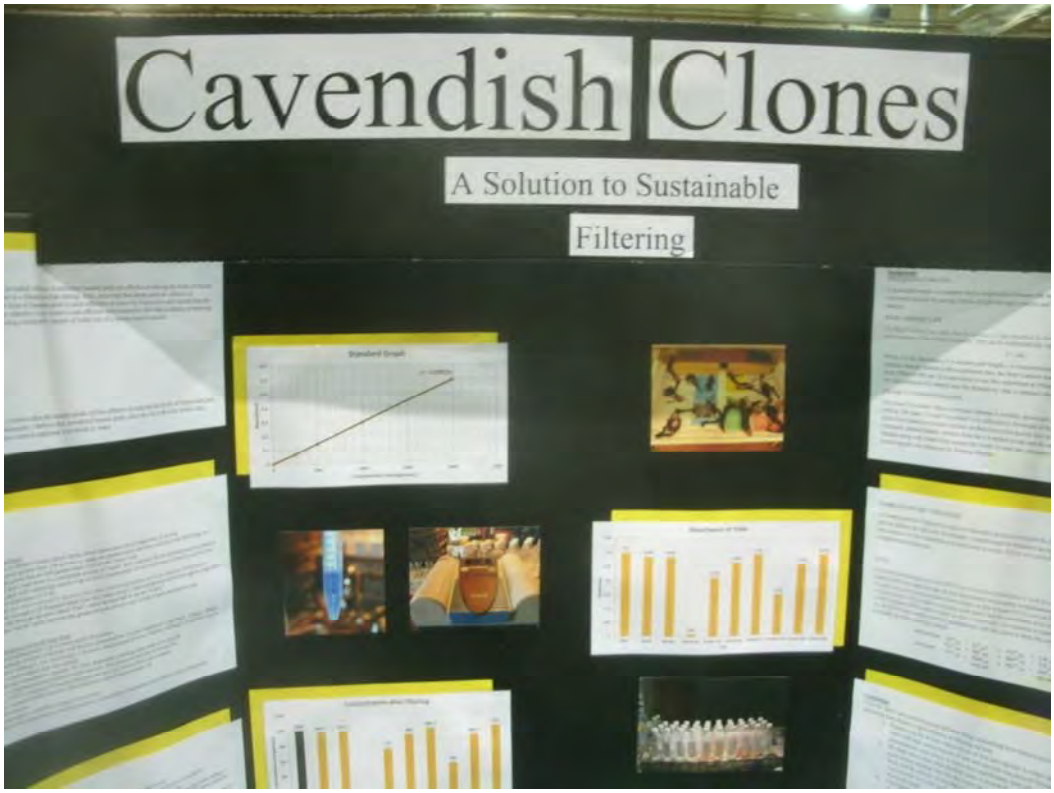
Tooba Razi, a student at Fort Richmond Collegiate, for Project 3504, on **The Identification of alpha-glucosidase inhibiting natural products from cinnamomum zeylancium.**

Hanbin Yim and William Kong, also from Fort Richmond Collegiate, for Project 4504, **Analyzing the Frying Stability of High Oleic and Regular Canola Oil.**

Philip Kawalec, from Sisler High School, for his project #4601, using **Cavendish Clones: A Solution to Sustainable Water Filtering**

The photos below were snapped and provided by the nice volunteers at the MSSS…

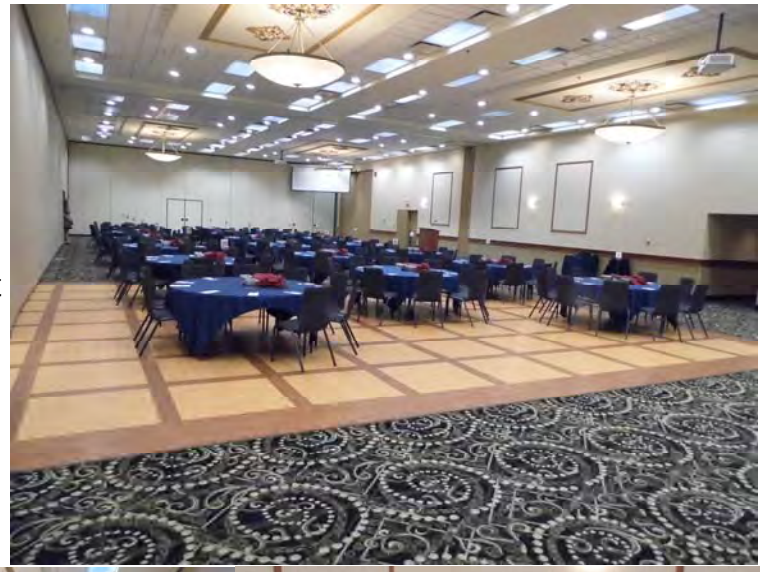

Analyzing the Frying Stability of
High Oleic and Regular Canola Oil
William Kong and Hanbin Yim
Background
Introduction
Methodology
Results
Hour
TBHQ-Regular
TBHQ-High Oleic
Regular
High Oleic
0 359.88 313.48 248.09 308.12
1 229.91 421.03 232.83 412.36
2 273.24 529.62 222.09 386.51
3 202.38 462.30 236.84 N/A
4 249.40 505.2 187.56 302.43
5 210.43 450.83 176.52 316.08
6 245.30 858.51 151.20 333.80
7 256.23 521.22 251.18 393.97
8 467.30 407.58 208.54 424.60
Peroxide value (Micromoles per kg)
Analysis
Conclusion
Application
Acknowledgement
References


Cavendish Clones
A Solution to Sustainable
Filtering

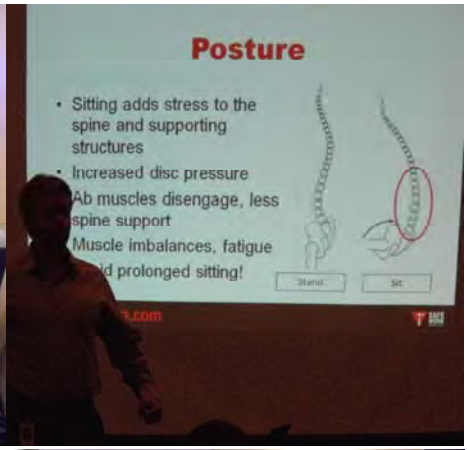
MSSS Awards Ceremony at the University of Manitoba. Above and below left, Dr. Digvir Jayas, P.Eng FEC speaks on behalf of the University. While most at the head table were students at the MSSS not that many years ago, Hugh McAlpine, below right has been integral to this event since its beginning in 1970s.

As we approached the 2015 edition of Mid-Canada AOAC Day, I realized that we had not been recording most of our previous events with many photos. This is a more complete photo essay, to tell you what it was like before and at our big June event last year. Please mark our 2016 date on your calendar. You don't want to take a chance that you will miss out!

Below is the main exhibit hall, the luncheon room below at right, and at bottom left, the buffet area, all taken early the day before the big day. At bottom right, our AOAC team helps our exhibitors, the evening before. Most arrive and set up the night before.



AOAC volunteers helping exhibitors, above left on the night before, and when the show opened on Tuesday morning above right. In the pics below, the show is nearly ready for the crowds of scientists to visit each of the booths.

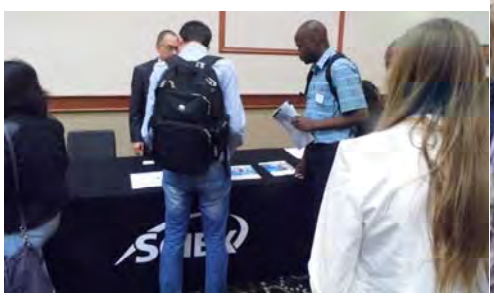


The heart of our AOAC Day is our selection of technical sessions. Each of us is offered lessons from experts on topics, from how to work safely, to the latest research in local labs. In the main exhibit hall, below local scientists take advantage of the expertise and table-top demonstrations from suppliers and info sources of all kinds.

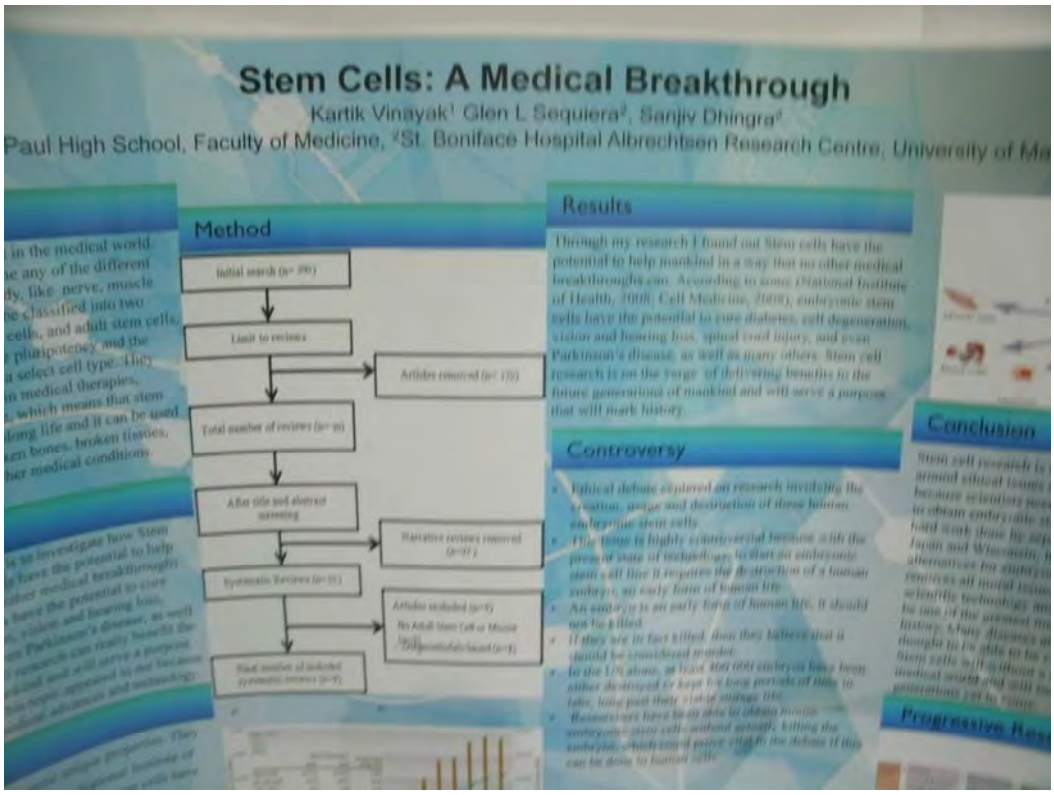
Local Food Science folks hold a specialized exhibit event each year. Because the exhibitors at their event, and the attendees, are not all the same as those at AOAC Day, our executive decided a few years ago to explore the idea of each of us telling our attendees about the 'other' event. Below and at right, more potential 'customers' looking over the displays of these vendors.

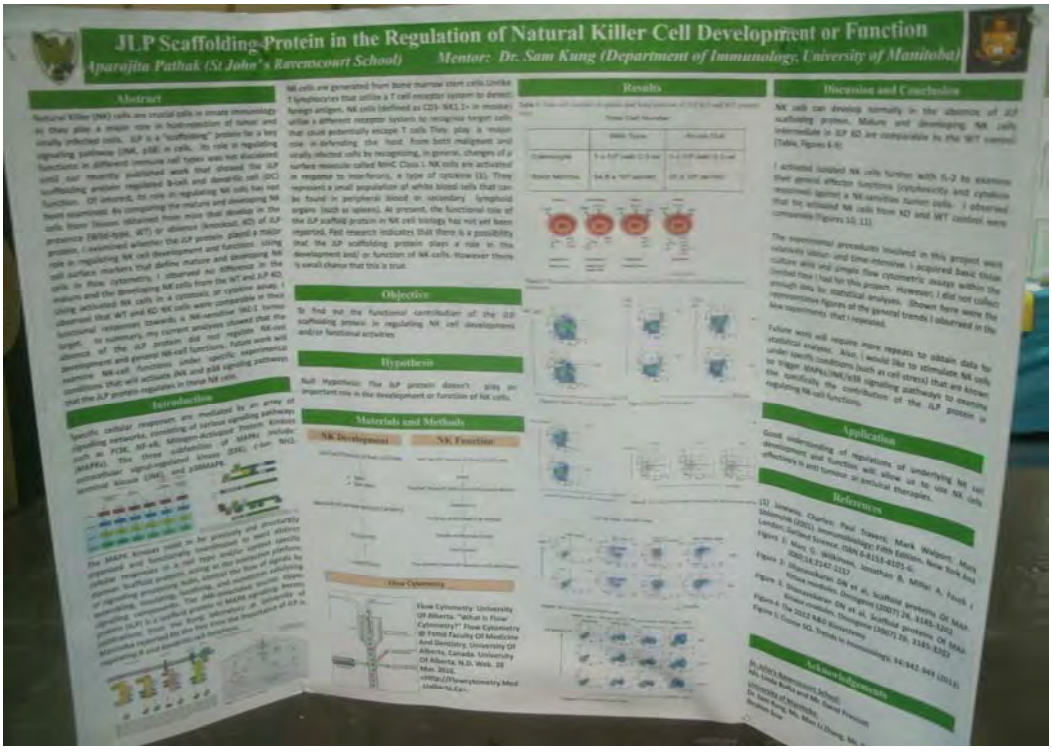
More scientists enjoying as they learn on the exhibit floor at AOAC Day.

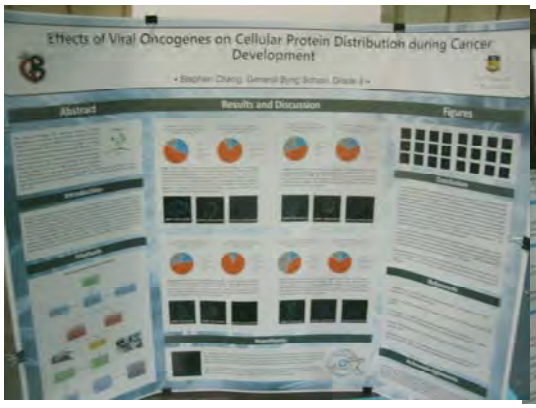
Below right, our President Brian Archer circulated on the exhibit floor in 2015, chatting with our attendees. We like to get more insights into what you folks think about this show.
Write us a reply and let us know your thoughts now !



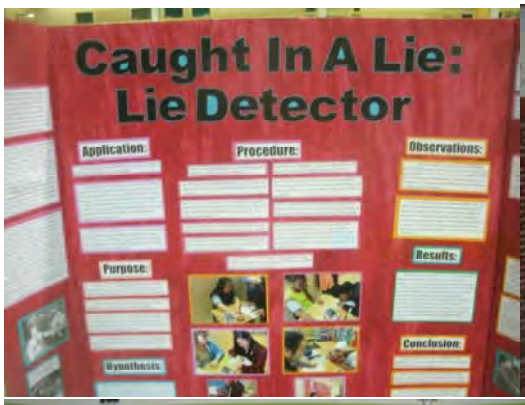
Our luncheon speaker is introduced above by Brian, our 2014-2015 AOAC President. Every year, we enjoy one of the biggest and best Conference centers in Winnipeg, even more elegant since their 2015 upgrades. There are refreshment breaks periodically through the day, as shown below.

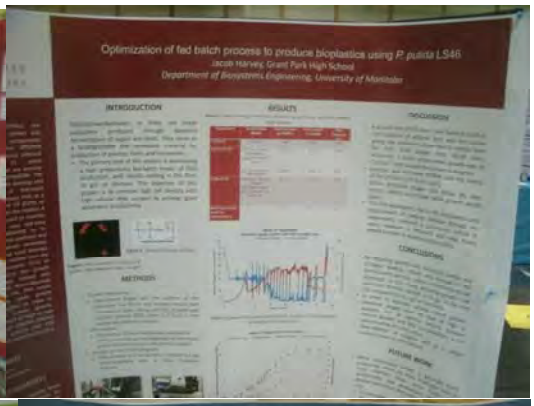

Stem Cells: A Medical Breakthrough
Kartik Vinayak[1] Glen L Sequiera[2], Sanjiv Dhingra[2]
Paul High School, Faculty of Medicine, [2]St. Boniface Hospital Albrechtsen Research Centre, University of Ma
Method
Initial search (n= 200)
Limit to reviews
Articles removed (n= 150)
Total number of reviews (n= 50)
After title and abstract screening
Narrative reviews removed (n=17)
Systematic Reviews (n=33)
Articles included (n=6)
Results
Through my research I found out Stem cells have the potential to help mankind in a way that no other medical breakthroughs can. According to some (National Institute of Health, 2008; Cell Medicine, 2008), embryonic stem cells have the potential to cure diabetes, cell degeneration, vision and hearing loss, spinal cord injury, and even Parkinson's disease, as well as many others. Stem cell research is on the verge of delivering benefits to the future generations of mankind and will serve a purpose that will mark history.
Controversy
Conclusion
Progressive Re

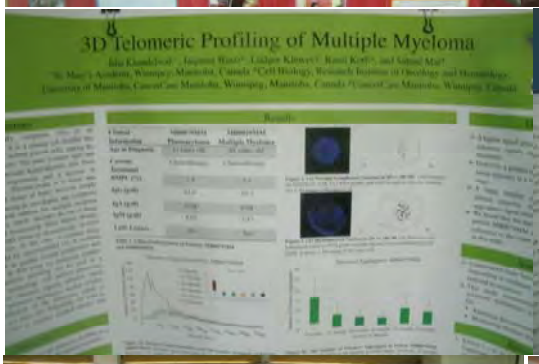

JLP Scaffolding Protein in the Regulation of Natural Killer Cell Development or Function
Aparajita Pathak (St John's Ravenscourt School)
Mentor: Dr. Sam Kung (Department of Immunology, University of Manitoba)
Abstract
Introduction
Objective
Hypothesis
Materials and Methods
Results
Discussion and Conclusion
Application
References
Acknowledgements

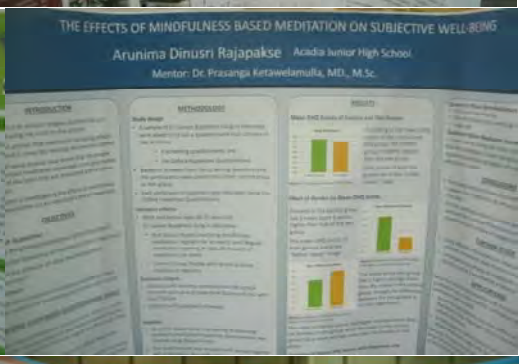

Effects of Viral Oncogenes on Cellular Protein Distribution during Cancer Development
Abstract
Results and Discussion
Figures

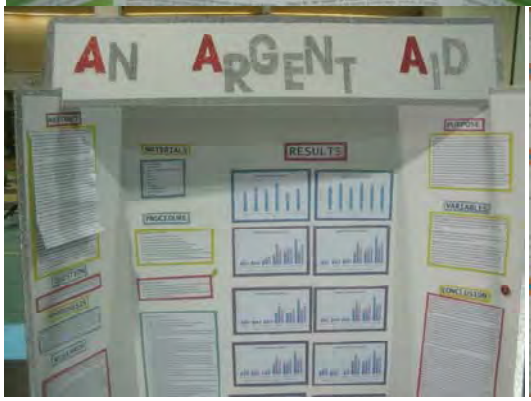

CUTS LIKE A KNIFE:
IMPROVING WATER VESSEL SPEED AND EFFICIENCY


Caught In A Lie:
Lie Detector
Application:
Procedure:
Observations:
Purpose:
Results:
Conclusion:
Hypothesis

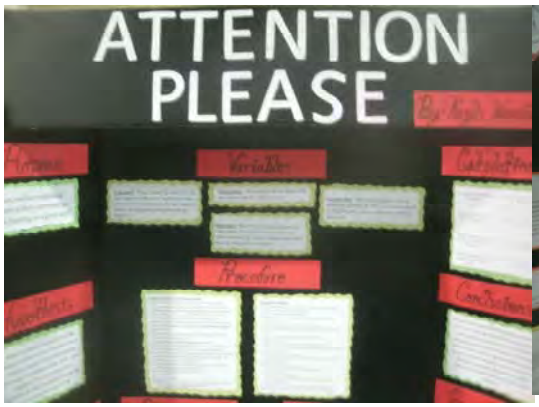

Optimization of fed batch process to produce bioplastics using P. putida LS46
INTRODUCTION
RESULTS
METHODS
CONCLUSIONS

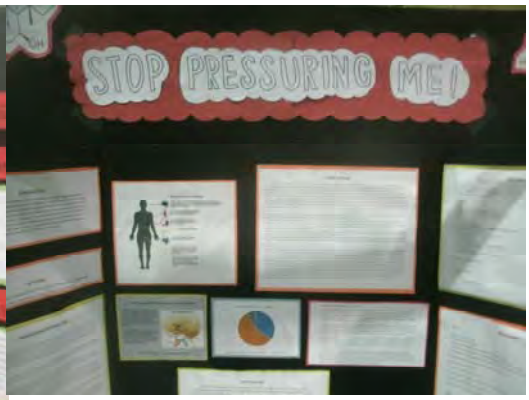

3D Telomeric Profiling of Multiple Myeloma


THE EFFECTS OF MINDFULNESS BASED MEDITATION ON SUBJECTIVE WELL-BEING
Arunima Dinusri Rajapakse
Acadia Junior High School
Mentor: Dr. Prasanga Ketawelamulla, MD., M.Sc.
INTRODUCTION
METHODOLOGY
RESULTS


AN ARGENT AID
RESULTS

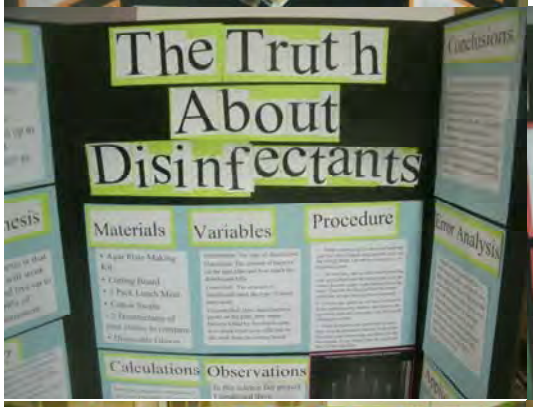

KILLER KEFIR

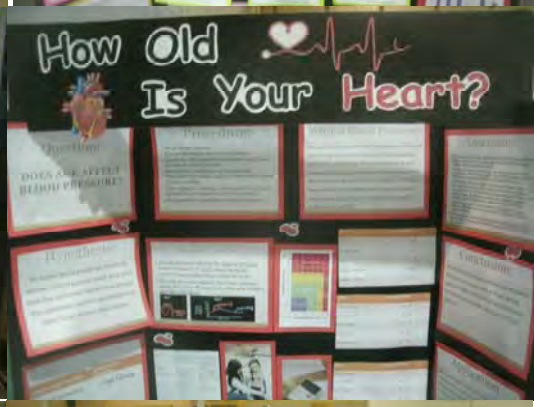

ATTENTION PLEASE
Variables
Procedure

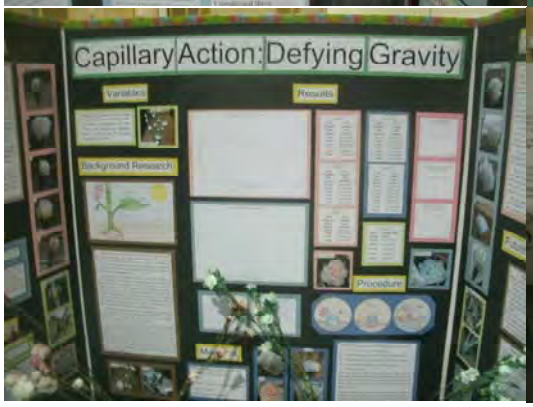

STOP PRESSURING ME!

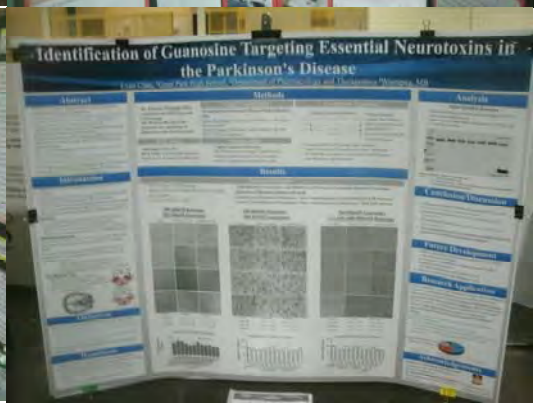

Fat... Mold Accelerator?

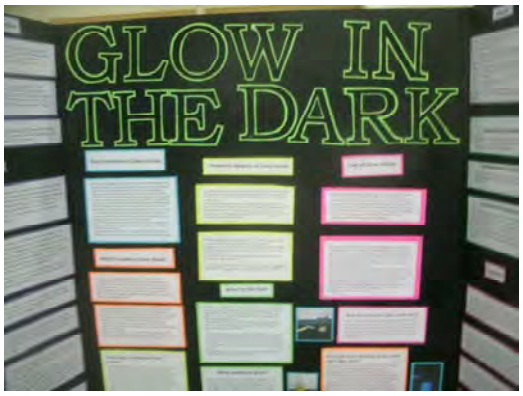

HIDDEN FLAX

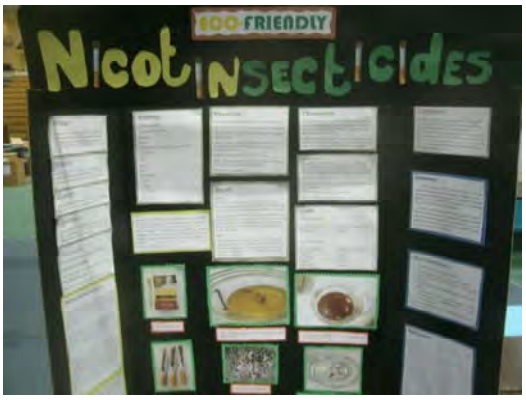

The Truth About Disinfectants
Materials
Variables
Procedure
Calculations
Observations
Conclusions


How Old Is Your Heart?


Capillary Action: Defying Gravity
Variables
Results
Background Research
Procedure


Identification of Guanosine Targeting Essential Neurotoxins in the Parkinson's Disease

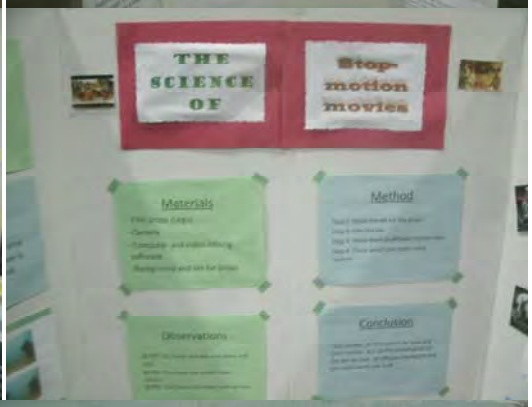

GLOW IN
THE DARK

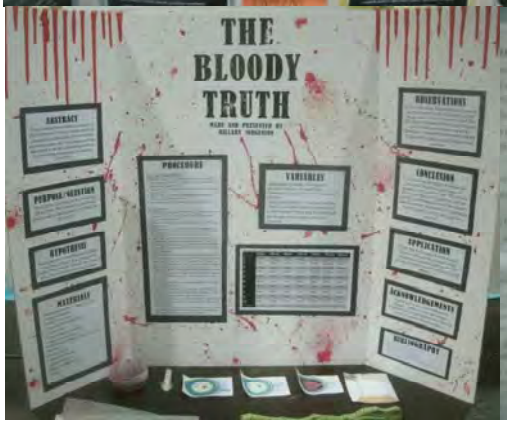

ECO-FRIENDLY
Nicot INSECTICIDES

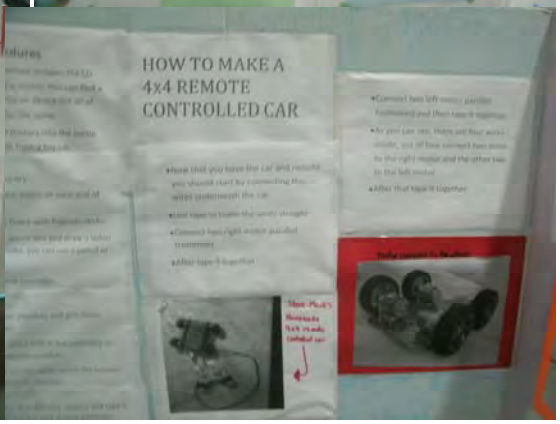

PENCIL
POWER
By:
RESEARCH
METHOD


Camo for my Mini-Sumo!
By: Navjot Purba
The Effects of Different Materials On An Ultrasonic Sensor
The Effects of Different Materials
On An Ultrasonic Sensor

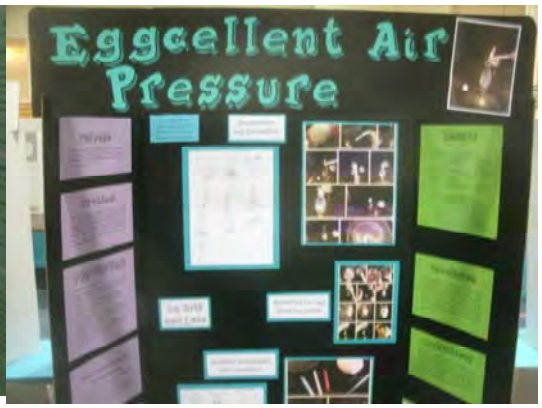

Piezoelectric
Generator
Data
Circuit
PROCEDURE


THE
SCIENCE
OF
Stop-
motion
movies
Materials
Method
Observations
Conclusion

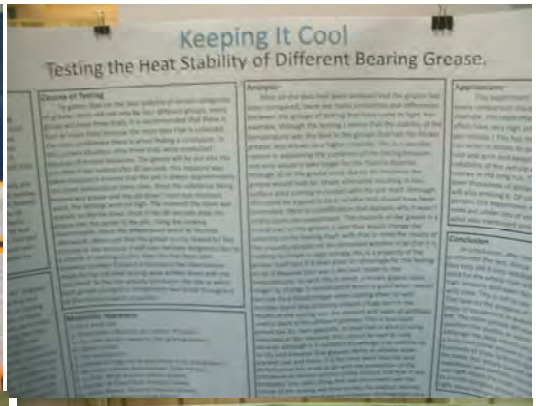

THE
BLOODY
TRUTH
ABSTRACT
PROCEDURE
VARIABLES
CONCLUSION
APPLICATIONS
ACKNOWLEDGEMENTS

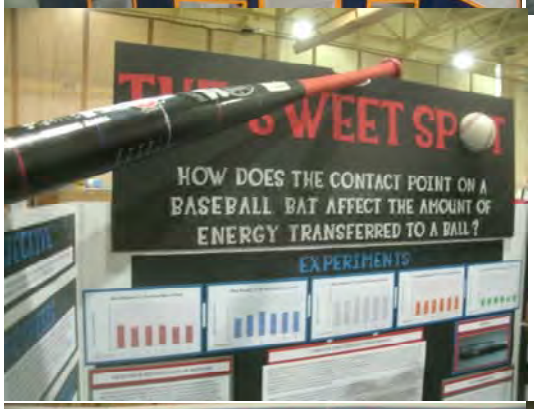

HOW TO MAKE A
4x4 REMOTE
CONTROLLED CAR


NERF ATTACK


Eggcellent Air Pressure

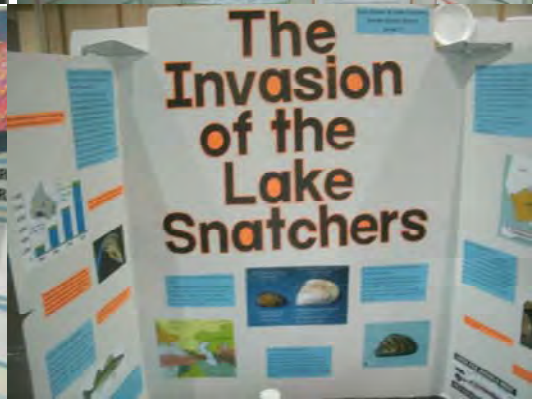

Protecting Electronics
What is the best material for impact protection?

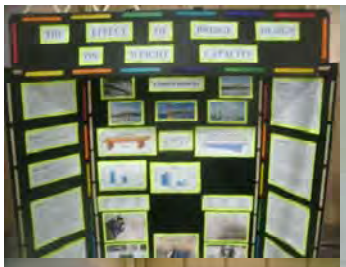

Keeping It Cool
Testing the Heat Stability of Different Bearing Grease.

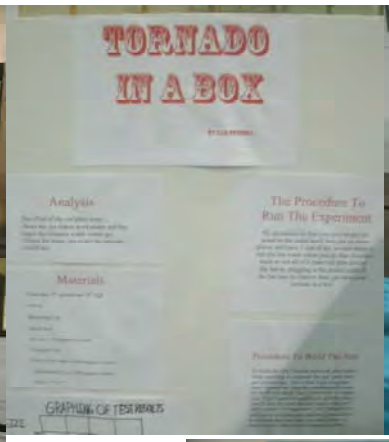

HOW DOES THE CONTACT POINT ON A BASEBALL BAT AFFECT THE AMOUNT OF ENERGY TRANSFERRED TO A BALL?
EXPERIMENTS

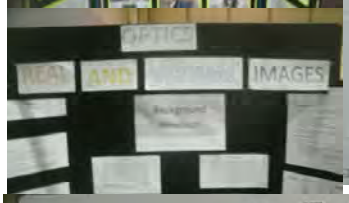

BIG GUNS


BIO-PLASTICS
PROBLEM/ QUESTION
HYPOTHESIS
PROCEDURES
RESULTS/ OBSERVATIONS


The Invasion of the Lake Snatchers

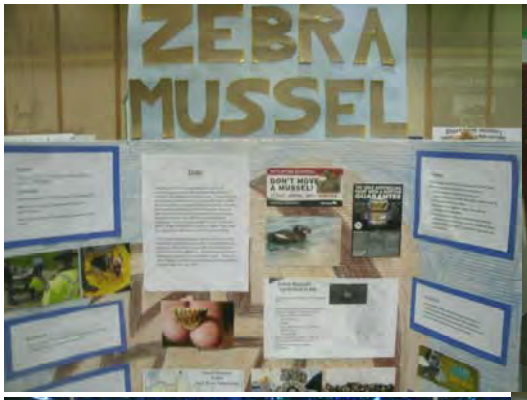



TORNADO
IN A BOX
Analysis
The Procedure To
Run The Experiment
Materials

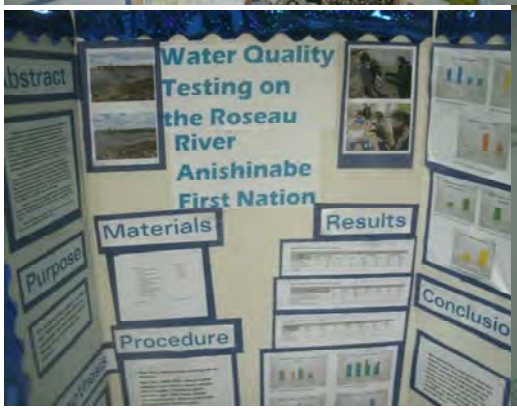

IMAGES

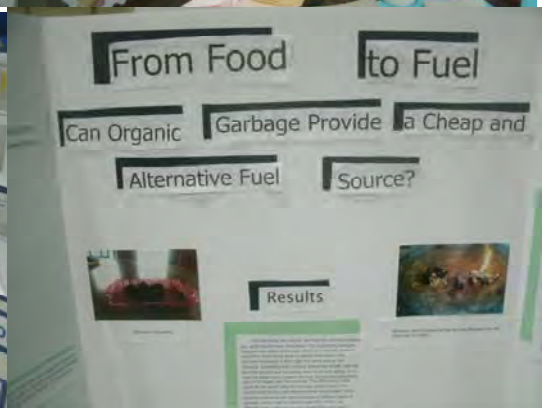

WATER & MINTS

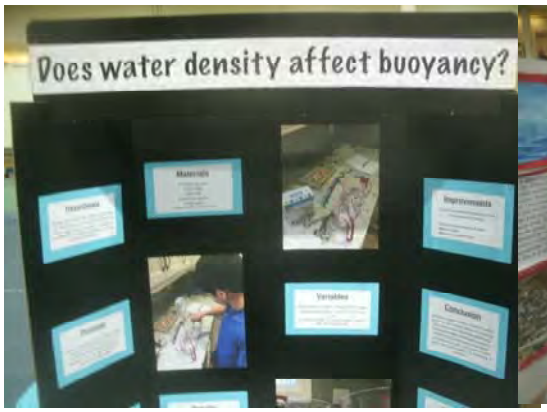

Only Brush
the Teeth You
Want to Keep!
Observation

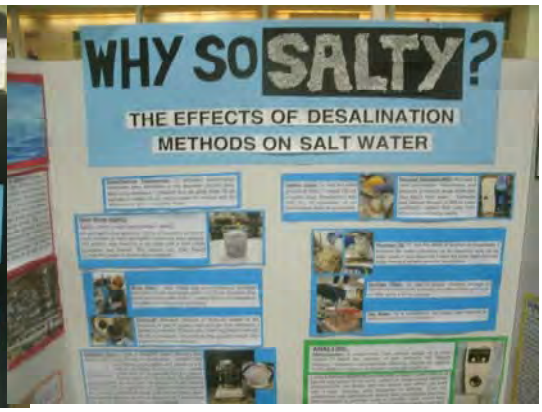

ZEBRA
MUSSEL
DON'T MOVE
A MUSSEL!


WHAT NATURAL SUBSTANCE IS
BEST FOR WATERPROOFING

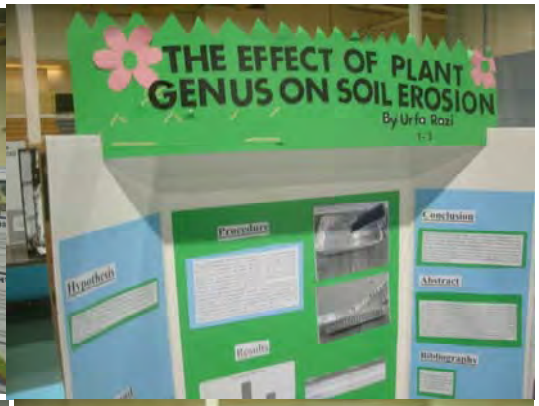

Water Quality
Testing on
the Roseau
River
Anishinabe
First Nation
Abstract
Purpose
Materials
Procedure
Results
Conclusio


From Food
to Fuel
Can Organic
Garbage Provide
a Cheap and
Alternative Fuel
Source?
Results

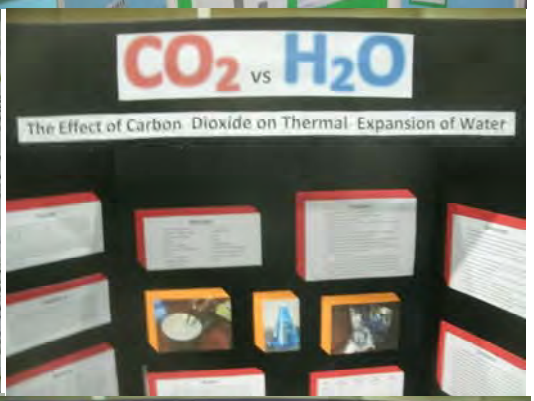

Does water density affect buoyancy?

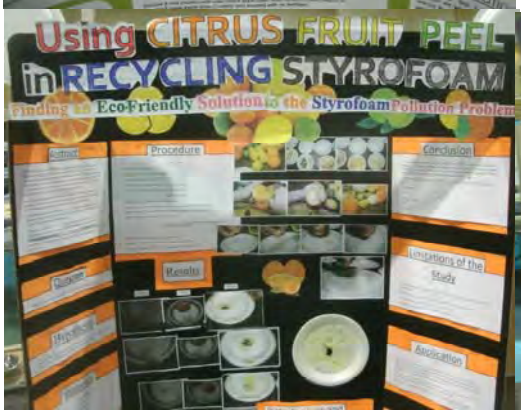

WHY SO SALTY?
THE EFFECTS OF DESALINATION METHODS ON SALT WATER


FISH FUEL
Producing Renewable Biofuels from Fish
PROJECT OBJECTIVES
MY EXPERIMENT
PURPOSE
HYPOTHESIS

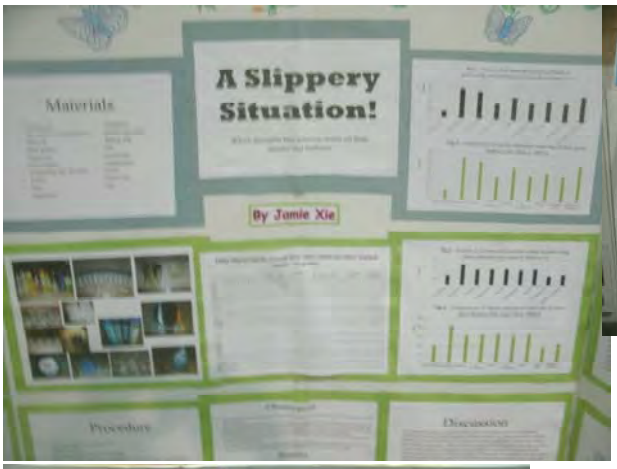

THE EFFECT OF PLANT GENUS ON SOIL EROSION
By Urfa Razi
Hypothesis
Procedure
Conclusion
Abstract
Bibliography

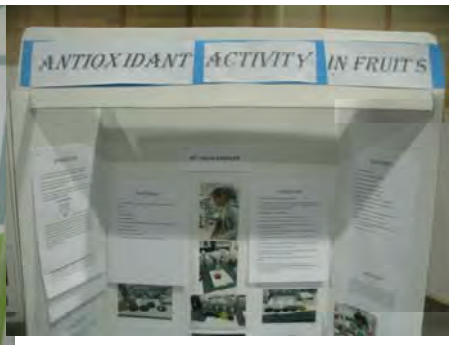

Reduce, Reuse, Recycle Fertilizer
Method
Results
Observations


CO2 vs H2O
The Effect of Carbon Dioxide on Thermal Expansion of Water


Using CITRUS FRUIT PEEL in RECYCLING STYROFOAM
Finding an Eco-Friendly Solution to the Styrofoam Pollution Problem
Procedure
Conclusion
Results
Limitations of the Study
Application

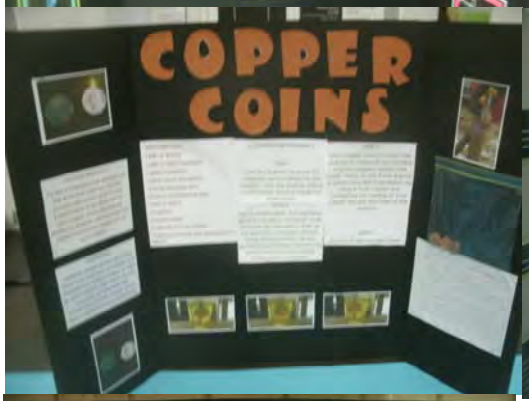

TREMORS
BEFORE
AFTER


A Slippery Situation!
Materials
By Jamie Xie
Procedure
Discussion

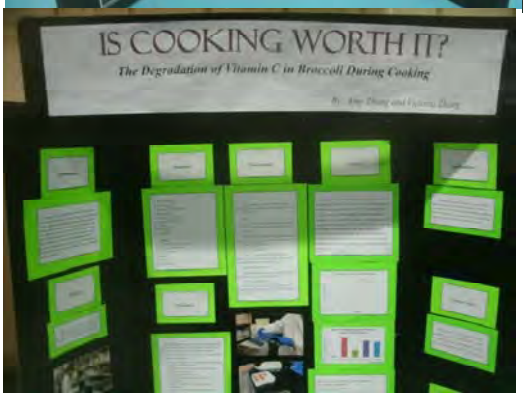

ANTIOXIDANT ACTIVITY IN FRUITS


Rainbow Fire
Flame Spectroscopy
Purpose
Procedure
Observation

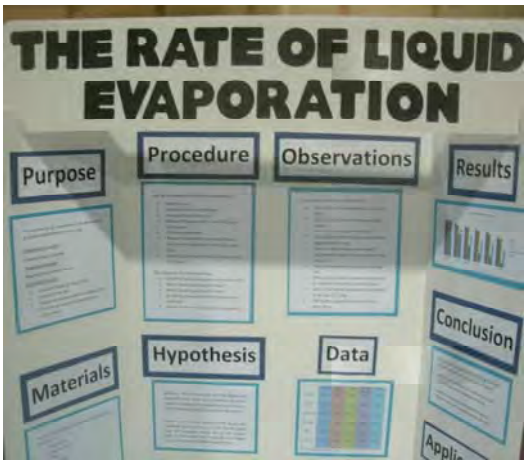

CUPCAKE MISTAKE
Cupcake liners


COPPER COINS


CAN I DRINK THIS?

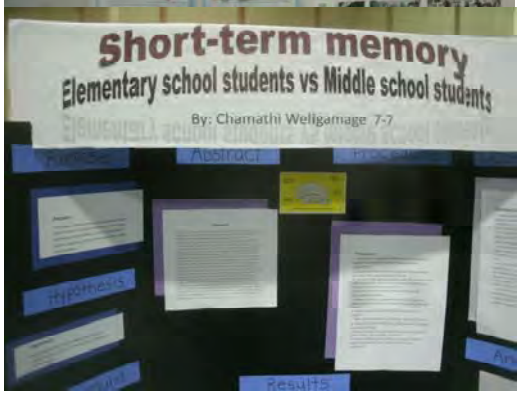

IS COOKING WORTH IT?
The Degradation of Vitamin C in Broccoli During Cooking


Epsom Salts crystals formed at room temperature


THE RATE OF LIQUID EVAPORATION
Purpose
Procedure
Observations
Results
Conclusion
Materials
Hypothesis
Data

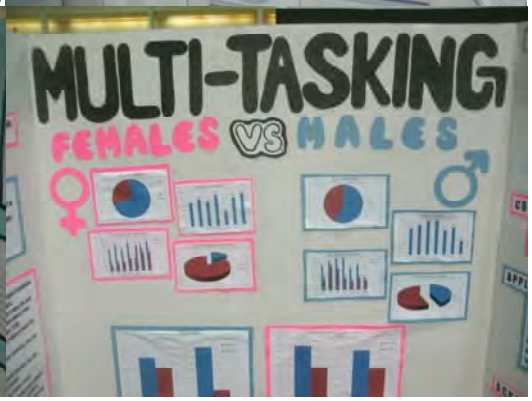

Who has Autism?


AUTISM
Logo
Definition
The most beautiful thing we can experience is the mysterious. It is the source of all true art and science.
- Albert Einstein
Did you kn
History
Diagnosis
Triggers
Autism Awareness Walk
Therapies and Treatments

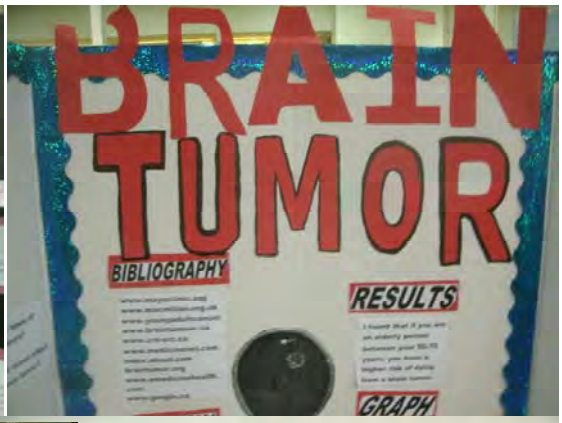

Short-term memory
Elementary school students vs Middle school students
By: Chamathi Weligamage 7-7


THE MOST POPULAR RANDOM NUMBER
Pick a number between 1 and 20!

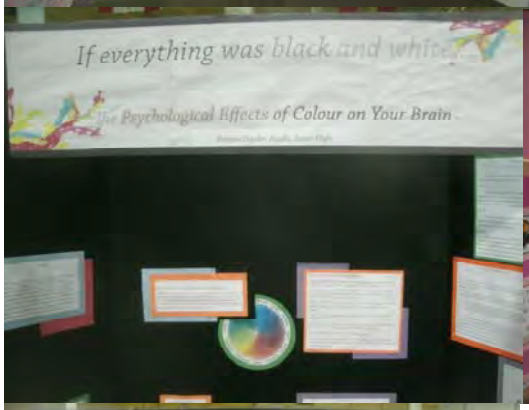

THE HALO EFFECT
How does beauty affect one's perception of kindness?


MULTI-TASKING
FEMALES VS MALES

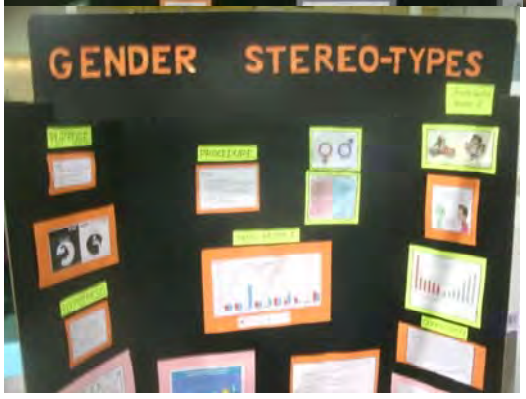

Do Distractions
Affect People's Scores
In a Driving
Video Game?
By: Dav

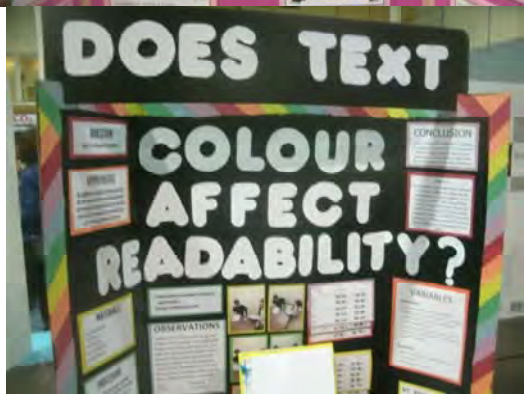

BRAIN
TUMOR
BIBLIOGRAPHY
RESULTS
GRAPH

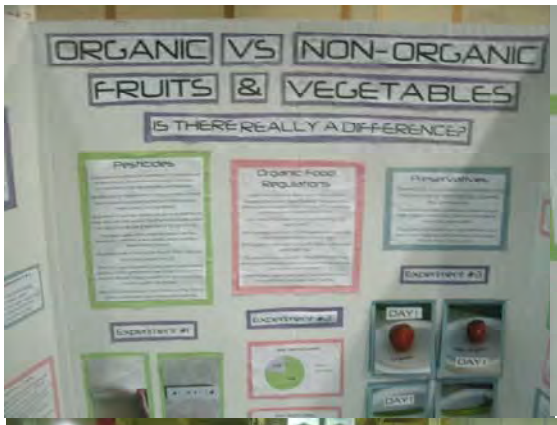

Is Sensitivity Heightened On
Your Dominant Side?
PICTURES
MATERIALS

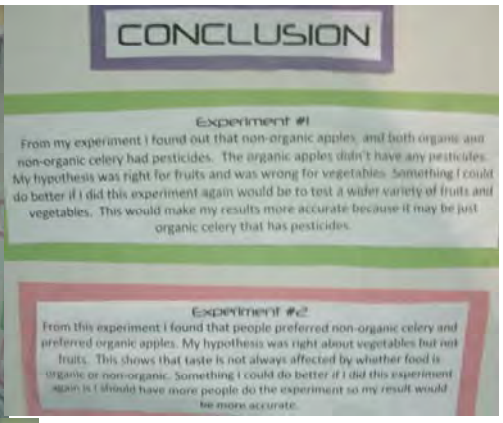

If everything was black and white
The Psychological Effects of Colour on Your Brain

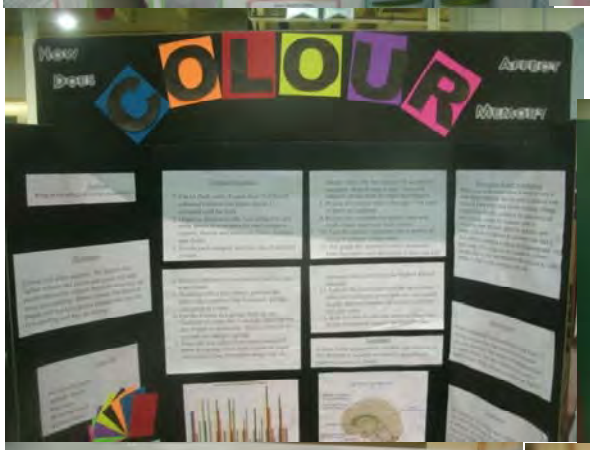

HOW GOOD IS
YOUR MEMORY?
PROCEDURE
RESULTS
GRAPHS


GENDER STEREO-TYPES

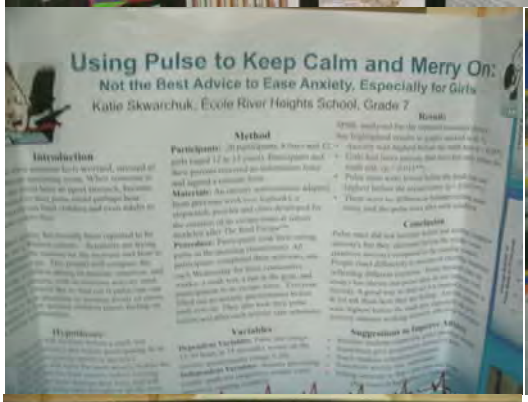

DOES TEXT
COLOUR
AFFECT
READABILITY?
CONCLUSION
OBSERVATIONS


ORGANIC VS NON-ORGANIC
FRUITS & VEGETABLES
IS THERE REALLY A DIFFERENCE?
Pesticides
Organic Food Regulations
Preservatives
Experiment #1
Experiment #2
Experiment #3
DAY 1
DAY 2
DAY 3


CONCLUSION
Experiment #1
From my experiment I found out that non-organic apples, and both organic and non-organic celery had pesticides. The organic apples didn't have any pesticides. My hypothesis was right for fruits and was wrong for vegetables. Something I could do better if I did this experiment again would be to test a wider variety of fruits and vegetables. This would make my results more accurate because it may be just organic celery that has pesticides.
Experiment #2
From this experiment I found that people preferred non-organic celery and preferred organic apples. My hypothesis was right about vegetables but not fruits. This shows that taste is not always affected by whether food is organic or non-organic. Something I could do better if I did this experiment again is I should have more people do the experiment so my result would be more accurate.


COLOUR

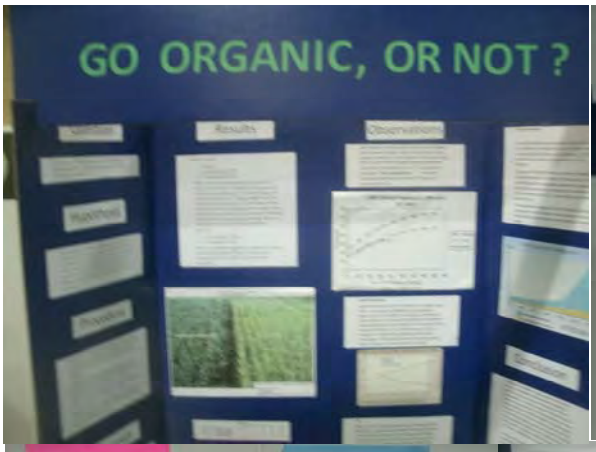

Taste Perception:
Does What You See Affect What You Taste?

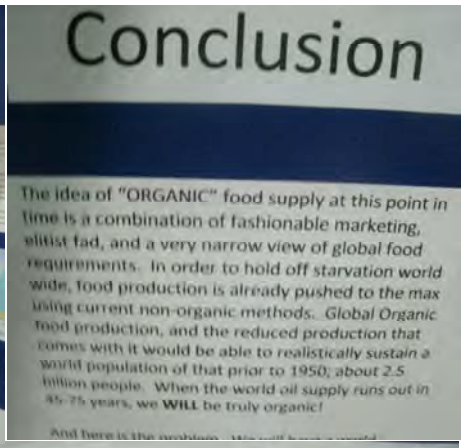

Using Pulse to Keep Calm and Merry On:
Not the Best Advice to Ease Anxiety, Especially for Girls
Katie Skwarchuk, École River Heights School, Grade 7
Introduction
Method
Result
Conclusion


Biomass into Biogas
Smashed Bananas
vs
Carrots

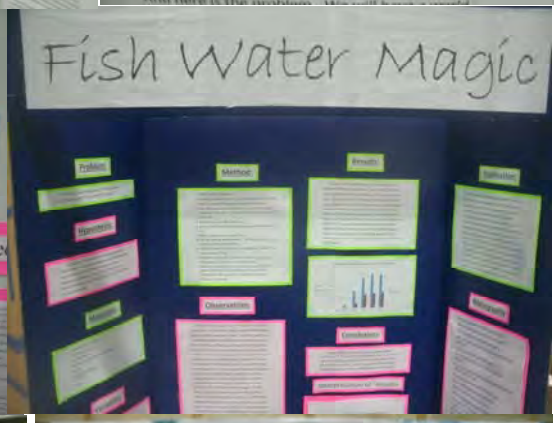

CAN WE GROW PLANTS IN SPACE?
PROBLEM
HYPOTHESES
MATERIALS
PROCEDURE
OBSERVATIONS
CONCLUSION
APPLICATION

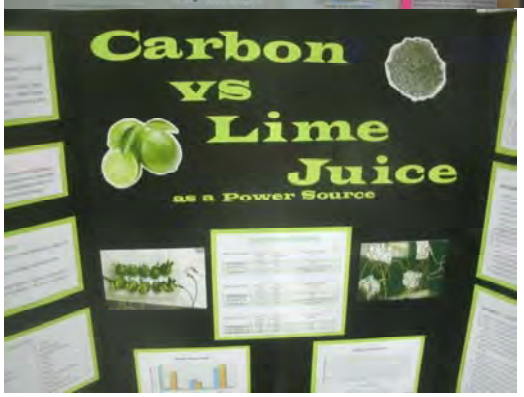

Energy Drinks For Plant Growth
Procedure:
Observations:
Day 7
Observations:

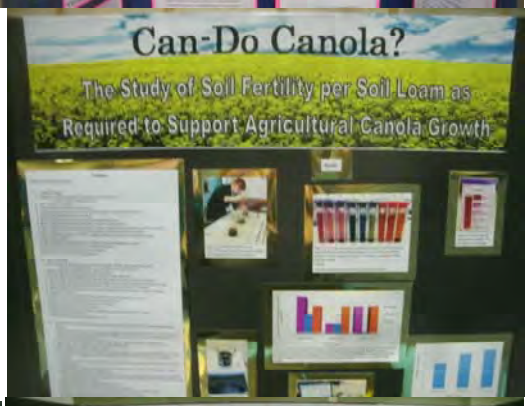

GO ORGANIC, OR NOT ?

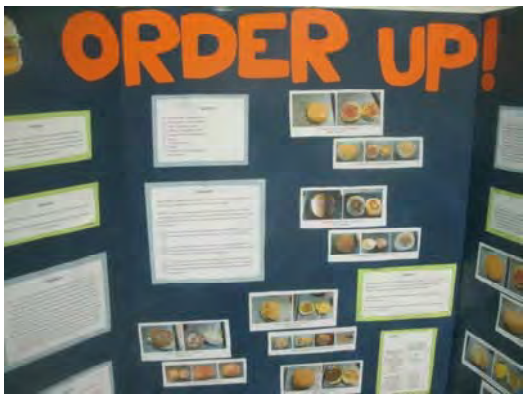

Conclusion
The idea of "ORGANIC" food supply at this point in time is a combination of fashionable marketing, elitist fad, and a very narrow view of global food requirements. In order to hold off starvation world wide, food production is already pushed to the max using current non-organic methods. Global Organic food production, and the reduced production that comes with it would be able to realistically sustain a world population of that prior to 1950; about 2.5 billion people. When the world oil supply runs out in 45-75 years, we WILL be truly organic!

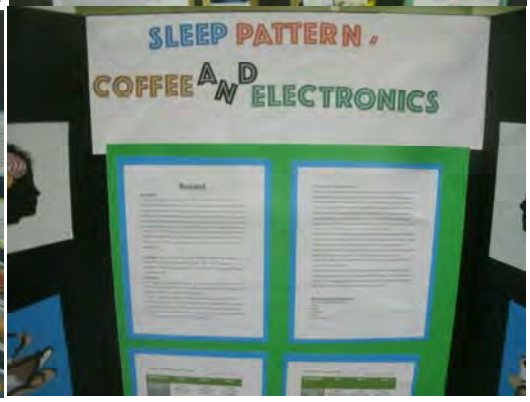

Can You Recognize It?
Data table
Diagrams
Facts
Opinions

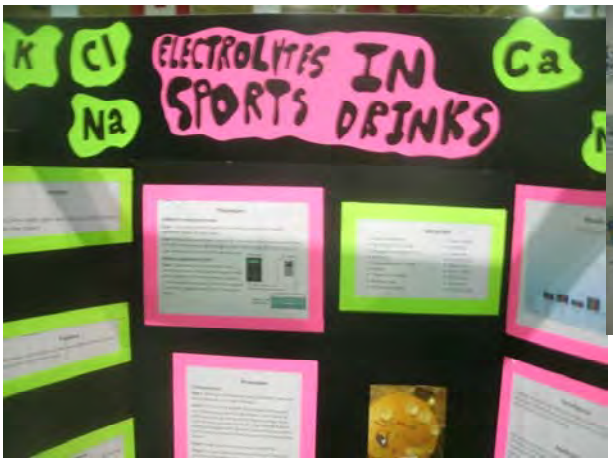

Fish Water Magic


Carbon vs Lime Juice
as a Power Source

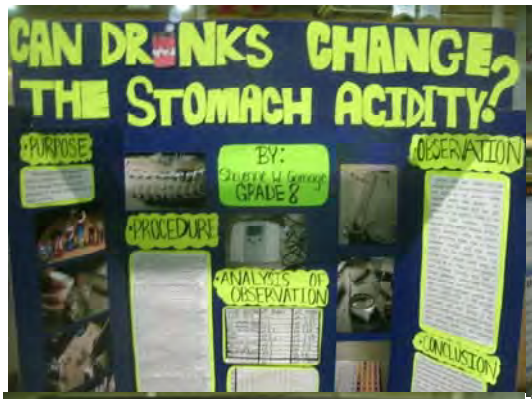

Can-Do Canola?
The Study of Soil Fertility per Soil Loam as Required to Support Agricultural Canola Growth


ORDER UP!


SLEEP PATTERN,
COFFEE AND ELECTRONICS


K
Cl
Na
ELECTROLYTES IN SPORTS DRINKS
Ca

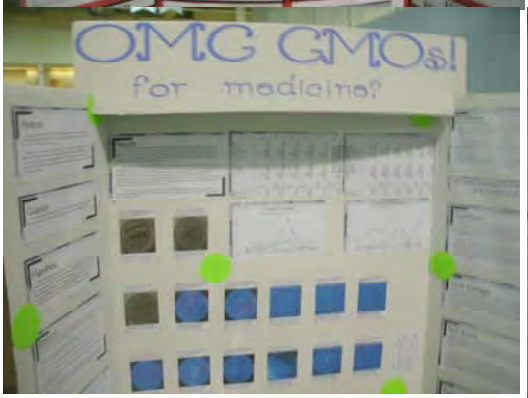

ANTACIDS
&
YOU!
COST:
PROCEDURE


CAN DRINKS CHANGE THE STOMACH ACIDITY?
PURPOSE
BY:
GRADE 8
OBSERVATION
PROCEDURE
ANALYSIS OF OBSERVATION
CONCLUSION


When the BLUE is gone...
The BACTERIA has come!!!
Observations

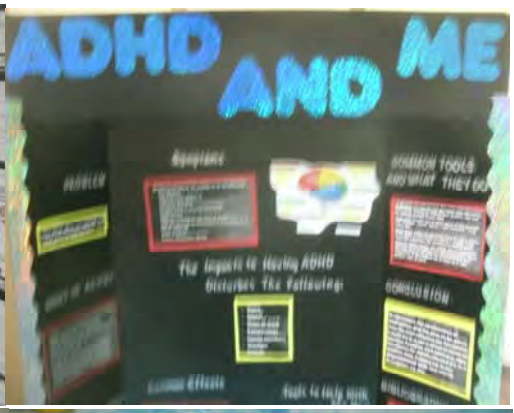

TO STUDY SYNERGY EFFECT OF MEDICINAL PLANTS ON ANTIMICROBIAL ACTIVITY OF GARLIC (Allium sativum)
PURPOSE
VARIABLES
MATERIAL REQUIRED
QUESTION
RESULTS
HYPOTHESIS
CONCLUSION
DATA ANALYSIS

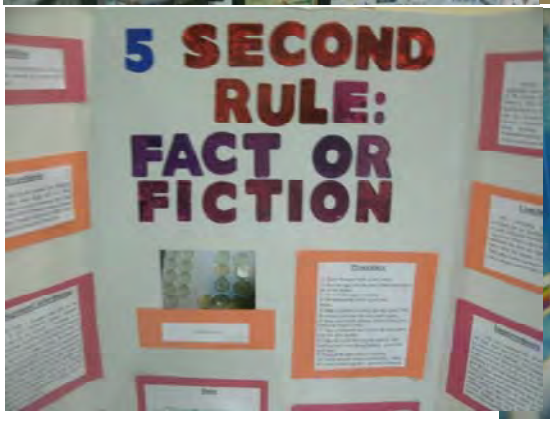

PSORIASIS: THE
DRY AND SCALY


OMG GMOs!
for medicine?


Lactose
Intolerance
Liver

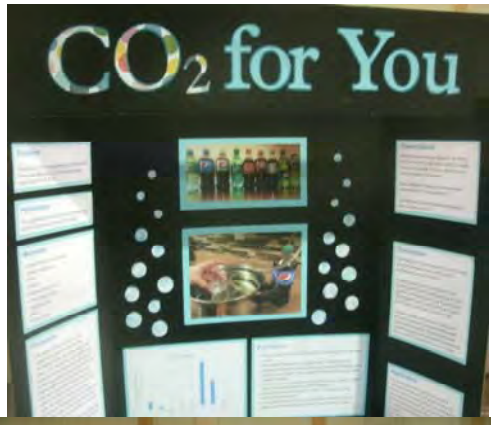

ARE E-CIGARETTES
A GATEWAY FOR
TRADITIONAL
SMOKING IN YOUTH

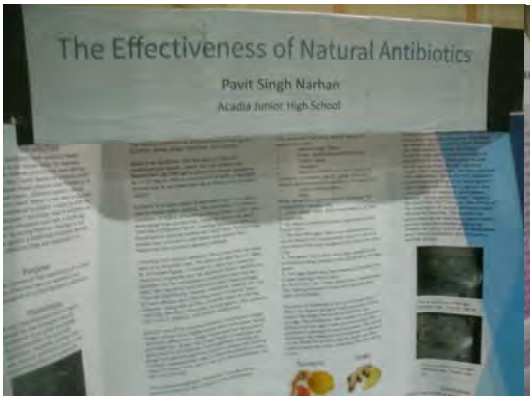

ADHD AND ME

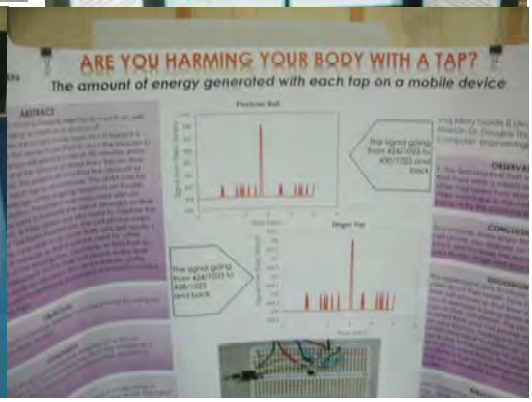

5 SECOND
RULE:
FACT OR
FICTION

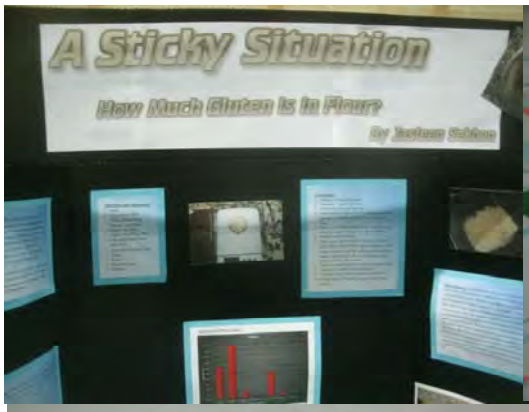

DON'T
GET
BURNED

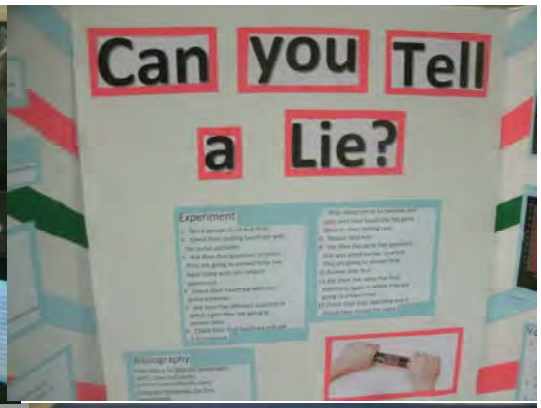

An Indigenous Cavendish Banana
(Musa acuminata Cavendish Subgroup)
Cider
MATERIALS &
EQUIPMENT
PROCEDURE
RESULTS
CONCLUSION

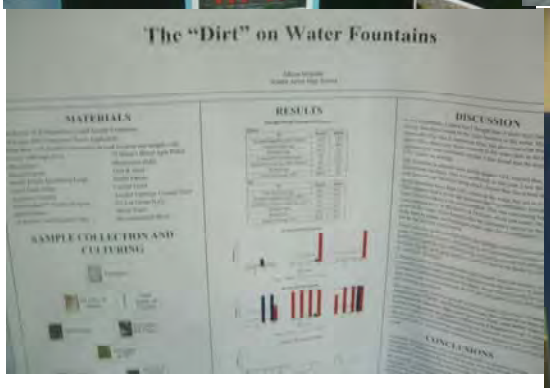

CO2 for You

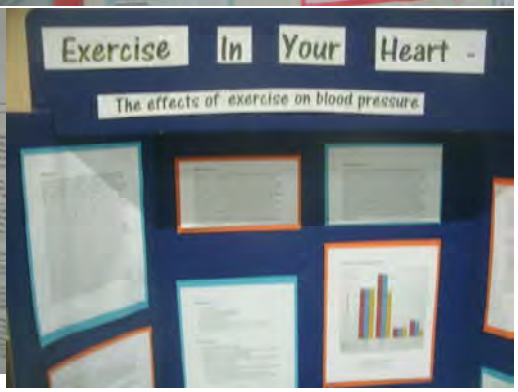

The Effectiveness of Natural Antibiotics
Pavit Singh Narhan
Acadia Junior High School


ARE YOU HARMING YOUR BODY WITH A TAP?
The amount of energy generated with each tap on a mobile device

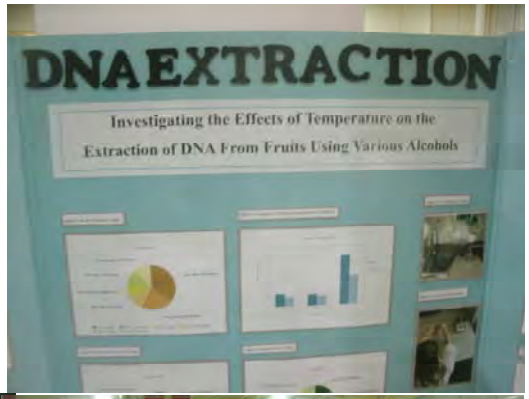

A Sticky Situation
How Much Gluten is in Flour?

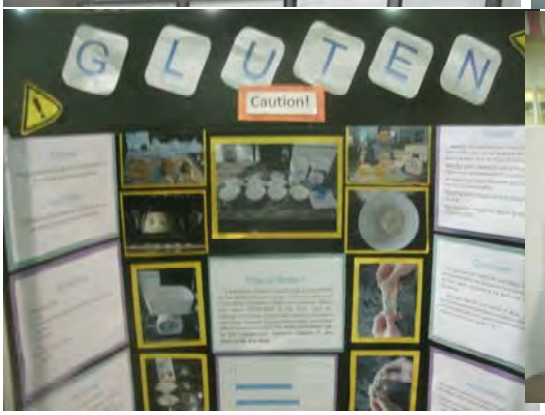

Can you Tell a Lie?
Experiment
Bibliography

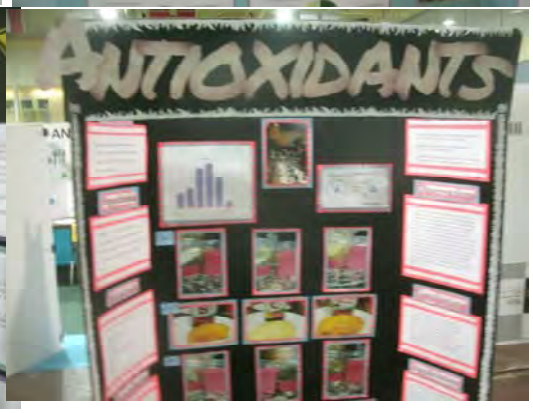

The "Dirt" on Water Fountains
MATERIALS
RESULTS
DISCUSSION
SAMPLE COLLECTION AND CULTURING
CONCLUSIONS

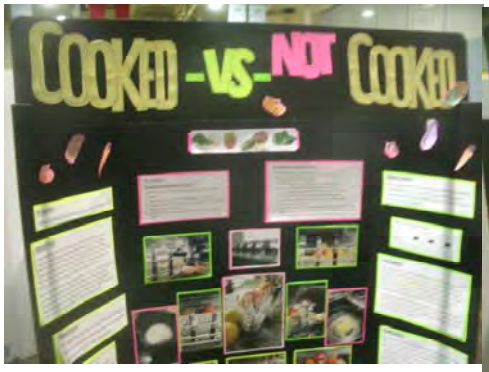

Exercise In Your Heart -
The effects of exercise on blood pressure

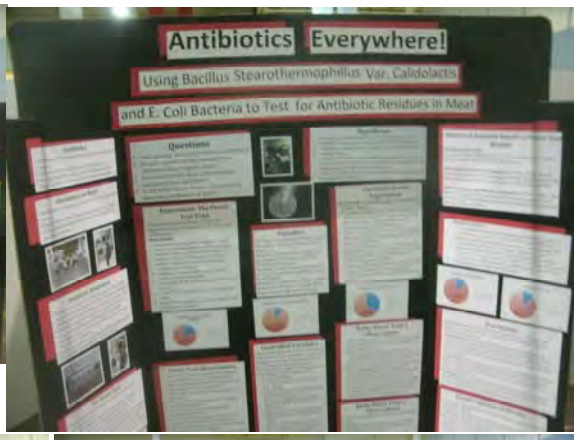

BACTERIA VS. ANTIBIOTICS

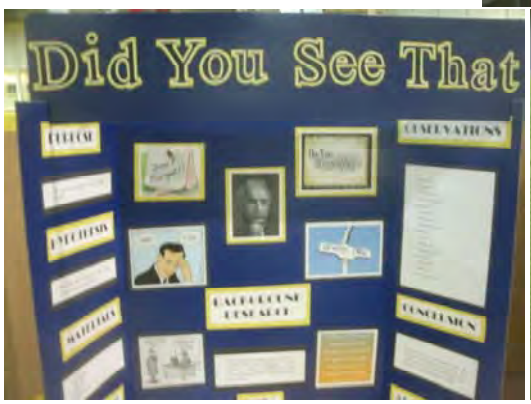

DNA EXTRACTION
Investigating the Effects of Temperature on the Extraction of DNA From Fruits Using Various Alcohols


GLUTEN
Caution!

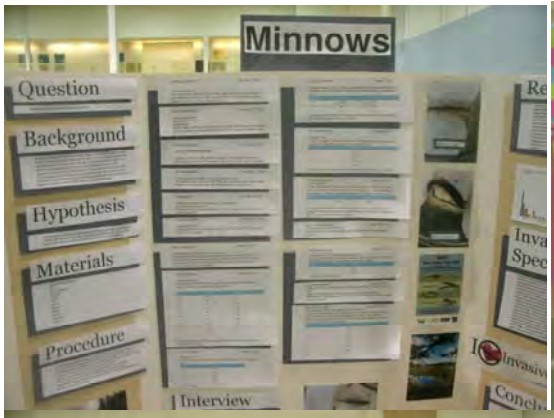

ANTIOXIDANTS


COOKED -VS- NOT COOKED


Antibiotics Everywhere!
Using Bacillus Stearothermophilus Var. Calidolactis
and E. Coli Bacteria to Test for Antibiotic Residues in Meat


Did You See That


Why are fossils important today?


Minnows
Question
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Procedure
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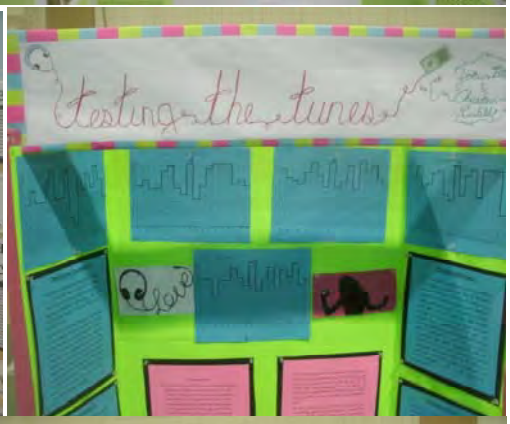
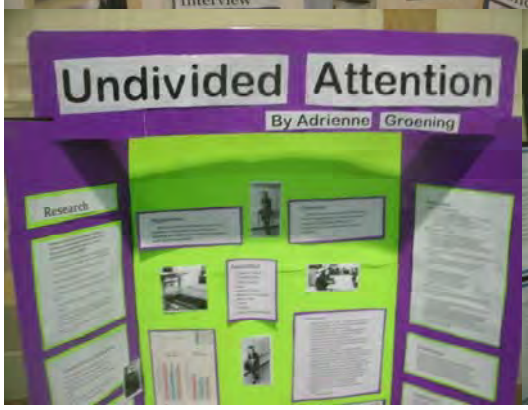
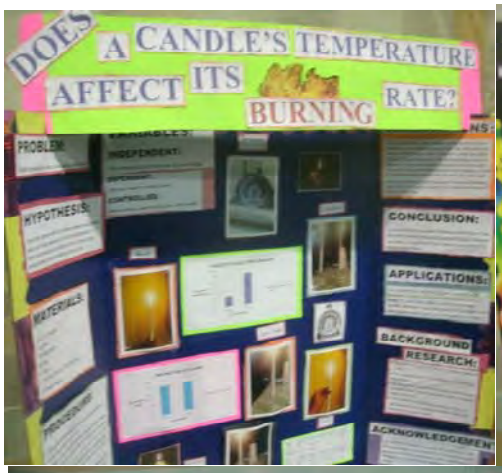

testing the tunes


Undivided Attention
By Adrienne Groening
Research


Speedy Rotifer
Automating Health Assessment of Rotifer, Micro-Organism For Space Research
Sparsh Agrawal


DOES A CANDLE'S TEMPERATURE AFFECT ITS BURNING RATE?
PROBLEM:
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MATERIALS:
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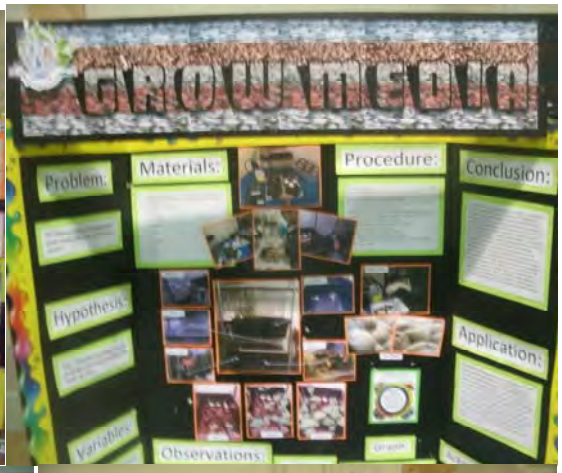
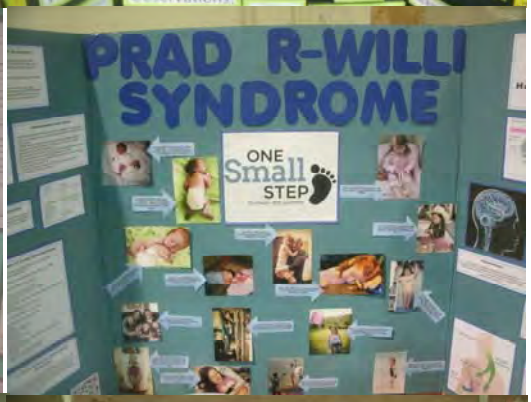
ACKNOWLEDGEMENT

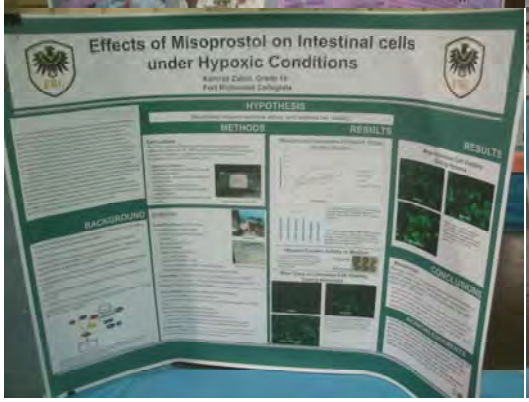

GROWTH CHART
Problem:
Materials:
Procedure:
Conclusion:
Hypothesis:
Application:
Variables:
Observations:

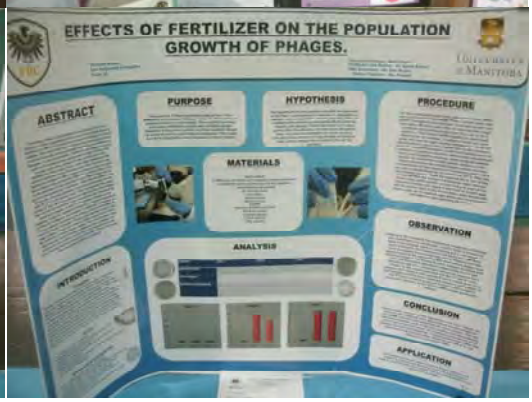

Take my (bad) Breath Away


PRAD R-WILLI SYNDROME
ONE Small STEP


MOUTH BACTERIA
OBJECTIVE:
PROCEDURE:
HYPOTHESIS:
MATERIALS:
SUGAR CONTENT CHART:
CONCLUSION:
APPLICATION
BIBLIOGRAPHY
OBSERVATION
ACKNOWLEDGEMENT


How I Communicate
How the ears, Nose and Mouth Contribute To SPEECH?


Effects of Misoprostol on Intestinal cells under Hypoxic Conditions
HYPOTHESIS
METHODS
RESULTS
BACKGROUND
CONCLUSION


EFFECTS OF FERTILIZER ON THE POPULATION GROWTH OF PHAGES.
ABSTRACT
PURPOSE
HYPOTHESIS
PROCEDURE
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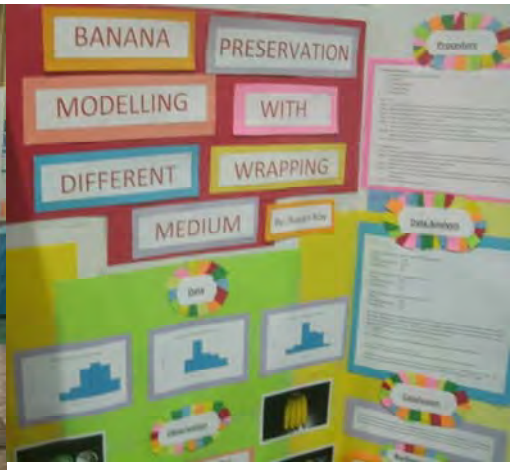
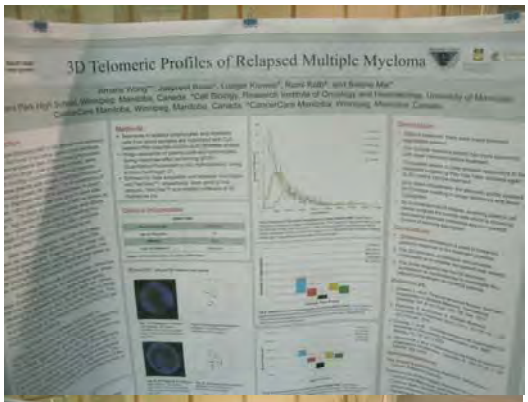
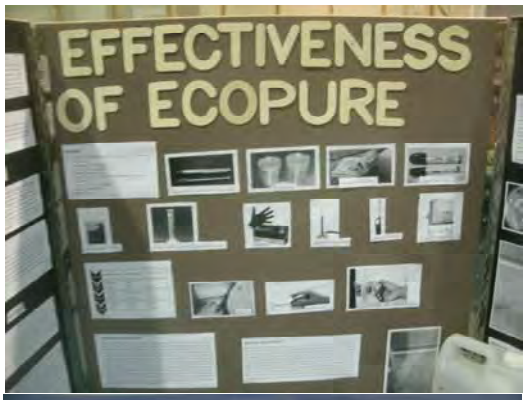
ANALYSIS
INTRODUCTION
CONCLUSION
APPLICATION


Do We Need Antibiotics For All Sore Throats ?

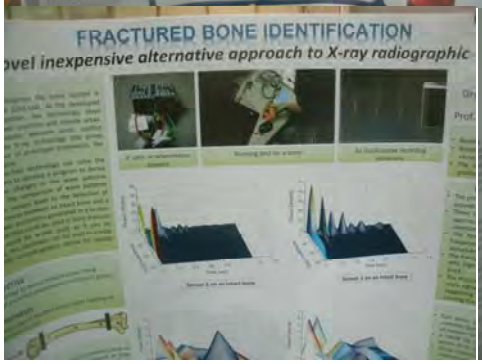

BANANA
PRESERVATION
MODELLING
WITH
DIFFERENT
WRAPPING
MEDIUM

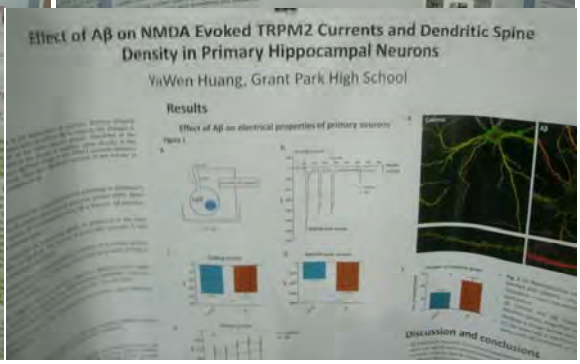

3D Telomeric Profiles of Relapsed Multiple Myeloma


EFFECTIVENESS
OF ECOPURE


The Role of Gel Electrophoresis Along with Protein Restructuring to Slow the Pathogenesis of Psoriasis


Can Garlic prevent the Pathogenesis of Agrobacterium Tumefaciens?
Mandeep Mangat
Crown Gall Disease Cycle


FRACTURED BONE IDENTIFICATION
ovel inexpensive alternative approach to X-ray radiographic


Effect of Aβ on NMDA Evoked TRPM2 Currents and Dendritic Spine Density in Primary Hippocampal Neurons
YaWen Huang, Grant Park High School
Results
Effect of Aβ on electrical properties of primary neurons
Discussion and conclusions