Proj.#	First Name	Last Name	Category	Division	Project Title	Project Summary
30	Ethan	Desbiens	Intermediate	Engineering	Thorium-based Nuclear Power - the Future of Electricity Production	In this project, I will dive into the marvellous concept of thorium-based nuclear power production. Using scientific research, and personal theory and opinion, I will present the numerous benefits and disadvantages of thorium reactors. Specifications, attributes, and functions of these ingenious plants will be explained and compared to other forms of energy production. I will construct a to-scale, sturdy prototype of a molten salt reactor as a visualisation. Additionally, information, graphics, and other media will be organised within a bristol board in a pleasantly arranged
45	Waleed	Sawan	Intermediate	Engineering	Drip - A Precision Agriculture System for the Developing World	It is expected that the world's population will increase by 30% by 2050, reaching 9.2 billion people, and global food production must increase by 70% to meet this increase. Although most of this increase is occurring in the developing world, farmers in those regions have not adapted to the evolving technological advancements. The Drip system leverages a series of sensors, such as Moisture, Temperature and Humidity that help the user understand the health of their plant. Coupled with a wide variety of online based services, along with several publicly available APIs and analytic rules, the user is able to identify issues in crop management and identify possible solutions to those problems.
48	Joshua	McPherson	Intermediate	Engineering	Physical Therapy Reward System	This project is designed to motivate a student to complete his physical therapy exercises by using a reward system. An electrical circuit will be placed on the ground with a light sensor. When the student touches his touches and covers the light sensor with his fingers, a buzzer will go off. The student will be required to complete this stretch for a specific number of times. When the student's teacher or parent has heard the buzzer sound that number of times, they will turn off the switch on the second circuit. The second circuit is attached to a box containing a computer keyboard. If the student tries to open the box while the circuit is on, another alarm will go off, and he will not be allowed to use the keyboard. If the student has successfully competed his physical therapy stretches, then the teacher or parent can switch off the alarm attached to the
49	Sara	Villacecer	Intermediate	Engineering	The Innovative Dog Collar	If you are a dog owner, you have most likely experienced the difficult task of getting your dog to stop barking when they hear something or if they are left alone for a long period of time. By using littleBits, we were able to create The Innovative Dog Collar. When triggered, the dog collar will release a frequency of over 20000 Hz (hertz). This frequency only audible to dogs, and will not affect any humans nearby.
50	Áine	Pucchio	Intermediate	Engineering	Reflections on Climate Change - Environmental Choices for Urban Roofs	Demand for electricity usage in the summer now exceeds the winter. According to data published by the Independent Electricity System Operator, the top twenty record electricity demand days in Ontario over the last 15 years occurred between June 28 and August 13. Given the large surface area and direct exposure to the sun, the temperature of a building is significantly influenced by its roof. Currently, the Ontario Building Code does not prescribe materials which increase solar reflection and reduce heat absorption. Experimentation will show how the colour and material types of roofing materials can reduce air conditioning requirements and electrical consumption in residential and commercial
27	Amal	Aziz	Intermediate	Life Science	Developing a "Trojan Horse" as a Novel Triad Neurovascular Medicine to Treat Alzheimer's Disease	A novel class of triple function neurovascular medicine could be re-engineered by fusing it with monoclonal antibodies (mAb) to the transferrin receptor (TR) on the blood-brain barrier (BBB). TRmAb can act as a molecular Trojan horse to ship the fused drug through the BBB via receptor-mediated transport, to improve AD phenotype, owing principally to the significantly improved CNS drug transport.
32	Tori	Chen	Intermediate	Life Science	A Novel Approach to Treating Diabetic Retinopathy	Diabetic retinopathy (DR) is the most common cause of blindness in North America. Increased synthesis of extracellular matrix (ECM) proteins and capillary basement membrane thickening of the retina are characteristic features of DR. The present study was undertaken to investigate the effects of ginseng extract on glucose-induced ECM gene expressions in human retinal microvascular endothelial cells (HRECs). In this experiment, HRECs were treated with normal and high glucose, then real time RT-PCR was performed for the target gene expression. It may be concluded that glucose-induced collagen 4α1 and fibronectin mRNA up-regulation in HRECs were prevented by ginseng in a dose dependent manner. Further experiment, Western Blot, provides more direct evidence that glucose-induced collagen 4α1 and fibronectin proteins up-regulation in HRECs were prevented by ginseng in a dose dependent manner, which will help to develop novel therapy methods for DR.
36	Jeng-liang (David)	Wu	Intermediate	Life Science	Sensitizing Human Tumour Cells to Cancer Drugs with Cranberry Flavonoids	As our knowledge of cancer treatment grows, it is evident that the lack of drug selectivity and drug resistance in cancer greatly hinder cancer chemotherapy efforts. Diets rich in certain phytonutrients known as flavonoids are suggested to reduce cancer risk, and are a potential source of novel anticancer agents. In my project, I looked into using cranberry flavonoid extract to sensitize cancer cells to drug treatment. Head/neck cancer cell lines HN-5a and HN-51/V15e were introduced to varying concentrations of cranberry flavonoids and the cancer drug vincristine, looking for a synergistic effect. If
38	Kavisha	Dayarathna	Intermediate	Life Science	Spices are key to be kidney stone free	This science fair project aims to discover correlations between the intake of selected herbs/spices and the growth of oxalate kidney stones. Kidney stones are a common urological disorder that continues to be a significant healthcare burden. It can cause significant morbidity in patients globally, with surgery being the cornerstone of care for these patients. Even though current evidence suggests potassium citrate is an effective agent in the treatment of calcium oxalate stones, consistently effective medical treatment is sparse. Spices have been used for many years as home remedies to treat kidney stones. With this knowledge in mind, cumin, coriander, cardamom, thyme, cinnamon and oregano were tested to see if they reduce oxalate kidney stone growth. This was carried out with a drosophila model system: feeding flies by mixing herbs/spices or their extracts with oxalate containing standard fly food. Differences in calcium oxalate crystal formation rate with and without spices/their extracts were detected on fly fecal matter using polarized light microscopy. ImageJ software processed calcium oxalate crystal deposits in fly fecal matter, and their statistical analysis showed a significant reduction in calcium oxalate crystal formation when flies were given food treated with cinnamon water extract. This research has potential to discover natural, next generation treatments for kidney stones and help millions of people
41	Justin	Yang	Intermediate	Life Science	Electricity and Food Spoilage	Food loss is an issue around the world. One third of all food production is spoiled before reaching to consumers, mainly in developing countries. An alternative cost-effective food storage system is needed to help prevent the food loss issue. In developed countries, refrigerators are large-energy consumers. By finding an alternative solution, it could save energy. The project investigates the relationship between electric voltage and food decay. The experiment is done by flowing electricity through banana slices, and observing the amount of decay/spoilage over time.

51	Ayah	Nehdi	Intermediate	Life Science	The Effect of Temperature on the Risidual of Shape Memory Alloys	This experiment determined the temperature at which the SMA regained its original shape in 15 seconds. SMAs are metals that remember their form and mechanical characteristics in responses to changes in temperature and electromagnetic fields. SMAs are used in many applications, like eyeglass frames, buildings, planes etc.
147	Reem	Yasin	Intermediate	Life Science	The effects of different coulored light on the height of bean plants	In this project the effects of different coulored light on the height of bean plants. In this experiment 8 sprouts were grown and exposed to 4 different colored lights. The plants exposed to blue, purple, and yellow grow the tallest and the plants exposed to red light were killed. This happened because the colors that worked had, blue-450nm, purple-400 nm, yellow-about 575 nm very low wavelengths. This came into importance because the color with a lower wavelength gives off more energy, giving the plant more energy to grow. While red has a very high wavelengths (700 nm) giving the plant no light energy to grow, the plant couldn't go through the process of photosynthesis.
151	Bhavya	Kapoor	Intermediate	Life Science	Microwave Radiation and its Effect on Life	I will be studying the effects of microwave radiation on different aspects of life such as plant seeds, yeast and bacteria. By placing each variation in the microwave for different time periods, I hope to show a correlation between the rate of growth and how much time the organism was under radiation. After photographing and gathering my data, I will attempt to use my information and apply it to real world situations.
159	Matthew	Zhou	Intermediate	Life Science	The Efficacy of Indomethacin as a Neuroprotective Drug against Glutamate Induced Excitotoxicity	The protective effect of indomethacin, a nonsteroidal anti-inflammatory drug (NSAID), was investigated in neurons exposed to glutamate-induced excitotoxicity. Glutamate is a neurotransmitter which can trigger the prostaglandin pathway and lead to the production of reactive oxygen and nitrogen species, ultimately resulting in irreversible depolarization, inflammation, and eventual cell death. In this experiment, rat cortical embryonic neurons were obtained and cultured for 14 days in vitro. Neurons were first pre-treated with indomethacin doses of 0.1, 1, 10, or 50 uM for 1 hour and then exposed to 100 uM of glutamate for 1, 3, or 6 hours. At 45 minutes prior to each experiment endpoint, PI was added to all treatments for staining dying cells. DAPI was added to stain for all cells when mounting the coverslips. Images were then taken using a confocal microscope to obtain PI and DAPI measurements. PI to DAPI ratios were used to quantify cell death. Results show that neurons treated with indomethacin after being exposed to glutamate excitotoxicity had a positive effect in reducing cell death when compared to glutamate control groups. These findings suggest that indomethacin may be explored in the treatment of neurodegenerative diseases.
31	Youseef	Sadiq	Intermediate	Physical Science	Electricity; A Rusty Catalyst? Or the Future of Rust Prevention?	This project aims to discover how an electrical current affects the rust formation on steel wool, whether it speeds it up or prevents it. To make the effects of rust more visible, the steel wool is placed in realistic saltwater, mimicking that of the Ocean's average salinity (the water used will be distilled water). This could change how we create steel infrastructure, by adding or removing electricity if that electricity prevents or speeds up rusting, respectively. The independent variable is amp hours.
140	Joshua	Williams	Intermediate	Physical Science	The Effect of Different pH Levels on the Weight of Iron Oxide on Metal	I will submerge 5 pieces of metal into different liquids, each with different potential Hydrogen (pH) levels. The pieces of metal will be identical in length, width, height, volume, weight, molecular structure, density, etc. After 2 weeks, I will measure the weight of the iron oxide (rust) that grows on the metals. Next, I will compare them for any correlation between pH levels of the liquid that the metal was submerged in and the weight of the iron oxide that grows on the metal.
142	Jasmine (Ryu Won)	Kang	Intermediate	Physical Science	Staying Alive with Strings	Many violinists and other string instrument players complain that the case does a poor job at insulating the instrument and maintaining the quality of the strings when exposed to cold weather. However, does this correlation really exist? This study investigates whether or not there exists a relationship between the quality of a violin string, measured by its ability to maintain pitch, and the type of thermal insulation that the string receives. Some of the materials used as thermal insulators are styrofoam, wood, cork, and corrugated sheet. The data collected from this experiment will be very meaningful to society, especially to string musicians, in that it will show which materials have the best thermal insulation for strings if there are any differences at all. This information could significantly come to case-makers' benefits, as they try to construct cases with
144	Prajeya	Parmar	Intermediate	Physical Science	The Effect of Salt (NaCl) on the Electric Conductivity of Water	Our science fair project involves measuring the salinity of salt in water through ohms, and coming to the conclusion on how this affects marine life.
145	Simon	Helleman	Intermediate	Physical Science	The Effect of Temperature on The Resistance of Copper Wire	The project demonstrates that the resistance of copper wire increases as temperature increases. The temperature coefficient of copper, for the temperature range tested, was calculated and found to be close to the reported temperature coefficient for this metal.
148	Anika	Garg	Intermediate	Physical Science	Using Coloured Filters to Decrease the Amount of Blue Light in the Spectrum	With increasing technology, people are spending more and more time in front of their electronic screens. Screens emit light that has a high concentration of blue light within its spectrum, which has been shown to adversely affect circadian rhythm. Decreasing exposure to blue light with various filters may solve this problem. The goal of this experiment is to assess which colour filter is the most effective.
150	Rayan Abu	Sardanah	Intermediate	Physical Science	the effect of poprocks on the amout of co2 produced	a 591ml coca cola bottle is taken, then some poprocks are added to the bottle then a balloon is added on the top to measure the amount of co2 that is being released
3	Sarah	Michaelson	Junior	Engineering	Solar Cells and the Spectrum of Light	This project is to determine which colours of light produce the most power from a solar cell. Sunlight is split using a prism, and the power produced is measured by moving a small solar panel through the spectrum.
7	Lucas	Ruble	Junior	Engineering	Free Energy From Air	In my project, I will see if my device can turn on a LED using energy from the air. The device uses diodes and capacitors to collect energy from power and radio waves around it.
9	Jeslyn	Wang	Junior	Engineering	Smart Home	The goal of this project is to design computer codes that will assist people in making their daily lives easier through smart technology. These codes will be able to remotely control the functions of a house depending on the current needs of the people living inside.
12	Imene	Ould Noughi	Junior	Engineering	3D Printers	My project is both a research project, and an innovation project, where I will be talking to you all about 3D printers as well as presenting to you my homemade 3D printer which I put together from scratch. My goal is to show that 3D printers aren't just for professionals, they can also be used by people like you and me for every day uses like fixing a broken handle or replacing a lost button.
16	Zakaria	Mahmoud	Junior	Engineering	Self-adjusting Time Companion	i have made an alarm clock app that can give multiple notifications on multiple tasks, and can also self-adjust based on how late you arrive. The purpose of this app is to help people who are generally late to work to be able to come on time no matter how many tasks they must perform before they go to work. Also i wrote it in the computer language Java.

17	Rabih	Ahmad	Junior	Engineering	The PiGRRL Zero Plus	My project is a small handheld device that is designed to play many games from a variety of different systems from the 80s and 90s, which include the Nintendo Entertainment System, Super Nintendo Entertainment System, the Sega Genesis, and many more! This is all done on a small computer called the Raspberry Pi Zero. This board allows you to emulate many different systems with the help of RetroPie. RetroPie is an Operating System that was made to play many different games from different gaming consoles, and uses a front end called Emulation Station. The actually project uses many different materials, like a screen, input PCBs, a battery, and more. All of these components fit into a small case made of PLA plastic so that you can enjoy the system when you are on the go!
18	Haroon	Yousaf	Junior	Engineering	How to Make Your Own Programming Language	This project is about creating your own programming and scripting language. This makes it easier to learn coding and makes it easier for people who have to write long lengths of code in very little time.
21	Zixiang (Peter)	Zhou	Junior	Engineering	Pancake Sorting and DNA Evolutions	The pancake sorting problem is as follows: Given a stack of pancakes that are in all different sizes, you are allowed to grab a bunch from the top, flip them over, and put them back on the top of the stack. What is the minimum number of flips needed to sort such a stack of pancakes from top to bottom? The pancake sorting problem is NP-hard, meaning there is no practical method to solve this problem if the number of pancakes is large. This problem has applications in DNA analysis, as during the process of evolution, sometimes entire genes get flipped, creating new species. Knowing approximately how many flips are needed to transform one sequence of genes into another can give a good estimate of how long ago the gene flippings happened. In 1979, Bill Gates proposed a pancake sorting method and gave a bound on the number of flips needed. His result remained the best known result for 30 years. Hence, my purpose is to design a practical method to sort a stack of pancakes that uses close to the minimum number of flips. In my project, I propose a new method based on 3-step forward. A comparison between my method and Bill Gates's method showed that my method uses less flips than Bill Gates's method in most situations. This result is useful in DNA evolution
23	Danish	Mahmood	Junior	Engineering	W.I.N.I.T.S. (Wireless Interconnected Non-Invasive Triage System)	In Mass Casualty Incidents (MCI) emergency response teams are required to manually assess and paper tag patients per their triage status. Assessments are communicated to first responders through radios, consuming an inordinate amount of time for different situations. These handwritten tags cannot be updated easily when the condition of the patient changes. Since first responders must prioritize over a certain group of patients with similar status, outdated paper triage tags greatly reduce the overall efficiency of the responders. Once patients are transported to a hospital, they need to be re-triaged for updated information, to administer necessary treatments. A novel solution to this problem is a W.I.N.I.T Band, a compact wireless triage device that can be worn around the finger of a patient. It continuously measures and monitors the temperature, heart beat, SpO2, and blood pressure of the patient. This device uses novel techniques and algorithms that allow vitals to be measured in real-time, without a blood pressure cuff, non-invasively. This data is sent wirelessly to an online dashboard, which can be accessed by first responders and hospitals, eliminating the need for inefficient triage tags. In addition to the wirelessly available data, each device has a small OLED screen displaying the device-id and real-time vitals of the patient. Multiple W.I.N.I.T Bands will allow for an interconnected triage system that displays the vitals for all patients, organized into one intuitive dashboard, that can be accessed by any hosptal or member of a first responder team.
25	Aly	Soliman	Junior	Engineering	Free Power Generator	Hi, my name is Aly. My project is about making a free power generators that converts energy to electricity which should light up the light. An idea is that it will save the environment and saves money.
53	Faith	Vanderveen	Junior	Engineering	Get Charged	Our project compares efficiency and cost-effectiveness of different ways to obtain charge for a cell phone. We compared a homemade solar-powered charger with a regular charger that uses electricity from normal outlets and with a purchased Coleman solar-powered charger. We created the homemade solar charger for this project using recycled materials.
59	Kate (Tianyi)	Duan	Junior	Engineering	Solar Power	my project is about which way should the solar panels face, and why? this experiment involves many things such as Such as the earth rotation with the sun, the earth rotates from west to east, and the sun rises from southeast and sets in southwest. And it's also related to the tropic of cancer and tropic of Capricorn, and why the equator is so hot it's because it's in between the tropic of cancer and the tropic of Capricorn, and the sun shines vertically to the equator, that's why the temperature gets higher and higher once you are near the equator. This experiment can help the world saving the energy because the result can teach many people which way their solar panels should face to get the most energy as possible.
60	Rayne	Pratt	Junior	Engineering	Is Touch Typing The Most Effective Kind of Typing	In my project I take data from people who type using hunt and peck and people who use touch typing. In my project I hope to find out which kind of typing is most effective by comparing different samples that my test subjects have done.
61	Maymuna	Aden	Junior	Engineering	S.A.R.A	My project is about S.A.R.A. it's a robot that I have built based on recent scientific discovery and my own innovation. S.A.R.A is a helper robot who assists and help people with diabetics. S.A.R.A stores all a diabetics meds . since I don't have all the proper materials for S.A.R.A I hope to one day advance on it. P.S. - S.A.R.A stands for Semi Automatic Robot Assistant:)
68	Maaz	Abbasi	Junior	Engineering	Infrared Waves	I'm trying to find out if these waves are able to pass or reflect off certain objects such as cardboard, marble, rock etc. I will be using a remote controlled object for this experiment.
74	Joshua	Devries	Junior	Engineering	Hydroelectric Energy	I built a water wheel for my project. It produced 3.88 volts and can power an LED flashlight. I have a my wheel, my display board, a video and some artifacts to showcase my project.

77	Melek	Sarikahya	Junior	Engineering	Power from Water: Put Water to Work	Earth is an amazing planet. It has everything that we need: food, shelter, and water. The oceans cover about 70% of the earth's surface. The ocean's energy is constantly being renewed and is available all the time. Energy can be made, or generated, using solids, gas or liquids as a source of power. Moving water has a lot of energy, it could be harnessed to produce light, heat or move the objects. That is what makes hydro power so useful and efficient. The study of the earth's waters is called Hydrology. Here, I will explore how to get power from water as “Hydro Power”, by converting the kinetic energy in moving water to mechanical energy. By using Hydrology, we can further our understanding of the different distribution and circulation of water. Here my goal is to understand the hydro power by transforming the energy stored in falling water.
79	Khali Hawa	Ahmed	Junior	Engineering	Meddash Can It Save Lives?	If you feel uneasy you would go to your family doctor or the clinic, and if it is something that is more massive you would probably be anxiously waiting for results. In a couple of months, you would possibly be sent to a specialist. Even if you were diagnosed with a life threating illness you can still be able to contact your doctor, but in some places, you would not be able to get the help you need so easily. For my science fair project, I will make an app that will hopefully help people in places that health care is not given to them as fast.
90	Gabriel	Zou	Junior	Engineering	H20=Power	My project is testing the power of hydropower using self built waterwheels, (Overshot and Undershot). We took the waterwheels to a volt meter to measure the amount volts of the different 2 designs of waterwheels generate.
98	Zaid	Abou-Sweid	Junior	Engineering	Can Solids Flow Like Liquids?	There are three types of matter: solids, liquids, and gases. They all have different characteristics and move differently. Solids are known to not flow very well, liquids can flow pretty well, and gases can flow very easily. Small matter that is made up of many individual particles is called a granular material. Granular materials can range in shape and size. For example, one rock rolling down a mountain is not acting like a liquid, but if fifty rocks and boulders were rolling down a mountain they would be considered flowing. This is called granular flow. This experiment aims at determining the factors impacting granular flow by pouring different foods which vary by size, texture and shape through a funnel and measuring the flow-rate.
100	Iris	Roybal	Junior	Engineering	How To Make a home made Motor	I will be demonstrating the principals of how electrical current can be converted into mechanical energy by the use of common house hold materials such as a battery, paper clips and wire.
105	Melanie	Puentes	Junior	Engineering	Water wheels	My partner and I tested out different numbers of paddles on a water wheel to see the effect it had on how long it would take to role up a string with a block of wood on the end. We built a water wheel and tested it with 2, 4, 6, 8, paddles.
108	Samuel	Harren	Junior	Engineering	L'auto coke et mentos	on va voir si 7 ou 5 mentor va aller plus loin et si 42 mentor va fait plus ou moins de distance que les autre quantité quand laisser tomber dans
114	Sajed	El Tarras	Junior	Engineering	Using sunscreen effeciently	Its about using sunscreen in differret spots or on object to see what happens between which will work more effecient so it will be discovered
116	Mark	De Jong	Junior	Engineering	Pump the liquid "Gold"	A project of innovation. A 1/5 scale of a manure tank with a centrally located pump, ideal for thick solids and sand manure. A self Engineered and built model.
118	Mohamed	Said	Junior	Engineering	Hero's Engine: Newton's Third Law on Motion	the hero's engine is one of three theories sir Isaac newton explored. There are different forms of hero engine experiments,one that you can fill the sphere with water, a flame is applied to it until the water boils, and the device begins to rotate and etc. Through hero's engine.Motion through hero's engine. Motion is used in our every day life and can be seen in numerous forms. Through this water motion experiment, you will learn that using light materials can create fast pace motion
124	Anisa Dahir	Ismail	Junior	Engineering	Measuring the surface tension of water with a penny	On a rainy day I wonder how water forms droplets on a window. I searched it up and I found that it all has to do with surface tension. I found that I could do something like this. The reason I chose this topic is because I could see the differences between dish soap and tap water. I want to measure how many drops of soap by how many drops that a soap affects the surface tension of water by putting drops of water on a penny.
138	Ella	Pauls	Junior	Engineering	Building a cybernetic prothstetic arm	useing a 3D printer, we printed the parts of a hollow hand and assembled them together. Inspired by the "winter soldier" from Marvel, we want to see if we could enhance the hand to make it not only move, but somehow make it stronger.
4	Medina	Omar	Junior	Life Science	The staining of an egg using coffee,tea,and cola.	My project is trying to figure out if coffee, tea, and cola can stain the white teeth and turn them a yellowish or discoloured.
5	Rajan	Sharma	Junior	Life Science	L'arrosage des plantes avec l'eau salée et l'eau normale	On a arrosé des plantes avec l'eau salée et l'eau normale pour voir quelle plante va pousser mieux en termes du temps, la taille de la plante et comment la plante se lève.
6	Yusuf	Jomaa	Junior	Life Science	Think before you Drink	My project describes the different ph balances in different waters purchased, filtered, or tap water which will identify the water preferences that should be made by individuals
10	Cameron	Seybold	Junior	Life Science	Cyber Security	Since everyone in our times now requires numerous passwords to access work computers, bank information, email, and social media, we found that password security was an ongoing issue for both people and companies. Our research into recent security breaches confirmed this was a topical subject to investigate. Through our background materials we found different types of hacking methods, and most commonly used passwords. In our project we tested the password security of typical 8 character passwords. We made 1,231 8 character passwords using all four types of characters (Letters, Caps, Numbers, and Symbols). Our hypothesis was that passwords using only numbers would be the fastest to decipher, and the passwords using all types of characters would take the longest to solve. The 1231 passwords were entered into a website which would generate the amount of time each password would take to be deciphered by a brute force cracking program on a standard home computer. We recorded the solve times for each password and group of password types. Prepared graphs and tables to illustrate the observations and results. We ultimately concluded that our testing verified our hypothesis that passwords with only numbers were quickest to decipher, taking only seconds, while passwords with symbols, numbers, letters and caps took the longest, sometimes averaging thousands of
11	Genan	Al-Halbouni	Junior	Life Science	Controlling Diabetes	The experiment will consist of testing a Diabetic who uses insulin and pills with different natural products . To see which is the best with full explanations, etc.

13	Antara	Gandhi	Junior	Life Science	Save Our Seas	Our project is on algae blooms in Lake Erie and testing the amounts of fertilizer. We also tested the effects of the fertilizer on the algae by making a simulation.
19	Sam	Karagiannis	Junior	Life Science	Direct Cellular Reprogramming	During organ transplantation there is often rejection of the transplanted tissue because the cells of the donor are recognized as foreign by the person receiving the transplant. One solution to this problem would be to take cells from your own body and turn them into cells of the tissue that is being replaced. Our purpose is to find transcription factors (proteins that turn genes on or off) that can reprogram cells of the body to
26	Tasneem	Mohamed	Junior	Life Science	Reward or Punishment: Which Is The Better Motivator?	Divide your test subjects into two groups, a “reward group” and a “punishment group.” Do not reveal to them the true nature of the experiment; instead tell them that you will be testing people’s ability to sit still and do a repetitive task. You will meet individually with each member of the groups. When meeting with a test subject for the first time, begin by thanking him for his participation in your project and give him a fancy pencil as a token of your appreciation. Subjects may use the pencil to take the test. Explain the test: “You will sit still at a desk for three minutes. Do your best to remain perfectly still. No moving, no shifting your weight, no scratching an itch, no coughing, etc. In those three minutes, draw rows of little circles, as many as you can in the allotted time.” Lastly, just before beginning the test, tell subjects from the “reward group” that if they do well on the test that you will give them a second pencil as a reward. Tell subjects from the “punishment group” that if they do poorly on the test you will have to take back the pencil you gave them. Did subjects from one or the other of the groups do on average a better job of sitting still? Did subjects from one or the other of the groups draw on average more circles? Were differences significant? What might this say about reward and punishment as motivators?
29	Sunaina	Vallamkonda	Junior	Life Science	Food Waster	The project is on food waste. We wondered what is done to the food that is wasted, and how to reduce the amount of food wasted. Therefore, we conducted three experiments in total: 1. Ask families to record the food wasted each week and what they did with the food. 2. Do the same as experiment one, but give them a few suggestions and tips as to what to do with the wasted food, etc. 3. A composting experiment to see if adding 1% yeast mixed with compost would help it degrade faster. The purpose of this experiment is meant as a tip for experiment two. In all, we hope that we will be able to reduce the amount of food wasted, even if it's only a few families.
54	Dawood	Hafiz	Junior	Life Science	Do Screen and Text Color Affect Retention?	This experiment explores whether computer screen and text color affect retention and if people subconsciously prefer combinations of colors that help retention. thank you
56	Amelia	Maknoni	Junior	Life Science	L'effet des liquides sur les plantes	Testing the effects of different types of liquids on plants to see their growth differences and reactions, extra steps included changing the environment of one plant and creating a solvent to give the plant
63	Injey	Ali	Junior	Life Science	Underground automated garbage collection: future of waste collection	How we can make London Ontario and other cities More clean more Green by utilizing a new garbage collection system in down town London and other cities
64	Deema	Soufan	Junior	Life Science	Blood Types	Bllod types and how they are different and why they can or cannot mix together when an organ or blood donation is needed. What happens when the donor blood type is mixed with the receipent blood type .
66	Eesha	Garg	Junior	Life Science	Feet vs. Fins - Does wearing fins make the swimmer faster?	Fins are used as a training tool in competitive swimming to help build swimmer's muscles. It is unclear whether wearing fins increases the swimmer's speed or results in decrease due to fatigue. The aim of this experiment is to assess if the use of fins results in faster swim times in a 25m pool.
70	Andrew	Shen	Junior	Life Science	Yeast Reproduction in Sugar Substitutes	During the process of respiration yeast break down sugars to generate energy that can be used by the cell. The purpose of this experiment is to identify which type of sugar is the most efficient source of energy for the yeast.
71	Emily	McMahon	Junior	Life Science	How to make ice last longer	On the internet, I saw that sea salt was the material to make ice last longer. I also saw that I could crush some ice and sprinkle some sea salt on it as well. I could also do that with ice cubes. So I decided that I would have a bowl of crushed ice and a bowl of ice that is not crushed and sprinkle some sea salt on both of the to see which one will last the longest. My hypothesis was that the ice cubes would last longer. I tried my experiment to see whether my hypothesis would be correct. My mom helped me crush some of the ice and I put crushed ice in one bowl and ice cubes into another bowl. Then I sprinkled the sea salt on both of them and put them into the fridge for a few hours to see the results. Then I took the bowls out of the fridge to see the differences between them by looking carefully. I noticed that the ice that was not crushed lasted longer than the crushed ice. For the ice that was not crushed I saw that there were still a few pieces of ice left in the bowl. For the crushed ice, I noticed that all of the ice that was in the bowl was melted. My hypothesis was correct! It is amazing how ice can last longer with the help of sea salt. I also made a video of my experiment.
73	Breanna	Vanderlei	Junior	Life Science	The Accessible House	The project outlines different options for creating an accessible house for wheelchair users to allow those individuals to have more freedom in their own home.
75	Leah	Conway	Junior	Life Science	What Type of Water Helps Beans Grow Best	The purpose of my science fair project was to find out what type of water helps bush beans grow the best; tap water with sugar, tap water with salt, tap water, creek water or carbonated mineral water. My hypothesis was that sugar water would help my plants grow best. In the end I was wrong. Creek water worked best because it has lots of nutrients that beans like. The creek watered plants are the tallest, and none of them have died. At least one of each other type of watered plants have died or not grown.
80	Serene Hayat	El Kahwaji	Junior	Life Science	Bamboo,Moss and Charchol Water Filter	663 million people - 1 in 10 - lack access to safe water. The water crisis is the number one global risk based on impact to society. The use of an improvised bamboo, moss and charcoal filter is a great way to remove sediments, remove many potentially harmful contaminants, and to improve taste. Bamboo, Charcoal and Moss have a number of health benefits also. My Science Fair topic is about assembling a water filter composed of Bamboo, Charcoal and Moss. This filter could also solve the problem of dehydration for people stranded in the wild.

81	Kadri	Mostafa	Junior	Life Science	Curing Stress: Tradional Medicine vs ALternative Medicine	This is a study of stress and its effect on the mind and body. It looks at treatment options for stress including medication and alternative treatments.
82	Sadeen	Abu Rumh	Junior	Life Science	How does the human body respond to different things	In this project I am going to conduct 2 experiment and find out how our body responds to some surrounding factors. The first experiment is to see how video games effect our body. The second one is to see how coffee, tea, etc cause the discolouration in our teeth.
84	Isabella	Restrepo	Junior	Life Science	Can I Eliminate the Stroop Effect by Changing the Shape of the Words?	In my project I test a different variation of the stroop effect with hopes to reduce the confusion/conflict that is produced during the testing of the standard stroop effect.
86	Latisha	Fray	Junior	Life Science	Plants in the spotlight	This science project focuses on the study of different wavelengths (Red, Green and purple) and how they affects the growth of plants,
87	Ammar	Turk	Junior	Life Science	The Kiki-Bouba Effect	My project is about the Kiki Bouba Effect, the Kiki Bouba Effect consists of me showing my volunteers 2 types of abstract pictures, one being classified as Kiki and the other Bouba. I don't tell the volunteers which one is which and there job is to try to figure it out. Using the data I collect from them, I make results, conclusions and prove a couple of things.
88	Ahmed	Salah	Junior	Life Science	The Best Diabetic Sweetner	My project is to find the best sweetner for people with diabetes to use without increasing their blood sugar level. I will do the experiment using several sweetner on several people and taking their blood sugar test before and after using each sweetner to find out if their is any affect on their
91	Amaani	Sahib	Junior	Life Science	WHY THE WAR ON DRUGS IS A HUGE FAILURE	Our misunderstanding of addiction is the leading cause of our failure to find a solution, and is why our current solution, the war on drugs, is a huge failure. For the reasons mentioned in my project, we have to gradually fix our society and rid ourselves of this decease that we have created with our own ignorance. We have to stop the war on drugs and stop the harm. For too long we thought restrictions, harsh policies, and violence would solve the problem but it has only created larger ones. We need to try a different approach, and spread the message. Change isn't going to
92	Samira	Yousuf	Junior	Life Science	Black Light: A novel indicator of bacterial growth	In my experiment i made a black and a fluorescent liquid, i sprayed a yellow fluorescent liquid all over the kitchen sink then i used the black light to make the bacteria fluoresce and more visible. After i cleaned the sink i used a black light to see if the bacteria or stains have been removed. What my main focus is about how much bacteria is removed after the sink once.
93	Bayan	Alamoudi	Junior	Life Science	Investigating Beauty With The Golden Ratio	My project's purpose is "Do people consider celebrities with facial measurements that come closest to the golden ratio to be the most attractive?" In this project, I measured celebrities faces to calculate their golden ratio and then I had students take a survey, to see if they think the celebrity is attractive or unattractive.
94	Jagdev	Saluja	Junior	Life Science	The Notorious Staph Aureus	Staphylococcus Aureus is one of the five most common causes of infection after injury or surgery. It has a variety of symptoms, ranging from minor skin infections, such as pimples and impetigo, to more severe infections, such as pneumonia and meningitis, to (at its worst) life-threatening blood infections, such as toxic shock syndrome and bacteremia. In 2005, there were more deaths due to Methicillin-resistant Staphylococcus Aureus than AIDS. Currently, there is no known killer of the pathogen, and in many countries, strains of the virus have developed resistances to the antibiotics commonly used to treat it. Upon learning this, we set out to find an alternative, herbal treatment for the virus.
95	Tristan	Look-Hong	Junior	Life Science	Oil Spills & Ferrofluid: A New Beginning with a Promising Future	Oil spills are a major problem in the modern world. When Deepwater Horizon exploded, BP had to cough up approximately $61.6 billion, and they were only able to pay $40 billion. They lost hundreds of thousands of barrels of oil, and the environmental damage was irreversible. Current clean-up methods are either inefficient, too costly, or make the situation worse. However, researchers at MIT have recently discovered a new, incredible way to remove the oil effectively, and efficiently. Ferrofluid. This magnetic liquid is able to merge with the oil, turning it magnetic, and preparing it for extraction with a magnetic force. In our project, we will explain the effects of oil spills, what ferrofluid is, what it's capabilities are, and much more. Ferrofluid is the petroleum's new beginning, capable of much more than just a magnetic rocket fuel.
96	Sanna	Mohamed	Junior	Life Science	What Stains and DE-Stains Your Teeth	Teeth are used for chewing and breaking down food in the mouth to help speed up the digestion process. Teeth are naturally white in color, but over time dark colored drinks like tea, coffee, and cola can stain teeth turning them yellow in color. In this experiment you will use egg shells to simulate the white color of teeth, and study how different liquids effect the color of the eggshells. got this summary off : https://www.scienceshopusa.com/blogs/life-science-biology-projects/80808070-question-does-tea-stain-your-teeth.
99	Awab	Hussain	Junior	Life Science	Alzheimers	My Science Fair project is about Alzheimer's, a mental disease that affect the human brain. I explain the regions where Alzheimer's affect different locations of the brain that results in the dis-function of the patient abilities that control language, memory, eye sight, and his general judgement.
101	Nabeeha	Anwar	Junior	Life Science	Effects of pH	My project is about the effects of pH with and without fertilizer. I will briefly talk about what pH means through my research that I have done, and then proceed to talk about the rest of my project and how I conducted the rest of the experiment.
102	Wid	AlShaikh	Junior	Life Science	SITTING OR STANDING, DOES IT EVEN MATTER?	In this study, I would like to examine the effects of standing on students' math performance. I tested each child using 2 math tests of the same level with a 5--minute limit, both while standing and sitting. The results of my study show that in general, most the students participating in this study had an increase in their math score while standing.
106	Iman	ElKassem	Junior	Life Science	Chemotherapy	If chemotherapy is beneficial to the human body based on benefits and burdens of chemo.Based on these benefits and burdens i will determine whether or not it is beneficial.
107	Anorin	Ali	Junior	Life Science	L'effet des types d'eaux sur les plantes	Pour mon projet, j'ai pris trois petites plantes et j'ai arrosée une avec la pluie acide, une avec l'eau distillée, et une avec l'eau de robinet pour voir quelles types d'eaux est la meilleure pour mes plantes.
117	Arlen	Griffiths	Junior	Life Science	L'effet du sel sur les graines	Our project is a dose response experiment measuring the effects of salt on plant life, by measuring lettuce seed growth after applying various salt solutions. We also gathered water samples from local sources to see if we could determine the possibility of salt contamination in our surrounding environment. The project idea came from a lawsuit filed against a municipality for causing crop damage from excess road salt usage.

119	Molly	Hartley	Junior	Life Science	Saving the Oceans Naturally	Oceans are a vital part of our ecosystem. When disasters such as oil spills occur, great damage is done to both plant and wildlife. Saving the Oceans Naturally explores the best method of cleaning up oil spills using the natural substance, coconut husks. Three different methods were tested and the amount of oil remaining determined the best method for cleaning up oil spills.
120	Sara	Soliman	Junior	Life Science	Memory Time	My project is a physiological study about how long it takes someone to remember something. I used 50 human test subjects to determined my
121	Yuliya	Kabak	Junior	Life Science	Music+Math	I conducted a survey to test the theory of Ancient Greek's who stated that if an interval in music had a smaller fraction of frequencies, it would sound better than an interval with a larger fraction of frequencies.
122	Adnan	Shabbir	Junior	Life Science	Managing psychosis: Does better blood sugar control improve response to treatment?	This Project used data from an individual who maintained meticulous records of his blood sugar levels over a period of a year.We were able to study a pattern of increased hallucinations and delusions with higher blood sugar levels. Regression analysis was used and the different variables were studied and are reported. The use of antipsychotics is associated with increases in blood sugar levels and irregular blood sugar levels, both very high and low, is linked to the occurrence of hallucinations This raises questions about the impact that medications used for treatment has on potentially contributing to psychosis. methods The meticulous records of an individual who suffers from a psychosis was used to study correlation and analyze possible associations between periods of raised blood sugar levels and a worsening in psychosis. Results There was a link between raised blood sugar levels and psychosis. the increases in blood sugar were only marginal but showed a strong correlation with increased psychosis. Routine management usually involved increasing the dose of antipsychotics medication where as better blood sugar management may phase served the purpose. Conclusions There is a link between poorly controlled blood sugar levels and the occurrence of psychosis and highlights the importance of ensuring good control of blood sugar levels
125	Anika	Sharma	Junior	Life Science	Skinthetics	We are searching for a combination of biocompatible materials that would give a synthetic tissue that we could use in our skin. The skin would be used to enclose wounds. There are already synthetic skins out there today, but they are all to cover up scarring and burns. Our goal is to enclose wounds with a cheap way. A procedure using a patient's skin cells in a “skin gun” has been created to allow skin to grow and regenerate over wounds. Like I said, the difference from our skin to the “skin gun”, is it’s a much cheaper alternative and it's easy for household or school use.
126	Layla	Ahmed	Junior	Life Science	Do Video Game Players Have Faster Reaction Times Than Non-Players.	In many action-packed video games, players have to quickly detect and avoid dangers. The highest scores are achieved by those players who respond the fastest to a detected danger. Playing action video games can be fun and highly entertaining, but can playing these games also improve a person's reaction time? Or do some people enjoy playing action video games because they already have fast reaction times?
130	Kim	Tran	Junior	Life Science	B.B.D in Focus	A three-part study on best before dates and their impact on taste perception. Part one is a survey on household food waste habits, part two is a psychological test on taste perceptions with respect to best before dates. Part three was a test on the different bacteria levels between before and after the best before dates.
132	Raeden	Black	Junior	Life Science	Antacid Effectiveness	We are testing various brands of antacids to determine which antacid works the fastest. We are hoping to determine if the price you pay for an antacid product has anything to do with how effective it works.
133	Isha	Desjardins	Junior	Life Science	Musical Madness	Our project tested the assumption of whether or not listening to music while concentrating on tasks will either help or hinder productivity. Our independent variable involved testing subjects on a concentration game while listening or not listening to music.
135	Obert	Guo	Junior	Life Science	Plastic To Plants	There are many plastic wastes in landfills and parks, but how can we reduce it? Nowadays, many stores have items that claims to be biodegradable or compostable, but, can it help the environment and can they replace plastic effectively? It is known that compost accelerators can quicken the process of composting, but can it also impact how biodegradable products decompose? The purpose of this experiment is to see how quick different biodegradable and compostable materials can decompose,and which types of biodegradable material can decompose faster. Meanwhile, we are also overlooking if plant compost accelerator have a direct correlation with the process of biodegrading. Plastic materials is an environmental issue for the modern society since there are numerous plastic waste surrounding the world. They can take centuries of years to decompose. We want to experiment their effectiveness in the modern society and if compost accelerators can differ their average results.
136	Khadijah	Meshrif	Junior	Life Science	Composting	My project is about making homemade compost. One will be made out of food waste and the other will be made out of newspaper and cardboard. I think that the food compost will work better because of that nutrients in the food will return to the soil and help the plant. While that newspaper and cardboard will hav ink on them which might harm the plants.
1	Mohammad	Elhayek	Junior	Physical Science	What happens when you drop a magnet through different pipes	My project is about what happens when you drop a magnet through different kinds of pipes. It is very unexpected for what happens its a very fun and entertaining project.
2	Sarah	Martinez	Junior	Physical Science	Water Density	My project; Water Density, is about the effects of different types of water, regarding flotation. In this project I put a piece of plastic in five different water mixtures; salt water, sugar water, baking soda in water, water with corn starch, and fresh water. I then measured the height of each piece. I based most of my research on the environment.
8	Kevin	Shao	Junior	Physical Science	Charging In Motion	We examined dynamic wireless charging and its potential to charge electric vehicles. We experimented with frequencies ranging from 3.4 to 3.7 MHz and 3 different gauges of wire.
14	Mayada	Fayad	Junior	Physical Science	Elephant Toothpaste	I chose to do Elephant Toothpaste for this year's science fair because I wanted to find out why combining certain chemicals can create such an intense and explosive reaction. My experiment consisted of 3 different experiments using 3 different volumes and percentages of Hydrogen Peroxide. I documented how using Hydrogen Peroxide effected the volume of foam produced and explored why the experiment needed soap

20	Nicola	Noordermeer	Junior	Physical Science	The Acid-Base Relationship in Bath Bombs	I looked at 2 different kinds of acid-base relationships when making bath bombs. The first relationship is between citric acid and baking soda and the second relationship is between cream of tartar and baking soda. I wanted to see which reaction had the most fizz, dissolved the fastest and then explain/understand why these things might have occurred.
22	Tesni	Greig-Clarke	Junior	Physical Science	C like a B	Bees are pollinators and further investigation into how they are attracted to flowers could help our greenhouses and gardens. Many plants like peppers, tomatoes and cucumbers need bees to pollinate their blooms. Increasing the amount of bee interest in flowers would be highly beneficial to commercial businesses and local farms. We think that by using different fluorescent substances in the water fed to plants, we will be able to affect the way the blooms look. Since bees primarily see blue, green, violet and ultraviolet parts of the spectrum, we will use an ultraviolet light to view the flowers and look for colours in that range of the spectrum. Though we can't see exactly what a bee will see, because we cannot see in the UV range, we believe that by using fluorescent fluid, we will visually change the way a flower looks and be able to predict
24	Sriya	Chakravarty	Junior	Physical Science	Logical Landings	The purpose of this experiment is to test the performance of parachutes made from different polymer materials, and see how they descend and react to turbulence. We also want to understand how well these parachutes compare to professional parachutes by using similarity and scaling factors. Four parachutes with canopies of 50cm diameter, made from Nylon, Polyester, Vinyl, and Bubble Wrap are tested. These small model parachutes are designed to be geometrically and physically similar to large US military T-10 parachute. Characteristics examined include time and speed of descent when dropped from a height, stability in turbulent conditions, and cost efficiency. Using the Froude number, performance for each of the four parachutes is compared with the T-10 parachute. We find that Nylon and Polyester parachutes perform best, with Bubble Wrap a close third and Vinyl being the worst performer. Suggestions for making better commercial parachutes are provided. In particular, based on the performance of the Bubble Wrap parachute, it may be worth doing research into incorporating air pockets into Nylon and Polyester based parachutes for use in extreme sports such as sky diving.
55	Eyad	Elhadary	Junior	Physical Science	How Antacids Realive Heartburn	I will be conducting an expirement by making artificial stomach acid and seeing how many TUMS tablets you need to change your ph to normal level.
57	Jacob	Harford	Junior	Physical Science	Magnetic Motion	This project is measuring the effects of variables (amount of ball bearing and magnets) on a home made Gaussian Gun. Measured by recording the speed of the ball bearings.
58	Andrew	Benn	Junior	Physical Science	Magnetic Fields and Fluid Flow	I created a device that consisted of a tube running through a magnetic field. I then used the device to measure the effect of the magnetic field on various liquids passing through the tube.
62	Kiyan	Sadeghi Janbahan	Junior	Physical Science	Porous Material Washout	I used ultrasonic wave application to break up a porous material blockup in my setup. I want to see if there is a difference between single wave and multiwave frequencies.
67	Khalid	Zabalawi	Junior	Physical Science	IF YOU CANT BEAT IT, USE IT!	MY project is about if exposing rocks to acids will make it better to absorb the oil so we can know is it better to extract oil from polluted areas or clean areas.
69	Katelyn	Vieira	Junior	Physical Science	how different types of liqiuds affect skittles?	my science project is about showing people what different types of liquids affect skittles. and also to show them why the skittle is reacting that way.
72	Anna	Lise	Junior	Physical Science	How Clean is Green?	My project investigates seven popular green (non-toxic) cleaners and compares them to see which one is most effective at killing bacteria. I tested the cleaners by swabbing a section of a plastic cutting board that had been rubbed with raw chicken. I swabbed each petri dish and then monitored the bacteria growth each day for five days. The results showed that water and vinegar followed by hydrogen peroxide, and doTerra essential oil cleaner were the most effective at killing bacteria.
76	Isabelle	Kapteyn	Junior	Physical Science	Does Exercise improve memory?	My science fair project was designed to find out if exercising after studying would improve your memory and also to determine if it was better to exercise right after studying or wait a couple of hours. My hypothesis was that if you waited 2 1/2 hours to exercise after studying your memory would be better then if you exercised right after studying. I used 50 participants and they each did 4 different memory tests. For the first test they had 30 seconds to memorize a variety of objects then 45 seconds to write what they remembered. The second test was the same except the participants had to do 5 minutes of exercise then take the test. For the third test the participants studied the objects but then waited 2 1/2 hours before taking the test. For the final test the participants studied the objects, waited 2 1/2 hours, then did 5 minutes of exercise before taking the test. Once testing was completed I reviewed all the results and concluded that my hypothesis was correct.
78	Angel	Peng	Junior	Physical Science	Fondation de l'eau	For my project, I measured the time that 4 ice cubes (with 5 tbsp in each) took to melt. On one ice cube I put 1 tbsp of salt on it, I put 1 tbsp of sugar on another, I put 1 tbsp of dirt on another, and for the last one I didn't put anything on it.
83	Yichen	Zhao	Junior	Physical Science	EVAPO-RACE-TION Do All Liquids Evaporate At The Same Rate?	I have 4 different liquids to evaporate, water, orange juice, nail polish remover, and rubbing alcohol. I'm seeing which liquid would evaporate the fastest, or if they evaporate all the same. No heat or pressure is being added to the liquids. I'm taking pictures and recording the amounts.
85	Holly	Venter	Junior	Physical Science	Driven To Distraction	My project is about distracted driving. I tested 18 teachers on a driving simulation called Highway Hazards to see how distracted they would get. Nine teachers recieved a phone call, and the other nine did not. Over the phone I asked the experimental group a series of questions about themselves. Their final scores were put into a chart with the other subjects scores in their group (phone call and no phone call). I then got an average percentage and an average score for each of the groups. Then I analyzed each of the groups final scores and compared them.
89	Emily	Pak	Junior	Physical Science	The Ferro Fix	Our project is the test of using nanotechnology and magnetism as a new and innovative way to clean up the hazardous oil spills plaguing our oceans today. Through our experiment we looked through the previous methods of cleaning oil spills, cost efficiency and the effectiveness of different amounts of ferrofluid applied to absorb and magnetize oil spills away.
97	Samantha	Blight	Junior	Physical Science	l'effet de liquides sur les ours de gummy (how does liquid affect gummi bears	we put gummy bears in various liquids for 24 hours and we measure the height length and width of the gummy bears and compare them to each other to see which on makes the biggest gummy bear.
103	Jacob Alexander	McGowan	Junior	Physical Science	Paper Towel vs. Water	The summary of my science project was to test the absorption of different paper towel brands, and to determine if the more expensive brands perform better.

104	Adebola	Idowu	Junior	Physical Science	Rusting Out	We are trying to see what liquid makes steel rust faster this ties in with acid rain effect on the world. So we are using steel wool and acid liquids
109	Emily	Streith	Junior	Physical Science	Furnace Fan Settings Effect On Temperature And Humidity	The purpose of our experiment was to test whether the temperature of a room provided by a furnace fan will fluctuate more with the fan on constantly or on demand (on and auto).
110	Jessica	Chen	Junior	Physical Science	SODIS: A Clear Path for the Future?	Boiling water is one of the most effective methods of disinfecting water and making water safe to drink. However, the process can be very costly and not always accessible to those residing in developing countries. SODIS (Solar Water Disinfection) provides a cheap and effective way to disinfect water using solar energy and PET bottles. The question is, how does the degree of opacity of the PET bottle affect the process? Should PET bottles be clear for the SODIS process or does it not affect it?
111	Jawahir	Al Bayati	Junior	Physical Science	from amputate to regenerate	In my project i will be trying out different serums to see if they will regenerate a limb. My goal in to be able to have main idea on to grow back our limbs.
112	Amr	Sahib	Junior	Physical Science	The Unseen Magnetic Field Exposed!	Magnets are not just play things, but are very important in our daily, modern lives. Magnets act as if they have a life of their own because the surrounding magnetic fields make them behave this way. In this project I am exposing the unseen magnetic field,and highlighting the importance of magnetism in our daily lives.
113	Ali	Hamou	Junior	Physical Science	What's Shaking?	The purpose of this experiment is to build and test a seismograph that can detect and record various intensities of ground motion. Problem that is being addressed is that earthquakes cannot be predicted accurately yet, but they can be detected once they happen and seconds before they happen. Gathering information and analyzing the data from seismographs can help us better understand the earth's tectonic plates and earthquakes in general. This can lead to possibly finding ways to predict earthquakes in the future that will give enough time for people to find safety. Understanding earthquakes will also help us build better homes and structures that will be able to sustain and withstand powerful earthquakes.
115	Eesha	Sharma	Junior	Physical Science	The DARK SIDE of the BLUE LIGHT	A scientific study and investigation for the impact that blue light is having on people. Many study shows the different types of effects that the blue light has. I will present my findings based on real life experience of people being impacted while being exposed to the blue light from different types of
127	Sarah	Ali	Junior	Physical Science	winter boots vs ice	Our project is to find out how different types of tread designs on winter boots help with grip on ice so you know which type of winter boots to buy for yourself or your children to prevent you/them from falling
128	Layla	Mahdi	Junior	Physical Science	How to make a electrical arc furnace	My science fair project is about creating an electrical arc furnace . It requires several different tools and is very useful and exciting . This science fair project will show my knowledge of me knowing how to melt different types of metals and how they react in several different ways. I hope it will be very entertaining to the judges and I hope to be a participant soon . Layla Mahdi
129	Layal	Al Kak	Junior	Physical Science	Is tap water healthy to drink?	In this project, we will know if tap water is healthy for your kidney or not. We will discover what are the specific amounts of each mineral or chemical that should be in the water so then we could test the tap water to see if it has those required chemicals ir minerals and their quantity
131	Charlie	Tang	Junior	Physical Science	Get A Grip	In our project, we tested different tread designs for the Mars Rovers. The 4 tread designs we used were the Lego Mindstorms EV3 tread design, (control variable) the Curiosity Rover tread design, (control variable) a dune buggy tread design, (control variable) and our own hybrid tread design. (independent variable). We were measuring the time that it took for the Rover to get across the simulated terrain. (dependent variable) Our hypothesis was that if the tread designs worked efficiently on a simulation on Earth, then it would have the same level of effectiveness on Mars. The experiment didn't provide information as for all the tread designs caused the wheels to get stuck and spin out. We also wanted to try using tank-tracks. The tank-tracks cruised across the terrain easily, showing that tank-tracks work better than regular tires.
134	Seenan	Al-Louzi	Junior	Physical Science	Is It Necessary To Fluoridate Our Water?	I will examine if the fluoride content from sources that we use in our daily lives suffices the necessary amount needed in place of fluoridating our water supply.
137	Bradley	Xiang	Junior	Physical Science	Invisible Light	Our project is testing the absorption of radiant energy by different colors. We want to see which color absorbs/emits the most amount of energy. We used an infrared thermometer to measure the temperature of the colored pieces of paper we placed under a shaft of sunlight. We used the Stefan-Boltzmann equation to figure the energy flow and the power output of the colored squares.
139	Emma	Chaddock	Junior	Physical Science	Which drink provides more electrolytes? A sports drink or orange juice?	My project was the comparison of electrolytes in orange juice and a sports drink. I made a kit to complete my experiment where I could read the amount of milliamps and microamps in each drink on a measuring device called a multimeter. My experiment took an hour to set up my kit, measure the liquids, and record my data. My hypothesis was that my results will show the sports drink (Gatorade) will have more electrolytes because of the chemicals and energy contained within the drink.
163	Hafiz	Adam	Junior	Physical Science	Eye see you	My project is about different eye colors and eye sight. I wanted to see if different eye colors could see differently, so I chose this project!
164	Hamzah	Hafiz	Junior	Physical Science	Which Slinky is better Metal or Plastic	Which Slinky is better Metal or Plastic. you will find out which Slinky is better Metal or Plastic and you will know so buy the better one
34	Atwood	Cohoon	Senior	Engineering	Arduino Controlled CD drive Drawing Machine	This project was done mostly as a learning experience to see if I could learn how to use and control and arduino. This project was chosen because it seemed sufficiently difficult in terms of hardware, and did not require very much coding. After the fact that it can be used to draw, it can also be used as a router, a 3D printer or a laser engraver depending on modifications. This can also be scaled up quite easily and is very cheap to build since it is made of recycled materials.

35	Dennis	Krasnov	Senior	Engineering	Artificial Neural Network for Autonomous Driving	Traffic accidents cause 3287 deaths each day around the world. Many of these accidents are due to driver error and other preventable causes. Leading companies such as Google, Tesla, and Uber believe that autonomous cars are the future of transportation. I have decided to create an autonomous driving system based on machine learning. To model a driving environment, I created a realistic physics engine which accurately simulates driving forces, resistance, and acceleration of the car. Instead of giving explicit control instructions, I used an artificial neural network which mimics connections in a human brain. I used an evolutionary approach to teach it to drive and optimise the algorithm's performance. The algorithms are evaluated and the most successful contenders become the base for the next generation.
37	Yamen	Abo-Amer	Senior	Engineering	Project Vision	"Blindness affects about 39 million people in the world" states the World Health Organisation(WHO) in 2016. Our projects seeks to replace the tools and physical aids that people who suffer from major vision loss are given. The current physical aids that are given have changed very little in the last century. Walking sticks, one of the more popular physical aids, is a clear example of the ageing technology. Our project uses ultrasonic senors and vibration motors to open up the world to people with major vision loss. This allows wearers to sense a full 360 degrees around them, at a maximum range of 4 metres. Our project paves the future for more technological advancements that benefit the blind. Thank you.
44	Harry	Chen	Senior	Engineering	A New Hip: Image-Based Design of A Rat Hip Prosthesis using Metal 3D Printing	The purpose of this project is to investigate the application of metal 3D printing in customized prosthesis through creating an image-based design of a rat hip prosthesis. Current orthopaedic implants may be limited by a lack of osseointegration, which is the adhesion of bone to implant surfaces - leading to reduced lifespan of implant. The development of metal 3D printing technologies have enabled us to create precise components small enough to be implanted and tested in a rat. This study offers insights into creating bone implants with higher precision and better osseointergration using imaging and 3D printing technology.
46	Hayden	Walker	Senior	Engineering	Guinness Feeder - An Internet Connected Dog Feeder	With over 35% of Canadian households owning a pet, there is a need for a simple pet feeder that will allow a user to control it with their phone. To help automate the pet feeding process, the Guinness Feeder was designed and created. Using littleBits, LEGO and IFTTT, a basic device was created that can controlled by a simple text. Whenever a user sends a text, an IFTTT action is triggered which in turn triggers the littleBits circuit. The littleBits circuit is made up of a DC motor and LEGO pieces which when triggered a mechanical door is opened and closed dispensing food for
47	Trent	Strong	Senior	Engineering	All Ears Music Machine	Music has a large influence on the lives of teenagers in the twenty first century. Listening to music through headphones is a common practise enjoyed by many, as is creating one's own melodies. However, when creating music on one's own, it can often be a hassle switching between listening to music for inspiration and creating music. Furthermore, it can be quite difficult to get the attention of someone who is listening to their favourite tunes, and people often have to resort to raising their voices. To solve both of these problems, the All Ears Music Machine was created. Using littleBits, a circuit was constructed which allows the user to switch from listening to their own music to creating music by simply flicking switch. In addition, if someone wants their attention, they simply have to speak, and a sound sensor will detect the noise and turn off the
152	Lauren	Goldrick	Senior	Engineering	The Application of Different Organic Structures in the Synthesis of Biodiesel	The creation of a biodiesel from a variety of oils. Testing the efficiency of each oil to find a correlation between structure, and overall heating value.
28	Moneet	Tiwana	Senior	Life Science	Identification of proteins/peptides using bioinformatics to inhibit enamel demineralization	The aim of this study is to investigate the demineralization of teeth and how it can be prevented using bioinformatics with experimental data. This study involves experimenting the change in human enamel pellicle structure by using human enamel fragments and observing the changes presented. By using multiple databases of protein sequences, such as UniProt, it was possible to identify the specific proteins involved in the experiment. This identifies which proteins are responsible for the demineralization of teeth.
33	Nancy	Liu	Senior	Life Science	Investigating the role of CCN1 and CCN2 in intervertebral disc health in mice	Lower back pain resulting from intervertebral disc (IVD) degeneration causes more global disability than any other condition and is one of the leading causes of activity limitation and work absence. There is a pressing need to better understand the molecular processes involved in disc degeneration in order to develop disease modifying treatments for this clinical problem. My project involves studying the roles of two matricellular proteins, CCN1 and CCN2, in the intervertebral disc using knockout mouse models. CCN1 and CCN2 are members of the CCN family of proteins that regulate cellular signalling in response to growth factors and extracellular matrix changes. CCN proteins are dysregulated in a large number of diseases involving chronic injury or inflammation, such as IVD degeneration. Accordingly, they have been identified as potential therapeutic targets for other such chronic pathological conditions. My objective is to determine whether the loss of these proteins in the disc alters disc degeneration. To study the roles of CCN1 and CCN2 in the IVD, we have generated mice that have either CCN1 or both CCN1 and CCN2 deleted from the nucleus pulposus of the IVD. I hypothesized that knockout mice lacking CCN1 and mice lacking both CCN1 and CCN2 would experience accelerated disc degeneration compared to control mice. I have stained the discs using saf-O/fast green staining and histologically scored the level of degeneration using an established histological grading scheme. The long-term goal of this study is to determine if
39	Wenyang	Miao	Senior	Life Science	Voluntary exercise rescues congenital heart defects induced by maternal pre-gestational diabetes	Women with diabetes have a 4 times increased risk of producing offspring with congenital heart defects (CHDs). A hyperglycemic gestational environment promotes the production of reactive oxygen species (ROS) detrimental to proteins involved in normal heart development. One such protein is endothelial nitric oxide synthase (eNOS), an enzyme that has been demonstrated by our lab to play a critical role in heart development. Under conditions of oxidative stress, eNOS becomes undimerized, and produces superoxide rather than nitric oxide. It has been demonstrated that recoupling eNOS can counteract the detrimental effects of pregestational diabetes on heart development. Thus, we hypothesized that maternal exercise during pregnancy can result in a lower incidence of CHDs in a mouse model of pregestational diabetes by upregulating eNOS. Compared to a 63% incidence rate of CHDs in the offspring of diabetic mice, voluntary exercise leading up to and during pregnancy decreased the incidence to 31%. With maternal exercise, fetal hearts showed significantly improved aortic and pulmonary valve remodeling compared to the non-exercised diabetic group. Both coronary artery diameter and abundance were decreased in offspring from diabetic dams, but these effects were mitigated with maternal exercise. There is some evidence that proliferation in the myocardium at embryonic day (E)12.5 is also increased with exercise. There is also a trend of increased gene expression of Cyclin D1, a marker of proliferation, and Hif1-alpha involved in coronary artery development. These changes in morphology and gene expression may be attributed to improved eNOS coupling.

40	Sarah	DeWeerd	Senior	Life Science	A Case for Natural Food Preservatives	In this project, the effectiveness of natural food preservatives was observed through the growth of bacteria cultures in the presence of various antimicrobials. Further experimentation involved the baking of homemade bread, in combination with a selection of natural food preservatives. Analysis of observed microbial growth on bread samples was recorded, analyzed, and compared to the growth of bacterial cultures in petri dishes. The case for natural food preservatives in bread was further supported through exploration and testing of a variety of storage techniques to extend the shelf life of natural foods.
43	Simone	White	Senior	Life Science	The Effect of Algal Blooms on the Great Lakes	This project was conducted to determine the best method for removing phosphorus from lake water. This project mimicked chemical removal in the great lakes. Our project also had a purpose to see what concentration of phosphorus under a grow light provides the best environment for algae growth.
143	Emily	Kacer	Senior	Life Science	An Environmentally Conscious Moisturizer	Our project innovates a new and more sustainable way to produce an effective and eco-friendly moisturizer. By using natural ingredients and eliminating harmful chemicals, our moisturizer can be produced in one's home by using common ingredients. Through creating this product, we have lessened the impact of the cosmetics industry on the environment and developed a tenable method to seal moisture within the skin. Our hope for this product is to create a pathway for change within our community and shed light to the various issues with mainstream moisturizers.
149	Grace	Na	Senior	Life Science	Road salts: A problem for the new generation	Finding alternative solutions to road salts. Road salts have a very harmful effect on the Great Lakes so our group decided to set out a series of projects to find the most effective and eco friendly alternative.
154	Stephanie	Yakubowski	Senior	Life Science	The Effect Of Microbeads On The Great Lakes	My experiment was to test the toxicity of a face scrub from a brand that contains microbeads and on three different home made honey face scrubs that contain salt, sugar or baking soda as en exfoliant to replace the microbes. These four face scrubs were tested on bacteria plates and the qualitative observations on the bacteria were recorded. From the observations it was then concluded which of the homemade face scrubs would be the most effective to clean someones face without harming the environment.
155	Melanie	Jonnalagadda	Senior	Life Science	Glucose Induced Expression of Endothelin-1 and its Relation to Diabetic Retinopathy	Compared the gene expression of endothelin-1 (ET-1) in glucose induced human retinal endothelial cells to normal human retinal endothelial cells. Experiment showed that the up regulation of ET-1 contributed to diabetic retinopathy.
156	Emily	Tam	Senior	Life Science	Does loss of RxR alpha from cartilage cells alter spine development?	In Canada, back pain is the most common musculoskeletal problem, and the second most common cause for doctor appointments. By exploring the pathways regulating spine development and disease, more effective treatments can be found. The purpose of my project was to determine whether Col2-Cre RxR knockout mice exhibit altered spine development. Data was collected for analysis using histological techniques, such as sectioning, staining, and imaging.
157	Shirley	Liu	Senior	Life Science	OATP1A1 as a novel dual-modality reporter gene for cell tracking in living subjects	Reporter gene imaging can enable the fate of transplanted cells to be visualized in both animals and humans and may be the key to improved evaluation of next-generation cancer therapies in preclinical models due to its ability to non-invasively track cancer cells in rodents over time. However, the feasibility of current reporter gene imaging technologies is limited by their weak sensitivities. In this project, I studied the rat renohepatic organic anion transporter protein, OATP1A1, which has been shown to enhance both bioluminescence imaging (BLI) and magnetic resonance imaging (MRI) signal generation by increasing cell uptake of the BLI substrate D-luciferin and the MRI contrast agent gadolinium ethoxybenzyl diethylenetriaminepentaacetic acid (Gd-EOB-DTPA). The intensity of BLI signal from cells expressing luciferase only and cells expressing both luciferase and OATP1A1 showed that co-expression of OATP1A1 resulted in increased light output. Moreover, the longitudinal relaxation rates (R1) of cells incubated with Gd-EOB-DTPA showed that OATP1A1-expressing cells had elevated R1 values (2.36 ± 0.26 Hz) compared to control cells (0.59 ± 0.02 Hz). Our cell data supports further development of OATP1A1 as a novel BLI reporter gene and clinical-field strength MRI reporter gene for cell tracking. Future work will explore the potential of OATP1A1 by using it to track cancer cell metastasis in mouse models using BLI and MRI, and to safely engineer cells to express OATP1A1 using clustered regularly interspersed palindromic repeats
160	Julia	Jacob	Senior	Life Science	The Effect of Synthetic Fragrances on Microorganisms	For our project, we will be making perfumes from esters and testing them on the environment. We will determine which acid/alcohol combination is the most harmful, and use this knowledge to make a greener alternative to synthetic perfumes.
161	Paul	Mun	Senior	Life Science	Formation of Carbonates using Carbon Dioxide	Assuming that carbon dioxide has been captured for us using carbon dioxide scrubber and/or any other methodologies, we are trying to form precipitates by performing various reactions to produce a compound that is not harmful for the environment and can be used for various purposes. We used soda water to simulate carbonic acid which is produced due to a reaction between carbon dioxide and water molecules. There is an abundance of carbonic acid in the ocean waters which accounts for the acidification of oceans. For the prevention of carbon dioxide reacting with water molecules to form carbonic acid, reactions are done to create carbonate compounds.
162	Christopher	Xu	Senior	Life Science	Determining the Best Way to Neutralize Drain Cleaner	The project is to determine the best way to neutralize Drain Cleaner by using a variety of household chemicals and measuring the respective PH and concentrations of the various substances using titration.
42	Jaya	Gupta	Senior	Physical Science	Bioplastic: The Material of the Future?	Plastics are a cornerstone of modern human life. From eating, to school, to work, to our recreational lives, we use plastic in almost every activity. However, despite humanity's reliance on plastic, the creation process is far from perfect: many toxic chemicals are used in the production of plastic and most consumer plastics tend to be petroleum-based (a non-renewable resource). As climate change and global warming become more relevant and pressing issues in our society, more industrial efforts are being allocated towards creating a plastic containing biologically based materials in an effort to explore a more sustainable future for our plastic-dependent society. Our project seeks to investigate the feasibility of bioplastics to replace petroleum-based plastics that are widely used today through experimentation with various types of bioplastics.
141	William	Knipe	Senior	Physical Science	Collecting Water From Air	Our project aims to find which compound is best at drawing in and then giving up moisture from air with a high moisture content. Three different compounds are tested and then the best one is tested at three different humidity levels.
146	Jun-won	Kim	Senior	Physical Science	Creating a Successful Biodiesel using different types of Cooking Oils	We are creating biodiesel using corn oil, vegetable oil, peanut oil, and sunflower seed oil. We will perform two different tests, clarity and 3/27 conversion, to compare the quality of the fuels.

153	Kelly	Kong	Senior	Physical Science	Optimizing the Process of Rubber Tire Recycling Using Different pH Solutions	The purpose of this project is to optimize the process of recycling tires. In North America, over 300 million tires are disposed annually onto landfills, and researching new ways to break them down into usable materials is critical in moving forward in our environmental responsibilities. For our experiment, we tested the effect of acids and bases on the strength of tires. To do this, we soaked strips of tires in an acid and a base, and then we tested their tensile strength using a tensile testing machine. We hypothesised that the treated tire would be weaker than the untreated tire because the sulfur bonds connecting the polymers within tire rubber would be broken by the acid and base, and oxygen molecules would
158	Matthew	Peck	Senior	Physical Science	Fresh Water or Salt Water: An examination of Salt Pollution in the Great Lakes	Through an experiment designed by our group and with guidance from our Chemistry teacher, we explored salt pollution in the great lakes through multiple experiments conducted on Road Salts and their alternatives.