



E-VIEW

The Journal of The British Columbia Technology Education Association

June 2017

In this edition.....

- President's Report
- BCTEA Executive Positions up for election in October @ AGM
- PSA Super Conference info
- BCTEA AGM & District Rep Meetings
- Rocketry

Have a great Summer Break!!



One of many photos uploaded to the BCTEA Facebook Page this year

See you in September!

President's Report



There are two main goals that I have been working on this spring. The first is organizing and working with a writing team to update the 2002 HEADS UP FOR SAFETY manual. The second has been working on looking at shop floor space and equipment placements to meet risk management requirements.

Both of these are lofty goals, but I am determined to see them through. In the end they will be posted under resources on our BCTEA web site for easy access. For both of these initiatives we have had BCTEA members volunteer to work on the projects.

HEADS UP FOR SAFETY has the following people presently working on machine procedures: Heather Elliott from Chilliwack, Kevin McIntyre from SD 22, Roger Bortignon from BCIT, Luc Ouellet from SD69 and me. We spent 3 days originally together to identify the machines to cover, a new template to work under and then started to produce the document. Work is continuing by all of us and we hope to have it close to completed in a rough draft by end of June. Then we will share with everyone and ask for your input, then off to worksafeBC to do the final touches. It should be ready to debut at the Super Conference.

Shop floor space. The Ministry of Education has specified floor allocations for our different shops. When a new school is built, or renovation is done, the architect works from these numbers. Peter Hamlin from Vancouver School district has agreed to work with me on drawing out different floor plans with these dimensions and then overlay some of our current shops so that we can get a good idea of what is acceptable for new floor space. We are also overlaying the machines with safety zones that align with Risk Management recommendations so we can safely set up a shop for today's classes and equipment. Hopefully this will assist teachers when confronted with the task of dealing with a new build and not knowing what is needed, and for those that get funds for new equipment to know how much space is required around the machine for operator safety.

The **Super Conference** has also been consuming quite a lot of time in setting up. It is hoped that Technology Education Teachers will support the conference by attending

and seeing presenters and keynotes that we would not normally have access to at our traditional conferences. Because of the scope of the conference, and with only 7 presentation spots, we chose to create workshops that would appeal to a more general audience in the hopes that we will assist teachers with the new ADST curriculum and maybe target more intermediate grades. To compensate for this limited variety, we have some great ideas outlined for our District Reps meeting the day before and a fun AGM off site where we can elect our new BCTEA executive members. We will also have a social function arranged for the Friday night of the conference.

Executive member nominations. Each year half of the BCTEA executive positions come up for election. Every year when the election of officers comes up there is a silence until someone volunteers or is nominated by a friend. This is not a good way to get a working executive. What are needed are BCTEA members to volunteer themselves and want to be on the executive. If we want the BCTEA to set goals and then work towards them, then the people volunteering must be prepared to put in some extra time to help move our PSA forward. We have 7 positions on the executive. It would be nice to have all 7 of these members willing to put in roughly 3 to 10 hours per month working on goals that we outline together and solicit input from our members. We have a monthly tele conference to keep in touch, and then each person on the executive is expected to take on some initiative. Because of this we do not expect someone to stay on the executive for extended periods of time as we all can only give for so long and there comes a time for new people to step up. Being an executive member means you feel you have the time, it is your turn to help our organization, you have some goals yourself you would like to see the BCTEA accomplish, and you recognize what good things past members have accomplished. Out of roughly 350 active members we should be able to see people step up for a couple of terms (each position is a 2 year term). I myself will be in my last year next year of my 4 years volunteering to be your president. I would recommend that the Vice President position coming up this year be filled by someone willing to move into the president role the following year. I will be kept on as Past President for a term to assist this new president, but it sure would be nice to have a Vice President next year getting started learning about some of

President's Report

tasks that need doing. Next year we have the Vice President, Treasurer and Member at Large positions coming up. If you would like to take your turn at joining our executive group, please send me a message. Hopefully we get more people volunteering and we get to have elections for the positions, as this always adds some excitement to our AGM's.

I want to thank so many of you for sending me messages such as putting in your name to volunteer for certain groups, giving feedback on shop issues, or sharing your concerns. If I do not get back to you please do not consider it an insult, as sometimes I put out information such as from the ITA asking about doing the summer

workshops. In that instance I gathered your input and passed it on to the ITA so they could decide when to run the workshops. I just did not have time to respond to everyone and I will hopefully be able to share more information as it comes to me. It sure is nice to get the input.

Thanks to everyone using Facebook, it is so informative and helpful. Now that it is working so well, another goal for the BCTEA is to build resources for our different shop areas. If you have good project ideas please pass them on to us.

BCTEA Facebook Page—Some posted pictures for 2017



Executive Positions Up For Election

Each year half of the BCTEA executive positions come up for election. Every year when the election of officers comes up there is a silence until someone volunteers or is nominated by a friend. This is not a good way to get a working executive. What are needed are BCTEA members to volunteer themselves and want to be on the executive. If we want the BCTEA to set goals and then work towards them, then the people volunteering must be prepared to put in some extra time to help move our PSA forward. We have 7 positions on the executive. It would be nice to have all 7 of these members willing to put in roughly 3 to 10 hours per

Elections for executive positions will take place at the 2017 Conference AGM at the Trev Deeley Motorcycles Museum on Thursday, October 19th. Positions are open to current BCTF members and members of the BCTEA PSA who are in good standing.

month working on goals that we outline together and solicit input from our members. We have a monthly tele conference to keep in touch, and then each person on the executive is expected to take on some initiative. Because of this we do not expect someone to stay on the executive for extended periods of time as we all can only give for so long and there comes a time

for new people to step up. Being an executive member means you feel you have the time, it is your turn to help our organization, you have some goals yourself you would like to see the BCTEA accomplish, and you recognize what good things past members have accomplished.

The following positions will be up for election this year and nominations are welcome for all positions.

Vice President (2 year term)

Martin Lim is presently in this position.

Treasurer (2 year term)

Brad Purves is presently in this position

Secretary (2 year term)

Devon Burroughs is presently in this position

Member At Large - Conference Registrar (2 year term)

Ryan Harmon is presently in this position

Please refer to the [BCTEA Website Executive Page](#) for the FULL descriptions of each executive position



Facebook Page Update

The BCTEA Facebook page has hit 320 MEMBERS!!!. You can "JOIN" the group if you are a Tech Ed teacher in a BC school. Only members of the group can POST and see other posts from members. Please "JOIN" the group @

<https://www.facebook.com/groups/bctea>

PSA Super Conference

October 20th & 21st @ Canada Place

The [PSA Super Conference](#) will bring together 26 Provincial Specialist Associations at the Vancouver Conference Centre for a two-day professional development event on October 20-21, 2017. The BCTEA will be a part of this Super Conference and will not be holding a regular conference until the Fall of 2018.



BCTEA District Reps Meeting 2017

Location: Trev Deeley Motorcycles Museum
1875 Boundary Rd, Vancouver, BC
<http://deeleyexhibition.ca/exhibition/>

Date: Thursday, October 19, 2017

Time: 2pm to 6pm, followed by AGM and museum tour

Pre registration is required (we will accept more than one person from a district at this meeting), email Randy.Grey@sd71.bc.ca

1. Applied Design, Skills and Technology presentation.
2. Skills Exploration courses.
3. Youth Trades Capital Equipment Program funding.
4. Heads Up For Safety. New document release.
5. Shop floor layout and equipment spacing.
6. Issues brought forward during our sharing time or prior to district reps meeting.

BCTEA AGM 2017

Location: Trev Deeley Motorcycles Museum
1875 Boundary Rd, Vancouver, BC
<http://deeleyexhibition.ca/exhibition/>

Date: Thursday, October 19, 2017

Time: 6pm to 8pm, followed by a museum tour

It is hoped that Tech Ed teachers will come for the AGM and a tour of the museum.

1. Report out by current Executive members.
2. Shop size and equipment layout plans.
3. Election of exec members.
4. General discussion
5. Tour of Trev Deeley Motorcylce museum.

PSA Super Conference Sessions and Workshops

October 20th & 21st @ Canada Place

ADST Woodwork Projects (Randy Grey)	Elementary or middle school teachers wanting to implement the new ADST curriculum, but who may be wary of using tools in the classroom, will be shown what they need and how they can get started. Participants will be shown safe tool use, safety procedures, and will leave with the new elementary/makerspace Heads Up For Safety Booklet. Each participant will also create a small woodworking project that could easily be done with students.
Building Kids By Building Robots (Jason Brett)	These are not robots. They are machines to inspire imagination, energize problem solving and engage creativity. Sure we build robots, but we also build teams, not just for students but cross-curricular teams of teachers, sharing their passions. Coding? Of course. Designing and building? Naturally. But writing, graphic design, filmmaking, finance, accounting and marketing? The more talents a team has, the more talented the team. A variety of approaches to robotics will be presented, from in-class challenges for middle-schoolers to world-class competition for secondary schoolers. Come join the robotics revolution... but don't forget: it's not about the robots.
Creating A Makerspace In Your Classroom (Dereck Dirom)	Participants in this workshop will learn how the MakerEd movement with a STEAM focus is an effective way to integrate the Applied Design, Skills and Technology (ADST) curriculum into their classroom or school. We will explore the various buzzwords, resources, tools, technologies and potential assessment strategies found in classroom based makerspaces. Participants will have a hands on opportunity to explore littleBits technology and discuss strategies on how to connect ADST to a language arts/aboriginal unit.
Exploring Problems Using 3D Printing (Devin Burroughs) (Heather McIntosh)	In this workshop we will discuss what it takes to incorporate 3D design and printing into your school. We will be touching base on the purchasing, maintenance and use of the equipment. We will also be looking at some basic 3D design software available and the pros and cons connected to them.
Implementing The New ADST Curriculum In Wood And Metal Classes (Heather Elliott)	Implementing the curriculum competencies in the wood and metal shop requires a new rubric for instruction and assessment. Along with this new direction for student projects—from an old "cookie cutter model"—is integrating the design process to personalize projects. Some new ideas will be shared, and then there will be open discussion time for participants to share what they are doing and thus build new teaching techniques and strategies to work within the new curriculum. In addition, we will introduce the revised edition of the <i>Heads Up For Safety</i> documents which include a broader range of equipment and will be divided into subject area format to make them easier and more accessible. It also includes a "junior" version for assisting in the implementation of the ADST curriculum at the K-6 Level. Hand outs and takeaways will be available.
Jewelry Making (Ryan Harmon)	This workshop will explore the world of art metal and jewelry design and showcases various projects, techniques and procedures found in primary through senior secondary classrooms. All participants will leave this hands-on workshop with a sample project, resources and a desire to create exciting learning opportunities in their own classrooms. No experience necessary!
Maker Thinking (Susan Crichton)	Makerspace encompasses two main initiatives. One is a space that has tools and materials available for youth to create solutions/artifacts. Second, it should involve design thinking, which is outlined in the new ADST curriculum as curriculum competencies. Participants will be guided through an exercise to assist teachers in learning design thinking.
AM— BCIT Aviation Campus Tour PM— Seaspans Tour (Steve Claassen)	<p>Two exciting tours have been set up. The morning tour is out to BCIT's huge aviation hanger which is Canada's leading aerospace training facility. The afternoon tour is to the Seaspans yard to check out their latest ship building project. You can pick one tour or both.</p> <p>Participants going on the Seaspans tour must have steel toed boots. If you do not have them, we have loaners, but sizes must be given prior to workshop. Please email Steve.Claassen@sd71.bc.ca to book a seat on these trips and reserve steel-toed loaner boots if required.</p>

Rocketry in classroom. Going to the next level.

By: Jordan Whyte

In early spring of 1991, I was introduced to the hobby of model rocketry. I remember a small Estes kit that included a bold, black lettered cardboard box containing various bits and pieces such as a plastic orange launch pad and an electrical trigger system. It even included a few motors!



My father, brother and I sat at the table using white glue, a hobby knife and masking tape to complete the kit rocket. For the finishing touches we used a can of red spray paint followed by water-based decals. We were very excited waiting for the good weather needed for a successful launch.

Days later, our rocket launch was spectacular! Clearly I remember a distinctive hissing sound and sulphurous odour from the thick white smoke as the rocket shot skyward. My Dad said the rocket went up about 250 meters, and we were so impressed! Although it landed high in a Douglas fir; the experience helped me gain an appreciation for model rocketry and the physics behind it. I was just 10 years old.

Since that time, technology has advanced considerably. No longer is the consumer restricted to cheaply made rocket kits and compressed black-powder fuelled rocket engines from *Estes* and *Quest* hobby companies. With the formation of *AeroTech Aerospace* and *Cesaroni Technologies*, the range and availability of rocketry products in Canada has increased exponen-



tially. Growth of Canadian amateur rocketry is in direct response to the modification of regulations by the Federal Government in the late 1990's in consultation with the *Canadian Association of Rocketry* (CAR/ACF)

Now I am excited to share model rocketry with middle school students in shop class. For the past two years students have been building rockets in my *Applied Technology* class. Through this experience students learn how aerodynamics affects the performance of a flying object.

We examine airframe construction, centre of pressure (CoP), centre of gravity (CG), fin geometry, design and recovery options. In addition, we use electronic altimeters which accurately measure velocity, altitude and G forces during flight. We've built both individual and large kit rockets that can fly to hundreds of meters in altitude and at incredible velocities! I've even attached micro sized RC video cameras to our rockets to record their flights.

Below: Photos of a 2.6" diameter AstroBee light framed rocket with an onboard high definition RC camera. Altitude is approximately 700 meters.



In November, my class was able to officially *break of the speed of sound* on three of our rockets! We re-designed the rockets' shape and used the same type of motor. Students reduced the overall mass of the rocket, narrowed the fuselage and changed the fin geometry. One of our three rockets survived the flight at **Mach**! Again, our electronic altimeter was used to accurately make measurements and transmit the data to my

Rocketry in classroom – Cont.

smart phone. Nothing beats hearing that distinctive *sharp crack* when a student-designed model rocket *passes through the sound barrier*! It's an amazing achievement that the students will certainly remember!

Below: One of our speed of sound challenges. Note: peak velocity is achieved at the end of the propellant burn cycle. Usually this is hundreds of meters above the launch pad. Most G composite motors burn out after just 1 second and rockets coast to altitude on their own momentum.



Below: a picture of an AeroTech G80 "blue thunder" motor during it's first initial moments of thrust - the flame colour is due to a fuel additive for visual effect and tracking purposes.



Safety is Critical !

Years of flying a variety of rockets has given me a good understanding of the safety procedures required while working with student groups. To ensure a safe, successful launch while using F and G composite fuel rocket engines I have upgraded the launch-hardware. We now use an ex-

truded aluminum 'T' rail with 1" and 1.5" Delrin rail buttons that guide the rocket along for the first 6 to 8 feet before 'flight'. This gives the rocket incredible stability when launched vertically. The rocket doesn't 'jam up' when it is fired and flights are nearly vertical every time.



Training:

Students are trained in: arming the launch controller, 2 way radio operation and preparing launch vehicles prior to flight. I complete the final inspection on the field. The check ensures that the parachute is in the rocket and able to eject without obstruction, motors are fused correctly and are properly seated in the rocket. We also go over worse case scenarios - 'what would happen if'? Students are really attentive during pre-flight discussions, even though much of the content is common sense.

Launching:

I am explicitly clear with my students throughout the rocketry unit about expectations, school and Federal regulations.

All launching is done with a 12 volt - key activated electrical ignition system. It has a safety switch and lock out to prevent accidental ignition. A 30 meter long ignition cable is attached to the launcher controller to the launch pad.

Composite fuel rocket motors are *energetic materials* and need to be treated with utmost care and respect. Safety dictates that rocket motors and igniters are locked up separately until the class is at the launch site. Rocket motors are fused **only** at the launch location and are **never**

Rocketry in classroom – Cont.

transported with the ignitors inside the motors - (in a *fused state*). I oversee all of the fusing procedure with students. They are then able to safely learn to correctly prep the motors on the launch field.

I believe that educating students in this manner is the **ONLY** way to prevent accidents and stop unsafe behaviours. Parents have attended launchings and been very supportive of my approach.

For more information about the Canadian Association of Rocketry (CAR/ACF) and current regulations/laws visit: <http://canadianrocketry.org>

Federal rules and regulations regarding model rocketry in Canada:

- model rocket motors must have **no more than 160 N/sec of total impulse** regardless of single or cluster motor arrangement. In addition, the rocket must weigh less than 1500 grams with propellant loaded.
- model rocket motors are **NOT** fireworks but are classified as a propellant-type explosive. These are exempt from certification and most municipal by-law restrictions.
- fire hazard restrictions must be followed: *Never launch during fire hazard conditions!*
- *rockets are always launched within 20 degrees of vertical. Launching a rocket horizontally is extremely dangerous and is a criminal act.*
- *Never launch a rocket in low cloud, fog or winds greater than 20 km/h*
- *Never launch a rocket near or at aircraft*
- model rockets do not have any speed or altitude restrictions in Canada. (unlike the US that requires FAA approval for certain altitudes)
- model rockets are **NOT** subject to drone or RC model restrictions in Canada.
- the largest motor that can be launched with-

out certification is a G sized motor.

- age limits for possession and acquisition for model rocket motors are:
 - 18 years of age or older for motors with total impulse of 80 newtons or more
 - *minimum* 12 years of age for motors up to 80 newtons.
- *To prevent ballistic descent:* All model rockets **MUST** have a recovery system such as: a parachute, a streamer or an alternative.



Canadian Rocketry Suppliers:

- #1. All Canadian Rocketry: <https://www.allrocketengines.ca>

Pavel Denu owns Denu Hobbies in Ontario. Pavel is a high power rocketeer who is currently flying in both the US and Canada. He is licensed on both sides of the border. At the time of writing, Denu's prices are most reasonable in Canada.

- #2. Sunward Hobbies: <https://www.sunwardhobbies.ca>

Angelo is the distributor for CTi rocket motors. He also sells hybrid rocket motors to licensed individuals. Angelo is a high power rocketeer who launches across Canada. He was the former national president of the CAR/ACF.

Check out Jordan's video of what his kids have been up to <https://videopress.com/v/OQB5UCoj>. You can contact him @ jwhyte@sd62.bc.ca