Hemlock Area STEM Center
Capital Campaign: 2019 - 2020





A plaque with your name and giving level will be engraved and mounted on the outside of the STEM Building with additional signage on the interior to honor your contribution.

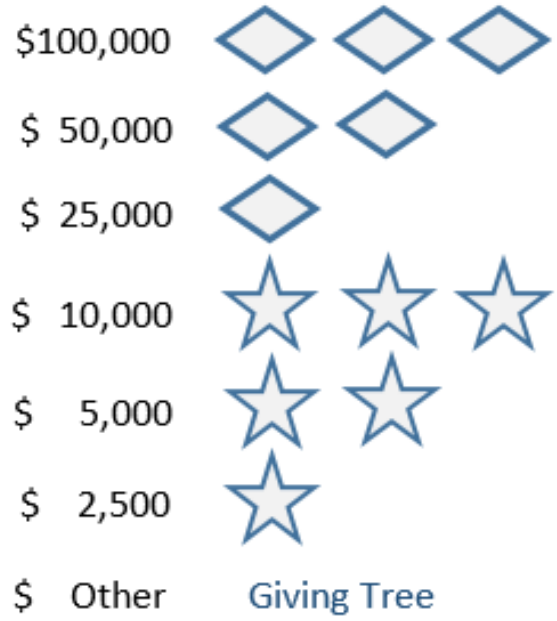
A sample plaque will soon be available.

Hope you share our excitement.

Checks can be made payable to:

Hemlock Public School District - Memo: STEM
P.O. Box 210
Hemlock, MI 48626

Diamonds & Stars will be used to help show Giving Levels.

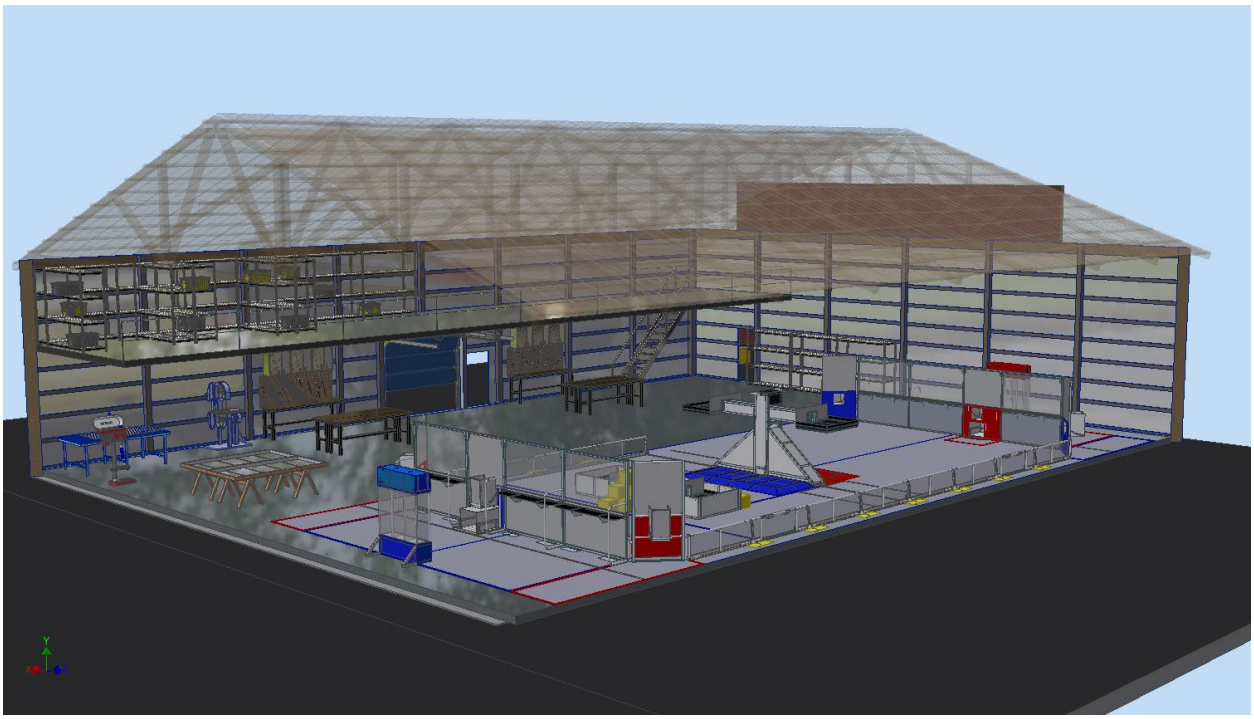


A. NARRATIVE

1. Executive Summary

Begin with a half-page executive summary. Briefly explain why your agency is requesting this grant, what outcomes you hope to achieve, and how you will spend the funds if the grant is made. The Hemlock Area STEM Center will serve as a regional catalyst to inspire Science, Technology, Engineering and Math (STEM) exploration by kindergarten - high school students from schools in the Great Lakes Bay Region (the closest of which are: Hemlock, Merrill, Swan Valley, St. Charles, and Freeland). Students will gain 21st-century employment skills such as Coding, Computer Aided Design, utilizing Electronics Control Systems, Fabrication using traditional techniques like Milling Machines and emerging technologies like CNC and 3D Printing. Also, soft skills like communications and strategic planning are emphasized. The center will be the home for Hemlock's elementary robotics teams. It will be open to area middle school and high school robotics teams to collaborate on robot construction (machining), computer programming, electronic control systems and robot competition. The Center will be a Maker Space in the off-season providing opportunities for community education programs. Students will be able to determine, with experience, if a STEM career is right for them. Students will work with professional engineers, manufacturing professionals, farmers, and software engineers to solve complex problems as part of an exciting and competitive program. The STEM Center will be located on the property of Hemlock Public School District next to the industrial arts wing. This project has deep support from the 100+ students involved in robotics at Hemlock, the 30+ mentors and the administration. The project is supported by neighboring school districts as is attested by their providing letters of support and by FIRST of the Great Lakes Bay Region, STEM In The Great Lakes Bay Region (STEM Pipeline), and our partners like Hemlock Semiconductor, Nexteer Automotive, Dow Corning, and the Rollin M. Gerstacker Foundation.

These experiences are relevant to all students be they college-bound or high school-to-work students.



The Hemlock Area STEM Center will be a 60'x80' structure that will provide programs for students from Merrill, Swan Valley, St. Charles, Freeland, and Hemlock schools.

Your contribution will help:

- Build the physical structure, a 60'x80' building where activities will take place.
- Provide tools for teams to use.
- Include materials to build field elements.
- Provide modern machining capabilities like CNC machines, 3D Printers and CAD equipment.

2. Purpose of Grant

Statement of needs/problems to be addressed; description of the target population and how they will benefit.

By looking at statistics the "STEM Imperative" becomes clear. The following facts are proven by research over and over again:

- Students, upon high school graduation, are not prepared to succeed in college, particularly in the subjects of Science and Mathematics.
- There is a critical shortage of employees to fill 2.5 million STEM jobs in this country. These are high paying unfilled positions.
- Females are under-represented in the STEM workforce making up only 30% of the employees.
- The STEM Imperative hits close to home. The Great Lakes Bay Region, a region with a rich and proud STEM heritage, faces the same challenges as the rest of the country.

From The Smithsonian Science Education Center:

78% of high school graduates don't meet benchmark readiness for one or more college courses in mathematics, science, reading, or English.[1]

By 2018 it is projected that 2.4 million STEM jobs will go unfilled.

From The Department of Labor:

The U.S. Department of Labor (DOL) forecasts that next year U.S. employers will be unable to fill nearly 2.5 million job openings in STEM and STEM-related occupations. At an average salary of $85,000 per year for jobs in STEM fields, 2.5 million unfilled positions means working Americans will suffer $200 billion in lost wages.[2]

From The World Bank:

In the United States, for example, women earn only about 35 percent of the undergraduate degrees in STEM, a number that has remained unchanged for the past decade, even though they account for almost 60 percent of college graduates.[3]

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[1] "STEM | Smithsonian Science Education Center." https://ssec.si.edu/stem-imperative Accessed 1 Sep. 2018.
[2] "To fill STEM jobs, federal programs need to focus on results ...." https://science.house.gov/news/in-the-news/fill-stem-jobs-federal-programs-need-focus-results. Accessed 1 Sep. 2018.
[3] "Breaking the STEM ceiling for girls | Let's Talk ... - World Bank Blogs." 9 Mar. 2017, http://blogs.worldbank.org/developmenttalk/breaking-stem-ceiling-girls. Accessed 1 Sep. 2018.

And from The Great Lakes Bay Region:

In the Great Lakes Bay Region 38% of economic output comes from manufacturing and healthcare. 71% of employers had difficulty hiring for a STEM job in the last 12 months (June, 2018).[4]

Following are the 2018 M-STEP scores for local school districts. Scores represent the percentage of students who were deemed proficient in mathematics.

Hemlock Public Schools 38.5% passed SAT mathematics readiness

Merrill High School 24.4% passed SAT mathematics readiness

Swan Valley High School 40.6% passed SAT mathematics readiness

St. Charles Community High School 40.3% passed SAT mathematics readiness

These are all school districts committed to improving student learning and are seeking relevant methods, like those proposed in this grant request, to address these shortcomings.

Description of project goals, measurable objectives, action plans, and statements as to whether this is a new or ongoing part of the sponsoring organization.

The target population for this grant is kindergarten – 12th-grade students from Hemlock, Merrill, Swan Valley, Freeland, and St. Charles schools. While this project will help all STEM programs of all age groups ***it will dramatically help middle school and high school students*** where the programs, materials, and tools are very expensive and the skill level to be successful is very high.

While student participation is the primary focus of this initiative it's important to acknowledge that the adult mentors involved in these programs are deeply affected by their participation. For adults to share their technical skills with students, to serve as role models and "teachers" can have a profound effect on the adult mentor's quality of life.

[4] "About the STEM Initiative - STEM Pipeline." https://www.stempipeline.com/stem-in-the-glbr/about/. Accessed 1 Sep. 2018.



High-quality adult mentorship is important to the students and the adult mentors participating in the programs. Here, a retired Dow Corning software developer works with FIRST Lego League students to program a robot at Hemlock Middle School.

Project goals are to:

- Increase student exposure to STEM topics.
- Continue and enhance these high-quality afterschool programs. A decade of research has shown that afterschool programs have a dramatic effect on students' academic achievement, social and emotional development, prevention of risky behaviors, and their health and wellness.[5]
- Provide a safe, positive, supportive environment that develops students' self-esteem and confidence.
- Create an all-season facility that will support the FIRST Robotics progression of programs.
- Form stronger relationships between the teams so that when key members leave the programs there is support while they go through leadership transitions.
- Develop off-season education and community programs.

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[5] http://www.sedl.org/pubs/sedl-letter/v20n02/afterschool_findings.html

The Measurable Objectives Are:

- Robotics teams will double student participation.
- Robotics teams will grow in number.
- Robotics programs will become more competitive on the regional, state, and national level.
- Standardized test scores in Mathematics and Science will improve.
- Enrollment of students in college "STEM Majors" will increase.
- Corporate sponsorship will increase.

The Action Plan:

- Reach consensus for the creation of the Hemlock Area Stem Center – complete
- Obtain site – complete – provided by Hemlock Public School District
- Create space utilization conceptual drawings – complete – created by Chris Bale
- Get support from local school districts and partners – ongoing
- Develop an accurate budget and architectural plan – complete – provided by Greg Turner of Pumford Construction.
- Fundraising – continuing.
- Create architectural plans for state approval – to be completed by Pumford Construction.
- Provide high-quality programs – these exist through the nine K-12 robotics programs at Hemlock and the programs sponsored by other districts. Programs will be expanded and enhanced as the facilities become available. This will include working with local STEM partners like FIRST in the Great Lakes Bay Region and the STEM Pipeline to develop additional (particularly summer) programs.

This project is an extension of the mission of Hemlock Public School District to provide STEM opportunities for its students. Hemlock Public School District Provides Advanced Educational Opportunities. By working with neighboring districts the depth, quality, and number of STEM programs will increase.

Timetable for implementation

There are two timelines. One is the “construction timeline” - the second is the annual cycle of events. First let’s look at the Construction Timeline:

Construction Timeline:

- Site acquisition - Property has been provided by Hemlock Public School District including land and parking.
- Ground Broken – February 1, 2020 (weather permitting).
- Cement Poured – March 1, 2020 (weather permitting)
- Building Roughed in – May 1, 2020
- Building Electrical and Heating Installed - June 2020
- Occupation Inspection – July1 2020
- Building Complete – August 1, 2020
- IT - final infrastructure complete – August 2020
- Robot programs begin – September 1, 2020
- FIRST Lego League and FIRST Tech Challenge Programs Begin - September 2020
- Annual Cycle of Programs continues with year-round utilization of this space.

Programs Annual Timeline:

- September 1, 2020: FIRST Lego League Begins (Upper Elementary Students)
- The FIRST Lego League Season begins in late August or Early September. The program is funded outside of this grant. Teachers meet with teams, understand challenges. Season "competitions" take place in November.
- September 1, 2020: FIRST Tech Challenge Season Begins (Middle School Students) Program is funded outside of this grant. Students are given a challenge and 8 weeks to build a robot. Season competitions take place in November - December.
- January 5, 2021: FIRST Robotics Competition Season Kickoff (High School Students). The program is funded outside of this grant. Students are given a challenge and 6 weeks to build a robot. FRC season begins the first week of March and goes through April the last week of April.
- Hemlock, Merrill, Swan Valley, St. Charles, Freeland and other area teams use this space to prototype, design, build and operate robots.
- June 2021, Summer build and programming activities occur.
- June 2021, Community Education programs begin.
- September 1, 2021: FIRST League and FIRST Tech Challenge teams begin programs in STEM Center. FTC teams from Hemlock, Merrill, Swan Valley, Freeland and St. Charles use the facility to build robots and to practice for their upcoming competitions.

List of other partners in the project and their roles

The Hemlock Area STEM Center is focused on providing opportunities for robotics teams and other STEM activities in Saginaw County. Reaching out to neighboring school districts, local businesses and other agencies is key to success. For the construction of the facility Pumford Construction will finalize the plans, submit them to the state, provide construction oversight through occupancy. Greg Turner, Chief Operating Officer of Pumford, has provided leadership and expertise so far at no charge. We've already hosted engineering presentations by Nexteer and Spicer Engineering; we plan to open these up to any school districts that would like to participate. We are currently working with Miranda Bierman, STEM Ambassador for the Dow Chemical Company on educational projects. We are reaching out to the Great Lakes Bay Regional Alliance (the STEM Pipeline) to formulate programming (beyond the robotics emphasis).



Business partners, like Nexteer, are critical to making STEM initiatives successful. Robert Lipscomb and his engineering team take questions from fourth-graders regarding the CAD design of steering systems.

Grantors for the STEM Center currently include: Dow Corning Donor Advised Grant, the Rollin M. Gerstacker Foundation, the Saginaw Community Foundation, Isabella Bank, Robert W. and Eileen E. Hesse Memorial Fund, Schneider Electric, Hemlock Semiconductor and for machining and tooling the Bayer Fund and the Masonic Charitable Foundation.

Support for the robotics programs includes: FIRST in the Great Lakes Bay Region – provides support, both financial and via mentorship for our FIRST robotics progression of programs. Nexteer, Dow Chemical, Interpower Induction, Metrofab, Hemlock Semiconductor, Dow Corning, Kurek Tool, Michigan Department of Education, Kenny Brothers Farms, Saginaw Control and Engineering, Merrill Technologies Group. Catholic Federal Credit Union, Hemlock

Lions Club, Maple Grille, Midpoint Party Store, R&S Marching Arts, Rick Ford, Carter Lumber, Fullerton Tool, Walmart, Shaffner Brothers Farm.

List of similar existing projects or agencies, if any, and explain how your agency or proposal differs, and what effort will be made to work cooperatively.

This project was inspired, in part, by the collaboration of robotics teams at the Kettering University STEM Community Center in Flint MI and teams in Midland, MI who use the Franklin Center as a meeting place. Unfortunately, a Midland location is a 26-minute drive from Hemlock, Merrill and Swan Valley and a 43-minute drive from St. Charles which makes it impractical to use on a nightly basis. The facility can only accommodate so many teams – with many teams in Midland and Bay County creating our own facility is important. The Hemlock Area STEM Center will be located 10 minutes from Merrill, 14 minutes from Swan Valley, and 18 minutes from St. Charles.

The Hemlock Area STEM Center will be a detached, self-contained, facility so that area teams have access to on an "as needed" basis. It will host the entire FIRST progression of programs from Kindergarten through 12th grade. It will be open year-round, hosting other efforts like Maker Space events, drone competitions and will be available for other STEM-related programs.

Description of the active involvement of constituents in defining problems to be addressed, making policy, and planning the program.

Once constructed the facility will be owned and operated by the Hemlock Public School District. It is the intent of the district that this facility be, as reasonably as possible, "open to the public" for STEM educational programs. The leadership of the area robotics teams is already established and decision making and budgeting for those teams are ongoing and they will continue to operate as autonomous entities.

Because of the FIRST Robotics heritage, students will be key contributors and decision makers when it comes to defining the use and focus of our programs.

Description of the qualifications of key staff and volunteers that will ensure the success of the program. List of specific staff training needs for this project.

Tom Lockwood is the Technology Director at Hemlock Public School District. He has managed four technology bond issues for two school districts with technology budgets of over one million dollars each. These projects have involved the installation and management of Servers, PC's, Wired Networks, Wireless Networks, Audio Video Systems, Security Systems and Video Surveillance Systems. Tom has been the Technology Director of Hemlock Public Schools and Merrill Community Schools for over 20 years. He has been a mentor for FIRST Tech Challenge Teams and the lead mentor for Hemlock's four-time World Championship Qualifying FIRST Robotics Competition team Hemlock's Gray Matter.



Here a Dow STEM Ambassador and Hemlock Public School District robotics mentor leads sessions at Camp Infinity a STEM Camp that Dow is sponsoring with the Michigan Council of Women in Technology.

Dr. Don Killingbeck, Superintendent of Hemlock Public School District, has been with the district for nearly seven years. Under his leadership and with the support of the Board of Education, the district has flourished as exhibited by the most stable enrollment in 40 years, best fiscal outlook, along with program enhancement and instructional improvements like K-12 Robotics, Childcare, Early Middle College, 1:1 technology, and so much more. He has advanced degrees in educational technology, curriculum design, and leadership. Don has been a champion of our mission and vision: innovate, collaborate, and educate a community of learners along with enhancing programs and services to students and families.

Hemlock Public School District's robotics mentors include Dana Lockwood, a 25 year business teacher, Stephanie Dunton, an elementary teacher, Kyle Wilkowski a Middle School Biology Teacher, and many community members including John Raths a Fabrication Designer at Metrofab, Chad Jones a Nexteer Mechanical and Electrical Engineer, Chris Bale an IT professional and Robotics Mentor with 15 years of experience, Alex Haltom and IT professional with a Computer Information Systems degree, Jim Urbaniak a General Motors Mechanical Engineer, Steve Ross a General Motors Electrician, Kyle Bray a Dow Employee with a degree in Computer Science, Ernie Kelly a CNC operator at Merrill Technologies Group and 20 other dedicated adults with a wide variety of skills.

This project does not have specific "training needs" as the mentors for these teams are highly qualified industry and educational professionals.

Long-term strategies for funding this project at the end of the grant period.

While grants will be necessary to get the facility constructed, there will be no grant funding depended upon to maintain the facility once it is completed. Additional grants will be sought to improve and enhance the facility but will not be necessary to provide daily availability and service.

The Hemlock Area STEM Center will be sustainable through the following mechanisms:

- The Hemlock Public School District will provide heat and electrical service to the building.
- Hemlock Schools' custodians will provide custodial service (though it will be required that the Teams involved will pick up after themselves).
- Hemlock Schools will provide normal maintenance, snow removal, repair etc.
- Hemlock's IT department will maintain the wired and wireless networks, computers, 3D printers and other technology equipment.
- Hemlock's, Swan Valley's, Freeland's and Merrill's robotics teams are already self-sufficient and will only make the facility more useful and full-featured with the addition of tooling, equipment and supplies.
- Robotics mentors' salaries are included in Hemlock Public Schools' teacher contract, ensuring long-term financial stability

The facility, while being open to several school districts will sit on the campus of Hemlock Public School District and will be the property of Hemlock Public Schools and will be treated like any other facility or structure.

Future Plans:

The goal of this alliance is to grow and improve the facility by seeking other grants and developing local business partners that recognize STEM as an important emphasis. Expansion of our machine shop and additive manufacturing will be important once the STEM Center is open.

The Hemlock Area STEM Center will be more heavily used over time. In addition, the needs of the teams will increase and there will be a need for advanced manufacturing techniques. This will lead to the procurement and use of CNC mills (one has already been purchased), CNC Routers, CNC lathes, more sophisticated 3D Printing and CAD tools.

3. Evaluation

Plans for evaluation including how success will be defined and measured.

Success looks like a STEM center that grows to give five area high schools a space to participate and practice robotics competitions. It is a space where six area middle school robotics teams have an opportunity to work on projects and competitions. High School students will help mentor middle school students; middle school students will help mentor elementary students.

Description of how evaluation results will be used and/or disseminated and, if appropriate, how the project will be replicated.

The success of this program will be measured in the following ways:

- Do participating students' PSAT, SAT, MSTEP and NWEA scores increase at a greater rate than their cohorts? Some of this is data is available publicly, the rest is available to school administrators. This data is and will be evaluated annually.
- Does female participation in Robotics and STEM related activities increase. This echos the concerns expressed earlier in the proposal. Female students will be actively recruited. Success is a 1:1 male to female ratio (we currently have a 2:1 ratio).
- Does the student population in general have a better understanding of STEM careers and STEM opportunities? This data will be gathered via a pre and post survey conducted at the school level via google form distribution. Students' email addresses will be captured to assure fidelity.
- Are participating students more likely to declare STEM based college majors. We currently do not track this data – but it will be an interesting measure that we will explore.

Evaluation will weigh the PSAT, SAT, MSTEP and NWEA testing. MSTEP scores are reported state-wide. PSAT, SAT and NWEA scores are measured by the constituent districts. PSAT and MSTEP scores are available publicly

Enrollment of high school students into college curriculum is tracked and will be reported.

This building can be replicated.

While there are no plans to replicate this project, the effort to build a relatively inexpensive space for STEM activities will be found attractive to many robotics teams and school districts.

In order to build a relatively large facility at a low price we've worked with Pumford Construction, to build a low-cost building with a flexible, open floor plan. **The median cost of school buildings is $242.96 per square foot; the cost of this facility, rated as a Group E structure for education, is $76 per square or about 30% the typical price of a building created for school occupancy.** This facility can serve as a template for other such STEM/Makerspace facilities. FIRST Robotics has a presence in almost every high school in the state. These programs face the same space issues that schools in Saginaw County face. The curriculum, the programs exist and do not have to be recreated. Building plans, construction details and budget numbers will be shared with FIRST in Michigan and FIRST at a national level.

Description of the active involvement of constituents in evaluating the program.

As a part of our annual program cycle we conduct surveys of students and mentors at the end of the season. The surveys are taken and shared with all program participants and school leadership

including: Superintendent of School, all mentors, all team participants. From this feedback we make modifications to suit the needs and aspirations of team members.

4. Budget Narrative/Justification

Physical Space - $367,003

The most critical need is for physical space, the 60'x 80' STEM Center building. When the building is complete the rest of the facility improvement and equipment can be added at a later time. We will have successful programs if we have the building. The building quote of $367,003 will be enough to complete the building. This is a free-standing fully usable space.

As mentioned previously, by working with Pumford Construction we've been able to create a structure that meets the State of Michigan Building code for Group E Occupancy (this is not a pole building, but an educationally approved structure). A building this size at a typical cost of $242.96 per square foot would cost $1,116,000.

See attached budget for greater detail.

5. Organization Information

Brief summary of organization's history.

Hemlock Public School District is a rural school district established in 1863. It serves approximately 1,200 students in western Saginaw County. Hemlock's Free & Reduced Lunch Rate is 33%. Recently Hemlock Public School District has become a leader in educational technology introducing the 2nd grade through 12th grade 1:1 computing initiative and supporting a K-12 robotics program. Coding for all middle school students and a high school robotics class outline the commitment of the district to STEM curriculum.

Hemlock Public School District's robotics teams collaborate with other teams under the loose umbrella of FIRST of the Great Lakes Bay Region.

Brief statement of organization's mission and goals.

Our entire team is dedicated to providing the highest level of STEM education programs to the students of our school districts. FIRST Robotics has established comprehensive programs that have proven to inspire and engage students around the world.

Students will learn real-world hands-on skills through machining, CAD, 3D Printing, software development (coding), improving math and engineering skills. They will be able to determine, with experience if a STEM career is right for them. Students will work with professional engineers, manufacturing professionals, farmers and software engineers.



Students and mentors develop deep, respectful relationships in addition to the skills and experiences that they gain.

The students will learn to collaborate with each other. The emphasis of FIRST teams on "gracious professionalism" will allow the students to move beyond the "rivalry" paradigm to more mature and healthy relationships based on mutual respect and helping each other to improve and grow.

Description of current programs, activities and accomplishments

Hemlock Public School District has emphasized STEM and hands-on education over the past several years including the formation of the full set of Kindergarten-12th grade FIRST Robotics programs including: 4 FIRST Lego League Jr., 2 FIRST Lego League, 2 FIRST Tech Challenge and 1 FIRST Robotics Competition teams.



Hemlock's efforts in promoting STEM and FIRST Robotics programs are recognized by Michigan's Governor, Rick Snyder, at the 2018 FIRST Robotics Competition State Championships.

Hemlock Public School offered a robotics class in the 2017-2018 school year and planned to offer it again in the future.

Hemlock Public Schools has paid mentors and a STEM teacher to help scaffold these programs. The robotics teams have qualified for State Championships and World Championships for 3 out of 4 years. The robotics teams have been responsible for raising almost $30,000 a year to support all of Hemlock's programs. School and community support have been strong.

Two years ago a Bridgeport Mill was purchased to help students experience basic machining techniques. A Tormach CNC machine has been purchased to help students learn automated machining techniques. An Omio CNC Router has been purchased to provide students an introduction to CNC machine operation.

Organizational chart, including board, staff and volunteer involvement.

- Don Killingbeck: Superintendent -Hemlock Public School District
- Tom Lockwood: Technology Director/STEM Advocate Hemlock Public School District, Merrill Community School District. Mentor FRC 5712.
- Dana Lockwood: Coop Coordinator Hemlock Public School District, Lead Mentor FRC 5712
- Miranda Bierman, STEM Ambassador - Dow Chemical Company. Mentor FLLJr teams.
- Kyle Wilkowski: Middle School Science Teacher - HPS, Lead Mentor FTC 10180, FTC 10438
- Janice Kato: STEAM Educator and Tech Coach - HPS, Lead Mentor FLL programs.
- Christopher Bale: Board Member - FIRST in GLBR, Mentor FRC 5712
- Craig Blower: High School Principal - Swan Valley High School, Lead Mentor FRC 5538
- Charlie Snider: FRC and FTC Freeland Robotics Coach and Nexteer Engineer

Hemlock Public School District Organizational Chart: Attached.

Great Lakes Bay Regional Alliance

October 4, 2018

Tom Lockwood
Technology Director, Hemlock Public Schools/ Merrill Community Schools
Lead Mentor FRC 5712
733 North Hemlock Road
Hemlock, MI 48626

Subject: Letter of Support for the Hemlock Area STEM Center Grant Proposal

Dear Grant Selection Team,

I am writing this letter on behalf of the Great Lakes Bay Regional Alliance representing the co-operation of high school education centers, Business and Industry, and Post-Secondary institutions across the Great Lakes Bay Region (Prosperity Region 5) in Michigan. We support the Hemlock Area STEM Center Grant as it would provide a hub in Saginaw County for FIRST Robotics activities, STEM training, makerspace opportunities and collaboration across multiple entities. It would also bring more equitable access to opportunities that are readily available in Midland County, but not in Saginaw.

I understand the grant will develop growth in the number of students seeking STEM careers and provide the ability for more students to gain access to training and practice fields. As students build and then test robot designs, a practice field is critical for allowing the engineering design process to be fully implemented. It is simply not sustainable for all teams to purchase the equipment, practice field, and other components in this grant proposal as separate entities. Midland County has already moved forward with a similar project that serves multiple schools and many others areas have done this as well such Kettering University. You can read more about the impact of Kettering's center at https://www.firstinspires.org/stories/universitys-first-center-becomes-community-stem-hub.

FIRST Robotics has been an inspirational program in the Great Lakes Bay Region, but we have a long way to go to develop centers and collaboration to make FIRST as sustainable as it is in the Detroit area where STEM centers are more common. This initiative brings us closer to having sustainable structures in the Great Lakes Bay Region for high-cost, high impact training that FIRST provides. In this initiative, I look forward to collaborating on potential expansions for educational and professional development opportunities between K-12, community college, university, and industry partners. Saginaw County is an ideal place to make an investment in robotics since we have an established, collaborative STEM Initiative and SVSU is incredibly active in STEM including hosting the FIRST Robotics State Championship event.

I hope you will agree that Hemlock Public Schools and all of the partners are well positioned to address the needs of STEM workforce shortages through this exciting project.

Thank you for all of your consideration.

Best Regards,

Lori Flippin

Lori Flippin
STEM Initiative Leader, Great Lakes Bay Regional Alliance
Members of the Great Lakes Bay Regional Alliance Board of Directors
(See attached list.)

Great Lakes Bay Regional Alliance Board of Directors

Bill	Allen	President & CEO	Midland Area Chamber of Commerce
Donald	Bachand	President	Saginaw Valley State University
Michael	Bacigalupo	Executive Director/ COO	State Theatre
Marisa	Horak-Belotti	Chief Strategy Officer	The F.P. Horak Company
Ed	Bruff	President & CEO	Covenant HealthCare
Ryan	Carley	President & CEO	Bay Area Chamber of Commerce
Frank	Cloutier	Public Relations Director; Chief	Saginaw Chippewa Indian Tribe
Eileen	Curtis	President & CEO	Bay Area Community Foundation
John	Decker	Associate Vice President and General Counsel	Saginaw Valley State University
Jim	Fabiano	Partner/Owner	Fabiano Brothers
Matt	Felan	President & CEO	Great Lakes Bay Regional Alliance
J. W.	Fisher	President	Fisher Companies
Dick	Garber	Owner	Garber Management Group
Gavin	Goetz	External Affairs	AT&T
Jean	Goodnow	President	Delta College
David	Green	Senior Banker/Senior VP	Huntington Bank
Jimmy	Greene	CEO	Associated Builders and Contractors - Greater Michigan Chapter
Robert	Hagen	Owner	Hagen Ford
Christine	Hammond, Ph.D.	President	Mid Michigan Community College
Dennis	Hoeg	VP, Global Manufacturing, Mfg. Egrg, and Enterprise Systems	Nexteer Automotive
Jim	Holton	Owner	Mountain Town Station, Mt. P. Brewery, Camille's on River
Bret	Hyble	President & CEO	Mt. Pleasant Area Chamber of Commerce
Dr. George	Kikano	Dean, College of Medicine	Central Michigan University
Shane	Ladwein	Global Director Engineered Materials Product Line	Dow Corning Corporation
Nancy	Lamb	Public Affairs Director for USA North and Canada, The Dow Chemical Company	The Dow Chemical Company
Jon	Lynch	President	Three Rivers Corporation
James	McBryde	President and CEO	Middle Michigan Development Corp
Bo	Miller	Co-Founder & Principal	NightFire Advisors, LLC
Tim	Morales	City Manager	City of Saginaw
Dick	Mott	Executive Vice President and Chief Financial Officer	Morley Companies Inc.
Kelley	Peatross, Ph.D.	Community Affairs Area Manager	Consumers Energy

Larry	Preston	CEO	Tri-Star Trust Bank
Keith	Pretty	President	Northwood University
Robert	Rathbun	VP of Purchasing and Marketing	Chemical Bank
Nancy	Ridley	City Manager	City of Mt. Pleasant
Greg	Rogers	President & CEO	MidMichigan Medical Center-Midland
George	Ross	President	Central Michigan University
Annie	Rummel	President & CEO	Great Lakes Bay Regional Convention & Visitors Bureau
Peter	Shaheen	Vice President	SSP Associates
Linda	Sims	Vice President/Executive Director for Communications and External Affairs	Saginaw Valley State University
Herb	Spence III	President & CEO	Spence Brothers Construction Services
Erin	Strang	President & CEO	CMU Research Corp
Ellen	Talbott	V.P. of Patient Care Services	McLaren Bay Region
Terri	Trotter	President & CEO	Midland Center for the Arts
Rob	Valentine	Global Director, Corporate Citizenship President, The Dow Chemical Company Foundation	The Dow Chemical Company
Robert	Van Deventer	President & CEO	Saginaw County Chamber of Commerce
Ray	Van Driessche	Director Community & Government Relations	Michigan Sugar
Jenee	Velasquez	Executive Director	Herbert H. and Grace A. Dow Foundation
Carolyn	Wierda	Executive Director of STEM@SVSU	Saginaw Valley State University

FIRST of the Great Lakes Bay Region
P.O. Box 2545
Midland, MI 48641
www.first-glbr.org

April 20, 2018

To whom it may concern,

I am writing to you in support of the proposal for the Hemlock Area STEM Center.

Outside of my 18+ year business career as a project manager for an international commercial print company, I serve as the President of *FIRST* of the Great Lakes Bay Region (first-glbr.org) and as a lead organizational and business mentor on a *FIRST®* robotics team, The Charge. All three of these roles have given me a greater understanding and passion for furthering the goals and mission of FIRST. I believe that the creation of this STEM Center can provide amazing opportunities for the children in this area.

FIRST® (firstinspires.org) is an international organization that celebrates teamwork and creativity, as well as competition, through STEM education. By the time students are in high school, they work hands-on with industry professionals learning to design, build, and test 100 lb large-scale robots in order to compete in "robo-sports". It's considered "the varsity sport for the mind", inspiring students to become future leaders in engineering and technology. Although a working robot is the immediate goal for the challenge, it is only a small part of what the students learn and experience by being a part of *FIRST®*.

On top of various types of engineering, students also learn project management, budgeting, fundraising, public speaking, brainstorming, presentation skills, industry safety standards, leadership skills, how to “fail forward”, good sportsmanship and gracious professionalism.

One of the keystones of a successful program is having the space to engage in all of these activities. As a senior mentor of a Midland team that manages a similar kind of space, I can tell you that its existence is largely responsible for the explosive growth of teams in Midland Public Schools. The younger students see what the older students are doing and the older students mentor the younger. Mentors train mentors. It is a self-fulfilling circle of education and inspiration. It also builds comradery and support and a feeling of family and responsibility between teams that are also competing against each other.

FIRST-GLBR was created by a handful of veteran teams to help support team expansion in this region. In the last 5 years we’ve seen explosive growth (from 4 high school teams to 34+) and we need more veteran teams leading the way. By Michigan standards, we may still be a “young” group, but we’re getting stronger. Hemlock's Gray Matter, FRC Team 5712, is one of those reasons. They are fast becoming a steward of this community and I hope that you see what potential this space has to turn the whole of Hemlock into a beacon for others. Not every team in our region has the resources for this kind of creative space and being invited to share in these spaces is part of how I think our region is leading the way.

I am more than happy to discuss further.

Annette Murray
President, FIRST of the Great Lakes Bay Region
Senior Mentor, FRC Team 2619 – The Charge, Dow High Robotics
C: 989-513-0518
E: amurray@mckaypress.com

ahead of the curve

nexteer AUTOMOTIVE

April 4, 2018

To whom it may concern:

I am writing this letter to strongly support Mr. Tom Lockwood's proposal to build a Hemlock Area Stem Center.

I am heavily involved in STEM initiatives at Nexteer Automotive. One of my biggest responsibilities is to administer a program which gives financial grants to Great Lakes Bay region FIRST Robotics programs. I am also the event coordinator for a FIRST LEGO League qualifying tournament and a FIRST LEGO League Jr expo, both sponsored by Nexteer.

It is through these activities that I have come to know Mr. Lockwood. In just a few years, Hemlock has grown from having a FIRST LEGO League team (4th-5th graders) to having nine teams spanning the gamut of FIRST programs and including students from Kindergarten through High School. I have attended a few events at Hemlock High School where he has proudly shown the growth of the STEM initiatives within the Hemlock School District. I have also had the opportunity to meet many of the impressive students positively impacted by their involvement in the Hemlock FIRST Robotics programs.

In short, Hemlock Public Schools are taking a leadership position in supporting STEM activities in this area of Michigan, largely through the vision of Mr. Lockwood.

As a comparison, the Midland Public Schools have spent considerable money on STEM-specific facilities that have enabled the Midland area FIRST programs to prosper. However, it is difficult for teams outside of Midland to travel that distance to take advantage of the facilities. The location of the proposed facility in Hemlock would be a great asset for FIRST programs such as St. Charles, Merrill, Swan Valley, and Freeland (and potentially other new programs).

In summary, a STEM facility in Hemlock, under the leadership of Mr. Lockwood and the Hemlock Public Schools, would be a great asset in this area of Michigan. It would allow Hemlock to pursue its rapidly expanding STEM initiatives and be a valuable resource for other area students.

Please contact me with any questions you may have.

Sincerely,

Robert H. Lipscomb

Robert Lipscomb
IT Project Manager
robert.lipscomb@nexteer.com

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3900 East Holland Rd.
Saginaw, MI | 48601-9494 | United States

www.nexteer.com

Sarah Kettelhohn
Merrill Community Schools, Superintendent
kettelhohn@merrillschools.org

April 09, 2018

To Whom It May Concern,

As a district leader at Merrill Community Schools there is a strong need to continue to expand science, technology, engineering, and mathematics (STEM) opportunities for the students we serve. The Hemlock Area STEM Center would create a space where students can apply learning needing to grow these skills and expand the regional talent pool in this critical area.

Through our partnership with Hemlock Public Schools, our students would share in the benefits of this facility. The Hemlock Area STEM Center would provide a much needed creation, design, construction, and practice space to the students of both Merrill, Hemlock, and surrounding area schools. Hemlock and Merrill Schools have a strong history of sharing resources and working together to support the students we serve. The creation of the Hemlock Area STEM Center would continue to foster this partnership and offer students of both schools the opportunity to collaborate together to think critically as they solve STEM related problems, including in Robotics.

At this time, Merrill Community Schools does not have the space or resources within our district to maintain the necessary equipment for participants to fully benefit from FIRST Robotics and other STEM programing. The Hemlock Area STEM Center would give our students the needed space to build and test the robot, as well as the opportunity to collaborate on issues encountered through the engineering and programming phases of development. This creates a unique real world opportunity for students to practice critical thinking, problem solving, and inquiry with other area peers.

Merrill Community Schools offers its full support to the development of the Hemlock STEM Center. Having the resources available through this partnership is of vital importance to the success of our STEM programming. I would highly recommend consideration of the application from Hemlock Public Schools and look forward to the shared resources available through its creation.

Kind Regards,

Sarah Kettelhohn,

Tara Mager,

431 W. Alice Street | Merrill, MI 48637 | Phone 989-643-7261 | Fax 989-643-5570

ST. CHARLES
COMMUNITY SCHOOLS

9/12/18

To Whom It May Concern,

This letter is written in support of the STEM robotics facility proposal at Hemlock Community Schools. Increasing STEM opportunities through the First Robotics competitions and practice is a local community goal for all students, in this case, the community extends past all local school district lines and into neighboring districts. We applaud Hemlock for leading the way on this regional goal and give full support to the project.

We are excited to have the St. Charles Community Schools Underdog Robotics Team work collaboratively with other local teams and have a regional location to compete.

If you are in need of any further information, please contact us.

Sincerely,

Michael R. Decker, Superintendent
St. Charles Community Schools

891 W. Walnut Street • St. Charles, MI 48655 • 989-865-9961 • Fax: 989-865-6185 • www.stccs.org

Superintendent: Michael R. Decker

Today's Learners • Tomorrow's Leaders

September 26, 2018

Tom Lockwood
Technology Director, Hemlock Public Schools
733 North Hemlock Road
Hemlock, MI 48626

Dear Mr. Lockwood:

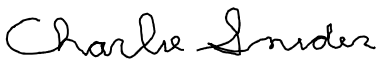
I am writing to you regarding the HPS discussions about a potential new technology-focused facility. Your school's idea to build a 60'x80' building to support STEM initiatives is simply wonderful news. As the Freeland Robotics Club Director, and lead mentor for 3 FIRST teams, I applaud your school district's initiative to lead this effort for the benefit of mid-Michigan youth.

Freeland would be elated if the dream of this facility becomes a reality. Our FIRST teams, FRC5166, FTC5386, and FTC6000 would all be grateful for any opportunity HPS may be able to extend to area teams like us to utilize the facility for practices, scrimmages, and sanctioned events.

Freeland's robotics program has well over 50 students involved at various age levels. Only a few short years ago, we started with 7 students. I expect our numbers to continue to grow. Freeland's district has also seen a major increase in other STEM clubs and activities, as I'm confident Hemlock and other schools have been experiencing the last several years.

I applaud your pursuit of this endeavor and offer any help that you may need in the planning and implementation phases. Good luck integrating this idea in your school's curriculum as well. It certain will benefit students from Hemlock and the surrounding area.

Charlie Snider



Freeland Robotics Club Director
FIRST Lead Mentor FRC5166, FTC5386, FTC6000
Nexteer Automotive Senior Manufacturing Engineer
989-297-0361
charlie.snider@nexteer.com

Hemlock Public School District
200 Wilson Street Hemlock MI 48626

April 6, 2018

RE: LETTER OF SUPPORT, STEM CENTER

To Whom It May Concern:

I am writing this letter in support of a proposal to build a Hemlock Area S.T.E.M. Center.

There is a definite demand that is reported daily in the news demonstrating the need to encourage students to pursue careers in science, technology, engineering, mathematics, and other hands-on related fields.

The Hemlock Area S.T.E.M. Center would provide a central location for collaboration amongst neighboring schools. The center would host the district's K-12 robotics teams as well as other STEM-related activities and be available to other area schools. This program and related activities help foster student interest, engagement, preparation for the world these children will live, and work.

It is important to note that this proposal, if funded would positively affect hundreds of students in grades K-12 at Hemlock Area School District and neighboring schools as well.

If you should have any questions, please do not hesitate to contact me at killingbeck@hemlockps.com or via phone (989) 642-5282.

Sincerely,

Donald R. Killingbeck Jr., Ed.S.

Swan Valley Schools
ONCE A VIKING... ALWAYS A VIKING!

SWAN VALLEY HIGH SCHOOL

8400 O'Hern Road
Saginaw, Michigan 48609
www.swanvalleyschools.com

Telephone - (989) 921-2401 **Fax - (989) 921-2405**

Craig G. Blower, Principal **Dave Adams, Athletic Director**
Wendy Bridges, Assistant Principal **Christine Luplow, Counselor**

April 6, 2018

To Whom It May Concern:

In the FIRST Robotics spirit of gracious professionalism and cooperative support of FIRST Robotics in the Great Lakes Bay Region, Swan Valley School District endorses the Hemlock Public School's pursuit of a robotics facility that would be open to all community teams.

The Swan Valley Vikingbots (team 5538) currently consists of twenty students and four adult mentors and has grown over its four year existence. As STEM and robotics continues to grow in the Great Lakes Bay Region a facility, such as what Hemlock is proposing, would take local robotics teams to the next level. As the mentor of 5538 we would take advantage of the Hemlock facility and work to collaborate and mentor other teams in the area. In addition, we would take advantage of the facility to improve our own team's competitive ability. As a fellow Tri Valley School, Hemlock could also utilize the facility to host a TVC Robotics Competition, similar to the other academic competitions in the league.

Hemlock Public Schools has our full support and cooperation in the establishment of the dedicated robotics facility.

Sincerely,

Craig G. Blower
Principal and FIRST Mentor