Thomas Bickford

Thank you for the opportunity to represent STEAM and to offer support for LD 1740.

I am Tom Bickford. I've been a part of the Maine STEAM environment since 2000. I am a biologist, a biomedical engineer, technologist, and educator. Over the past 40 years I've worked as a private entrepreneur, an educator, and an administrator. I am here today representing myself and my experience in these fields.

In 2000 I was hired at the University of Maine to promote computer science here in Maine. It became immediately clear that the mission of expanding computer science literacy was going to be seriously impeded by the population's general lack of technology knowledge.

So plan B was rolled out and we started offering workshops to schools, teachers, and parents. Since the fall of 2000 we've held student robotics competitions. In 2002 we started offering summer STEAM programs. In 2005 we added a spring robotics competition. And in 2021 we added the Maine STEM Film Challenge for all ages.

In 2004 the programs were transferred to Maine Robotics, a Maine non-profit corporation. I served as the director there until 2020 when Maine Robotics was transferred to the University of Southern Maine in Portland.

Tallying all three entities together, we've offered Maine 95 workshops, run 99 academic STEAM competitions, and run 413 week long summer camp sessions.

This amounts to over 27,000 Maine participants and 830,000 contact hours with this population.

We've intentionally focused on this for several reasons.

1. We live in a technologically driven society and our youth deserve to develop the skills they need to be successful.
2. Hands-on learning is one of the most successful ways to transfer and promote learning, while also being one of the most rewarding and motivating forms in which to engage the students.
3. Our economy is critically dependent on technology of all STEAM varieties. Companies cannot prosper without engineers, designers, programmers, technicians, data specialists, and researchers.

With STEAM Outreach, we hit all three problems at once. We engage the students and do critical skill building. We foster an educational and career path for the students towards these fields. And we bolster Maine's economic outlook by providing our future workforce in the areas that Maine desperately needs.

It's a long range plan, one that will likely need constant changing because technology will never stop changing. We need to be nimble in our response to meet those needs. LD 1740 will provide a basis for that nimbleness. I urge you to support this program for the continued growth of Maine's STEAM economy.

Thomas Bickford
149 Ichabod Lane Ext
Gorham, ME 04038
(207) 735-3748
bickford@mainerobotics.org

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Why is STEM/STEAM important on a personal pathway to development for our Maine population and workforce?

My personal experience with STEAM growing up helped to curve my pathway towards a lifetime of both learning and service. I have listed here some of those activities that helped serve to make that happen.

1. While in middle school, growing up in Newton, Massachusetts, I was fortunate to have been offered an afterschool job helping out at the school district's Science Department. This was located in the former middle school building and had two full time employees and rooms full of equipment that could be signed out for teachers in the district. My responsibility was to check in kits and refill any missing materials and put them back in storage for the next sign out. They had a library, a stock room, and an animal room as well. This helped me understand the need for being well equipped within the STEAM field in order to be useful for education.

2. In 1979, while at high school, one of our mathematics teachers had the opportunity to work with the school's one computer to teach a cross-purposed class of statistics and computer programming. This early exposure led me to add programming classes when I went to college in 1980.

3. The high school I attended was a very large school, with 2400 students in one building. Within that building you could take everything from auto repair to advanced physics. Art classes to a lifesaving certification course at the pool. While there I was often found in the science office and in my senior year they crafted a course for two of us that was in Elementary Science Education. We would craft science lessons and then go to the local elementary school down the street and provide those lessons to a class. It was not a very formal process, but they saw a need for these two students and provided it. It made a difference in my pathway.

4. Also in high school I took a class in Marine Biology. That class had us take a field trip out into Boston Harbor to do core sampling; water sample collection; and several other site specific data collection experiments. While on that trip I met an adult from another group and ended up talking about the School for Field Studies. This woman would go to Honduras every summer and help researchers do a study on algae off the island of Utila. Through this connection, I was able to connect with the group and signed up for a 22 day

trip to Honduras during the summer before my senior year. It also required me to get certified in SCUBA diving, which I did through a local college program. That trip to Honduras cemented my love of learning, of science, and of seeking out new knowledge.

Where would I have ended up if these opportunities had not been available? I don't know, but I've always been thankful for the opportunities at a time when these were truly unusual to have. To be able to try my hand at education, computer science, biology, and research all led towards a lifetime of both science and public service. I've spent the past 25 years trying to provide similar opportunities to our Maine youth. Both by mentoring the mentors and by providing direct learning opportunities for Maine youth.

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