RREV's Innovative Pilot: RSU 71 Belfast Area High School

As part of the **Innovative Mindset and Pilot Development** courses being offered through several of Maine's institutions of higher education, the RREV project uses a consistent template for the creation of all future pilots. Because every pilot created and tested with RREV funds WILL BE published in EnGiNE, we want all of Maine's educators to have the assurance of consistency.

This template provides an outline of the components required of an Innovative Pilot. The information in this template will serve as the basis for requests for school/district level project funding.

Section 1: Define the Need

A. Describe your innovation.

Consider what evidence supports the need for an innovation, and the evidence that suggests your innovation will improve the current situation.

The newly proposed Marine Institute and Internship Program at Belfast Area High School (BAHS) provides an opportunity to turn a nationwide workforce deficiency into potential career exploration opportunities for students. In 2014, 39% of 38,000 U.S. employers reported difficulty hiring skilled workers (Bessen, 2014). Bessen goes on to explain that new technologies frequently require specific employment skills that schools don't teach and that labor markets don't supply. The Roux Institute in Portland, Maine, an organization devoted to developing tech talent and innovation, concluded in 2021 that Maine lags the nation as a whole in developing a workforce for 21st century jobs. They are working to remedy this by encouraging STEM education as it applies to local economic activities (Schreiber, 2021). The Marine Institute will prepare students for future skilled jobs through community partner internships and career experiences coupled with field research using various technologies including environmental sensors, 3D printers, and drones.

Currently, there are limited opportunities for students at BAHS to gain career and job skills in the community during the school day. In addition, many students are not trained in STEM skills and practices through the school curriculum. This leads to a limited understanding of STEM learning that is relevant to their interests and goals. Thus, students do not consider all possible career and education opportunities that exist for them after high school. This RREV Grant Application will support the creation of a school-wide internship program that will benefit both students who are participating in the Marine Institute and those who are not.

The current program of studies at the high school offers very few opportunities for students to explore careers of interest by visiting and working with professionals in the community. This proposal aims to prepare all Marine Institute students to apply STEM skills and practices in their career and future education by implementing a half-day program that allows for both community partnerships as well as career exploration through site visits and STEM related field trips. This RREV Grant Application will also support a rapid expansion of the number of student internships across the academic year, including the summer.

Interviews with BAHS students have also exposed a desire to have more choice in high school courses. When the Marine Institute program was described to students as a flexible pathway to gain skills for jobs of the future through immersive field experiences and community-based internships in marine and maritime studies, over 90% of students responded that they would seriously consider enrolling in such a program. In addition to expanded internship and career exploration programming, the Marine Institute promises to deliver nontraditional credit-bearing courses focused on project-based field research of the Penobscot Bay.

Additional PDSA cycles were completed during Fall 2021 through work with the REL Continuous Improvement team. One cycle tested teachers promoting STEM work and making explicit connections to career options. Student surveys showed that students were able to independently cite careers that would use skills they were learning in the classroom. Another cycle tested the impact of teachers aligning lessons to match student interests, which again was received favorably by the students as indicated in interviews, surveys, and student work.

B. Identify which students would be impacted, targeted, or supported by the innovation.

Review the evidence – quantitative and qualitative data and research – that indicates this group of students is considered the most vulnerable and would benefit from the described innovation.

Data you can use to inform your innovation, rationale, and targeted student population include the performance of various groups of students (e.g., students in rural locales, students from low socio-economic conditions, students with disabilities, students who are Els, students at risk for dropping out, student who are homeless) with regard to academic achievement, graduation rates, social emotional and mental wellness, economic data, and/or workforce participation.

The BAHS Marine Institute is intentionally designed to serve a diverse student population. Much of the specialized programming that we currently offer is directed towards a specific group of students. Our AP courses and science clubs typically serve our science-focused, higher achieving students while our lower achieving students typically go to the technical center for more applied STEM related instruction. Our vision is that this program will serve as a vehicle for students at all levels to explore their STEM related interests. This includes alternative education students, students with disabilities, students who need to recover credits for graduation, students seeking internship opportunities and high academic performing students.

BAHS serves a very diverse socio-economic community. More than 50% of our students qualify for free or reduced lunch, and in 2019 56% of our students are proficient in Science based on the MEA. Our students demonstrate a wide variety of needs and have an even larger range of career aspirations. These demographics necessitate the need for a flexibly designed program that could support combined programs such as marine biology research and marine diesel technology exploration in the same classroom. With carefully designed and planned curriculum and instruction, we believe that the diversity of learners will serve as an asset to this immersion program and contribute to greater collaboration amongst students, teachers, and the community.

Students surveyed in focus groups overwhelmingly supported the idea of an off-campus internship for sophomores, juniors and seniors. The internship program will be open to all students in grades 10-12, regardless of whether they participate in the proposed Marine Institute.

Section 2: Describe the Innovation

A. Describe the goals of your innovation.

Consider how your innovation will meet the needs of the identified target student population(s) and how you plan to achieve your goals. Additionally, consider any changes in policy, practice or structures you expect as a result of the innovation.

The goal of the Marine Institute is (1) to use the local community as an extension of the classroom to connect a diverse student population in rural, coastal Maine with employers and authentic field-based learning experiences, and (2) develop an Internship structure and process to support students within the Marine Institute as well as students outside of the institute, seeking extended learning opportunities in the community.

BAHS students who participate in the internship program will be placed in the local community with business leaders, business owners, professionals and non-profit organizations. The goal is to expand the student experience beyond the walls of BAHS and to help students identify areas of the public and private sector that they may want to think about for future career paths, and identify training programs and post-secondary opportunities linked to these areas of interest.

The objectives of these innovations are to:

1. Offer all 10th, 11th, and 12th grade students the opportunity to explore careers of interest and to gain training in transferable skills through immersive field experiences and community-based internships in marine and maritime studies.
2. Strengthen school-community partnerships and placed-based educational experiences in the Belfast area to foster student development into becoming more involved and engaged citizens of the community.
3. Identify complex real world problems in our community and design solutions based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and trade-off considerations by conducting field studies in Penobscot Bay.
4. Teach ocean literacy principles for students to gain an understanding of the ocean's influence on them and their influence on the ocean.
5. Develop a school-wide structure and process to support community-based internships and Marine Institute career placements.

As a result of this innovation we expect student engagement and career readiness to increase, both within the proposed Marine Institute, as well as others seeking internship opportunities. As author Grace Lee Boggs observed, "You cannot change any society unless you take responsibility for it, unless you see yourself as belonging to it and responsible for changing it." The Marine Institute and supporting internship process will inspire new student practice by nurturing a sense of place and belonging in students, so that they become stewards of our community, ready to change society. We expect teacher practices to continue to blend place-based educational experiences and to integrate

technology into the curriculum. We expect this Institute to provide opportunities for teachers in many departments to utilize technology and field equipment in their classes.

The thematic focus of the institute is marine and maritime for several reasons. First, the inclusion of field research is critical for teaching skills and habits of work which will prepare students for future careers. Penobscot Bay offers students a wealth of local field research opportunities. In addition, ocean literacy is necessary to understand and protect our planet. Multiple global impacts of anthropogenic climate change are affecting the oceans and threatening our existence; solutions will require the training of future ocean stewards. According to the National Marine Educators Association, the American public is largely ignorant of the importance of the oceans in their lives. The Marine Institute program will equip students with an understanding of the ocean and ocean processes and potential related careers.

The internship program is an elective credit-bearing experience (content credit may be entertained on a case by case basis) connecting students with local businesses and companies to provide work experience for students and potential workforce pathway for employers in Waldo County. Grading will be Pass/Fail. Credit value will be decided based on the individual student internship plan. A semester based internship for .5 credits will consist of a minimum of 40 hours of on-site contact time. There will be additional time spent by the student on pre and post internship reflection.

B. Describe activities included in your plan for each stage – preparation (P) or implementation (I) – of your innovation.

- ***Preparation*** *includes building stakeholder awareness, establishing routines and processes, and coordination of logistics.*
- ***Implementation*** *includes planned implementation activities, as well as professional development for the educators participating in the innovation.*

Activity	Purpose	Stage (P or I)	Date of Completion	Person Responsible
Plan the master BAHS schedule	Work with the counseling office to discuss scheduling limitations and opportunities to shuffle science courses to allow for appropriate staff in the program	P	March 2022	Leadership Team, Admin, Guidance
Campus improvement planning	Meet with facilities to plan facilities expansion	P	Spring 2022	Leadership Team, Admin, Facilities Director, Finance Director
Site-visits to organizations with similar programs or	Travel to and/or meet with other programs in the area	P	Spring 2023	Leadership Team

that may support the program	to develop our implementation plan			
Create ELO Coordinator Position Description and Advertise and Hire Person	To facilitate the implementation of the internship program and community partnerships	P/I	Winter/Spring 2022	RREV Team
Develop and approve internship program structure	To have a structure moving into implementation.	P	Summer, 2022	
Course development	Summer PD with education consultants to develop placed-based science and career courses	P	Summer 2022, SY 2022-2023	Leadership Team, Project Based Learning Consultant, ELO Coordinator
Advertisement to students about Marine Institute	Promote the course to students prior to course sign ups, students register for Marine Institute and self-identify	P	February 2023	Leadership Team, Admin, Guidance Internship Program
Advertise Internship Program	Promote internship opportunities to students	I	Spring/Summer 2022	ELO
Master Schedule	Build master school schedule so it allows for maximum teacher involvement in Institute courses	I	Spring 2022- for pilot program for 2022-2023 year, Spring 2023 for full implementation 2023-24	Leadership Team, Guidance
Implement Internship Program	Select student for internship experiences and place them with sites	I	Fall 2022	ELO Coordinator
Securing Community Partners	Solidify community partners and prepare them to receive student interns	I	Summer and Fall 2022	Leadership Team, Community Partners, Partner Development Consultant, ELO Coordinator
Gear and Equipment Deadline	All necessary gear, equipment, and facility purchases and organization completed	I	Spring 2023	Leadership Team, Facilities, Admin, Central Office, Contractors
Marine Institute Launch	Institute course will be taught at Belfast Area High School	I	Fall 2023	2 science teachers, 1 social studies teacher, 1 additional teacher, Community partners

Sustain ELO Coordinator position	Identify a plan for sustaining the ELO Coordinator position	I	Spring 2023	Administration

Section 3: Define Innovation Outcomes & Measure to Assess Outcomes

A. Identify the outcomes *(i.e., student outcomes, changes in instructional practices, changes in student practice)* that you expect to see as a result of your innovation.

Consider both short-term and long-term outcomes, at different points in the time (e.g., at 6 months, 12 months, 2 years and 3+ years).

This innovation is presented as a 2-year pilot project, with a timeline of important outcomes indicated below. However, the work described in the proposal is expected to carry on and be augmented in future years. Outcomes achieved in the first two years are considered short-term outcomes. Outcomes achieved in three or more years are long-term outcomes.

Project Outcomes Timeline

2021-2022	2022-2023	2023-2024	2024-2025
6 mos -Framework for one additional graduation pathway focused on marine and maritime issues (Obj. 1, 3) -Framework for an internship program created (Obj. 5) -Hire an ELO Coordinator to design and monitor internships and Marine Studies placements. (Obj. 5)	*12 mos* -Curriculum planning for up to 3 new place-based courses (Obj. 3, 4) -5 existing community partnerships enhanced and 1 new partnership developed (Obj. 2, 5) -Create a plan to sustain funding for ELO position (Obj. 5)	*2 yrs* -Marine Institute launch (Obj. 1, 2, 3, 4) -3 new placed-based courses, 2 science, 1 humanities or other credit based on student interest and need (Obj. 3, 4) -12 students a year complete an internship (Obj. 1)	*3+ yrs* -Up to 10 manageable and sustained community partnerships (Obj. 2) -24 students a year complete an internship (Obj. 1) -Student and community ocean literacy increases (Obj. 4)

Program outcome metrics after two years will include: increasing pathways to graduation; doubling interdisciplinary course offerings in BAHS program of studies; growing the number of participants in the program up to 24 students; building partnerships in the community up to 10 businesses and organizations, building a sustainable structure for the internship program and ELO Coordinator.

Educational Measure to Assess Objectives and Outcomes

Maine's Guiding Principles and the Career and Life Ready Standards will be used to assess the success of the project objectives and outcomes. Student educational performance will be measured by quantifying the number of students who meet the performance indicators using the existing BAHS guiding principle rubrics.

Objective	**Guiding Principle and Career and Life Ready Standards as Performance Measure**
1. Offer all 10th-12th grade students the opportunity to explore careers of interest and to gain training in transferable skills through immersive field experiences and community-based internships in marine and maritime studies.	A self-directed and lifelong learner who formulates a post-secondary career or education plan utilizing academic and career goals based on strengths and weaknesses, using technology and community resources. **Career and Life Ready Standards Strand A.1- Self-Knowledge** Students demonstrate an understanding of their own capabilities, characteristics, attitudes, and how these attributes impact their future choices, including local, state, national, and global opportunities.
2. Strength school-community partnerships and placed-based educational experiences in the Belfast area to foster student development into becoming more involved and engaged citizens of the community.	An integrative and informed thinker who frequently makes good real-life decisions showing an understanding of consequences of actions and works collaboratively with a positive attitude. **Career and Life Ready Standards Strand B.1- Aspirations. Exploring Opportunities:** Students understand their options and can navigate choices and experiences concerning interests and future opportunities.
3. Identify complex real world problems in our community and design solutions based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and trade-off considerations by conducting field studies in Penobscot Bay.	A creative and practical problem solver who participates in the planning and implementation of a community-based research project. **Career and Life Ready Standards Strand A 2- Life Skills.** Students demonstrate and reflect on skills that influence interpersonal relationships in positive ways in school, work, and the global community. a. Use a variety of communication skills in a responsible manner.

	b. Exhibit ethical behavior, including responsibility for self and others. c. Understand and exhibit professionalism in changing situations and environments.
4. Teach ocean literacy principles for students to gain an understanding of the ocean's influence on them and their influence on the ocean.	A responsible and involved citizen who recognizes the power of personal participation to affect the community and demonstrates participation skills. **Career and Life Ready Standard A 3- Problem Solving.** Students evaluate and implement strategies to manage multiple roles and responsibilities as involved members of their local and global communities. a. Evaluate responsibilities and potential impact as students, community members and employees. b. Engage in issues impacting local and global communities.
5. Develop a school-wide structure and process to support community-based internships and Marine Institute career placements.	A self-directed and lifelong learner who formulates a post-secondary career or education plan utilizing academic and career goals based on strengths and weaknesses, using technology and community resources.

B. Describe your plan for collecting and reviewing data to assess your innovation outcomes.

Potential data to collect includes qualitative and quantitative data (e.g., surveys, interviews, focus groups, observations, exit tickets, and on-demand assessment(s) that can be considered.

Data Type	**Baseline (B) Interim (I) Summative (S)**	**Frequency of Data Collection**	**Person(s) Responsible for Collection and Data Quality**
Marine Institute Enrollment	BIS	Annual	Admin and Marine Institute Advisor
Marine Institute Attendance	B	Semester	Admin and Marine Institute Advisor
Internship Placement Rate	BS	Annual	Admin and ELO Coordinator
Internship Attendance	B	Semester	Admin and ELO Coordinator
Student Reflections and Surveys	BIS	Quarterly	ELO Coordinator, Marine Institute Advisor, Admin

Community Partner/Site Mentor Reflection and Survey	I	Annual	ELO Coordinator
Credits Earned	S	Annual	Admin and School Counseling
Post Secondary Placement/Success Rate	S	Annual	Admin and School Counseling

C. Describe how you will **scale and sustain** your innovation, including necessary policy changes, changes in mindsets, capacity-building activities, and **long-term financial sustainability**.

Consider the systems changes that this innovation will require and promote.

After the two-year pilot phase, we plan to scale and sustain our innovation by increasing enrollment and deepening school-community partnerships. Through teacher presentations and student-to-student conversations we anticipate enrollment to double from the pilot class size. New stipend positions will be created for coordination of the Marine Institute. In addition to collaborations outside the district, collaborations with other district programs (*e.g.*, CTE, Alternative School, JMG, ELO Coordinator) will help scale and sustain the program. The Marine Institute will serve as a transferable structure for immersion programs in other disciplines. In addition, students who have completed internships with certain organizations will have acquired the necessary training for future jobs with these organizations. Alumni of the Marine Institute will serve as ambassadors of the program and help recruit future students. If they are working locally, they may potentially mentor students. We predict this will increase community support of the Marine Institute and the overall internship program, helping to ensure long-term survival for both..

Once developed, the internship program will be a model for other districts to utilize offering a clear process for school and community to work together expanding educational opportunities.

D. Describe the feasibility study you engaged in during the development of your innovative pilot plan, including which aspects of the plan for the pilot were reviewed, which stakeholders were engaged, feedback received and revisions made to the plan as a result of the feedback.

We initially mapped the existing sequence of instruction from course selection to skills acquisition from a student perspective. We identified variation within the system regarding student engagement, which led us to quantify the extent of this problem. We interviewed students regarding their engagement and motivation, finding the biggest and most frequent problem reported to be lack of student choice in their school work. Teachers also reported that hands-on, collaborative, and project-based work was the best way to engage students. We felt an opportunity to develop a program that could offer student choice, was project-based and collaborative was possible in our thriving coastal community. Conceptual prototypes in the form of Blue and Yellow cards were completed to

summarize and quantify the problem, promise, and proof of our idea. Subsequent mining took place to evaluate the feasibility of an idea for a Marine Institute during the school day that would involve internships and field research in the Penobscot Bay.

We identified possible obstacles (i.e., "death threats") to the development and implementation of the Marine Institute. We considered stakeholder, technology, and organizational risk and conducted several mini-research cycles (Plan-Do-Study-Act or PDSA cycles). One PDSA cycle addressed whether an adequate number of students would enroll in the semester long program. Over 90% of students interviewed reported a high level of interest in such a program, especially if it was credit bearing and during the school day. Another PDSA cycle researched the plausibility of finding multiple community mentors to provide internships for students. Five of six businesses and organizations that were contacted responded that they would be able to work with between one and five high school students. Thirteen different possible projects and career fields were described by these employers.

Prototypes were developed to further develop the innovation. A conceptual prototype included making hypothetical 4-year plans for students following four different paths to graduation. All 4-year plans met graduation requirements and included the half-day Marine Institute in the junior or senior year. We also implemented a functional prototype by having a student shadow the school nurse for about an hour during the school day. The reflections from both the student and mentor highlighted important considerations about implementing and evaluating student internship experiences.

We conducted focus groups and student surveys regarding interest and understanding of internship opportunities. Students were overwhelmingly positive about the possibility and are excited to learn more about the opportunity as it develops.

Section 4: Identify Key Expenses

A. Identify the key expenses associated with the preparation, implementation, and ongoing refinement of your pilot.

Expenses could include staff time, materials, professional development activities, facilities, and other related expenses. This section does not need to include specific costs, but rather list out the different costs that should be considered to implement the innovation.

1. Staff Time/Benefits (teacher stipends)
2. Professional Services (boat charters, community mentor stipends, curriculum development, wet lab and storage planning and construction, Extended Learning Opportunities Coordinator 1 yr position, property water/power lines for lab)
3. Materials (field gear, touch tank, classroom supplies, aquaponics, technology-related software)
4. Transportation (field trip bus/van use)