

STEAM Challenge Grant – Request for Applications 2023-2024 School Term

The Vermont Agency of Education (AOE) invites Supervisory Unions/Supervisory Districts (SU/SDs) to complement and/or amplify their existing secondary school curricula by providing students an innovative learning opportunity to use STEAM learning principles to solve a problem within their communities or the state. Successful applicants will demonstrate their ability to organize interdisciplinary teams of at least five secondary students and one licensed educator to identify a problem within the state, propose a process to understand the root causes of the problem, leverage the expertise of their education community, and create a sustainable solution using a STEAM approach.

This short-duration, competitive grant opportunity will make awards of up to \$15,000. The agency anticipates that most requests will be at \$10,000 or less. SU/SDs who were previously awarded a challenge grant are eligible to apply, however, SU/SDs that did not receive funding in the previous grant offering will be prioritized for award. The total amount of funding available for this grant opportunity is \$100,000. AOE reserves the right to make no awards, should applicants not fulfill the eligibility requirements.

Application Due Date: October 16, 2023 (4:00 PM)

Anticipated Grant Duration: June 30, 2024

Number of Awards: Number of awards will be determined by the number of applications received and available funding.

Informational Meeting: October 2, 3-3:30 pm, request meeting link from lisa.helme@vermont.gov. This is an optional meeting for applicants to ask questions.

For additional information, contact:

Lisa Bresler, Arts Specialist, at lisa.bresler@vermont.gov

Note: All recipients of the STEAM Challenge Grant are required to participate in a two-hour STEAM training before work is started on their individual challenges. A date and time for the training will be set after all recipients are selected.

General Information and Background:

AOE is offering this competitive grant opportunity to support programs providing Vermont students with a holistic STEAM experience. The AOE defines STEAM as “an authentic, student-centered learning experience that targets the application and integration of the knowledge, skills, and practices of science, technology, engineering, the arts, and mathematics.” (See [Appendix B](#) for more information.)

The goal of this grant opportunity is to begin building a coherent system of understanding regarding the tenets of STEAM education, and to provide structures for schools, SU/SDs and CTE centers in developing and sustaining STEAM programs that are aligned with state

adopted standards, including those standards that may be currently under-addressed (e.g., arts, engineering, computer science, etc.).

The Challenge:

Are your students looking to make a difference in your community? Is there a problem or hurdle faced by fellow Vermonters? If you have a desire to understand the root causes of a problem, leverage the expertise of your education community, and create a sustainable solution, then the STEAM Challenge is for you! Vermont public secondary schools, including CTE centers, are invited to organize interdisciplinary teams of at least five students and one licensed educator to address a problem within the state. Teams are encouraged to consider including community members or organizations, such as makerspaces. The term secondary student applies to students in 7th through 12th grades.

A problem is a situation your students want to change, a risk they want to reduce, or an opportunity to seize. Common types of problems include:

- Ambiguous - A problem that is wide open with a universe of possible solutions
- Constrained – A problem that is heavily constrained with few available options
- Decision Making – Problems that require choices between strategies or options
- Improvement – Changing things incrementally to improve and optimize them
- Political – Situations that involve cooperation or competition between organizations, teams, informal social structures and individuals
- Reinvention – A problem that calls for completely replacing things with something new
- Technical – Problems that aren't social in nature such as fixing a machine
- Workaround – Attempting to get things working again as soon as possible without addressing the causes of a problem; the focus is on getting things working again

Once your team has identified a problem to solve, they must utilize a STEAM approach to come up with a solution. The team must specifically demonstrate that they applied and integrated the knowledge, skills, and practices of science, technology, engineering, arts, and mathematics and provide a plan for how they would present their solution to the public. There may be an opportunity for student projects to be on display and presented to community members. (See [Appendix A](#) for the specific STEAM approach chart later in this application.)

The STEAM Challenge will include students completing a written challenge/solution survey (to be provided to winning applicants) and creation of a digital product (video, podcast, etc.) or art project (poster, display, etc.) that explains your problem, your STEAM problem-solving process, and solution. The team's work should also demonstrate how students understood and applied an entrepreneurial approach to the problem. Entrepreneurship is characterized by the taking of risks in the hope of making gains against the identified problem.

Grant Purpose and Details

The intent of this grant is to:

- Promote rigorous, relevant, and authentic STEAM learning experiences that encourage students to apply STEAM concepts to real-world situations.
- Identify thematic and interdisciplinary approaches that can serve as a model for authentic STEAM education.
- Enable participating students to demonstrate entrepreneurial skills in identifying and offering a solution to a real-world challenge.

Grant funds may be used for:

- Student enrichment activities that may include travel to gain a better understanding of the problem and build knowledge and skills in the area targeted for a solution.
- Professional learning for licensed educators working with the interdisciplinary student team to develop knowledge and skills for STEAM education.
- Tools, supplies, technology, services, and/or consulting needed to create the model or another demonstration element of the STEAM Challenge.
- STEAM curriculum, including STEM curriculum with art-infused elements.
- Fund requests may be for less than \$15,000 but may not exceed this amount. It is anticipated that most request will be for \$10,000 or less. Funds must be completely expended within the challenge window starting at grant execution through June 30, 2024. The AOE application review team may elect to award less funds than requested if deemed that the project could be accomplished with fewer resources.

Eligibility & Requirements:

This grant opportunity is open to all Vermont supervisory unions/districts and the public secondary schools and the Career Technical Education centers they operate. School teams may include students from district elementary schools, but the team must be comprised of at least five secondary level students. Applicants are encouraged to attend a pre-grant application webinar on October 2 for a briefing on a proposed STEAM framework that will guide the creation of grant proposals.

- Applicants must identify the type of problem to be addressed (see above).
- Applicants must identify how they will utilize a STEAM approach to solving the problem drawing from the areas of science, technology, engineering, arts, and mathematics. (Appendix A)
- Applicants must demonstrate that they can complete the STEAM Challenge project itself by June 1, 2024. This will allow teams time to prepare for a public showcase of teamwork before the end of the school term or June 30, 2024.
- Applicants must complete a budget, with appropriate object and function codes.

- Grant recipients must have student teams of no fewer than five secondary students and be willing to have their students present to the AOE STEAM team or at another public event.
- Grant recipients must send at least one educator to a virtual two-hour STEAM training prior to commencing work on the challenge project.
- Grant recipients must complete a STEAM Challenge evaluation at the conclusion of the project to assist in the creation of future STEAM Challenges. (Evaluation template will be provided.)
- The licensed educator leading the interdisciplinary student team must be willing to provide comments and other evaluations of AOE STEAM documents.

Project Award and Timeline

The grant period is projected to begin November 15, 2023 (or upon execution of the grant agreement) and expire on June 30, 2024, with the expectation that program objectives are met and all reporting and monitoring requirements are successfully fulfilled. The grantee is expected to provide a proposal, timeline, and budget request for the identified grant activity period.

Important Dates

Application Opens: September 18, 2023

Applicant Informational Webinar: October 2, 2023 (3 PM)

Application Due: October 16, 2023 (4:30 PM)

Awards Announced: November 15, 2023

Anticipated Grant Duration: Date of executed grant agreement - June 30, 2024

Award amounts: No more than \$15,000

Number of Awards: Number of awards will be determined by the number of applications received and the available funding.

Evaluation

A. Adherence to Format. DO NOT FORGET COVER PAGE. Appendix D (10 Points)

B. Proposal Description (55 Points):

- 1) **Problem Statement:** Identify the type of problem your student team will tackle. (Select from the list provided in the *Challenge* section above) Describe the problem and why your student team selected it. Be concise.
- 2) **Student Participation:** List the number of students anticipated for the team, the students' grades, and schools.
- 3) **Project Goals, Plan, Timeline, and Benchmarks:** Describe how your team will meet and conduct work for the challenge. This scope and sequence must be

developed for the period between execution of the grant agreement and June 30, 2024.

- Provide a concise description of goals;
- number of participants and students to be served; and
- an achievable plan and timeline, and monthly project benchmarks.

Note: At the conclusion of the challenge, the student team must submit to AOE a completed online survey (link to be provided) and accompanying digital or art project that explains the problem, their STEAM problem-solving process and the solution outcome. *This should be reflected in the project plan and timeline.*

4) **STEAM Strategy and Solution:** Provide a detailed description of how your team will utilize a STEAM approach to come up with a solution. The chart in Appendix A is meant to assist you in demonstrating the STEAM content areas that will be applied in pursuing an integration of knowledge and skills from these areas to test your solution. Include this completed table in your application.

C. Capacity for Success (20 Points):

The bulleted items will be considered by reviewers when they score this section of the application.

- **Staffing:** Is there an endorsed educator available to lead the challenge project?
- **Students:** Are there no fewer than five students or more participating in the challenge project, the majority from the secondary level?
- **Enrichment:** Is any professional development planned for adult leaders and students to expand their knowledge and skills in STEAM or in understanding the problem/solution itself?
- **Achievement:** Is the team structure and project plan practicable and sufficient to support the proposed project?
- **Budget:** Is the proposed budget realistic and adequately documented? Does the applicant have the resources in place to be successful? See example spreadsheet in Appendix E. Applicants may request less than \$15,000 but may not exceed that amount.

D. Evaluation (15 Points):

Describe how you will define and evaluate student success and challenge achievement, even if your ultimate solution is unsuccessful in solving your identified problem.

Selection Process:

All proposals will be read and scored by a small review panel of internal AOE personnel. The rubric that will be used is found in Appendix C. Common high scores will be chosen through a reviewer consensus model. AOE reserves the right to decline to select any award winners should all proposals fall short of the basic requirements for the award.

Appendix A

STEAM Approach Chart

Steam Content Area	Solution Link *	Standards Identified to be Addressed and /or Assessed in Challenge **	Content Educator Support (Yes or No) ***
Science			
Technology			
Engineering			
Arts			
Mathematics			

	Describe how students will understand & apply an entrepreneurial approach to the problem.
Entrepreneurship	

* Describe how knowledge and/or skills from this area will be used in your solution.

** Identify what standards you will be addressing throughout the proposed unit by content area.

*** STEAM is collaborative in nature & educators are encouraged to share content expertise with each other.

Demonstration of educator participation and integration from multiple disciplines will be looked upon favorably by the review team.

Note: Applicants should produce a table similar to the one above in their application using as much space as needed to address each content area and also explain how students make the connection between their work and being entrepreneurial. This table is a part of the three-page program description.

Appendix B

What is STEAM?

STEAM education is an all-encompassing approach for inspiring inquiry and curiosity in students. STEAM education integrates Science, Technology, Engineering, the Arts, and Mathematics as core components of teaching and learning. STEAM offers a connected, interdisciplinary curricular structure, driving students to develop critical thinking and problem-solving skills while exercising creativity and innovation through real-world learning experiences.

It is important to emphasize that the use of STEAM, rather than STEM, is not a competitive notion. STEM is not diminished, but rather enhanced by incorporating the arts in an integrated approach that invites educational participation by all learners. STEM remains the more familiar reference for initiatives focused on bolstering student participation in these targeted curricular areas. As such, AOE also supports initiatives under a STEM banner but seeks to expand this engagement to include the arts.

The AOE defines STEAM as:

An authentic, student-centered learning experience that targets the application and integration of the knowledge, skills, and practices of science, technology, engineering, the arts, and mathematics.

STEAM Instructional Practices

Ideally, STEAM is taught collaboratively. According to The Institute for Arts Integration, STEAM is an approach for guiding inquiry dialogue and critical thinking, which is important for all subjects. When STEAM is isolated into a siloed class with a teacher labeled as the “STEAM teacher,” it defeats the purpose. However, having a “STEAM teacher” lay the foundation work and be given time to collaborate with other educators is a start. Ideally, all educators incorporate STEAM experiences in their teaching and have access to a STEAM coordinator or coach to assist them.

Transdisciplinary Learning

Transdisciplinary learning transcends the pedagogical practices that happen in traditional school subjects and settings. It is closely aligned to the ideal of STEAM education. Educators from different disciplines collaboratively lead students to work toward a common end-product or goal. Learning is directly applied to a real-world context and is taught through a cohesive curriculum in which students work together to solve a multifaceted problem. A transdisciplinary curriculum is innovative and built on a foundation of cooperation and intentionality in its design. These experiences can be viewed as collaborative learning opportunities between teachers, students, field experts, and the community.

Incorporating an Entrepreneurial Approach to Learning

Tomorrow's trends and great ideas are often created by kids and young adults. Some Vermont middle and high schools have begun incorporating elements of entrepreneurial activities, but likely won't ever be able to offer a comprehensive curriculum under the current structure of education discipline silos. However, STEAM education, a multi-disciplinary approach is a key component to a thriving entrepreneurial ecosystem that helps inventors and aspiring business minds succeed in developing new ideas and bring those ideas to market. STEAM education in public education is the basis for building a maker mindset and the 'on ramp' for innovation driven entrepreneurship. Entrepreneurship is the "what we will do with our creation/solution" aspect of STEAM. Grant applicants are asked to describe how the entrepreneurial process of developing and integrating new ideas to a workable solution were addressed in the team's approach to this challenge.

Appendix C

Scoring Rubric: STEAM Challenge 2023-2024 School Term

Guiding Questions	Poor	Average	Excellent
Format - (10 Points) <ul style="list-style-type: none"> Does the application adhere to the application formatting requirements? Does the application include all elements required in sufficient length and detail? 	0 – 3	4 – 7	8 – 10
Proposal Description - (55 Points) <ul style="list-style-type: none"> Is a specific type of problem identified? Is the problem adequately explained & the reasons for the student interest in solving this problem? Are participating students appropriately identified? Did the applicant provide a description of how the team will meet to address the challenge? Did the applicant address how they will utilize an integrated STEAM approach & included the appropriate completed table? Is the proposed challenge approach innovative, promote learning, create new opportunities for student engagement? 	0 – 17	18 – 35	36 – 50
Capacity for Success - (20 Points) <ul style="list-style-type: none"> Is there an endorsed educator involved & no fewer than five students participating in the challenge? Can the work be completed in a quality manner within the meeting approach proposed by the applicant? Is the proposed budget adequate? Are the resources in place to be successful? Is any professional development proposed for adults/students? 	0 – 8	9 – 15	16 – 25
Evaluation - (15 Points) <ul style="list-style-type: none"> Are there evaluation components inherent in the project—are outcomes based in a measurable way? Is there any evaluation of how the student team integrated STEAM knowledge & skills in their challenge approach? Are there clear measures of success identified? Does the applicant describe how they will present their Challenge process and outcomes? 	0 – 5	6 – 10	11 – 15
Total Score (max points 100) *			

* Though reviewers may score in this manner, close or common scores will be determined by consensus by the review group.

Appendix D

Grant applicants must include this form in their grant application. Once the application is accepted, AOE will resend this form directly to the Superintendent should any additional information or verification is needed.

Proposal Cover Page: STEAM Challenge Grant 2023-2024

School District & SU (School where equipment will be delivered)	
Contact Person	
Contact Person E-mail	
Business Manager	
Phone	
E-mail	
Superintendent Name	
Superintendent Email	
	Provide detail about the school as follows:
School	
Grade Spans	
Current Enrollment	

Superintendent Signature:

(This signature will be obtained through AOE's DocuSign E-signature process.)

Date

Appendix E

SAMPLE SPREADSHEET

Create your budget as shown in the example below. Include relevant items as you see fit. Specific items listed below are provided as an example only. Function and object codes not included in this example may be used by applicants but must adhere to AOE budgeting requirements. Consult your business office personnel if you have questions about appropriate function and object codes to use.

STEAM CHALLENGE GRANT 2023										
School	Contact Person	Email		Phone						
Object Codes										
Function Code	(100) Stipends	(200) Benefits	(300) Professional & Technical Services	(500) Other Purchased Services	(600) Supplies	(700) Technology Related Hardware	(700) Technology Related Software	(800) Miscellaneous Expenditures	(900) Other Items	TOTAL
1000 - Instruction	Stipends for staff work outside of regular teaching role.				All classroom supplies needed for team to create a working model.					\$1,500
2212 - Instruction & Academic Supports								Acquisition of STEAM curriculum, including activities guide.		\$3,000
2213 - Instructional Staff Development & Training			In-service training.							\$1,500
2230 - Instruction - Related Technology					ABC Corp. kit of electronic building materials for workable switch.					\$2,000
2495 - Administration for Grants										
2715 - Field Trips								Transportation & entrance fees to the ABC factory.		\$1,000
2716 - Extra/Co-Curricular Transportation										
TOTAL OF ALL REQUESTS										\$9,000