STEAM Grant Opportunity – Request for Applications

The Vermont Agency of Education (AOE) invites SUs/SDs and CTE centers to complement their existing STEAM programs and [FIRST Robotics](https://www.firstinspires.org/robotics/frc) teams with an opportunity to apply their skills in leadership and understanding of STEAM principles to sustaining FIRST teams in their SU/SD, CTE center or CTE center region. This competitive grant opportunity will award no fewer than three proposals to fund FIRST Robotics teams up to $20,000 each.

**Application Due Date:** December 10th, 2021

**Anticipated Grant Duration:** January 3rd – June 30th, 2022

**Number of Awards:** No fewer than three.

For additional information, contact:

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# STEAM Grant Application

## Introduction

The goal of this project is to begin building a coherent system of understanding regarding the tenets of STEAM education in order to help provide structures for SU/SDs and CTE centers to build STEAM programs that are aligned with state adopted standards, including those that could be currently under-addressed (e.g., arts, engineering, etc.).  ​In order to begin supporting programs in providing Vermont students a holistic STEAM experience, the AOE is offering a competitive grant opportunity to help fund schools’ 2022 FIRST Robotics competition (FRC) team and complement current STEAM initiatives. To ensure FIRST competition sustainability and system-wide STEAM efforts, this opportunity funds internal support for the development of FIRST Tech Challenge (FTC) and FIRST Lego League (FLL) teams from feeder schools. That is, this grant is an opportunity for current FRC teams to support their SU/SD’s or CTE service region’s younger students in preparing for FIRST competitions in addition to offering funds for the 2022 FRC competition. Note that these funds cannot be used to reimburse any expenditures outside of the grant window of January 3rd, 2022 – June 30th, 2022.

FIRST Robotics teams consist of 9th-12th graders, students ages 14-18. In the competition, teams engage in the following:

*Team members design and build a competitive industrial-sized robot using sophisticated hardware and software technology to meet the challenge. Students experience real-world engineering and entrepreneurship. Each team competes for judged and competition awards at an action-packed multi-day event with other teams. FIRST Robotics Competition is a sport where all participants can choose to become a professional (*[*FRC*](https://www.firstinspires.org/robotics/frc)*).*

FIRST TECH Challenge teams can consist of students ages 12-18. In this challenge, students engage in the following:

FIRST *Tech Challenge’*s *thrilling robotics competitions help students develop a sense of accomplishment and the understanding that they can do anything with their collective skills, leadership, and confidence, and that their experience will positively impact their future and take them further than any other sport can (*[*FTC*](https://www.firstinspires.org/robotics/ftc/cost-and-registration)*).*

FIRST Lego League can include participants as young as four. In this program, students engage in the following:

FIRST *LEGO League introduces science, technology, engineering, and math (STEM) through fun, exciting hands-on learning. Participants gain real-world problem-solving experiences through a guided, global robotics program, helping today’s students and teachers build a better future together.*

The application and integration of the STEAM knowledge and skills used in FIRST competitions equips students with the tools to navigate the 21st century workforce by preparing them to solve problems, make sense of information, and gather and evaluate evidence to make informed decisions.

STEAM empowers educators to employ different forms of pedagogy that foster an inclusive learning environment. Project-based Learning, problem or challenge-based learning, and design-based learning allow all students to engage and contribute to the learning process, synergizing between the modeling process and different content areas. The disciplines of science, technology, engineering, the arts, and mathematics are similar in that each involves multiple creative processes and integrative methods for inquiry and investigation. These processes and methods for creative problem solving and inquiry will better prepare students to become innovators for future careers and occupations.

According to [the U.S. Bureau of Labor Statistics](https://www.bls.gov/emp/tables/stem-employment.htm), STEM and STEAM occupations are poised to grow 10.5% from now until 2030, with an estimated median annual wage difference of $50,000 between STEM/STEAM occupations and Non-STEM/STEAM occupations. Even if a student does not choose a career in STEM or STEAM, the transferable skills a student practices can be translated to any career choice.

STEAM learning requires creative, analytical, and metacognitive processes embedded in artistic literacy and supported by social collaborative activities. Social and co-constructed learning activities can be fueled by arts partnerships and the creative process (Guyotte et al., [2015](https://files.eric.ed.gov/fulltext/EJ1082006.pdf); Schlaack & Steele, [2018](https://files.eric.ed.gov/fulltext/EJ1177205.pdf)). By embedding collaboration and collaborative creativity through a FIRST Robotics team, students can engage in an authentic STEAM experience. Furthermore, focusing on creativity as a collaboration among peers can reinforce student understanding of creativity as a process and not an inherent quality (Guyotte et al., [2015](https://files.eric.ed.gov/fulltext/EJ1082006.pdf)). Related, STEAM activities (e.g., FIRST) of which creativity is the center, support student efficacy and motivation in pursuit of scientific literacy (Conradty et al., [2020](https://www.mdpi.com/2227-7102/10/3/70/htm); Togue et al., [2020](https://ieeexplore.ieee.org/document/8952636)), thus supporting access to STEAM understanding for all students.

The intent of this grant is to:

* Support student access to a quality expanded STEAM learning opportunity through the FIRST Robotics competitions.
* Support current FRC teams’ high schools or CTE centers by offering guidance to their feeder schools on preparing for FIRST competitions and developing their STEAM skills.
* Identify programs that can serve as a model for engaging students in STEAM education.
* Develop opportunities to integrate arts disciplines into FIRST projects.

This grant will help fund a FIRST Robotics team to participate in the 2022 competition cycle. Additionally, the grant will help fund current FRC teams with supporting their feeder schools in developing the skills and understanding to participate in future FIRST challenges. Therefore, the grant can offer funds for the following:

* + 1. Event fees for FRC.
    2. Tools/hardware for FRC.
    3. Mentors/community partnerships.
    4. FRC transportation/hotel costs.
    5. Materials and resources to support FIRST skills with younger students in feeder skills.
    6. Expanded learning providers to support FRC teams or feeder schools FTC or FLL skill development.
    7. Event or registration fees for 2022 FLL or FTC competitions, when possible.
    8. Other materials that support integration of FIRST competitions into STEAM programs and CTE pre-technical and technical programs.

Through a competitive process, awards will be granted to SU/SDs and CTE centers that clearly identify and explain how their FIRST team will be used to enhance the STEAM experience of younger students in their SU/SD or CTE service region or potential future CTE center students. Each grant recipient will:

1. Commit to student learning through appropriate support of feeder school students’ STEAM skills and future FIRST team development;
2. Collaborate with the Vermont internal STEAM teamat the AOE, and communicate the status of goals and deliverables on a monthly basis;
3. Develop a sustainability plan beyond the allotted grant period at the receiving school, which can include additional fundraising plans and strategies for engaging feeder schools’ FTC and/or FLL programs; and
4. Commit to offering feedback on and/or piloting AOE STEAM self-evaluation tools based on draft STEAM framework.

The total amount available for this grant opportunity is $20,000 per team. At least three applications will be awarded. Grant applications will be reviewed by the Agency of Education after the application deadline. Approved grants may be fully or partially funded. The final award will be determined by the reviewers.

## Background

In the summer of 2021, the AOE was invited by Education Commission of the States and the Arts Education Partnership (ECS/AEP) to attend two policy academies related to STEAM policy development. The purpose of these academies is to support state agencies and their stakeholders in developing STEAM initiatives in their state to enhance access to STEAM education experiences for students. Identifying access points to high quality expanded learning opportunities for STEAM is a key element of the AOE initiatives that stem from these academies. Programs like FIRST are model high quality expanded learning opportunities for STEAM and, therefore, are one of many integral pieces to the state’s developing STEAM efforts.

FIRST was started by Dean Kamen over 30 years ago with initial support from Boston Scientific. FIRST is headquartered in Manchester, NH but participation is international. It is increasingly diverse, including approximately 45% female participants

FIRST is made up of the following levels of team competition:

* FLL/FIRST Lego League: ages 4-16  (up to grade 8, age varies internationally)
* FTC/FIRST Tech Challenge: ages 12-18
* FRC/FIRST Robotics Competition: ages 14-18

This grant opportunity targets current FIRST Robotics competition teams. These funds can be used to support the 2022 competition season. Additionally, this grant targets FIRST team development. FRC team recipients are expected to engage their SU/SD’s or CTE service region’s younger students, including potential incoming CTE center students, in developing success skills for future FIRST competitions.

## III. Vermont Agency of Education Priorities

This competitive grant will support a program that:

1. Identifies how FIRST is a complement to and/or enhances the school’s current STEAM efforts.
2. Prepares a clear plan for the 2021-22 school year for supporting feeder schools in developing appropriate skills for FIRST team development.
3. Works with the AOE to pilot the state STEAM framework and associated program evaluation tools.
4. Includes a plan for implementation, monitoring, and sustainability (e.g., mentoring feeder schools, establishing programs to support FLL development, etc.) for FIRST competitions and their integration into STEAM programs across the applicants’ SU/SD.
5. Identifies how arts education will be used to enhance the FIRST Robotics or FIRST Tech competition experience.
6. Identifies connections to student-centered learning (i.e., personalized, proficiency-based, flexible pathways), career and college advising, and workforce exploration.

## IV. Project Award and Timeline

The grant period is projected to begin on January 3, 2022 and expire on June 30, 2022 with the expectation that program objectives are met and all reporting and monitoring requirements are successfully fulfilled*.* Recipients are expected to provide a plan, timeline, and budget request for the identified grant activity period.

## Review Timeline

**Grant Application Released:** November 8, 2021

**Application Deadline:** December 10, 2021

**Anticipated Grant Duration:** January 3 – June 30, 2022

**Number of Awards:** No fewer than three grants will be awarded.

## FIRST Robotics Timeline

**Registration Opens:** May 2021

**Season Kick-off and Start of Build Season:** January 2022

**Regional and District Competitions:** March – April 2022

**FIRST Championship:** April 2022

## V. Application Requirements

The narrative sections of the application must be double-spaced, and the font must not be smaller than 12-point and **shall not exceed 6 pages**. **Only applications that use the templates provided in the appendices for the grant narrative, budget and budget justification, and contact information will be reviewed.** Each application must contain the following sections:

1. **Grant Narrative (See Appendix A for Grant Narrative Template.):**
   1. Project Description and Justification: A detailed description of how you will integrate FIRST Robotics as part of your STEAM, CTE pre-technical or CTE program that includes:
      1. The rationale behind this project;
      2. The intended outcomes for students;
      3. The number of students that will be served (please identify how younger students might be served, not only those on the FIRST team);
      4. Intended strategies for communication with and among the internal AOE STEAM group, and any stakeholders who might support you with the competition;
      5. Strategies to sustain FIRST in STEAM programs and across your SU/SD or CTE center through feeder school support and/or FTC/FLL team development;
      6. Fundraising strategies to support current and future FIRST teams; and
      7. A description of the measures that will be used to determine successful implementation of the program and student outcomes.
   2. Scope and Sequence:
      1. **Project Goals, Plan, Timeline, and Benchmarks:** Provide a clear description of goals, an achievable plan and timeline, and monthly project benchmarks. This scope and sequence must be developed for the time period between January 3, 2022 and June 30, 2022 (note that FIRST competitions extend through April. The June deadline is for any materials/documentation that need to be organized for your final report/evaluation AND for any feeder school plans that extend beyond the FIRST April competition).

**2. Budget and Budget Justification: (See Appendix B for the Budget and Budget Justification Template)**

1. Include a detailed budget for up to $20,000; and
2. Provide a budget justification that is clearly tied to the scope and sequence of the project. Be specific with how funds will be used to support skill development with younger students who could attend your CTE center in the future or who are in your SU/SD. Any funds intended for FRC should be aligned with FIRST costs, registration, hardware/kit fees, etc.:

* [FIRST Robotics](https://www.firstinspires.org/robotics/frc/cost-and-registration)

**3. Contact Information: (See Appendix C for Contact Information Templates.)**

1. Name, address, phone number, and email information for Lead Grant Contact (Please see Appendices A and B).

**4. Evaluation to be submitted by July 15th, 2022:**

1. Project Evidence and Final Evaluation Plan: A detailed description of how the project goals were met, measures of success, as well as any challenges that were encountered. Additionally, the final evaluation will include:
   1. An explanation for how this work will be sustained.
   2. Evidence of FRC participation as well as feeder school skill development (i.e., how did you use funds to support younger students’ skill development?).
   3. Description of how funds were used.

## Application Submission and Review

**Submission:** Applicants must submit a copy signed by an authorized institutional official to Kyle Anderson ([Kyle.Anderson@vermont.gov](mailto:Kyle.Anderson@vermont.gov)) at the Vermont Agency of Education. Electronic signatures will be accepted. Typed names with date signed are accepted. To be considered for funding, original signed applications must be received at the Vermont Agency of Education by 4:00 PM on December 10th, 2021.

VII**:** The Review Process

A review panel will evaluate the eligible applications in accordance with the required application components.

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| --- | --- |
| **Criteria** | **Points** |
| Project Description and Justification | 40 |
| Scope and Sequence | 35 |
| Budget and Budget Justification | 25 |

| **Score** | **Scoring Guide: Criteria are awarded a score of 1 to 20, with 20 being the highest. We offer the following as a guide to assist you.** |
| --- | --- |
| 16-20 = Excellent | The proposal demonstrates the highest level of thinking, capacity or impact. The content of the responses is exemplary in this particular criteria area and could be an example to others. |
| 11-15 = Good | Exhibits ideas that will affect positive change. While the criteria are not fully addressed, the responses are thoughtful and striving for effectiveness. |
| 6-10 = Fair | Gaps are apparent. Criteria are not addressed fully. Responses lack detail. |
| 0-5 = Poor | Weaknesses are apparent in the criteria; the question is not addressed, or the logic is faulty. |

The Agency reserves the right to award in full or in part, to reject any and all applications in whole or in part, and to waive technical defects, irregularities or omissions if, in its judgement, the best interest of students would be served. After receiving the application, the Agency reserves the right not to award a grant, to negotiate specific grant amounts and to select certain grantees regardless of points awarded as part of the process to meet federal requirements or State Board of Education priorities.

VIII. Award Administration

1. **Notification of the Award:** The Lead Contact will be notified of the status of their application within two weeks after the application deadline.
2. **Reporting Requirements:** The Lead Contact will provide quarterly updates on progress to a designated staff person at the Agency of Education.

## Appendix A: Grant Narrative Template

The narrative sections of the application must be double-spaced, and the font must not be smaller than 12-point and **shall not exceed 6 pages**. Each application must contain the following sections:

**Project Description and Justification** (40 Points):

A detailed description of how you will integrate FIRST Robotics as part of your STEAM program that includes:

* + 1. The rationale behind this project;
    2. The intended outcomes for students;
    3. The number of students that will be served (please identify how younger students as well as students on the FIRST team might be served);
    4. Intended strategies for communication with and among the internal AOE STEAM group, and any stakeholders who might support you with the competition;
    5. Strategies to sustain FIRST in STEAM programs and across your SU/SD or CTE center through feeder school support and/or FTC/FLL team development;
    6. Fundraising strategies to support future FIRST teams; and
    7. A description of the measures that will be used to determine successful implementation of the program and student outcomes.

| **Project Description and Justification** |
| --- |
|  |

**Scope and Sequence** (35 Points):

Provide a clear description of goals, an achievable plan and timeline, and monthly project benchmarks. This scope and sequence must be developed for the time period between January 3, 2022 and June 30, 2022 (note that FIRST competitions extend through April. The June deadline is for any materials/documentation that need to be organized for your final report/evaluation AND for any feeder school plans that extend beyond the FIRST April competition).

| **Timeline** | **Goal/Purpose** | **Description of Activity** | **Participants** | **Deliverable Product** |
| --- | --- | --- | --- | --- |
| ***Example:*** *January* | *Identify student participants and other team affiliates.* | *Prepare and disseminate student interest form.* | *Lead teacher, school-based FIRST leaders* | *Established FIRST Robotics team roster.* |
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## Appendix B: Budget and Budget Justification

Budget Template: This form is a **required element** of the grant application. Justification for each of the categories shall be included in the **budget narrative** portion of the application. The funding request and justification for each of the categories shall be included in the template provided. The funding request can be up to $20,000.

| **Functions** | **Salaries (100)** | **Employees Benefits (200)** | **Professional and Technical Services (300) Consultants Contracts** | **Other Purchased Services (500) Travel Printing** | **Supplies (600) Food Books Periodicals** | **Miscellaneous Expenditures (800)**  **Subgrants, Dues, and Fees** | **Total** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 2213 - Instructional Staff Training |  |  |  |  |  |  |  |
| 2219 - Other Improvement of Instruction Services |  |  |  |  |  |  |  |
| 2290 - Other Support Services - Instructional Staff |  |  |  |  |  |  |  |
| 2715 - Field Trips (Education related) |  |  |  |  |  |  |  |
| 2901 - Other Support Services |  |  |  |  |  |  |  |
| **Total** |  |  |  |  |  |  |  |

## Appendix C: Contact Information

|  | **Superintendent** |
| --- | --- |
| Institution or Organization |  |
| Name |  |
| Title |  |
| Address |  |
| Telephone |  |
| Email |  |
| Fax |  |
| Signature |  |

|  | **Lead Grant Contact** |
| --- | --- |
| Institution or Organization |  |
| Name |  |
| Title |  |
| Address |  |
| Telephone |  |
| Email |  |
| Fax |  |
| Signature |  |

|  |  |  |
| --- | --- | --- |
|  | | **Business Manager** |
| Institution or Organization | |  | |
| Name | |  | |
| Title | |  | |
| Address | |  | |
| Telephone | |  | |
| Email | |  | |
| Fax | |  | |
| Signature | |  | |