STEM Scale-Up Programs

Menu for 2015-2016

GREATNESS STEMS FROM IOWANS

GOVERNOR'S STEM ADVISORY COUNCIL

2015-2016 Scale-Up Program Menu

Description: AWIM provides science, technology, engineering and math education through inquiry based real world engineering challenges designed for primary, elementary and middle school students.
Grade Level: K-8
Contact: Chris Ciuca, SAE International, cciuca@sae.org
For more information: www.awim.org

Description: Curriculum for Agricultural Science Education, CASE, curricular materials provide a high level of STEM educational experiences to students to enhance the rigor and relevance of agriculture, food, and natural resources (AFNR) subject matter.
Grade Level: 9-12
Contact: Joshua Remington, Iowa FFA Foundation, joshua.remington@iowaffafoundation.org
For more information: www.iowaffafoundation.org

Description: Defined STEM is a web-based content resource that brings the core fundamentals of STEM education to life for all teachers and students within a school.
Grade Level: K-12
Contact: Johnjoe Farragher, Defined Learning, LLC, johnjoe@definedlearning.com
For more information: www.definedstem.com

Description: Engineering is Elementary is a research-based, standards-driven, and classroom-tested curriculum that integrates engineering and technology concepts and skills with elementary science topics.
Grade Level: 1-6
Contact: Christopher Soldat, Grant Wood AEA Van Allen Science Teaching Center, csoldat@gwaea.org
For more information: www.aea10.k12.ia.us/vastscience/curriculumnew.html

Description: FIRST Tech Challenge (FTC) is a community-focused robotics program while teaching students the value of hard work, innovation and creativity while going beyond the robotics competition by teaching teenagers the importance of working together, sharing ideas and treating each other with respect and dignity.
Grade Level: 7-12
Contact: Rebecca Whitaker, University of Iowa, rwhitake@engineering.uiowa.edu
For more information: http://www.usfirst.org/roboticsprograms/ftc

Description: HyperStream/IT-Adventures and VREP, either independently or in combination, fosters real-world learning for 5th-12th graders through hands-on technology projects, competitions, showcases and engaging presentations through after-school clubs or integrated into curriculum, combined with the opportunity to work with technology mentors.
Grade Level: 5-12
Contact: Tamara Kenworthy, Program Manager, Technology Association of Iowa (TAI), tamara@technologyiowa.org
For more information: http://hyperstream.org

Description: KidWind's program introduces teachers and students to renewable energy STEM concepts: our REcharge Labs will bring effective training and resources to teachers across Iowa, while the KidWind Renewable Energy Festival and the Online Renewable Energy Challenge give students a hands-on application for the concepts they learn.
Grade Level: 2-12
Contact: Michael Arquin, KidWind, michael@kidwind.org
For more information: http://learn.kidwind.org/

A World in Motion (AWIM)

2015-2016 Scale-Up Program

Overview: AWIM provides science, technology, engineering and math education through inquiry based real world engineering challenges designed for primary, elementary and middle school students.

Grade Levels: K-8

Program Summary

SAE International's A World In Motion® (AWIM) program is an educator-administered program that brings STEM education to life in the classroom. The AWIM program provides age-appropriate multidisciplinary hands-on experiences for students. Each AWIM activity is benchmarked to national standards, and combines a comprehensive curriculum built around the AWIM Engineering Design Experience. This problem solving process allows students to work within a structure to solve a "challenge" to design, build, and test a prototype, then defend their design though a presentation.

Project Description/Objectives

- Engage students in STEM subjects and careers to increase student performance and interest in these areas;
- Provide Iowa educators with a program that provides the opportunity to introduce students to STEM professionals as classroom volunteers for real world exposure to STEM careers;
- Increase students understanding and mastery of standards based concepts and skills including: team work and collaboration, experimentation, organizing/presenting data through tables and presentations as measured on an educator pre- and post-participation survey;
- Improve educator effectiveness through professional development, which will enhance their understanding of the subject matter and delivery of the curriculum, increase their confidence for teaching in general and their comfort with physical science concepts in particular;
- And, deliver a value driven program with proven, effective, and measurable results indicating students' improved performance in STEM subjects.

What does the project provide?

- Applicants receive one day of professional development—PD will take place in each STEM Region at central locations. Applicants will receive PD customized to primary (K-3), elementary (4-6) or middle school levels (6-8).
- AWIM curriculum and classroom materials—Applicants will receive AWIM kit-based learning material (each kit serves 24+/- students). AWIM kits include the full curriculum and materials required for program delivery.
- Reimbursement of $120 per applicant attending training.
- Ongoing implementation support and resources.

What is required by the applicant in order to implement this program?

As a selected Service Provider, SAE International is not only providing curriculum/material kits on a cost basis to educators choosing the AWIM program, but also a number of "in-kind products and services" to support the success of the Scale-Up Program, which included the following:

- Administrative support to applicants (in-kind);
- SAE/Iowa STEM Scale-Up customized website to interface with applicants (in-kind);
- SAE Staff travel funds (in-kind);
- And, an additional 25% in curriculum and classroom materials for applicants that partnered with a "STEM Volunteer" to enrich the AWIM experience for participating educators/students (in-kind).

The following are the only requirements for the applicant:

- Attendance/Participation of implementing educators in Professional Development;
- Timely completion of AWIM experience in the classroom;
- Outcome reporting (as deemed appropriate by Regional STEM Manager);
- Agreement to use/implement material received through Scale-Up award.

Website to View Program and Standards Alignment: http://www.awim.org/pdf/standards_document.pdf
Program Video: http://www.awim.org/videos/video-player-awim.htm

Curriculum for Agricultural Science Education (CASE)

2015-2016 Scale-Up Program

Overview: Curriculum for Agricultural Science Education (CASE) curricular materials provide a high level of STEM educational experiences to students to enhance the rigor and relevance of agriculture, food, and natural resources (AFNR) subject matter.

Grade Levels: 9-12

Program Summary

As populations increase, productive agricultural land area decreases and food quality needs increase. The agriculture industry has to have access to the best problem-solvers and scientists to address those issues.

The purpose of "The CASE for Agricultural Science Education in Iowa" is for the Iowa FFA Foundation, in partnership with ag stakeholder groups, to promote stronger agriscience and STEM educational programming. The audience will include secondary instructors, industry, and support organizations related to agricultural education in Iowa with far-reaching impacts on Iowa's more than 16,000 agriculture education students.

Improving instructional delivery systems, expanding student career opportunities, increasing instructional competencies in STEM and CORE content areas (particularly science), and interaction between academic institutions will enhance career readiness. In 2012, Iowa imported 1906 H-1B visas for STEM careers that were unable to be filled by domestic supply.

The agriculture industry, encompassing multiple STEM careers, will benefit from better-prepared students and employees through the increased rigor and relevance of CASE courses. Iowa's agriculture industry is thriving, but there is one obstacle: the availability of an educated, prepared workforce. To overcome this obstacle, a well-prepared contingency of secondary agriculture educators trained in student-centered, inquiry-based pedagogy, using a nationally developed curriculum is needed.

Project Description/Objectives

- Adoption of "Curriculum for Agriscience Education" (CASE) in secondary agriculture education programs;
- Provide data-collection equipment to provide students with technology skills for careers in agriscience;
- Development of uniform Programs of Study through secondary and post-secondary linkages including concurrent enrollment of college credits, providing a seamless educational experience for students;
- Provide purposeful enhancement of science, mathematics, and English language understanding;
- And, utilize science inquiry for lesson foundation and concepts are taught using activity-, project-, and problem-based instructional strategies.

What does the project provide?

- Professional Development - CASE Curriculum Institute, including:
  - Two-week professional development institute;
  - Curriculum Packet – 172 ready to implement lessons cross walked with national content standards;
  - Access to CASE Communities of Practice network;
  - Continual course updates;
  - Meals and lodging during Case Curriculum Institute (if in Iowa);
- Equipment/Supplies – Provide funds to purchase needed CASE equipment/supplies from secured vendors in the amount allotted by the Scale-Up award.

What is required by the applicant in order to implement this program?

- Sign and return the agreement form on or before the designated deadline;
- Register to attend a Professional Development institute;
- Attend a training webinar on equipment needs;
- Complete equipment orders on or before designated deadline;
- Attend a two-week professional development institute during the summer of 2016;
- And, implement the chosen CASE course beginning with the Fall semester of 2016.

Website to View Program and Standards Alignment: http://www.iowaffafoundation.org/casescale-up.aspx
Program Video: https://www.youtube.com/watch?v=8MK0bPAq3Tw

Defined STEM

2015-2016 Scale-Up Program

Overview: Defined STEM is a web-based content resource that provides educators with real-world based performance and literacy tasks built around a central career theme.

Grade Levels: K-12

Program Summary

Defined STEM is a K-12, subscription-based web service available to all students, educators, and parents throughout Iowa and can be used in multiple learning environments. Defined STEM is designed to support STEM education and follows four core principles: relevance, rigor, application, and understanding.

Defined STEM contains video resources designed to motivate students by contextualizing STEM skills in an array of professional career applications.

Performance tasks are built from the "Understanding By Design" framework and present a real-world problem within the context of a career/industry. Students are instructed to complete 1+ culminating activities based on the task's "Goal".

Defined STEM's literacy tasks are designed for alignment with the Common Core English Language Arts Standards to promote high-quality student assignments that develop reading, writing, and thinking skills in a cross-curricular fashion.

Finally, by aligning all Defined STEM tasks to the state, Common Core, and Next-Gen Science Standards, Defined Learning's project-based learning platform provides an environment for differentiating learning for a wide range of student abilities.

Project Description/Objectives

- Integrate STEM education across all subject areas for all K-12 students;
- Bring career relevance into the classroom through real world videos depicting how various jobs use STEM;
- Infuse project based learning and authentic assessment into the curriculum;
- Solve real world problems with the use of cross curricular learning with a focus on 21st century skills;
- And, infuse real world STEM career based non-fiction reading writing into the curriculum.

What does the project provide?

Defined STEM is a web-based resource that is available to applicants 24 hours a day 7 days a week. Each applicant will also receive the following:

- Customer and technical support between the hours of 9 to 5 Monday through Friday;
- Access to the unfacilitated online professional development course for Defined STEM.
- And, unlimited number of facilitated professional development webinars hosted by Defined STEM staff, covering the following topics:
  - Standards-based instruction;
  - 21st Century teaching and learning;
  - Rigor/relevance framework;
  - Multiple intelligences;
  - Differentiated instruction;
  - Webb's depth of knowledge;
  - New Bloom's Taxonomy;
  - Performance assessment;
  - Understanding by Design;
  - Analytical rubrics;
  - Integration of technology tools;
  - And, Authentic assessment.

What is required by the applicant in order to implement this program?

Defined STEM is a web-based resource that can be accessed from any computer, tablet, or phone that is connected to the Internet. A school or other organization will have to have the ability to access www.definedstem.com by an Internet connected device.

Defined STEM will not reimburse any participant to attend a professional development session. All participants are responsible for their travel-related costs and any other costs associated with attending the professional development session.

Website to View Program and Standards Alignment: http://definedstem.com/standardgrid.cfm (user name is iastem and password iastem)
Program Video: http://definedstem.com/home/learn-more.cfm

Engineering is Elementary (EiE)

2015-2016 Scale-Up Program

Overview: Engineering is Elementary is a research-based, standards-driven, and classroom-tested curriculum that integrates engineering and technology concepts and skills with elementary science topics.

Grade Levels: 1-6

Program Summary

Children are born engineers—they are fascinated with building, with taking things apart, and with how things work. However, K-12 educational settings have traditionally done little to develop children's engineering and technological literacy.

The Engineering is Elementary (EiE) project fosters engineering and technological literacy among elementary-level students. EiE has created a research-based, standards-driven, and classroom-tested curriculum that integrates engineering and technology concepts and skills with elementary science topics. EiE also connects with literacy and social studies.

Grant Wood Area Education Agency will partner with the Museum of Science, Boston in providing professional development. To date, EiE has reached over 2.7 million students and 32,000 educators and is presently used in all fifty states. EiE units are designed to engage students in the engineering design process and include:

- Storybooks—Features child characters from a variety of cultures and backgrounds, who introduce students to an engineering problem and challenge them to solve a problem similar to that faced by the main character;
- Lesson plans for educators—EiE educators guides include vocabulary, learning objectives, tie-in science content, detailed materials and preparation sections, and step-by-step instructions on how to facilitate each EiE activity;
- And, materials set appropriate materials to support the embedded investigations.

Project Description/Objectives

- Goal 1. Reach students who are underserved or underrepresented in STEM fields.
- Goal 2. Increase students' technological literacy.
- Goal 3. Increase elementary educators' ability to teach engineering and technology.
- Goal 4. Increase the number of schools or other organizations in Iowa that include engineering at the elementary level.

What does the project provide?

Engineering is a new discipline for elementary-level educators. To learn more about engineering and technology content and pedagogy, the EiE project offers professional development workshops.

- Professional Development:
  - New EiE Scale-Up award applicants will attend a full day of professional development;
  - And, returning EiE Scale-Up award applicants will attend a half-day webinar.
- Stipends, substitute pay reimbursement, and travel to attend professional development will be provided.
- Awarded applicants will receive funds for at least one EiE curriculum and materials set.

What is required by the applicant in order to implement this program?

- Attend a half-day or full-day professional development session;
- Use the EiE unit(s) in conjunction with (or soon after) a corresponding science unit is completed;
- And, teach the entire EiE unit, which takes 6-8 hours of instructional time to complete.

Website to View Program and Standards Alignment: http://www.eie.org/sites/default/files/eielinked_ia_final_0.pdf AND www.eie.org/sites/default/files/eie_mapped_to_ngss.pdf

Program Video: http://vimeo.com/31808766

FIRST Tech Challenge (FTC)

2015-2016 Scale-Up Program

Overview: FIRST Tech Challenge (FTC) is a community-focused robotics program that teaches students the value of hard work, innovation, and creativity while going beyond the robotics competition by teaching teenagers the importance of working together, sharing ideas, and treating each other with respect and dignity.

Grade Levels: 7-12

Program Summary

FIRST Tech Challenge (FTC) is a mid-level robotics program designed to inspire and increase the interest of young people (ages 12-18) into STEM fields. FTC offers students the opportunity to: design, build and program robots, build experience and confidence with complex STEM-based concepts, document the engineering design process, develop problem-solving and team-building skills, enhance their public speaking skills, and compete and cooperate in alliances during tournaments. Additionally, FTC enables students, including those traditionally underrepresented in the STEM fields, to solve real-world challenges and offers a life-changing experience to help students realize a STEM career is feasible. Since 2008, The University of Iowa College of Engineering has served as the Affiliate Partner for the FTC program in Iowa. The FTC program in Iowa has receives continual support from Rockwell Collins and John Deere.

Project Description/Objectives

- Increase the number of students who are engaged in a hands-on, team-based, STEM programming. FTC students have the opportunity to engage with STEM concepts, including: programming, physics, trigonometry, programming algorithms, calculus, etc. FTC is more than the robot—students also apply critical life skills: professionalism, effective communication, teamwork, etc.
- Increase the number of formal (schools) and informal groups (extension clubs, non-profit organizations, Boys/Girls Clubs etc.) who offer FTC to the students of their community.
- Increase the number of community partners involved with FTC. This includes the encouragement of local businesses to have employees serve as team mentors or as volunteers at local and regional events. Community partnerships increase team sustainability and allow businesses to give back to local labor force.
- Empower FTC teams to host local events. Regardless of where a team is located, by providing sufficient equipment and training, team will be able to host local competition events for teams in their area.
- Educate the FTC coaches and mentors through different Professional Development opportunities. Through education, coaches and mentors have a higher likelihood of program sustainability for several years.

What does the project provide?

FTC is for student teams of up to 15 students. The actual size of the team depends on the preferences of the coach. Through support from Rockwell Collins, new FTC teams will receive the FTC kit-of-parts and the licenses to the software platforms. The FTC kit-of parts is reusable for several seasons. Through the Scale-Up program, teams will receive equipment beyond the robot kit-of-parts. This equipment includes a laptop, reusable field equipment, consumable field equipment, extra robot parts, and required electrical components for hosting an event.

Two levels of professional development will be offered to FTC coaches, in which one PD is required for all coaches to attend. The FTC coaches and mentors will have access to periodic emails from the FTC-Iowa program and regular emails from the FIRST program. FTC students, mentors, and coaches will also have access to resources provided by FIRST, including a 24/7 competition and rule forum in which they can post questions and receive answers from the game designers. They will also have access to the local FTC website and the national FIRST website. Students who participate in FTC also qualify for college scholarships. These scholarship awards range from $500 to full, four-year tuition.

What is required by the applicant in order to implement this program?

- A majority of the items will be **COST REIMBURSEABLE** to the applicant. There will be a list of vendors and items that will need to be purchased, and the applicant will need to submit receipts for reimbursement. **Reimbursement will take place in March or April.**
- **New FTC teams** will receive the following items directly: a laptop, a router, buttons, a binder with guides, a non-consumable field perimeter, consumable field elements, and a set of non-consumable tiles. New applicants will have approximately $2,400 they will need to spend on pre-approved items and seek reimbursement. Receipts and other documentation will be required.
- **Returning FTC teams** will receive the following items directly: a binder with guides and a set of consumable field elements. They will have approximately $530 to use for robot materials and other equipment from a pre-approved list of items. Receipts and other documentation will be required.
- No other materials—or bins—will be distributed during the PDs.

The Timeline for the applicant in order to implement this program:

- **August 2015**: Service provider will coordinate the logistics and finalize agreements with applicants.
- **September 2015:** A representative coach/mentor from each team must attend the Professional Development for either rookie teams (new to FTC) or returning teams (participated in the past.) Only two PDs will be hosted in Iowa.
- **September—October 2015:** The FTC Game is revealed and the build season begins. Teams establish regular meeting time.
- **November—December 2015**: Local tournament "meets" take place in each region. Teams compete in at least 3 meets.
- **January—March 2016**: Regional and statewide tournaments occur.
- **March/April 2016**: Applicant assessment and reimbursement.

Website to View Program and Standards Alignment: https://www.engineering.uiowa.edu/ess/ftc-standards-alignment
Program Video: http://youtu.be/XULHBkAJUXs

HyperStream and VREP

2015-2016 Scale-Up Program

Overview: HyperStream (created by the Technology Association of Iowa) and VREP foster real-world learning for 5th-12th graders through hands-on technology projects, competitions, showcases and engaging presentations through after-school clubs or integrated into curriculum.

Grade Levels: 5-12

Program Summary

Since 2008, the program brings technology education to Iowa students by providing a comprehensive STEM educational experience. Combined, the program is in nearly 200 Iowa schools and other organizations. You can choose to work with HyperStream only, VREP only, or both programs.

- **HyperStream:** Students may create their own technology projects that solve real-world issues for their school or community, as well as participate in several project tracks, leading to spring competitions in robotics, game design/programming, cyber defense, multimedia, and app development. Students have the opportunity to be mentored by technology professionals from their local communities or virtually.
- **VREP:** Students have the opportunity to work with virtual reality, leading to a Spring Showcase while advised by their educators.

Project Description/Objectives

- To raise awareness for technology careers across all industries and STEM careers in general;
- To provide students with the tools and resources to create technologies solving real-world challenges;
- To provide a program that aligns with 21st century skills, including problem-solving, innovation, teamwork, collaboration, initiative, leadership, adaptability, and effective communications;
- And, to see an increase in students going into post-secondary programs of technology, computer science, computer engineering, and engineering, whether at the community college or college level.

What does the project provide?

*****Please note where differences may apply depending on the program option of HyperStream or VREP.**

- ***Project learning modules, curriculum, and kits for HyperStream tracks (app development, game design/programming, robotics, multimedia, cyber defense) **OR** program criteria and resource materials for VREP schools (virtual reality);
- Program and curriculum training for educators, including an educator stipend for time and travel ($170);
- ***Project mentoring/coaching by technology mentors for HyperStream Clubs. Note that VREP is designed for the students to be self-directed in these projects as advised by their educator;
- Field trip opportunities and potential internships and scholarships for students;
- Travel stipend ($250 per club) to attend HyperStream competition, VREP Showcase, or tech-related events;
- ***HyperStream competition in Ames in late April for students in grades 9-12 or spring virtual competition for students in grades 5-8. VREP Showcase is in April for students in grades 5-12;
- Virtual MentorPlace serves as a portal with archived presentations on specialized tech skills, technology by industry, and emerging technologies;
- ***And, marketing materials for applicants, including t-shirts, magnets, posters, and brochures to promote the program to students and parents.

What is required by the applicant in order to implement this program?

***** Please note where differences may apply depending on the program option of HyperStream or VREP.**

- ***HyperStream is offered free applicants. For VREP, applicants must provide and purchase their own special virtual reality equipment, **which costs approximately $4,500.**
- Applicants must provide an environment with access to computers for project implementation, as well as utilize the software provided.
- Minimum of one educator to serve as a liaison and Educator champion that will provide timely communications with program staff relative to plans, registrations, surveys, etc.
- Applicants are responsible for recruiting students into the program and attending mandatory educator training.
- ***Educator champion is responsible for attending HyperStream Club meetings/classes to facilitate student rapport and communications. For VREP, students are monitored by an educator champion on their independent projects.
- Educator champion(s) coordinate students' attendance in the program and management of communications.
- Educator champion(s) ensure mandatory completion by students of surveys provided by program staff and the STEM Council. Applicants will also be required to complete a program survey.
- Educator champion(s)/chaperones attend student competitions/showcases and coordinate travel plans and expenses beyond $250 travel stipend provided.
- *** HyperStream applicants must register high school-level students for the two-day competition in late April in Ames; and middle school-level students for virtual competition. VREP applicnats must participate in regional and state showcases.
- ***For HyperStream, applicants will be responsible to work in partnership with the HyperStream staff in seeking and/or solidifying technology mentors from their local community.
- ***Program runs from September to May. HyperStream meetings are held at least twice a month or weekly. VREP students work independently.

Website: www.hyperstream.org **AND** www.vrep.org
Program Video: HyperStream: http://tinyurl.com/ltqqfgy **AND** VREP: http://tinyurl.com/kgy7y6p

KidWind: Wind Power and Renewable Energy

2015-2016 Scale-Up Program

Overview: KidWind's program of training, materials, and student events empowers educators and students to dig deep into renewable energy STEM concepts.

Grade Levels: 2-12

Program Summary

KidWind proposes a program to bring effective renewable energy STEM training to educators through its REcharge Labs and provide students with hands-on applications of their knowledge with the KidWind Renewable Energy Festival and the Online Renewable Energy Challenge. Learn more here http://kidwind.org/workshops/iowa-stem/2014/.

- **Training—**REcharge Labs will cover the integration of wind and solar topics into grades 2-12 and the use of all kits and materials. While all the training is introductory, educators will be separated into two levels: Elementary School and Middle/High School.
- **Materials—**Once educators have attended the training, they will be able to select the materials that work best for their situation. These materials include wind and solar kits and data collection and support materials and tools to do the activities. These kits can be from KidWind, Recharge, and Vernier.
- **Festivals and Online Challenges—**Educators will be asked to demonstrate the use of their materials by participating in an Online Challenge or Renewable Energy Festival in their region. These events allow students to share their projects in supportive and engaging environment.

Project Description/Objectives

- Improve educators' understanding of renewable energy STEM concepts and introduce them to a suite of standards-based activities and lessons;
- Generate student excitement and interest in STEM fields—especially amongst historically underrepresented populations—through collaborative, creative, hands-on renewable energy design competitions;
- Introduce students to relevant, real-world applications of STEM processes behind renewable energy issues;
- And, encourage students to build connections between STEM concepts and social, economic, environmental, and cultural issues as they relate to renewable energy.

What does the project provide?

- A full-day of professional development training will be offered during the summer of 2015. Applicants must attend training to receive materials stipends. **Training in Iowa will occur the first two weeks of August. Dates will be finalized by March 1, 2015**. Educators need only to attend one day of training.
- After the training, educators will be able to select materials they wish to use in their classrooms. Elementary-level educators receive a budget of $600. Middle and high school- level educators will receive a budget of $1600.
- These materials will be used with students to participate in an event or online KidWind Energy Festival.
- Educators who have attended a REcharge Lab will have access to curriculum, online video, PowerPoints, and other educational support resources through a web portal.
- Educators and students will have access to the KidWind Renewable Energy Online Challenge competition website for teams to document and upload their submissions.
- Office hours are Monday through Friday, 9 a.m. to 5 p.m. by phone with after hours web support.

What is required by the applicant in order to implement this program?

- **August** – Attend a one-day REcharge Lab Training in your region. Before attending this training, applicants must submit their signed and submitted an agreement.
- **August –** Select kits to use and implement. The deadline to return order forms for materials is August 31, 2015.
- **September** – Materials are delivered and support is provided by KidWind as needed.
- **October to February –** Implementation of activities.
- **February to May** – Participate in the Online Renewable Energy Challenge or KidWind Renewable Energy Festival held in your region.

Website to View Program and Standards Alignment: http://learn.kidwind.org/workshops_events/iowa/stem-scale-up
Program Video: **http://vimeo.com/116185065**

National STEM League: TEN80

2015-2016 Scale-Up Program

Overview: TEN80: Student Racing Challenge, one of five National STEM League (NSL) Challenges, offers an entry point into STEM for everyone with a broad range of team roles, projects, and challenges that keep students involved for years and the comprehensive curriculum that prepares them for success in college and STEM careers.

Grade Levels: 6-12

Program Summary (Download the "Wall Post Overview" at this link.)

The National STEM League (NSL) is a practice league for future professionals and a product of over a decade of research-based, classroom-tested development that has yielded an exciting approach to project-based learning that doesn't forget the learning or the usual limitations of science, math and CTE classrooms.

TEN80: Student Racing Challenge is a model that has proven to build a strong foundation for building community support and for future growth into all the opportunities open to partners with TEN80 Education in the NSL. The "Racing Challenge" supports 21st century skills and the Iowa Core Standards as participants collaborate, create and if they choose to, compete in ways that mirror professionals in business, project management, marketing, graphic and web design, race engineering, small scale manufacturing (3D design and 3D printing, mechatronics) and innovations in driverless cars (open source software and hardware) and sustainable energies.

Students "own" a motorsports team. Their racecar is one-tenth scale, electric, and radio-controlled. The technology arrives ready-to-run, so the first weeks of engagement are spent learning how systems operate and how to organize data rather than following "build" instructions. Once students master the fundamentals of problem solving, data and mechanical systems, they specialize into areas of personal interest.

This curriculum can be implemented as a stand-alone STEM course (one semester or year round), out-of-school club, summer camp, or integrated into core math and science classes. Download a list of Suggested Implementation Schedules and Guides.

Competition is optional but suggested. There are two ways to compete: (1) web-based points race and (2) the 2016 Iowa Open Invitational. Leaders in both earn invitations to the National STEM League Finals in May 2016. Teams compete in head-to-head races and time trials, Data-Driven Design projects that may include renewable energies or driverless programming, enterprise categories and community leadership presentations in which they do well by doing good.

Project Description/Objectives

- Increase the number of students actively and sustainably engaged in STEM and the process of innovation;
- Increase the number of educators who understand STEM as an opportunity to engage all students in team-oriented, project based learning and that know how to achieve desired learning outcomes as stated in the Iowa Core through STEM education;
- To ensure sustainability, train local partners to run invitationals and STEM Expos (school assemblies to engage all students in STEM);
- And, increase mentorship of educators and students through Ten80's coalition of national and local partners.

What does the project provide?

- A Program manager will oversee IOWA implementation and meet with state-level organizers in each year of implementation.
- TEN80 trainers will provide ongoing web-based professional development and 24/7 access to forums, recorded sessions and resources.
- Two years of registration into the National STEM League competition per site will provide coaches and students with access to the web-based points race and feedback from remote mentors that review and comment on student submissions.
- A donated Innovation Station that includes three 3D printers and license to TEN80's Innovation Space online course will offer one centrally-located host the opportunity to offer training to educators, students, and potentially generate revenue from the course.
- Per school, a donated Robo RaCeCar kit, so that one team of students at each site can specialize into open source coding and hardware.
- SolidWorks 3D CAD program is sponsored for all students participating in the NSL (student license, not networkable).
- With a minimum number of implementing sites, TEN80 will send a team to run regional invitationals and the Iowa State Finals.
- TEN80 will train local partners to organize invitationals and school-based STEM Expos.

What is required by the applicant in order to implement this program?

- **AUG:** Educators attend any of the **two-day trainings** scheduled in the first two weeks of August (two days between 8/3 – 8/14).
- **FALL through EARLY WINTER:** Implement the curriculum as a one-semester, year-round course or out-of-school club.
- **MARCH/APRIL:** Release and support travel for students and educators to attend an **Iowa State Open Invitational**.
- **MAY:** If funding secured, support travel for students and educators to attend the **National STEM League Finals** (location TBD, May)

Website to View Program and Standards Alignment: www.Nationalstemleague.com/Racing-Standards-and-Schedules

Student Produced Video: http://www.nationalstemleague.com/video-students-student-racing-challenge

Pint Size Science: 1

2015-2016 Scale-Up Program

Overview: The Science Center of Iowa's Pint Size Science program provides a platform for young children ages 3 to 5 to explore science in a highly-engaging, interactive, and safe manner.

Grade Levels: Pre-K and Kindergarten (Ages 3-5)

Program Summary

JD Chesloff, chairman of the Massachusetts Board of Early Education and Care notes, "The link between early childhood and STEM is indisputable. Early exposure to STEM—whether it be in school, at a museum, a library, or just engaging in the natural trial and error of play—supports children's overall academic growth, develops early critical thinking and reasoning skills, and enhances later interest in STEM study and careers."

Pint Size Science introduces children to STEM topics through discovery learning. Using a hands-on approach that engages and inspires young minds to explore scientific phenomena, the program works to not only build science understanding but also respond to the ever-changing interests and abilities of children.

Pint Size Science introduces STEM topics by using concepts that emphasize the identification and basic understanding of earth, life, physical, and space sciences. The topics are introduced in these four curriculum modules:

- "Science Sprouts" serves as an introduction to the field of science;
- "Gizmos & Gadgets" helps children investigate how applying technology makes work and play easier for us;
- "Mini Meteorologists" focuses on the weather happening around us;
- And, "Insect Investigators" develops skills in sorting and classifying as children observe and compare features of insects.

Additionally, each Pint Size Science session includes a literacy component, where every class reads a book that pulls together the most important ideas of the STEM topic being discussed. Fundamental mathematical skills are also reinforced through activities, including counting, numbering, and recognizing geometrical shapes.

The professional development component of Pint Size Science shows educators how to use their knowledge of the children's backgrounds and interests to help them develop inquiry skills for exploring basic phenomena and materials of the world. The program helps educators prepare a learning environment that creates experiences where children engage in explorations and investigations.

Project Description/Objectives

- Ignite student interest in STEM by helping them discover science in the world around them through interactive, hands-on activities;
- Expand the toolkit of instructional methods available to Early Childhood educators across the state;
- And, provide for "out-of-the-box" implementation by supplying educators with a complete set of curricula, activities, and program supplies.

What does the project provide?

- A kit for all four curriculum modules including lesson plans with opportunities for adaptations to the needs of local audiences;
- All necessary supplies and materials to conduct each program module;
- And, professional development training on inquiry and project-based learning.

What is required by the applicant in order to implement this program?

Applicant must participate in a day of professional development and a walkthrough of each classroom curriculum module.

Website to View Program and Standards Alignment: http://www.sciowa.org/learn/pint-size-science/
Program Video: http://bit.ly/pintsizevideo

Pint Size Science: 2

2015-2016 Scale-Up Program

Overview: The Science Center of Iowa's Pint Size Science program provides a platform for young children ages 3 to 5 to explore science in a highly-engaging, interactive, and safe manner.

Grade Levels: Pre-K and Kindergarten (Ages 3-5)

Program Summary

JD Chesloff, chairman of the Massachusetts Board of Early Education and Care notes, "The link between early childhood and STEM is indisputable. Early exposure to STEM—whether it be in school, at a museum, a library, or just engaging in the natural trial and error of play—supports children's overall academic growth, develops early critical thinking and reasoning skills, and enhances later interest in STEM study and careers."

Pint Size Science: 2 expands upon the first year of themes as it introduces children to additional STEM topics through discovery learning. Using a hands-on approach that engages and inspires young minds to explore scientific phenomena, the program works to not only build science understanding but also respond to the ever-changing interests and abilities of children. Pint Size Science: 2 provides essential tools and materials to extend learning resources and promote intellectual growth.

Pint Size Science: 2 introduces new STEM topics by using concepts that emphasize the identification and basic understanding of animal classification as well as robotics and coding. The topics introduced in these two curriculum modules:

- "Classifying Creatures" teaches students to group and classify animals based on their similarities and differences;
- And, "Bits and Bots" uses robots provide students a chance to learn beginning programming and coding.

Additionally, each Pint Size Science: 2 kit includes a literacy component that pulls together the most important ideas of the STEM topic being discussed. The literacy selections provide an opportunity to develop vocabulary and language; practice skills of comprehension and give children experience with different types of books and text. Fundamental components of mathematics are reinforced through activities; including numbers and operations, measurement, special sense, patterns and data-analysis.

The professional development component of Pint Size Science: 2 shows educators how to use their knowledge of children's backgrounds and interests to help develop inquiry skills for exploring basic phenomena and materials of the world. The program helps educators prepare a learning environment that creates experiences where children engage, explore and investigate the world around them.

Project Description/Objectives

- Ignite student interest in STEM by helping them discover science in the world around them through interactive, hands-on activities;
- Expand the toolkit of instructional methods available to Early Childhood educators across the state;
- Provide for "out-of-the-box" implementation by supplying applicants with a complete set of curricula, activities, and program supplies;
- And, build a system of support for Iowa educators as they integrate STEM for Iowa's young children.

What does the project provide?

- A kit for both curriculum modules, including lesson plans with opportunities for adaptations to the needs of local audiences;
- All necessary supplies and materials to conduct each program module;
- And, professional development training to create deeper connections and instructional techniques to implement a STEM rich environment with a focus on inquiry, project-based learning, questioning, and evaluation of student learning.

What is required by applicant in order to implement this program?

Applicants must participate in a day of professional development and a walkthrough of each classroom curriculum module.

Website to View Program and Standards Alignment: http://www.sciowa.org/learn/pint-size-science/
Program Video: http://bit.ly/pintsizevideo

PLTW Computer Science and Software Engineering

2015-2016 Scale-Up Program

Overview: Funding will assist Iowa educators in implementing PLTW's Computer Science and Software Engineering (CSE) course with the flexibility to fit the course within either a school's existing PLTW Engineering program (PLTW Engineering: CSE Scale-Up) or as a start to the PLTW Computer Science program (PLTW Computer Science: CSE Scale-Up). If interested in PLTW Engineering: CSE – tuition will be provided for CSE Core Training. If interested in PLTW Computer Science: CSE – tuition for CSE Core Training AND the annual PLTW Computer Science Participation Fee for 2015-16.

Grade Levels: 9-12

Program Summary

Project Lead The Way (PLTW) is a nonprofit organization and the nation's leading provider of K-12 science, technology, engineering, and math (STEM) curricular programs—including PLTW Launch* (K-5), PLTW Gateway* (6-8), and three high school programs: PLTW Engineering*, PLTW Computer Science* and PLTW Biomedical Science. PLTW's world-class, activity-, project-, and problem-based curriculum and high-quality teacher professional development model, combined with an engaged network of educators and corporate partners, help students develop the skills needed to succeed in our global economy. PLTW's rigorous and relevant curriculum is collaboratively developed and consistently reviewed and improved by PLTW staff, teachers, university educators, industry experts, and school administrators. It leverages an innovative, project-based approach, fostering collaboration and building critical thinking skills.
**Part of 2015-16 Iowa Governor's STEM Scale-Up selected programs*

What does the project provide?

Funding will assist Iowa high schools in implementing Project Lead The Way's Computer Science and Software Engineering (CSE) course, which has the flexibility to fit within either the PLTW Engineering or the PLTW Computer Science program. As such, PLTW will offer two Scale-Up funding options for implementing the CSE course:

1. PLTW Engineering: CSE — As a specialization course in the PLTW Engineering program, educators will be provided tuition for the Computer Science and Software Engineering (CSE) Core Training.
2. PLTW Computer Science: CSE — As part of the PLTW Computer Science program, educators will be provided tuition for Computer Science and Software Engineering (CSE) Core Training **AND** the PLTW Computer Science Participation Fee for the 2015-2016 academic year. Thereafter, the $2000 annual program fee will be the responsibility of the site.

➢ Computer Science and Software Engineering (CSE) Core Training will be for one educator held at:

- Iowa State University College of Engineering, Ames, IA: Monday, July 6th —Friday, July 17th
- The University of Iowa College of Engineering, Iowa City, IA: Monday, July 20th —Friday, July 31st

What is required by the applicant in order to implement this program?

- Sites need to review the Iowa Governor's STEM Advisory Council's 2015-16 Scale-Up Programs info and pertinent PLTW information: PLTW Engineering or PLTW Computer Science Program Requirements, the sample PLTW Agreement, the PLTW Partnership Team Guidebook and the PLTW Guide to Successful Implementation PDF.
- Sites will then need to apply for the Iowa Governor's STEM Scale-Up and register the program with Project Lead The Way. Registration does not commit the site to PLTW implementation; however, it does provide valuable information about a site's program and Scale-Up award interest to Project Lead The Way and the Iowa Gov.'s STEM Adv. Council.
- Review the PLTW Register Now webpage. Choosing either 1) My school or organization already has one or more PLTW programs OR 2) This is my school or organization's first PLTW program and follow the instructions listed.
- Register the school district and/or the participating schools. Select a District Administrator (DA) and School Administrator (SA) (for each school) to serve as the main points of contact with PLTW and be responsible for providing and maintaining accurate data and information. Upon registration, the DA will receive an email with a link to the PLTW Agreement.
- Review site's PLTW agreement with authorities such as the school board, superintendent, and legal department to ensure all parties are aware of district and school responsibilities. After obtaining the authorized signatures, email agreement to PLTW School Support Team.
- Execute LEA Agreement with PLTW as a part of the Scale-Up before attending Core Training and before purchasing materials.
- Select a teacher to attend PLTW CSE Core Training. Teachers should be excited to teach a project-based curriculum and meet the requirements of the PLTW agreement. After the signed agreement has been received and processed, the DA and/or SA should contact the PLTW School Support Team (877-335-7589) to add and/or update district/school contacts, including teachers.
- Register teachers for CSE Teacher Training (2-week training). Teachers must successfully complete and pass all required online PLTW CSE Readiness Training modules prior to attending and passing Core Training. Award covers tuition for one teacher, which includes parking and lunch meals; however, this does not include other costs associated with Core Training, such as lodging, teacher stipend, additional meals, etc. Training sites will provide training lodging/meals packages for participants.
- Review the PLTW Order Instructions, the PLTW CSE Pricing in Computer Science Inventory Workbook and PLTW Computer Specifications to order the necessary equipment and supplies for the course. Start the ordering process early to ensure the lab is fully equipped before the new school year.

Website to View Program and Standards Alignment: http://alignment.pltw.org/site/index
PLTW Video: https://www.youtube.com/watch?v=jXGjNRceHa0&list=PLcCTPHuIP75L4OB5bdEiFmryWewqxbXRT&index=9

PLTW Engineering: Principles of Engineering (POE)

2015-2016 Scale-Up Program

Overview: Funding will assist educators in implementing and expanding Project Lead The Way's Engineering program by providing tuition for Principles Of Engineering (POE) Core Training for one educator and six VEX PLTW Engineering Robotics Kits.

Grade Levels: 9-12

Program Summary

Project Lead The Way (PLTW) is a nonprofit organization and the nation's leading provider of K-12 science, technology, engineering, and math (STEM) curricular programs—including PLTW Launch* (K-5), PLTW Gateway* (6-8), and three high school programs: PLTW Engineering*, PLTW Computer Science* and PLTW Biomedical Science. PLTW's world-class, activity-, project-, and problem-based curriculum and high-quality teacher professional development model, combined with an engaged network of educators and corporate partners, help students develop the skills needed to succeed in our global economy. PLTW's rigorous and relevant curriculum is collaboratively developed and consistently reviewed and improved by PLTW staff, teachers, university educators, industry experts, and school administrators. It leverages an innovative, project-based approach, fostering collaboration and building critical thinking skills.

**Part of 2015-16 Iowa Governor's STEM Scale-Up selected programs*

What does the project provide?

Funding will assist Iowa high schools in implementing the PLTW Gateway program by providing…

1. This project will provide selected LEA sites with teacher training for PLTW Engineering: Principles of Engineering (POE). One educator is required to attend the 2-week Core Training this summer at The University of Iowa College of Engineering, Iowa City, IA (exact training dates to be released in March).
2. Six VEX Robotics Kits that will ship to selected schools, once the teacher(s) have completed Core Training. These kits, representing more than two-thirds of one-time equipment costs, will allow schools to adequately outfit one lab with the robotics equipment needed for up to 24 students (one kit for every four students) per class.

What is required by the applicant in order to implement this program?

- Sites need to review the Iowa Governor's STEM Advisory Council's 2015-16 Scale-Up Programs info and pertinent PLTW information: PLTW Engineering Program Requirements, the sample PLTW Agreement, the PLTW Partnership Team Guidebook and the PLTW Guide to Successful Implementation PDF.
- Sites will then need to apply for the Iowa Governor's STEM Scale-Up and register the program with Project Lead The Way. Registration does not commit the site to PLTW implementation; however, it does provide valuable information about a site's program and Scale-Up award interest to Project Lead The Way and the Iowa Gov.'s STEM Adv. Council.
- Review the PLTW Register Now webpage. Choosing either 1) My school or organization already has one or more PLTW programs OR 2) This is my school or organization's first PLTW program and follow the instructions listed.
- Register the school district and/or the participating schools. Select a District Administrator (DA) and School Administrator (SA) (for each school) to serve as the main points of contact with PLTW and be responsible for providing and maintaining accurate data and information. Upon registration, the DA will receive an email with a link to the PLTW Agreement.
- Review site's PLTW agreement with authorities such as the school board, superintendent, and legal department to ensure all parties are aware of district and school responsibilities. After obtaining the authorized signatures, email agreement to PLTW School Support Team.
- Execute LEA Agreement with PLTW as a part of the Scale-Up before attending Core Training and before purchasing materials.
- Select a teacher to attend PLTW Engineering: POE Core Training. Teachers should be excited to teach a project-based curriculum and meet the requirements of the PLTW agreement. After the signed agreement has been received and processed, the DA and/or SA should contact the PLTW School Support Team (877-335-7589) to add and/or update district/school contacts, including teachers.
- Register teachers for POE Teacher Training (2-week training). Teachers must successfully complete and pass all required online PLTW CSE Readiness Training modules prior to attending and passing Core Training. Award covers tuition for one teacher, which includes parking and lunch meals; however, this does not include other costs associated with Core Training, such as lodging, teacher stipend, additional meals, etc. Training sites will provide training lodging/meals packages for participants.
- Review the PLTW Order Instructions, the PLTW Engineering: POE Pricing in Engineering Inventory Workbook and PLTW Computer Specifications to order the necessary equipment and supplies for the course. Start the ordering process early to ensure the lab is fully equipped before the new school year.

Website to View Program and Standards Alignment: http://alignment.pltw.org/site/index
Program Video: https://www.youtube.com/watch?v=yyDn9dXJ3MI&list=PLcCTPHuIP75L4OB5bdEiFmryWewqxbXRT&index=8

Project Lead The Way Gateway: DM/AR

2015-2016 Scale-Up Program

Overview: Funding will assist Iowa educators in implementing the PLTW Gateway program by providing Core Training tuition for one or two educators to attend teacher summer Core Training for the two foundational units: Design and Modeling (DM) (1-week Core Training) and Automation and Robotics (AR) (1-week Core Training) and five VEX PLTW Automation and Robotics Kits.
Grade Levels: 6-8

Program Summary

Project Lead The Way (PLTW) is a nonprofit organization and the nation's leading provider of K-12 science, technology, engineering, and math (STEM) curricular programs—including PLTW Launch* (K-5), PLTW Gateway* (6-8), and three high school programs: PLTW Engineering*, PLTW Computer Science* and PLTW Biomedical Science. PLTW's world-class, activity-, project-, and problem-based curriculum and high-quality teacher professional development model, combined with an engaged network of educators and corporate partners, help students develop the skills needed to succeed in our global economy. PLTW's rigorous and relevant curriculum is collaboratively developed and consistently reviewed and improved by PLTW staff, teachers, university educators, industry experts, and school administrators. It leverages an innovative, project-based approach, fostering collaboration and building critical thinking skills.
**Part of 2015-16 Iowa Governor's STEM Scale-Up selected programs*

What does the project provide?

Funding will assist Iowa high schools in implementing the PLTW Gateway program by providing…

1. Educator training (one educator per session) for the two foundation units of PLTW Gateway: Design and Modeling (DM) and Automation and Robotics (AR). Applicants may send one educator to both Core Training sessions (DM and AR); or two educators, one to DM Core Training, and another to AR Core Training. Trainings will be held this July at Iowa State University College of Engineering, Ames, IA (exact training dates to be released in March).
2. Five VEX PLTW Gateway Robotics Kits for the AR unit that will ship to selected schools, once the teacher(s) have completed Core Training. These kits, representing more than two-thirds of one-time equipment costs, will allow schools to adequately outfit one lab with the robotics equipment needed for up to 25 students (one kit for every five students) per class period.

What is required by the applicant in order to implement this program?

- Sites need to review the Iowa Governor's STEM Advisory Council's 2015-16 Scale-Up Programs info and pertinent PLTW information: PLTW Gateway Program Requirements, the sample PLTW Agreement, the PLTW Partnership Team Guidebook and the PLTW Guide to Successful Implementation PDF.
- Sites will then need to apply for the Iowa Governor's STEM Scale-Up and register the program with Project Lead The Way. Registration does not commit the site to PLTW implementation; however, it does provide valuable information about a site's program and Scale-Up award interest to Project Lead The Way and the Iowa Gov.'s STEM Adv. Council.
- Review the PLTW Register Now webpage. Choosing either 1) My school or organization already has one or more PLTW programs OR 2) This is my school or organization's first PLTW program and follow the instructions listed.
- Register the school district and/or the participating schools. Select a District Administrator (DA) and School Administrator (SA) (for each school) to serve as the main points of contact with PLTW and be responsible for providing and maintaining accurate data and information. Upon registration, the DA will receive an email with a link to the PLTW Agreement.
- Review site's PLTW agreement with authorities such as the school board, superintendent, and legal department to ensure all parties are aware of district and school responsibilities. After obtaining the authorized signatures, email agreement to PLTW School Support Team.
- Execute LEA Agreement with PLTW as a part of the Scale-Up before attending Core Training and before purchasing materials.
- Select a teacher(s) to attend PLTW Gateway: DM/AR Core Trainings. Teachers should be excited to teach a project-based curriculum and meet the requirements of the PLTW agreement. After the signed agreement has been received and processed, the DA and/or SA should contact the PLTW School Support Team (877-335-7589) to add and/or update district/school contacts, including teachers.
- Register teacher(s) for the PLTW Gateway: DM/AR Teacher Trainings (each unit 1-week). Teachers must successfully complete and pass all required online PLTW Readiness Training modules prior to completing Core Training. Award covers teacher tuition, which includes parking and lunch meals; however, this does not include other costs associated with Core Training, such as lodging, teacher stipend, additional meals, etc. Training sites will provide training lodging/meals packages for participants.
- Review the PLTW Order Instructions, the PLTW Gateway pricing in the Gateway Inventory Workbook and PLTW Computer Specifications to order the necessary equipment and supplies for the course.

Website to View Program and Standards Alignment: http://alignment.pltw.org/site/index
Program Video: https://www.youtube.com/watch?v=qQq6Fu8VK3A&list=PLcCTPHuIP75L4OB5bdEiFmryWewqxbXRT&index=3

Project Lead The Way (PLTW) Launch

2015-2016 Scale-Up Program

Overview: Funding will assist Iowa educators in implementing a new Project Lead The Way (PLTW) Launch program by providing tuition for two required Lead Teachers per site to attend a 3-day PLTW Launch Lead Teacher Summer Core Training at Iowa State University College of Engineering or The University of Iowa College of Engineering, the first year's PLTW Launch Participation Fee for 2015-16, and a $2,000 PLTW Launch materials allowance.

Grade Levels: K-5

Program Summary

Project Lead The Way (PLTW) is a nonprofit organization and the nation's leading provider of K-12 science, technology, engineering, and math (STEM) curricular programs—including PLTW Launch* (K-5), PLTW Gateway* (6-8), and three high school programs: PLTW Engineering*, PLTW Computer Science* and PLTW Biomedical Science. PLTW's world-class, activity-, project-, and problem-based curriculum and high-quality teacher professional development model, combined with an engaged network of educators and corporate partners, help students develop the skills needed to succeed in our global economy. PLTW's rigorous and relevant curriculum is collaboratively developed and consistently reviewed and improved by PLTW staff, teachers, university educators, industry experts, and school administrators. It leverages an innovative, project-based approach, fostering collaboration and building critical thinking skills.
**Part of 2015-16 Iowa Governor's STEM Scale-Up selected programs*

What does the project provide?

1) PLTW Launch Lead Teacher Training and PLTW Launch Classroom Teacher Training includes…
   a) **Teacher training tuition** for the required two Lead Teachers per site to attend a 3-day PLTW Launch Lead Teacher Core Training ($650 x 2 = $1300) at either Iowa State University College of Engineering in Ames, Iowa or at The University of Iowa College of Engineering in Iowa City, Iowa.
      i) PLTW Launch Lead Teacher Core Training begins at 8 a.m. on Day 1 and ends at 5 p.m. on Day 3 for both training locations:
         - **Iowa State University College of Engineering, Ames, Iowa**
            - Monday, July 6 – Wednesday, July 8
            - Thursday, July 9 – Saturday, July 11
            - Monday, July 13 – Wednesday, July 15
            - Thursday, July 16 – Saturday, July 18
         - **The University of Iowa College of Engineering, Iowa City, Iowa**
            - Monday, July 20 – Wednesday, July 22
            - Thursday, July 23rd – Saturday, July 25th
            - Monday, July 27th – Wednesday, July 29th

      ii) Lead Teachers facilitate Building-Level Readiness Training for any building teachers intending to teach any of the PLTW Launch modules at the site – includes 8-hour session and 1-hour individual Readiness Training work.
      iii) All teachers planning to teach any of the K-5 PLTW Launch modules are required to do Module-Specific Core Training, delivered asynchronously through the PLTW Learning Management System (LMS) and is designed to provide approx. 6-8 hours of learning content.
2) PLTW Launch participation fee for the 2015-2016 academic year. Thereafter, the $750 annual program fee will be the responsibility of the site.
3) **$2000 PLTW Launch Materials Allowance.** All General Equipment and Supplies Kits available for order through PLTW (including the VEX IQ Kits and Equipment) can be purchased with the $2000 Materials Allowance (see PLTW Launch Price Sheet).

What is required by the applicant in order to implement this program?

- PLTW Launch is highly flexible and can work in many in-school and after-school settings with 24 ten-hour PLTW Launch modules aligned to grade-level standards (4 per grade level)--combined to create a thematic unit—of Engineering, Biomedical Science and Computer Science curricular components.
- Sites need to review Iowa Governor's STEM Advisory Council's 2015-16 Scale-Up Programs info, PLTW Launch Program Requirements, the sample PLTW Agreement, the PLTW Partnership Team Guidebook and the PLTW Guide to Successful Implementation PDF.
- Review the PLTW Register Now webpage. Choosing either 1) My school or organization already has one or more PLTW programs OR 2) This is my school or organization's first PLTW program and follow the instructions listed.
- Register the school district and participating schools through the PLTW online registration process. Select a District Administrator (DA) and School Administrator (SA) (for each school) to serve as the main points of contact with PLTW and be responsible for providing and maintaining accurate data and information. Upon registration, the DA will receive an email with a link to the PLTW Agreement. Registration does not commit the site to implement PLTW, however, it provides program and Scale-Up Award interest-level info to PLTW and the Iowa Gov.'s STEM Adv. Council.
- Review site's PLTW agreement with authorities such as the school board, superintendent, and legal department to ensure all parties are aware of district and school responsibilities. After obtaining the authorized signatures, email the agreement to PLTW School Support Team.
- Execute LEA Agreement with PLTW as a part of the Scale-Up before attending Core Training and before using the $2000 PLTW Material Allowance.
- Select two teachers to attend PLTW Launch Lead Teacher Training. Teachers should be excited to teach a project-based curriculum and meet the requirements of the PLTW agreement. After the signed agreement has been received and processed, the DA and/or SA should contact School Support (877-335-7589) to add and/or update district/school contacts, including teachers.
- Register teachers for Launch Lead Teacher Training (3-day training). Teachers must successfully complete and pass all required online PLTW Launch Readiness Training modules prior to attending Core Training, and upon completion of Core Training fulfill responsibilities to conduct building-level teacher training. Award covers tuition for the two Lead Teachers, which includes parking and lunch meals; however, this does not include other costs associated with Core Training, such as lodging, teacher stipend, additional meals, etc. Training sites will provide training lodging/meals packages.
- Review the PLTW Order Instructions, the PLTW Launch Price Sheet and PLTW Computer Specifications to order the necessary equipment and supplies for the course. Start the ordering process early to ensure the lab is fully equipped before the new school year.

Website to View Program and Standards Alignment: https://www.pltw.org/sites/default/vfiles/Launch%20Standards%20Alignment%20Document%202014_15.pdf
Program Video: https://www.youtube.com/watch?v=jEiBf33RM3s&index=2&list=PLcCTPHuIP75L4OB5bdEiFmryWewgxbXRT

Spatial-Temporal (ST) Math

2015-2016 Scale-Up Program

Overview: ST Math's mission is to ensure all students are mathematically equipped to solve the world's most challenging problems. Through our uniquely visual, non-language based approach to teaching math–delivered through our ST Math instructional software–students across the country are deeply understanding math, developing perseverance and problem-solving skills, and becoming life-long learners prepared for success.
Grade Levels: K-6

Program Summary

Spatial-Temporal (ST) Math® is the leader in visual math instruction and represents the highest quality and most effective blended learning math solution in K-12 education.

Created by MIND Research Institute, ST Math is game-based instructional software for K-12, offered as a whole-class instructional supplement and is designed to boost math comprehension and proficiency through visual learning. Integrating with classroom instruction, ST Math incorporates the latest research in learning and the brain and promotes mastery-based learning and mathematical understanding. The ST Math software games use interactive, graphically-rich animations that visually represent mathematical concepts to improve conceptual understanding and problem-solving skills.

Whether in the classroom, computer lab or at home, learning never stops with ST Math. When teachers bring ST Math into the classroom, projected onto a screen or interactive whiteboard, the software games help students make connections between the visual representations from ST Math and symbolic representations found in their core instruction. With the touch functionality of ST Math, students experience an even greater level of interactivity. With ST Math, learning continues outside of school too, as teachers can assign specific math objectives in the software program for homework.

ST Math software, comprised of thousands of math games, allows students to engage in a personalized, self-paced learning path through Common Core-aligned math objectives.

Project Description/Objectives

- To ensure that all students are mathematically equipped to solve the world's most challenging problems;
- To utilize cutting edge research in learning and neuroscience to inform continual improvement of programming;
- To provide students with the opportunity to strengthen neural connections as they learn new concepts, immersing students in richly interactive, hands-on learning;
- To provide educators with a meaningful, effective technology resource to engage their students and provide rigorous content;
- And, to provide Iowa students with a program that has a track record of success.

What does the project provide?

- Access to ST Math Software at school site and updates;
- Consultation with MIND Implementation Manager, generating a Project Plan for successful and timely implementation;
- Thorough Professional Development provided to teachers and administrators for Start-up;
- Post-Startup Training and Professional Development modules, including video and scheduled live webinars, to improve program knowledge, use, and outcomes;
- Ongoing Best Practices Consulting and Personalized Support through phone, e-mail, Skype, or webinar;
- Monthly summary progress reports at school or district level;
- Yearly data meeting to review the past year and set goals for the following year;
- ST Math Digital Training Manuals;
- Web-based class level, school level, and individual student reports;
- Real-time, class-level, school-level, and individual reports, indicating level of math standards mastery and RTI growth.
- Service and technical support via e-mail, phone, or online chat;
- And, a suite of online support resources.

What is required by the applicant in order to implement this program?

ST Math is a web-delivered resource that can be accessed from any Internet connected computer or tablet. The applicant will need to have the ability to connect to the Internet. Recommended implementation time for students is 90 minutes per week (60 minutes for K-1).

All teachers using ST Math should attend Professional Development either in-person or via the web prior to implementing. This ensures that all parties are comfortable, prepared, and supported in their usage of ST Math.

Website: http://mindresearch.org/
Founder's TEDx Talk: https://www.youtube.com/watch?v=2VLje8QRrwg
Demo Games: http://mindresearch.org/play/
Data and Results: http://mindresearch.org/results/

Interactive Introduction to ST Math:
http://learn.stmath.com/courses/c01/
Guide to WestEd Evaluation of ST Math:
http://mindresearch.org/pdf/WestEd_CA_Roadmap_web.pdf