STEAM FAQ for Educators

Join a growing variety of similarly minded STEAM educators to share expertise and plans for better learning experiences for your students and you.

STEAM is an acronym that represents how all topics in subject areas relate to each other and to the real world.

The sentence that defines this is: Science & Technology, interpreted through Engineering & the Arts, all based in Mathematical elements.

The A stands for the broad spectrum of the arts going well beyond aesthetics; it includes the liberal arts, formally folding in Language Arts, Social Studies, Physical Arts, Fine Arts & Music that each shape developments in STEM fields. (For more information see our About page and our FAQ and Downloads.)

It is a framework for teaching that is based on natural ways of learning, customizable for ALL types of students and programs and is FUNctional!

Shifting to a STEAM perspective means understanding learning contextually; not only in terms of having a framework that illustrates where the subjects overlap, but also in providing a living and adaptable learning structure for ever-changing personal and global development.

STEAM is showing success in schools all around the world to better teach academic and life skills in a standards-backed, reality-based, personally relevant exploratory learning environment.

STEAM Educators report feeling rejuvenated by richer living work environments. They have the ability to use more diversification of teaching methods and be more of a facilitator to learners. It empowers educators to meet the guidelines in a variety of unique and engaging ways and to meaningfully cross-reference concepts and vocabulary. They have the opportunity to teach collaboratively, exchange ideas, have easier preparations for substitutes and have more productive common planning times. The teachers report feeling the positive shift from ME to WE in the staff as well as with students.

They state that through the structure of rubric-based portfolios and process work, they have a better (broader and deeper) understanding of what their students prove they know in different ways including what they can tangibly accomplish. Educators can better match their learning objectives and goals to the variety of learners they encounter. They can cater the themes to those of interest to the local students and community.

Classrooms: Embedded in the framework is a system to establish well-balanced teams among educators and students based on a variety of characteristics. All participants have ways they are advanced and are challenged. With this system, their skills are used for leading in some areas while other areas are strengthened through observing and assisting. Educators instruct within their specialty with co-planned thematic units that everyone contributes to in projects related to the required benchmark concepts and skills. There are times when various groups of educators co-teach overlapping
subject areas and assignments. However, most of the time, educators still are able to work focused on their own schedule and tie to the theme when it is convenient in their plans. Special times are designated for working on projects, so that as new concepts are learned they can be applied and built upon. The classrooms and common areas become a network of specialty topics in a living and growing discovery place.

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1. Defining the STEAM Framework
STEAM is a framework for teaching FUNctional Literacy that is based on natural ways of learning and is customizable for all types of educators and students. It has been successfully implemented in PK-12, college classes, museums, after-school programs and with rehabilitation and dementia patients. STEAM is adaptable, benchmarked, measurable and easily reinforces the standards in unique and engaging ways. STEAM ties ALL the subjects to each other in an interdisciplinary way as well as to the full spectrum of the rapidly changing business and professional world. It is a life-long career and life-readiness way of educating and learning that is adaptable to the rapidly changing global world we live in.
2. STEAM Team Membership Information

STEAM Education offers memberships to our online virtual community with the following benefits:

STEAM Membership Levels

Tier 1: STEAM Theory
Tier 2: STEAM Program Creation
STEAM Curricula-Lesson Plan Bank
Tier 3: This tier is not for sale, but is included in the price for members attending an Educator Certification Training or contracted package.
Tier 4: STEAM Virtual Training
Tier 5: STEAM Virtual Certification

Click here for more details on STEAM Membership Levels.

Coming next:

• STEAM Book
  You have several options. You may purchase the entire book or each individual chapter. Package deals will also be available with our recommended groupings for administrators, elementary, middle, and high school teachers (among others).

  Lesson Plan Access: Tiers 3-5 and the Curricula-Lesson Plan Bank Tier will grant you access to our growing bank of on-line STEAM curriculum created by teachers in our network, including a licensing agreement to use the lesson plans in your classroom. This live online curriculum is written by teachers for teachers and vetted by experts in the field. New lesson plans are continually being added, and, unlike textbooks, this system of developing curriculum is set up to be reflective of a rapidly changing society.

• Teachers that continue to add to the network of curriculum will earn a discount off their next year’s annual fee of $20 per approved lesson plan. Adding only 7 lesson plans per year will cover access to the network.

3. What packages are offered for STEAM Certification?

We provide professional development for individuals and educational programs to assist and support the transition to a STEAM platform. We offer three types of training packages- one for individual Educators, one for Staff, and one for whole Programs. For a printable version, see our Program Description document.

4. What is covered in a training session?

Our training curriculum includes theory, program and classroom establishment instructions and help writing custom STEAM lesson briefs. It results in being prepared to write and submit a vetted STEAM Lesson Brief to become a STEAM Certified Educator. Certification requires about another 4 hours for completing a lesson plan and the process, less if training with a team.

Both STEAM Trained and Certified educators will have access to the training and teaching documents, as well as the live bank of STEAM lesson plans for a year after their training, including updates made and new documents added during that time.
Educator Training includes:

- Theory and Reasoning
  - Introduction to the STEAM framework
  - Review of epistemology and pedagogy of STEM/STEAM
  - Learn about the commons of the subjects
  - Class management tactics – behavioral & interdisciplinary
  - Meeting extensions for all types of learners
  - Review of previous examples of STEAM projects and programs
- Practicum and Plan Creation
  - Reasoning for and how to create STEAM Teams for educators and students
  - Examples of STEAM themes & interdisciplinary PBL styled projects – hands-on
  - Program sustainability considerations and tactics
  - Partnerships, sponsorships and grants advice
  - Community Outreach structure and STEAM school events
  - Lesson plan creation/expansion based on benchmarks

5. What are STEAM Educator Certification Training Camps for individuals?
We offer Educator Certification Training where an administrator, curriculum coordinator, informal educator or teacher can come to learn to use the STEAM framework and to see if the program is a good fit for their whole program’s needs. These provide educators with an introduction to STEAM theory, program and classroom establishment, as well as help in creating personalized STEAM lesson plans and student portfolios. We offer these Educator Certification Trainings throughout the year and try to rotate the locations around larger cities in the different regions of the continental U.S. Trainings are available with the option of training only (9 PD points) or training plus certification (12 PD points). You can check our Store Page for upcoming camps.

If you’d like to receive our new camp announcements and other STEAM news, you may sign up for our newsletter on our homepage.

6. What is the difference between being STEAM trained and STEAM certified?
Educators who attended a full STEAM training may state that they are STEAM trained on how to deliver and teach with STEAM lesson plans and practices. Educators who have completed a lesson plan and been certified may state that they are STEAM certified and have proven that they know how to write a STEAM lesson plan. Educators with STEAM certification and experience are becoming sought after in the global market. Both STEAM Trained and Certified staff will have access to the training and teaching documents as well as the live bank of STEAM lesson plans for a year after their training, including updates made and new documents added during that time.

7. STEAM Results
Many people ask us for studies on the effects of using STEAM methodologies, the response is not a simple one, but we hope you will take the time to read this and understand why there is no clear answer as of yet.

It is the goal of STEAM to help students become FUNctionally Literate, meaning they understand the basics of what the benchmarks outline in each subject area AND are able to understand the context of when and how to apply each to be responsible members of society. STEAM educational developmental
skills go well beyond test-taking skills, they include many more divergent thinking and implementation skills. Because STEAM lessons are built to accommodate the broad spectrum of learning styles and abilities at all grade levels as well as personality types, the lessons are created to be more appealing and better-understood by a wider spectrum of people. They are also based in reality for up-to-date context, field discoveries and inventions. Students are able to create impressive portfolios of what they can do and apply for knowledge across the spectrum of the subjects. – For more details please see the related download on our website.

8. What are some more details on certified STEAM lesson plans?

The bank of lesson plans: There is a growing bank of STEAM lesson plans that are contributed by teachers with a similar philosophy – integrated meaningful reality-based STEAM education. The first sets of teachers in the network helped frame the lesson plan template and as things develop in the educational world, the template is adaptable to accommodate shifts. The lesson plan template is a device for educators to have a structure that helps coordinate ideas across the spectrum of subjects and is adaptable for all educational levels. Once the lesson plans are inclusive across the subject areas for a specific educational level and are certified, they are uploaded and offered to the network.

The point of having educators write STEAM lesson plans to contribute to a commons is two-fold: the first is to verify that they understand how to build a STEAM lesson plan after the training and to receive suggestions on how to make them more well-rounded and polished, the second is to give voice to the educational experts, the teachers in the field, to create a standards-based, live curriculum better than any individual educational program or company can alone. By having STEAM certified teachers contribute at least one lesson plan to the commons, the plans become searchable by the network and everyone is submitting work that can be used, tweaked, updated and supported by similarly minded teachers around the world. It is possible that, with good contributions, there will be enough lesson plans online very soon, so that educators can pick and choose variations of lessons teaching similar level topics to build a personalized curriculum that works for their students. There is a growing number of lesson plans in an on-line bank for our members.

In order to maintain the structure that supports impassioned educators to collaborate freely and without biases towards funders, we have to charge to have access to and be a part of the network that shares ideas and lesson plans.

Most states offer professional development points for educational publications, so educators would have the added benefit of being able to apply for additional PD points for any approved lesson plans that they submit.

9. Details on international STEAM training

All domestically offered services are available for international requests including Staff Training, Program Certification, Keynotes & Presentations and Consulting. The most economical way to receive training is to sign up for the membership that includes the video training. This training is currently offered in English, please contact us to give us feedback on what other languages would be most useful to have a translation in. (For details please see our International Training Document available as a download on our website.)
10. Where can I visit a STEAM school?
You can see the total numbers of STEAM schools, staff and individuals trained on the interactive map on our website. However, to protect our schools' privacy, we cannot share our roster of STEAM-trained schools with the public. We hope to have a list of STEAM schools that are open to visitors soon. In the meantime, you may see our interactive map on our website and/or post your question on our LinkedIn Page.

11. Does our school need special equipment to get started with STEAM?
It can be quite helpful to have a STEAM lab with work tables and open spaces that classes can use for constructing things, but it is not necessary. As STEAM labs are unique to each school, we offer help in designing them. No special space or equipment is required to be a STEAM school, but highly recommended are: a STEAM room for building things, a grade level appropriate technology education shop/lab and a clean room for robotics equipment, some garden beds and greenhouses with a hydroponics lab, and a 3D printer. If the district is capable of offering electronics to students, we suggest laptops, not tablets and iPads. Laptops provide the ability for students to go much deeper with their studies. We do hope that programs are able to at least offer a 1:4 ratio of laptops for their students.

12. How do STEAM programs work in relation to standardized tests?
Required standardized tests are a reality that STEAM educators are not often able to remove their programs from, therefore the framework of implementing STEAM, especially in the US, is built to accommodate this most common structure of our public school system. With the wide-spread adoption of Common Core standards, STEAM has been structured to accommodate those requirements as well. The benchmarks affiliated with standardized testing can be very useful for building STEAM thematic units that reach a broad spectrum of grade-level expectations for students. We have developed a structure to help use Common Core and national and state benchmarks to plot out pacing guides for the development of thematic units and STEAM lessons within them.

It is very important that STEAM lesson plans be built backwards from standards so that they are meaningful applications of the pre-determined content and supportive of giving students opportunities to use the knowledge for deeper understanding. If this is done, then the STEAM projects are giving the students more reasons to learn the content and make more cognitive connections to the information with a larger variety of synapses, thus providing more opportunities for recall when they take the required tests.

13. Where does the time come to complete a project in the core subjects?
A combination of direct teaching, STEAM-PBL’s and blended learning is promoted. STEAM projects should be worked on in every classroom. The projects can be small or large, they can link to other projects or be independent. Ideally, they should relate to a common theme, there is benefit for the students to see knowledge and application links. A well-developed STEAM program has coordinated projects that show more direct links between the subjects, but for the most part can still be worked on in individual class times. Planning in 2 times a week for STEAM knowledge application on projects is most common in our first year programs. In a full STEAM program, all teachers use STEAM practices and projects in their classes, it becomes a thread throughout the school. Individual educators expand their curriculum to be STEAM curriculum and tie things together around common themes. Each academic specialist learns how to teach with STEAM to add their perspective.
14. What does STEAM look like in a Pre-K through 1st Grade program?
Most K-1st grade classrooms focus on community and basic content, behavior and interaction skills. STEAM schools expand on these concepts to include understanding oneself and how to work on teams and getting a concept of the world beyond what they have experienced in their local community. Teachers will naturally cover the basics of how the students will interact, respond to being in a school environment and being part of a group. Those activities can naturally involve counting, basic writing and drawing, some scientific vocabulary and investigation behaviors. A STEAM educator will also investigate with the students where their choices come from globally to learn geography and possibly some socio-cultural pieces that include PE, Music and Fine Arts. This is the area that richer STEAM projects can come from. Each team of teachers uses their required benchmarks to create themes to teach with and the extension teachers help support that theme. It can change at any time and we suggest small activities within a theme versus one large activity.

15. What can STEAM do for disadvantaged and advanced learners?
Embedded in the STEAM framework is a system to establish well-balanced teams among educators and students based on a variety of characteristics. All participants have ways they are advanced and are challenged. With this system, their skills are used for leading in some areas while other areas are strengthened through observing and assisting. The ‘quick’ answer to this question is that having a student with particular areas of excellence or limitations on a team with students who have complimenting strengths naturally helps both types of learners and the accommodations regularly made for each.

16. Cooperation and collaboration are different skills. How do you get students to truly collaborate and not just cooperate?
There is a structure for both within the STEAM framework. In order to get students to do anything meaningfully, cooperation is a basic behavior management skill that all educators must assist their students in doing well at. However, most traditional schools do not focus on collaborative projects. STEAM offers a variety of way to set up a STEAM classroom to be supportive of still having students accountable for individual work but to promote their skills to be recognized in ways they can be leaders and for them to work with students who are stronger with skills that they are not as adept with to help improve those skills for them. There is also a grading structure that helps promote collaboration that works within the structure of traditional school grading policies. When you tie comfort zones, less-threatening ways to diminish a student’s hindrances and grading structures to promote meaningful collaboration around reality based problem solving projects, many more students see good reasons to collaborate for personal, classroom and society based goals.

17. Where does computer science and programming fall in the STEAM framework?
Everywhere, just as it does in life. For younger students it begins with pointing out what is driven by computers and what the basics of hardware and software are. For mid-elementary students, teaching the basics of coding introduces them to an important international language. For older elementary students, it is very important to have them start understanding the basics of computer controlled devices and doing basic robotic, and related programming. By middle-school they should have the skills to incorporate building basic apps, doing basic animatronics and understanding a broader spectrum of electronics and circuitry. By high school they should be able to find problems, frame them and develop ideas, programs or tangible computer-controlled devices to conduct research or solve a piece of the problems they identify around them. Within our training we offer specific ideas on how to
18. How do we make meaningful STEAM connections in both foreign language classes and with students who speak English as a second language?
ESL — allows students to do much of the work in their native language and then have students translate the synopsis they create to report back to their teams and for presentations. Foreign Language Teachers can most easily relate by finding cross lesson vocabulary to reinforce in those classes. For a more detailed explanation, there is a chapter of the book coming out for ESL/Foreign Language teachers, and, for now, documents can be found in the membership downloads.

19. How do these specific educational support staff fit into STEAM Teams?

- **Guidance Officers** — Find they get more support from classroom teachers who regularly include connections to careers and place students in roles that are well-matched to their skills and interests. Students get a broader sense of who they are and how to use that to guide what options they select for courses and career goals. Guidance officers can help connect the teachers to the community, chambers of commerce and guest speakers as well as future training programs and summer opportunities for students.
- **Librarians/Media Specialists** — Find that students are doing more research as a part of coursework and can help students find information, look for resources for educators as they plan, provide loans for in-class projects and also provide spaces in the media center for STEAM projects to go on display for other students in the school to see what everyone is working on.
- **Informational/Educational Technologists** — Find that educators are learning with their students about new processes in technology and are sharing resources and ideas on how keep everyone well-connected as well as using the most advantageous digital technologies. They act as a filter of what is recommended by staff and students and match that with the policies and capabilities of the school district so that investments in new educational technologies rise and are supported from students, educators and staff.

20. How do I find a job with a STEAM Education focus?

There are STEAM programs popping up in areas all around the world. Depending on the focus of the program, they are drawing from the STEM and Arts fields for people to fill the new types of jobs emerging in the educational market. Educators who go through our training and receive a certification are seen as having worked with the primary researcher and developer in the field. Educators with this certification are sought after and we help place them in jobs as we hear about them.