

The Governor's STEM Competition

2025 PaGSC Competition eBook

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2025 PA Gov. STEM Competition

Competition Dates and Venues:

Round 1: Virtual

Finals: [PSU Main Campus in State College, PA](#)

April 29, 2025- April 30, 2025

Registration

- [2025 Governor's STEM Competition Registration Form](#)

Competition Theme

- Harmonious Fusion: The Art and Science of STEAM

Eligibility to Participate in the Competition

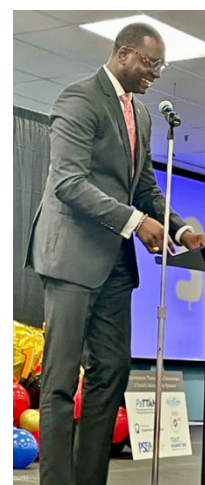
- All commonwealth public and non-public high schools, Career and Technical Centers, Charter Schools, and home-schooled students are invited to participate in the competition
 - Teams must consist of five students in grades 9-12 and at least 1 advisor.
- A [team advisor](#) must complete the registration form for all students participating in the competition.

Description of Divisions

- Division 1: This division is for teams with all, or a majority of members, who have competed in the state competition previously
- Division 2: This division is reserved for teams who have never, or have most team members, not competed in the state competition.

Prototype Submission Guidelines

- Submission of a Digital Research Poster is required
 - [Adherence to the Digital Research Poster Guidelines is required](#)
- The Digital Research Poster is the sole scoring component for Round 1.
 - [Rubric](#)
- The written and video submissions that were required for the 2024 PaGSC have been embedded into the digital research poster required for the 2025 PaGSC.



Students are invited to participate in the Prototype Submission with the Digital Research Poster, Logo Competition, *AND* Non-Competitive Digital Research Poster.

Stipend

- Registrants receive a one-time \$600 stipend for their prototype or device.
- Stipends are distributed to schools in January, upon commitment to the competition.
- School district **business offices** receive and are responsible for stipend disbursement to team advisors.
- Teams withdrawing from the competition must email the PaGSC planning team and return the full stipend to:

*Lancaster-Lebanon Intermediate Unit 13
Business Services
1020 New Holland Avenue
Lancaster, PA 17601*



Mentorship

- Teams must work with a business and industry partner throughout the design process.
- Teams may select their business and industry partner or request one from the statewide competition planning team.
- Invent Penn State's LaunchBox & Innovation Network may be used as a team's business and industry partner (see [LaunchBox & Innovation Network](#)).

Lodging, Transportation, and Meals

- Cost for lodging, meals, and transportation will be covered for the 20 Teams who progress to the Finals.

Say Cheese

- Team photo is requested to be uploaded to the 2025 Governor's STEM Competition Registration form.
- Your team photo will be displayed at the State Finals.
- You may also [email](#) your team photo to the competition planning team.

Contact Information for Statewide Planning Team


- Email: govstemcomp@pattan.net
- Phone: (717)901-2285

Frequently Asked Questions

- [FAQs \(pa.gov\)](#)



2025 PaGSC Important Dates

Event	Dates
Registration Opens for: <ul style="list-style-type: none"> ○ Competitive Prototypes w/ Digital Research Poster ○ Non-Competitive Digital Research Poster ○ Logo Contest ○ Business/Industry Intent to Contribute 	Tuesday, September 17, 2024
Logo Contest Submission Form Closes	Thursday, October 31, 2024
Registration Form Closes for: <ul style="list-style-type: none"> ○ Competitive Prototypes w/ Digital Research Poster ○ Non-Competitive Digital Research Poster ○ Volunteer Judges 	Monday, December 23, 2024
Judges Training Session (Mandatory)	Tuesday, January 28, 2025 6 PM-7 PM
Judging Timeframe for Round 1	Monday, February 3, 2025, to Wednesday, February 25, 2025
Top 20 Prototypes Announced via Email	Friday, March 7, 2025
Business/Industry Intent to Contribute Form Closes	Monday, February 24, 2025
<u>Personal Liability and Medical Release</u> due for Top 20 Teams	Monday, March 17, 2024
2025 Governor’s STEM Competition State Finals 	Tuesday, April 29 thru Wednesday, April 30, 2025 Pennsylvania State University State College, State College

The Art and Science of STEAM

Infusion of the Arts

How do the Arts enhance the fields of Science, Technology, Engineering and Mathematics?

1. **Enhanced Creativity:** The arts encourage thinking outside the box, which can lead to innovative solutions in STEM fields. For example, a software engineer might use design principles to create more intuitive user interfaces.
2. **Improved Communication:** Arts education often involves storytelling and visual communication, which can help STEM professionals present complex data and ideas more clearly and persuasively.
3. **Better Problem-Solving:** Artistic practices like drawing, music, and drama can improve cognitive flexibility and the ability to approach problems from multiple angles.
4. **Human-Centered Design:** Incorporating the arts into STEM can lead to more user-friendly and aesthetically pleasing designs, whether in product development, architecture, or technology.
5. **Interdisciplinary Collaboration:** The arts can bridge gaps between different STEM disciplines, fostering collaboration and the integration of diverse perspectives.
6. **Increased Engagement:** Integrating the arts into STEM education (often referred to as STEAM) can make learning more engaging and accessible, encouraging more students to pursue careers in these fields.

By blending the analytical and technical skills of STEM with the creativity and expressiveness of the arts, professionals can develop more holistic and innovative approaches to their work.

Citation: Jo. (2022, December 2). *Comparing STEM vs. STEAM: Why the Arts Make a Difference* | UCF Online. UCF Online. <https://www.ucf.edu/online/engineering/news/comparing-stem-vs-steam-why-the-arts-make-a-difference/>

STEAM Careers

Careers that combine the arts with mathematics, science, technology, and engineering:

1. **Animator:** Uses mathematical principles to create animations and visual effects for movies, video games, and other media.
2. **Web Designer:** Combines coding, design, and artistic skills to create visually appealing and functional websites.
3. **Graphic Designer:** Utilizes geometry and spatial awareness to create visual concepts for advertisements, product designs, and more.
4. **Architect:** Integrates engineering, mathematics, and artistic design to plan and design buildings and structures.
5. **Industrial Designer:** Merges engineering and artistic skills to design products that are both functional and aesthetically pleasing.
6. **User Experience (UX) Designer:** Uses psychology, design, and technology to create user-friendly interfaces for software and applications.
7. **Biomedical Illustrator:** Combines medical knowledge with artistic skills to create detailed illustrations for textbooks, research, and medical training.
8. **Game Designer:** Integrates storytelling, art, and programming to create engaging video games.
9. **Data Visualization Specialist:** Uses artistic skills to create visual representations of data, making complex information more accessible.

10. **Architectural Engineer:** Combines engineering principles with architectural design to ensure buildings are safe, functional, and aesthetically pleasing.

Citation: Indeed Editorial Team. (2024, April 18). *13 math and art careers that combine STEAM concepts*. Indeed Career Guide. <https://www.indeed.com/career-advice/finding-a-job/math-and-art-careers>

Notable Examples

Successful arts-enhanced STEM (STEAM) projects:

1. **NASA's Data Visualization:** NASA often collaborates with artists to create visual representations of complex scientific data. These visualizations help make the data more accessible and engaging to the public.
2. **Rube Goldberg Machines:** These intricate machines, often built by engineering students, combine principles of physics and engineering with creative design. They are a fun and educational way to demonstrate complex concepts.
3. **BioArt:** This interdisciplinary field combines biology and art. Artists and scientists work together to create living art pieces, such as genetically modified organisms that produce fluorescent proteins.
4. **Video Game Design:** The video game industry is a prime example of STEAM in action. Game design requires a blend of storytelling, visual arts, music, and advanced programming.
5. **Architectural Projects:** Many modern architectural projects integrate advanced engineering with artistic design to create buildings that are both functional and aesthetically pleasing. Examples include the Guggenheim Museum in Bilbao and the Sydney Opera House.
6. **STEAM Education Programs:** Programs like the STEAM Carnival use art and technology to create interactive exhibits that teach STEM concepts in a fun and engaging way.

Citation: Hertz, M. B. (2016, February 1). *Full STEAM ahead: Why arts are essential in a STEM education*. Edutopia. <https://www.edutopia.org/blog/arts-are-essential-in-stem-mary-beth-hertz>

Digital Research Poster Guidelines

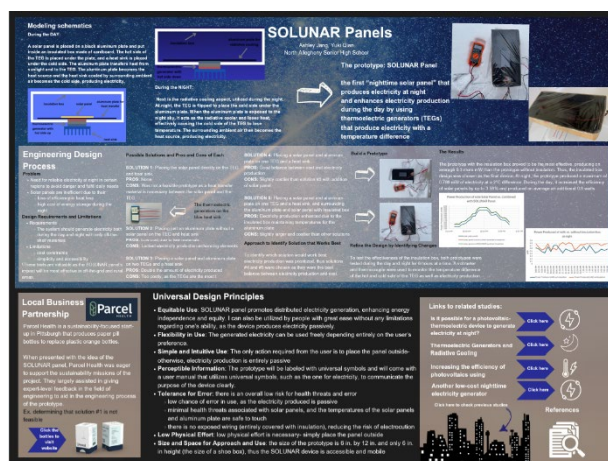
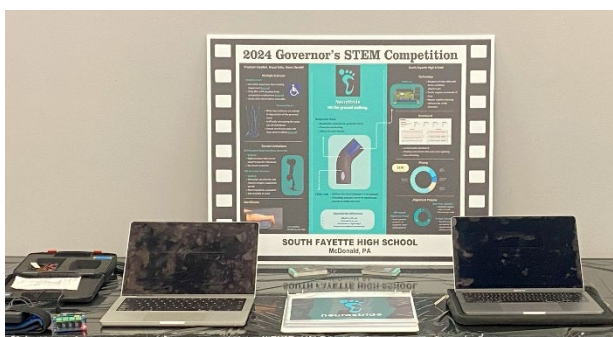
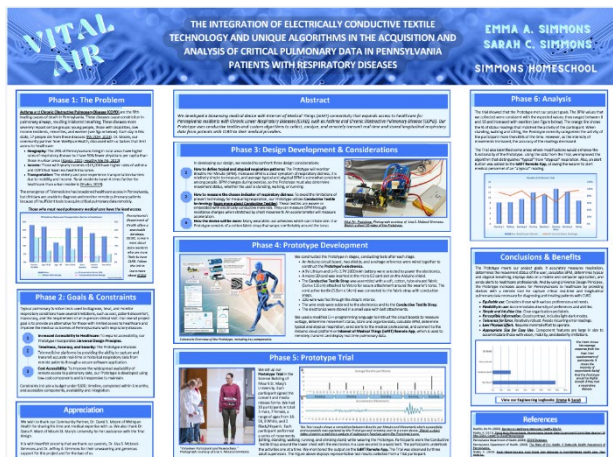
Guidance is for Competitive and Non-Competitive Digital Research Posters

** Required for Competitive Prototype Submissions**

The digital research poster for the 2025 Governor's STEM Competition should be a comprehensive and visually appealing presentation that effectively communicates the project's objectives, methodology, and outcomes.

- **Acknowledgments:** Give credit to individuals or organizations that supported your team throughout the design process.
- **Body Text:** Ensure the body text is no smaller than 24-point font to avoid eye strain.
- **Bullet Points and Numbered Lists:** Present information concisely using bullet points or numbered lists.
- **Clear Organization:** Ensure the poster is well-organized with clear headings and subheadings to guide the viewer through the content.
- **Color Scheme:** Use high-contrast colors to make the poster visually appealing. Avoid using color alone to convey information for accessibility.
- **Consideration of Need for Commonwealth Residents:** Thoroughly consider and address the needs of Commonwealth residents, providing detailed analysis and solutions.
- **Digital Poster Design and Formatting Guidelines:** Possible Design Platforms: Adobe Illustrator, Corel Draw, Canva, PowerPoint, Publisher. Preferred File Formats, in order of preference: Vector, EPS, PDF (most common), SVG (Canva). Do not use JPEG, PNG, Photoshop Files, Microsoft Paint.
- **Engaging Design:** Use a modern layout, appropriate color schemes, and high-quality images to capture the viewer's attention and make the poster stand out.
- **Engineering Process:** Clearly document and follow the Engineering Process throughout the project, including problem identification, brainstorming, prototyping, testing, and iteration.
- **Formatting:** Size: 30w x 24h. Orientation: While Horizontal is typically the most flexible format, the same vertical dimensions would work for production.
- **Headings:** Use a 48-point font size to organize the content.
- **Interactive Elements:** Embed short video clips or audio recordings within the poster to highlight key points or demonstrate certain aspects of the project. There is no need for a separate video submission.
- **Margins:** Background colors or background images should bleed the entire way to the edge (Zero margin). No important text or embedded picture frames should extend into the outer ½” of the finished poster (1/2” margin).

- **Narrative Sections:** Summarize how your team engaged in the competition, including need identification, the use of Universal Design principles, the Engineering Process, and local business or industry partnerships. Use concise and clear language. There is no need for a separate written submission. *Limit use of narrative components.*
- **QR Codes:** Incorporate QR codes that direct viewers to additional resources or supplementary materials, such as a detailed project report, a website, or a video presentation. Every presentation must include a QR code in the lower right-hand corner of the poster to facilitate audience engagement with both the poster and its digital components.
- **References:** Include link to original source to give credit to author.
- **Subheadings:** Use subheadings to break down information into smaller sections.
- **Team Members:** Provide the names of all team members who contributed to the prototype creation.
- **Title:** Use a 60-point sans-serif font (e.g., Arial, Times New Roman, Calibri, Helvetica, or Verdana) to ensure readability from 6 feet.
- **Universal Design:** Thoroughly consider and apply Universal Design principles throughout the project, ensuring accessibility and usability for all users.
- **Prototype Presentation:** The prototype presentation is integrated into the digital research poster and lasts 10-15 minutes.
- **Visual Aids:** Use infographics, charts, and diagrams to convey complex information in an easily digestible format, replacing lengthy written descriptions. Incorporate high-quality charts, graphs, and images relevant to the content.



Prototype and Digital Research Poster Rubric

	Criteria	Excellent (4 points)	Good (3 points)	Fair (2 points)	Not Included (0 points)
1.1	Acknowledgments	All individuals and organizations that supported the team are credited.	All individuals on the team are credited but does not include credit to supporting organizations.		No acknowledgments are provided.
1.2	Budget	A detailed budget is provided, outlining all expenses related to the project. Spending does not exceed \$600.	A budget is provided but is incomplete OR exceeds \$600		No budget is provided.
1.3	Clear Organization	Poster is well-organized with clear headings and subheadings guiding the viewer through the content.	Poster is organized but some headings or subheadings are unclear.	Poster has some organization but lacks clear headings or subheadings.	No clear organization is present.
1.4	Color Scheme	High-contrast colors are used effectively, and accessibility is considered.	High-contrast colors are used but accessibility is somewhat lacking.	Colors are used but lack contrast or accessibility considerations.	No color scheme is used.
1.5	Universal Design	Universal Design principles are thoroughly considered and applied throughout the project.	Universal Design principles are considered but not thoroughly applied.		No consideration of Universal Design principles.
1.6	Engaging Design	Design is engaging, appropriate color schemes, and high-quality images are used to capture attention.	Design is engaging but lacks appropriate color scheme elements OR high-quality images.	Design is somewhat engaging but lacks appropriate color scheme elements AND high-quality images.	No engaging design elements are present.
1.7	Font Sizes and Styles	Title, headings, body text, and subheadings use appropriate font sizes and styles.	Most text uses appropriate font sizes and styles.	Some text uses appropriate font sizes and styles.	No appropriate font sizes or styles are used.
1.8	Bullet Points and Numbered Lists	Information is presented concisely using bullet points or numbered lists, with minimal narrative sections.	Most information is presented concisely using bullet points or numbered lists, with some narrative sections.	Some information is presented concisely using bullet points or numbered lists, with several narrative sections.	No bullet points or numbered lists are used, and there are extensive narrative sections.
1.12	QR Codes	Required QR code is incorporated			Required QR code is not incorporated.
1.13	References	All sources and research are cited via link to original source.		Some sources and research are cited via link to original source.	No sources and research are cited via link to original source.

	Criteria	Excellent (4 points)	Good (3 points)	Fair (2 points)	Not Included (0 points)
1.14	Visual Aids	High-quality infographics, charts, and diagrams are used to convey information.	Most visual aids are high-quality.	Some visual aids are high-quality.	No visual aids are used.

Scoring Criteria for Required Prototype Demonstration Video (Replaces video submission that was required prior to the 2025 competition)

	Criteria	Excellent (4 points)	Good (3 points)	Fair (2 points)	Not Included (0 points)
2.1	Embedded Prototype Demonstration Video	Prototype Demonstration Video is embedded into Digital Research Poster	Prototype Demonstration Video is provided via link and is not embedded into Digital Research Poster		Prototype Demonstration Video is not included. Go to section 3: Automatic loss of 24 points for section 2.
2.2	Prototype Description	Detailed description of a need that can make the quality of life better for Pennsylvanians.	Limited description of a need that can make the quality of life better for Pennsylvanians.		No description of a need that can make the quality of life better for Pennsylvanians.
2.3	Innovation	Prototype exhibits extraordinary originality and inventiveness.			Prototype lacks originality and inventiveness.
2.4	Organization	Logical organization of information	Adequate organization of information.		Lack of organization of information.
2.5	Team Dynamics	All team members shared responsibility during the presentation and worked together as a team.	One member took the lead, however, all other team members remained engaged throughout the presentation.	Majority of the presentation completed by one student and other students seemed disengaged.	
2.6	Timing	Presentation is within the 10–15-minute time frame.	Presentation is slightly over or under the 10–15-minute time frame by 1-2 minutes.	Presentation is over or under the 10–15-minute time frame by 3-4 minutes.	Presentation is over or under the 10–15-minute time frame by more than 5 minutes.

Prototype Submissions

	Criteria	Excellent (4 points)	Good (3 points)	Fair (2 points)	Not Included (0 points)
3.0	Timely Submission	Submission is made on time.	Submission is 1-2 late.	Submission is 3 days late.	Submission is later than 4 days.

***Submissions will not be accepted past 5 days late.*

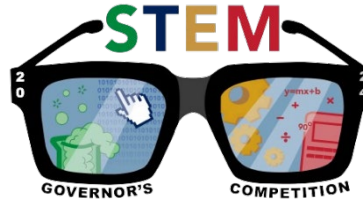
Logo Contest

We are excited to announce the launch of our **2025 Logo Contest!** This is a fantastic opportunity for creative minds to showcase their talent and contribute to the visual identity of our competition. We invite all interested high school students to submit their original logo designs based on the criteria stated. The theme for the 2025 PaGSC is *Harmonious Fusion: The Art and Science of STEAM*. Adherence to the 2025 theme is required for all logo entries.

Contest Guidelines

Possible Design Platforms

- Adobe Illustrator
- Canva
- Corel Draw
- PowerPoint
- Publisher



Color Scheme: Use high-contrast colors to make the poster visually appealing. Avoid using color alone to convey information for accessibility.

File Formats: Preferred file formats are Vector, EPS, PDF, or SVG. Avoid formats like JPEG or Photoshop files that may include backgrounds.

Preferred File Formats (in order of preference)

- EPS
- PDF (most common)
- SVG (Canva)
- Vector



No Background: Submit the logo as an image with a transparent background.

Originality: We encourage unique and original designs.


Relevance: It should reflect the theme and values of our organization.

Scalability: Ensure the logo maintains its quality and clarity when resized.

Simplicity: The logo should be simple and easy to recognize.

Typography: If the logo includes text, choose fonts that are easy to read and complement the overall design.

Versatility: The logo should look good in various sizes and formats.

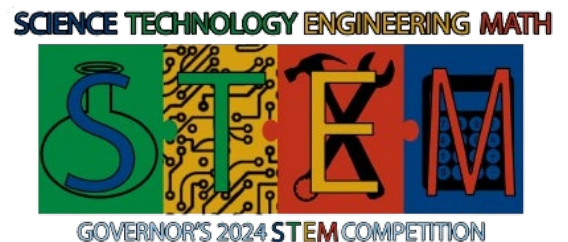
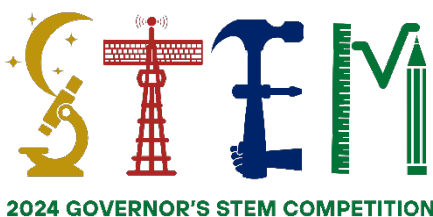
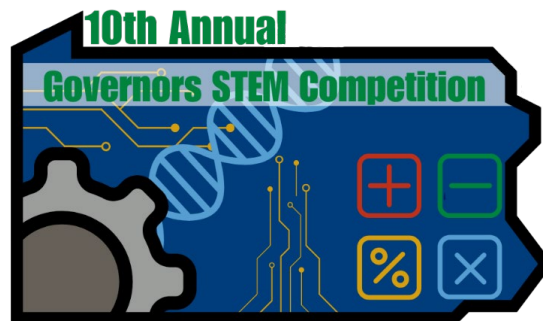
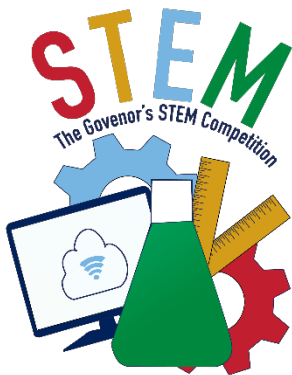
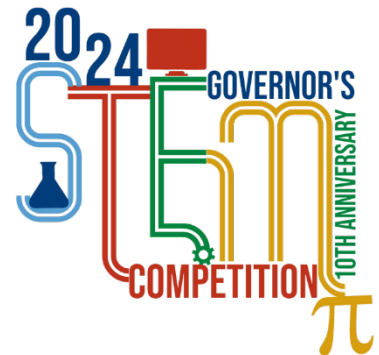
 The following file types are either very difficult to edit or unable to be edited or adjusted for formatting. **PLEASE DO NOT USE:**

- JPEG
- PNG
- Microsoft Paint (Saved files are like a JPEG or PNG.)
- Photoshop Files (Saved files are like a JPEG or PNG.)

Submission Details

- **Deadline:** All entries must be submitted by **Thursday, October 31, 2024.**
- **How to Submit:** [2025 Governor's STEM Competition Logo Submission Form](#)
- **Prizes:** The top 3 design will be featured as our official logos, and the designers will receive a competition t-shirt and invitation to the 2025 Governor's Competition Finals.

Previous PaGSC Student-Created Logos



Student Permission Form and Media Release

The Governor's STEM Competition Student Permission Form and Media Release

I, , give permission for to participate in the Governor's STEM Competition with the staff advisor listed below.

I hereby give my written consent to the Pennsylvania Department of Education (333 Market Street, Harrisburg, Pennsylvania), its successors, assigns and licensees and any agencies designated by the Pennsylvania Department of Education, to use my student's picture and/or voice for slide, website, or film/video purposes, including the use of said pictures on television and in magazines and newspapers and social media, wherever, whenever, and in whatever manner they shall desire, consistent with good taste which will not be derogatory, degrading, or detrimental to my student or family in any way. I understand that I will not receive any compensation, neither now or in the future, for the above.

I give permission for my child to participate as described above.

I do not give permission for my child to participate as described above.

Student Name:

School:

Staff Advisor:

Parent/Guardian Name:

Parent/Guardian Signature:

Date:

In addition to the submission of this document, it is recommended that this form be kept on file with the district high school or LEA.

Download here: [Governors STEM Competition Student Permission Form.pdf](#)

Student Permission Form and Media Release must be uploaded by **Dec. 23, 2024**, to the

[Competitive Prototype Registration Form](#)

LaunchBox & Innovation Network



Invent Penn State created the [LaunchBox & Innovation Network](#) to directly serve entrepreneurs in local communities across Pennsylvania. The Network consists of 21 innovation spaces (most are called “LaunchBox”) plus two large prototyping and fabrication spaces (located in State College and New Kensington). The Network provides free startup training and accelerators, business workshops, product development assistance, [free legal support](#), and other programs tailored to local community and ecosystem needs. Some locations offer additional makerspace and coworking services. *No affiliation with Penn state is required to take advantage of our resources.* Our network of locations offer incredible access of our resources to PA entrepreneurs – in fact, 96% of all Pennsylvanians live within 30 miles of one of our locations and 75% live within 15 miles.

For the Governor’s STEM Challenge, we invite student teams to use the **coaching and advising services** offered at *all* innovation spaces/LaunchBoxes to develop their ideas plus the **prototyping services** offered at the Network locations below. Keep in mind that you can get help from more than one LaunchBox!

- Abington LaunchBox
- Berks LaunchBox (Reading)
- Brandywine LaunchBox (Lansdowne)
- North Central LaunchBox (DuBois)
- James R. Meehl Innovation Commons (Erie)
- Hazleton LaunchBox (Hazleton)
- Great Valley LaunchBox (Malvern)
- Corner LaunchBox + Digital Foundry (New Kensington)
- OriginLabs (State College)



* LaunchBox locations offer virtual and on-site coaching and advising services.