***This 4Q Report was prepared under contract with the Utah Governor's Office of Economic Opportunity (Go Utah) as the lead organization of the Utah Defense Manufacturing Community (UDMC), with financial support from the Office of Local Defense Community Cooperation, Department of Defense (OLDCC). The content reflects the views of the Utah Defense Manufacturing Community (UDMC) and does not necessarily reflect the views of the Office of Local Defense Community Cooperation.***

***During the fourth quarter of the second year under the Defense Manufacturing Community Support Program (DMCSP), the objectives focused on program execution, program partner engagement, and continuing operations.***

***While working program engagements we placed special emphasis on any efforts that aid in the diversification of the defense supply chain, reduction of procurement costs and/or improvement of procurement processes and increasing the capacity of the defense workforce. The following activities describe those efforts.***

**Key Accomplishments:**

UMDC programs reached more than 900 students, worked with 150 schools, included over 40 courses/workshops/seminars, and assisted in submitting 11 STTRs.

**Workforce**

Our various programs conducted courses/programs, reached over 900 students, included 150 schools, provided over 40 courses/workshops, and served 12 companies.

**Supply Chain**

Our supply chain efforts have reached over 100 companies. The CONNEX supply chain platform underwent a major update, workforce programs included in CONNEX is 54.

**Research**

Under UDMC, 5 new research projects (63 total) that support defense manufacturing by Utah's research institutions were identified a major UDMC-funded event was accomplished.

**Small Business**

Under the various small business programs, there were 450 attendees from more than 15 companies, and over 25 workshops.

***Pillar 1: Workforce***

***<u>Objective/task title: Task 1.0</u>***

***Objective/task description:*** Utilize Utah Works to address the unemployed and underemployed through retaining and retooling, in order to meet the needs of the defense industry.

***Narrative of achievements:***

Work on marketing and building industry relationships has greatly increased enrollment in SLCC's Utah Works courses this quarter. The increase can be attributed to SLCC's increased instructional capacity from hiring PT instructors and filling the vacant Coordinator position in June. Since April, SLCC has fulfilled its commitment to Albany engineered composites to host weekly Composites Technician and bi-monthly Aerospace Assembly courses.

Challenges still exist from instructor availability, training, and hiring, however, no classes have been canceled due to lack of instructors. This is a significant accomplishment considering the challenges we face. Our team and partners remain committed to the success of this initiative.

**Accomplishments:**

**Number of students served**

- Albany Composites Technician: 29
- Injection Molding Technician: 5
- Aerospace Assembly Metals: 5
- Aerospace Assembly Composites: 40

**Number of companies served**

- Boeing: 5
- Albany: 69

**Pre-Employment Students Participating**

- Injection Molding Technician: 5

**Courses conducted**

- Injection Molding Technician: 1
- Aerospace Assembly Metals: 1
- Composites Technician: 8
- Aerospace Assembly Composites: 6

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

- Number of students who participated in the Utah Works Program: 79 in the quarter
- Number of students who Completed the Utah Works Program: 72 in the quarter
- Number of Workers Trained: 72

***Objective/task title: Task 1.1***

***Objective/task description:*** Increase and expand Career Pathway Programs. Talent Ready Utah (TRU) contracts with Davis Technical College (DTC) to expand the Utah Aerospace Pathways program through the development of coursework at both the secondary and post-secondary level, program setup, and offer exploration experiences to increase student interest and engagement, culminate with a work-based learning experience in the form of an externship or project that is

hands-on and has real-world application to increase capacity in the workforce for the defense manufacturing community.

***Narrative of achievements:***

Talent Ready Utah contracted with Davis Technical College to expand the Utah Aerospace Pathways programs through the development of coursework at both the secondary and post-secondary level, program setup, and offer exploration experiences to increase student interest and engagement, culminate with a work-based learning experience in the form of an externship or project that is hands-on and has real world application to increase workforce for the defense manufacturing community. Talent Ready Utah also contracted with Davis Technical College to expand the Utah Aerospace Program (UAP) program to additional high schools within the region and to expand the UAP / composite programs within K-12 schools within the consortium's region, which will benefit the DoD industrial base with increased availability of qualified workforce. Davis Tech worked with DSD to expand enrollment at two high schools, add the program to one high school and aim for 20-30% of students enrolled in the composites program to enroll in UAP. The grant also allows for expanding capacity, upgrading equipment and curriculum development at both the high school locations and the Davis Tech main campus.

We were able to complete payments on many of the upgraded systems on our autoclave and control systems upgrades, and our students continue enjoying this updated equipment. Classes at the high schools have started within the last two weeks. While enrollment numbers are still being finalized and confirmed, we have an estimate of how many students are enrolled.
Syracuse High School has approximately 33 students, Northridge has approximately 44 students and Clearfield has approximately 7. These numbers are still in flux as students finalize their schedules and complete the enrollment process within our NorthStar system at the College. We show no students having completed the pathway or getting job placements on this report as it will take 2-3 years for secondary students to progress through the pathway. Because of this timeframe, these numbers will be dependent on which grade the students are in when they enroll. The program is course-based and self-paced, so completion is dependent on how quickly a student completes coursework and will vary by student.

**America Makes**

Task 1.0 Expand Utah Works to meet labor needs within the defense manufacturing industrial base.

Task 1.1 Increase and expand career pathway programs.

Task 1.2 Encourage work-based learning and apprenticeships.

Task 1.3 Expand Systems Engineering education and training in Utah.

America Makes collaborates to leverage best practices from the EWD library and engagement of members where applicable. Examples include apprenticeship frameworks, credentialling programs, bodies of knowledge, Girl Scout Additive MFG Patch Program, Middle School Recruitment Toolkit, Micro-learning for Middle School Students, Additive Edge – high school awareness and inspiration program.

During the fourth quarter of 2022, America Makes had the opportunity to further collaboration efforts with Granite Technical Institute and 10 of their feeder middle schools. America Makes continues to support the opportunity for Granite School District to deploy the America Makes NOCTI (National Occupational Competency Testing Institute) Essentials of Additive Manufacturing (AM) credential for high school students created in partnership with America Makes funded through a grant provided by the National Institute of Standards and Technology (NIST). For employers, credentials are an assurance a candidate has the industry-relevant skills, knowledge, and support needed to produce a highly agile additive manufacturing workforce. For a rapidly growing field like additive manufacturing, this is especially important in building workforce pipeline. This new Essentials of AM credential not only serves as a validation of student skills but will also provide connections to the industry and can serve as a bridge to professional-level certifications. As one of the sites deploying the new America Makes NOCTI Essentials of AM credential, Granite School district received a 3D printer package from America Makes, funded through a grant provided by the National Institute of Standards and Technology (NIST), to assist in the adoption and sustainment of the credential.

To further expand the additive manufacturing pipeline within the Granite School district, America Makes deployed our Middle School eLearning Modules to the ten middle schools in the district along with the Youth Educational Support School. These 11 microlearning modules feature a series of short interactive lessons to introduce students to the basic elements of AM. Each module demonstrates a unique step in the AM process, beginning with an introduction to additive manufacturing, continuing through CAD software instruction, basic printer operation, trouble shooting and cybersecurity. In addition, school instructors and administrators will be provided with supplementary Instructor Guides and Cybersecurity Tips and Tricks to assist in the deployment of the microlearning modules in the classroom.

During Q4, America Makes also supported Davis Technical College in creating exciting activities for their summer camp program. America Makes collaborated with Davis Tech personnel, providing access to micro learning assets, additive manufacturing outline framework, and a NIST/DoC SME Tooling U scholarship from America Makes to gain access to vetted training content to support curriculum creation.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

- Total number of Pathway students: 86
- Total number of certificate completions: 0
- Total number of student job placements: 0
- Total number of schools: 3

***Objective/task title: Task 1.2***

***Objective/task description:*** Expand the Talent Ready Apprenticeship Connection (TRAC) to defense manufacturing companies and establish as the state's youth apprenticeship center.

***Narrative of achievements:***

- The program saw a 95% passing rate for currently enrolled AMFG students in the Spring 2022 semester.

- AMFG 1100 has been re-developed to improve the math and hands-on skills of new apprentices

- Development of all AMFG courses was completed in Q2

**Progress Towards Key Activities/Commitments:**

Updating curriculum for three courses in the existing Advanced Manufacturing Apprenticeship A.A.S. program.

- Curriculum development for two 40-hour train-the-trainer workshops including the translation and publishing of development content: Manuals, handouts, and training materials for Supervisor Training and Industry Partner Apprenticeship Development Training.

- Delivery of two, five-day train-the-trainer workshops for Company Apprenticeship Development Training to be coordinated with the Center to facilitate the participation of TRAC potential industry and education partners as well as those already working with Salt Lake Community College.

- Delivery of two, three day follow up training sessions to provide additional coaching for Industry Partner Apprenticeship Development Training to be coordinated with the Center.

- Delivery of apprenticeship education and training for 22 apprentices.

**Program Success Stories:**

Seven of the eight Year 3 apprentices celebrated graduation at a ceremony hosted by Stadler Rail in July 2022. They all have received a full time offer letter from their company, many of whom had multiple departments bidding for the apprentices. Some of the apprentices are looking to continue their education to advance their careers even further.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

- Number of students that participated in TRAC: 36

- Number of students that completed TRAC: 8

- Number of students that had job placements because of TRAC (all students are currently employed as apprentices at Stadler Rail): 36

***Objective/task title: Task 1.3***

***Objective/task description:*** Expand Systems Engineering Education and Training in Utah.

***Narrative of achievements:***

The UDMC team continues to expand system engineering education and training in Utah. This effort is critical to all the UDMC community, but especially so for the capacity of the defense

workforce. For the spring semester five students completed the program and all five were placed in employment. For the fall semester, we have seven new enrollments in system engineering.

Systems Engineering job growth is expected to grow by at least 8% over the next 10 years. Weber State expects to place our students in systems engineering jobs include:

- Manufacturing
- Aerospace
- Healthcare
- Information Technology
- Defense technology
- Pharmaceutical
- Medical devices

Weber's focus on INCOSE standards, teachings, and the Certified Systems Engineering Professional (CSEP) exam, provides students with additional career advancement opportunities.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

- Number of students participating: 7
- Number of students who completed: 5
- Number of workers Trained: 0

***Objective/task title: Task 1.4***

***Objective/task description:*** Conduct outreach for an Advanced Composite Materials and Structures Center which would be a joint venture to be developed at Utah State University (USU) in association with Weber State University (WSU), to provide a Master of Science degree that is geared towards practicing engineers and will be taught through a hybrid model approach.

***Narrative of achievements:***

The UDMC coordinated support for the new Composites Degree Program. Even though this Task is officially completed, and funding is in place, the UDMC still continues our work to advance this program further.

The UDMC team organized strategic meetings with Utah State to start moving forward on new collaboration and ideas:

- America Makes offered leveraging the Additive Edge program to help build out additive manufacturing pathways in local feeder school districts to inspire the talent pipeline.

- America Makes offered facilitating the collaboration with RCBI to establish an additive manufacturing apprenticeship program within Utah State.

In addition to these meetings America Makes will be collaborating to leverage best practices from the EWD library and engagement of members where applicable.

***Quantitative/qualitative output and/or outcome (accomplished or expected): Task Complete***

***Objective/task title: Task 1.5***

***Objective/task description:*** Focus on involvement of women and girls, by building programs that amplify and create talent within the STEM fields to support more females from kindergarten through high school, advanced degree program, to the boardroom.

***Narrative of achievements:***

***Ogden Weber Technical College (OTech)***

The Ogden-Weber Technical College welcomed 12 students for the second UDMC Women in Welding Summer Camp. Students ages 14 - 18 came from all over Weber County to spend 4 days with us. The group was even joined by a foreign exchange student from France that chose to spend her first week in the United States with us. The camp was offered August 9th – 12th to kick off the school year and remind students that they can fill their free blocks by taking a program with The Ogden-Weber Tech College.

With a new Program Coordinator, we approached the camp a little differently this year. He consulted women in our welding program and asked them what they would like to see as a project in our camp. He worked with them to decide on smaller projects the students could make to get comfortable with the equipment. Kathy, an OWTC welding instructor, was asked to design a modern wind chime and to lead the students for the week.

Students started from scratch, learning the basics as they cut, bent, and welded all materials themselves. After completing the wind chimes students worked on flowers, hummingbirds, or butterflies to decorate a shepherd's hook that would hold their wind chimes. The final project gave students the opportunity to design something that they wanted to make. We saw a huge variety in designs from the students, from antlers to headphones to shooting stars.

During the camp the girls had a couple visitors. One of Ogden-Weber Tech's NDI instructors, Cami Felix, came to share her experience with the students. She started her career welding and eventually was given an opportunity to move in into quality which led her back to the OWTC for a second certificate in Non-Destructive Inspection. Cami shared with the girls that welding can be hobby and career, but it can also be a solid steppingstone that could lead you into other fields and leadership.

The last day of camp we were joined by parents and siblings. The student's projects were showcased, and families were invited to tour the program area. Parents and siblings were able to see the equipment their students used and hear stories about the week from our instructors and student helpers.

Even though we had 100% of registered students attend the camp we did not max out our registration like we did last year. We believe that we improved on finding our target audience but the dates we picked might have been too close to the beginning of the school year. We intend to keep the camp running next year but adjust the dates to better accommodate our student audience.

The UDMC documented a lot of high school growth in our welding program over the last two years. While the majority of our high school students are male, we have been seeing more and

more female students start our program. We believe a big part of that has been from offering this camp two years in a row now and the positive stories it has generated among the students.

***Davis Technical College (DTC)***

As part of the Northern Utah Women's Networking and Career Exploration Event, The UDMC team held the "Spark Your Career" women's networking event on Monday, June 13th. It was an open-house-style event where women looking for a manufacturing career learned more about our CNC, Composites, Automation, Welding, and Injection Molding programs. Representatives from DTCs student services and financial aid departments were available to show attendees how to complete the enrollment and financial aid processes. The women who attended received vital information about the options available to them in the manufacturing fields. Our recruiters have the contact information for those who registered and will continue to reach out with enrollment information. This gives us the opportunity to continue building on the great work already underway while expanding the future workforce support for our defense manufacturing community.

Davis Technical College also held a welding camp for girls on June 14-17, 2022, on our main campus in Kaysville, Utah. This exciting camp was for high school girls interested in exploring the art and science of metalwork through the medium of welding. We had 15 young women attend. These young women worked with two of our Welding Technology instructors to learn different processes, metal tolerances, and design techniques to create beautiful and useful pieces. Lincoln Electric, one of our long-time industry partners, provided gloves and head wraps for each camper. ORE Designs welcomed the young women to their facility and gave them a tour. These experiences allowed the campers to hear directly from employers about the many possibilities the welding industry has for women.

At the end of the week, our Davis Tech advisors spoke to the girls about the next steps in enrolling in the Welding Technology program at the college. We currently have one of the girls who attended camp enrolled in the program here at Davis Tech, and two others indicated they would like to enroll soon. In their pre-camp questionnaires, no attendees indicated any prior experience with welding. In their post-camp surveys, the results were overwhelmingly positive. They loved the experience and would recommend this camp to someone else. They raved about the instructors and enjoyed interacting with other girls during the process. Their interest in welding grew across the board, and their likelihood of taking a welding class in the future increased.

Our instructors put together a video of the week, showing the girls at work:
https://youtu.be/mPE_rLbsCCY

The Davis Journal ran a story about the camp:
https://www.davisjournal.com/2022/07/05/405138/girls-with-blow-torches-prove-welding-is-not-just-for-men

Fox 13 News ran a story as well:
https://www.youtube.com/watch?v=kTouUvRfRN8

See Attachment 1_Task 1.5 Spark Your Career

These events continue providing critical visibility to the opportunities within our defense manufacturing community. While the efforts focused on the youth in our community take years to show as quantifiable additions to the workforce and increased supply chain capacity, this is also one of the most effective ways to ensure long-term sustainability.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

Number of Girls Attended: 15

***College and Career Awareness Utah State University (USU)***

The UDMC completed the development and pilot testing of the Project-Based Learning Plan for the College and Career Awareness educators. The PBL plan, Tool-Up Tech: First Aid for the Backcountry, was published on the ccapbl.org website:

https://ccapbl.org/resources/tool-up-tech-first-aid-for-the-backcountry/.

This PBL plan was presented at the 2022 Summer College and Career Awareness Conference to 165 teachers.

We created a tutorial video (not part of our original proposal), to help teachers in executing the PBL plan. This YouTube video is linked within the PBL plan.

We completed work on three videos highlighting Utah women engineers engaged in aerospace, with a focus on manufacturing and composites. These videos are part of a YouTube playlist and are linked to the PBL plan developed in this grant and provided as a resource for other STEM PBL plans. It is estimated that 8,000-10,000 female middle school students will interact with the PBL plan, and the video created from this project.

This was a development project. As noted, we had 165 teachers participate in the College and Career Awareness Conference and hope the resource will be used by these educators who will work with 16,000 students with 8,000 being female.

This is the link to the videos curated, three were developed through this project funding.

https://www.youtube.com/playlist?list=PLWWFK-VssObFleFx8SWGgyz8SkKRCk7Kb

**Tech-Moms (WSU)**

The UDMC Cohort of 22 women begins on Sept 17, 2022 at the Community Education Center on 26th and Monroe, Ogden. We have six children involved in the childcare program associated with Tech Moms. This allows the moms to have the opportunity to attend class without having to find childcare. This service alleviates a barrier many mothers face when trying to retool themselves in any industry.

Please reference the following stories on the efforts:

https://www.ksl.com/article/50223146/massive-influx-of-utah-moms-training-for-tech-careers-with-local-nonprofit

https://kslnewsradio.com/1957096/local-program-looks-to-help-women-break-into-tech-industry/

https://www.sltrib.com/news/2021/03/20/new-program-designed/

https://www.bestcolleges.com/bootcamps/features/rise-of-tech-moms/

**4H Utah State University (USU)**

This has been a very productive quarter with the 4H project. We have held two different youth leadership trainings to prepare youth as leaders in teaching materials at clubs and camps in the area. This resulted in eight camps with 221 participants. We also worked with afterschool educators to implement programming in our targeted areas to expand outreach. This programming is continuing this fall.

We continue to add to the Engineer Everything curriculum and are in the process of formatting both existing and newly developed curriculum into a cohesive package. These are available for use free of charge, both within the 4-H community and for other educators.

One strong focus has been creating portable "Innovation Station" kits supporting our curriculum that can be checked out by our youth mentors and other educators for local use. These kits are "maker" kits in a box. They align with the curriculum we have developed to increase interest and accessibility for underserved populations, especially girls. One of the issues with teaching making or manufacturing is that educators often do not know where to start. We created a series of 16 Innovation Stations, or portable maker kits, that focus on an area of making and contain all of the non-consumable supplies and equipment to hold clubs and camps with a manufacturing focus. So far responses to kit use has been phenomenal. We will report on usage numbers and data from these pilots in our next report.

See Attachment_3 Task 1.5 USU 4H for Pictures

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

- Number of girls that were introduced to STEM programs in each of the 4 programs outlined. Engineer Everything 422, Young Problem Solvers 111, TRY Teams: 36, STEM Spots 115: 684 girls

- Number of Young Problem Solvers Camps (in form of afterschool clubs): 8 camps

- Number of Young Problem Solvers Camp participants: 111

- Engineering Everything Kits – Number of Kits created 3000

- TRY Teams – Number of Mentors 8

- TRY Teams – Number of Camps 7

- Number of girls that were supported to participate in TRY Team Training 36 girls

- Number of teachers implementing PBL within manufacturing 22

- 88% girls interested in pursuing STEM/manufacturing

- Number of Toolkits/Playbooks/Roadmaps: 4

- Number of Webinars/Workshops held: 4

- Number of Marketing & Communications Tools: 1

**Trego Engineering**

There are two goals for this subcontract:

The first goal is for Angela Trego to deliver a 2+1 workshop format for STEM and CTE faculty training, teaching skills in the areas of unconscious bias, micro-messaging and gamification principles. Engaged learning principles will be utilized which faculty can immediately use upon completion of the first workshop to increase the enrollment of women and underrepresented populations.

The second goal is to increase enrollment of non-traditional participants, especially females in STEM courses and ultimately STEM careers through training high school counselors. Angela Trego was identified to deliver a workshop for high school counselors teaching skills in the areas of unconscious bias and micro-messaging as well as informing counselors on the various career options for STEM students

**Task a: Provide "Breaking Barriers" training for up to 25 faculty**

Training has been scheduled for the Provo School District CTE teachers beginning in September 2022 and the final session will be completed by November 2022.

**Task b: Research coordination with district and develop survey for counselors**

A set of surveys for pre and post facilitation were developed and are ready for use at the beginning of the first facilitation. The first offering of the STEM counselor training, called "The Real Realities of STEM" will be at Davis School District in October 2022.

- Number of SEM/CTE teachers trained: 15

- Number of New workforce programs created or enhanced with advanced manufacturing: 2

**America Makes (UMDC DoD Institute partner)**

Objective: Focus on involvement of women and girls, by supporting and building programs that amplify and create talent within the STEM fields.

America Makes offered collaboration potential, Project Materials, Middle School Recruitment Toolkit, Middle School eLearning Modules, Micro Badges, Girl Scout Badges, High School Additive Edge Program, Scholarships available for self-paced AM eLearning courses. Continued offer of engagement of America Makes Members to provide Mentoring, Workforce, Education, Training, Outreach.

The America Makes team is preparing to assist in the launch of several key initiatives within the UDMC. Examples include deployment of micro-eLearning modules and a middle school recruitment toolkit for middle school students, deployment of Additive Edge in high schools, assisting high schools in the alignment to new industry credentialling programs, etc…

America Makes aligned collaborative efforts with the programs selected to receive funding through UDMC as listed below:

- Mother Coders/Tech Moms – America Makes continues their support of Weber State in upcoming grant proposals to deploy our Additive Edge program to the Tech Moms future cohorts. While not initially chosen for grant funding, work continues to look for opportunities to work with the team at Weber State and Tech Moms.

- Code Camp for Girls – America Makes offered to leverage members for involvement.
- Welding Camps – America Makes participated in planning meetings for the summer girls welding camp and offered to coordinate a tech talk on Metal Additive to highlight the parallels between welding and metal additive manufacturing. America Makes' Additive Edge program was offered as a potential camp activity.

- Career Awareness Course Development – program will be using videos to highlight women who work in manufacturing (as technicians, engineers). America Makes offered potential video/tech talk from member Fitz Frames and the Additive Edge project.

- Women's Mentoring and Networking – America Makes offered to provide a tech talk on Additive Manufacturing and will engage members for the mentoring opportunities.

- STEM Programs for Girls - 4H programs – America Makes leveraging the middle school modules.

During the fourth quarter, the team continued supporting the first expansion of the America Makes Additive MFG Patch with the Girl Scouts of Utah in collaboration with UAMMI and the Utah STEM Action Center. The patch will be earned through engagement in the AM technical areas of Design, Manufacturing, and Post-Production. Q4 brought the announcement of America Makes' partnership with Ultimaker to donate more than twenty 3D printers to be used in middle and high schools, as well as community organizations and non-profits across the country with the goal to grow awareness, inspiration, and entrepreneurship opportunities for 3D printing technology among young women and diverse groups and communities through educational outreach. America Makes supports the Utah Girl Scouts and the Utah STEM Action Center to apply for consideration to participate in this exciting partnership to further the adoption of the America Makes Additive MFG Patch.

Based on industry recognized credentials, the America Makes Additive MFG Patch is aligned to many Girl Scout Badges, including STEM and others where AM can be applied and integrated. Badges are a key component of the Girl Scout Leadership Experience, which focuses on four content pillars of Outdoors, Life Skills, Entrepreneurship, and STEM, with the goal of fostering courage, confidence, and character in girls to prepare them for a lifetime of leadership. America Makes provided a Playbook for best practices on integrating AM into Girl Scout programming, GSLearn modules, and customized curriculum created to earn the patch, including fashion and

game board design. To supplement the learning materials that accompany the America Makes Girl Scout patch, the Utah Girl Scouts and supporting partners have been provided with access to America Makes AMNation Pipeline Portal and our Middle School eLearning Modules. These 11 microlearning modules feature a series of short interactive lessons to introduce students to basic elements of Additive Manufacturing (AM). Each module demonstrates a unique step in the AM process, beginning with an introduction to additive manufacturing, continuing through CAD software instruction, basic printer operation, trouble shooting and cybersecurity. To further enhance the scouting experience, incorporate boots on the ground, and facilitate mentoring opportunities, America Makes continues to support a collaboration with the Women Tech Council, Girls Scouts of Utah, America Makes, and UAMMI personnel. America Makes will continue to work to identify potential opportunities for collaboration to support the Utah Girl Scouts in their deployment of the patch activities, either through equipment or industry partner support.

**Additional Information:**

Through collaboration with Davis Tech in the design and curriculum creation of their youth summer camp, we are pleased to report an exciting success story for the quarter. America Makes provided access to micro learning assets, additive manufacturing outline framework, and a NIST/DoC SME Tooling U scholarship from America Makes to gain access to vetted training content to support the camp. Reports from the camp were phenomenal! Participants had fun learning the additive manufacturing processes. Two of the students were inspired to continue learning about the opportunities in Advanced Manufacturing and returned to participate in the CNC summer camp. We truly celebrate helping students experience that "lightbulb" moment – as the students returned for their second week of camp, they were excited to relay stories about the 3D printed projects they were now completing at home because of the spark ignited at Davis's summer camp.

See Attachment_2 Task 1.5 America Makes for pictures and figures.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

As this task includes result from multiple UDMC partners, our quantitative results are included in the narrative for each partner above this section.

***Objective/task title: Task 1.6 STEM and K-8th Grade***

***Objective/task description:*** Educate and inform kindergarten through eighth-grade students about the manufacturing industry, before they reach high school.

***Narrative of achievements:***

***STEM Action Center***

Over the last quarter, the STEM Action Center finished registration of the new Additive Manufacturing kit which will impact an estimated 1,500 students statewide. Additionally, the STEM Action Center will be hosting workshops with Girl Scout Troops to help them earn the America Makes' Additive Manufacturing patch.

The STEM Action Center finished the registration of the new Additive Manufacturing kit as part of its STEM in Motion program. The kit will be used every week of the upcoming school year, impacting an estimated 1,500 students across the entire state.

Additionally, the STEM Action Center will be working with Girl Scouts of Utah to host workshops focused on additive manufacturing. After completing a workshop with the STEM Action Center, Girl Scout troops will be able to check out a 3D printer to complete America Makes' Additive Manufacturing patch.

- Number of Students Participated: Anticipated 1500
- Number of new courses/programs created: 1 Additive Manufacturing Kit (registration finished)
- Number of new courses/programs updated: 1 Girl Scouts Patch ready to launch
- Number of Webinars/Workshops: Anticipated 4 workshops

***America Makes***

Objective: Results of a survey in June 2020 found that 73% of high school students in Utah do not consider manufacturing as a career. This project's objective is to educate and inform K - 8$^{th}$ about the manufacturing industry before they reach high school.

STEM Action Center and America Makes implemented new modules for additive manufacturing Additive Manufacturing/3D Printing activities-kit. Digital badging topic area outline and the AM Process Graphic was provided to the STEM Action Center to support building out the 3D printing kits. America Makes continues to support the STEM Action Center through access to our America Makes AMNation Pipeline Portal and the educational outreach assets hosted on the portal, including the Middle School Micro-learning modules for Middle School Students, and Additive Edge – a high school awareness and inspiration program. In addition to STEM Action Center personnel being provided with access to America Makes AMNation Pipeline Portal and the Middle School eLearning Modules to support their efforts in assisting deployment of the America Makes Girl Scout patch, America Makes continues the efforts to align printing equipment assets with increasing female inclusion in STEM curriculum through our Ultimaker partnership program.

Working Group, American Makes, and My Tech High develop curriculum, Additive Manufacturing/3D Printing K-8 Modules, for K-8th grade. America Makes continues to work towards collaboration with My Tech High to leverage the America Makes Middle School Recruitment Toolkit and Additive Edge – a high school awareness and inspiration program.

America Makes continues to work with UAMMI and the Utah Manufacturing Association to strengthen outreach in the region to facilitate additional scaling of our educational assets during the 2022-23 school year.

***My Tech High***

UDMC partners UAMMI and My Tech High held several meetings with various stakeholders, including:

- Course Developers

- America Makes
- Educators
- UAMMI leadership
- UDMC STEM Action Center

- Worked with Scott Brown of Brainmaker Games to discuss the process of self-publishing, manufacturing, and bringing board games to market.
- Met with Joe Larson (3D Printing Expert) develop and record videos applicable to coursework.
- Met with McKay Bowman to discuss the process for self-publishing games.
- Met with Optimize Play (graphic design) and engaged with them to develop additional characters and backgrounds for the new course.
- Researched and tested Shapr3D for implementation in future course development.
- Researched and tested PrintPlayGames for implementation/use in the current course.
- Completed development of a full year course for students in grades 3-5.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

- Number of new courses/programs created: 1 new course in progress for Beta Fall 2022
- Number of courses/programs updated: 2 (both courses are updated in real-time)
- Number of Students who Participated & Completed: 109 enrolled

***Pillar 2: Supply Chain***

***Objective/task title: Task 2.0***

***Objective/task description:*** The development of CONNEX for the UDMC will be expanded to allow for increased collaboration between academic institutions, Hill Air Force Base (HAFB), and the defense industrial base by furthering workforce initiatives and research and development (R&D), as well as the defense industrial base by increasing the number of organizations connected in the platform.

***Narrative of achievements:***

**America Makes**

Supply Chain: Objective: Continue development of the CONNEX supply chain tool to improve resilience, reshoring manufacturing, and creation of composites center of excellence.

Research:

Objective: Research programs better aligned to support the defense industry.

Small Business

Objective: Support small businesses, the backbone of the defense manufacturing industry, by enhancing supply chain opportunities and providing innovation and rapid development of new products.

America Makes attended UDMC Supply Chain Working Group meetings and will be engaging as a committee member to leverage both active and past projects as well as engage stakeholders

on a national scale. America Makes will assist in identifying correlations and alignments to national defense strategies where applicable. The America Makes information technology team reviewed and assessed the CONNEX tool for alignment to the America Makes technology roadmap prior to final release.

**i5**

**New functionality added to CONNEX:**

Since the launch of the new combined platform that we call CONNEX Marketplace (CM), there has been a lot of movement towards national adoption of this platform. Although CM is operational nationwide with manufacturing organizations in all 50 states, we have *focused implementation* of CM in ten partnership states, two of which are new since our last report. These states include: UT, WY, KS, MO, OK, MI, TN, FL, VA and a region of TX. This movement towards national adoption will make the CM environment a richer and deeper experience for all involved, including organizations from Utah.

**- Research and Development**

We are in the phase of adjusting based on live data entry and user feedback. Additional enhancements were released to the live environment on Aug 10, 2022:
- Added "Areas of Expertise" field that a researcher can use to describe their own areas of interest and expertise. Besides making a narrative available to help improve an understanding of the researcher in the platform, this new field is indexed and searchable which will help to bring their organization to a higher position in search results if matching terms are used in a search.
- Added "Personal Website" field that a researcher can add to link users to their own external profile page. This hyperlinks to the external profile page via a new tab as a convenience.

**- Additive Manufacturing:**

On June 15, 2022, i5 Services (Roger Salisbury, Jer Duck) and UAMMI (Tulinda Larsen) met with Josh Cramer with ncdmm.org to review current AM materials, equipment and processes that are set up in CM. Josh will then take that information and consult with his circle of associates and provide us with feedback.

**- Workforce:**

Workforce status update meetings were held every other week throughout the last quarter starting on Thu May 12, 2022 through Aug 19, 2022. We worked together towards the debut of this module in CM. Attendees included the following: Tulinda Larsen, Martin Moore, Jer Duck and Roger Salisbury. i5 Services will continue to adjust for UDMC pillar features in CM as deemed necessary throughout 2022. The UDMC team will resume progress meetings with working groups and add additional participants in CM in 2023 and through 2025.

This release was the debut of the Workforce module that was ported over from the prior state-specific instance of CONNEX. (These state instances were retired when the combined CM platform was released in March 2022.) All Utah organizational data for Workforce from the retired platform was reviewed by UAMMI personnel, updated off-line for any needed adjustments, and then imported into CM. Some highlights of the Workforce functionality in CM includes:

- A registration process for the Workforce organization type to enable the onboarding of new Workforce organizations.

- Unique profiles sections just for Workforce organizations. These include:

  - Education and Training programs

  - Consulting and Services

  - Resources and Activities

- Ability to be found by Manufactures and other Workforce organizations in CM's powerful Search tool using all profile data.

- A full-featured "Explore" tool dedicated just for Workforce organizations. This includes a full list of all Utah Workforce organizations currently registered in the platform with a map view of each location as pins on a map, a quick search tool, and instant navigation to the organizations full profile.

**Number of additions to CONNEX: 19**

-This quarter, 13 new defense manufacturers were added bringing the total to 95.

-Small Disadvantaged Businesses - 1 new addition bringing the total to 9.

-Small Disadvantaged businesses 8a - no new additions keeping the total of 1.

-HUBZone - no new additions keeping the total of 1.

-Veteran-Owned Small Business - 1 new addition bringing the total to 7.

-Service-disabled Veteran-owned Small Business - 2 new additions bringing the total to 3.

-Economically Disadvantaged Women-Owned Small Business - 1 new addition bringing the total to 4.

-Women-Owned Small Businesses -1 new addition bringing the total to 35.

Added together, the new count to CONNEX is 2 this past quarter.

*These numbers were pulled by doing a query on organizations with an SBA program attached.*

**Workforce programs currently in CONNEX:**

-Number of workforce programs: 54, the same as Q1. Workforce was launched in the new CONNEX Marketplace platform in August 2022.

**Research programs currently in CONNEX:**

-Number of research projects: with the addition of 5 new R&D projects, the total is 63.

**Workshops:**

Planned upcoming Workshops:

Workforce, R&D and AM:

- To resume quarterly in 2023 per UDMC SOW

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

*Number of new functionalities added to CONNEX: 5*

*Publicly announce new functionalities: Announced in April*

*Number of Companies identified as Defense Manufacturers: 95*

*Number of New Participants added to CONNEX: 19*

*Number of workforce programs included in CONNEX: 54*

*Number of research projects included in CONNEX: 63*

*Number of Companies identified as Veteran Small Business: 10*

***Objective/task title: Task 2.1***

***Objective/task description:*** COVID-19 illustrated the national security risks that arise due to foreign dependency in manufacturing critical materials for defense. Based on the findings of the UAMMI study, which will identify Utah reshoring opportunities, the UDMC will develop an execution plan.

**Narrative of achievements:**

UAMMI sent targeted communications in early June to cluster members regarding the program. Tulinda Larsen, Executive Director, also participated in a webinar that highlighted the grant program on June 17, 2022, with iMpact Utah and the Governor's Office of Economic Opportunity (Go Utah).

UAMMI directly reviewed draft proposals for 10 firms, an effort that overlapped with and is documented as part of UAMMI's role in relation to SBA/RIC.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

The UDMC project's expected outcomes were completed in the third quarter with the provision of the "Reshoring Utah" report. Moreover, expectations were exceeded based on the use of the report information in the elaboration of the Manufacturing Modernization Grant Program.

The program was a major success for the UDMC. Of the 22 firms that have been awarded MMGP, six were among the 10 members that UAMMI directly assisted. These firms are:

- Alloyed Solutions

- Crockett Gear

- Lakeshore Plastics

- Merit 3D

- Origen MFG

- Really Right Stuff

Although not all these firms are directly or currently involved in defense manufacturing, many are using the grant funds to position themselves to expand sales into the aerospace and defense sectors.

The total value of the MMGP awards to these cluster members is $2.06 million, representing just over 20% of the $10 million grant pool.

Under its UDMC contract with Go Utah, in upcoming quarters, UAMMI will monitor the performance of all recipient firms in compliance with grant terms. Additionally, UAMMI will evaluate reshoring programs that may develop at the Federal and state levels nationwide to advise UDM on how these may indicate potential improvements to the MMGP program or indications of potential challenges.

***Objective/task title: Task 2.2***

***Objective/task description:*** With the onset of new USAF Agility Prime programs of unmanned aerial systems (UAS); electric vertical take-off and lift (eVTOL); Advanced Air Mobility (AAM); ORBS for logistics, rescue, and troop movement and swarm warfare, lower cost and higher speed aircraft, new materials, and manufacturing methods are urgently needed. The UDMC will support small business and research institutions' Small Business Technology Transfer (STTR) Open Topic proposals for Agility Prime.

***Narrative of achievements:***

The UDMC delivered the investable plan for a Utah Center of Excellence for testing and qualifying advanced materials in Q1. This Task is closed.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

The UDMC delivered the investable plan for a Utah Center of Excellence for testing and qualifying advanced materials.

***Pillar 3: Research***

***Objective/task title: Task 3.0***

***Objective/task description:*** Increase collaboration between academic institutions, Hill AFB, and the defense industrial base by furthering R&D initiatives.

***Narrative of achievements:***

The UDMC proceeded with follow-up work from our symposium held last quarter. This included multiple discussions with members of our research community and preparation for additional events going forward. We also made significant progress with HAFB and aligning their supply chain organization with our small business community for execution of prioritized initiatives.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

- Research opportunities in CONNEX: 63

***Objective/task title: Task 3.1***

***Objective/task description:*** Research related to composites.

***Narrative of achievements:***

This task is closed with the Business Plan final deliverable for the Utah Aerospace Advanced Manufacturing Center, provided by the UDMC in February 2022.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

With the delivery of this business plan, this task is now complete.

***Objective/task title: Task 3.2***

***Objective/task description:*** Research related to converting coal to carbon fiber (C2CF).

***Narrative of achievements:***

We completed all the work on this task and attached our final report included in the last report.

***Pillar 4: Small Business and Incubators***

***Objective/task title: Task 4.0***

***Objective/task description:*** Identify veteran owned defense manufacturing businesses and utilize existing outreach initiatives to increase awareness and access for veterans with a focus on veteran owned businesses in the defense manufacturing industry.

***Narrative of achievements:***

Our UDMC team worked to continue the advancement of CONNEX to facilitate the inclusion and identification of veteran owned defense manufacturers within the tool. Additionally, our team worked to enhance the tool's usability for those companies as described under task 2.0.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

Veteran owned Defense Manufactures in Connex: 10

***Objective/task title: Task 4.1***

***Objective/task description:*** Outreach of existing programs for entrepreneurs and small businesses through the Utah Industry and Innovation Center under GOED. This will be accomplished by utilizing existing resources within the state, such as the SBIR/STTR, and working with UDMC to identify small businesses eligible for these programs.

***Narrative of achievements:***

Two virtual SBIR 101 trainings were held during the quarter, and one training was held in-person which focused on women entrepreneurs.

Two additional outreach events:

- Virtual Panel Discussion with three Utah entrepreneurs sharing best practices and their experience with the SBIR/STTR programs – 46 attendees; this was held during the National Seed Fund Week

- NSF workshop – some overlap with UDMC companies – 28 registrants

***Quantitative/ qualitative output and/or outcome (accomplished or expected):***

Ten small businesses under the UDMC umbrella received services from Center staff to submit 11 SBIR/STTR proposals during the quarter. This included eight Phase I, one Phase II, and two Direct to Phase II proposals.

One company was notified by the Army that the proposal was selected but is going through final approval. Three companies, Coreform, Nielson Scientific and InnoSys received Phase II awards from the Dept. of Energy for technologies that are relevant to defense priorities: https://business.utah.gov/innovation-center/department-of-energy-awards-utah-companies-8-2-million-in-research-and-development-grants/

Spotlighted company, Silicon Technologies Inc., that has worked with the Department of Defense beginning with DARPA to develop technology with a broad commercialization impact in and outside of the DoD: https://business.utah.gov/innovation-center/utah-company-works-to-bring-semiconductor-business-back-to-the-us/

**PTAC Report**

Events Sponsored/Participated in: 25

Highlights:

- Go Utah/PTAC Aerospace/Defense Industry Event: 375

- How to do Business with the Veterans Administration & Bureau of Land Management: 25

- Establish Mentor/Protégé, Joint Ventures & Teaming Agreements 19

- Congressional Client Meeting with Rep. Blake Moore: 30

- Counseling Hours: 586

- Contract Awards: $96,012,000

***Objective/task title: Task 4.2***

***Objective/task description:*** Leverage UAMMI's contract with Small Business Administration (SBA) for Regional Innovation Cluster (RIC) and Rapid Advanced Materials Program (RAMP) programs to assist in expanding and growing the defense industrial supply chain.

***Narrative of achievements:***

As shown in previous reports, RAMP is a key program for our RIC efforts. Through this program, our team can spend time with key Cluster Members and provide one on one training and mentoring. This program continues to provide the RIC cluster with significant accomplishments. The UDMC team continues to mentor RAMP participants and previous graduates.

The UDMC team selected our business teams for the Fall Cohort of RAMP and are scheduled to start on September 22. Multiple companies applied resulting in a strong final selection.

***Quantitative/qualitative output and/or outcome (accomplished or expected):*** Through our RIC engagement we continue to meet our goal of providing individual counseling/training to at least 15 small businesses per quarter.

**UDMC Expected Impact Areas**

Please note the following additional key activities, meetings, and engagements focused on diversification of the defense supply chain, reduction of procurement costs, improvement of procurement processes, and/or increasing the capacity of the defense workforce. These events represent a sample of our efforts that span beyond any single task and focus on a larger programmatic perspective. While this is not all inclusive of every meeting or event, we want to be sure to illustrate the additional efforts under the UDMC.

**UDMC meetings not detailed above:**

6/2/2022: UAMMI Price Office Opening (44 Attendees)

6/23/2022: AMCC Virtual Briefing- Sustainable Manufacturing

6/29/2022: UAMMI Lunch with the Governor (13 Attendees)

7/28/2022: International Logistics Workshop

8/10/2022: Preparing Utah's Manufacturers for Looming Recession (76 Attendees)

8/11/2022: Information session- UAMMI’s Programs for Manufacturing Companies

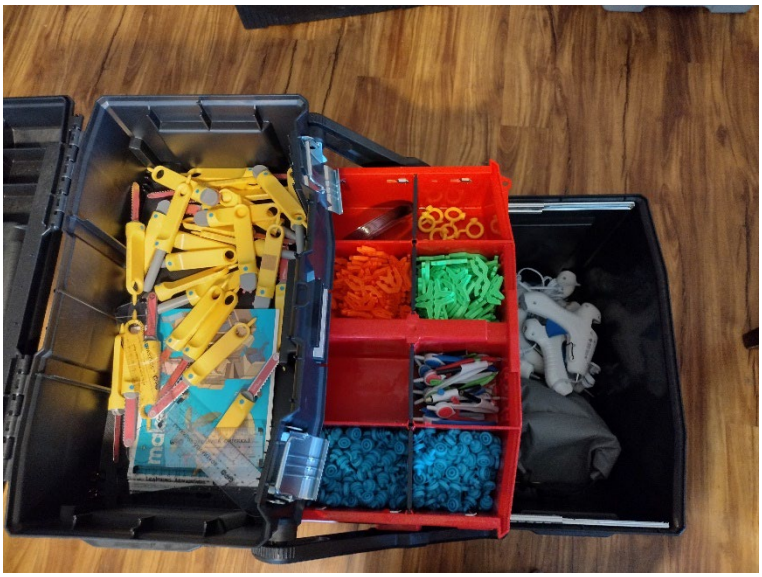
8/18/2022: UAMMI Board Members Congressman Curtis Meeting (12 Attendees)

***Task 1.5***

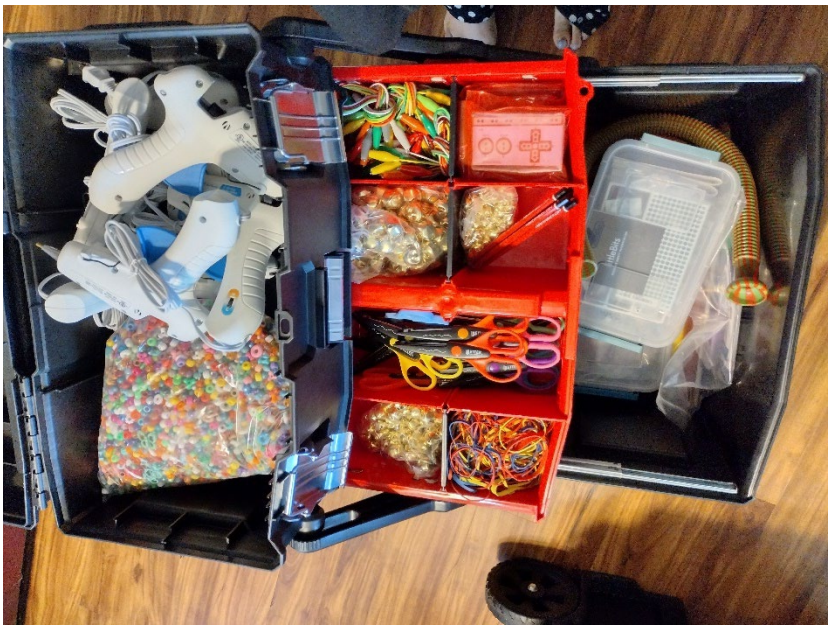
This is a **Stop Motion Animation** Innovation Station, and includes document cameras, a foot pedal and manipulatives that youth can use to create a stop-motion animation story. Computers are also available for checkout to use with this activity

This is the **Sweet STEM** Innovation Station. We use it to teach Engineering Design, but starting with a creative activity that holds interest for many girls. The first focus of this kit is using cooking to teach the computational thinking concepts of pattern recognition, abstraction, decomposition, and algorithmic thinking.

This is a **Textiles** Innovation Station, which focuses on the engineering design process through sewing skills. This includes sewing tools, crochet, cross-stitch and looms. We use the engineering design process and mathematical skills in laying out the patterns and designing a graphed "prototype". You will notice that this kit facilitates many of the pixelations activities outlined in our last report. Bernina sewing machines are also available for checkout.



This is the **Cardboard Creations** Innovation Stations. It includes reusable hardware for manufacturing prototypes using cardboard. This is an easy-entry point for most camps and clubs because cardboard is readily available and not intimidating to those with limited tech experience. It is a great place to start with engineering design.

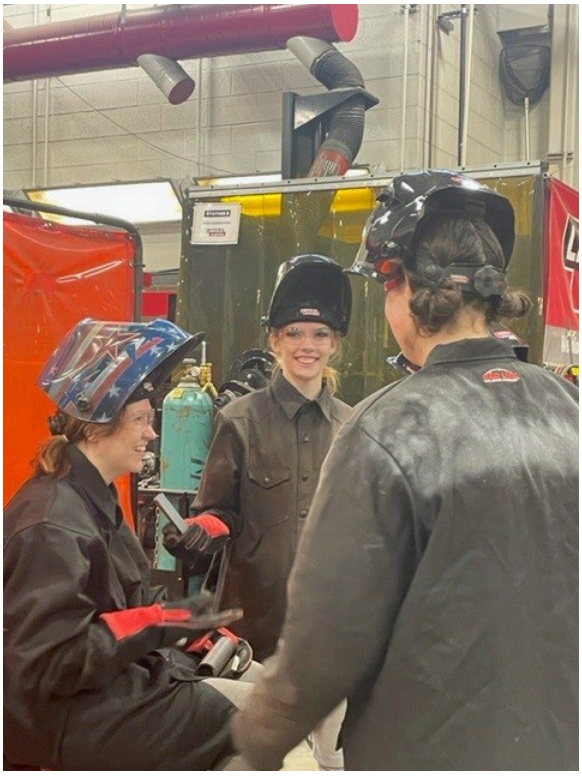


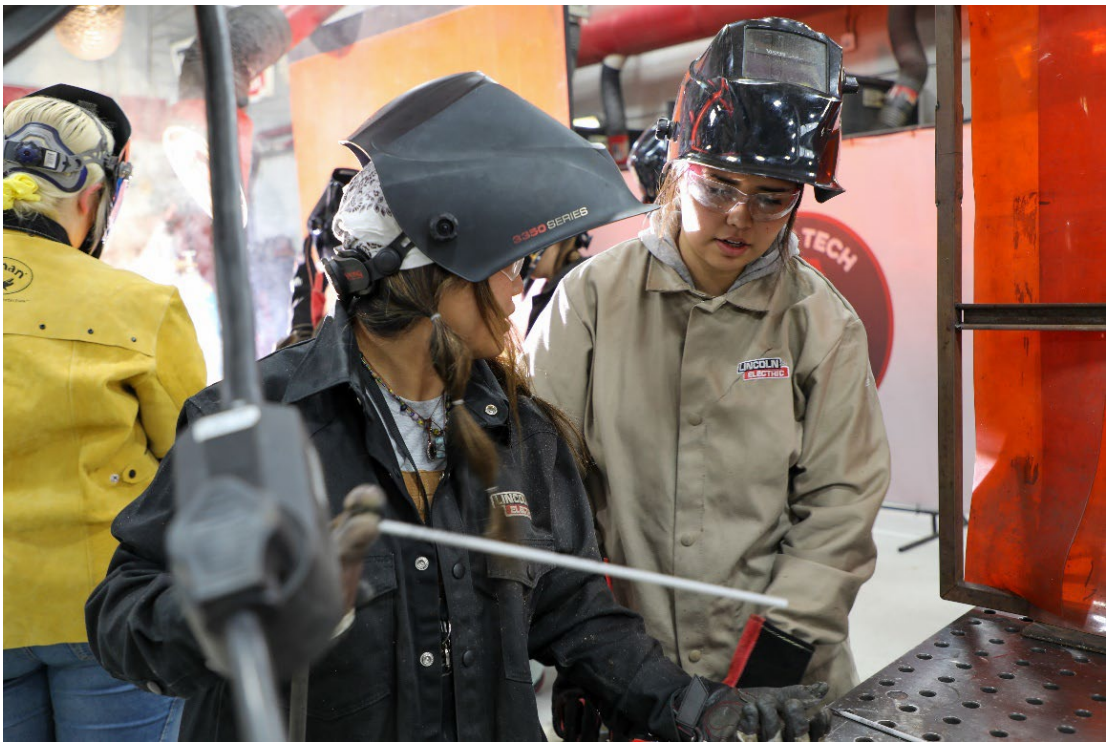
This is the **Music Makers** Innovation Station. This kit is based on the research showing that girls are more likely to show interest in STEM if there is a focus on creativity. This station teaches both the physics of music and making both digital and analog instruments.


This is the **Creatathon Coding** Innovation Station. It includes different types of robots that lend themselves well to storytelling to integrate creativity into coding. The robots can be designed using crafts or paper art to create characters which can then be animated through coding.

We also offer more traditional Innovation Stations, such as electronics

***Task 1.5***

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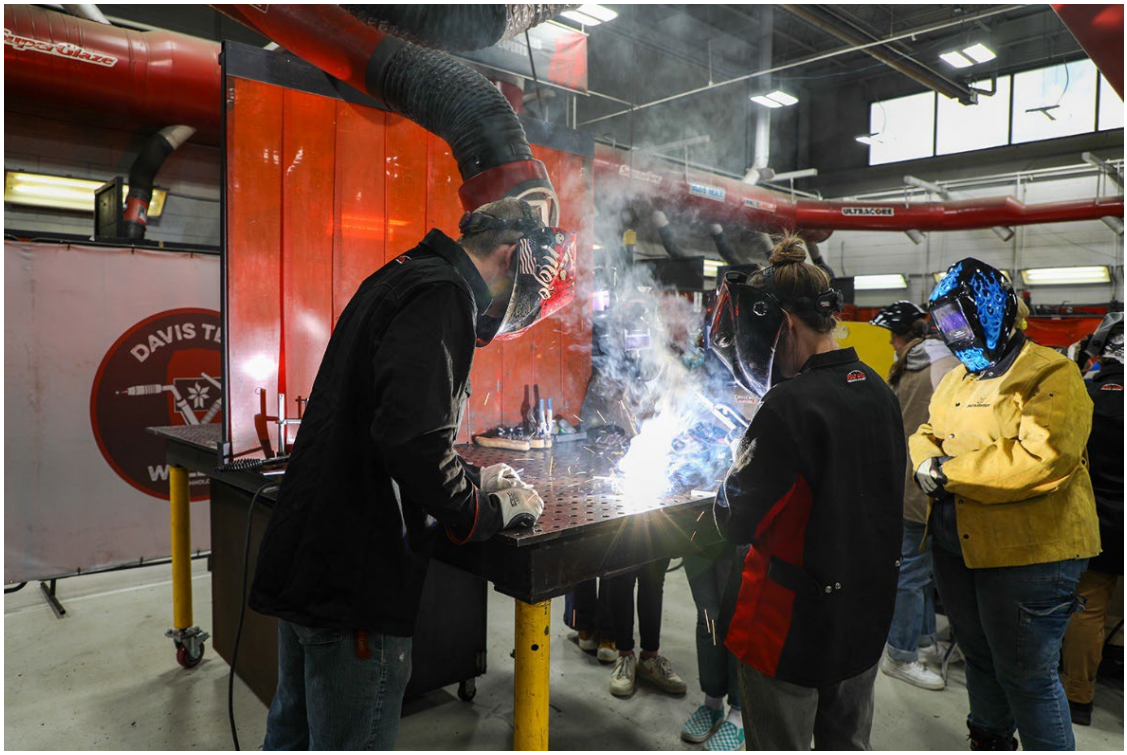
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***Task 1.5***


*Figure 1: Girl Scouts of Northeast Ohio (GSNEO)America Makes AM Patch*

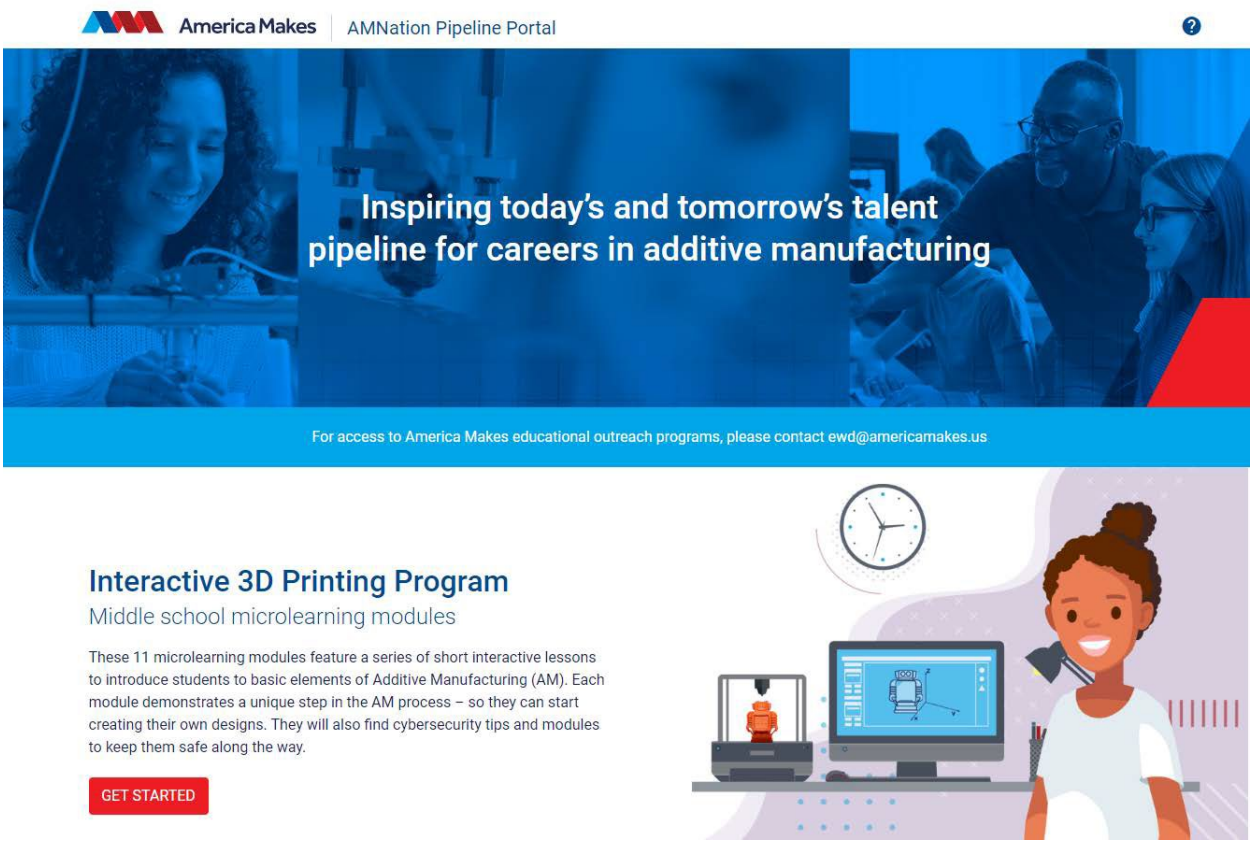


*Figure 2: America Makes AMNation Pipeline Portal landing page/Middle School eLearning Modules*