Utah State Board of Education
Utah K-12 Computer Science Initiative

"To give every student access to robust computer science education …" - Utah Governor Gary Herbert

Full 4-year Grant Application FY 2021

Link to Frequently Asked Questions (FAQ) Document, Legislation, and Code:
http://bit.ly/K12UtahCSFAQs

Application Final Due Date: Wednesday, June 30, 2021 at 5:00 PM

Completed application document links must be submitted using the following link:

Submit K-12 Computer Science Full 4-Year Plan

NOTE: *To be considered, the Utah State Board of Education (USBE) must receive your electronic copy by the date specified above. All digital submissions will be confirmed with a receipt email from USBE within 24 hours. It is the responsibility of the LEA to follow up with USBE to confirm the receipt of the application by the articulated due date. The narrative sections of the proposal must be no smaller than 11-point and maintain the section titles as presented.*

Please direct all questions to:

Kristina Yamada
CS | IT | Digital Media CTE Education Specialist
Utah State Board of Education
Phone: (801) 538-7849
kristina.yamada@schools.utah.gov

Ashley Higgs
CTE K-8 Education Specialist
Utah State Board of Education
Phone: (801) 538-7594
ashley.higgs@schools.utah.gov

Sarah Young
Director of Strategic Initiatives
Utah State Board of Education
Phone: (801) 538-7528
sarah.young@schools.utah.gov

Copies of this application and rubric and support materials are on the Utah State Board of Education website at: https://www.schools.utah.gov/cte?mid=3363&tid=4

Introduction & Background

PURPOSE: To give every student access to robust computer science education by the conclusion of the four year CS plan.

H.B. 227 (Knotwell) established the Computer Science for Utah Grant Program in 2019 for purposes of implementing the Utah Computer Science Master Plan. The grants are for the express purpose of "improving computer science outcomes and course offerings, demonstrated by the creation and implementation of a local agency computer science plan and the effective implementation of approved courses and the provision of effective training opportunities for licensed teachers." H.B. 227 (63N-12-506)

Details of the CS Utah Grant Program state eligible local education agencies can apply for the grant, submit it to the State Board of Education for review and recommendation to the Talent Ready Board for approval based upon the following criteria:

Local Education Agencies (LEA) shall submit a written 4-year "computer science plan that addresses the recommendations in the Utah CS Master Plan that identifies targets for improved computer science offerings, student learning and licensed teacher training; describes a professional development program and other opportunities for high-quality professional learning for licensed teachers or individuals training to become teachers. Includes a detailed budget, communication, and reporting structure for implementing the computer science plan."

ACTION STEPS: Create a 4-year LEA computer science plan following the template outlined below, including:

- Effective implementation of approved computer science courses (as outlined in the Data and Reporting section of the plan template) for students
- Providing effective computer science professional learning opportunities creating effective CS teachers
- Produce a clear picture of the evolving and growing implementation of computer science from integrated fundamentals to articulated high school course work
- Develop a communication plan for advancing computer science in your community, including parents and students
- Set specific data targets associated with measuring success of your plan

LEAs with full Computer Science 4-years plans will[1]:

- ❏ Establish a Computer Science Program Leader within the LEA and create working groups in partnership with teacher leaders across departments to help implement the computer science plan
- ❏ Commit to providing one computer course offering approved by the Talent Ready Board in every middle and high school within the local education agency (as outlined in the Data and Reporting section of the plan template)
- ❏ Commit to integrate computer science education into the curriculum of every elementary school within the LEA
- ❏ Promote all new CS courses to the LEA administration for K-12, coherent with the LEA plan. *(Free marketing materials are available at: https://code.org/promote)*
- ❏ Hold a district-wide Hour of Code™ event each year. Computer Science Education week is the second full week of December, but LEAs can calendar in accordance with their schedules for each school year
- ❏ Establish course codes for middle school and high school computer science classes in alignment with your projected CS offerings at your LEA by Fall 2021
- ❏ Include computer science course offerings that count for science graduation credit *(AP Computer Science, Computer Science Principles, and/or Computer Programming II)* on materials related to school counseling and planning for all students
- ❏ Allow Computer Science PD to satisfy district hourly requirements for annual professional development
- ❏ Provide on-going follow up on key implementation details and dates, such as professional development workshops and marketing/orientation events for teachers and principals
- ❏ Support use of LEA facilities for professional development of teachers (if needed) at no cost to partner organizations identified in the plan
- ❏ Allow the Utah State Board of Education, Talent Ready Utah, and its evaluators to assess the program, including aspects of teacher professional development and student outcomes
- ❏ Include computer science plan, communication tools, training, and data outcomes as required in this plan on your LEA website for easy stakeholder access
- ❏ Sustain the computer science program after the term of the award
- ❏ Establish or connect with a community of practice within the geographic area, and share best practices with other Utah LEA leaders

[1] Adapted from "District Partnership Plan" from Code.org, accessed 1/12/2020 https://code.org/files/DistrictPartnershipPlan.pdf

- ❏ Meet any other requirements established by the state board in consultation with the Talent Ready Board and submit a written report annually to the state board and the Talent Ready Board

K-12 Computer Science 4-Year Grant Program Pre-Approval Requirements

Before submitting an application to the advisory committee for approval by the Board, an LEA shall:

1. Visit Utah Computer Science Education Master Plan, and read the full document.

In cooperation with your LEA leadership team and a representative group of all LEA stakeholders including school administrators, teacher leaders, educators, paraeducators, school board members, and parents:

2. Complete the full 4-year grant application by June 30, 2021 and submit to USBE **Submit K-12 Computer Science Full 4-Year Plan**

K-12 Computer Science Grant Program Post-Approval Requirements

An approved and participating LEA, shall engage in all of the following program required events to maintain funding for future fiscal years:

- **Utah K-12 Computer Science Summit** (Annually, Summer)
  This event happens once a year starting in the summer of 2022. The event focuses on sharing best practices, workshops around current research, and review of evaluation requirements. This event also requires each K-12 Computer Science Awardee to create a poster using the template from USBE.

- **Computer Science Site Visits** (Annually, Fall/Winter)
  USBE CS Team staff will complete site visits in the fall to provide technical assistance toward LEA implementation of their plan. Site visit locations and dates will be coordinated with the LEA CS team leader. The visit needs to involve a combination of administrators and CS teacher leaders. This team may also consist of school board members, community partners, and others.

- **Annual Reporting Requirements**
  Please note the following future reporting requirements that will be included in the Utah K-12 Computer Science Grant Annual Accountability and Data Report will be due by June 1st of each year of the award starting in 2022. These are not items that require response for the plan submission, but are important for LEA data collection over the implementation of the award.

Information: Future Reporting Requirements
1. Current fiscal year CS engagement tables as presented in the Data and Analysis section of the plan.
2. Progress toward achieving goals and measures in the approved LEA K-12 computer science plan.
3. Documentation of use of funds to expand computer science.
4. Other information requested by the Superintendent. LEAs will be notified of those requests in advance of the report.

- **K-12 Computer Science Budget Resubmission**
  Each year, after the conclusion of the award cycle, each LEA will resubmit a budget sheet for the new fiscal year to USBE for the available award value requested based on redistributed excess funding. USBE is committed to distributing all available full-plan funding to the field each year.

TEAM: LEA Computer Science Leadership

Outline your Computer Science planning team with contact information provided for each member.

Recommended Length: **1 Page**

LEA Name			
Title	**Name**	**Email**	**Phone**
LEA Computer Science Lead	Alden Thorpe	athorpe@mwmacademy.org	801-946-1916
Superintendent/Director	Angie Johnson	ajohnson@mwmacademy.org	801-580-4972
CTE Director	Hannah McGough	hmcgough@mwmacademy.org	801-566-6962
Curriculum Director	Sheri Ebert	sebert@mwmacademy.org	801-566-6962 x102
Technology Director	Terra Olsen	tolsen@mwmacademy.org	801-566-6962 x100
Technology Consultant	Jess Burns	jess.burns@etscorp.com	801-784-5686
School Leader: Media & Assessment Specialist	Melissa Zuckerman	mzuckerman@mwmacademy.org	801-566-6962 x131
Special Education Advisor	Sandee Robison	srobison@mwmacademy.org	801-566-6962 x147
Accessibility Specialist	Coleen Mahar	cmahar@mwmacademy.org	801-566-6962 x123
Business Administrator	Karen Wilson	kwilson@mwmacademy.org	801-566-6962 x101
Industry Partner: L3 Harris	Scott Robison	scott @casaderobison.com	801-643-9651
Industry Partner: Skill Struck	Talon Hatch	talon@skillstruck.co	801-940-9288

Industry Partner: Imagine Learning	Gretchen Brown	gretchen.brown@imaginelearning.com	702-460-8306
Middle/High School Teacher Leader	Allison Fairbourne	afairbourne@mwmacademy.org	801-566-6962 x150
Middle/High School Integration Leader	Becca Bumgarner	bbumgarner@mwmacademy.org	801-566-6962 x152
Middle/High School Integration Leader	Dustin Clark	dclark@mwmacademy.org	801-566-6962 x133
Upper Elementary School Teacher Leader	Alisha Kocs	akocs@mwmacademy.org	801-566-6962 x116
Lower Elementary School Teacher Leader	Autumn Lord	alord@mwmacademy.org	801-566-6962 x108
School Board Member	Nelson Altamirano	naltamirano@mwmacademy.org	801-566-6962
School Counselor	Marianne Noble	mnoble@mwmacademy.org	801-566-6962 x104

VISION: Abstract for K-12 Computer Science Plan

Each LEA must provide an overview of the LEA's K-12 Computer Science Plan (up to 500 words), including:

- An alignment to the vision and guiding principles for computer science for all students in the Utah Computer Science Education Master Plan.
- Articulation of the long-term goal that will be achieved through implementation of the plan.
- An overview of the implementation steps that will be taken to achieve the long-term goal.

Recommended Length: **1 Page**

***REQUIRED**: The abstract will be used in the Utah State Board of Education Computer Science community to introduce your project to the public and to other grantees. If you are targeting different levels with your funding (elementary, middle, and high) be sure to describe each. Include the purpose, what will be different as a result of the grant, why the grant is important to your district, information about the target population, the vision for computer science, etc.*

Mountain West Montessori Academy is a K-9th grade community of educators, parents, and students committed to student-centered, authentic learning. We employ a research-based Montessori educational philosophy to foster intellectual curiosity, collaboration, social responsibility, and creative problem-solving in our students; and believe that learning occurs best as diverse groups of individuals leverage their strengths in confronting authentic situations and goals. These are the values upon which we base our plan for systemic, rigorous computer science instruction at our school.

We have spent the past two years garnering input from a wide range of stakeholders and piloting computer science instruction in elementary classrooms and our middle school. Despite Covid-19 restrictions, we provided exposure to computer science principles and access to our CS instructional platforms to all students. Based on feedback from teachers, students, parents, administrators, instructional leads, the MWMA Board of Directors, and community partners, we created a comprehensive computer science instructional plan which (a) identifies key barriers, (b) sets short and long-term goals, and (c) establishes action items for implementation.

Two key barriers to effective computer science instruction were identified. First: lack of resources including time, expertise, and materials. Second: teachers' view of computer science as a non-preferred task due to lack of content knowledge, experience, and time. To address these barriers, our plan includes solicitation of grant funds and the addition of a 0.5 FTE computer science instructor to provide professional development, mentor teachers, and co-teach lessons I(via a gradual release model) with them during the first years of implementation.

Our end goal is to have 100% of our students participating in weekly, rigorous computer science instruction with 60% of students demonstrating proficiency in the Utah Computer Science Standards by June of 2025. To meet these goals, we have established short and long-term action items in the following areas:

Integration of Computer Science Standards - Master Plan part VI

- Teachers align Utah CS standards for their grade level with Skill Struck curriculum and lessons in other content areas.
- They create rubrics for assessing learning and mastery in students.
- Every student receives regular instruction and has frequent opportunities for exploration and practice of the standards and practices in the Utah CS standards.

Sustainable Professional Development - Master Plan part V

- All teachers receive training on the purpose, standards, and best practices of CS instruction.
- Trained teachers are able to mentor future teachers, creating a sustainable professional learning system.

Access & Diversity - Master Plan part VII

- Every student receives high-quality CS instruction from trained teachers throughout their K-9 experience at our school.
- Students with disabilities have full access through technology and human aides.
- Underserved populations have the opportunity to see themselves in computer science professions as we visit industry and higher education workplaces and have engaging speakers who reflect our school's diverse community.
- Employing our school counselor to promote CS career pathways for MS students.

Partnerships & Outreach - Master Plan part VIII

- We partner with industry and higher education partners to provide mentoring, exposure, and authentic learning opportunities to students and their families through in-school and after school events.
- We seek out funding through sponsorships and donations from community partners.

Alignment to the Utah CS Master Plan:

- Change and improve the culture of public education, classroom instruction, student and parent engagement, teaching and learning processes.
    - Addressing the rational, emotional, and environmental aspects of change, and formulating and implementing specific strategies to address each of these areas, our plan will effectively change classroom culture around computer science and improve instruction and outcomes for our students in this important area.
- Support the Utah Core and provide systemic support for student engagement and classroom innovation:
    - *The majority of state-licensed teachers possess a very low knowledge of computer science concepts, which results in not only shallow instruction, but in this instruction being a non-preferred task for teachers. To overcome this obstacle, we have devised a co-teaching model to support teachers and engage them with the concepts, as well as a professional development plan. This plan will include high quality professional development and following up coaching/co-teaching with feedback. The co-teaching model will include high yielding student engagement strategies.*
- Provide access (teacher, student and home) to quality digital curriculum, learning management support structures, collaboration systems, formative assessment systems, ongoing access to proven software, instructional practices research.
    - Students will be provided with access to a quality digital computer science curriculum and collaborate with teachers to complete lessons and assessments within the software.
- Prepare students for college and careers including an emphasis on higher-order problem solving across the curriculum:
    - By mastering the computer science standards, students' problem-solving and logical thinking skills will increase, students' career options will widen, and in turn, broaden future college and career options.
- Broaden STEM career path options for students:
    - As students master computer science standards, their problem-solving and logical reasoning skills will improve and in turn, widen students' STEM career options.
- Support the drive toward on-demand, 24/7 learning and the flipped classroom.

    - In our pilot program, we have already shown that many students are highly engaged with the digital computer science curriculum and will access it outside of school.
- Drive economic development by providing students the skills and experiences they need to give Utah companies the quality workforce that they need.
    - Knowledge of computer science concepts as a solid foundation for future STEM studies is an inestimable gift to students and to Utah companies hungry for graduates with these skills; ultimately this will contribute to statewide efforts to drive economic development through a technologically skilled workforce, a large sector of Utah's thriving economy.

Alignment to the Guiding Principles for Computer Science Learning for All Students

- Recognize the complexity and significance of the change management process required for success.
    - MWMA's leadership team fully recognizes the complexity and significance of change management required to make our plan a success. Our state-licensed teachers require additional training and support in order to teach computer science concepts. In order to build teacher-capacity, we have allocated MWMA funds and will also utilize grant funds to provide high quality PD and also hire a highly qualified computer science teacher/coach who will provide follow-up coaching/co-teaching with feedback. The co-teaching model will include high yielding student engagement strategies.
- Technology supports, not supplants, excellent teaching. The key to quality instruction is the teacher.
    - During the 2020/2021 school year, we piloted a coaching and co-teaching computer science model with a few teachers. Our computer science coach taught, co-taught and then provided feedback with pilot teachers. Lessons utilized technology to support, enrich and enhance student engagement within excellent core subject instruction. This model has been so successful with the pilot teachers that we will provide coaching and co-teaching for all teachers.

- Tools are managed by elected local boards with their own policies, priorities and constituents who prefer local control of the education system for their students.
    - Board policy requires that our Board approves utilizing school funds and grant funds to implement our professional development and coaching plan. Our board approved the plan in a recent Board meeting.
- Changes to processes require thoughtful planning and preparation to maximize success. Effective and sustainable change requires forethought, step-by-step planning and action steps.
    - In order to maximize long-term success, we piloted our computer science coaching and co-teaching model with a few teachers. The model has been so successful this year, we are ready to roll it out with the entire teaching staff next year.

CURRICULUM AND STANDARDS: Computer Science High-Quality Curriculum

Each LEA must complete the table below to provide an overview of the LEA's K-12 Computer Science Goal, including:

- A plan to develop or adapt K-12 Computer Science resources, lesson plans and computer science courses at each grade level/grade band for implementation and delivery across the K-12 system.
- A commitment to how each student in the LEA will have access to computer science learning as outlined in the Utah Computer Science standards during the school day for each grade at the conclusion of the 4-year plan.
- An alignment to the vision and guiding principles for computer science for all students in the Utah Computer Science Education Master Plan.
- Projected implementation dates for achieving access to all students in each grade level.

Guidance and resources to review before completing your plan:

1. **HOW IS COMPUTER SCIENCE TAUGHT IN EACH GRADE DURING THE SCHOOL DAY?**

Keyboarding ***is not*** computer science. Keyboarding is the activity of typing information into a computer. Computer science is the study of computers and algorithmic processes, including their principles, their hardware and software designs, their [implementation], and their impact on society (Tucker et. al, 2003, p. 6). The Utah State Board of Education has created standards that provide guidance on the core concepts and practices in computer science.

2. UTAH K-5 COMPUTER SCIENCE STANDARDS

The Utah State Board of Education approved the K-5 Computer Science standards in October 2019. The standards were created for each grade level with an example of how that standard could be taught in the grade level, both plugged and unplugged activities. The K-5 Computer Science standards can be found here.

3. UTAH 6-12 COMPUTER SCIENCE STANDARDS DRAFT

The 6-12 Standards are meant to be integrated into existing courses in all middle schools and high schools and must be available to all students. The 6-12 standards can be accessed here.

4. UTAH COMPUTER SCIENCE AND INFORMATION TECHNOLOGY PATHWAYS

Career Pathways show students a direct connection between doing well in high school and being able to transition smoothly to postsecondary opportunities or getting a good job when they graduate. Students who focus on a Career Pathway acquire the skills necessary for entry into well-paid careers with high potential for rapid financial growth, increased levels of responsibility, and a high degree of personal satisfaction.

Utah Career Pathways align with and are categorized by the national Career Clusters®. Each Career Pathway culminates in an industry recognized credential of value. Your long term plan should include a solid pathway for your students in a CS or IT field of study.

A list of Career Pathways can be found here.
The Career Pathway charts for SY 20-21 can be found here.

5. WHICH COMPUTER SCIENCE COURSES COUNT FOR THE DIGITAL STUDIES GRADUATION REQUIREMENT?

The following computer science courses meet the digital studies graduation requirement:

- Computer Programming 1
- Computer Science Principles
- Exploring Computer Science
- Web Development 1

6. WHICH COMPUTER SCIENCE COURSES COUNT FOR A SCIENCE GRADUATION REQUIREMENT?

The following computer science courses meet the science graduation requirement:

- AP Computer Science
- Computer Science Principles
- Computer Programming 2

7. ARE THERE EXISTING RESOURCES TO SUPPORT OUR COMPUTER SCIENCE CURRICULUM SELECTION?

Yes, please see the following list of resources. This list is not exhaustive, but highlights curriculum that is available and cataloged for easy access. Each LEA may decide upon their own curriculum, including offerings that are not included on this list.

A. **UEN Resources - CS4Utah:** https://emedia.uen.org/hubs/cs4utah
The purpose of the CS4Utah Initiative is to unify efforts across the state in Computer Science education and provide support and strategic direction for those efforts, resulting in a state-wide Computer Science education ecosystem. This hub serves as an online community for teachers who integrate or specialize in CS/IT across all grade levels. The hub includes resources, lesson plans, modules, group discussions, grant support, announcements, and links to additional resources. We welcome your participation in this community and hope you will both find and share resources to improve CS/IT education throughout the state.

B. **Grade K-5: Free Courses by Code.org and List of 3rd Party Coursework:** https://code.org/student/elementary

C. **Grades 6-12: Free Courses by Code.org and List of 3rd Party Coursework:** https://code.org/student/middle-high

D. **3rd Party Resources:** https://code.org/educate/curriculum/3rd-party

Recommended Length: **2 Pages**

Curriculum

Our elementary computer science curriculum is focused on aligning the national CSTA Standards with Utah's CS standards by integrating Skill Struck and Code.org lessons with core subjects. The integral piece of making this alignment work will be a school-wide professional development with teachers working in teams to research and align Skill Struck and Code.org lessons (based on CSTA standards) with the Utah CS standards. This will be discussed in-depth in the Professional Development portion of this grant.

By Fall 2024 LEA's scope and sequence for computer science will include:

Grade Level	Course	Frequency	Proposed Curriculum	Implementation Target Date
Example: Kindergarten	*Kindergarten CS will be taught integrated with the Kindergarten Math curriculum.*	*2 lessons/week*	*Utah Core Guides (link) and Code.org Scratch*	*Spring 2021*

Kindergarten	Kindergarten CS will be taught as a "special" with weekly topics integrated into math, ELA, science and social studies and coordinated with the classroom teacher.	Beginning with one 30-minute lesson/week. As teachers receive training they will add integration into at least one additional lesson each week.	Skill Struck and Code.org lessons correlated with the Utah Core. These lessons will focus on hands-on and collaborative work with students exploring real-world problems integrated into their core curriculum lessons.	Beginning Fall 2021. Adding an additional integrated lesson per week by Fall 2022.
1st Grade	CS will be taught as a whole-group special with weekly topics integrated into math, ELA, science and social studies topics coordinated with the classroom teacher.	Beginning with 1 45-minute lesson/week with a 20-30 minute follow up assignment to be done in class. As teachers receive training they will add integration into at least one additional core lesson per week.	These lessons will focus on hands-on and collaborative work with students exploring real-world problems integrated into their core curriculum lessons using Skill Struck and Code.org.	Beginning Fall 2021. Adding an additional integrated lesson per week by Fall 2022.
2nd Grade	CS will be taught as a whole-group special with weekly topics integrated into math, ELA, science and social studies topics coordinated with the classroom teacher.	Beginning with 1 45-minute lesson/week with a 20-30 minute follow up assignment to be done in class. As teachers receive training they will add integration into	These lessons will focus on hands-on and collaborative work with students exploring real-world problems integrated into their core curriculum	Beginning Fall 2021. Adding an additional integrated lesson per week by Fall 2022.

		at least one additional core lesson per week.	lessons using Skill Struck and Code.org.	
3rd Grade	CS will be taught as a whole-group special with weekly topics integrated into math, ELA, science and social studies topics coordinated with the classroom teacher.	Beginning with 1 45-minute lesson/week with a 20-30 minute follow up assignment to be done in class. As teachers receive training they will add integration into at least one additional core lesson per week.	These lessons will focus on hands-on and collaborative work with students exploring real-world problems integrated into their core curriculum lessons using Skill Struck and Code.org.	Beginning Fall 2021. Adding an additional integrated lesson per week by Fall 2022.
4th Grade	CS will be taught as a whole-group special with weekly topics integrated into math, ELA, science and social studies topics coordinated with the classroom teacher.	Beginning with 1 45-minute lesson/week with a 20-30 minute follow up assignment to be done in class. As teachers receive training they will add integration into at least one additional core lesson per week.	These lessons will focus on hands-on and collaborative work with students exploring real-world problems integrated into their core curriculum lessons using Skill Struck and Code.org.	Beginning Fall 2021. Adding an additional integrated lesson per week by Fall 2022.
5th Grade	CS will be taught as a whole-group special with weekly topics integrated into math, ELA, science and social studies topics coordinated with the classroom	Beginning with 1 45-minute lesson/week with a 20-30 minute follow up assignment to be done in class. As teachers receive training they will add	These lessons will focus on hands-on and collaborative work with students exploring real-world problems integrated into their core	Beginning Fall 2021. Adding an additional integrated lesson per week by Fall 2022.

	teacher.	integration into at least one additional core lesson per week.	curriculum lessons using Skill Struck and Code.org.	
6th Grade	CS will be taught as a whole-group special with weekly topics integrated into math, ELA, science and social studies topics coordinated with the classroom teacher.	Beginning with 1 45-minute lesson/week with a 20-30 minute follow up assignment to be done in class. As teachers receive training they will add integration into at least one additional core lesson per week.	These lessons will focus on hands-on and collaborative work with students exploring real-world problems integrated into their core curriculum lessons using Skill Struck and Code.org.	Beginning Fall 2021. Adding an additional integrated lesson per week by Fall 2022.
7th Grade	The Creative Coding course will be taken by all 7th graders at our school in a semester-long course.	Students will have two 90-minute lessons per week taught by the Creative Coding instructor.	Code.org's CS Discoveries curriculum will be aligned with USBE standards and utilized to teach the Creative Coding course. Lessons focus on using problem solving skills to solve real-world problems. Students collaborate in an environment similar to what a new coder might experience while learning about and applying new pieces of code. ---	Creative Coding implemented Fall 2020 with full (including Capstone class) by Fall 2022.

	--- All content teachers will coordinate to integrate CS core practices and standards into core lessons.	--- Middle School teachers will integrate CS core practices and standards into the Capstone class, taught by all Middle School teachers and will be supported in including CS in their instruction.	Teachers will pull from Utah CS standards, Skill Struck integrated lessons, and Code.org to enhance their core content lesson plans.	--- Beginning Fall 2021 with full implementation by Spring 2023.
8th Grade	8th and 9th graders will have access to a Python 1 semester-long elective course. --- All content teachers will coordinate to integrate CS core practices and standards into capstone lessons.	Students will have two 90-minute lessons per week taught by the Python 1 instructor. --- Middle School teachers will integrate CS core practices and standards into the Capstone class, taught by all Middle School teachers and will be supported in including CS in their instruction.	Skill Struck's Python 1 curriculum will be aligned with USBE standards and utilized to teach the Python 1 course. --- Teachers will pull from Utah CS standards and the Code.org CS Discoveries course to enhance their Capstone lesson plans.	Beginning Fall 2021 --- Beginning Fall 2021 with full implementation by Spring 2023.
High School Course Offerings	9th graders will have access to a Python 1 semester-long elective course. --- All content	Students will have two 90-minute lessons per week taught by the Python 1 instructor. ---	Skill Struck's Python 1 curriculum will be aligned with USBE standards and utilized to teach the Python 1 course. ---	Beginning Fall 2021 ---

	teachers will coordinate to integrate CS core practices and standards into capstone lessons.	Middle School teachers will integrate CS core practices and standards into the Capstone class, taught by all Middle School teachers and will be supported in including CS in their instruction.	Teachers will pull from Utah CS standards and the Code.org CS Discoveries course to enhance their Capstone lesson plans.	Beginning Fall 2021 with full implementation by Spring 2023.

PROFESSIONAL LEARNING: Creating Effective CS Teachers

Each LEA must complete the tables below to provide an overview of the LEA's K-12 Computer Science Goal, including:

- Professional development for teachers of other subjects is required to leverage the existing pool of teachers and provide a short-term approach for increasing the number of CS opportunities in schools.
- Long term sustainability will include steps towards a certification or license endorsement to teach computer science, and adding a pipeline of new teachers graduating from pre-service programs with the ability and desire to teach CS.
- A commitment to how teachers and leaders in the LEA will have access to computer science learning as outlined in the Utah Computer Science standards during the school day for each grade at the conclusion of the 4-year plan.
- An alignment to the vision and guiding principles for computer science for all students in the Utah Computer Science Education Master Plan.
- Projected implementation dates for achieving training to all teachers and leaders in each division.

Recommended Length: **4 Pages**

Professional Learning Introduction:

MWMAs personalized professional learning vision is to provide a structured co-teaching

model which includes professional development for our teachers and access to digital instructional software for our students. Post professional development, our computer science coach will support teachers in creating lessons that are aligned to the Utah CS Standards, Skill Struck, and Code.org to enhance core instruction in all content areas. Lessons will be co-taught (via a gradual release coaching model) in order for teachers to eventually have the knowledge and skills to independently teach core instruction lessons that are enhanced by technology.

How:

- **Curriculum Planning and Instruction**: All teachers will submit a pre and post professional learning survey that will be utilized to hone professional learning. All teachers will collaboratively map and align the Utah CS Standards to the Skill Struck curriculum. In addition, all teachers will attend high quality professional development on the CS standards and Skill Struck (K-6) and Code.org curriculum (7-9). Post professional development, our computer science coach will support teachers in creating lessons that are aligned to the Utah CS Standards, Skill Struck, and Code.org to enhance core instruction in all content areas. Lessons will be co-taught (via a gradual release coaching model) in order for teachers to eventually have the knowledge and skills to independently teach core instruction lessons that are enhanced by technology.
- In addition, as part of the professional learning and CS standards mapping, teachers will collaboratively develop evaluation rubrics aligning Utah CS standards with Skill Struck and Code.org lessons.

What/When:

Professional Learning Model: Mountain West Montessori Academy's professional learning model includes professional learning and coaching to support teachers to eventually have the confidence and skills necessary to independently teach core instruction lessons that are

enhanced by technology. The plan includes a pre and post PL survey for teachers (to identify their needs) and the survey results will drive PL.

- Organically adjusting the 4-year PL plan based on the survey results will be crucial in order to meet the needs of teachers.
- In addition, K- 6 teachers will map the CS Standards to Skill Struck and Code.org. Secondary teachers will integrate CS core practices and standards into their Capstone classes with Code.org lessons taught by secondary teachers.
    - All teachers will receive post-PL follow-up coaching (I do, we do, you do) from our computer science coach and/or media/assessment specialist.

Professional Learning Model Articulation: All teachers were informed that the professional learning model will be directly tied to supporting their success in achieving the desired student-learning outcomes *Specifically, we identified that 60 % of students would master the CS standards.* In addition, teachers shared extremely positive feedback regarding our CS pilot co-teaching model 2020/2021 solidifying teacher buy-in.

Learning Progression by Grade Level: We are a Montessori school and as such our elementary teachers teach multi-age classrooms with 3 grade levels per classroom. In other words, our model will look differently from a traditional school. K – 6 teachers will understand, map, and receive co-teaching and coaching support with alignment to the CS standards for all 3 grade-levels they are teaching.

- Secondary teachers will receive co-teaching and coaching support aligned to the CS standards and in turn integrate core practices and standards into their Capstone class content with Code.org lessons being taught by secondary teachers. These lessons will be crucial in supporting students' successful creation and presentation of computer science integrated projects at the yearly Capstone Fair.
- All teachers will receive post-PL follow-up co-teaching and coaching support (I do, we do, you do) from our computer science coach and/or media/assessment specialist.

BASELINE FOR CURRENT STATE OF TEACHER CS ENDORSEMENTS:

Computer Science Endorsements	Current # of Teachers with Endorsement in LEA
*__Exploring Computer Science__ [now historic (as of Feb 1, 2020)]	**0**
Computer Science 1 (updated endorsement to Introduction to Computer Science as of 2/1/2020)	**0**
Computer Science 2 (updated endorsement to Programming and Software Development as of 2/1/2020)	**0**
Introduction to Information Technology (updated endorsement to Information Technology Systems as of 2/1/2020)	**0**
Web Development (updated endorsement: Web Development as of 2/1/2020)	**0**

COMPUTER SCIENCE PROFESSIONAL LEARNING TIMELINE

Elementary Teachers

When	Grade level	# of Projected Participants	Content	Outcome/ Endorsement
Ex 2021 - 2025	*K - 3 teachers*	*3 sessions with 3 teachers*	*Data and Analysis Standards in Utah CS Standards 3-5*	*Teachers will be able to incorporate data visualizations and technology into their math and science instruction.*
Fall 2021-Spring 2022	*K-6*	*Four sessions with 13 elementary teachers*	Utah CS standards, Skill Struck lesson pathways, & CSTA national standards. **PL & Coaching Description** -Pre-PL and pre-coaching Skill Struck & CS standard's survey. The results will be used to frame PL and follow-up coaching for individual teachers. -PL (Skill Struck) I do, We do, schedule: September, November, January, & March. All teachers will receive post PL co-teaching support.	-Teachers will receive PL and coaching support to co-teach Skill Struck lessons aligned with CSTA standards with Utah CS standards. -Teachers will co-teach lessons, receive feedback, and self-assess instruction supported by the computer science specialist.
Fall 2022-Spring 2023	*K-6*	*Four sessions for 13 elementary teachers*	Utah CS standards, Skill Struck lesson pathways, CSTA national standards	Teachers will map CS standards to Skill Struck's scope and sequence) and

			PL & Coaching Description - PL/planning: We do, you do: Teachers will map CS standards to Skill Struck's scope and sequence) and plan co-taught aligned lessons: September, November, January, and March. All teachers will receive post PL/planning co-teaching support. -May 2023: Administer post-PL & co-teaching survey (same as September 2021 survey) to measure teacher growth/ gaps.	plan co-taught aligned lessons.
Fall 2023-Spring 2024	*K-6*	*Four sessions with 13 elementary teachers*	Utah CS standards, Skill Struck lesson pathways, CSTA national standards **PL & Coaching Description** -We do and/ or you do: September, November, January, and March, teachers either teach or co-teach CS standards-based cross content Skill Struck lessons with coaching feedback. -PL on the use of the evaluation rubric to assess students on their mastery of the CS standards.	-Teachers will proficiently use an evaluation rubric to assess students on their mastery of CS standards and adjust instruction accordingly.

Fall 2024 - Spring 2025	*K-6 (6th grade is part of our combined age elementary school and their training will include 6th grade standards.)*	*Four sessions with 13 elementary teachers*	Utah CS standards, Skill Struck lesson pathways, CSTA national standards **PL & Coaching Description** -You do: Teachers video themselves September, November, January, & March. Teachers observe their videod CS- based cross content lessons and reflect (what went well, what would you change and how). Using the evaluation rubric, teachers will identify if students showed mastery of CS standards? If not, identify how they can reteach and personalize the learning? -Coach only supports as needed.	-Teachers will self-reflect on their proficiency @ teaching CS standards by videoing their lessons. -Teachers will independently use the evaluation rubric to assess student-mastery of CS standards and adjust instruction accordingly.

Middle School Teachers

When	Grade level	# of Projected Participants	Content	Outcome/ Endorsement
Ex. Fall 2020	*Elementary teachers grade 6*	*2 sessions of 30 teachers*	*Data and Analysis Standards in Utah 6th grade CS Standards*	*Teachers will be able to incorporate data visualizations and technology into their science instruction.*
Fall 2021-Spring 2022	*7-8 grade teachers*	*Four sessions for 5 teachers*	-CS standards, Code.org, CS Discoveries lessons, and CSTA national standards **PL & Coaching Description** -Pre-PL and pre-coaching CS standards and Code.org CS Discovery lessons survey. The results will be used to frame PL and follow-up coaching for individual teachers. -PL: I do, We do, schedule: September, November, January, & March. All teachers will receive post PL co-teaching support.	-Teachers will receive PL and coaching support to be able to co-teach Code.org lessons aligned with CS & CSTA standards within their Capstone classes. -Teachers will co-teach lessons incorporated into their Capstone lessons, receive feedback, and self-assess instruction supported by the computer science coach and/or media/assessment specialist. -In addition, the school counselor will include technology Career Pathways in her Capstone lessons and pathway conversations with students and parents. -CS -integrated Capstone lessons will be crucial in

				supporting students' successful creation and presentation of computer science integrated projects at the yearly Capstone Fair.
Fall 2022-Spring 2023	*7-8 grade teachers*	*Four sessions with 5 middles school teachers*	CS standards, Code.org, CS Discoveries lessons, and CSTA national standards. **PL & Coaching Description** - PL/planning: We do, you do: Teachers will map CS standards to Code.org CS Discovery lessons within their Capstone lessons. -Co-taught lesson schedule: September, November, January, and March. -All teachers will receive post PL/planning co-teaching support. -May 2023: Administer post-PL & co-teaching survey (same as September 2021 survey) to measure teacher growth/ gaps.	-Teachers will map CS standards to Code.org CS Discovery lessons for their Capstone lessons. -In addition, the school counselor will include technology Career Pathways in her Capstone lessons and pathway conversations with students and parents. -These lessons will be crucial in supporting students' successful creation and presentation of computer science integrated projects at the yearly Capstone Fair.
Fall 2023-Spring 2024	*7-8 grade teachers*	*Four sessions for 5 teachers*	CS standards, Code.org, CS Discoveries lessons, and CSTA national standards. **PL & Coaching**	-Teachers will begin using an evaluation rubric to assess students on their mastery

			Description -We do and/ or you do: September, November, January, and March, teachers either teach or co-teach CS Discovery lessons incorporated within their Capstone lessons with coaching feedback. -PL on the use of the evaluation rubric to assess students on their mastery of the CS standards.	of CS and CSTA standards and adjust instruction accordingly. -In addition, the school counselor will include technology Career Pathways in her Capstone lessons and pathway conversations with students and parents.
Fall 2024-Spring 2025	*7-8 grade teachers*	*Four sessions for 5 teachers*	CS standards, Code.org, CS Discoveries lessons, and CSTA national standards. **PL & Coaching Description** -You do: Teachers video themselves September, November, January, & March. Teachers observe their videod CS Discovery lessons within their Capstone lessons and reflect (what went well, what would you change and how). Using the evaluation rubric, teachers will identify if students showed mastery of CS standards? If not, identify how they can reteach and personalize the	-Teachers will self-reflect on their proficiency @ teaching CS and CTSA standards by videoing their lessons. -In addition, the school counselor will include technology Career Pathways in her Capstone lessons and pathway conversations with students and parents. -Teachers will independently use the evaluation rubric to assess student-mastery of CS & CTSA standards and adjust instruction accordingly. -The rubric will be

			learning? -Coach only supports as needed.	crucial in adjusting instruction to effectively adjust instruction and in turn, support students' successful creation and presentation of computer science integrated projects at the yearly Capstone Fair.

High School Teachers

WHEN	**Grade level**	**# of Projected Participants**	**Content**	**Outcome/ Endorsement**
Ex. Fall 2021	*High School Teachers for Computer Science Principles (CSP) Endorsement*	*1 session of 15 teachers*	*Weeklong Training sponsored by the STEM Action Center with Code.org*	*Teachers will have completed the methods requirement for their Intro to CS endorsement.*
Fall 2021-Spring 2022	*9th grade teachers*	*Four sessions for 5 teachers*	-CS standards, Code.org, CS Discoveries lessons, and CSTA national standards. **PL & Coaching Description** -Pre-PL and pre-coaching CS standards and Code.org	-Teachers will receive PL and coaching support to be able to co-teach Code.org lessons aligned with CS & CSTA standards within their Capstone classes. -Teachers will

			CS Discovery lessons survey. The results will be used to frame PL and follow-up coaching for individual teachers. -PL: I do, We do, schedule: September, November, January, & March. All teachers will receive post PL co-teaching support.	co-teach lessons incorporated into their Capstone lessons, receive feedback, and self-assess instruction supported by the computer science coach and/or media/assessment specialist. -In addition, the school counselor will include technology Career Pathways in her Capstone lessons and pathway conversations with students and parents. -These lessons will be crucial in supporting students' successful creation and presentation of computer science integrated projects at the yearly Capstone Fair.
Fall 2022-Spring 2023	*9th grade teachers*	*Four sessions with 5 middles school teachers*	CS standards, Code.org, CS Discoveries lessons, and CSTA national standards. **PL & Coaching Description** - PL/planning: We do, you do: Teachers will map CS standards to Code.org CS Discovery lessons within their Capstone	-Teachers will map CS standards to Code.org CS Discovery lessons for their Capstone lessons. -In addition, the school counselor will include technology Career Pathways in her

			lessons. -Co-taught lesson schedule: September, November, January, and March. -All teachers will receive post PL/planning co-teaching support. -May 2023: Administer post-PL & co-teaching survey (same as September 2021 survey) to measure teacher growth/ gaps.	Capstone lessons and pathway conversations with students and parents. -These lessons will be crucial in supporting students' successful creation and presentation of computer science integrated projects at the yearly Capstone Fair.
Fall 2023-Spring 2024	*9th grade teachers*	*Four sessions for 5 teachers*	CS standards, Code.org, CS Discoveries lessons, and CSTA national standards. **PL & Coaching Description** -We do and/ or you do: September, November, January, and March, teachers either teach or co-teach CS Discovery lessons incorporated within their Capstone lessons with coaching feedback. -PL on the use of the evaluation rubric to assess students on their mastery of the CS standards.	-Teachers will begin using an evaluation rubric to assess students on their mastery of CS and CSTA standards and adjust instruction accordingly.
Fall 2024-Spring 2025	*9th grade teachers*	*Four sessions for 5 teachers*	CS standards, Code.org, CS Discoveries lessons, and CSTA national	-Teachers will self-reflect on their proficiency

			standards. **PL & Coaching Description** -You do: Teachers video themselves September, November, January, & March. Teachers observe their videod CS Discovery lessons within their Capstone lessons and reflect (what went well, what would you change and how). Using the evaluation rubric, teachers will identify if students showed mastery of CS standards? If not, identify how they can reteach and personalize the learning? -Coach only supports as needed.	@ teaching CS and CTSA standards by videoing their lessons. -In addition, the school counselor will include technology Career Pathways in her Capstone lessons and pathway conversations with students and parents. -Teachers will independently use the evaluation rubric to assess student-mastery of CS & CTSA standards and adjust instruction accordingly. -The rubric will be crucial in adjusting instruction to effectively adjust instruction and in turn, support students' successful creation and presentation of computer science integrated projects at the yearly Capstone Fair.

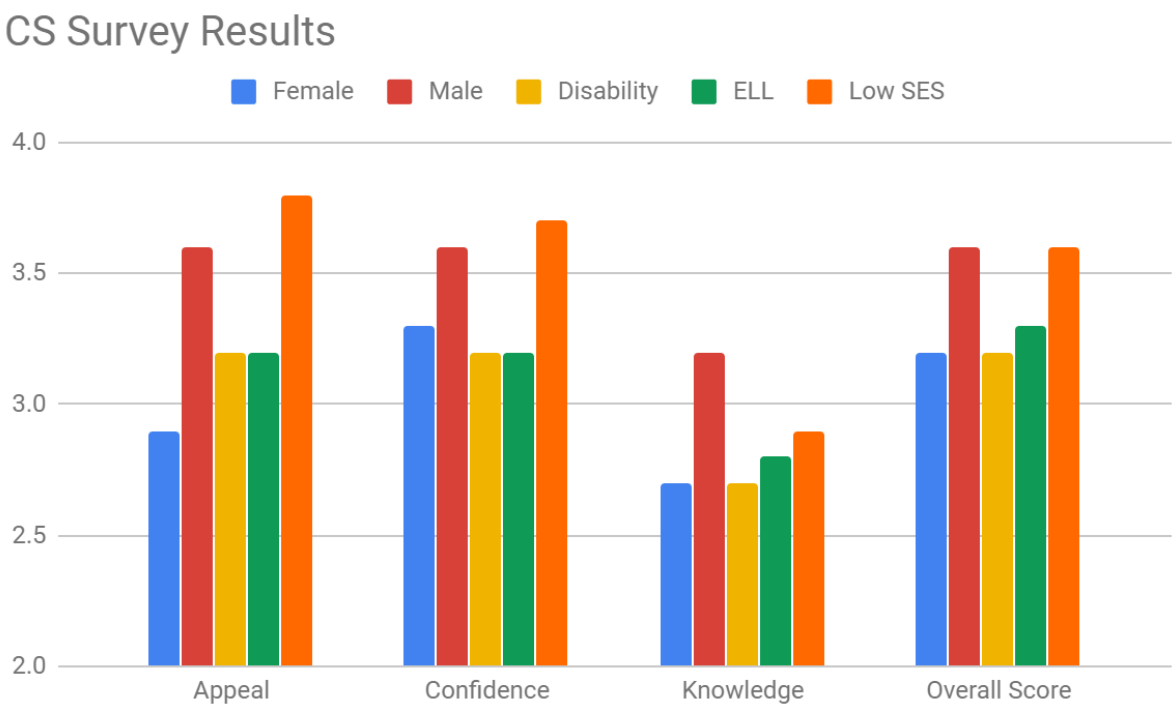
DIVERSITY: Creating Computer Science for ALL

Each LEA must complete the responses below including:

- Computer science for every student requires that equity and diversity be at the forefront of any transformative effort. When equity prevails, there is appropriate support based on individual students' needs so that all have the opportunity to achieve similar levels of success.
- A successful plan will ensure that every student in Utah has equitable access to high-quality computer science curriculum and instruction aligned to the UT K–12 CS Framework.
- An alignment to the vision and guiding principles for computer science for all students in the Utah Computer Science Education Master Plan.

Recommended Length: **2-3 Pages**

***REQUIRED**: How will your LEA increase numbers of female students, as well as traditionally underserved students in computer science?*
We identified several areas of underserved populations within our student body based on a survey which asked students: - "How much do you know about computers?" - "How much do you like learning about computers?" - "How confident are you in your ability to learn computer science?" - "How important do you think computer science is?" - "How likely do you think you will be to get a job that relates to computer science?" The survey used a 5 point Likert Scale for students when answering each question. Female students and students with disabilities rated low across all survey questions (average of 3.2) compared to the average for male students of 3.6. ELLs were low in their knowledge and confidence (2.8 and 3.2). Interestingly, students from low-SES homes scored highest among all groups in their confidence (3.7) and how much they like learning computers (3.8).



We will use this survey information to longitudinally evaluate the knowledge and confidence of these lagging groups and measure their response to instruction, adjusting our approach as needed. Our pilot program identified specific topics and strategies that are meaningful and effective for those low-rated groups (females, low-SES, ELLs, and those with disabilities), with a focus on expanding exposure and access to computer science. The goal for the 2021-22 school year is to raise the survey results for female students and those with disabilities to an average of 3.5 across all questions. We also aim to raise ELL scores in knowledge and confidence to 3.5. The goal by the end of the grant term will be to raise these to 3.9.

Surveys and interviews will be conducted by classroom teachers and the computer science Lead team as a pre and post assessment for each year's instruction and results recorded. Survey growth will be charted as a spreadsheet using Google Forms.

Based on the data, student engagement peaked when content involved face-to-face interactions, authentic content, and real world problems. The curricula chosen and implemented will focus on these modalities to maximize student learning. Females, more than males, enjoyed group work and assignments. The use of hands-on materials and self-pacing accommodate students with differing abilities. Several girls involved in the hands-on robotic lessons showed a significant increase in interest and recognition of the importance of computer science after the lessons. One student is currently designing a website around her specific interest areas.

We will focus on integrating coding and robotics instruction into the curriculum in the general classroom to ensure exposure and practice for all students. This grant would allow improvement of teacher knowledge and quality of instruction by funding more time for professional development (including a teacher-produced alignment of curriculum platform lessons with Utah computer science standards), providing materials such as robots and books, and providing mentoring to co-teach lessons with our educators; this would all reduce barriers to rigorous instruction.

We will work with our Special Education department to ensure our 504 and IEP students receive equitable access to the computer science curriculum. This includes, but is not limited to the following:

- Ensuring all students have the opportunity to take part in and benefit from all computer science activities.
- Providing students with disabilities the same types of opportunities and experiences as other students.
- Making sure the quality of computer science education provided is equal to those received by other students.
- Emphasizing computer science curriculum accessibility and providing the proper equipment to increase student comfort and chances for success.

Our Special Education department has experience implementing a variety of assistive technologies including screen-readers/magnifiers, dictation software, and accessible peripherals, among others. Because inclusion of underserved populations is our primary goal, we will ensure students with IEPs (and their teachers and paras) are trained in adaptive technologies to allow them full access to the CS curriculum.

We will also be capitalizing on our relationships with computer science professionals within our parent population, student community, and larger community to expose all students to the world of computer science careers and the diversity of people in the field. This interaction will increase student awareness of the importance of jobs involving computer science and show them areas in the field which align with their interest areas. They will have a chance to talk with and ask questions to professionals currently working in the field.

Educator professional development will include training on inclusive and affirmative language in computer science; teachers will express in daily language the understanding that anyone can learn about computer science, engage in CS activities, and become a computer scientist. They will also affirm that computer science is fun!

***REQUIRED**: How will you ensure that all curriculum and course content is accessible to all students, including students with disabilities?*

As we implement our computer science curriculum in the general classroom, it will be an expectation for all students to participate. By improving student-device ratios in classes all students will have ample opportunity to engage in lessons and practice. There will be teacher-led lessons and individual and group follow-up to the lessons which each student will need to complete. The follow-up work will be differentiated based on student interest and ability.

Once all students have device access, we will improve individual content access by providing peer mentoring, bolstering the adult-student ratio during computer science lessons, and providing assistive technology as needed.

First, we will train student leaders in each classroom to help their peers practice their computer science skills and offer basic technical support (e.g. logging in, debugging). In our pilot program students responded well to peer support after receiving initial instruction from teachers. It not only helped those receiving help, but the advanced students improved markedly in their ability to use content-specific language to describe their work. This approach allows many more students to get their code up and running than when the teacher is the only expert in the room. In addition, this grant will allow our computer science leads to be available for weekly lessons to help classroom teachers deliver high quality instruction and support students who struggle to access content due to disability.

Our SpEd team specialists will work with elementary students by pushing into classrooms and providing support to students with IEPs and during specialized Study Skills courses in middle school. They will also provide advice and expertise on accessibility and specific student needs. For students with disabilities we will provide assistive technology as needed, such as screen readers/magnifiers, voice-to-text, and video tutorials built into the Skill Struck platform to support text instructions. We will comply with the Americans with Disabilities Act (ADA) in providing necessary accommodations to all students.

***REQUIRED**: What strategies will you develop and implement for increasing diversity in K-12 Computer Science (i.e. expand programs to include parents and counselors in the learning process)?*

Our school will offer a student-led Hour of Code Night event on an annual basis. Middle School students will act as leads in organizing a hands-on event with activities for all ages and abilities. The goal is to increase family and community involvement in coding and gain positive exposure to computer science by offering engaging activities led by students and volunteer industry professionals.

Our partnerships with Skill Struck and Imagine Learning will connect students with industry via site tours and inside-look interviews with mentoring professionals (onsite or virtual). Students can connect and engage with real world mentors as they work on computer science problems, and will have more opportunities to tie what they're learning in the classroom to their future in the workforce.

With our Hour of Code Night events we will expand our outreach to underserved students, parents, caregivers, and industry professionals in our community. Our goal is to reach 100 individuals each year through these events. One of our computer science leads will take a headcount at the door to track this goal.

Our school counselor will present the Utah Career Pathways career cluster in Computer Science and Information Technology to middle school students, including Cybersecurity, Information Technology Systems, Programming & Software Development, and Web Development, within our CTE program. The counselor will also utilize information and

resources from the National Center for Women and Informational Technology (NCWIT) “Counselors for Computing” program to encourage girls and underrepresented groups to pursue computer science.

OUTREACH AND COMMUNICATION

Each LEA must complete the responses below including:

- Increase awareness of the current computer science work and resources available in the state, communicate the CS Master plan, receive dynamic feedback from a variety of stakeholders, and communicate best practices for implementation across the state.
- Increase awareness of the importance of computer science across your LEA, including a dedicated website URL
- Create a network for proactive communication at the LEA and school level
- An alignment to the vision and guiding principles for computer science for all students in the Utah Computer Science Education Master Plan.

Recommended Length: **2 Pages**

***REQUIRED**: How will your LEA communicate your computer science offerings and advances toward access for all students as you implement your 4-year plan?*
• We will take a multifaceted approach to increasing school and community awareness of our computer science work and the importance of computer science in the elementary and middle school classroom. We will use varied communication avenues (email, website, newsletter, school podcast, etc.) to inform multiple stakeholders--teachers, students, parents, administrators, instructional leads, the MWMA Board of Directors, and community partners--about our CS plan, implementation, and outcomes.

- Our MWMA school podcast, *Do You See?*, has a widespread audience in our school community and will feature several episodes devoted to computer science. This will serve as a channel of communication to apprise stakeholders of the details of our CS initiative and keep them informed of events, progress, and outcomes. Episodes featuring (1) CS team leads detailing our program, (2) MWMA students reporting on current CS work or projects, and (3) experts in the field presenting current trends and real world insight will garner excitement for the initiative and increase CS awareness generally in our community.

- Digital portfolios of student work in computer science will be shared with parents at parent teacher conferences. Parents and stakeholders will also receive updates on our computer science implementation in board meetings on a quarterly basis. The Computer Science Lead Team will use monthly professional development activities as an opportunity to help elementary and middle school teachers see the value of integrating computer science in the classroom.

- The school's annual Jog-a-thon fundraiser will set a goal to raise funds for building and sustaining our computer science program. The Jog-a-thon increases awareness for a cause and brings the community together to reach a specific goal. It provides an opportunity for us to build awareness within the community about our computer science program. Donors include local businesses, parents, family

members, and friends. Every student participates in raising money and running in the event. Parents and caregivers help plan and implement the Jog-a-thon, which includes reaching out to local businesses for sponsorships. After the funds are counted, we issue a press release and newsletter showing the community directly how the money raised is used to accomplish our goal.

- During our Hour of Code event hosted at the school, students, their families, and the community at large are invited to participate in mini workshops centered around a variety of digital literacy skills including coding, scratch, robotics, websites, etc. This gives students a chance to demonstrate learned skills and be exposed to new aspects of computer science. Parents and guardians get the opportunity to see what their child is learning and how computer science is integrated into academic and life skills. The event builds community awareness and momentum around computer science.

- Computer science professionals from within the community will be invited to participate and speak at our Hour of Code Night and work with students throughout the year, helping to connect classroom learning to their future careers and bring home the relevance of our computer science program. Our Computer Science Lead Team will work hard to ensure these presenters represent our

underserved populations in order to increase appeal to students and families throughout the school.

***REQUIRED**: Where will your LEA communicate your plan, updates on implementation, and required data and reporting on your website?*
https://mwmacademy.org/computer_science

DATA AND REPORTING

Each LEA must complete the responses below including:

- Measure the state of computer science and computer education and technology in Utah across demographics and regions to inform the LEA's goals.
- An alignment to the vision and guiding principles for computer science for all students in the Utah Computer Science Education Master Plan.

Recommended Length: **5 Pages**

Elementary and Middle Current Computer Science Course Offerings FY 2020
(Please note that keyboarding and digital literacy are not CS courses.)

Grade Level	Number of Students Engaged in Computer Science Learning FY 2020	Total Number of Students
PreK (if applicable)	NA	NA
Kindergarten	47	47
First Grade	42	42

Second Grade	51	51
Third Grade	51	51
Fourth Grade	47	47
Fifth Grade	47	47
Sixth Grade	43	43
Seventh Grade	31	33
Eighth Grade	0	33

Elementary and Middle Computer Science Student Demographics:

Grade Level	Female %	Underserved CS Population %	SPED %	ELL %	FRL %
PreK (if applicable)	NA	NA	NA	NA	NA
Kindergarten	100%	100%	100%	100%	100%
First Grade	100%	100%	100%	100%	100%
Second Grade	100%	100%	100%	100%	100%
Third Grade	100%	100%	100%	100%	100%
Fourth Grade	100%	100%	100%	100%	100%
Fifth Grade	100%	100%	100%	100%	100%
Sixth Grade	100%	100%	100%	100%	100%
Seventh Grade	100%	100%	80%	100%	90%
Eighth Grade *CS was not offered*	0%	0%	0%	NA	0%
TOTAL representation in all CS courses currently offered **92% of K-8 received CS instruction**	**93%**	**97%**	**92%**	**100%**	**93%**

High School Current Computer Science Course Offerings FY 2020

Course Code and Title	Number of Sections Offered (FY2020)	Total Students Enrolled FY2020
'35020000037', -- Algorithms and Data Structures	-	
'35020013037', -- Algorithms and Data Structures CE	-	
'35020000041', -- AP Computer Science	-	
'35020000034', -- AP Computer Science Principles	-	
'35020000030', -- Computer Programming 1	-	
'35020013030', -- Computer Programming 1 CE	-	
'35020000040', -- Computer Programming 2	-	
'35020013040', -- Computer Programming 2 CE	-	
'35020000035', -- Computer Science Principles	-	
'35020013035', -- Computer Science Principles CE	-	
'35020000003', -- Creative Coding	Only 7th grade	Only 7th grade
'35020000007', -- Exploring Computer Science 1	-	
'35020000008', -- Exploring Computer Science 2	-	
'35020000045', -- Gaming Development Fundamentals	-	
'35020000046', -- Gaming Development Fundamentals 2	-	
'35020000055', -- HTML5 App Development Fundamentals	-	
'35020000050', -- IB Computer Science SL 1	-	
'35020000051', -- IB Computer Science SL 2	-	
'35020000048', -- Mobile Development Fundamentals	-	

Secondary Computer Science Student Demographics: NONE

Course Code	Female %	Underserved CS Population %	SPED %	ELL %	FRL %
'35020000037', -- Algorithms and Data Structures	-				
'35020013037', -- Algorithms and Data Structures CE	-				
'35020000041', -- AP Computer Science	-				
'35020000034', -- AP Computer Science Principles	-				
'35020000030', -- Computer Programming 1	-				
'35020013030', -- Computer Programming 1 CE	-				
'35020000040', -- Computer Programming 2	-				
'35020013040', -- Computer Programming 2 CE	-				
'35020000035', -- Computer Science Principles	-				
'35020013035', -- Computer Science Principles CE	-				

'35020000003', -- Creative Coding	This course was offered for 7th grade only.				
'35020000007', -- Exploring Computer Science 1	-				
'35020000008', -- Exploring Computer Science 2	-				
'35020000045', -- Gaming Development Fundamentals	-				
'35020000046', -- Gaming Development Fundamentals 2	-				
'35020000055', -- HTML5 App Development Fundamentals	-				
'35020000050', -- IB Computer Science SL 1	-				
'35020000051', -- IB Computer Science SL 2	-				
'35020000048', -- Mobile Development Fundamentals	-				
TOTAL 9th grade representation in all CS courses currently offered	**0%**	**0%**	**0%**	**0%**	**0%**

PROPOSED BUDGET

An effective budget development and review process is guided by a deep understanding of school finance at the District, State and Federal levels. Funding is required to achieve many of the goals in this Utah Computer Science plan, including:

- In the short term, dedicated funding for computer science should be allocated and the funding should emphasize the professional development of existing teachers for the purpose of expanding computer science education efforts.
- In the long term, funding streams from state and federal sources, as well as from public/private partnerships, should support a system of high-quality computer science education.
- All budgets at the district and school level are aligned in order to prioritize student learning and cost-efficiency, with consistent funding streams for both recurring and non-recurring costs.

Note:

1. All costs must be in alignment with state purchasing guidelines.
2. All costs must directly support your plan and the expansion of computer science during the school day to all K-12 students.
3. Reminder that the following are not allowable expenses as defined in legislation:
   (1) to fund non-computer science programs;
   (2) to purchase mobile telephones;
   (3) to fund voice or data plans for mobile telephones;
   (4) to supplant existing funding for educational technology; or
   (5) for any expenditures outside of an LEA's budget for the LEA's approved plan.
4. This grant will be administered through the Utah State Board of Education through the Utah Grants Management System.

Recommended Length: **3-4 Pages**

REQUIRED: Proposed K-12 Computer Science Plan Budget Narrative

<Describe your proposed budget, including:

- an outline and justification of all identified resources (with realistic costs) to ensure the plan's success
- a justification for each budget category
- indicate the increase in FTEs (for K-12 Grant Program funds proposed for salaries)>

Our first priority with this grant is to prepare our staff to be able to deliver high-quality computer science instruction from kindergarten to 9th grade with confidence and authenticity.

We will dedicate $23,530 to salaries, benefits, and professional development incentives/reimbursement for our teachers to compensate them for time spent in planning, creating teacher training and instructional materials, carrying out training, and providing one-on-one support to teachers as they implement computer science instruction. This will also cover the cost of our part-time middle school computer science teacher who is an experienced professional. We feel that this is essential, as many teachers do not feel comfortable providing computer science instruction currently. The computer science lead team will be able to deliver tiered support based on teachers' current knowledge and comfort level and follow up with observations and interviews to determine effectiveness. This will equate to approximately 0.625 FTEs.

Second, we will use $3,175 of funds for transportation to take students on field trips to

industry and higher education facilities to gain a vision of themselves in computer science professions by better understanding what it involves and connecting with professionals. They will have the opportunity to meet diverse professionals in a variety of industries in an authentic setting. We will continue providing these field trips each year to all students.

The budget request of $700 for professional services will allow us to bring in high-quality, engaging professionals as speakers to our Hour-of-Code nights. The money will be paid as honoraria to bring in these speakers.

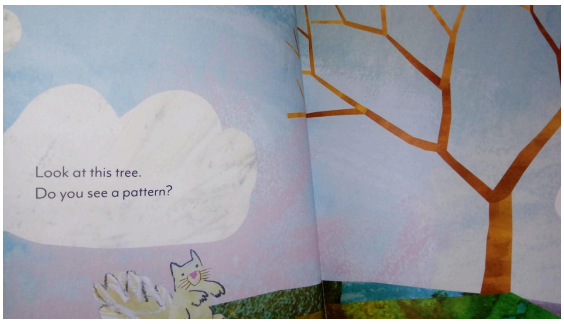
Fourth, the supplies and materials line includes $10,000 to pay for a site license for Skill Struck's Voyage product making it available to every student in the school. These services include standard-aligned curriculum, engaging learning experiences, online student portfolios, teacher and administrative tracking, and dynamic lesson plans for teachers to implement in the classroom. We have found through our pilot that underrepresented students and those with disabilities responded best when they could receive immediate feedback and have opportunities to create in an authentic coding environment. The program offers numerous accessibility resources (screen-reader, text highlighters, videos, etc.) that makes learning code accessible to every student. Teachers found the program to be indispensable in providing support and content since they currently have little training in providing computer science instruction. We feel that the Skill Struck platform and curriculum, in addition to our robotics program, provides needed support for teachers and motivation for students. Younger students (K-2) will receive instruction using hands-on

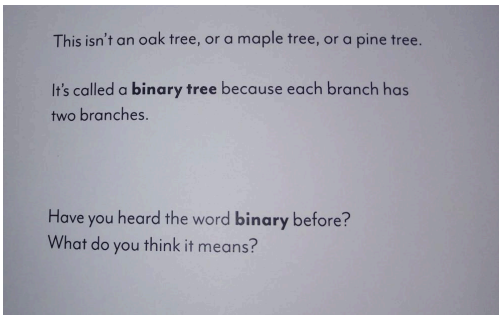
and unplugged materials as well as basic programming with robots. During our pilot program, students responded very positively to the Skill Struck program, creating several web pages from lessons integrated into our core class curriculum as well as on their own.

In addition, the $4,000 for materials in year one (decreasing to $1,000 in years 2-4) includes accessible children's literature, Montessori-style hands-on materials for understanding concepts within computer science, and robotics kits to help students explore basic computational thinking principles. During our pilot, students responded well to having these multi-sensory, hands-on experiences that provided access to more levels of DoK than simply using computer software. This investment in materials upfront will allow us to support our computer science curriculum for years to come. In our pilot groups, the students responded well to using the robots as we integrated them with language arts, geometry, and social studies. The $1,000 in years 2-4 will be to supplement additional materials and to replace and update existing materials.

Pictured below are some examples of the high-quality materials produced by https://www.learningbeautiful.com/. The binary towers effectively teaches young children (K-2nd grade) numbers in a binary system while also enhancing their number sense.

There is also age-appropriate literature that explains and expands on the materials. Here are two pages from a book that goes with the binary tree material, teaching the concept of exponential growth through patterns understandable to young children.





REQUIRED: Use of non-grant funds and existing LEA resources.

<Describe how additional non-grant funds will be utilized to support your K-12 Computer Science 4-year plan.>

MWMA will utilize four additional sources of income to support our K-12 CS initiative:

Land Trust funds, Digital Teaching & Learning funds, fundraising, and general funds.

MWMA's Community **Land Trust** Committee is invested in supporting CS instruction at our school and has included "increasing student access to computer science instruction

and resources which reinforce mathematical and critical thinking skills" as an element in one portion of our land trust funding for the 2021-22 school year.

MWMA has applied for, and received, the **Digital Teaching & Learning** grant which will support our CS initiative over the next 5 years by providing funding which may be used to increase student access to digital devices and supplement staff salaries or support professional development.

MWMA's annual Jog-a-thon **fundraiser** has set a goal to raise funds for building and sustaining our computer science program. The Jog-a-thon increases awareness for a cause and brings the community together to reach a specific goal. It provides an opportunity for us to build awareness within the community about our computer science program. Donors include local businesses, parents, family members, and friends. Every student participates in raising money and running in the event. Parents and caregivers help plan and implement the Jog-a-thon, which includes reaching out to local businesses for sponsorships. After the funds are counted, we issue a press release and newsletter showing the community directly how the money raised is used to accomplish our goal.

In addition, MWMA's general budget includes a five year plan to incorporate a part-time CS specialist as a permanent staff position at our school and provide a budget for future curriculum and materials expenses as part of the general curriculum budget.

REQUIRED: How will your LEA sustain the computer science program after the term of the award?

Funding from this grant will focus on training for staff and students, acquiring lasting materials, and creating connections that will allow us to maintain our curriculum into the future without extra funding. We will be able to leverage our connections, school funds, and future grants to fund any needs to update technology, further training, and encourage retention of trained teachers.

Teacher Training and Retention

Once the majority of our teachers are trained and experienced in giving instruction, we will be able to train new teachers in-house with PD and mentoring. In addition, our school staff has a low turnover rate. Both of these factors will eliminate some future training costs. The school will continue to set aside funds for training, professional development, conferences, and certifications as computer science leads seek continuing education to keep our school on top of evolving best practices and relevant professional skills. Also, by providing training to all teachers, the loss of any computer science leads will not lead to an end of the program as other teachers can fill the role.

Our partnership with Skill Struck has provided a quality coding environment for students to explore, innovate, and build their own products and gain an ownership of their computer science learning. During our pilot program we have already had students use the platform to create websites and programs for teaching core concepts and creating their own personal projects (one student used Skill Struck to write a program to find all

prime factors of a number). This structured environment and curriculum provides teachers scaffolding as they learn to implement robust computer science curriculum to students in a variety of ways.

By the end of this grant we will have programs securely in place and teachers trained in kindergarten through middle school. This will ensure continued access to high-quality curriculum for all students in our population. Trained teachers and connections with professionals will also allow us to continue providing integration and mentoring.

Student Involvement

Student and parent involvement and investment in after school activities, fairs, field trips, and partnerships will be an essential component of our computer science program. During this grant period we will build on the parent/community relationships we have already established as we plan events such as coding nights, competitions, clubs, and performances. Students will also be able to demonstrate their skills through the Middle School Capstone fair, showing student projects, and digital portfolios created by the students to present at Parent Teacher Conferences. These efforts to increase student excitement, engagement, and sense of accomplishment can help contribute to parental investment--both emotionally and monetarily. This will ensure that we will be able to continue our computer science efforts with a smaller school budget and fundraisers that do not rely on, but can be supplemented by, future funds from public and private sources. And finally, we will look for opportunities for students to be engaged in searching out and

applying for grants and donations for technology needs as they have already accomplished through their tree planting and podcasting grants at our school.

Materials

Within this grant we are requesting funds for devices and hands-on computer science materials to enhance our ability to provide high-quality access to all students. This will allow us to move from our current capacity of serving one group of students at a time to ensuring students have regular access during instruction and independent work time to computer science materials. This exposure, we believe, will begin to engender an improved attitude toward computer science in our most underserved students. By using these funds for needed materials initially, we will be able to focus future school and grant funds primarily on upkeep and repair of devices.

High quality “unplugged” Montessori coding materials that are purchased with these funds are sturdy and will serve students for years to come.

Connections

We will continue supporting these connections, both subscription/fee based and free, by seeking additional funding through other grants, and private companies. Regardless of funding, our computer science lead team is committed to fostering relationships with a variety of individuals, companies, and institutions of higher education who are invested in student success. These partnerships will be ones that will voluntarily provide supportive services to our staff and students, such as our current partnership with Imagine Learning: they have volunteered their workplace for field trips and their staff as mentors for

teachers and students. This type of relationship is likely to continue due to it's mutually beneficial nature, as it is a way for them to better connect with their product's target population of teachers and students and receive feedback about their program and services. In our efforts, we will seek other such invested companies and institutions.

We will also seek collaboration with local businesses and nonprofits through our school's Community Connect program. Many of these companies have already provided goods and money for previous efforts and fundraisers at our school. This is a likely avenue for continuing funding for essential and innovative computing programs.
To continue conducting CS-focused field trips, we will seek donations from parents and industry partners to sponsor trips.

REQUIRED: If an increase in funding is available through unclaimed grant redistribution, how will your LEA utilize additional funding toward your plan?

<In the event that additional K-12 CS funding becomes available, describe how you anticipate using the funds.>

- <50% increase
    - $1,000-$1,500 for coaching.
        - First we would use funds to provide more mentorship time and computer science instruction in classrooms by trained teachers to help build up the teachers who are less comfortable providing this instruction.
    - $5,000-$10,000 professional development.
        - We would provide additional outside training for our computer science team and interested teachers to build the variety of certificates, endorsements, and skills in our school.
    - $500-1,000 Additional hour of code events
- >100% increase

- This would allow us to hire a full-time computer science instructor and work towards getting teachers endorsed in a variety of CS areas.

Proposed Budget				
Description	Funding Requested – Year One (FY2021)	Funding Requested – Year Two (FY2022)	Funding Requested – Year Three (FY2023)	Funding Requested – Year Four (FY2024)
A.(100) Salaries	$21,300	$21,300	$21,300	$21,300
B (200) Employee Benefits	$2,230	$2,230	$2,230	$2,230
C. (300) Purchased Professional & Technical Services	$700	$700	$700	$700
D. (400) Purchased Property Services				
E. (500) Other Purchased Services	$3,175	$3,175	$3,175	$3,175
F. (580) Travel				
G.(600) Supplies/Materials	$15,850	$11,320	$11,320	$11,320
H. (800) Other (Exclude Audit Costs)				
I. TOTAL DIRECT COSTS (Lines A through H)	$43,255	$38,725	$38,725	$38,725
J. (800) Other (Audit Costs)				
K. Indirect Costs				
L. Property (includes equipment)				
M. TOTAL (Lines I through L)	**$**43,255	**$**38,725	**$**38,725	**$**38,725

STATEMENT OF ASSURANCES

Should an award of funds from the K-12 Computer Science Grant Program be made to the applicant in support of the activities proposed in this application, the authorized signature on this page of the application certifies to the USBE that the authorized official will:

1. Upon request, provide the Utah State Board of Education with access to records and other sources of information that may be necessary to determine compliance with appropriate federal and state laws and regulations.

2. Conduct educational activities funded by this project in compliance with the following federal laws:

   a. Title VI of the Civil Rights Act of 1964

   b. Title IX of the Education Amendments of 1972

   c. Section 504 of the Rehabilitation Act of 1973

   d. Age Discrimination Act of 1975

   e. Americans with Disabilities Act of 1990

   f. Improving America's Schools Act of 1994

3. Use grant funds to supplement and not supplant existing funds from all sources.

4. Take into account, during the development of programming, the need for greater access to and participation in the targeted disciplines by students from historically underrepresented and underserved groups.

5. Submit, in accordance with stated guidelines and deadlines, all K-12 Computer Science Grant Program and evaluation reports required by the Utah State Board of Education.

6. The applicant will retain records of the K-12 Computer Science Grant Program for five years and will allow access to those records for purposes of review and audit.

7. Execute all actions defined under the LEA Statement of Assurances outlined below.

<Name>	<Title>	<Signature>	<Date>
Alden Thorpe	Computer Science Director		6/28/21

(Digital Signatures encouraged, as final submission of plan needs to be a Google Document.)

LEAs with full Computer Science 4-years plans will[2]:

- ❏ Establish a Computer Science Program Leader within the LEA and create working groups in partnership with teacher leaders across departments to help implement the computer science plan
- ❏ Commit to providing one computer course offering approved by the Talent Ready Board in every middle and high school within the local education agency
- ❏ Commit to integrate computer science education into the curriculum of every elementary school within the LEA
- ❏ Promote all new CS courses to the LEA administration for K-12, coherent with the LEA plan. *(Free marketing materials are available at: https://code.org/promote)*
- ❏ Hold a district-wide Hour of Code™ event each year. Computer Science Education week is the second full week of December, but LEAs can calendar in accordance with their schedules for each school year
- ❏ Establish course codes for middle school and high school computer science classes in alignment with your projected CS offerings at your LEA by Fall 2021
- ❏ Include computer science course offerings that count for science graduation credit *(AP Computer Science, Computer Science Principles, and/or Computer Programming II)* on materials related to school counseling and planning for all students.
- ❏ Allow Computer Science PD to satisfy district hourly requirements for annual professional development
- ❏ Provide on-going follow up on key implementation details and dates, such as professional development workshops and marketing/orientation events for teachers and principals
- ❏ Support use of LEA facilities for professional development of teachers (if needed) at no cost to partner organizations identified in the plan
- ❏ Allow the Utah State Board of Education, Talent Ready Utah, and its evaluators to assess the program, including aspects of teacher professional development and student outcomes
- ❏ Include computer science plan, communication tools, training, and data outcomes as required in this plan on your LEA website for easy stakeholder access
- ❏ Sustain the computer science program after the term of the award
- ❏ Establish or connect with a community of practice within the geographic area, and share best practices with other Utah LEA leaders
- ❏ Meet any other requirements established by the state board in consultation with the Talent Ready Board and submit a written report annually to the state board and the Talent Ready Board

[2] Adapted from "District Partnership Plan" from Code.org, accessed 1/12/2020 https://code.org/files/DistrictPartnershipPlan.pdf