



WYOMING
DEPARTMENT OF EDUCATION

*Creating Opportunities
for Students to Keep
Wyoming Strong*

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Date: September 13, 2017

To: Co-Chairmen Coe and Northrup
Joint Education Interim Committee Members

From: Dicky Shanor, WDE Chief of Staff
Laurel Ballard, WDE
Jill Stringer, WDE

Subject: Computer Science Education (Priority #3)

INTRODUCTION

Computer science and computational thinking is critical in today's workforce. The work completed during this interim session on computer science will have long lasting impacts on students' success and opportunities as they move into the workforce. The WDE, in coordination with multiple partners, is putting together a task force to create and implement Wyoming's long-term plan for expanding computer science education. Motion from June 20-21 Joint Education Interim Committee:

“Senator Rothfuss, moved, seconded by Representative Bovee, the Joint Education Committee requests the Department of Education to work with Wyoming school districts, the Professional Teaching Standards Board, community colleges, and the University of Wyoming, as necessary, to develop a roadmap, milestones, and a timeline towards achieving:

- 1) Access to an Advanced Placement Computer Science course or dual/concurrent enrollment equivalent for all Wyoming High School Students;
- 2) Access to at least two semesters of coding courses or dual/concurrent enrollment equivalent for all Wyoming high school students; and
- 3) Five hundred annual Advanced Placement Computer Science tests taken or dual/concurrent enrollment earned credit equivalent with broad student demographic participation.

The Committee further requests the Department of Education recommend any necessary statutory changes needed to achieve these objectives and report back to the Joint Education Committee at the September 27-28 meeting.”

Current data related to the three goals identified by the JEIC is as follows:

- 1) In the 2016-17 school year, three AP Computer Science courses were offered in three school districts, one IB Computer Science course was offered in one school district, and dual/concurrent Computer Science courses were offered in three school districts.
- 2) In the 2016-17 school year, six of 16 school districts with certified staff offered Computer Science courses, utilizing nine of the 34 total certified staff in the state.
- 3) Six students took the AP Computer Science test in the 2015-16 school year (the College Board has not yet released data for the 2016-17 school year). In the 2016-17 school year, four students enrolled in a dual/concurrent Computer Science course.

COMPUTER SCIENCE EDUCATION TASK FORCE

To achieve the goal of increasing access to computer science education throughout Wyoming's education system, it will take support from many different partners. The WDE built a task force in July 2017, focused on developing a roadmap, milestones, and timeline towards achieving the goals set forth by the Joint Education Interim Committee. The task force consists of membership from the Wyoming Legislature, Department of Education, Professional Teaching Standards Board, State Board of Education, University of Wyoming, community colleges, Wyoming school districts, and industry partners. Attachment A provides a full list of task force members.

The Computer Science Education Task Force has met three times to develop the Wyoming Roadmap for Computer Science Education, which includes guiding principles, milestones as listed below, timelines, and goals to address the three goals identified by the JEIC in June 2017. A summary of the draft roadmap can be found in Attachment B.

Milestones related to JEIC computer science goals 1 & 2:

- Publicly elevate and highlight the importance of computer science education
- Define computer science education and develop state content standards
- Train 500 teachers and assure appropriate certification to teach computer science

Milestones related to JEIC computer science goal 3:

- Develop and implement programs targeted at equity in computer science education
- Increase student engagement through industry partnerships

The task force will be meeting again in October, and the roadmap will continue to be refined to meet the needs of students, schools, and industry. It will be vetted with various education organizations across the state. Additional feedback from the Joint Education Interim Committee will also be considered by the task force.

RECOMMENDED STATUTORY CHANGES

1. Incorporate computational thinking/computer science into the state "basket of goods," officially known as the common core of knowledge and skills (W.S. 21-9-101(b)).
2. Allow computer science to count toward high school graduation requirements (W.S. 21-2-304(a)(iii)). It is already incorporated into Hathaway requirements.
3. Request the State Board of Education to promulgate computer science standards either as stand alone or integrated across the current content standards.

4. Temporarily limit the Wyoming Education Trust Fund Grant (W.S. 21-22-106) of approximately \$250,000 annually to professional development for computer science teaching.

Attachments:

- Attachment A - Computer Science Education Task Force Membership
- Attachment B - Draft Wyoming Roadmap Summary

ATTACHMENT A:

Computer Science Education Task Force Membership

Name	Organization	Representing Role
Allyson Anderson	University of Wyoming	Postsecondary/College of Engineering and Applied Science
Julie Arp	ETS	IT Industry
Nick Bellack	PTSB	Educator Certification
Gerry Chase	Johnson #1	District Administrator
John Drescher	Apple	IT Industry
Tighe Fagan	Gannett Peak	IT Industry
Ryan Fuhrman	State Board of Education	Board Member
Keith Harris	Big Horn #1	District Administrator
Carla Hester Croff	Western Wyoming Community College	Postsecondary/Community College
John Lyttle	Laramie #1	School District Administrator
Gary New	NCAR	IT Industry/Workforce Development Council
Zac Opps	Park #1	School District Computer Science Teacher
Sean Roberts	Code.org	National Partner
Karen Rogers	Wyoming Game & Fish	GIS Industry
Carmalee Rose	Department of Workforce Services	Workforce/IT Sector Strategy
Chris Rothfuss	Wyoming Legislature	Senator
Darren Schmidt	Johnson #1	School Principal
Julie Snyder	Johnson #1	School District Computer, Teacher/Integration Specialist
Eric Trowbridge	The Array School of Technology and Design	Postsecondary/CS Education
Jim Wall	Microsoft	IT Industry
Rebecca Watts	University of Wyoming	Teacher Education Initiative
Brian Worthen	Mammoth Networks	IT Industry

Wyoming Department of Education Support		
Dicky Shanor	WDE	Chief of Staff
Brent Bacon	WDE	Chief Academic Officer
Shelley Hamel	WDE	Director of School Support Staff
Laurel Ballard	WDE	Task Force Co-Chair/Facilitator
Jill Stringer	WDE	Task Force Co-Chair
Alicia Vonberg	WDE	Personalized Learning Consultant
Karen Bierhaus	WDE	21st CCLC Program Consultant
Randall Butt	WDE	Career Technical Education Consultant
Robin Grandpre	WDE	Project and Performance Manager

ATTACHMENT B: Draft Wyoming Roadmap for Computer Science Education Summary

Guiding Principles:

1. Computer science knowledge is essential for an engaged citizenry.
2. Computer science, particularly coding, is a highly valued skill for today's jobs and is projected to be even more so in the future.
3. Districts and schools have a responsibility to provide and promote access to computer science skills and knowledge, including advanced opportunities/pathways, for every Wyoming student regardless of geography, background, or circumstance.
4. Schools should provide opportunities that empower every Wyoming student to become an innovator of technology.
5. Early access to computer science knowledge and skills in grades K-8 is necessary to achieve advanced opportunities in computer science.
6. In addition to computer science being taught as a stand-alone subject, schools should take advantage of the many meaningful opportunities to integrate computer science across content areas throughout K-12.
7. The state's role is to define computer science and to support districts with resources for meeting district responsibilities.

IEIC Computer Science Goals 1 & 2

- 1) *Access to an Advanced Placement Computer Science course or dual/concurrent enrollment equivalent for all Wyoming High School Students;*
- 2) *Access to at least two semesters of coding courses or dual/concurrent enrollment equivalent for all Wyoming high school students;*

Milestone 1: Publicly elevate and highlight the importance of computer science education

December 2017-March 2018

- Announce computer science education as a priority for the state and launch statewide informational campaign
- Educate districts on ways to integrate computer science education into current courses and programs
- Increase participation in Computer Science Education Week to show public support for and celebrate computer science-related activities
- Partner with industry and economic development organizations to develop a long-term plan to align computer science education with Wyoming workforce needs

- Incorporate computational thinking/computer science into the state “basket of goods” and allow computer science to count toward high school graduation requirements

Milestone 2: Define computer science education and develop state content standards

April 2018 - July 2019

- Create a definition for computer science education
- Develop a K-12 computer science education framework mapping out knowledge and skills foundation needs
- Promulgate computer science standards either as stand alone or integrated across the current content standards

Milestone 3: Train 500 teachers and assure appropriate certification to teach computer science

August 2017-August 2022

- Create an educator certification pathway to allow educators to teach computer science and coding along with model professional development plan
- Provide extensive professional development throughout K-12
- Support K-6 teachers with integrating computer science into other content areas
- Encourage school districts to utilize federal Title IIA funds to provide computer science professional development
- Temporarily restrict the use of the Wyoming Education Trust Fund Grant to incentivize teachers to gain certification and districts to offer computer science courses.

JEIC Computer Science Goal 3

- 3) *Five hundred annual Advanced Placement Computer Science tests taken or dual/concurrent enrollment earned credit equivalent with broad student demographic participation.*

Milestone 1: Develop and implement programs targeted at equity in computer science education

March 2018

- Establish state funding to support students in taking AP CS exams
- Introduce K-8 computing concepts to encourage early interest in each student’s education pathway
- Develop and deliver intentional, targeted outreach to historically underrepresented student populations in computer science

- Partner with afterschool programs to provide additional opportunities for students

Milestone 2: Increase student engagement through industry partnerships

September 2017 - September 2019

- Provide career development opportunities for students to learn where computer science is used in various industries
- Create job shadowing and internship opportunities applying computer science knowledge and skills
- Work with communities and industry partners to create community spaces, such as makerspaces, for students, community members and industry to meet and collaborate
- Support industry-sponsored opportunities where students can compete using their computer science knowledge and skills