Legislative Report

Computer Science Teacher Education Grant Program 2023-24

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Executive Summary

The Computer Science Teacher Education Grant
The Colorado General Assembly created the Computer Science Teacher Education (CSEd) Grant Program in 2017 with Senate Bill 17-296. The goal of the program is to increase the number of teachers able to provide computer science education in Colorado by providing funding for professional development for teachers. The CSEd grant is available to Colorado public schools, including district charter schools, Charter School Institute charter schools, boards of cooperative services (BOCES), school districts and facility schools.

Fiscal Year 2023-2024 Summary and Timeline
The legislature appropriated about $559,000 for this grant program during the 2023-24 school year. Excluding administrative costs, about $402,656 was available for distribution to local education providers (LEPs). **CDE awarded $363,135.51 to 14 LEPs** across the state, including two BOCES and one charter school.

The grant funds were distributed by CDE in February 2024. Originally, grantees were directed to expend funds through June 30, 2024. Four grantees requested no-cost extensions (NCEs) which extended their spending deadline through September 30, 2024. By that date, 11 of the 14 grantees had spent their entire award on eligible expenses, one had expended 93% of it, one had expended 78% of it and the remaining grantee had expended only 10% of the awarded funds. The unspent funds will be reverted. According to the end-of-grant reporting data, a total of 366 teachers were trained through the 2023-24 CSEd grant program and collectively they gained a total of 294 credentials or endorsements.

Looking ahead to 2024-25
The legislature appropriated about $553,000 for this grant program during the 2024-25 school year. Excluding administrative costs, about $395,668.00 was available for distribution to local education providers (LEPs). In Fall 2024, **26 LEPs applied for $927,816.90, which is an increase in applications.** Districts expressed high interest in funding for computer science activities as AI and cybersecurity become pressing matters in education spaces. **CDE awarded $395,668.00 to 12 LEPs** across the state, including 1 BOCES. Fourteen districts were denied funds, which is a first in recent years.

Grantees, Funded Amounts and Uses
- For the names of the LEPs that received funds, and the amount awarded to each, please see Appendix B.

- For the number of teachers in each district who benefitted from the grant, please see Appendix C.

- For the details about the professional development that the grant funded, including postsecondary courses, degrees, training programs, or industry recognized certificates completed and the education provider that provided the education, please see Appendix D.

Introduction

Grant History

Administered by the Colorado Department of Education (CDE), the Computer Science Teacher Education Grant (CSEd) Program is a state-funded program designed to increase the number of teachers able to provide computer science education in Colorado. The intent of the grant program is to grow the capacity of schools to offer computer science courses and increase the number of students who interact with computer science content. This is accomplished by providing funding for professional development to introduce teachers to computational thinking, develop the use of computational thinking as a problem-solving process across all disciplines using methods for teaching computer science in both online and unplugged formats, and encourage the integration of computer science into general classroom curriculum. The CSEd grant is available to Colorado public schools, including district charter schools, Charter School Institute charter schools, boards of cooperative services (BOCES) school districts and facility schools.

The Colorado General Assembly created the Computer Science Teacher Education Grant Program in 2017 upon the passage of Senate Bill 17-296 and appropriated $500,000 for FY 2017-18. The legislature increased the appropriation by $500,000 in 2018 through the passage of Senate Bill 18-1322 for a total of $1,000,000 in FY 2018-19. Due to COVID-19 budget constraints, funding for this grant was reduced back to $500,000 in FY 2020-21 and has remained close to that level for the past four years. This is the only remaining state-funded computer science grant as the Computer Science Education grant was repealed in 2023.

State statute requires that CDE submit an annual report to the education committees of the Senate and House of Representatives of the Colorado General Assembly annually by January 1, detailing the following:

- The number of grants awarded during the previous calendar year (See Table 1.)

- The amount of each grant awarded to each grant recipient (See Appendix B.)

- The number of teachers in each district who benefitted from the grant (See Appendix C.)

- The uses of each grant, including postsecondary courses, degrees, training programs, or industry recognized certificates completed and the education provider that provided the education (See Appendix D.)
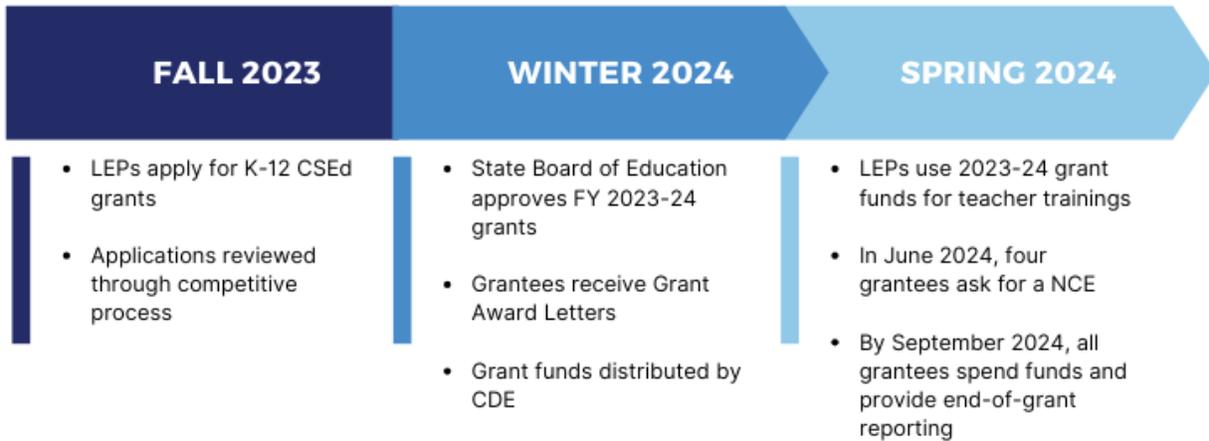
Fiscal Year 2023-2024 Summary and Timeline

The legislature appropriated $559,403 for this grant program to support computer science teacher professional development during the 2023-24 school year. Excluding administrative costs, $402,656 was available for distribution to local education providers (LEPs). CDE awarded $363,135.51 to 14 LEPs across the state, including two BOCES and one charter school. Comparatively, CDE awarded 17 CSEd grants totaling $394,645 in the 2022-23 grant cycle.

For the 2032-24 fiscal year, the grant funds were distributed by CDE in February 2024. Originally, grantees were directed to expend funds through June 30, 2024. Four grantees requested no-cost extensions (NCEs) which extended their spending deadline through September 30, 2024. Despite the tight timeline for spending, 93% of funds were spent on or before September 30, 2024. The remaining funds that could not be spent by grantees have been reverted to the state. Diagram 1 below illustrates the CSEd grant funding cycle through the 2023-24 fiscal year.

To provide additional time for LEPs to take advantage of grant funding, CDE plans to release any future RFAs in early spring, pending the legislature's appropriation of funding and the State Board of Education's grant

approval. This updated timeline will provide grant award winners a longer amount of time to strategically spend grant funding as a part of a sustainable professional development plan, aiming to expand computer science programming.

DIAGRAM 1: 2023-24 Computer Science Teacher Education Grant Distribution Timeline

FALL 2023
- LEPs apply for K-12 CSEd grants
- Applications reviewed through competitive process

WINTER 2024
- State Board of Education approves FY 2023-24 grants
- Grantees receive Grant Award Letters
- Grant funds distributed by CDE

SPRING 2024
- LEPs use 2023-24 grant funds for teacher trainings
- In June 2024, four grantees ask for a NCE
- By September 2024, all grantees spend funds and provide end-of-grant reporting

Eligibility

Local education agencies that participated in the CSEd grant program were eligible to receive funds to provide teachers with professional development in computer science. The funds could be used for any of the following:

- Tuition, including fees
- Professional development training program costs, including substitute/stipends
- Professional development books and/or materials used by the teacher during professional development

The authorizing legislation and CSEd grant rules stipulate that CDE give priority to LEPs designated as rural and those with high populations of students of color and/or low-income students. CDE provided applying LEPs with assistance in completing the application to aid in meeting CDE's goals for establishing or bolstering LEPs' computer science programming.

Computer Science Grant Participation & Funding Allocations

Local Education Provider Participation

CDE received 14 applications for the teacher education programs from districts, Charter School Institute schools, and BOCES for the 2023-24 school year. Applicants requested a total of $363,135.51. After committee reviews, all applicants were awarded their full requested amounts, totaling $363,135.51 of the total $395,668 available for grant distribution. Table 1 (next page) illustrates the total number of grants, total amount requested and the total amount awarded.

TABLE 1: 2023-24 Computer Science Teacher Education Grant Applications

Number of LEPs that Applied	Amount Applied For	Number of LEPs Approved	Amount Awarded
14	$ 363,135.51	14	$ 363,135.51

Figure 1 shows the location of the awarded districts throughout Colorado. Appendix B details what each reporting LEP applied for, amount received and how the funds were distributed.

Local Education Provider Priority Criteria

As noted previously, the CSEd grant program prioritizes LEPs designated as rural and those with high populations of students of color and/or low-income students. Of the 14 grantees in the 2023-24 grant cycle, 7 are designated as rural or small rural districts according to CDE definitions.[1] Two grantees are BOCES which also represent rural districts. The remaining seven grantees are non-rural districts. In addition, five grantees have student populations that are greater than 40.2% (the state average in 2023) eligible for free or reduced-price lunches and four grantees have student populations that are greater than 49% (the state average in 2023) students of color. Figure 2 below provides a summary of the priority areas the grant serves. For a detailed listing of all grantees and the priority area(s) each grantee met, view Appendix A.

FIGURE 2: 2023-24 Computer Science Education Grant Awardees by Priority Area

Number of Grantees by Priority Area

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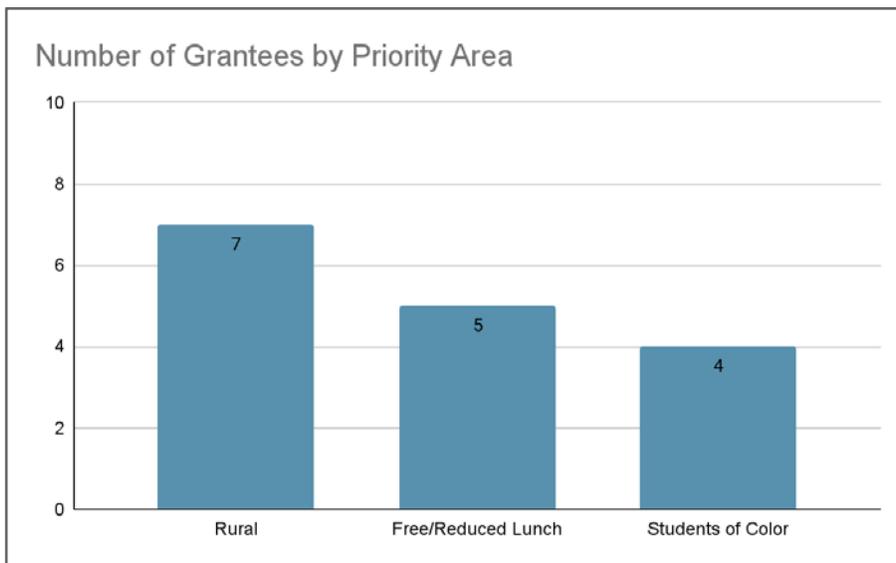
[1] A Colorado school district is determined to be rural based on the size of the district, the distance from the nearest large urban/urbanized area and having a student enrollment of approximately 6,500 students or fewer. Small rural districts are those districts meeting these same criteria and having a student population of fewer than 1,000 students. - Rural Education Council | CDE (https://www.cde.state.co.us/ruraledcouncil)

FIGURE 3: Map of Colorado School Districts Receiving CS Teacher Education Grant Awards in 2023-24
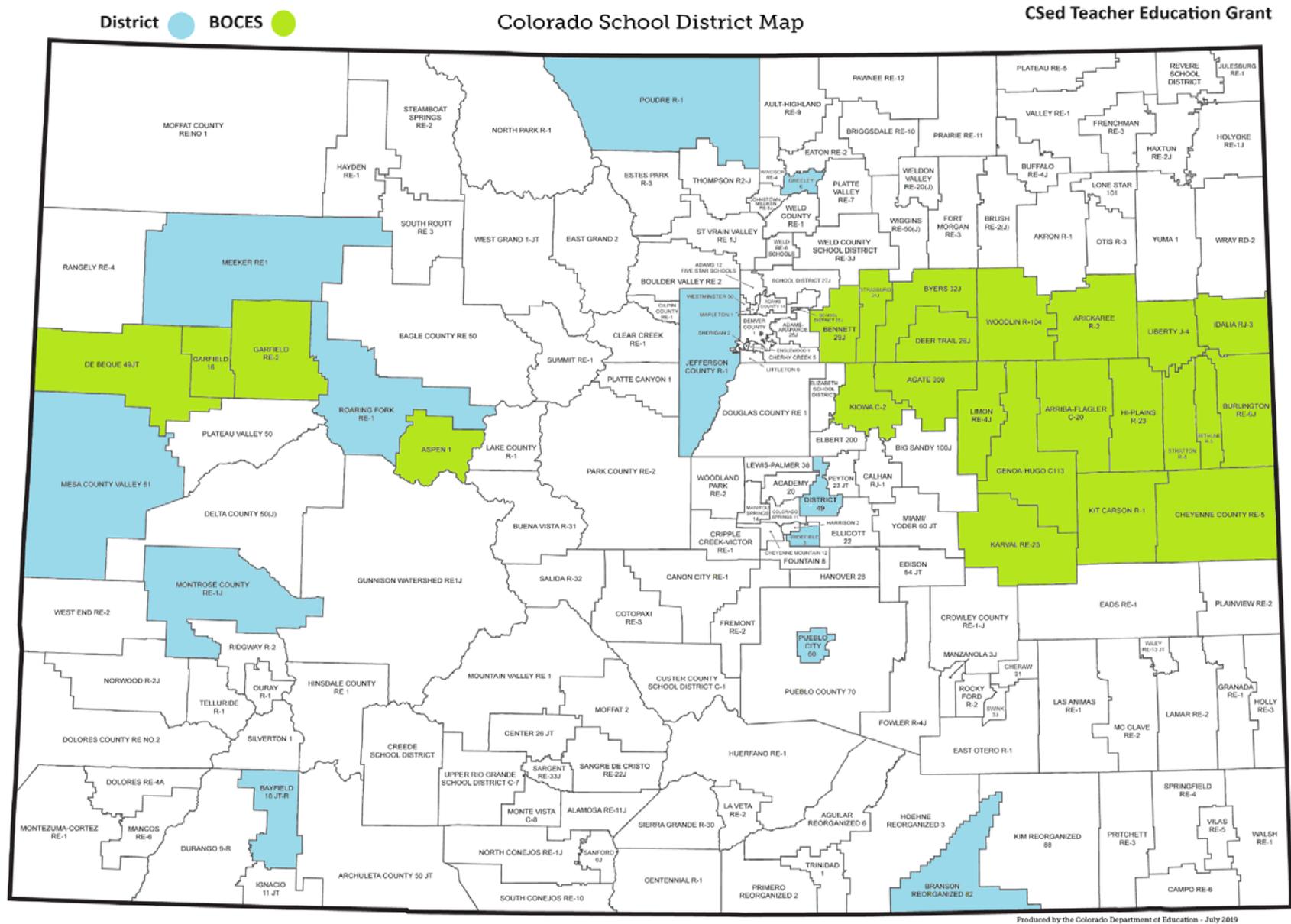
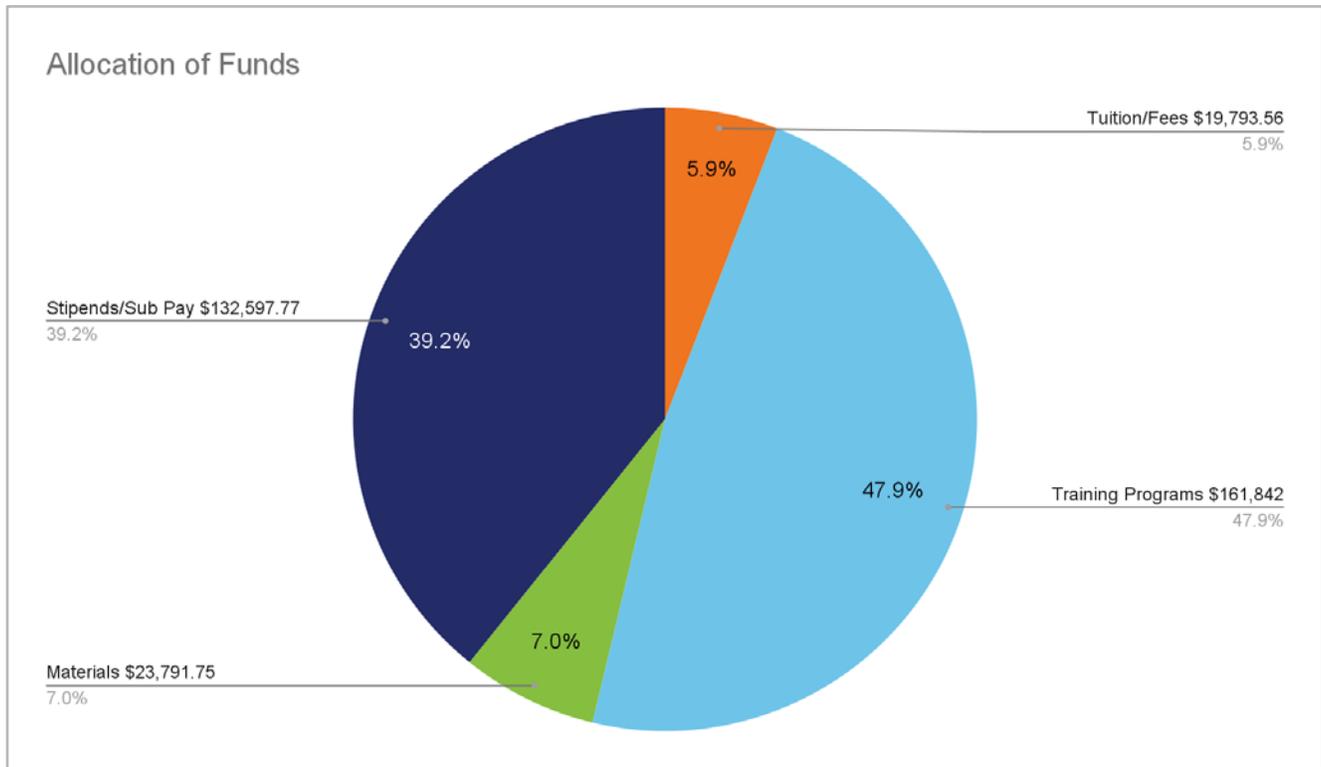Note: Districts highlighted in blue received grant funding based upon submission of individual applications, while those in green were served through an awarded BOCES.

Designation of Funds

Most of the $338,025.10 spent by grantees through the Computer Science Teacher Education Grant program were used for professional development and training (47.9%). The second largest allocation category was funds for stipends and substitute pay (39.2%). Figure 4 shows an overall summary of the currently reported allocation of funds.

FIGURE 4: 2023-24 Computer Science Education Grant Allocation of Funds

Allocation of Funds

- Tuition/Fees $19,793.56 — 5.9%
- Stipends/Sub Pay $132,597.77 — 39.2%
- Training Programs $161,842 — 47.9%
- Materials $23,791.75 — 7.0%

Program Implementation Activities

Using the funds provided by the 2023-24 Computer Science Teacher Education Grant, grantees were able to select the professional development providers which best met the needs of their students and districts. Thus, a variety of professional development options such as Artificial Intelligence (AI) Literacy and Computer Science Fundamentals training were funded through the grant program. Grantees may use grant funds to contract with a provider to train their teachers or grantees can allocate money to specific teachers to participate in training by various providers. Additionally, grantees may utilize grant funds for university tuition, online courses and district-directed professional development. The table in Appendix D provides a listing of training programs and courses grantees provided to their teachers using grant funds.

Impact on Teachers

According to the end-of-grant reporting data, a total of 366 teachers were trained through the 2023-24 CSEd grant program and collectively they gained a total of 294 credentials or endorsements. Additionally, grantees have reported an increase in teachers working towards a CDE endorsement connected to computer science education. As reported by grantees, the funding has positively impacted teacher development. Table 2 illustrates the aggregated total number of teachers trained from the 2023-24 grant.

TABLE 2: Aggregated Totals of Teachers Trained through 2023-24 CSEd Grant Program

Total Number of Grantees	Total Number of Teachers Trained	Total Number of Credentials or Endorsements Gained
14	366	294

Conclusion

The Colorado Department of Education continues to administer the Computer Science Teacher Education (CSEd) grant program, now in its seventh year, with the primary goal of expanding the pool of qualified computer science educators across the state to broaden computer science pathways and programming for K-12 students. Through partnerships with universities, colleges and professional development providers, the program equips educators with the essential skills, knowledge and confidence to integrate computer science principles throughout K-12 education.

The grant has benefited teachers and students by increasing access to artificial intelligence (AI) literacy training, supporting educators with the knowledge of how to integrate both online and unplugged teaching methods, and expanding computer science education at the elementary and secondary levels. Self-reported data from grantees demonstrates that some schools have expanded their computer science course offerings and have seen higher student enrollment in these programs. There has been broader integration of computer science across K-12 education, accompanied by a growing number of teachers pursuing CDE endorsements in computer science.

Many grantees have developed comprehensive K-12 computer science pathways and frameworks as part of their grant applications, indicating a commitment to long-term program sustainability. To sustain this vital initiative, LEPs have expressed how critical this grant funding has been in their efforts to attract and retain qualified teachers in this rapidly expanding field of emerging technologies. The grant program's success has catalyzed a broader adoption of computer science practices across Colorado's K-12 educational landscape.

Appendices

Appendix A: 2023-24 Computer Science Education Grant Awardees by Priority Area

Local Education Provider	Rural	> 40.2% Free or Reduced Lunch	> 49% Students of Color
Bayfield 10 JT-R	✓	*	*
Branson Reorganized 82	✓	*	*
Colorado River BOCES	✓	*	*
East Central BOCES	✓	✓	*
Greeley 6	*	✓	✓
Jefferson County	*	*	*
Meeker RE-1	✓	*	*
Mesa County Valley 51	*	✓	*
Montrose County RE-1J	✓	✓	*
Pioneer Technology and Arts Academy (El Paso County 49)	*	*	*
Poudre Re-1	*	*	*
Pueblo City 60	*	✓	✓
Roaring Fork RE-1	✓	*	✓
Widefield	*	*	✓
Total	7	5	4

Appendix B: 2023-24 Total Grant Award and Use of Funds

Local Education Provider	Total Grant Award	Total Amount spent	Tuition Fees	Professional Development / Training	Materials	Stipends and Substitute Pay
Bayfield 10 JT-R	$15,125.00	$14,065.00	$5,395.00	-	$920.00	$7,750.00
Branson Reorganized 82	$19,465.82	$1,988.76	-	$1,988.76	-	-
Colorado River BOCES	$35,750.00	$35,750.00	-	$18,622.00	-	$17,128.00
East Central BOCES	$30,000.00	$30,000.00	-	$ 23,000.00	$5,200.00	$ 1,800.00
Greeley 6	$3,150.00	$3,150.00	$3,150.00	-	-	-
Jefferson County	$21,869.76	$21,869.76	-	$3,691.04	$12,148.88	$6,029.84
Meeker RE-1	$29,144.02	$29,144.02	-	13,600.00		15,544.02
Mesa County Valley 51	$30,000.00	$30,000.00	$3,600.00	$25,800.00	$105.00	$495.00
Montrose County RE-1J	$30,000.00	$23,426.65	-	$14,571.00	$5,417.87	$3,437.78
Pioneer Technology and Arts Academy (El Paso County SD 49)	$35,000.00	$35,000.00	-	$11,000.00	-	$24,000.00
Poudre Re-1	$27,233.91	$27,233.91	-	$6,326.49	-	$20,907.42
Pueblo City 60	$30,000.00	$30,000.00	-	$12,384.19	-	$17,615.81
Roaring Fork RE-1	$27,500.00	$27,500.00	-	$27,500.00	-	-
Widefield	$28,897.00	$28,897.00	$7,648.56	$3,358.54	-	$17,889.90
Total	**$363,135.51**	**$338,025.10**	**$19,793.56**	**$161,842.02**	**$23,791.75**	**$132,597.77**

Appendix C: 2023-24 Computer Science Education Grant Participants by Grantee

Local Education Provider	Total Number of Teachers Trained	Total Number of Endorsements Gained
Bayfield 10 JT-R	3	3
Branson Reorganized 82	1	1
Colorado River BOCES	44	22
East Central BOCES	50	50
Greeley 6	1	0
Jefferson County	68	58
Meeker RE-1	35	35
Mesa County Valley 51	40	3
Montrose County RE-1J	1	1
Pioneer Technology and Arts Academy (El Paso County SD 49)	21	21
Poudre Re-1	24	24

Local Education Provider	Total Number of Teachers Trained	Total Number of Endorsements Gained
Pueblo City 60	18	18
Roaring Fork RE-1	2	0
Widefield	58	58

Appendix D: 2023-24 Computer Science Education Workshops and Courses Implemented

Course / Workshop Title
• Training on Microbit V2 Inventors Kit using Sparkfun Educators Inventor packs • Colorado School of Mines Courses focusing on teaching computer aided manufacturing • Science in the Rockies • BootUp Professional Development Training on Scratch and Scratch Jr including virtual instructional coaching support • MindSpark Learning workshops focused on Artificial Intelligence (AI) and Project-Based Learning (PBL) implementation • Computer Science Coursera Program through the University of Colorado • Colorado School of Mines Praxis Prep through Code HS • AP Career Kickstart Cybersecurity Training through Career Kickstart • NICE Conference Attendance • Cyber Security Master's Degree • AP Computer Science Microsoft Make Code Training • Cybersecurity Certification • AP Computer Science A Workshop • Principles of Programming through CSU Global • Computer Science Fundamentals through CSU Global • ISTE Conference Attendance • Tech Smart Certification • HTML, CSS Certifications • Rock CS Attendance • STEMCon Attendance • Elementary Cadre Scope & Sequence Development • Middle School Cadre Scope & Sequence Development • Machine Learning • Microsoft Minecraft pilot training • Python Coding/Codex Programming and AI Workshop • TechSmart US training • CollegeBoard AP Summer Institute • CodeHS Professional Learning Program • Unplugged activities and hands-on practice with computer science tools - Lego Spike Prime, Turing Tumble, Programming SmartHome, MakeCode Arcade Player Tech, and FEMA's Cybersecurity board games, students engaged in "unplugged" CS thinking. This approach fostered problem-solving and computational skills without relying on screens, making CS more accessible. • Student courses added including: AP Computer Science Principles, Web Design, Introduction to Computer Programming, AP Cybersecurity, and College Board Career Kickstart Cyber Security course