



Indiana Department of Education

Dr. Katie Jenner, Secretary of Education

To: Honorable Eric J. Holcomb, Governor of Indiana
Dr. Katie Jenner, Secretary of Education

From: Jake Koressel, Assistant Director of STEM and Computer Science
Karrienne Polk-Meek, Director of Teaching and Learning
Dr. Charity Flores, Chief Academic Officer

Date: January 15, 2022

Subject: IC 20-20-45 Next Level Computer Science Program Biannual Report

Background

IC 20-20-45 established the Next Level Computer Science (CS) Grant Program and Computer Science Fund to award grants, after June 30, 2019, to eligible entities. The program and fund were established for eligible entities to implement teacher professional development programs for teaching computer science. This requires the Indiana Department of Education (IDOE) to:

1. Administer the program and fund; and
2. Develop, in consultation with the Governor's Office, guidelines to award grants from the fund to eligible entities.

Additionally, IC 20-20-45 requires IDOE to biannually submit a progress report to the Governor regarding the:

1. Development and administration of the program and fund; and
2. Status of public schools in meeting computer science curriculum requirements. This biannual report must be submitted by July 15, 2018 and not later than July 15 and January 15 each year thereafter.



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Development and Administration of the Program and Fund

Timeline*

- January 2021
 - IDOE renews professional development contracts with the following five vendor partners:
 - CodeHS;
 - Indiana University School of Informatics and Computing at IUPUI;
 - IndianaComputes!;
 - Nextech; and
 - Project Lead The Way.
- February 2021
 - IDOE refines the Tech Plan Survey questions for computer science educators to optimize the collection of kindergarten through grade eight computer science implementation data and information related to accessibility barriers.
- March 2021
 - New Career and Technical Education (CTE) computer science course codes and competencies are released.
- April 2021
 - Indiana's biennial budget is finalized for FY 2022-2023, including \$3 million annually for the Next Level Computer Science Grant Program.
- May 2021
 - IDOE and the Governor's Workforce Cabinet begin collaborating to develop an exploratory computer science program of study.
- June 2021
 - IDOE makes a "Data Science 4 Everyone Commitment" to explore the inclusion of data science in computer science courses, mathematics courses, and/or other academic pathways for students in kindergarten through grade 12.
- July 2021
 - IDOE sponsors numerous week-long professional development programs for computer science teachers of all grade levels.



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- August 2021
 - IDOE attends CS State Supervisors Workshop to share and learn about successes, challenges, and best practices for implementing computer science education.
- September 2021
 - IDOE convenes educator committees to begin revisions of kindergarten through grade eight Indiana Academic Standards for Computer Science.
- October 2021
 - 2022-2023 Course Titles and Descriptions are released with information regarding new computer science course options and programs of study.
- November 2021
 - IDOE attends CEdCon International Computer Science Conference to strategically plan opportunities for Indiana's Computer Science educators and identify additional implementation resources.
- December 2021
 - The Indiana Learning Partnership focuses on computer science and CEdWeek.
 - IDOE partners with Nextech to recognize winners of the Nextech CSforGood Competition at the Statehouse.
 - IDOE delivers the IC 20-30-5-23 report to the Governor's Office, Indiana General Assembly, Indiana Commission for Higher Education, and State Board of Education.

*For timeline information prior to January 1, 2021, see Appendix F



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Training Snapshot by Provider

Between June 1, 2018 and January 15, 2022, over 3,200 Indiana kindergarten through grade 12 educators received CS training through partnerships between IDOE and the following providers. See appendices A-E for training partner contracts.

CodeHS Computer Science Training Numbers			
Workshop	Description	Total Number Trained	Number Trained in 2021
New CS Teacher Workshop	Two-day workshop focused on high school teachers who will be teaching a computer science course for the first time.	21	0**
Computer Science Principles Workshop	Two-day workshop focused on high school teachers who will be teaching AP Computer Science Principles or Computer Science I.	7	4
Computer Science A Workshop	Two-day workshop focused on high school teachers who will be teaching AP Computer Science A or Computer Science II.	8	2
Cybersecurity Workshop	Two-day workshop focused on high school teachers who will be teaching Computer Science III: Cybersecurity or will be integrating cybersecurity content into other courses.	10	4
Coding Bootcamp	Month-long, intensive, asynchronous session focused on building programming skills.	91	78
Introduction to CS Workshop	Two-day workshop focused on high school teachers who will be teaching Introduction to Computer Science.	10	10
Computer Science I Workshop	Two-day workshop focused on high school teachers who will be teaching Computer Science I.	4	4
Total Educators Impacted		151	102

***zero participants due to a programmatic change*



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Indiana University School of Informatics and Computing CS Training Numbers			
Workshop	Description	Total Number Trained	Number Trained in 2021
Computing by Design Workshop	11-day program intended to help high school teachers implement the Computing by Design (CxD) curriculum of the Informatics Diversity-Enhanced Workforce (iDEW) program.	75	0**
Interdisciplinary CS Workshop	A series of workshops focused on teaching standalone and/or interdisciplinary computer science in grades 6-12.	186	186
CS-Focused PBL Workshop			
Innovation Workshop			
Programming Workshop			
Total Educators Impacted		261	186

**zero participants due to a programmatic change

IndianaComputes! Computer Science Training Numbers				
Workshop		Description	Total Number Trained	Number Trained in 2021
Cohort 1	Elementary	Year-long program intended to build teacher CS content knowledge that culminates in a week-long curriculum development experience.	30	30
	Middle		17	17
	High		12	12
	Multi-Grade/Other		15	15
Cohort 2	Teacher Coaches		17	17
	Elementary		47	47
	Middle		23	23
	High		19	19
Total Educators Impacted			180	180



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Nextech Contract #2 - Computer Science Training Numbers

Workshop	Description	Total Number Trained	Number Trained in 2021
CS Principles	Nine-day professional development experience for high school teachers including five-day, intensive training in the summer followed by quarterly Saturday workshops during the school year.	51	24
CS Principles Refresher	Two-day workshop for those who have participated in an initial CSP training but want to learn about changes to the course and associated exam.	20	0**
CS Discoveries	Nine-day professional development experience for middle and high school teachers including five-day, intensive training in the summer followed by quarterly Saturday workshops during the school year.	101	42
Integrating CS in Middle School	One- or two-day workshop for middle school teachers.	103	77
Elementary Workshops	One- or two-day workshop for elementary teachers.	781	222
SCRIPT (districts)	One- or two-day workshop for district teams.	49	0**
Cybersecurity Workshop	Three-day cybersecurity training for high school teachers.	23	13
CSAwesome (Java)	Five-day intensive Java training for high school teachers.	34	12
WeTeach_CS Licensure Prep	Five-day preparation course for teachers seeking the CS license addition.	57	31
Total Educators Impacted		1219	421

***zero participants due to a programmatic change*



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Project Lead The Way Computer Science Training Numbers

Workshop	Description	Total Number Trained	Number Trained in 2021
Computer Science for Innovators and Makers	Five-day training for middle school teachers teaching a computer science course.	63	38
App Creators		46	24
Computer Science Essentials	Up-to 10-day training for high schools teaching introductory computer science.	21	13
Computer Science Principles	Up-to 10-day training for high schools teaching AP CS Principles or Computer Science I.	25	11
Computer Science A	Up-to 10-day training for high schools teaching AP CS A or Computer Science II.	13	8
Cybersecurity	Up-to 10-day training for high schools teaching Computer Science III: Cybersecurity.	25	13
Total Educators Impacted		193	107



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Status of Public Schools in Meeting Computer Science Curriculum Requirements

Kindergarten through Grade Eight

Prior to the enactment of SEA 172 (2018), there was limited availability of computer science-specific data for kindergarten through grade eight. IDOE has identified the following as currently-available indicators of progress at these grade levels.

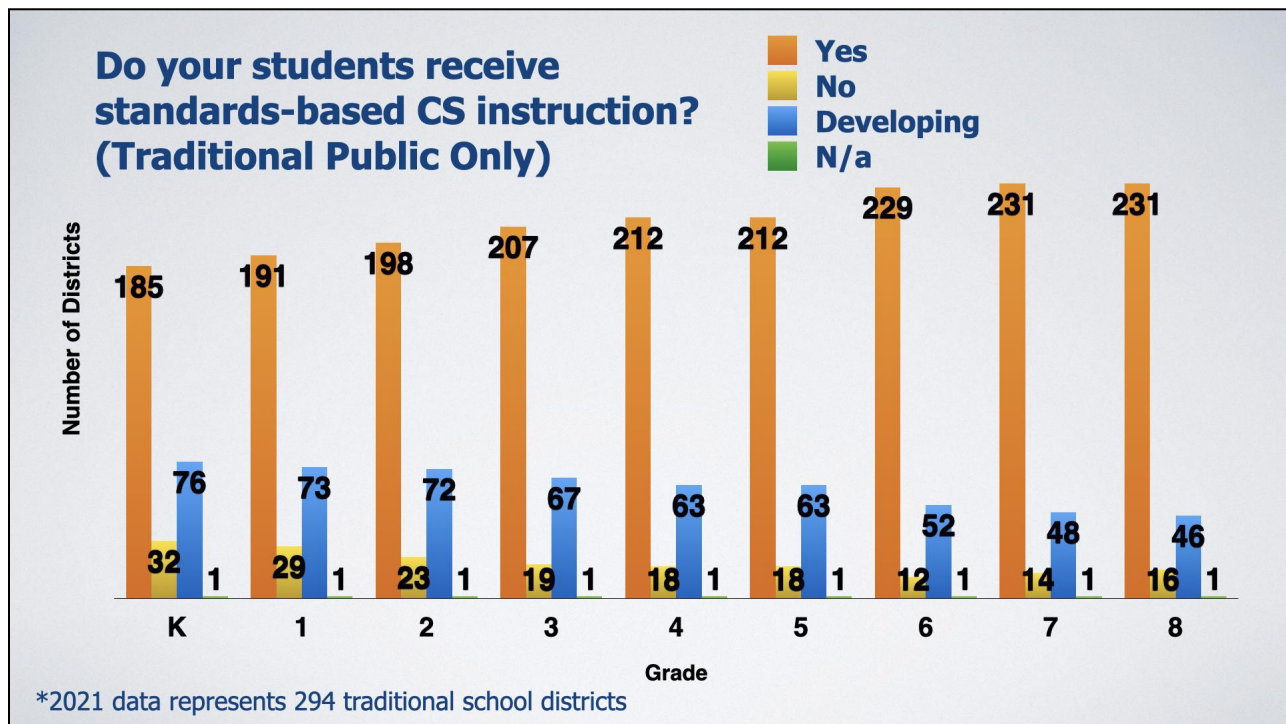
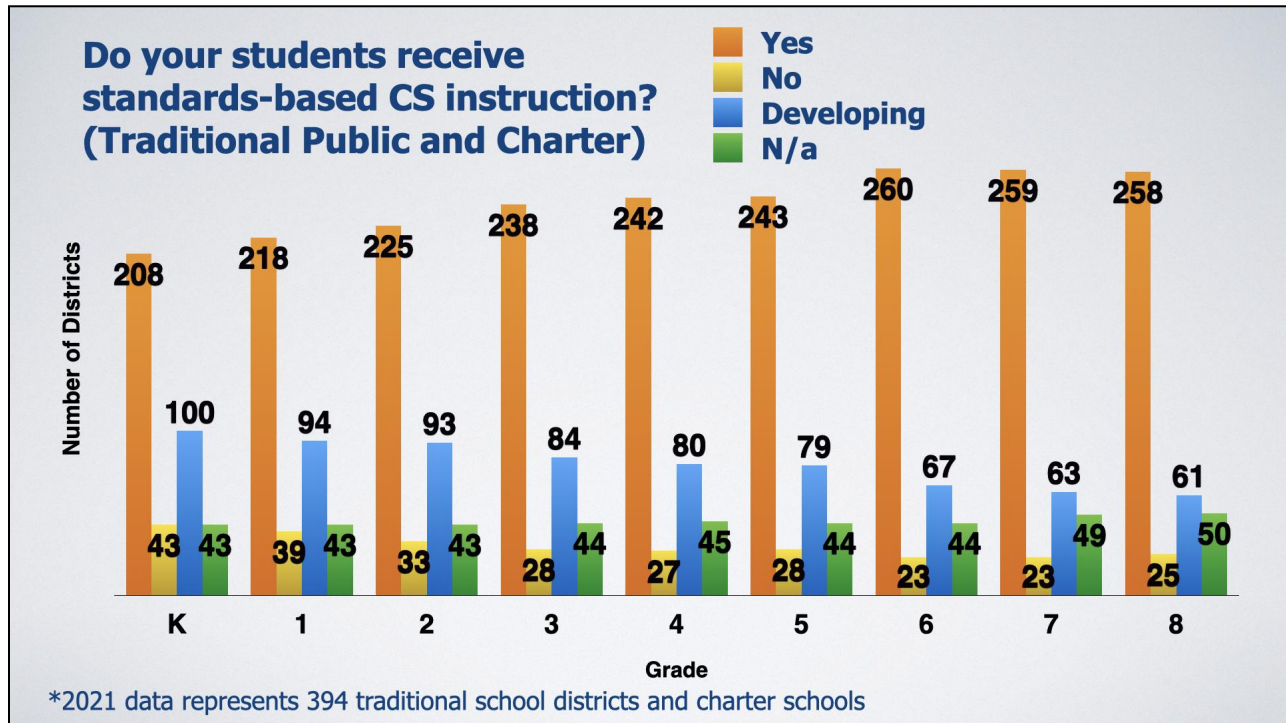
Relevant Elementary and Middle School Student Enrollment Trends					
Course	Year				
	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021
0488.K2 Computer Science <i>(kindergarten through grade two)</i>	-	-	-	-	8338
0488.35 Computer Science <i>(grades three through five)</i>	-	-	-	-	12740
0488.68 Computer Science <i>(grades six through eight)</i>	-	-	-	8714	11488
4803 Introduction to CS <i>(early high school)</i>	21	80	250	1084	366

Additionally, IDOE included kindergarten through grade eight CS-related questions in the annual Tech Plan Survey for educators in February 2021. Visual representations of the results are located on the following pages. The next Tech Plan data collection will take place in spring 2022.



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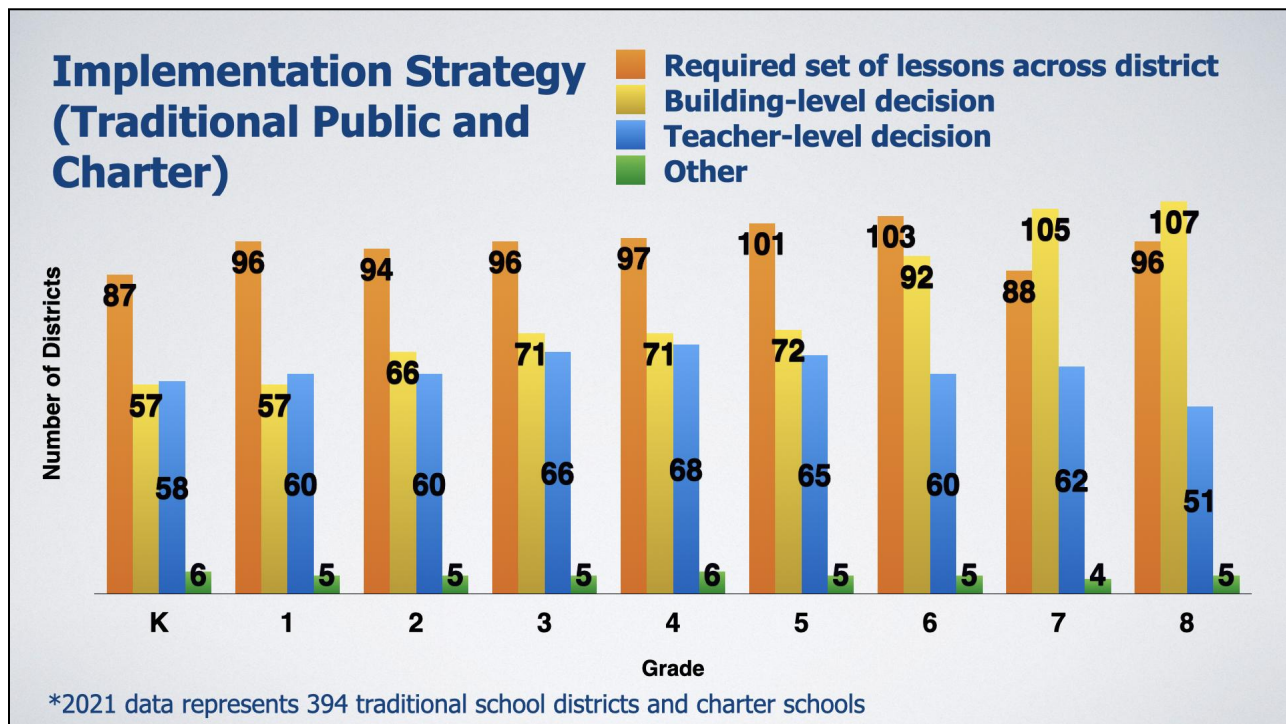
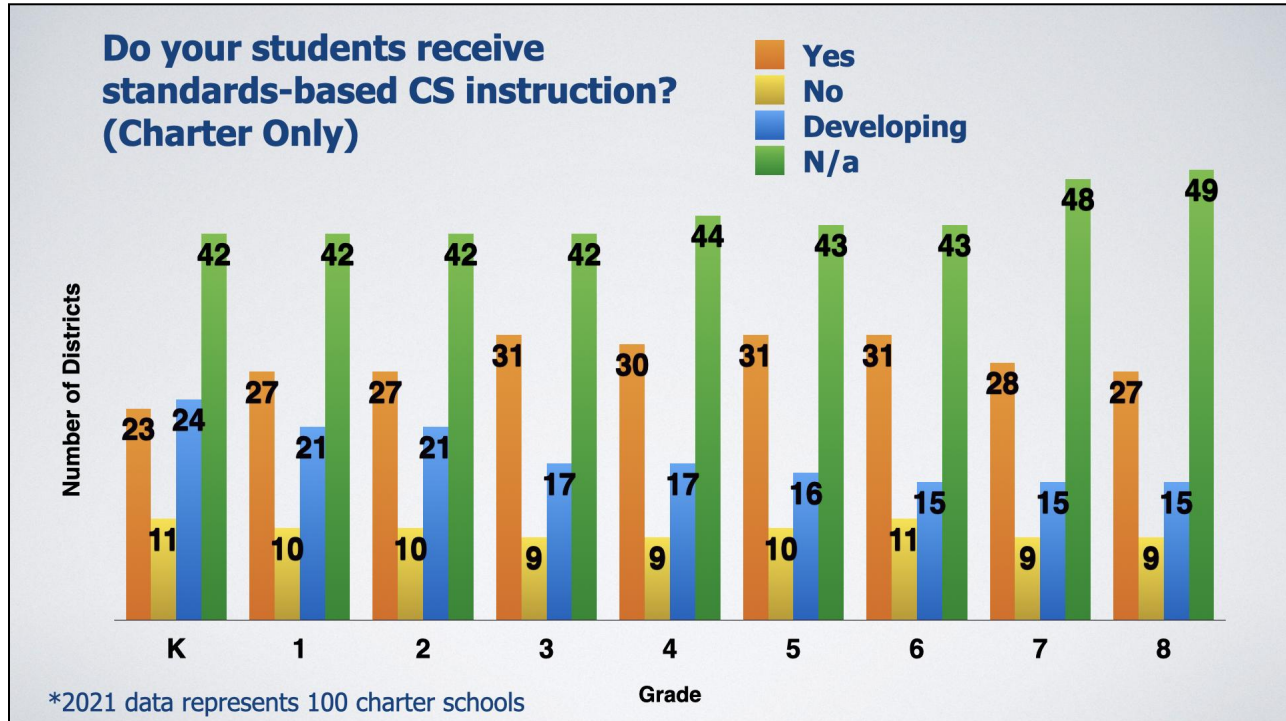
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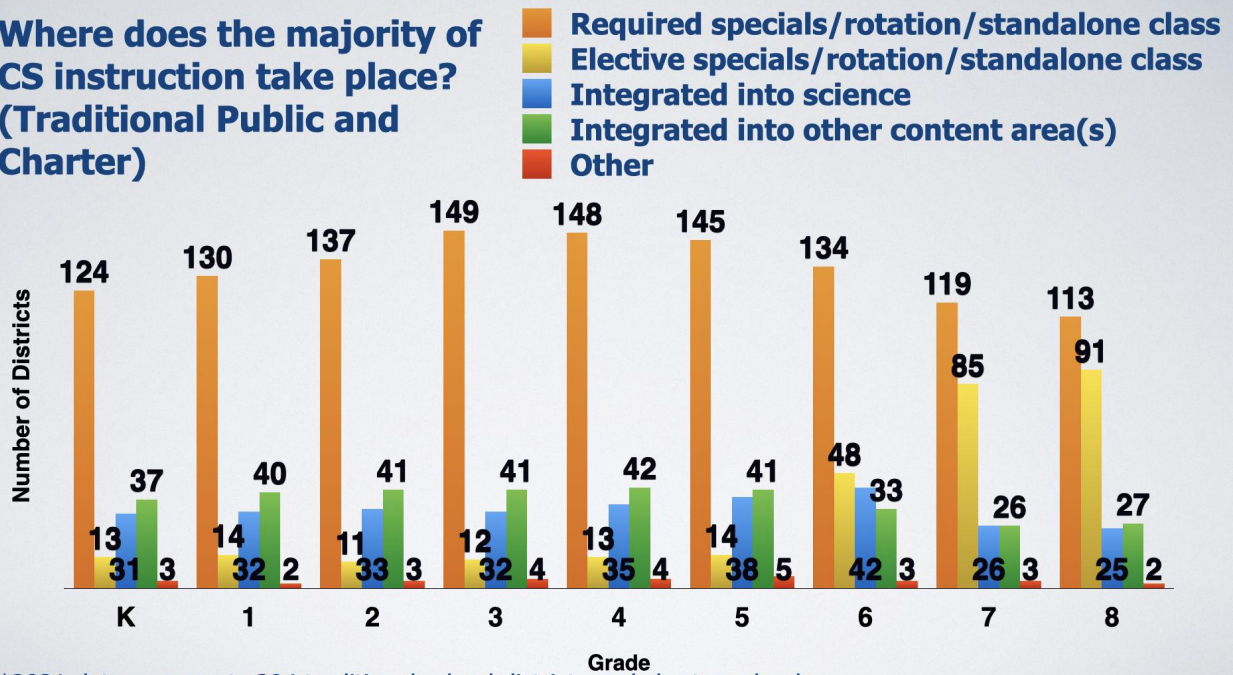




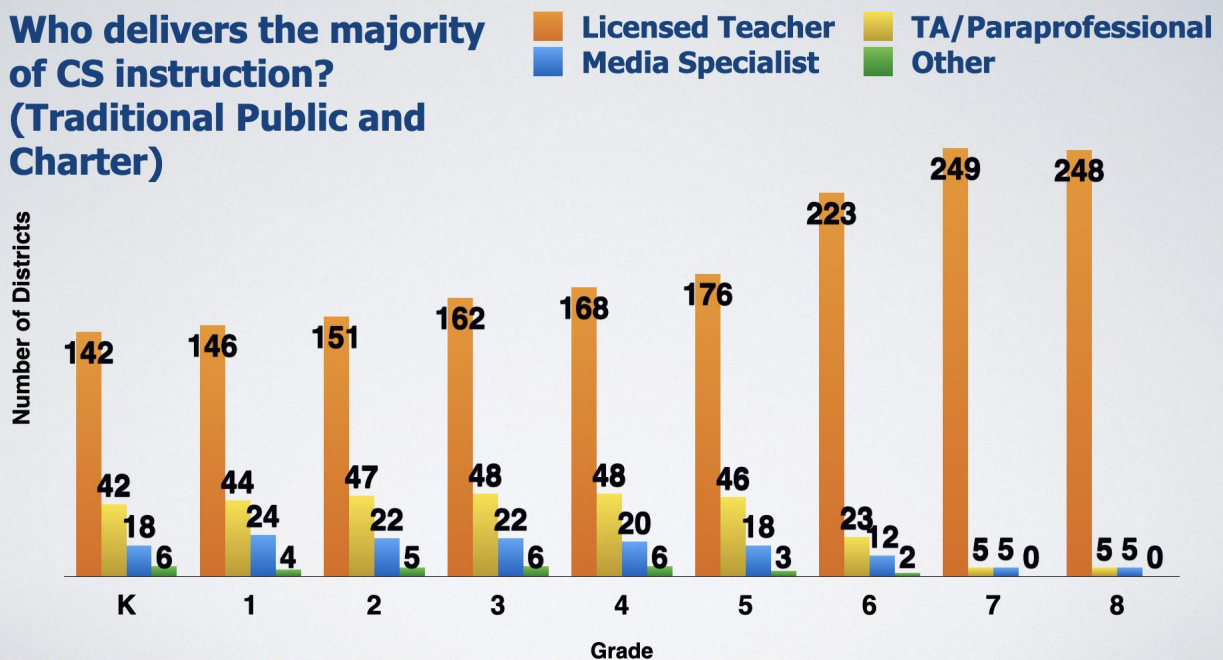
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Where does the majority of CS instruction take place? (Traditional Public and Charter)



Who delivers the majority of CS instruction? (Traditional Public and Charter)

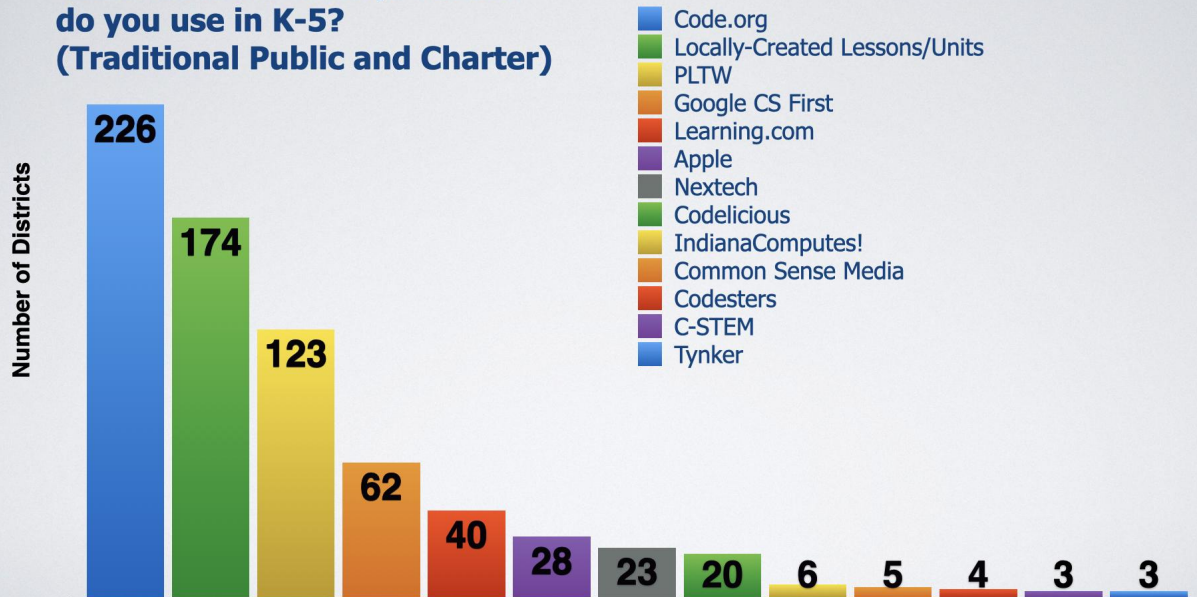




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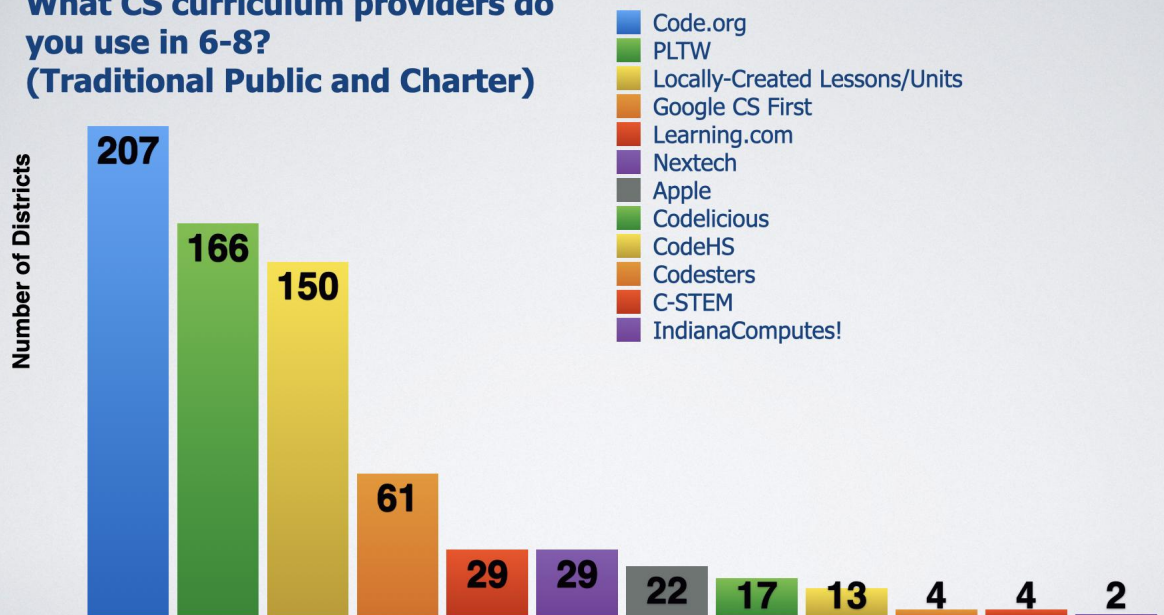
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What CS curriculum providers do you use in K-5? (Traditional Public and Charter)



*2021 data represents 394 traditional school districts and charter schools

What CS curriculum providers do you use in 6-8? (Traditional Public and Charter)



*2021 data represents 394 traditional school districts and charter schools



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Grades Nine through 12

ALL SCHOOLS			
School Year	Number of Schools	Number of Schools Offering At Least 1 CS Course	Percentage of all Schools
2016-2017	526	205	39%
2017-2018	537	239	45%
2018-2019	536	277	52%
2019-2020	535	339	63%
2020-2021	540	354	66%

TRADITIONAL PUBLIC SCHOOLS			
School Year	Number of Schools	Number of Schools Offering At Least 1 CS Course	Percentage of Schools
2016-2017	368	163	44%
2017-2018	367	186	51%
2018-2019	365	213	58%
2019-2020	366	264	72%
2020-2021	367	279	76%

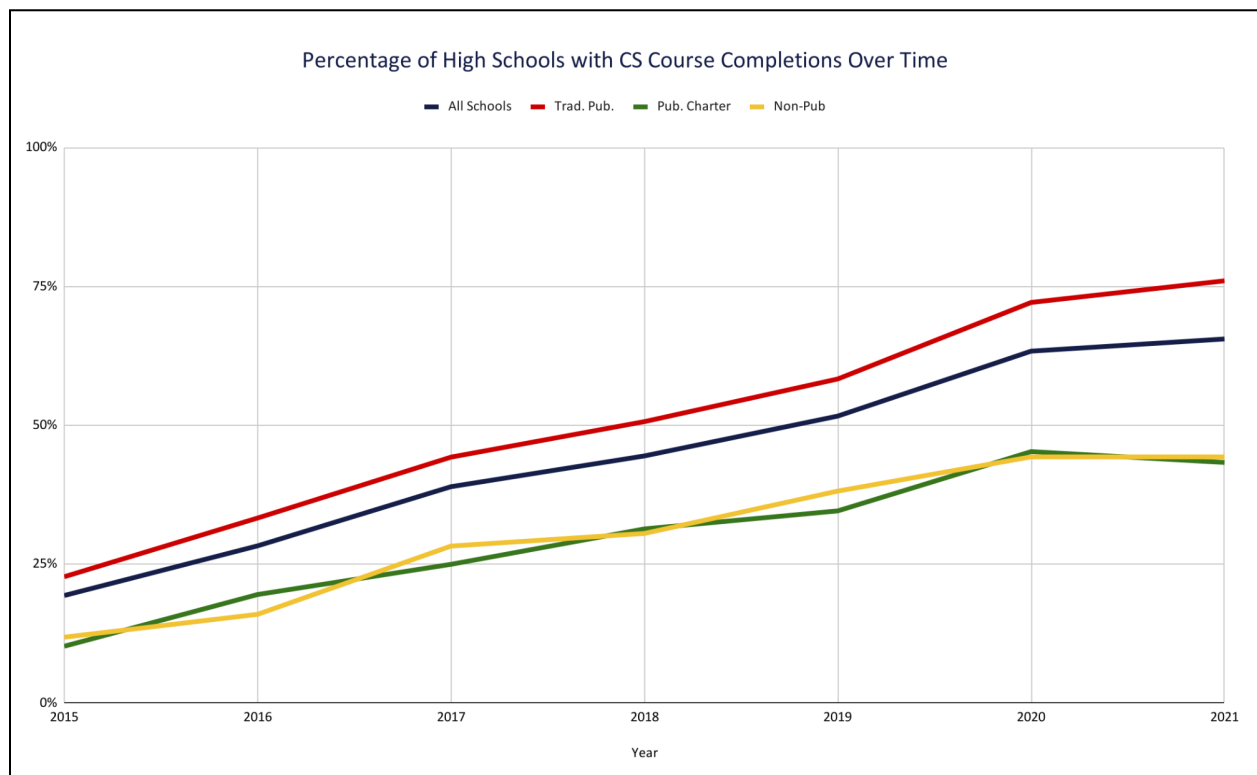
PUBLIC CHARTER SCHOOLS			
School Year	Number of Schools	Number of Schools Offering At Least One CS Course	Percentage of Schools
2016-2017	48	12	25%
2017-2018	51	16	31%
2018-2019	52	18	35%
2019-2020	53	24	45%
2020-2021	60	26	43%

NONPUBLIC SCHOOLS			
School Year	Number of Schools	Number of Schools Offering At Least One CS Course	Percentage of Schools
2016-2017	99	28	28%
2017-2018	108	33	31%
2018-2019	110	42	38%
2019-2020	106	47	44%
2020-2021	106	47	44%



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Traditional Public Schools <i>Without</i> a CS Course										
LOCALE	2016 - 2017		2017 - 2018		2018 - 2019		2019 - 2020		2020 - 2021	
	#	%	#	%	#	%	#	%	#	%
City: Large	12	41%	10	37%	6	32%	4	21%	3	16%
City: Midsize	9	90%	4	40%	4	40%	3	30%	4	36%
City: Small	13	46%	12	43%	10	38%	10	38%	6	26%
Rural: Distant	69	68%	60	59%	49	49%	38	38%	36	37%
Rural: Fringe	34	55%	31	50%	23	37%	14	23%	9	15%
Rural: Remote	2	50%	2	50%	2	50%	1	25%	1	25%
Suburb: Large	18	35%	20	38%	19	36%	7	13%	7	14%
Suburb: Midsize	2	33%	1	17%	1	17%	0	0%	0	0%
Suburb: Small	6	100%	4	67%	3	50%	3	50%	2	33%
Town: Distant	29	58%	26	52%	23	48%	12	25%	9	19%
Town: Fringe	11	55%	11	55%	8	40%	5	25%	3	15%
Town: Remote	1	100%	1	100%	0	0%	0	0%	0	0%
N/A	2	100%	5	100%	8	57%	10	56%	14	54%



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Public Charter Schools <i>Without</i> a CS Course									
2016-2017		2017-2018		2018-2019		2019-2020		2020-2021	
#	%	#	%	#	%	#	%	#	%
35	70%	38	69%	35	66%	30	56%	34	57%

Non-Public Schools <i>Without</i> a CS Course									
2016-2017		2017-2018		2018-2019		2019-2020		2020-2021	
#	%	#	%	#	%	#	%	#	%
61	71%	55	65%	68	63%	64	59%	59	56%

Since 2017, Indiana has shown consistent growth in the number of all school types offering computer science. Additionally, the number of counties with no computer science offered in traditional public high schools decreased from seven in 2019-2020 to five in 2020-2021. Blackford, Ohio, Starke, Union, and Warren counties offered no computer science in traditional public high schools in 2020-2021.

High School Enrollment	Year						
Course	2015	2016	2017	2018	2019	2020	2021
Introduction to CS	292	1428	2446	3553	5357	7585	8068
CS I	283	1592	3779	3596	4877	5100	6255
CS II	638	753	935	914	956	1035	1082
CS III: Special Topics	0	0	0	120	195	0	213
CS III: Software Dev	N/a	N/a	N/a	N/a	0	18	92
CS III: Databases	0	0	0	19	34	0	71
CS III: Informatics	N/a	1	35	48	15	138	73
CS III: Cybersecurity	N/a	N/a	N/a	N/a	11	315	524
AP CS A	900	958	1070	1098	1180	1247	1025
AP CS Principles	0	0	559	764	1301	1659	1940
CS Standard Level, IB	0	28	33	29	30	30	34
CS Higher Level, IB	0	0	0	0	0	0	0
Cambridge Int AS and A	N/a	N/a	N/a	N/a	0	0	0
	2113	4760	8857	10141	13956	17127	19377



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Plans for Continued Growth

- Develop a comprehensive outreach plan and support strategy to address remaining compliance gaps.
- Update kindergarten through grade eight CS standards to ensure alignment with national best practices.
- Develop and disseminate resources to aid in the transition from 2016 CS standards to 2022 CS standards.
- Identify additional strategies for supporting and engaging schools that are experiencing barriers to computer science implementation.
- Continue existing partnerships with organizations such as Girls Who Code, Expanding Computing Education Pathways Alliance, CSforIN, professional development partners, and others to continue scaling CS education across Indiana.
- Leverage the Expanding Access to Well-Rounded Courses Grant to develop creative solutions for offering CS courses in non-traditional ways.
- Maintain a high level of support and technical assistance for schools and districts.

Conclusion

Indiana is fortunate to have a supportive policy climate as related to computer science education. This, along with state-supported professional development efforts, has resulted in tremendous growth of computer science implementation in Indiana's kindergarten through grade 12 schools over the past few years. The data and indicators outlined above demonstrate this growth and also clarify areas where continued or expanded support is necessary.

- Successes of note include:
 - The percentage of all high schools (public, public charter, and non-public) offering at least one computer science course reached an all-time high of approximately 66% in the 2020-2021 school year.
 - The number of Indiana counties where no high schools are offering at least one computer science course has reached an all-time low of >1%.



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- The vast majority of kindergarten through grade eight public schools are either currently teaching computer science standards or developing a plan to teach computer science standards.
- New CTE programs of study have been aligned with postsecondary and industry credentials.
- Areas for improvement:
 - While the number of high school students taking a computer science course has reached 19,377, this number only represents approximately 6% of high school students.
 - High school student participation in advanced computer science coursework is relatively low.
 - Anecdotal evidence and survey results indicate that identifying a teacher may be a barrier to computer science implementation in some schools.

With continued support from IDOE, the Indiana General Assembly, the Governor's Office, Indiana K-12 schools, families, and other public and private stakeholders, Indiana can continue to expand computer science education and opportunities for students and be a recognized leader in computer science education across the United States.

Please contact [Jake Koressel](#) with any questions.

Appendices

Appendix A - CodeHS Contract (October 1, 2019 - July 31, 2022)

Appendix B - Indiana University Contract (October 1, 2019 - July 31, 2022)

Appendix C - Nextech Contract (October 1, 2019 - July 31, 2022)

Appendix D - Notre Dame Contract (February 10, 2020 - July 31, 2022)

Appendix E - Project Lead The Way Contract (May 1, 2020 - July 31, 2022)

Appendix F - SEA 172 Gov CS Report, January 2021