

MEMORANDUM

To: Honorable Eric J. Holcomb, Governor of Indiana
Dr. Jennifer McCormick, State Superintendent of Public Instruction

From: Jake Koressel, Computer Science Specialist
Ben Carter, Director of Workforce and Innovation
Robin LeClaire, Chief Academic Officer

Date: January 15, 2020

Re: IC 20-30-5-23 NextLevel Computer Science Program Biannual Report

Background

IC 20-30-5-23 established the NextLevel computer science grant program (program) and computer science fund (fund) to award grants, after June 30, 2019, to eligible entities to implement teacher professional development programs for training in teaching computer science (CS). This Act 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.

Requires, not later than August 1, 2018, the State Superintendent of Public Instruction to enter into a contract for professional development services.

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 15th and January 15th each year thereafter.

Development and Administration of the Program and Fund**Timeline**

- April 2018
 - IDOE completed the special procurement process with Nextech
 - IDOE funded \$70,000 for start-up of Nextech contract (Appendix A)
 - State Board of Education approved IDOE-recommended CS course additions (Appendix B)
 - Announcement of 2018-2019 STEM Acceleration Grant recipients (Appendix C)
- May 2018
 - First CSforIN Summit: www.CSforIN.org
 - IDOE met with Nextech, the Governor's Office, and other stakeholders to discuss Nextech budget forecast (Appendix D)

- IDOE awarded grants to seven schools to implement the Project Lead The Way (PLTW) Cybersecurity Pilot Program (Appendix E)
 - IDOE published computer science professional development opportunities (continuously updated): <https://www.doe.in.gov/wf-stem/cspd>
- June 2018
 - First IDOE-sponsored Computer Science Fundamentals workshop takes place
 - Computer Science Specialist position begins at IDOE
 - Memo to the field regarding CS requirements and support (Appendix F)
- July 2018
 - 2018 CSforAll Letter of Commitment (Appendix G)
 - Strategic CSforALL Resource and Implementation Planning Tool (SCRIPT) Train-the-Trainer Workshop at Pathfinders Institute for IDOE and ESCs
 - Attendance at Computer Science Teachers Association (CSTA) Conference
- August 2018
 - Indiana Course Access Portal (iCAP) enrollments begin - computer science is included in course options: <https://www.doe.in.gov/icap>
 - State-Level Partnership with Girls Who Code begins (Appendix H)
 - Identification of Computer Science Champs (Appendix I)
 - Memo to the field regarding CS requirements and support (Appendix J)
 - Development of two-day “Integrating CS in Middle School” workshop (Appendix K)
 - Updated Computer Science Assignment Codes (Appendix L)
- September 2018
 - In conjunction with OMB and the Governor’s Office, IDOE finalized Nextech contract amendment - additional \$600,000 (Appendix M)
 - First IDOE-sponsored SCRIPT workshop takes place
- October 2018
 - Attendance at CSforALL Summit
 - First IDOE-sponsored Integrating CS in Middle School workshop takes place
- November 2018
 - Launch of IDOE STEM Six-Year Strategic Plan (Appendix N)
 - Established CS Training Badge for IDOE-sponsored workshop participants (Appendix O)
 - Announcement of 2019-2020 STEM Acceleration Grant recipients (Appendix P)
 - Development of State CS Plan in accordance with the Code.org Advocacy Coalition’s Nine Policies
 - CS Champs meet to begin development of middle school CS course
- December 2018
 - Attendance at National Initiative for Cybersecurity Education (NICE) K-12 Conference
 - Announcement of IDOE/PLTW Cybersecurity Grant recipients (Appendix Q)
 - Computer Science Education Week activities promoted by IDOE

- Call for applicants to participate in “Computational Thinking for Every Educator” online course (Appendix R)
 - Approval of the addition of PLTW Cybersecurity to Indiana’s Course Description Guide
 - Updates to the CTE funding memo impacting computer science courses (Appendix S)
- January 2019
 - Indiana named the third state to adopt all nine Code.org Advocacy Coalition Policy Recommendations (Appendix T)
- February 2019
 - IDOE-sponsored Computer Science Curriculum Showcase (Appendix U)
- March 2019
 - State Vex Robotics Competition
 - 50 educators complete “Computational Thinking for Every Educator” course
- April 2019
 - 0488 Computer Science - Middle Level is approved by the Indiana State Board of Education (Appendix V)
 - State Board of Education adopts rules allowing computer science courses to fulfill Core 40 requirement for third-year science (Appendix W)
 - Nextech contract amended to include additional summer 2019 projects (Appendix X)
 - STEM Plan Playbook developed, including computer science and cybersecurity (Appendix Y)
 - CS Champs meet to begin developing CS portion of Science Framework
 - Computer Science Assignment Codes updated to provide additional flexibility (Appendix Z)
 - Biennial budget is finalized including \$3,000,000 annually for the Next Level Computer Science Grant Program
- May 2019
 - Letter of Intent submitted to IDOA for Computer Science Professional Development RFP
 - Memo to the field regarding CS requirements and support (Appendix AA)
- June 2019
 - Phase 1 of Science Framework released, including K-8 Computer Science Standards (<https://www.doe.in.gov/science/framework>)
 - Attendance at State Computer Science Supervisors Workshop
 - Attendance at Arkansas’ National Computer Science Summit for State Leaders
 - RFP Released for K-12 Teacher Professional Development in Computer Science
 - STEM Certification Rubric Updates include compliance with IC 20-30-5-23 (Appendix BB)
- July 2019
 - 2019 CSforALL Letter of Commitment (Appendix CC)
 - Attendance at Computer Science Teachers Association (CSTA) Conference
 - Attendance at Cybertech Midwest Conference
 - New course completion data collected

- August 2019
 - K-12 Computer Science Professional Development RFP submissions scored
 - Computer science assignment codes updated to provide additional licensing flexibility
 - Identification of five additional Computer Science Champs
- September 2019
 - K-12 Computer Science Professional Development RFP awardees publicly notified
 - IDOE publishes vetted list of STEM and computer science curriculum (Appendix DD)
 - Attendance at CEdCon International Computer Science Education Conference
- October 2019
 - IDOE-sponsored STEM and Computer Science Curriculum Showcase (Appendix EE)
- November 2019
 - Superintendent of Public Instruction Dr. Jennifer McCormick releases 2020 Legislative Priorities for IDOE including requiring educator preparation programs to prepare new practitioners in state-recognized computer science programs (Appendix FF)
 - Attendance at CS Policy Academy co-hosted by Education Commission of the States (ECS) and the College Board
- December 2019
 - Attendance at NICE K-12 Cybersecurity Education Conference
 - Announcement of 2020-2021 STEM Acceleration Grant recipients (Appendix GG)
 - Updates to the CTE funding memo impacting computer science courses (Appendix HH)

Training Snapshot

2018-2019 SY Nextech Computer Science Training Numbers (June 2018 - July 2019)				
Workshop	Description	Target Number of Participants	Number Trained to Date	Progress Toward Target
Computer Science Principles (CSP)	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	44	44	100.00%
Computer Science Discoveries (CSD)	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	60	60	100.00%
Integrating CS in Middle School (ICS)	One- or two-day workshop targeting middle school (6-8) teachers	120	207	172.50%
Computer Science Fundamentals (CSF)	One- or two-day workshop targeting elementary (K-5) teachers	520	744	143.08%
SCRIPT (districts)	One- or two-day workshop for district teams	16	66	412.50%
Cybersecurity Workshop	Three-day cybersecurity training for high school teachers including one day of industry exposure	24	32	133.33%
Java Workshop	Four-day intensive Java training for high school teachers	12	14	116.67%
Classroom to Career Experiences	One-day computer science industry experiences for K-12 teachers	36	37	102.78%

Additional considerations:

- These numbers represent only teachers of public and public charter schools. Additional private/parochial teachers and after school/extracurricular professionals have also been trained.
 - Computer Science Principles - 6
 - Computer Science Discoveries - 7
 - Integrating CS in Middle School - 10
 - Computer Science Fundamentals - 28

Status of Public Schools in Meeting Computer Science Curriculum Requirements

Grades K-8

Prior to SEA 172, there was limited availability of computer science-specific data for grades K-8. IDOE has identified the following as currently available indicators of progress at the K-8 level.

TEACHERS TRAINED IN CURRICULUM APPROPRIATE FOR MIDDLE SCHOOL	
Computer Science Discoveries	110
Integrating CS in Middle School	230
Computer Science Fundamentals	901

RELEVANT MS COURSE ENROLLMENT TRENDS					
Course	Year				
	2014-15	2015-16	2016-17	2017-18	2018-19
Digital Citizenship	0	8923	15881	18277	23790
Middle Level Business	72702	64057	58708	57884	53004
Introduction to CS	92	22	22	89	364

Plans for future collection of K-8 CS implementation data collection:

- Creation of middle school computer science course - data available beginning SY 2020-2021
- Creation of elementary computer science subject code
- Computer science element added to STEM Certification Rubric

Grades 9-12

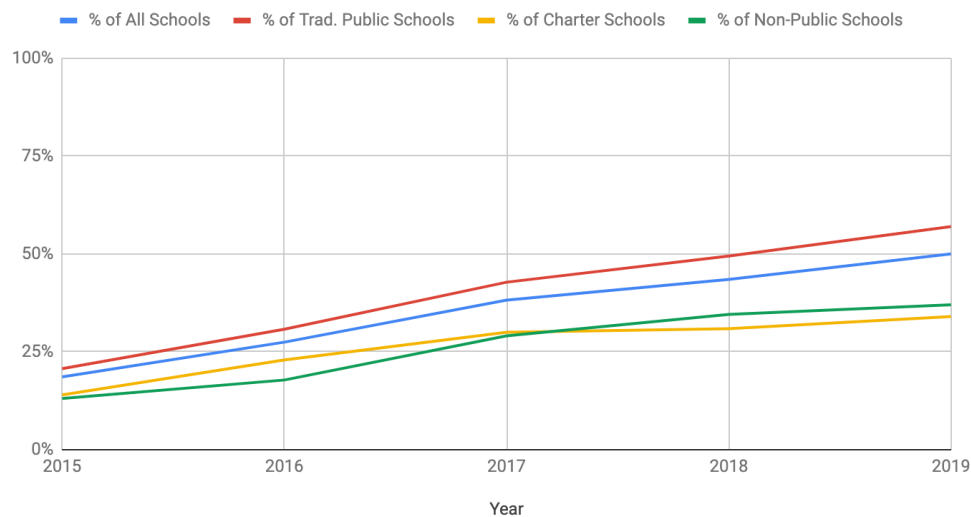
ALL SCHOOLS			
Year	# of Schools	# of Schools Offering At Least 1 CS Course	% of School
2015	528	98	19%
2016	521	143	27%
2017	526	201	38%
2018	531	231	44%
2019	537	271	50%

TRADITIONAL PUBLICS			
Year	# of Schools	# of Schools Offering At Least 1 CS Course	% of School
2015	387	80	21%
2016	377	116	31%
2017	374	160	43%
2018	372	184	49%
2019	369	210	57%

CHARTER PUBLICS			
Year	# of Schools	# of Schools Offering At Least 1 CS Course	% of School
2015	43	6	14%
2016	48	11	23%
2017	50	15	30%
2018	55	17	31%
2019	53	18	34%

NON PUBLIC SCHOOLS			
Year	# of Schools	# of Schools Offering At Least 1 CS Course	% of School
2015	92	12	13%
2016	90	16	18%
2017	86	25	29%
2018	84	29	35%
2019	108	40	37%

High Schools with CS Course Completions Over Time



TRADITIONAL PUBLIC SCHOOLS WITHOUT CS COURSE										
LOCALE	YEAR									
	2015		2016		2017		2018		2019	
	Count	%	Count	%	Count	%	Count	%	Count	%
City: Large	20	71%	18	67%	11	39%	9	33%	6	32%
City: Midsize	8	89%	8	89%	8	89%	3	33%	4	44%
City: Small	22	71%	17	59%	15	52%	11	39%	11	41%
Suburb: Large	33	58%	25	45%	21	39%	22	41%	20	37%
Suburb: Midsize	5	83%	3	50%	2	33%	1	17%	1	17%
Suburb: Small	5	100%	5	100%	5	100%	3	60%	2	40%
Town: Distant	42	81%	37	74%	29	58%	26	52%	24	49%
Town: Fringe	18	90%	15	75%	11	55%	11	55%	8	40%
Town: Remote	2	100%	2	100%	2	100%	1	50%	0	0%
Rural: Distant	87	86%	82	81%	70	69%	63	62%	50	50%
Rural: Fringe	52	84%	39	64%	33	54%	31	51%	24	39%
Rural: Remote	3	75%	3	75%	2	50%	2	50%	2	50%

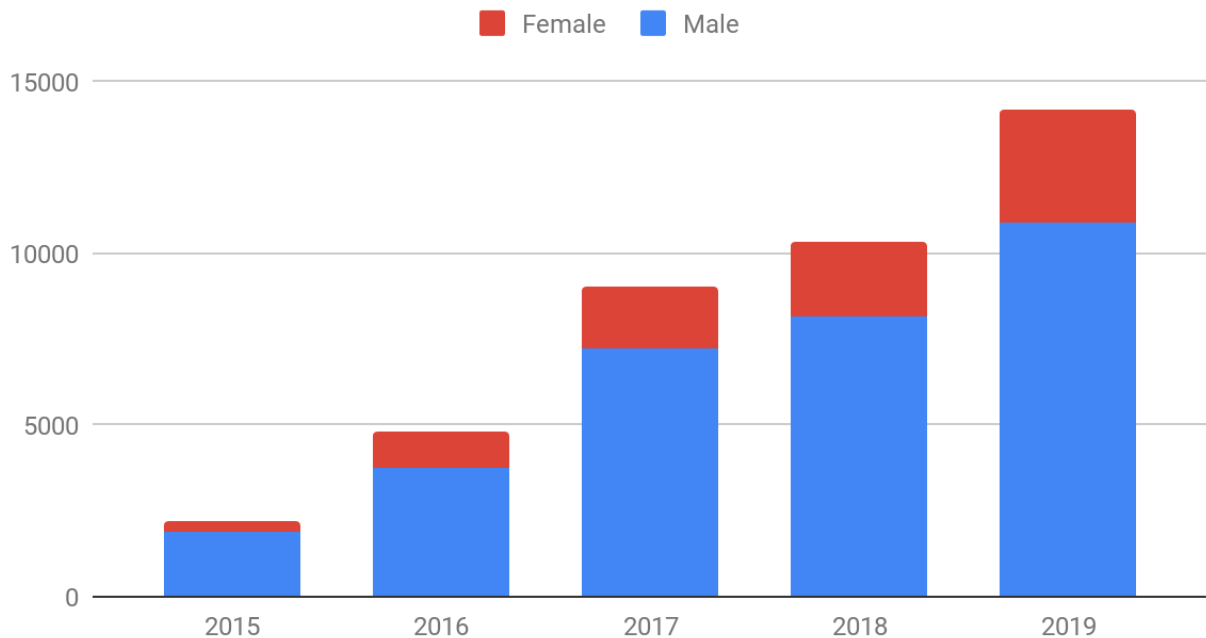
CHARTER PUBLIC SCHOOLS WITHOUT A CS COURSE									
2014-15		2015-16		2016-17		2017-18		2018-19	
Count	%	Count	%	Count	%	Count	%	Count	%
37	86%	37	77%	35	70%	38	69%	35	66%

NON-PUBLIC SCHOOLS WITHOUT A CS COURSE									
2014-15		2015-16		2016-17		2017-18		2018-19	
Count	%	Count	%	Count	%	Count	%	Count	%
80	87%	74	82%	61	71%	55	65%	68	63%

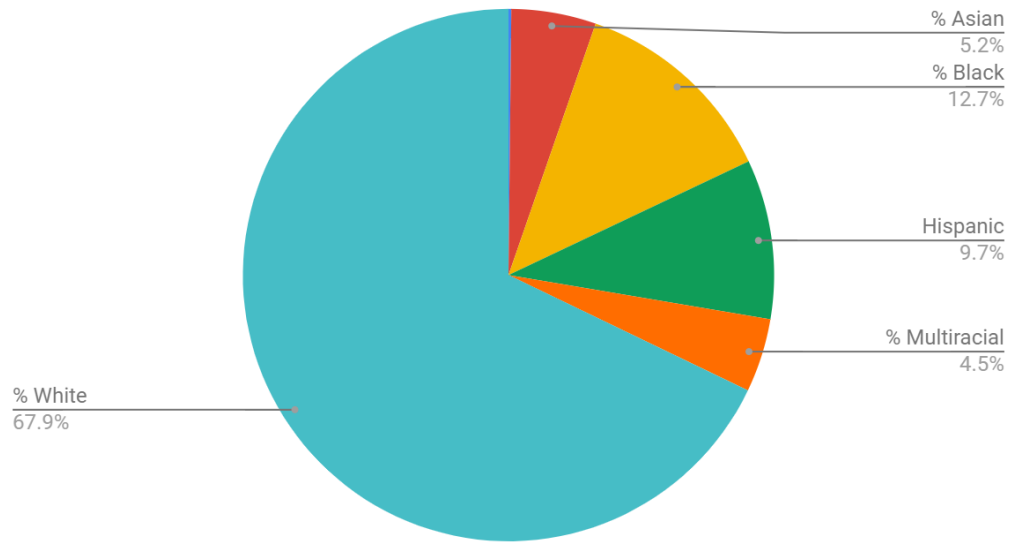
2018-19 COUNTIES WITH NO CS OFFERED IN TRAD PUBLIC HS		
Blackford	Jennings	Rush
Cass	Lawrence	Sullivan
Decatur	Ohio	Tipton
Fayette	Owen	Union
Franklin	Pulaski	Vermillion

Course Completions by High School Course					
Course	School Year				
	2014-15	2015-16	2016-17	2017-18	2018-19
Introduction to CS	313	1433	2467	3605	5460
CS I	283	1594	3806	3654	4918
CS II	681	754	947	929	966
CS III: Special Topics	0	37	93	132	211
CS III: Software Dev	0	0	0	0	0
CS III: Databases	0	0	1	19	34
CS III: Informatics	0	1	35	48	19
CS III: Cybersecurity	0	0	0	0	11
AP CS A	900	963	1070	1098	1181
AP CS Principles	0	0	560	789	1329
CS Standard Level, IB	0	28	33	29	30
CS Higher Level, IB	0	0	0	0	0
Cambridge Int AS and A	0	0	0	0	0
Total	2177	4810	9012	10303	14159

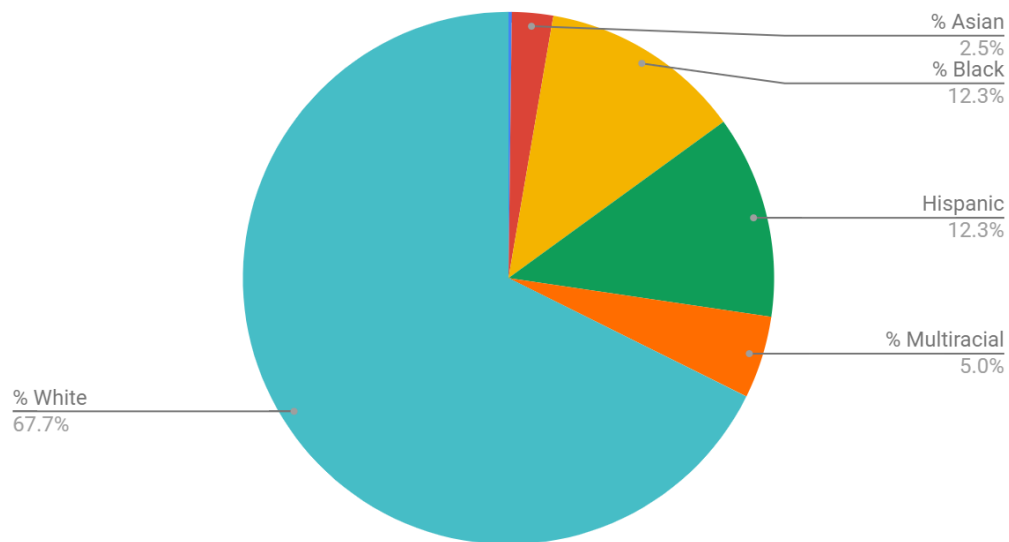
CS Course Completions by Gender Over Time



2019 Course Completions by Race



2019 Overall Student Population by Race



Additional Data

- January 2017-October 2018
 - IDOE Outcomes Supporting Governor's NextLevel Agenda (Appendix II)
- June 2018-Present
 - Computer Science Fundamentals Workshop Offerings (Appendix JJ)
- August 2018-January 2019
 - IDOE Computer Science Support activities (Appendix KK)
- September 2018-Present
 - SCRIPT Workshop Offerings (Appendix LL)
- October 2018-Present
 - Integrating Computer Science in Middle School Workshop Offerings (Appendix MM)
- December 2018
 - Computer Science Pathway Model Created (Appendix NN)

Appendices

Appendix A - Initial Nextech Contract

Appendix B - Amendment to Course Titles and Descriptions 2018-2019

Appendix C - 2018-2019 STEM K-6 Acceleration Grant Awardees

Appendix D - Nextech Budget Estimate Forecast 2018-2022

Appendix E - IDOE/PLTW Cybersecurity Pilot Grant Recipients

Appendix F - IC 20-30-5-23 - Next Level Computer Science Program

Appendix G - Taking CS in Indiana to the Next Level

Appendix H - IDOE/Girls Who Code Partnership, Girls Who Code Partnership Map, List of Indiana Girls Who Code Clubs

Appendix I - Computer Science Champs

Appendix J - IC 20-30-5-23 - Computer Science Education

Appendix K - Nextech One-Day Middle School Standards Workshop Schedule

Appendix L - Updated Computer Science Assignment Codes

Appendix M - Nextech Contract Amendment #1

Appendix N - IDOE STEM Six-Year Strategic Plan

Appendix O - CS Training Badge

Appendix P - 2019-2020 STEM K-6 Acceleration Grant Cohort 2 Awardees

Appendix Q - IDOE/PLTW Cybersecurity Grant Recipients

Appendix R - Introduction to Computational Thinking for Every Educator Online Course Syllabus

Appendix S - CTE Funding Memo Updates

Appendix T - Code.org Advocacy Coalition's Nine Policy Recommendations, IDOE Press Release

Appendix U - Computer Science Curriculum Showcase Agenda, Vendor Information

Appendix V - Indiana Department of Education Academic Standards Course Framework: Computer Science, Middle Level

Appendix W - Core 40 Science Requirement Recommendations

Appendix X - Nextech Contract Amendment #2

Appendix Y - Indiana STEM Playbook - 2019-2025

Appendix Z - Updated Computer Science Assignment Codes

Appendix AA - IC 20-30-5-23 - Computer Science Education

Appendix BB - Computer Science Element of Updated STEM Certification Rubric

Appendix CC - State Computer Science Competition/Challenge

Appendix DD - Evidence-Based STEM Curriculum, Computer Science Curriculum

Appendix EE - STEM and Computer Science Curriculum Showcase Agenda

Appendix FF - Indiana Department of Education 2020 Legislative Priorities

Appendix GG - 2020-2021 STEM Acceleration Grant Recipients

Appendix HH - CTE Funding Memo Updates

Appendix II - Indiana Department of Education Outcomes Supporting Governor's NextLevel Agenda

Appendix JJ - Computer Science Fundamentals Workshop Offerings

Appendix KK - IDOE Computer Science Support Activities

Appendix LL - SCRIPT Workshop Offerings, SCRIPT Participating Schools Map

Appendix MM - Integrating Computer Science in Middle School Workshop Offerings

Appendix NN - Computer Science Pathway Information

Please contact Jake Koressel (jkoressel@doe.in.gov) with any questions.