

MEMORANDUM

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

From: Jake Koressel, Computer Science Specialist
Jennifer Jensen, PhD, Director of Teaching and Learning
Robin LeClaire, Chief Academic Officer

Date: July 15, 2020

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

Background

IC 20-30-5-23 (Act) 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.

Additionally, IC 20-30-5-23 requires:

- Not later than August 1, 2018, the State Superintendent of Public Instruction to enter into a contract for professional development services.
- 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
 - State Board of Education (SBOE) approved IDOE-recommended CS course additions
 - Announcement STEM Acceleration Grant - Cohort 1 recipients
- May 2018
 - First CSforIN Summit: www.CSforIN.org

- IDOE met with Nextech, the Governor's Office, and other stakeholders to discuss Nextech budget forecast
 - IDOE awarded grants to seven schools to implement the Project Lead The Way (PLTW) Cybersecurity Pilot Program
 - 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
- July 2018
 - 2018 CSforAll Letter of Commitment
 - Strategic CSforALL Resource and Implementation Planning Tool (SCRIPT) Train-the-Trainer Workshop at Pathfinders Institute for IDOE and Educational Service Centers
 - 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
 - Identification of Computer Science Champs
 - Memo to the field regarding CS requirements and support
 - Development of two-day "Integrating CS in Middle School" workshop
 - Updated Computer Science Assignment Codes
- September 2018
 - In conjunction with OMB and the Governor's Office, IDOE finalized Nextech contract amendment - additional \$600,000 (Appendix A)
 - 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
 - Established CS Training Badge for IDOE-sponsored workshop participants
 - Announcement of STEM Acceleration Grant - Cohort 2 recipients
 - 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
 - Computer Science Education Week activities promoted by IDOE
 - Call for applicants to participate in “Computational Thinking for Every Educator” online course
 - Approval of the addition of PLTW Cybersecurity to Indiana’s Course Description Guide
 - Updates to the CTE funding memo impacting computer science courses
- January 2019
 - Indiana named the third state to adopt all nine Code.org Advocacy Coalition Policy Recommendations
- February 2019
 - IDOE-sponsored Computer Science Curriculum Showcase
- 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 SBOE
 - SBOE adopts rules allowing computer science courses to fulfill Core 40 requirement for third-year science
 - Nextech contract amended to include additional summer 2019 projects
 - STEM Plan Playbook developed, including computer science and cybersecurity
 - CS Champs meet to begin developing CS portion of Science Framework
 - Computer Science Assignment Codes updated to provide additional flexibility
 - Biennial budget is finalized including \$3,000,000 annually for the Next Level Computer Science Grant Program
- May 2019
 - Letter of Intent submitted to the Indiana Department of Administration for Computer Science Professional Development RFP
 - Memo to the field regarding CS requirements and support
- 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
- July 2019
 - 2019 CSforALL Letter of Commitment
 - 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
 - Attendance at CEdCon International Computer Science Education Conference
- October 2019
 - IDOE-sponsored STEM and Computer Science Curriculum Showcase
- 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
 - 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 STEM Acceleration Grant - Cohort 3 recipients
 - Updates to the CTE funding memo impacting computer science courses
- January 2020
 - Announcement of STEM Acceleration Grant - Cohort 4 recipients
 - IDOE hosts meeting with representatives from Indiana Educator Preparation Programs to discuss CS in the pre-service teacher education experience
- February 2020
 - Tech Plan Survey questions updated to include K-8 CS implementation details
- April 2020
 - Plans made to shift all summer 2020 computer science professional development opportunities to a virtual format due to the COVID-19 global pandemic
 - Elementary CS course codes created and approved by SBOE
 - Group of Elementary CS teachers convene to begin development of K-5 CS Framework
- May 2020
 - Virtual STEM and Computer Science Showcase conducted
- June 2020
 - Attendance at virtual State Computer Science Supervisors Workshop
 - Various IDOE-sponsored professional development experiences offered through partner providers
 - Announcement of STEM Acceleration Grant - Cohort 5 Recipients
 - Expansion of vetted STEM and Computer Science curriculum list

Training Snapshot by Provider

CodeHS (See Appendix B)

<u>CodeHS Computer Science Training Numbers (Projections through Summer 2020)</u>		
Workshop	Description	Number Trained
New CS Teacher Workshop	Two-day workshop focused on high school teachers that will be teaching a computer science course for the first time	19
Computer Science Principles Workshop	Two-day workshop focused on high school teachers that will be teaching AP Computer Science Principles or Computer Science I	10
Computer Science A Workshop	Two-day workshop focused on high school teachers that will be teaching AP Computer Science A or Computer Science II	12
Cybersecurity Workshop	Two-day workshop focused on high school teachers that will be teaching Computer Science III: Cybersecurity or will be integrating cybersecurity content into other courses	11
Total Educators Impacted		52

Indiana University School of Informatics and Computing (See Appendix C)

<u>Indiana University SOIC Computer Science Training Numbers (Projections through Summer 2020)</u>		
Workshop	Description	Number Trained
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
Total Educators Impacted		75

IndianaComputes! (See Appendix E)

<u>IndianaComputes! Computer Science Training Numbers (Projections through Summer 2020)</u>		
Workshop	Description	Number Trained
Elementary	Year-long program intended to build teacher CS content knowledge that culminates in a week-long curriculum development experience.	121
Middle		48
High		68
Multi-Grade/Other		58
Total Educators Impacted		295

Nextech (See Appendix A and Appendix D)

2018-2019 SY Nextech Computer Science Training Numbers (June 2018 - July 2019)		
Workshop	Description	Number Trained
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
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
Integrating CS in Middle School (ICS)	One- or two-day workshop targeting middle school teachers	207
Computer Science Fundamentals (CSF)	One- or two-day workshop targeting elementary teachers	744
SCRIPT (districts)	One- or two-day workshop for district teams	66
Cybersecurity Workshop	Three-day cybersecurity training for high school teachers including one day of industry exposure	32
Java Workshop	Four-day intensive Java training for high school teachers	14
Classroom to Career Experiences	One-day computer science industry experiences for K-12 teachers	37
Total Educators Impacted		1204

Nextech Computer Science Training Numbers (Projections through Summer 2020)		
Workshop	Description	Number Trained
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	27
CSP 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
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	55
Integrating CS in Middle School (ICS)	One- or two-day workshop targeting middle school teachers	30
Elementary Workshops	One- or two-day workshop targeting elementary teachers	551
SCRIPT (districts)	One- or two-day workshop for district teams	49
Cybersecurity Workshop	Three-day cybersecurity training for high school teachers	10
CSAwesome (Java)	Five-day intensive Java training for high school teachers	25
WeTeach_CS Licensure Prep	Five-day preparation course for teachers seeking the CS license addition	27
Total Educators Impacted		794

Project Lead The Way (See Appendix F)

Project Lead The Way Computer Science Training Numbers (Projections through Summer 2020)		
Workshop	Description	Number Trained
Computer Science for Innovators and Makers	Five-day training for middle school teachers teaching a computer science course	25
App Creators		22
Computer Science Essentials	Up-to 10-day training for high schools teaching introductory computer science	8
Computer Science Principles	Up-to 10-day training for high schools teaching AP CS Principles or Computer Science I	14
Computer Science A	Up-to 10-day training for high schools teaching AP CS A or Computer Science II	5
Cybersecurity	Up-to 10-day training for high schools teaching Computer Science III: Cybersecurity	12
Total Educators Impacted		86

**Approximately 2,506 Indiana K-12 educators are expected to have received computer science training through partnerships between IDOE and the above mentioned providers by the end of summer 2020.

Status of Public Schools in Meeting Computer Science Curriculum Requirements

Grades K-8

Prior to SEA 172 (2018), 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 levels.

TEACHERS TRAINED IN CURRICULUM APPROPRIATE FOR MIDDLE SCHOOL (Projections through Summer 2020)	
Computer Science Discoveries	110
Integrating CS in Middle School	237
Computer Science Fundamentals	1295
CS for Innovators and Makers	25
App Creators	22

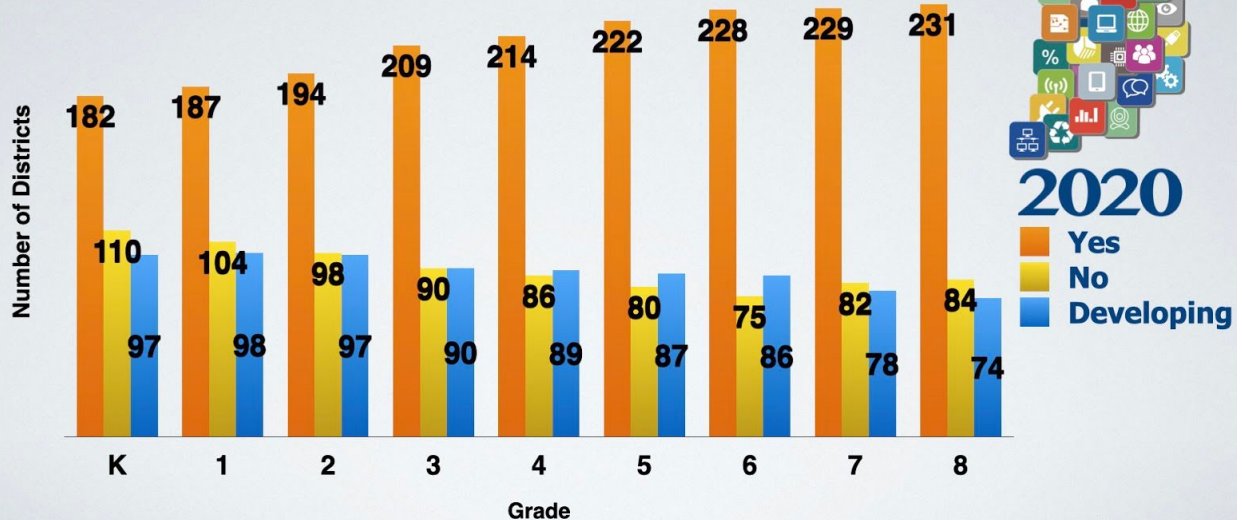
RELEVANT MS COURSE ENROLLMENT TRENDS					
Course	Year				
	2014-15	2015-16	2016-17	2017-18	2018-19
Digital Citizenship	0	8923	15881	18277	23790
Middle Level Business	72702	64057	58708	57884	53004
Introduction to CS	92	22	22	89	364

Additionally, IDOE added K-8 computer science-related questions to the annual Tech Plan Survey. Visual representations of the results can be found below.



INDIANA SCHOOL TECH PLAN

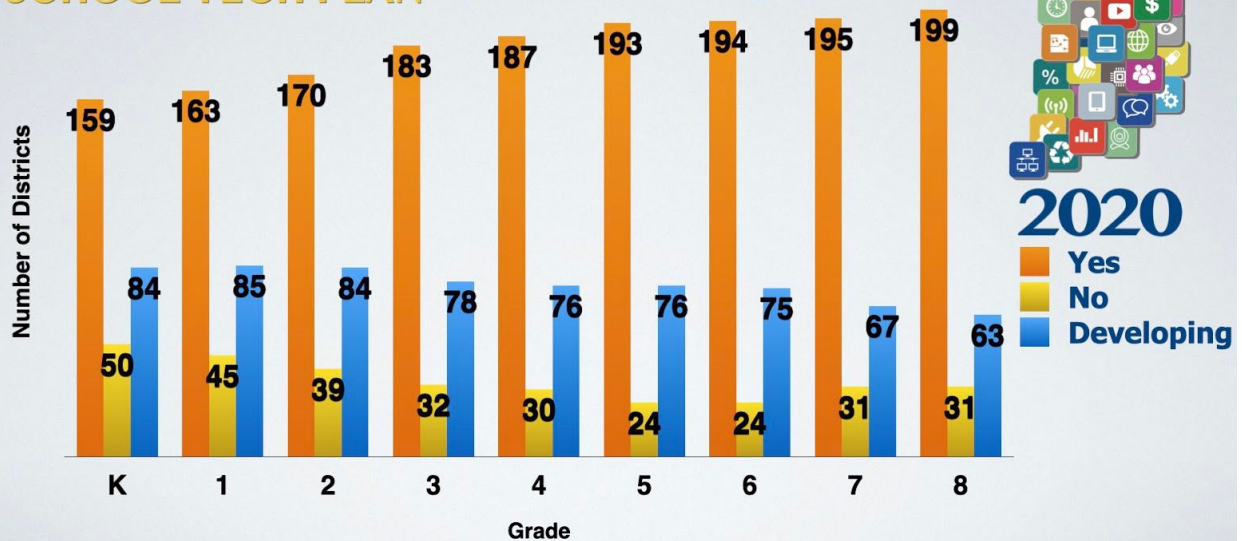
Do your students receive
standards-based CS instruction?
(Traditional Public and Charter)



*2020 data represents 389 traditional school districts and charter schools

INDIANA SCHOOL TECH PLAN

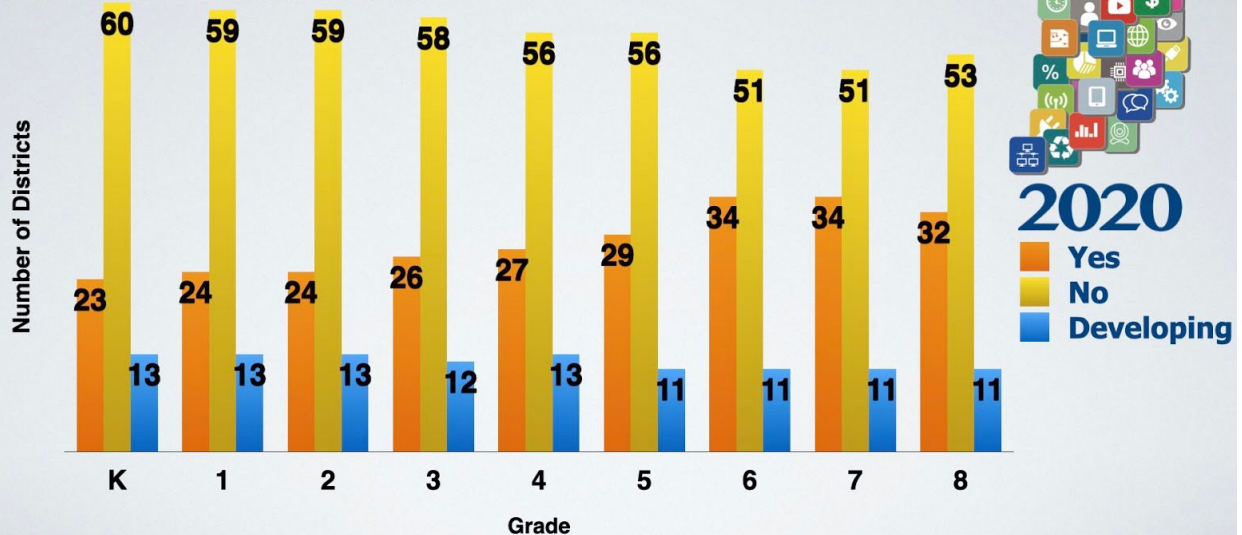
Do your students receive
standards-based CS instruction?
(Traditional Public Only)



*2020 data represents 293 traditional school districts

INDIANA SCHOOL TECH PLAN

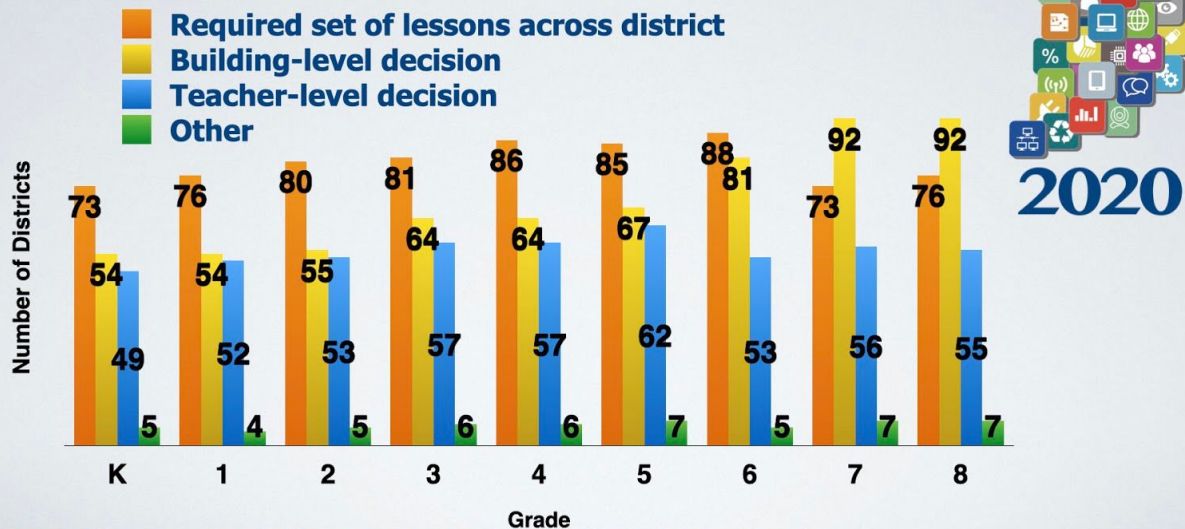
Do your students receive
standards-based CS instruction?
(Charter Only)



*2020 data represents 96 charter schools

INDIANA SCHOOL TECH PLAN

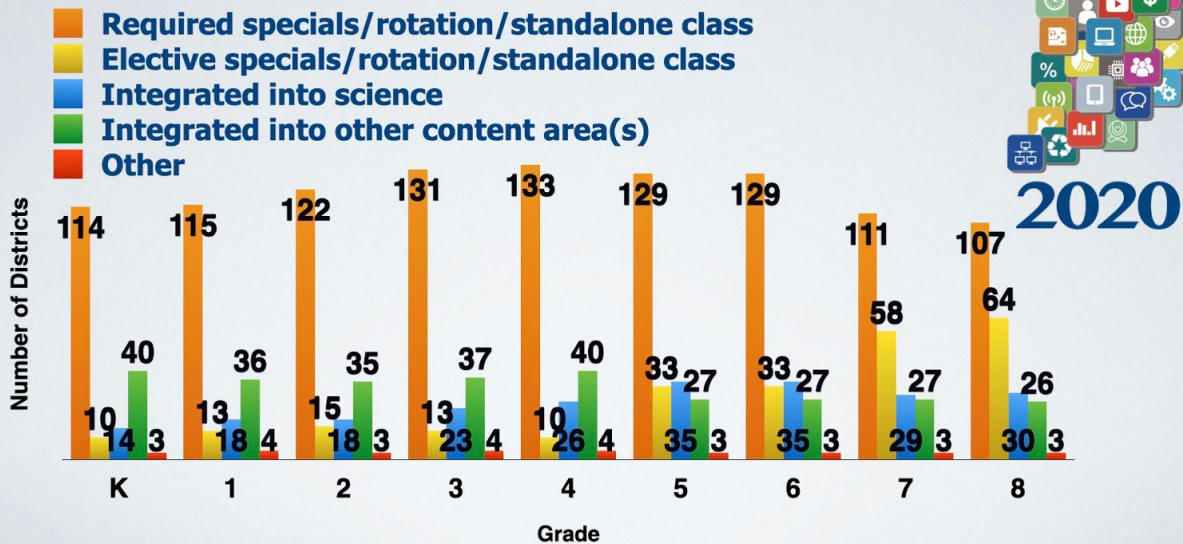
Implementation Strategy
(Traditional Public and Charter)



*2020 data represents 389 traditional school districts and charter schools

INDIANA SCHOOL TECH PLAN

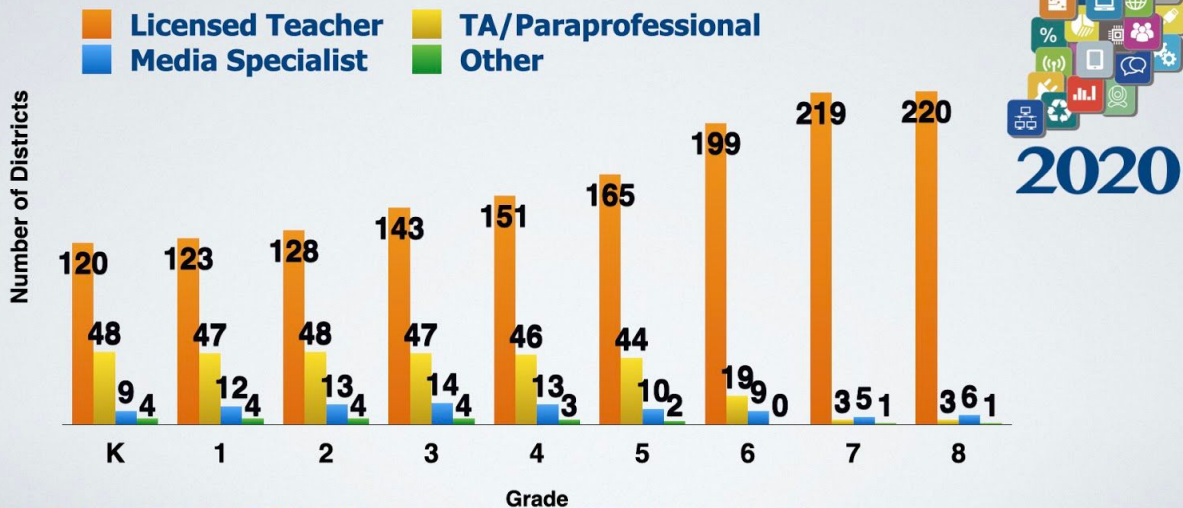
Where does the majority of CS instruction take place?
(Traditional Public and Charter)



*2020 data represents 389 traditional school districts and charter schools

INDIANA SCHOOL TECH PLAN

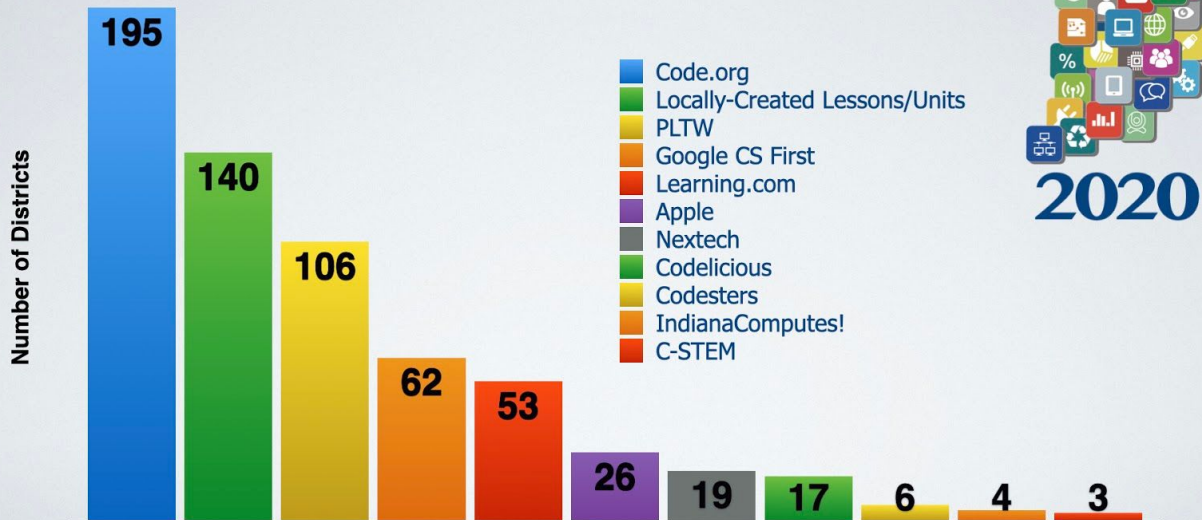
Who delivers the majority of CS instruction?
(Traditional Public and Charter)



*2020 data represents 389 traditional school districts and charter schools

INDIANA SCHOOL TECH PLAN

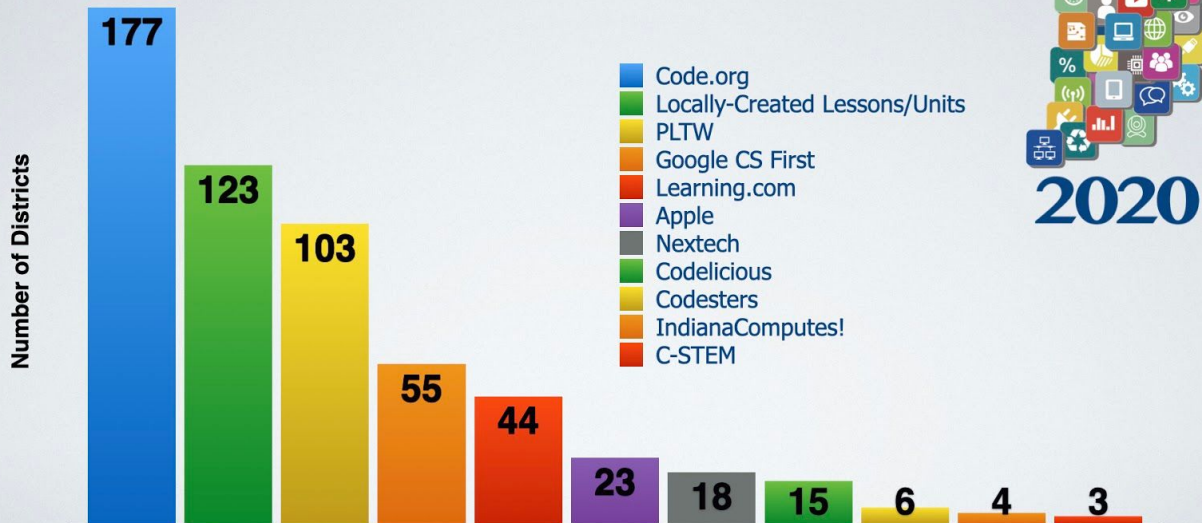
**What CS curriculum providers
do you use in K-5?
(Traditional Public and Charter)**



*2020 data represents 389 traditional school districts and charter schools

INDIANA SCHOOL TECH PLAN

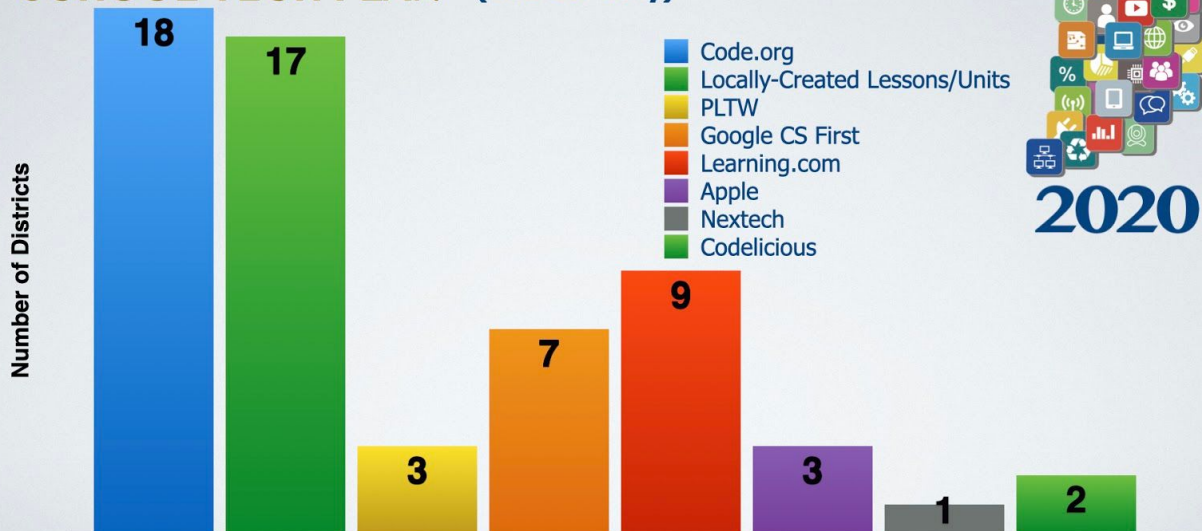
**What CS curriculum providers
do you use in K-5?
(Traditional Public Only)**



*2020 data represents 293 traditional school districts

INDIANA SCHOOL TECH PLAN

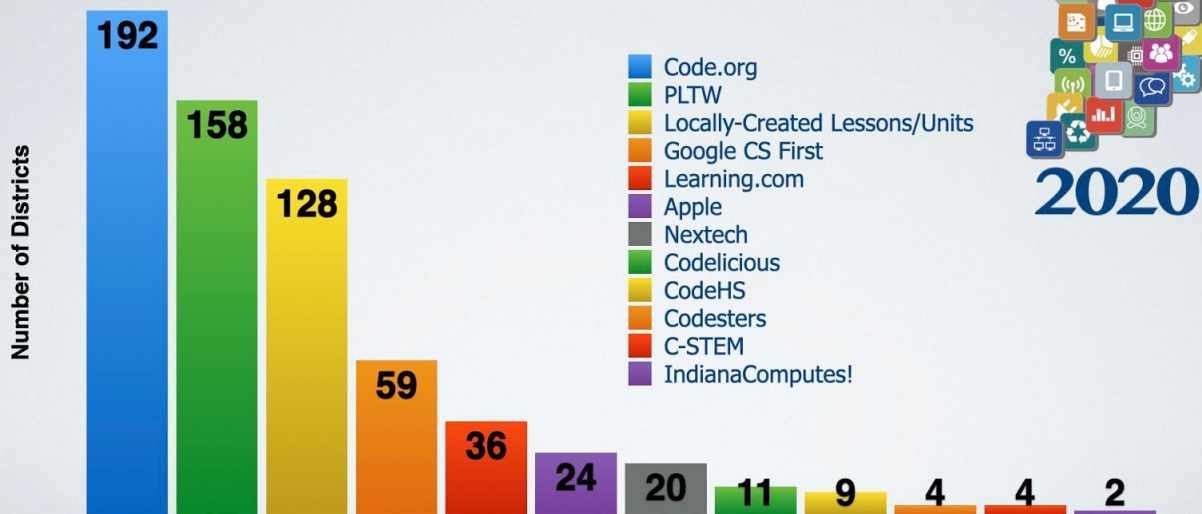
**What CS curriculum providers
do you use in K-5?
(Charter Only)**



*2020 data represents 96 charter schools

INDIANA SCHOOL TECH PLAN

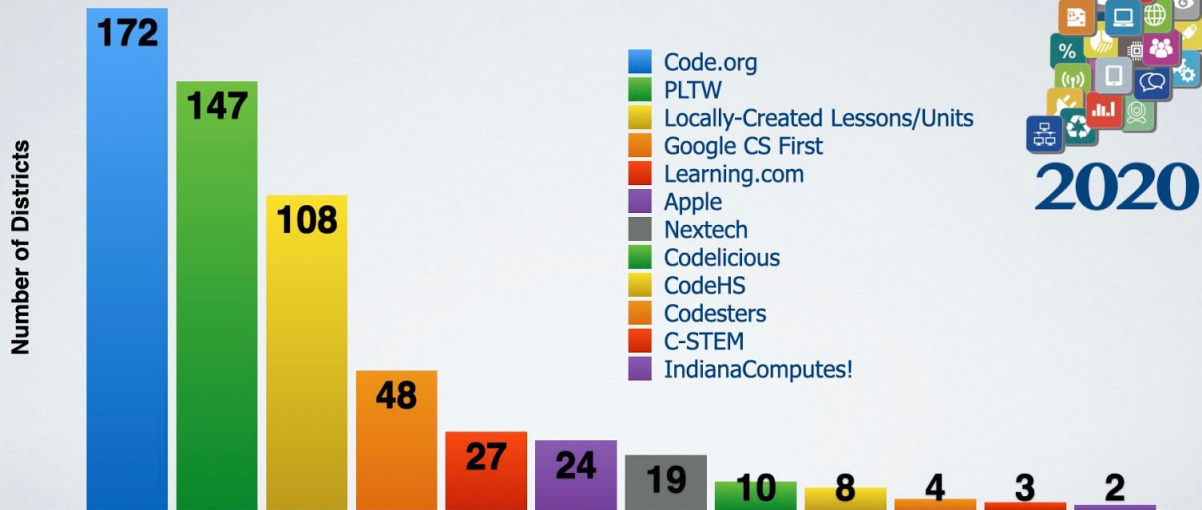
**What CS curriculum providers
do you use in 6-8?
(Traditional Public and Charter)**



*2020 data represents 389 traditional school districts and charter schools

INDIANA SCHOOL TECH PLAN

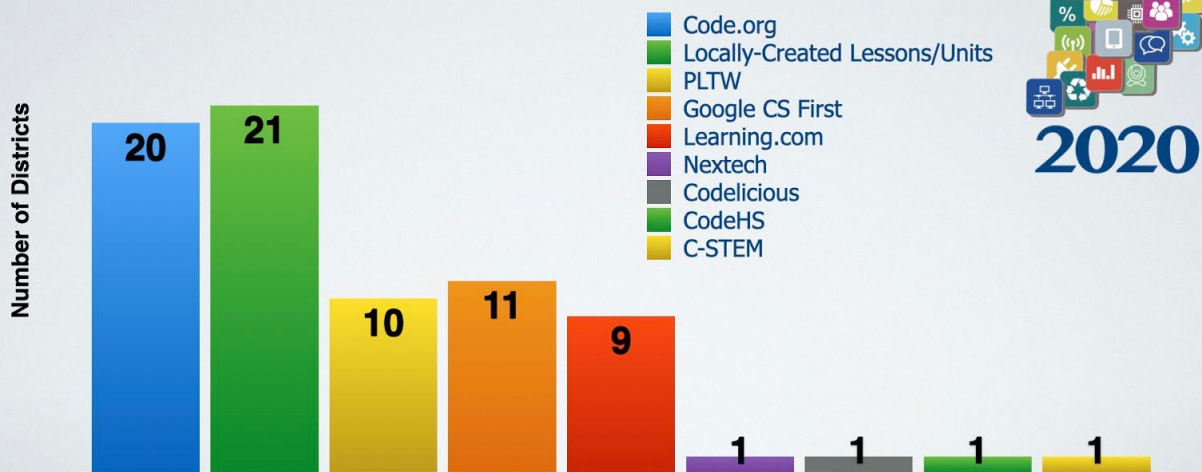
**What CS curriculum providers
do you use in 6-8?
(Traditional Public Only)**



*2020 data represents 293 traditional school districts

INDIANA SCHOOL TECH PLAN

**What CS curriculum providers
do you use in 6-8?
(Charter Only)**



*2020 data represents 96 traditional charter schools

Grades 9-12

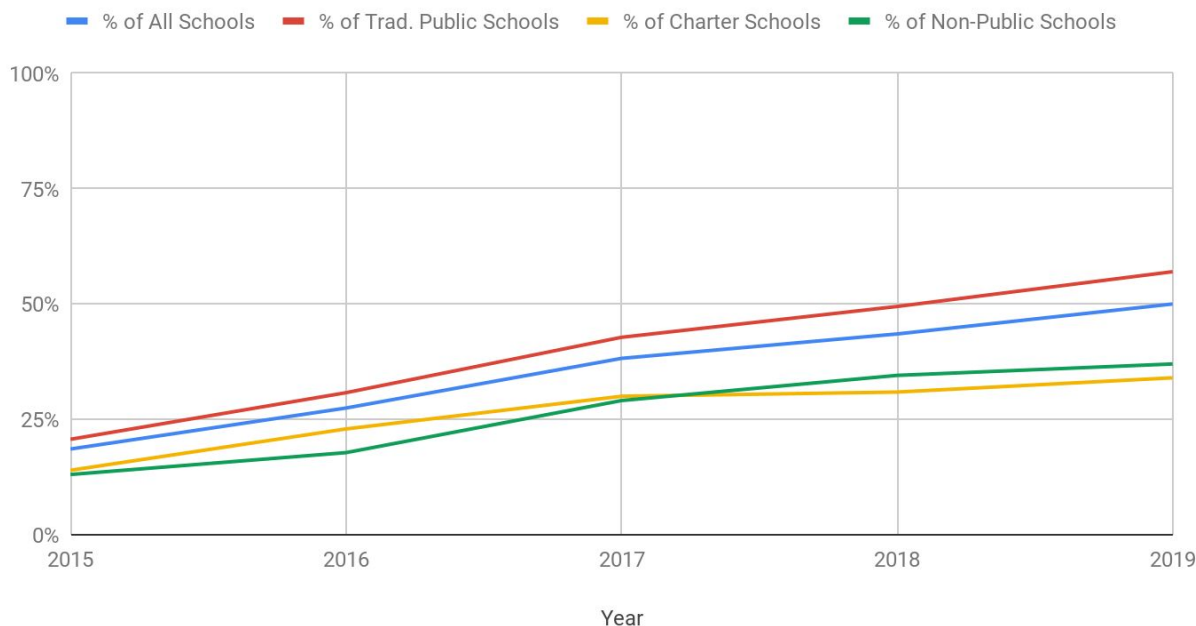
ALL SCHOOLS			
Year	# of Schools	# of Schools Offering At Least 1 CS Course	% of School
2015	528	98	19%
2016	521	143	27%
2017	526	201	38%
2018	531	231	44%
2019	537	271	50%

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%

Percentage of High Schools with CS Course Completions



TRADITIONAL PUBLIC SCHOOLS <u>WITHOUT</u> 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 <u>WITHOUT</u> 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 <u>WITHOUT</u> 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 ✓

✓ Indicates that a high school teacher from that county is involved in the summer 2019 Nextech teacher cohort, signifying intention to offer computer science in 2019-2020

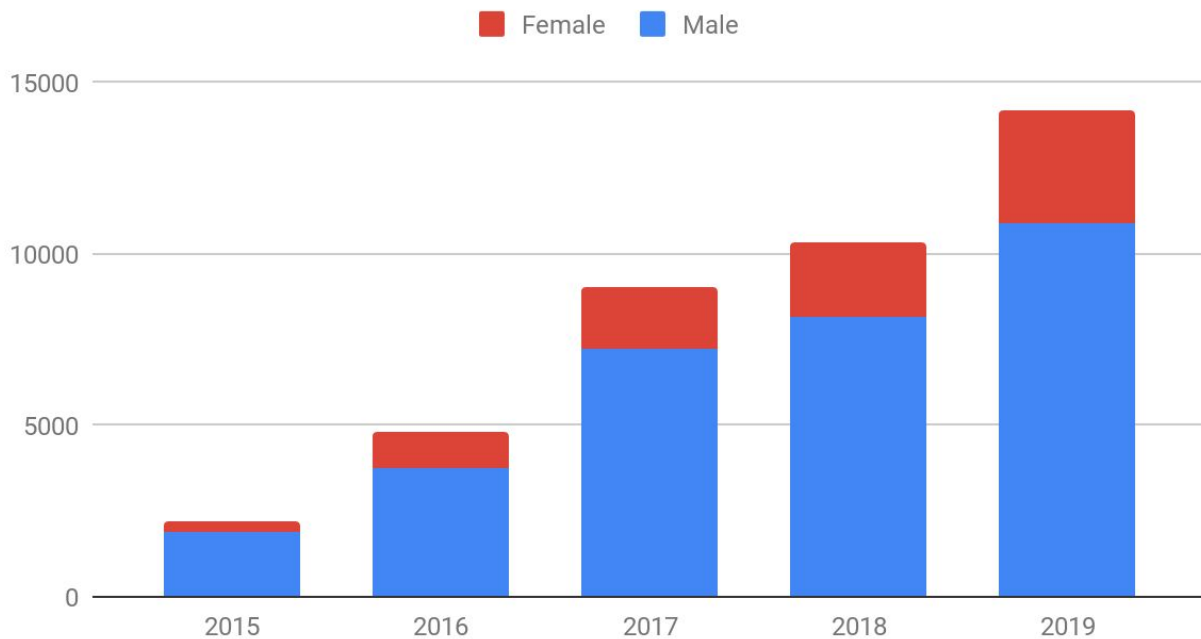
✓ Indicates that a high school teacher from that county was involved in PLTW CS training in summer 2019, signifying intention to offer computer science in 2019-2020

✓ Indicates that a high school teacher from that county did not participate in Nextech or PLTW PD in summer 2019, but confirmed that a high school offered a CS course during the 2019-2020 school year

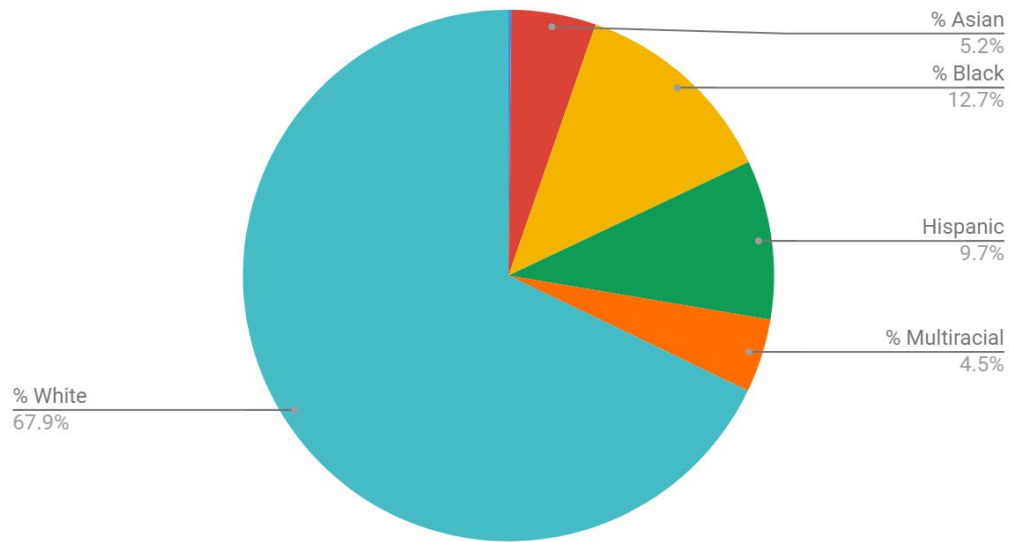
*Course completion data for the 2019-2020 school year will be available in late July 2020.

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

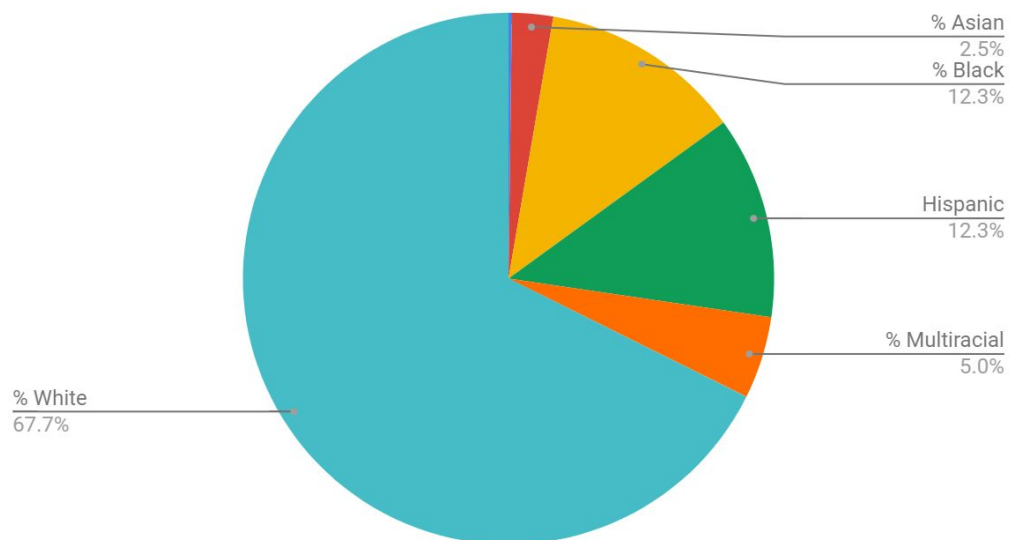
CS Course Completions by Gender Over Time



2019 Course Completions by Race



2019 Overall Student Population by Race



Plans for Continued Growth

- Continue to reach out to schools/counties not offering CS to ensure awareness of professional development opportunities and other resources.
- Identify additional strategies for supporting and engaging late adopters.
- Develop K-5 Computer Science Framework complete with grade-specific standards interpretations, aligned activities, and opportunities for interdisciplinary connections.
- Analyze July 2020 course completion data to identify additional areas of need/focus.
- Continue existing partnerships with organizations like Girls Who Code, Expanding Computing Education Pathways Alliance, CSforIN, professional development partners, etc. to continue scaling CS education across Indiana and making equity a priority.
- Maintain a high level of support and technical assistance for schools and districts.

Appendices

Appendix A - Nextech Contract (June 1, 2018 - July 31, 2019)

Appendix B - CodeHS Contract (October 1, 2019 - July 31, 2021)

Appendix C - Indiana University Contract (October 1, 2019 - July 31, 2021)

Appendix D - Nextech Contract (October 1, 2020 - July 2021)

Appendix E - Notre Dame Contract (February 10, 2020 - July 31, 2021)

Appendix F - Project Lead The Way Contract (May 1, 2020 - July 2021)

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