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Acceleration of
Computing and
Equity

PACE LAB
SUMMARY & TIMELINE

BUILDING COMPUTER SCIENCE PATHWAYS IN MASSACHUSETTS SCHOOL DISTRICTS



What is the PACE Lab?

The PACE Initiative is led by the Massachusetts Association of School Superintendents (M.A.S.S.) to make K-12 computer science (CS) an integral part of every student's education. This work supported by the Massachusetts Computing Attainment Network (MassCAN), a coalition of government, industry, higher education, nonprofits, and philanthropists.

Part of the PACE Initiative, called *The PACE Lab*, is a collaboration between selected school districts and PACE's computer science education team. The PACE team will assist Lab districts in planning and implementing computer science pathways, building on what they currently offer, to scale by grade band, and eventually across all of K-12.

How will Districts be Selected?

Districts who have indicated interest will be selected to participate in the PACE Lab by the M.A.S.S. Executive Committee. The first cohort will comprise approximately 12 districts that are already offering some CS in their schools. Later cohorts may be larger and contain districts less experienced with CS.

First Cohort:

- Already offering some CS, ready to expand over district-wide grade-band
- Committed to reaching goal of 30% CS competency* over 5 years
- Cohort balanced for representation from MASS Roundtable regions and for coverage in three grade bands

The "30% CS Competency" Goal

Graduate 30% of the district's high school students with *computer science competency* by 2023, with the vision that eventually all high school graduates in Massachusetts reach this benchmark.

*CS Competency is defined as passing (a "C" letter grade, or better) in a course equivalent to the AP[®] Computer Science Principles (CSP) course, or receiving a 3 or higher on the AP[®]CSP test.

How will PACE Lab Districts Benefit?

- Participation in a structured, facilitated planning process will lead your district’s team to producing a workable implementation plan for computer science across one grade band (K-5, 6-8, or 9-12). With persistent commitment over 4 years, your district will build a sustainable K-12 CS Pathway.
- Each district participating in the first PACE Lab Cohort, starting in Spring 2018, will be named a Massachusetts Computer Science Leadership District.
- Participation will provide opportunities to learn from other districts and from the CS content expertise of the MassCAN program staff.
- PACE Lab Districts will shape PACE reports to the field:
 - Snapshot Report - summarize values, goals, and progress-to-date in CS education in MA at the start of the PACE Lab Cohort.
 - Implementation Guide - synthesize learnings from the PACE Lab’s first planning and implementation cycle.
 - Online Repository - assist planning and implementing district-wide K-12 CS in MA, and will also advance our shared agenda with other leading states in CS Education.

TIMELINE - First Cohort of PACE Districts

Mar-Jun '18	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
DISCOVERY	PUBLICATION Snapshot Report		PUBLICATION Plan & Impl. Guide		
District Selection	PLANNING	Prof. Dev.	Prof. Dev.	Prof. Dev.	Prof. Dev.
District team of ~4 people; 3 half-day meetings	Team of ~6 people; 6 full-day meetings	Implement Grade Band A	SCALE UP...		
			Implement Grade Band B	SCALE UP...	
				Implement Grade Band C	SCALE UP...

Phase 1: April 2018 - August 2018

DISCOVERY & DOCUMENTATION PHASE

Teams from each district participate in series of 3 discovery and documentation sessions. The team should have approximately 4 people who are most familiar with their district's CS programs such as Superintendent, Assistant Superintendent, STEM Director, District Technology Coordinator, Department Heads, CS Teachers, Media/Tech Specialists.

Phase 1 Goals

- Collect information from participants to capture current picture of CS in lab districts.
- Report on these findings so that we can show off a summary of CS in the Lab districts.
- Prepare for Planning Phase; identify planning team members for each district.

Phase 1 Deliverables

1. Districts prepare a short report, in response to a questionnaire, summarizing their CS Ed efforts to date, and share it electronically before the first meeting. This prompts them to gather necessary information before the first meeting, and it also provides us with a written record.
2. PUBLICATION: *"Taking a Snapshot of CS in K-12: a look at MA Leadership Districts"* MassCAN staff publishes report giving a snapshot of CS in these schools. Summarize information learned during discovery phase and showcase the PACE initiative, and recognizing the Lab districts.
3. Districts name their District Planning & Implementation Team, after receiving guidance about choosing stakeholders who will influence positive district systemic change.

Phase 1 Discovery & Documentation Sessions

Discovery Session #1 - PACE Initiative Kickoff and Overview

- Build rapport, establish common base of knowledge, share experiences.

- Each district gives short presentation explaining their CS program: Initial goals, information gathered, key leadership roles, courses/programs offered, key decisions, challenges encountered, solutions, next steps. (guided by pre-report)

Discovery Session #2 - Sharing District Snapshots

- Dig deeper to process and think about CS experiences so far.
- Work by grade band through conversation prompts.

Discovery Session #3 - Clarifying What We've Learned

- Review key points from previous discussions. Clarify takeaways to be shared with other districts.
- Discuss each district's needs, ideas for continuous improvement plans, and emerging best practices.
- Review and set expectations regarding Phase 2 goals and timeline.
- Why District Leadership essential to success, how to assemble a team for next phase.
- Each district to name a 6-8 member District Planning & Implementation (P&I) Team
 - Teams *must* include: District-level admin, Building-level admin, Representative CS Teacher(s), Technology Director, Tech/Media Specialist

Phase 2: August 2018 - June 2019

PLANNING & IMPLEMENTATION PHASE

Planning & implementation teams from each district will engage in an in-depth, facilitated planning process based on the SCRIPT Framework¹. By June 2019 each team will have a plan to implement CS across their target grade-band implementation in school year 2019-20.

Phase 2 Goals

- Each district crafts a plan for implementing CS in one grade-band for the following school year. Decisions are made about curriculum, preparing teachers (PD), capacity planning, building essential partnerships, and providing necessary leadership.

- Work out logistics for summer professional development. (PACE may negotiate and facilitate with PD providers to combine PD sessions, depending on the programs the districts choose.)
- Engage stakeholders (parents, teachers, principals, students) for higher likelihood of sustainability.

Phase 2 Deliverables

1. Each district produces: District Implementation Plan for One Grade Band (Elem, Middle, or High) for School Year 2019-20.
2. Professional Development sessions scheduled for Summer 2019, that fulfill PACE Lab districts' grade-band commitments for school year 2019-20.
3. Repository of resources, such as agendas, summaries, stakeholder letters, that aid in building and sustaining district-wide CS programs. (Appropriate artifacts posted to Clearinghouse.)
4. PUBLICATION: *"Insights from Leadership Districts: Guidance on Computer Science Implementation in Schools"*
Resource for districts in early stages of CS planning; Summarizes strategies and best practices from facilitated learning process of the Pilot Districts.
Guide will be made available online to other districts via the Clearinghouse.

Phase 2 Planning & Implementation Sessions

- CS Visions: Setting District Rationales for CSforAll
- Mapping Your Current and Future CS Instruction Goals
- Setting Near and Medium Term District Goals
- Using Digital Literacy & Computer Science Standards as framework for CS Pathway
- Establishing shared common knowledge around CS with stakeholders
- Computing as a basic literacy; Engaging stakeholders in the community
- Equity and Diversity
- PD Decision-Making (Logistics for Summer 2019)
- Developing Practical Measures for Improvement
- Values-based Curricula Selection and Adaptation

- Planning District Team Structures for Implementation Phase
- District-Level Systems Change

Looking ahead: 2019 and beyond

Each spring a new district cohort enters the PACE Lab and goes through the planning and implementation process, which has been iteratively refined based on lessons learned. With cross-sector support, the PACE program would continue supporting district cohorts until all districts have gone through a facilitated planning year for all three grade bands and their K-12 CS pathway implementations are in a sustainability phase.

Systemic Change & Sustainability

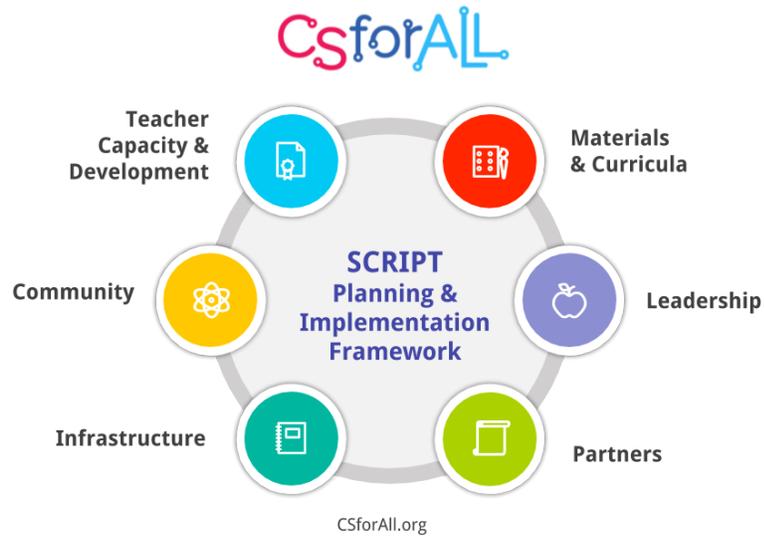
When a K-12 district-wide pathway has been established, districts will enter a stabilization Phase.

- Record and share lessons learned.
- Adopt problem-solving strategies that are conducive to long-term sustainability.
- Focus on systems-level change, institutional memory, district processes, school and teacher support.

References

1. SCRIPT / CS For All

The SCRIPT framework has been developed from research-proven methods in organizational development and the learning sciences. The facilitated, intensive planning process allows district personnel to develop computer science pathways customized to the needs of their students. This process will help identify appropriate resources and partners and determine steps for implementing CS curricula across the targeted grade band.



The SCRIPT framework has been developed over years of education research at CSNYC and now continues with CS For All. See <https://www.csnyc.org/our-work/cs4all> for more information.

Recognizing that school districts have their own unique goals and circumstances, PACE will provide a suite of services and tools to empower districts to make their own decisions about implementing computer science pathways.

"**School districts** are the **critical unit of change** for CS education. They have the authority to ...ensure that CS is ...supported for long-term sustainability. They are also best positioned to create rigorous K-12 CS pathways that build from year to year."

-- CSforALL, *Medium*, 8 Nov 2017. <https://medium.com/@CSforALL/school-districts-write-their-own-script-with-csforall-1a4a82790b13>

PACE Lab Contacts

SHAILEEN POKRESS, PACE PROGRAM DIRECTOR
spokress@edc.org

TOM SCOTT, M.A.S.S. EXECUTIVE DIRECTOR
scott@massupt.org