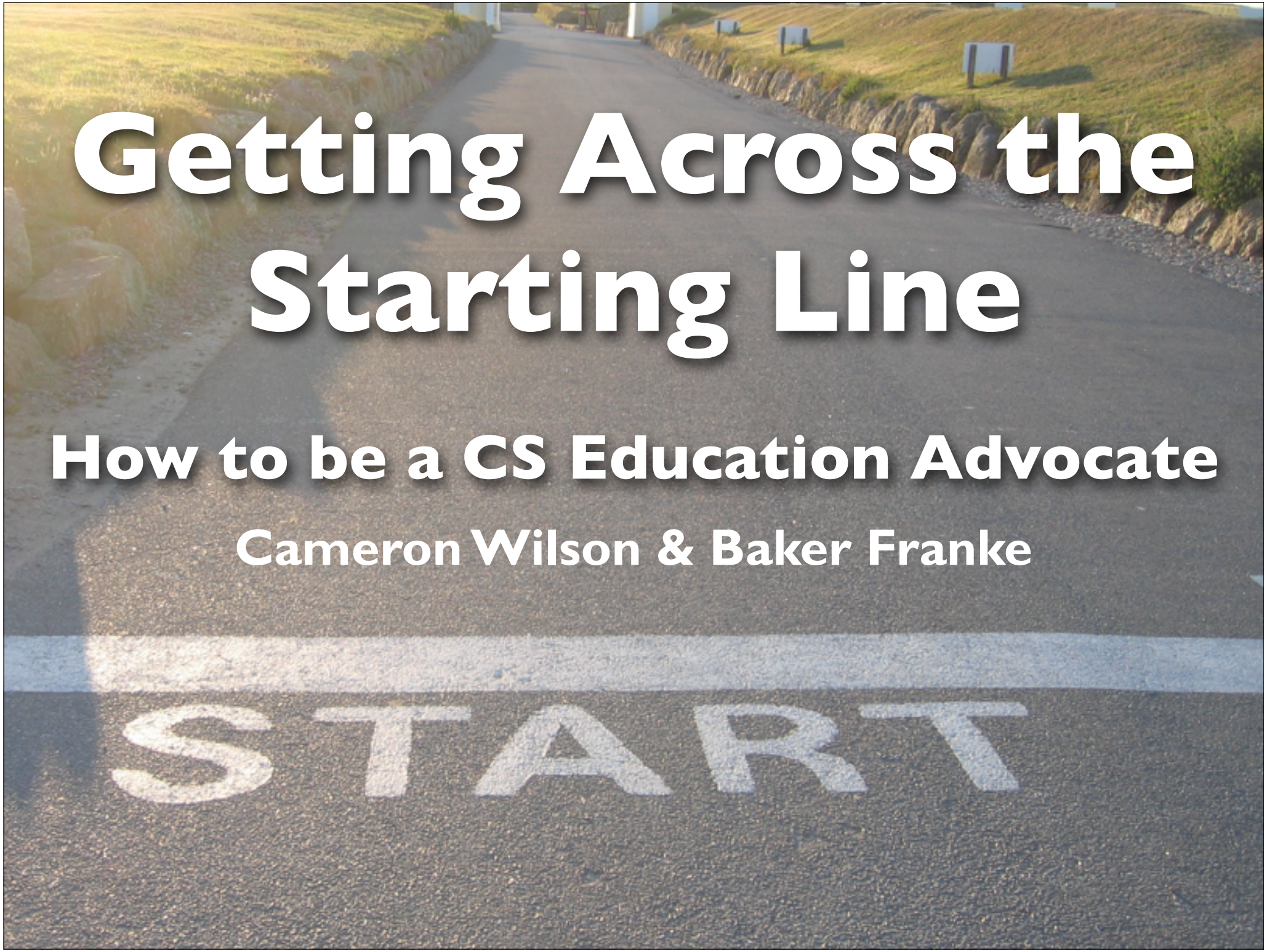


Getting Across the Starting Line

How to be a CS Education Advocate

Cameron Wilson & Baker Franke

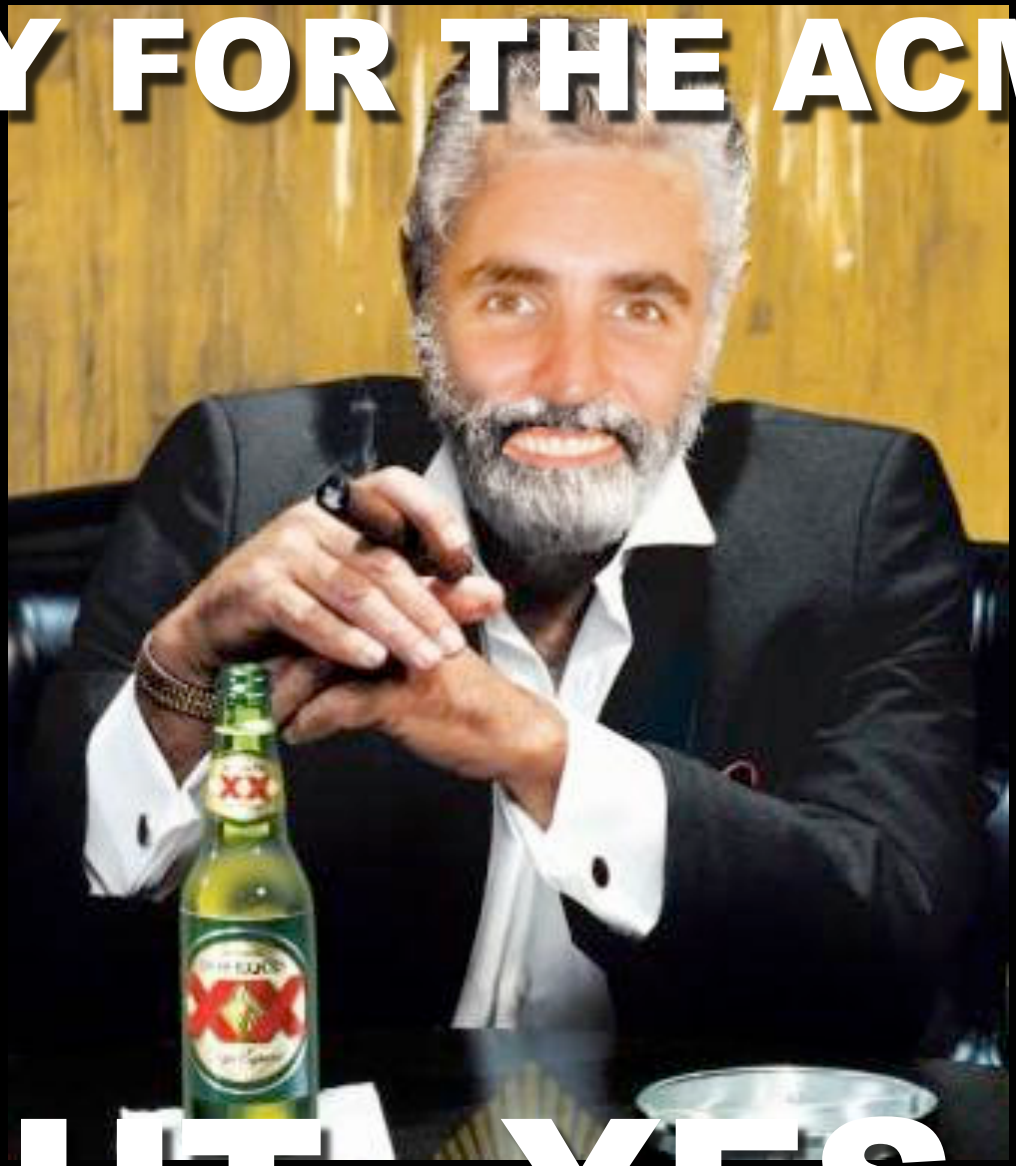
Teacher

v.

~~Teacher~~

Policy Guy

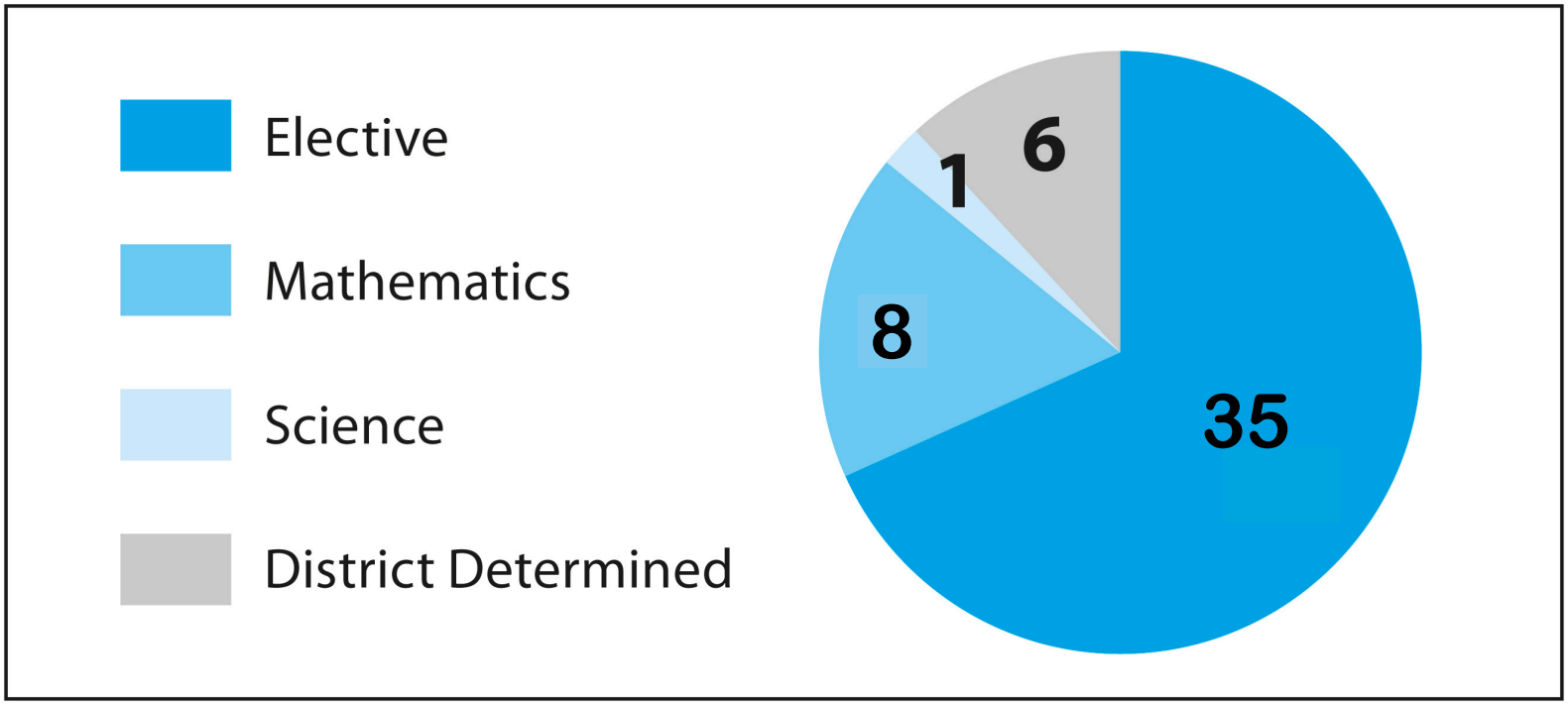
I DON'T ALWAYS DIRECT POLICY FOR THE ACM



BUT...YES I DO

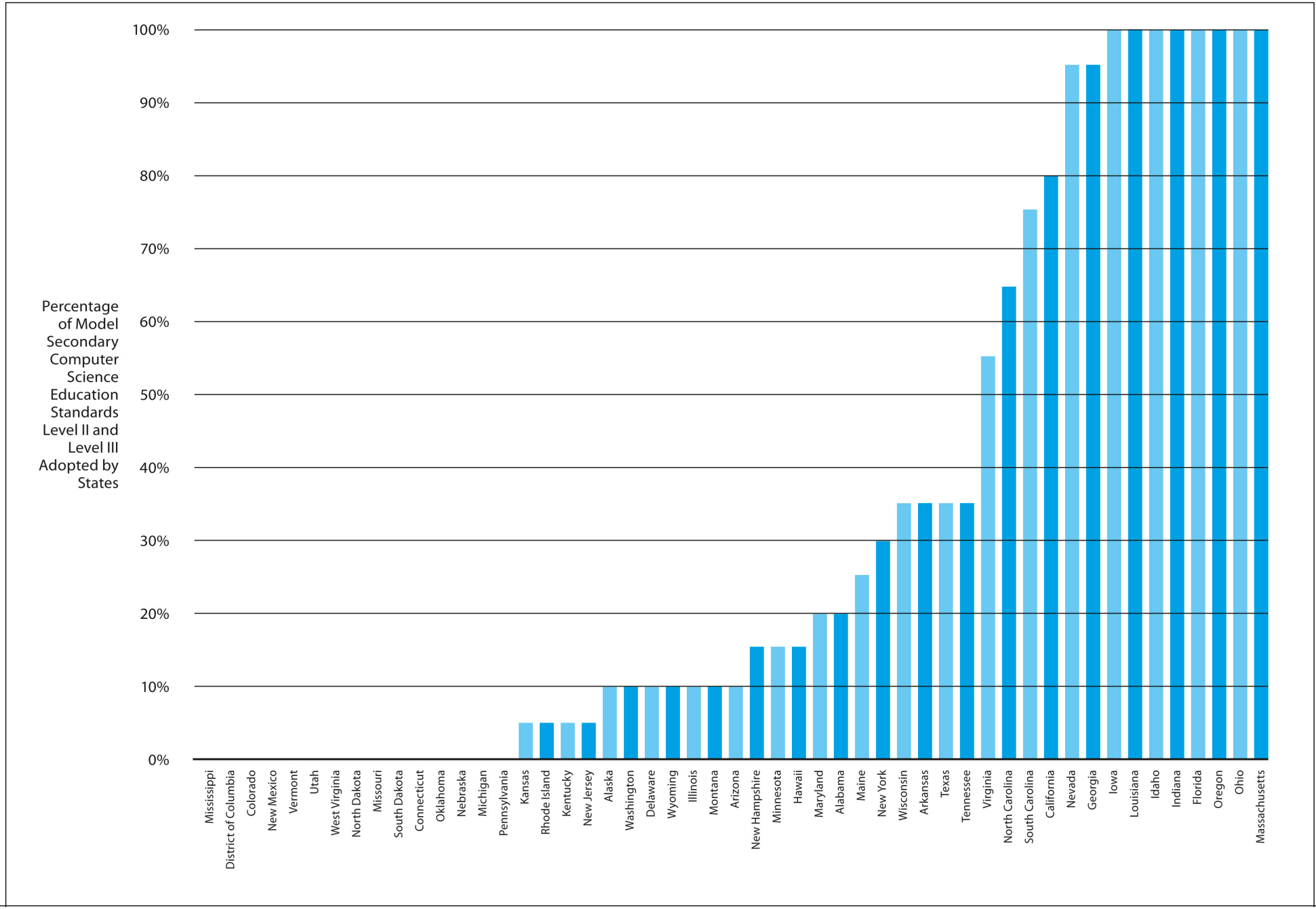
Findings: Graduation Credits

FIGURE 12 How Computer Science Courses Count Toward Graduation Requirements



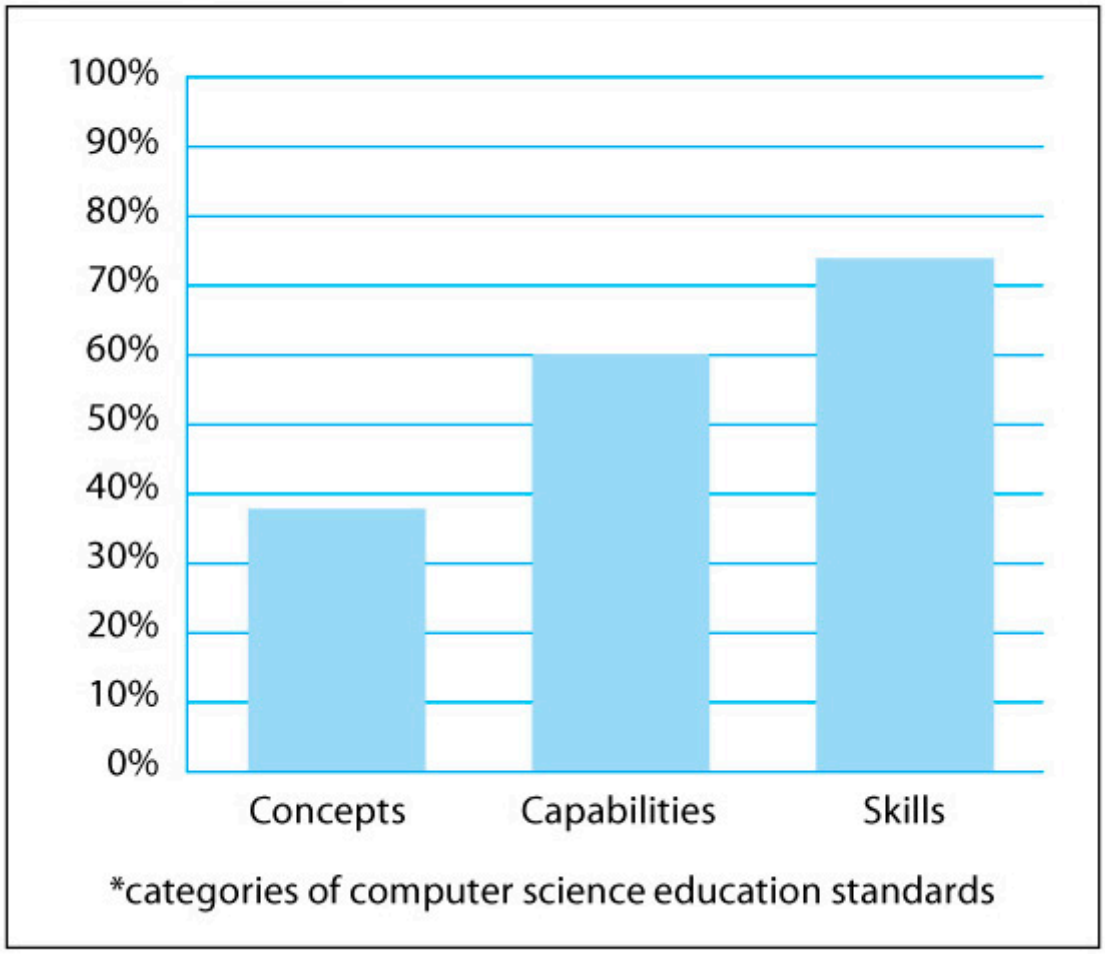
Findings: Standards

FIGURE 3 **Secondary School Standards Level II and Level III Adoption by State**

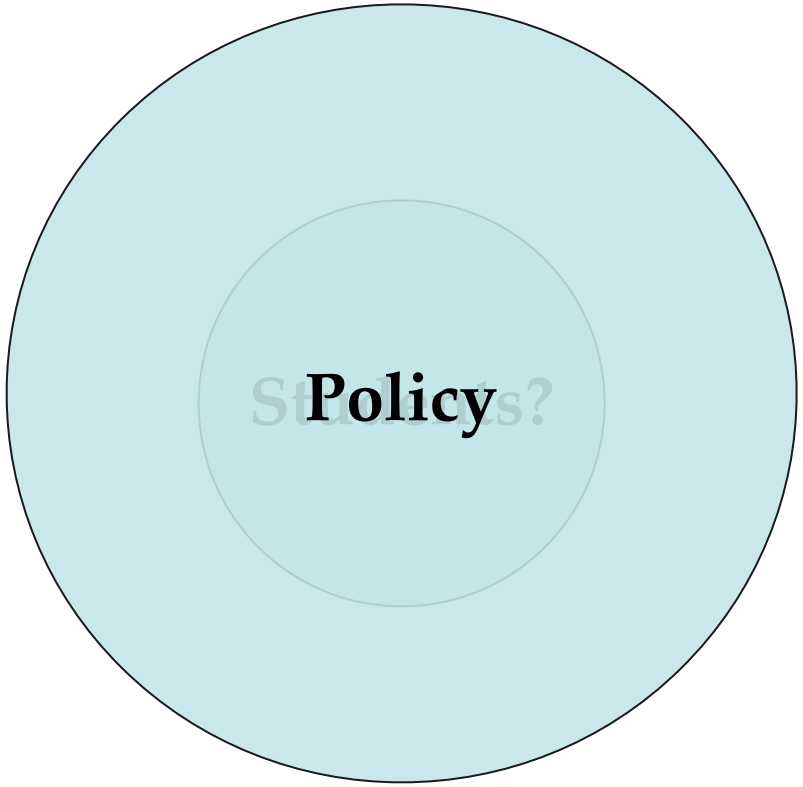


Findings: Standards

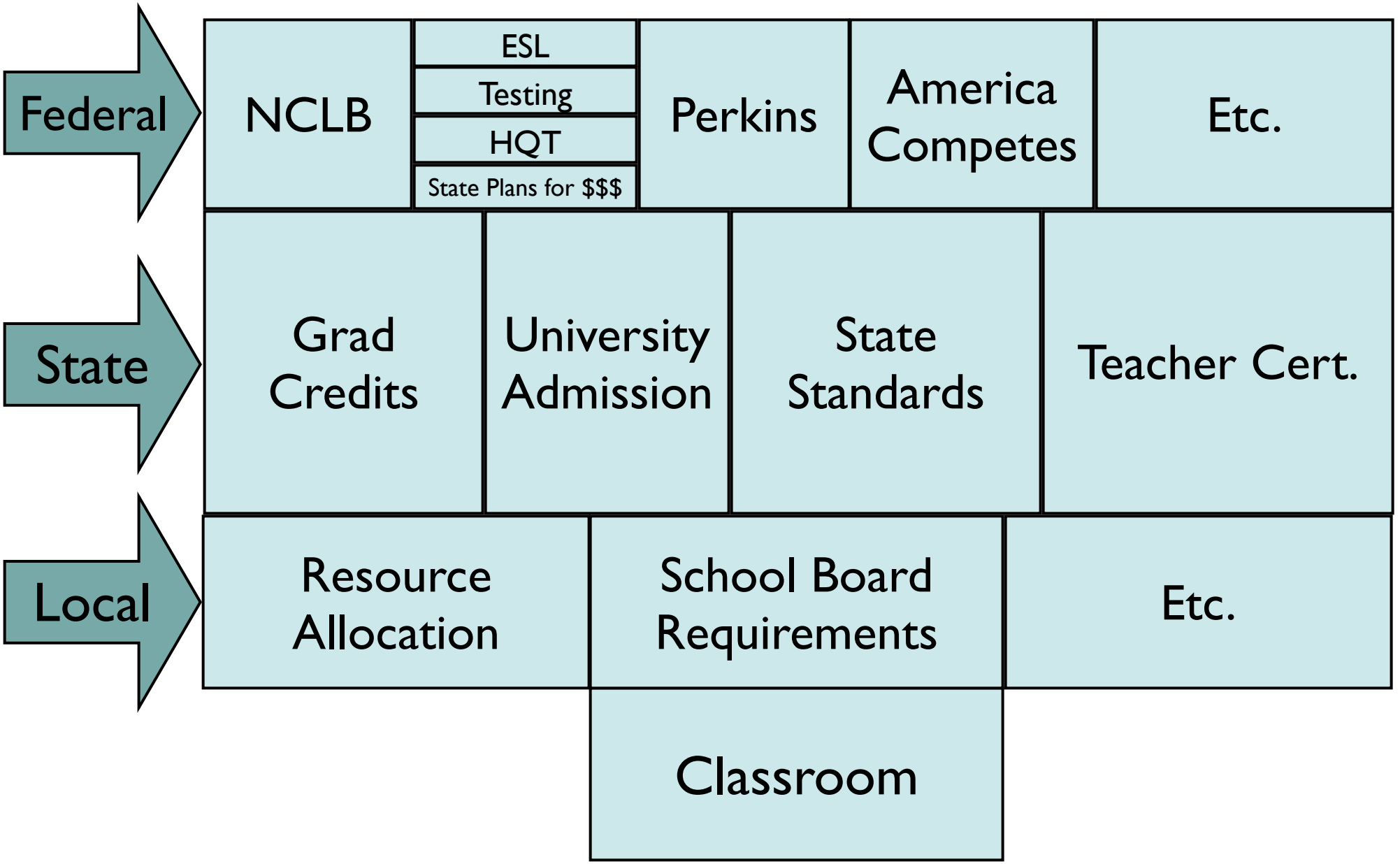
FIGURE 2 National Snapshot: Adoption of Computer Science Standards*



Why?

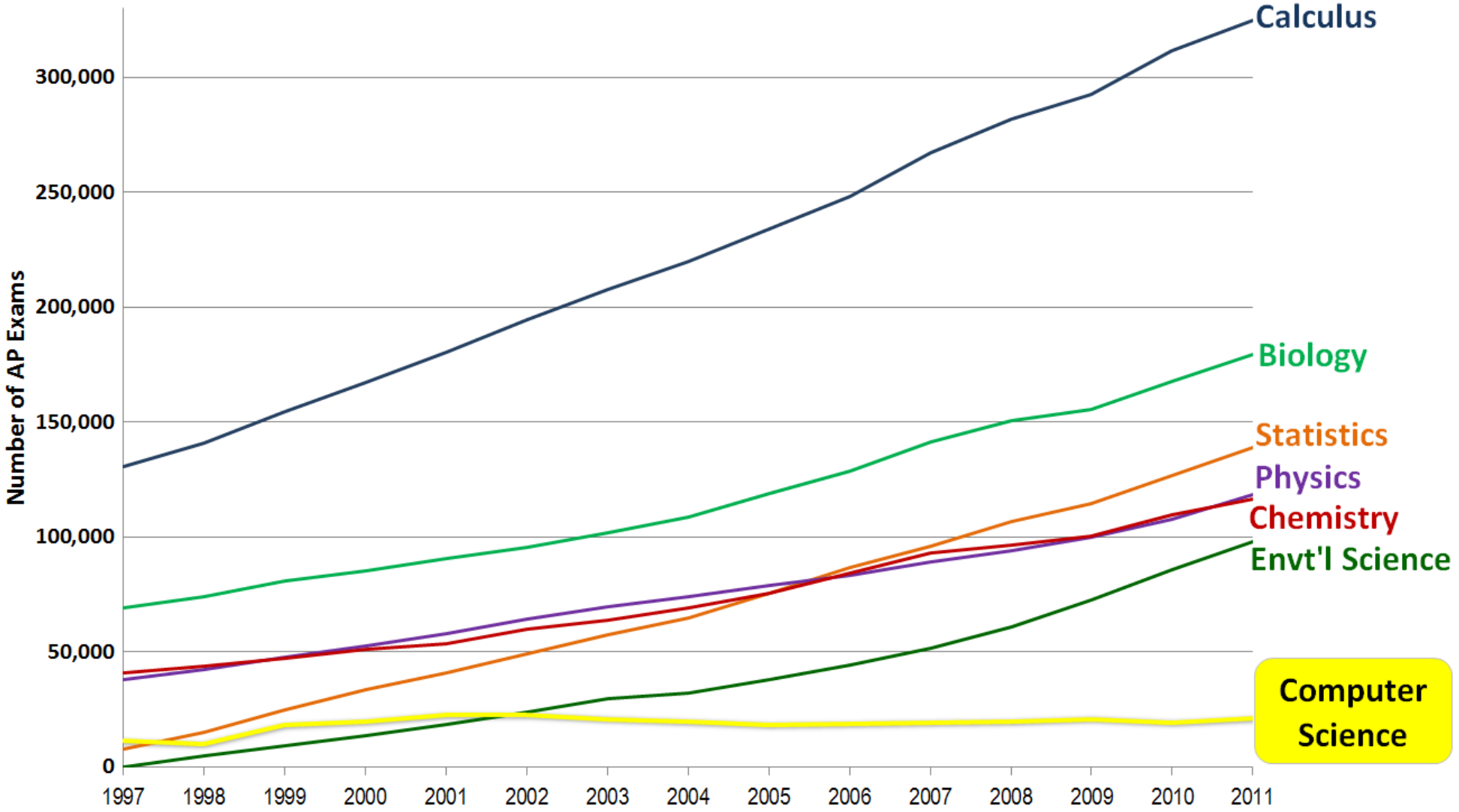


Policy Landscape: Layers of Complexity



High School Advanced Placement

Exams 1997-2011



Source: College Board, Advanced Placement (AP) Exam Data 2011, available at http://professionals.collegeboard.com/data-reports-research/ap/data. Calculus represents the combined data of Calculus AB and BC. Physics represents the combined data of Physics B, C:Electricity and Magnetism, and C:Mechanics. Computer Science represents combined data of Computer Science A and B.

Baker's Rules for CS Advocacy

Rule #1 Believe that CS should be a fundamental part of education for all students

acm
Association for
Computing Machinery
Advancing Computing as a Science & Profession

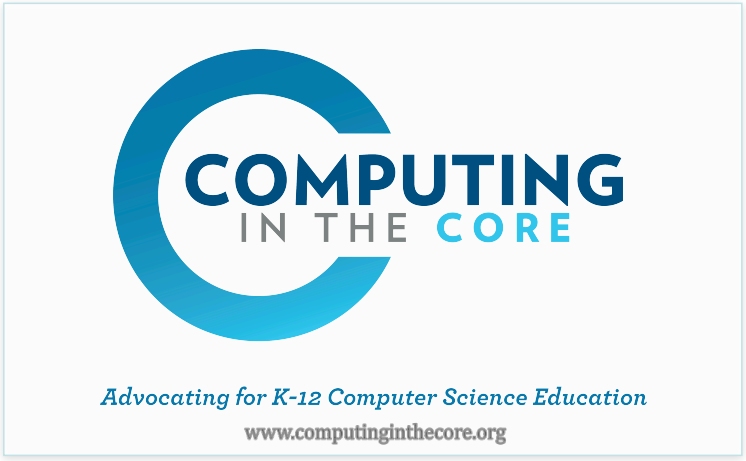
CollegeBoard

Google

csta
Computer
Science
Teachers
Association

Microsoft

NCTM
NATIONAL COUNCIL OF
TEACHERS OF MATHEMATICS


COMPUTING
IN THE CORE
Advocating for K-12 Computer Science Education
www.computinginthecore.org

IEEE
computer
society

ANITA BORG INSTITUTE
FOR WOMEN AND TECHNOLOGY

national center for
women &
INFORMATION
TECHNOLOGY

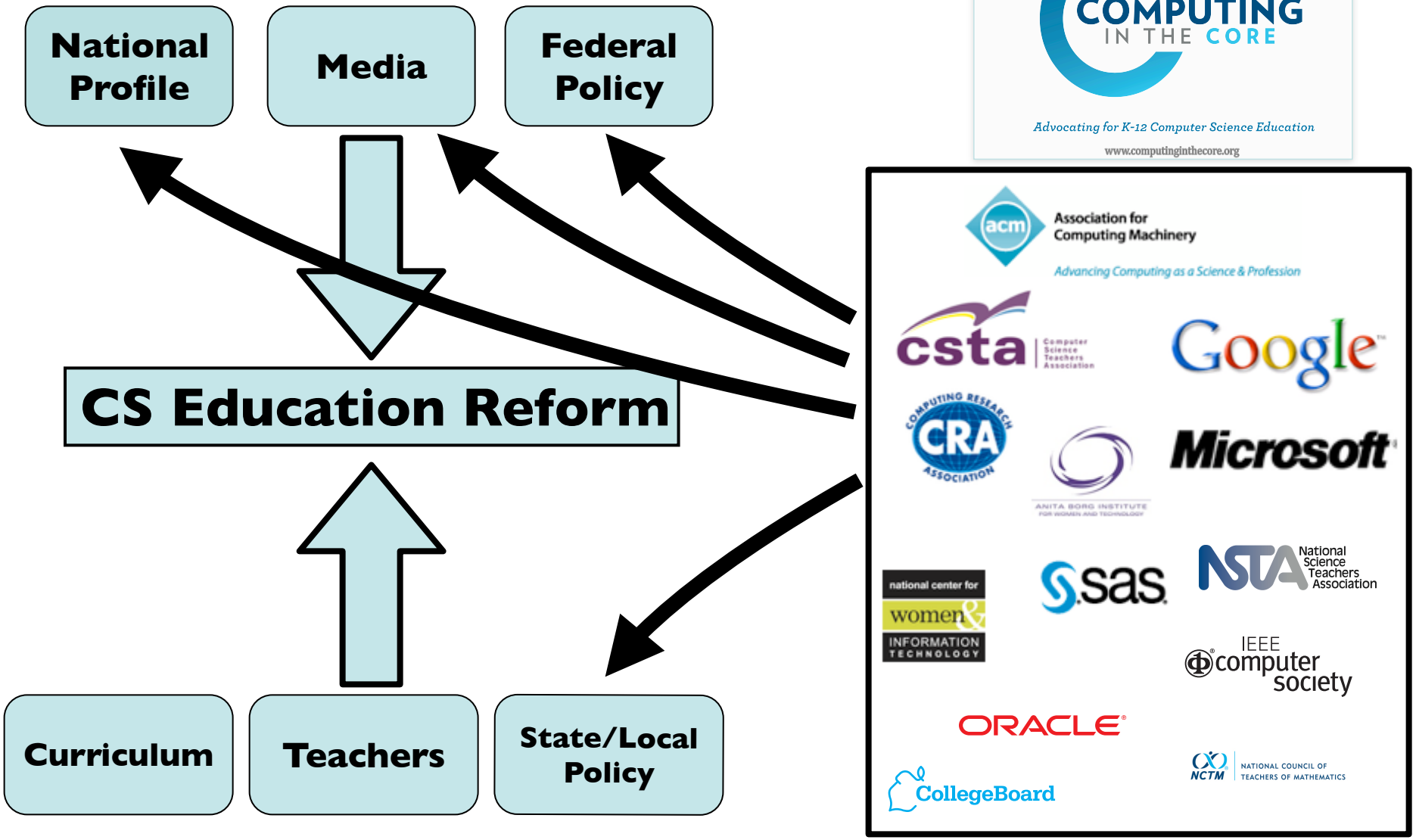
sas

COMPUTING RESEARCH
CRA
ASSOCIATION

ORACLE

NSTA
National
Science
Teachers
Association

Strategy for Reform

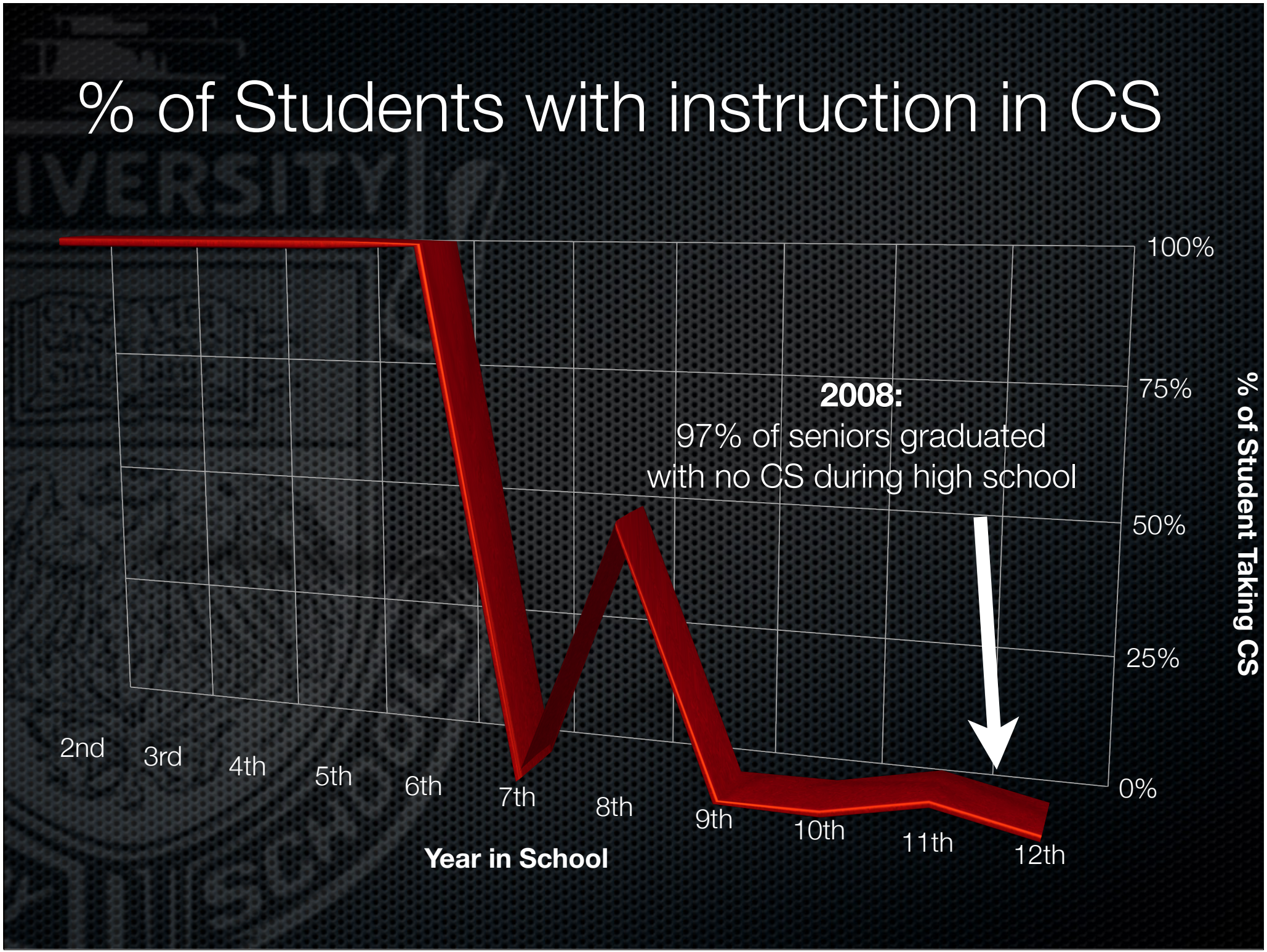


"The change that comes first to mind, the one that overshadows and even controls all others, is the *technological* one…

That this revolution should not affect education in some other than a superficial fashion is inconceivable."

--John Dewey, *The School and Society, 1907*

% of Students with instruction in CS

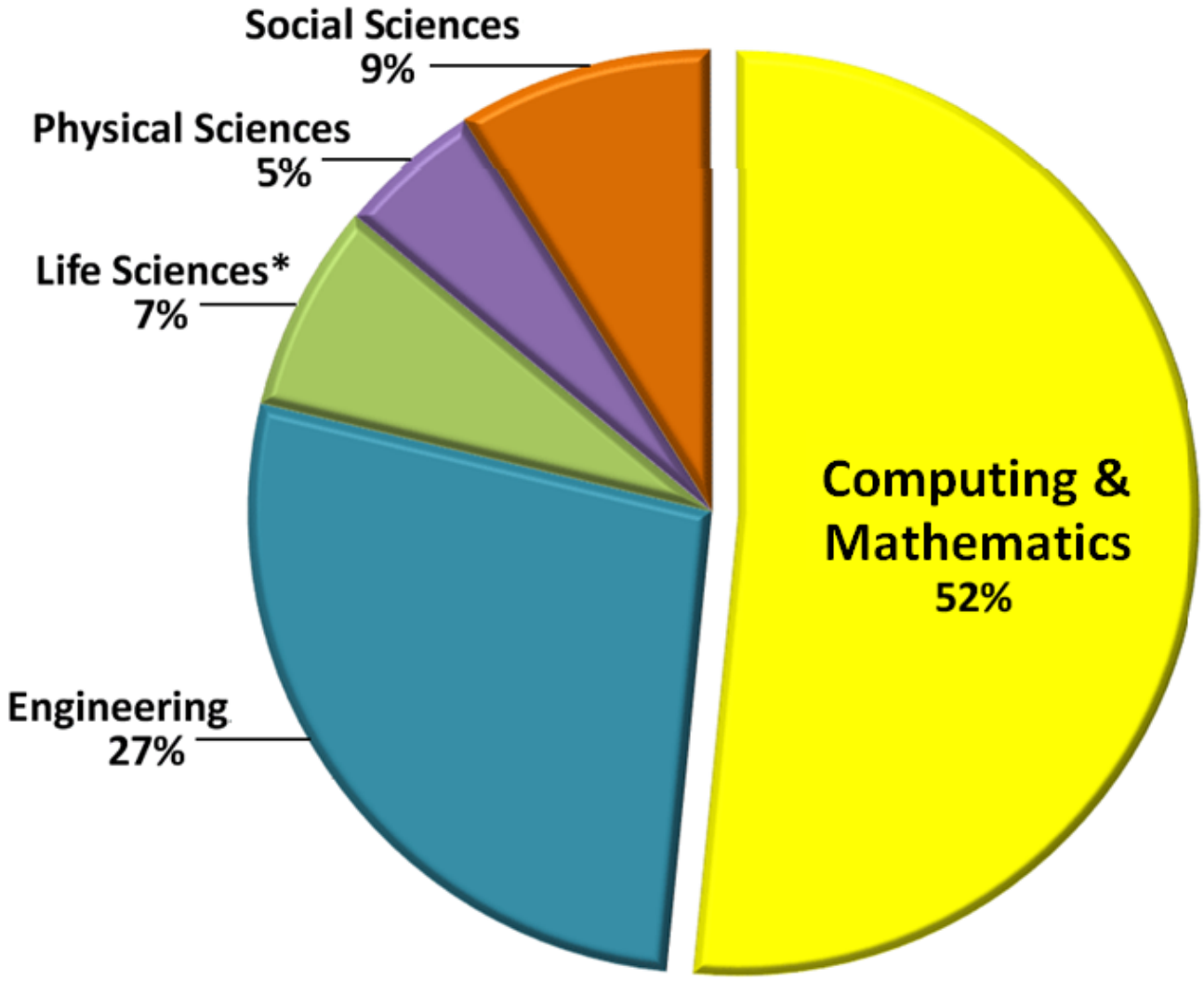


Sample 9th Grader 2008-09

1		English	English	English	English
2	CS	PE	Advisory	CS	Advisory
3	History	History	PE	History	History
4	Spanish	Spanish	Spanish	PE	Spanish
5	Band	Band	Band	Band	PE
6					
7	Biology	Biology	Biology		Biology
8	Biology	Math		Biology	
9	Math		Math	Math	

Where the STEM Jobs Will Be

Projected Annual Growth of STEM Job Openings 2010-2020



* STEM is defined here to include non-medical occupations.

Source: Jobs data are calculated from the Bureau of Labor Statistics (BLS), Employment Projections 2010-2020, available at http://www.bls.gov/emp/.

Where the U.S. Jobs Will Be

Top 10 Major Occupational Groups 2010-2020 and Average Salaries in May 2011

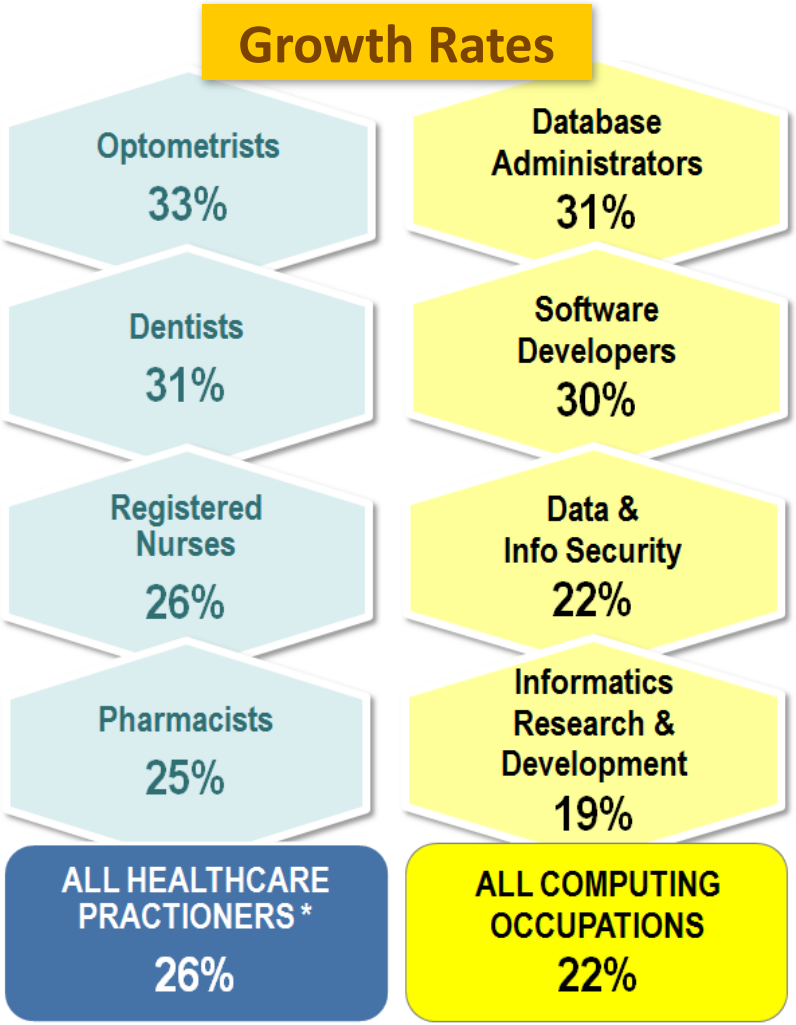
	Major Occupational Group	% Growth 2010-2020	2011 Average Annual Salary
1	Healthcare Support Occupations	35%	$27,370
2	Personal Care and Service Occupations	27%	$24,620
3	Healthcare Practitioners and Technical Occupations	26%	$72,730
4	Community and Social Service Occupations	24%	$43,830
5	Construction and Extraction Occupations	22%	$44,630
6	**Computer and Mathematical Occupations**	**22%**	**$78,730**
7	Business and Financial Operations Occupations	17%	$68,740
8	**Life, Physical, and Social Science Occupations**	**16%**	**$67,470**
9	Education, Training, and Library Occupations	15%	$50,870
10	Transportation and Material Moving Occupations	15%	$33,200

U.S. Employment through 2020

22% job growth rate
in computing jobs, as comparable to healthcare job growth rates 2010-2020.

51,000 projected shortfall
in qualified health IT workers 2011-2015.

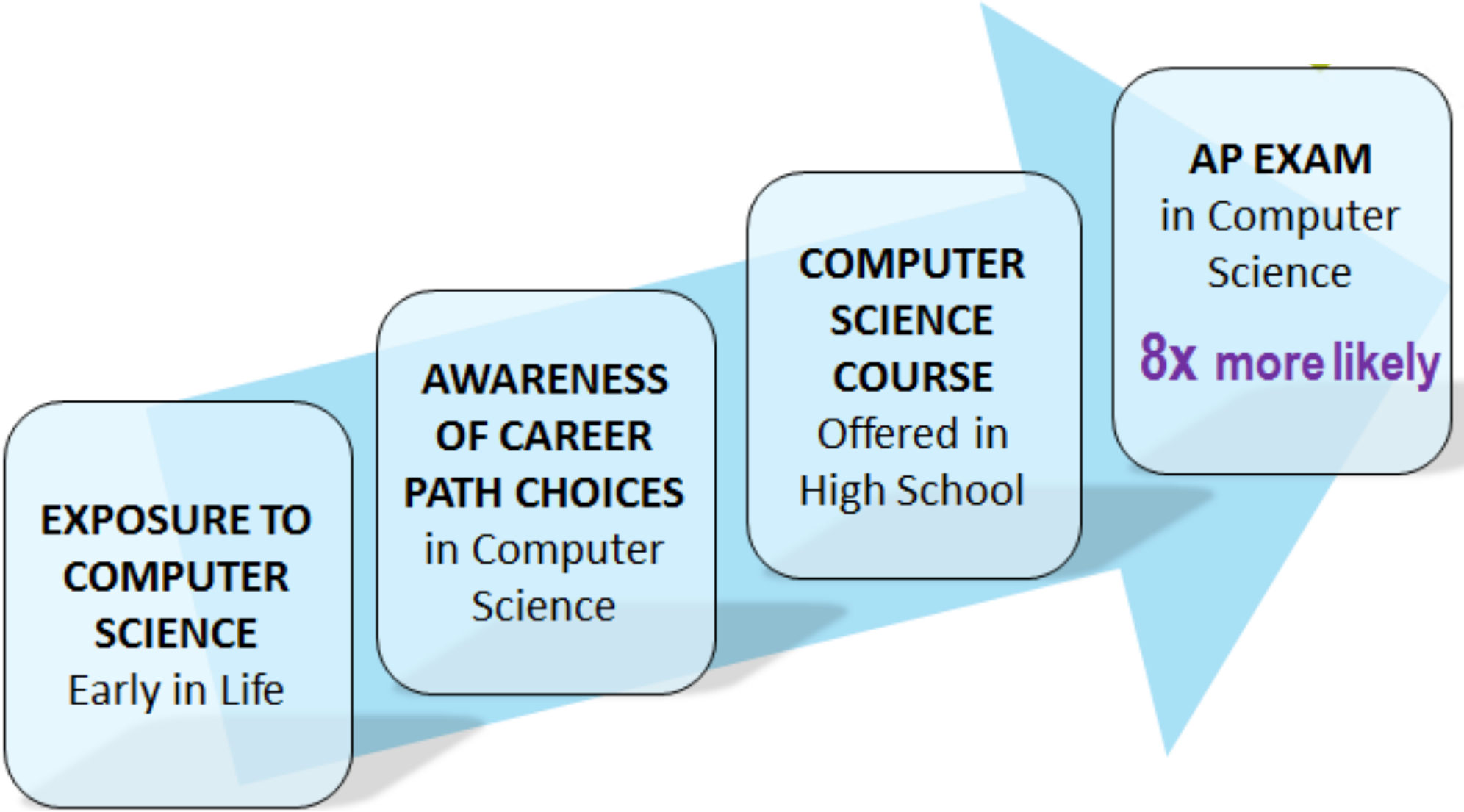
90% of physicians
to use electronic health records by 2019 as a result of the federal HITECH Act of 2009.



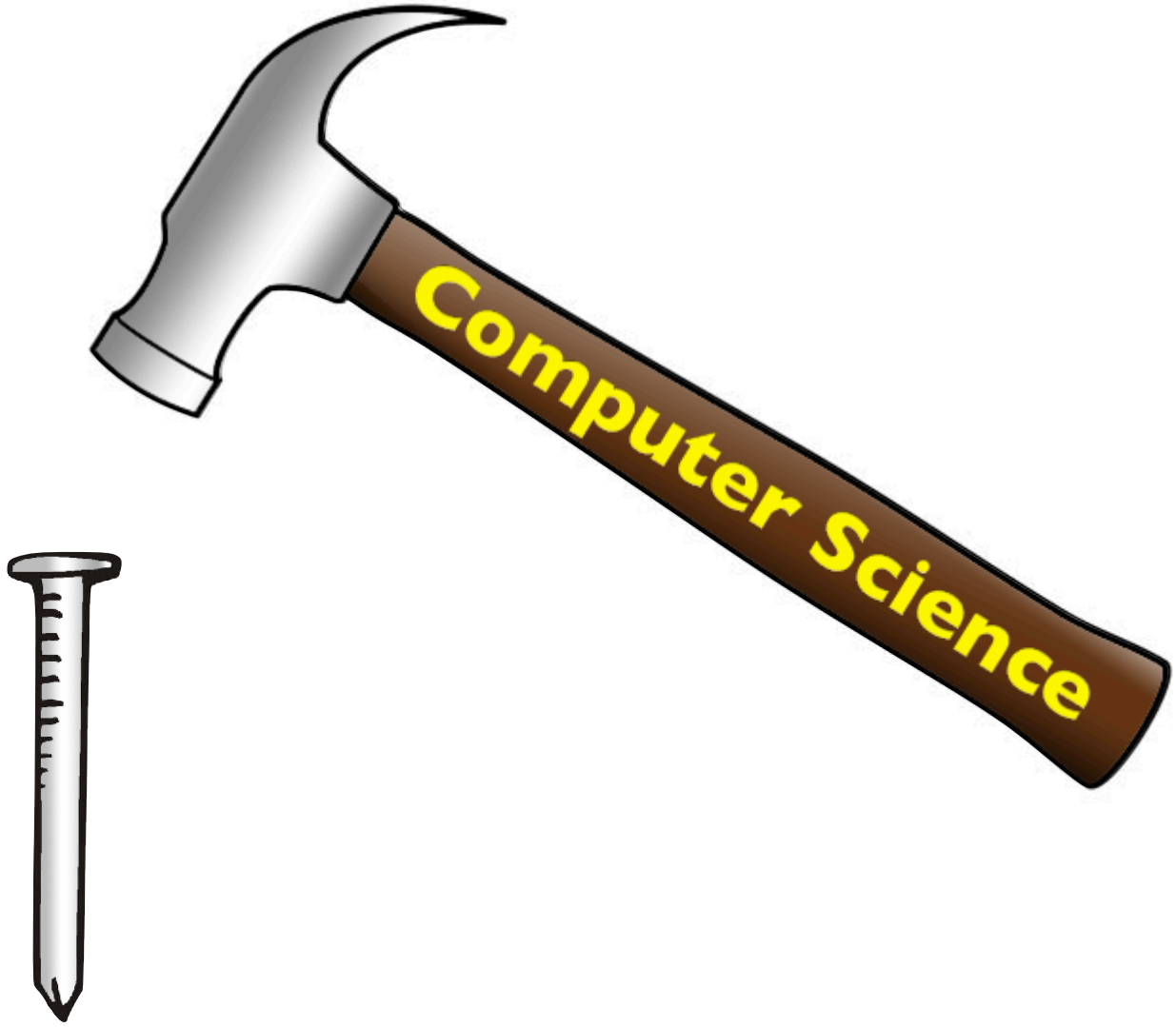
* Healthcare practitioners and technicians

Sources: Bureau of Labor Statistics (BLS), Employment Projections 2010-2020, available at http://www.bls.gov/emp/. U.S. Department of Health and Human Services (HHS), HITECH Programs, http://www.healthit.gov. Congressional Budget Office, Analysis of HITECH Act of 2009.

Why K-12 Computer Science?



Source: COLLEGE BOARD, IS AP EXAM PARTICIPATION AND PERFORMANCE RELATED TO CHOICE OF COLLEGE MAJOR? (RESEARCH REPORT 2011-06, 2011), available at http://professionals.collegeboard.com/profdownload/pdf/RR2011-6.pdf. Google, Survey Results of U.S. Employees (2010) (unpublished).



Problems with Education

Baker's Rules for CS Advocacy

Rule #2 Alcohol. It works.

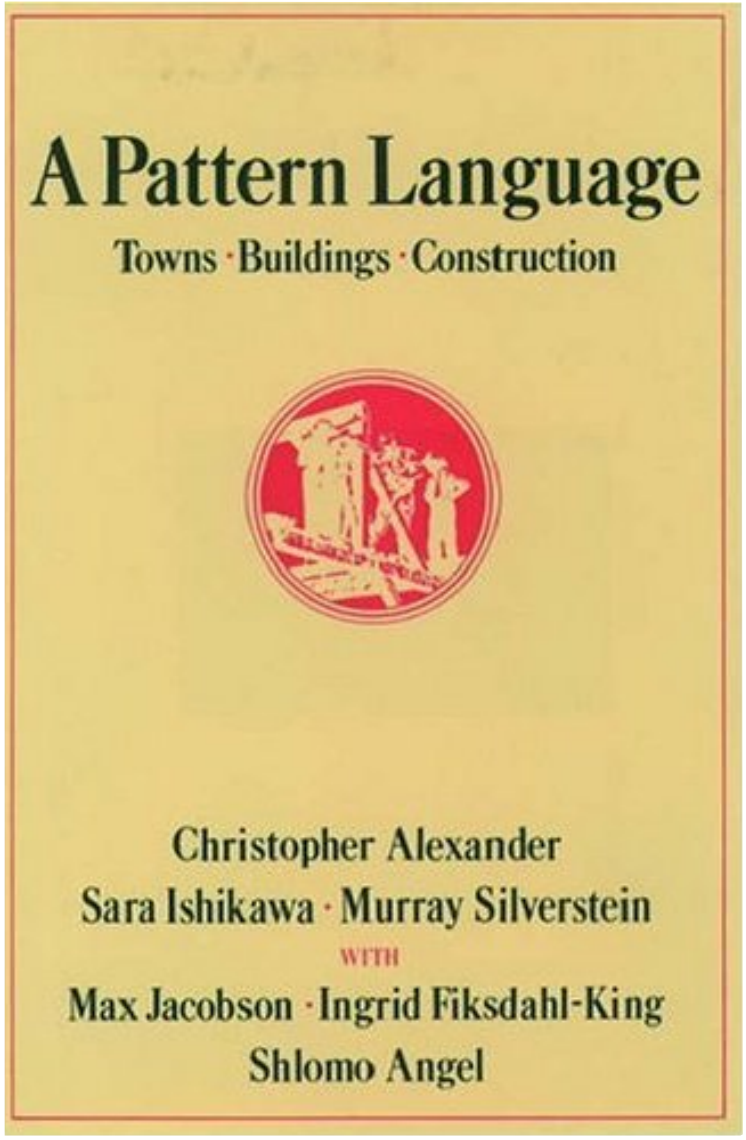
Baker's Rules for CS Advocacy

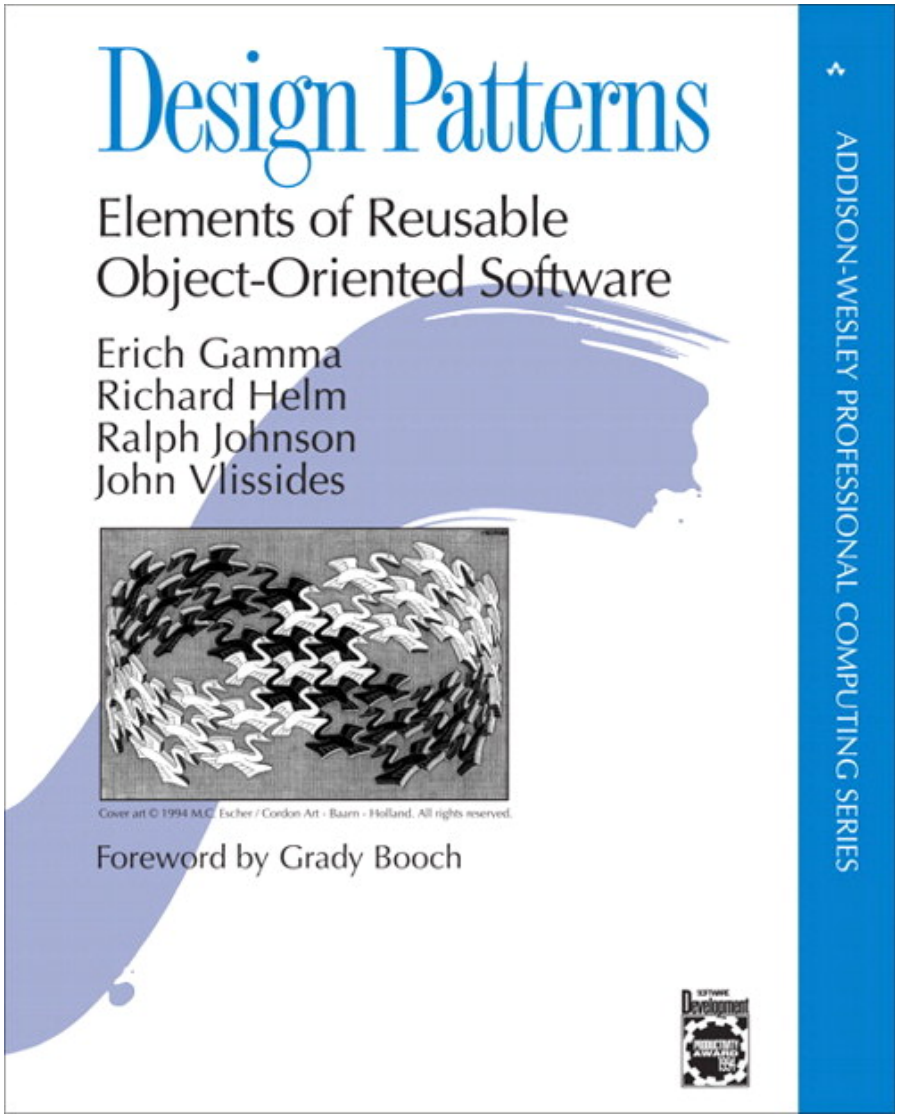
Rule #2 *Alcohol. It works.*

You have to meet people...in person.

Baker's Rules for CS Advocacy

Rule #3 You are not alone.
Use and trust your CSTA chapter.


A Pattern Language
Towns · Buildings · Construction
Christopher Alexander
Sara Ishikawa · Murray Silverstein
WITH
Max Jacobson · Ingrid Fiksdahl-King
Shlomo Angel


Design Patterns
Elements of Reusable
Object-Oriented Software
Erich Gamma
Richard Helm
Ralph Johnson
John Vlissides
Cover art © 1994 M.C. Escher / Cordon Art - Baarn - Holland. All rights reserved.
Foreword by Grady Booch
ADDISON-WESLEY PROFESSIONAL COMPUTING SERIES

"A pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem in such a way that you can use that solution a million times over without ever doing it the same way twice."

--Christopher Alexander

CS Advocacy Patterns

1. The Value Narrative
2. Documentation Tiers
3. The Zero Sum Problem
4. Implementation Plan
5. Whom to Convince
6. Person in Your Corner

Baker's Rules for CS Advocacy

Rule #4

Answer the Bat Signal

Platforms/Opportunities for Advocacy

- Advocacy is about awareness -- use CSEdWeek (year round if you have to)

COMPUTER SCIENCE
Education Week
WWW.CSEDWEEK.ORG

- Summer town halls with your Member of Congress
- Next Generation Science Standards -- How about a commitment from 200 teachers in this room?
- CS&IT -- National conferences are great hooks for carrying out advocacy

Platforms/Opportunities for Advocacy (cont.)

- No bad time for advocacy ... but sometimes are better than others
- Things run in cycles -- learn them:
  - Back to school? Reach parents?
  - August recess? Good for Federal folks back home?
  - Career fair at your school? Meet with school board?
- Advocacy is fundamentally about applying pressure to carry out YOUR agenda.

State Policy Toolkit

- Builds off existing efforts
- Parts:
  - Primer
  - Talking Points
  - Model Legislation
  - Draft letter articulating issues and asking for reform

Advocacy Live