Mathematics is the language of STEM

Chicago Regional NCTM Meeting
November 30, 2017

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people

STEM

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audience

STEM

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view?

STEAM

or

STREAM

or

STHREAM

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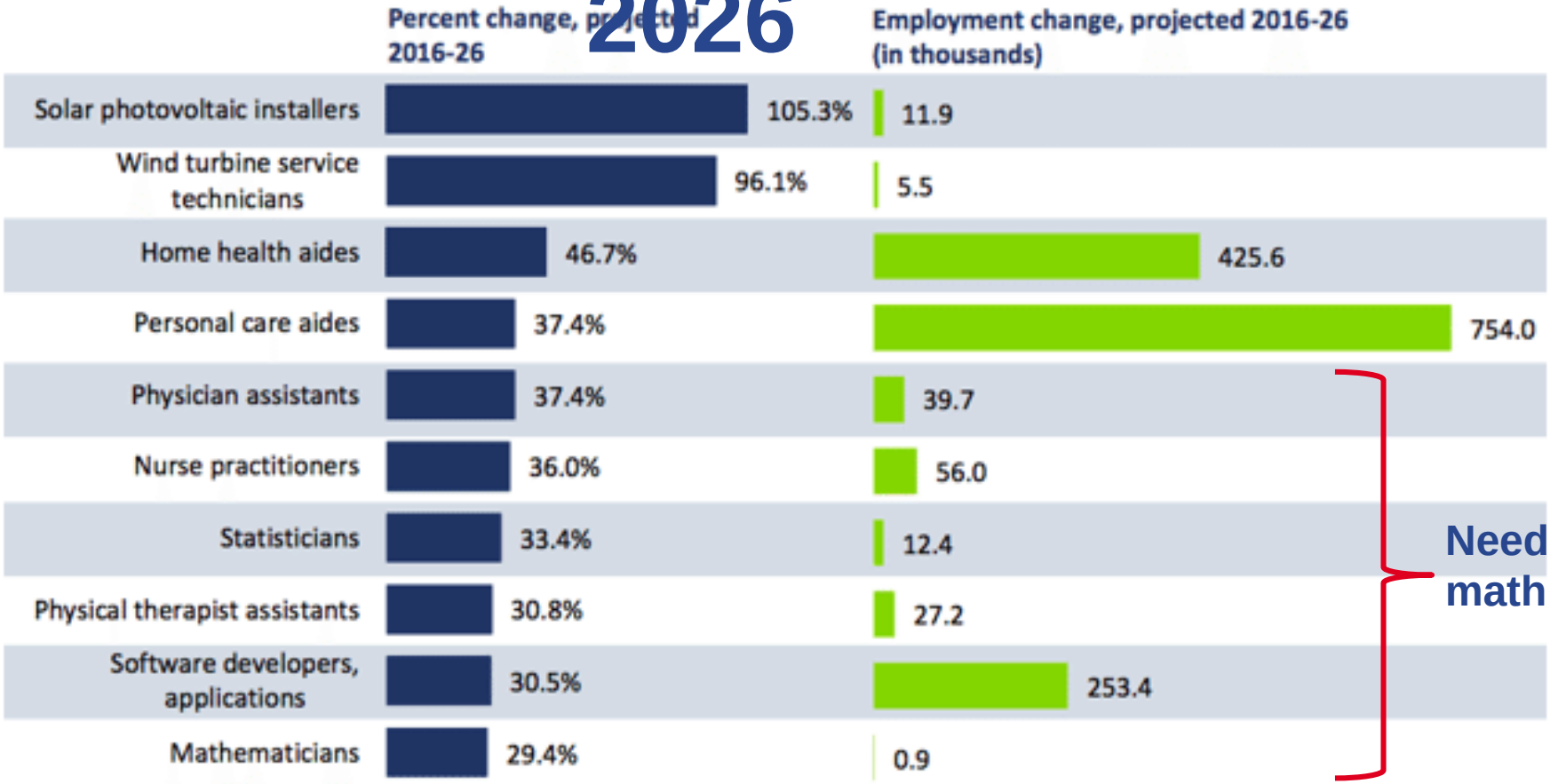
occupations 2016-2026



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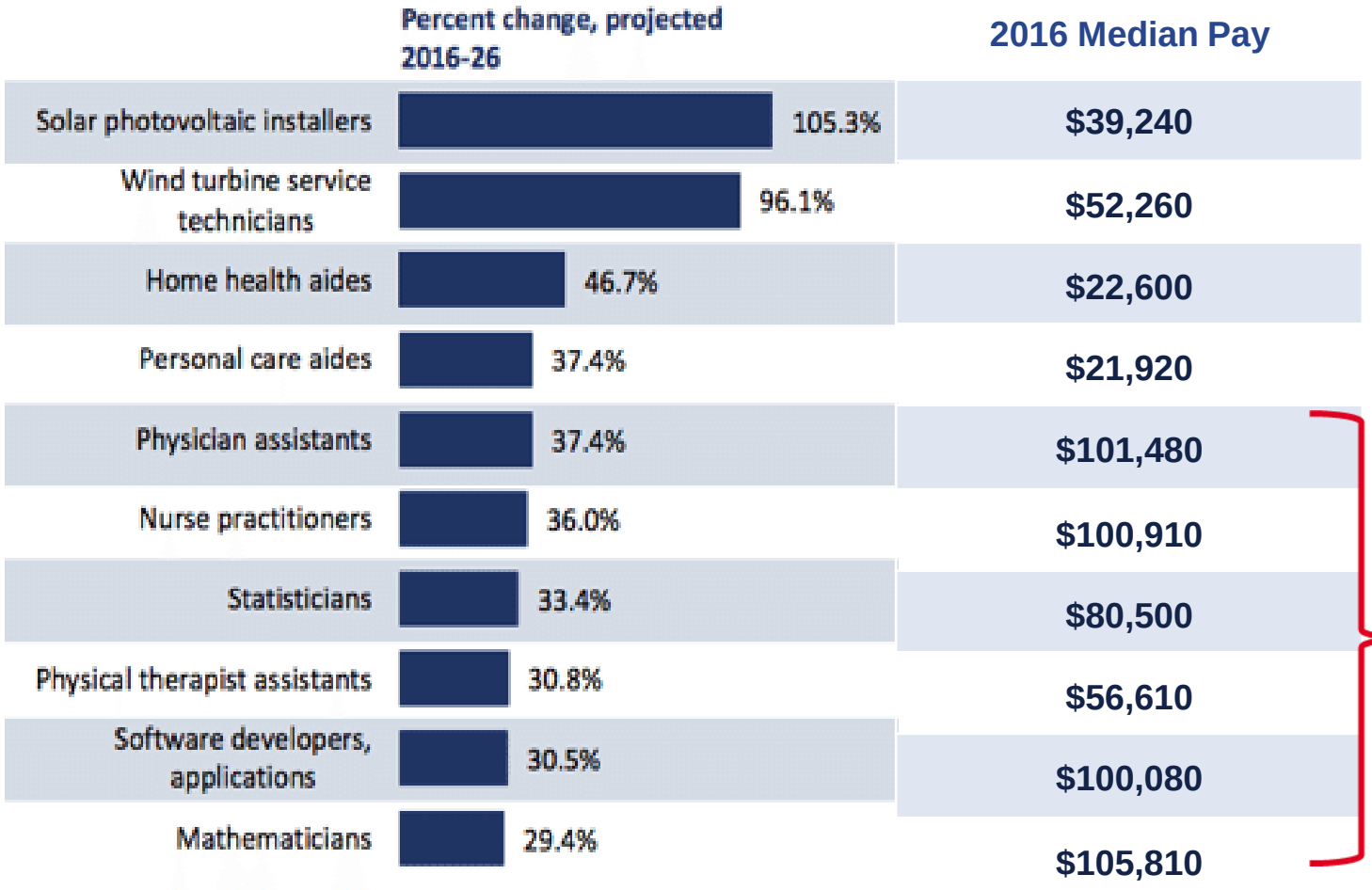
Source: Bureau of Labor Statistics Occupational Outlook Handbook, October 24, 2017

Median Salaries of fast-growing occupations



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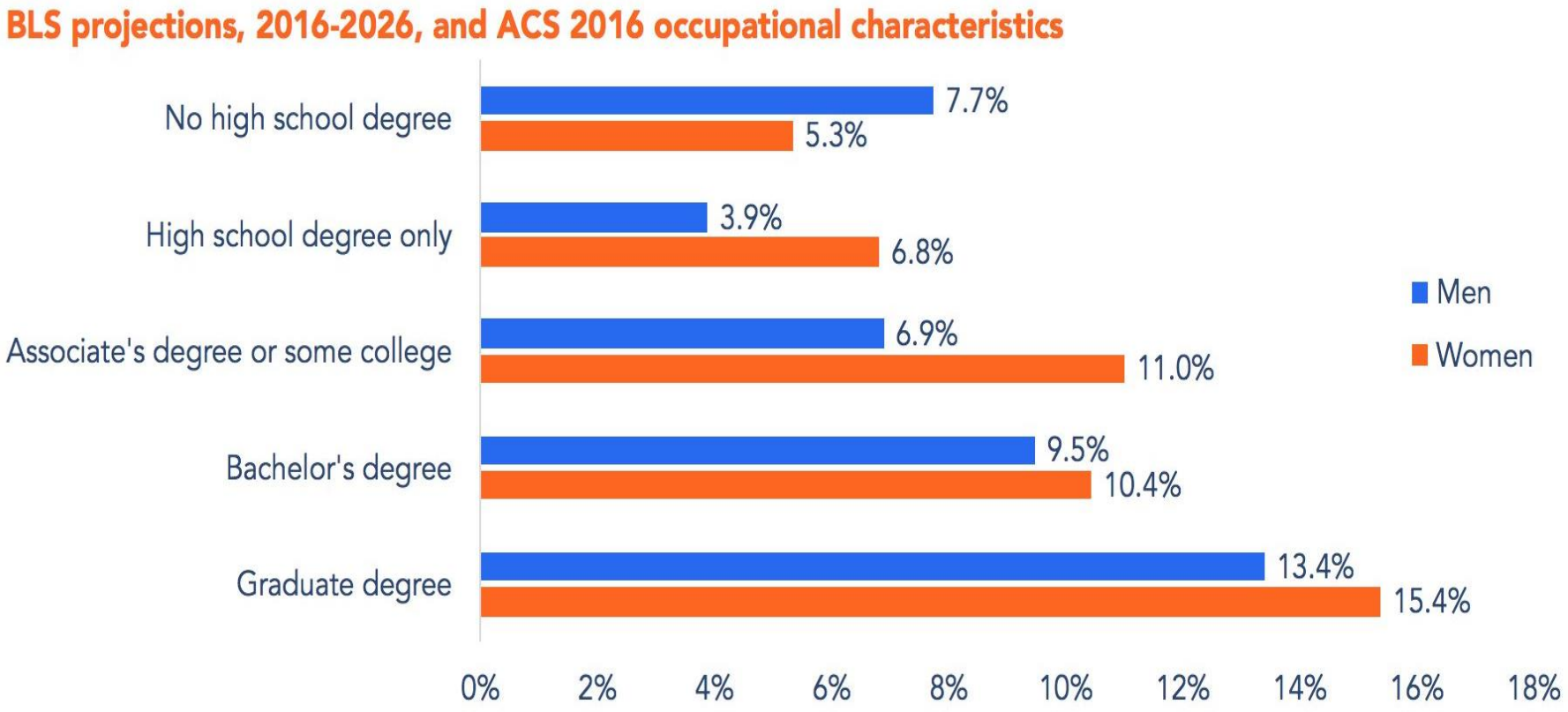
Source: Bureau of Labor Statistics Occupational Outlook Handbook, October 24, 2017

Education Required and Typical Gender



Source: Indeed analysis of BLS Data, 2016-2026

STEM Capable Jobs

Computing jobs span the economy

According to the U.S. Bureau of Labor Statistics, 3.8 million people in the U.S. work in computing occupations. Yet Change the Equation finds that more than twice as many—7.7 million Americans—say they use computers in complex ways in their jobs. **Many of these jobs are in non-STEM fields.**

All perform tasks such as

- Developing software or modifying computer games
- Programming using languages like Java, SQL, PHP, or Perl
- Maintaining a computer network

SOURCE: CTEq 2015 analysis of OECD's Programme for the International Assessment of Adult Competencies, 2012

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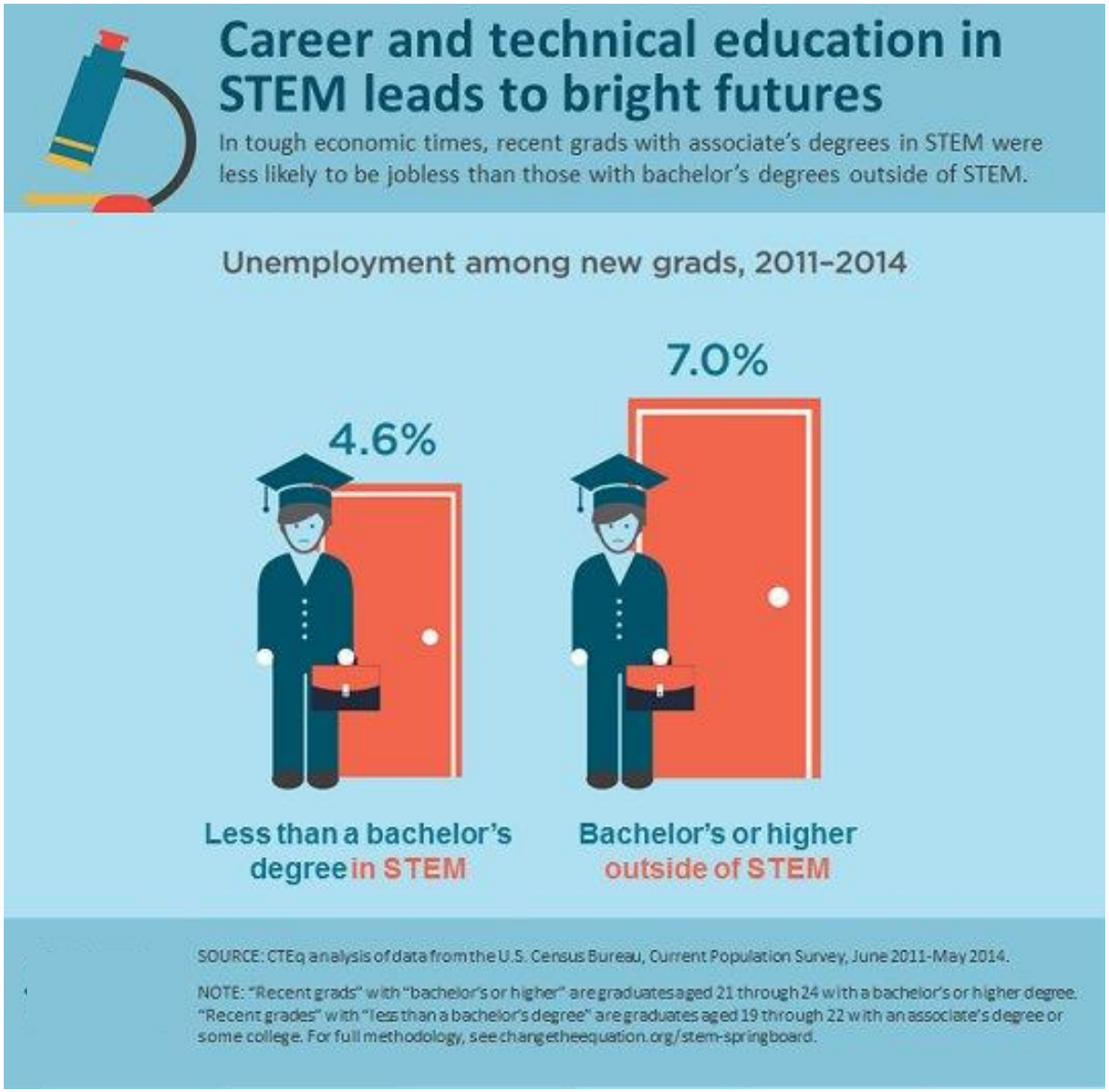
degrees



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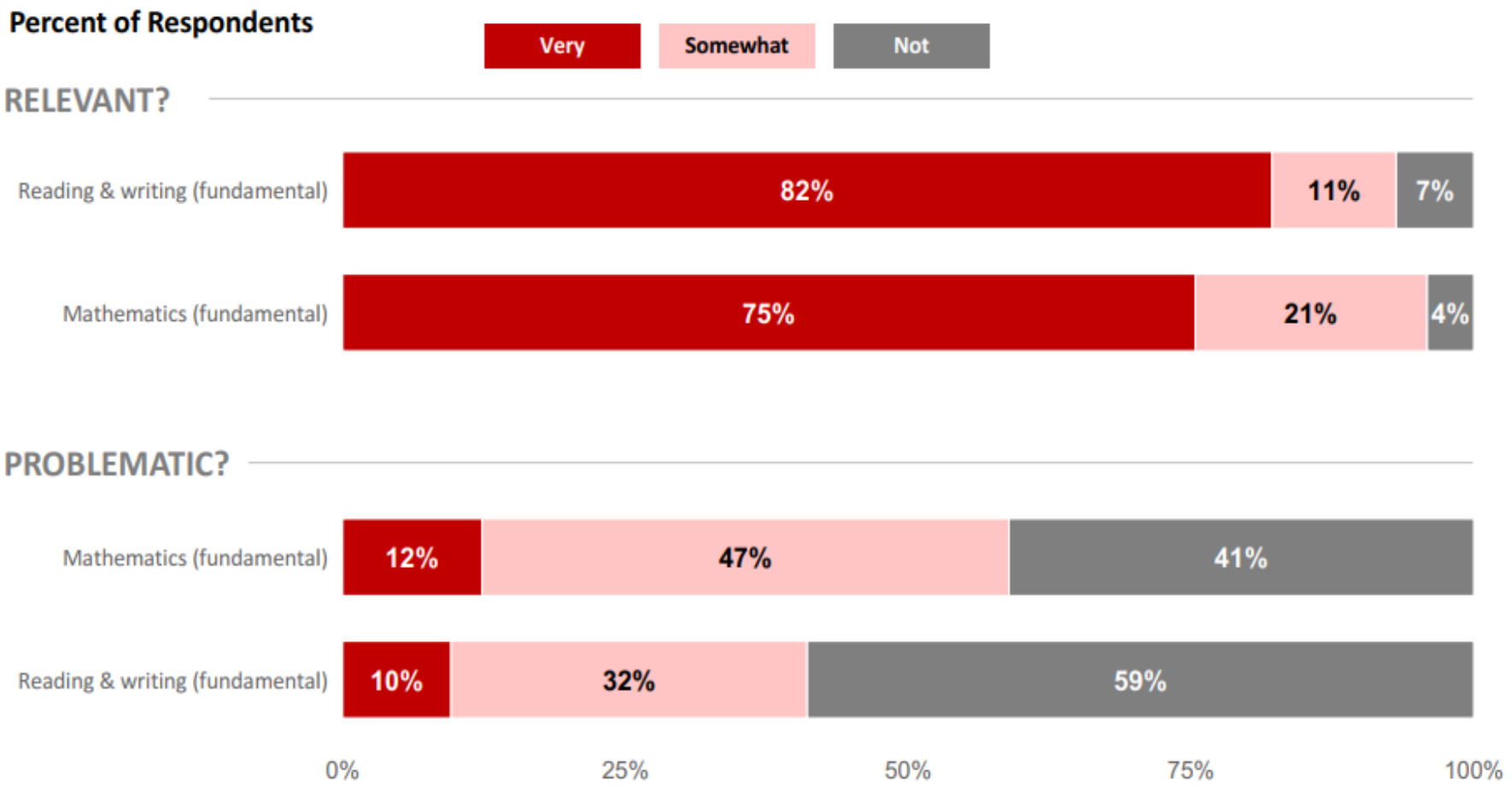
fundamental skills



Responses: n = 73

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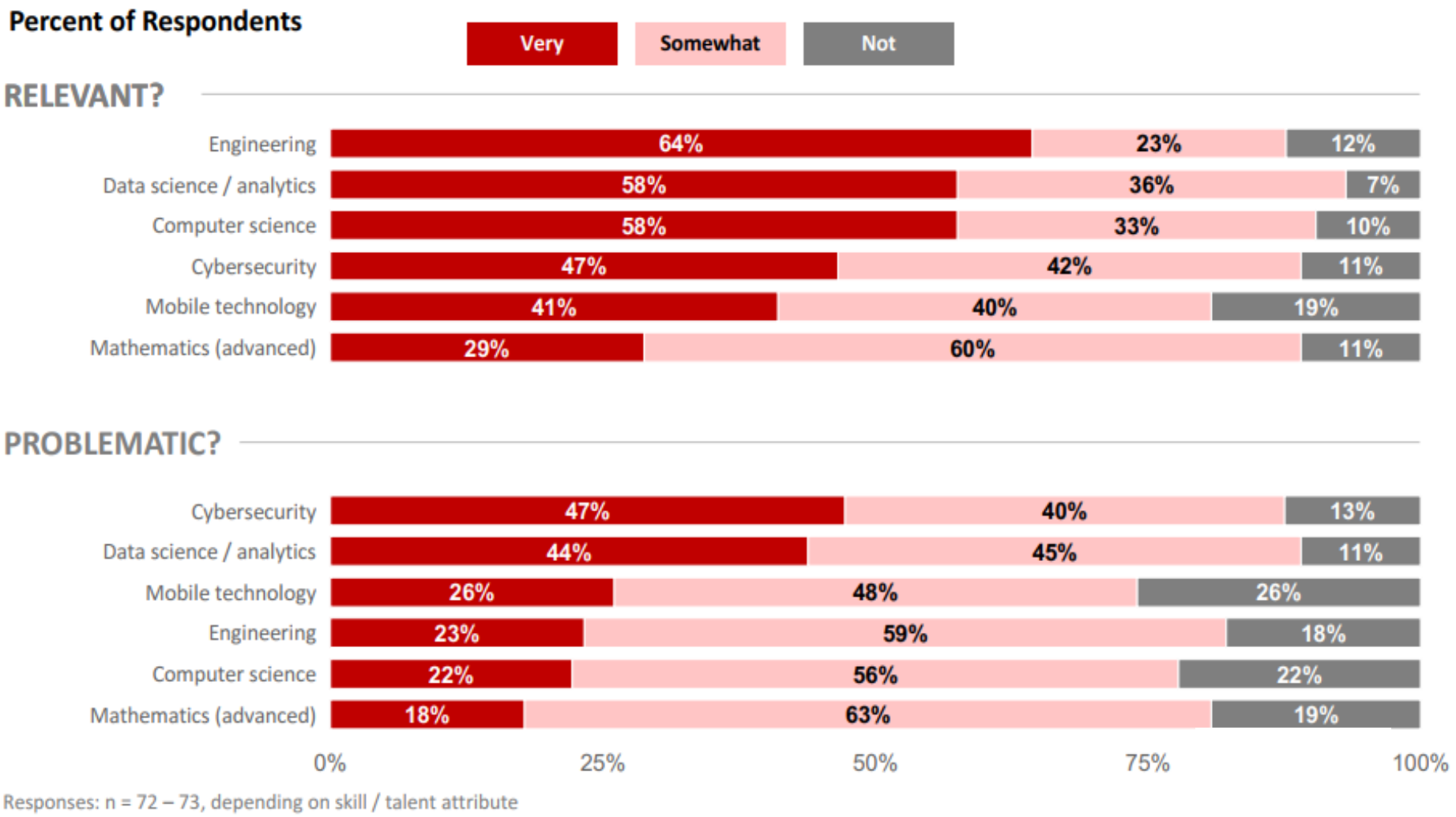
Source: Business Roundtable 2016 Member Company Talent survey

applicants



Responses: n = 72 – 73, depending on skill / talent attribute

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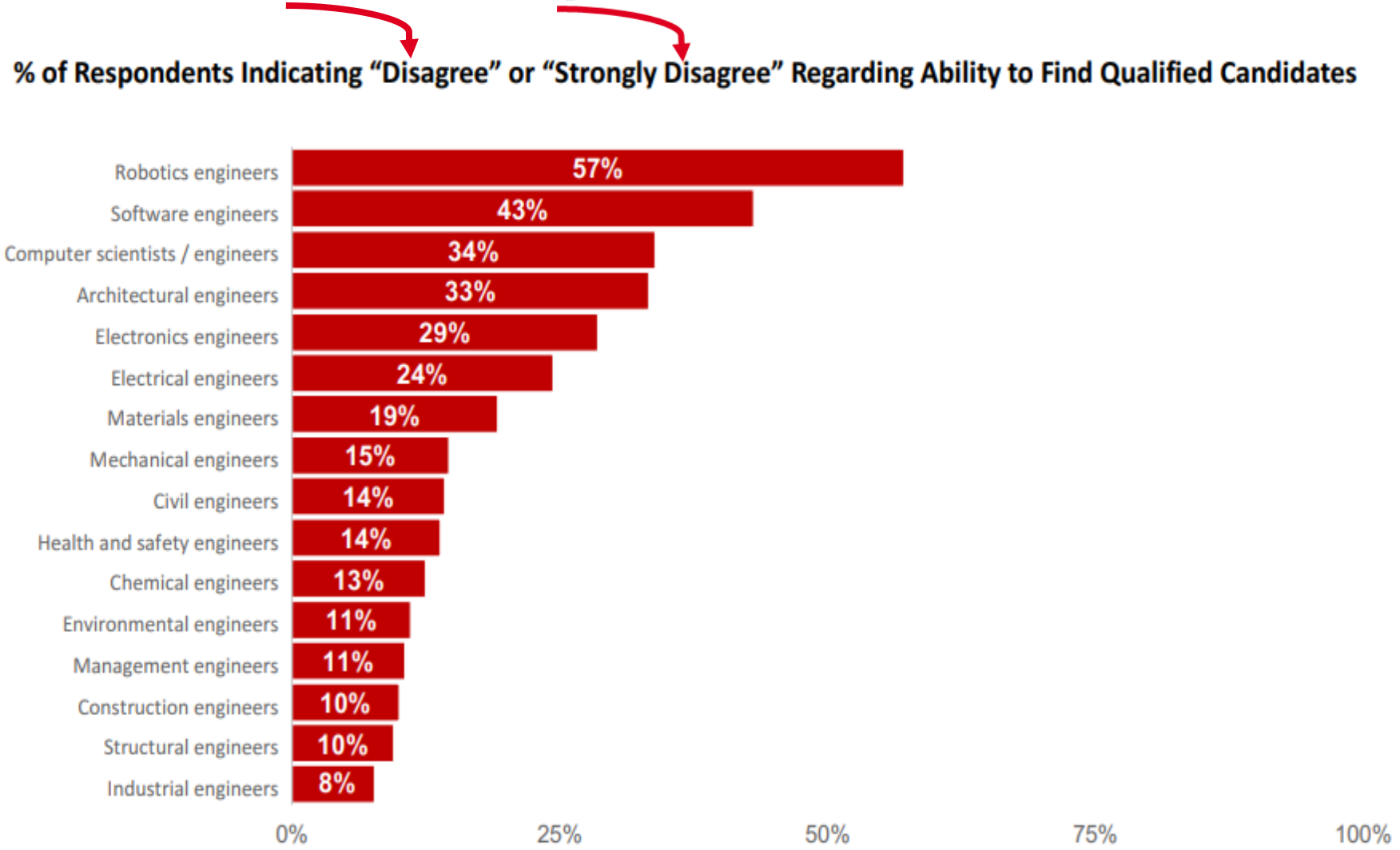
Source: BRT 2016 Member Company Talent survey

I am able to find qualified candidates as…



Responses: n = 12 – 56 depending on engineer type

Note: this list excludes engineering occupations employed by less than 12 BRT member companies

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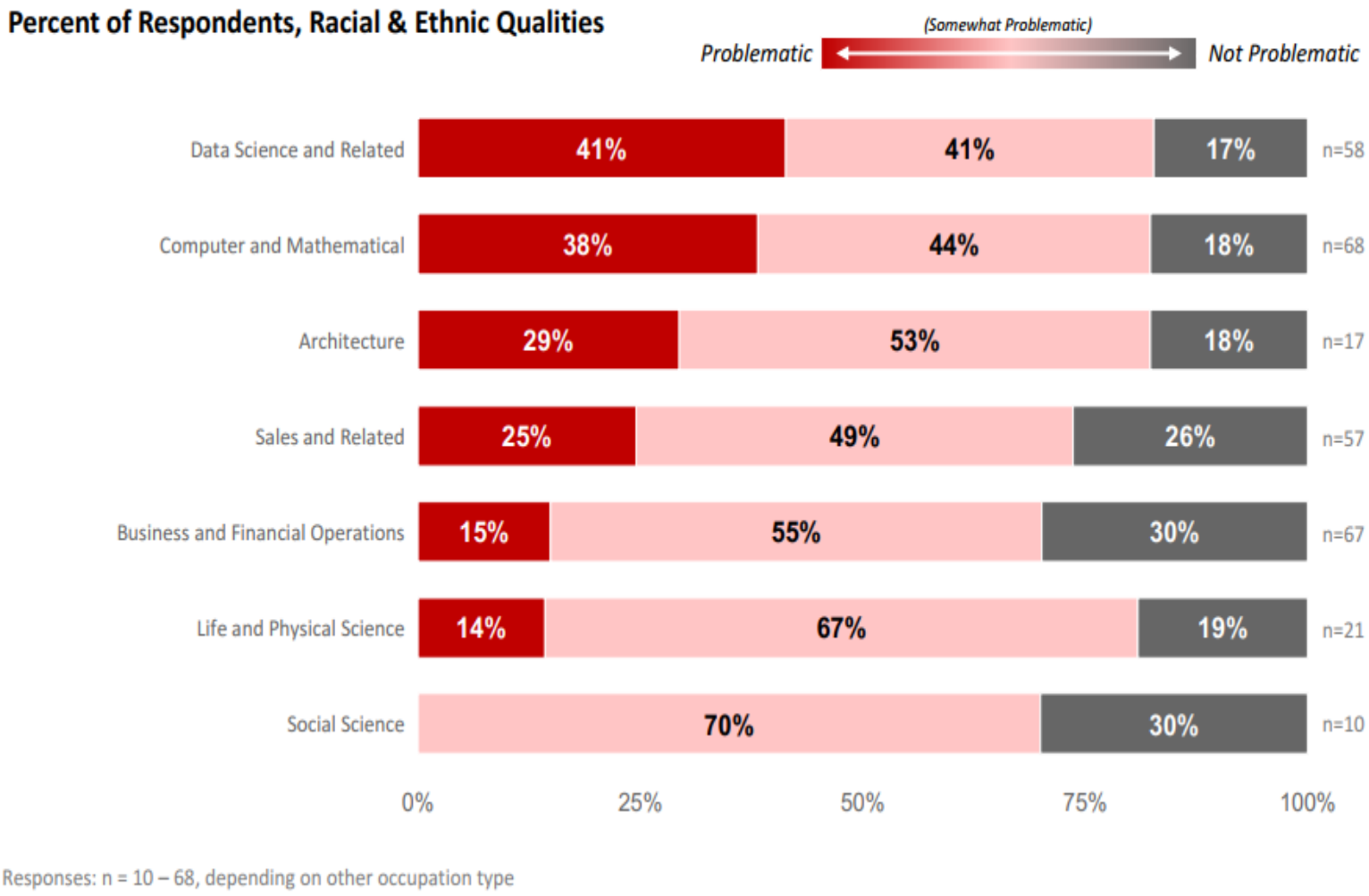
Source: BRT 2016 Member Company Talent survey

diversity



Responses: n = 10 – 68, depending on other occupation type

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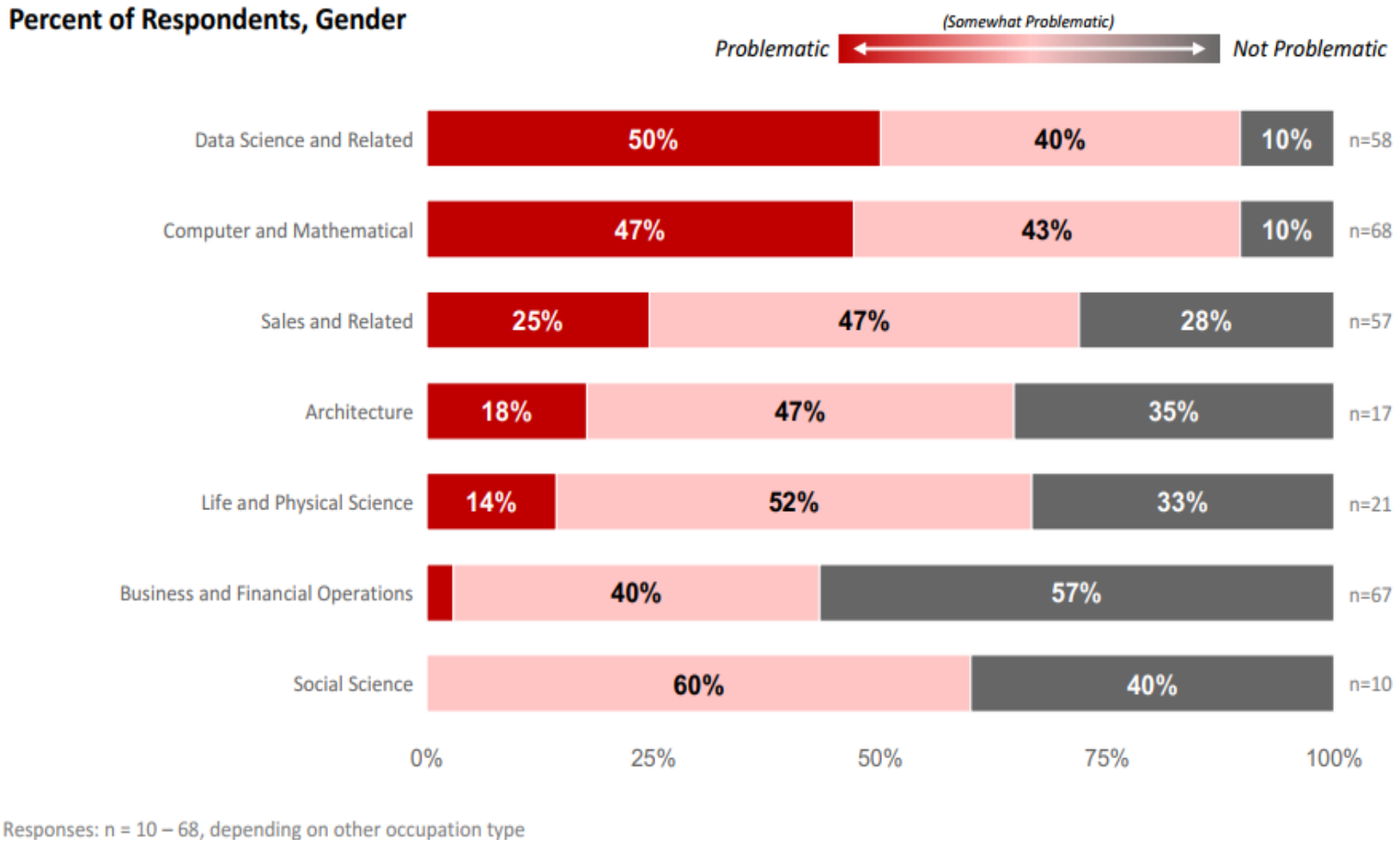
Source: BRT 2016 Member Company Talent survey

Difficulty in hiring qualified females



Responses: n = 10 – 68, depending on other occupation type

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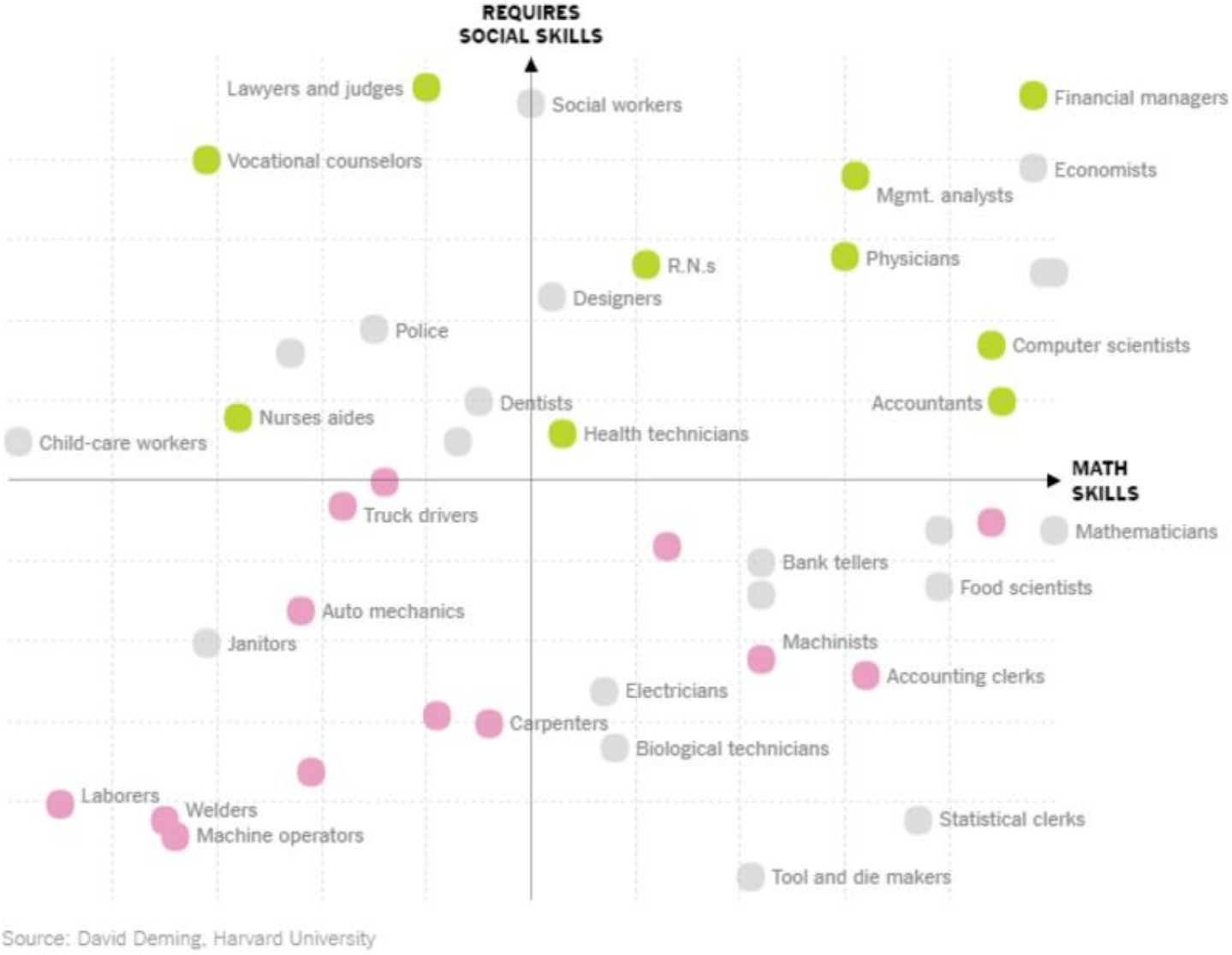
Source: BRT 2016 Member Company Talent survey

beneficial



Source: David Deming, Harvard University

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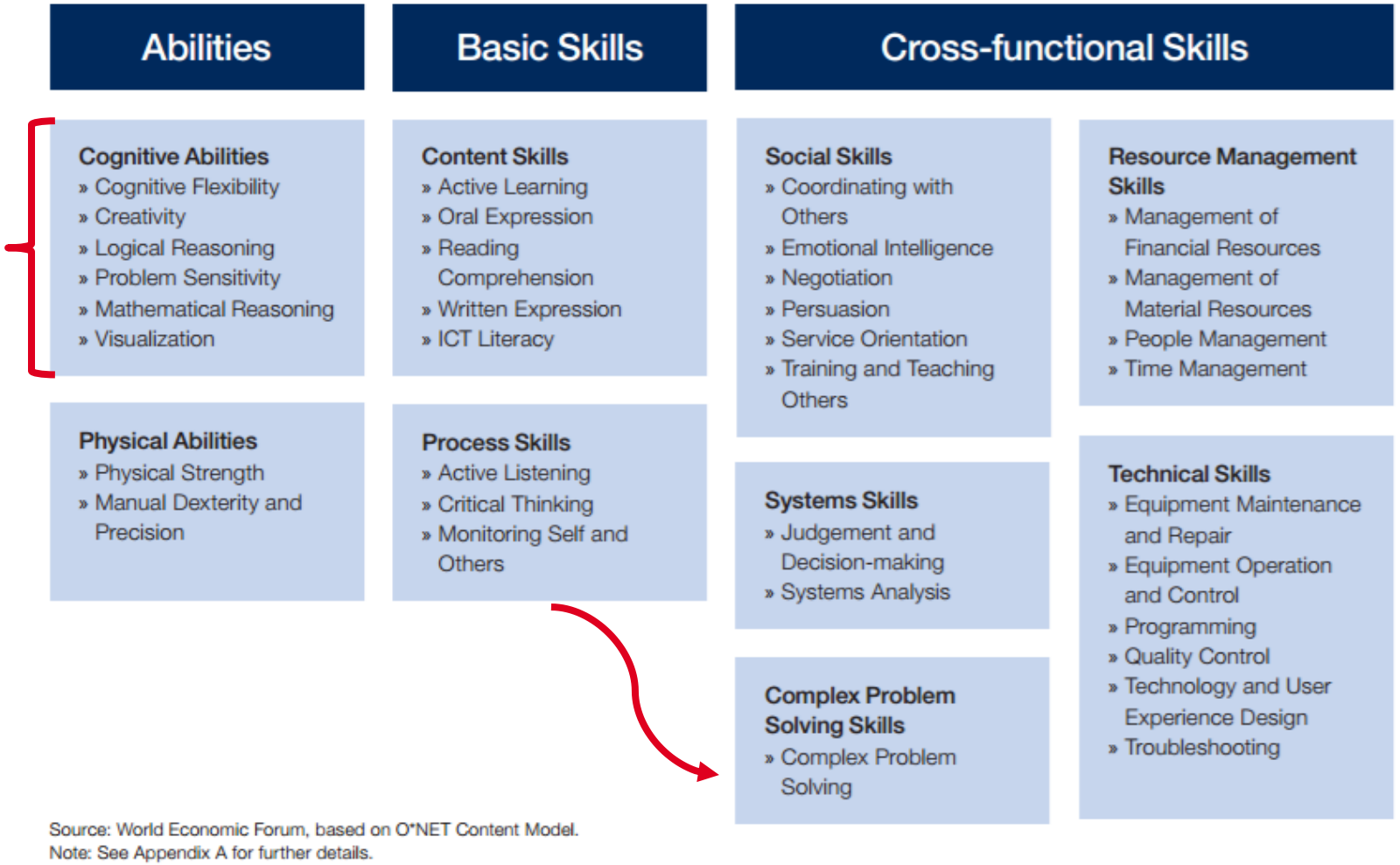
Change in share of jobs, 1980 to 2012

Fell About the Same Grew

skills



Source: World Economic Forum, based on O*NET Content Model.
Note: See Appendix A for further details.

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"Reading, writing, *and* arithmetic
— I'm too *young* to multitask!"

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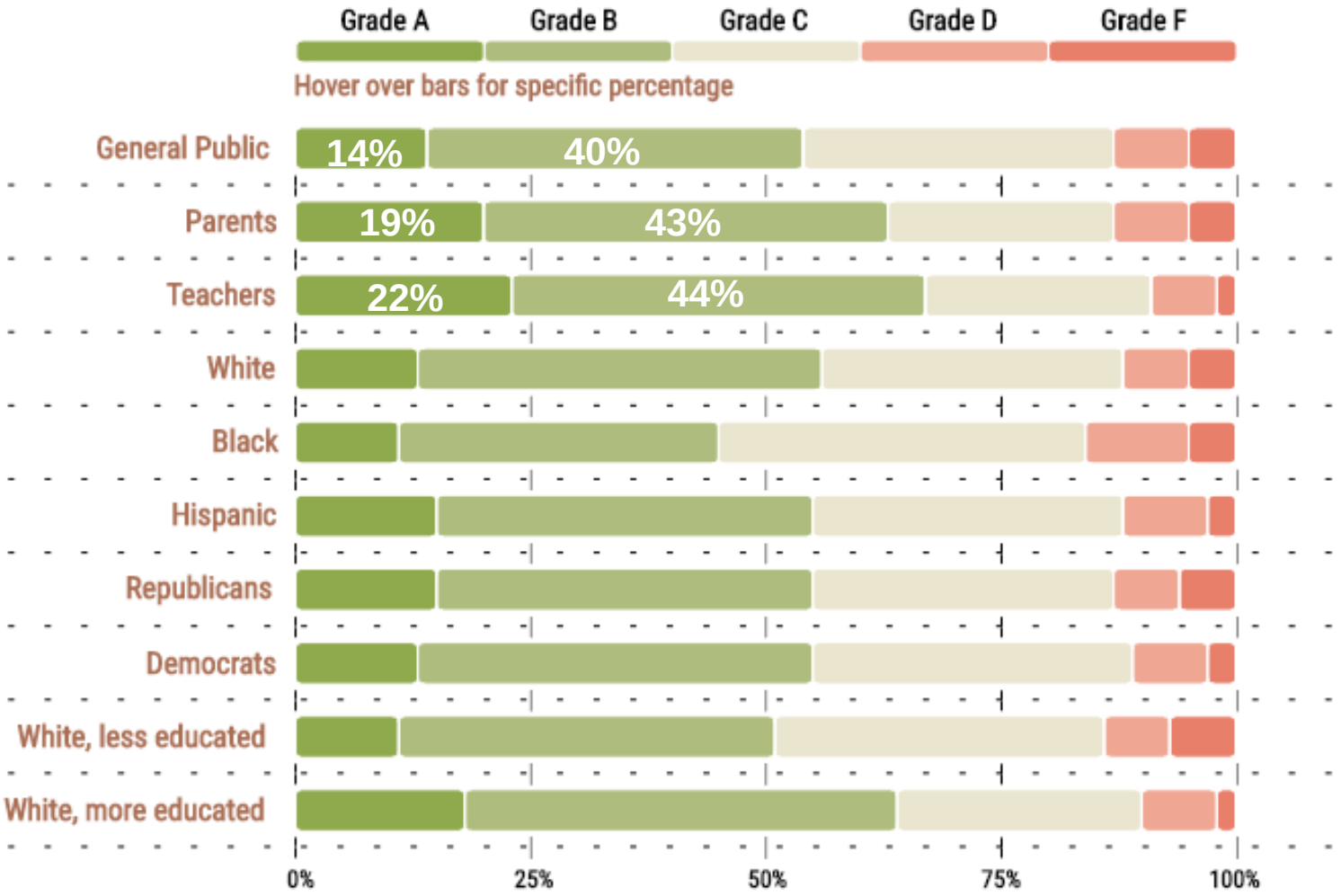
schools?



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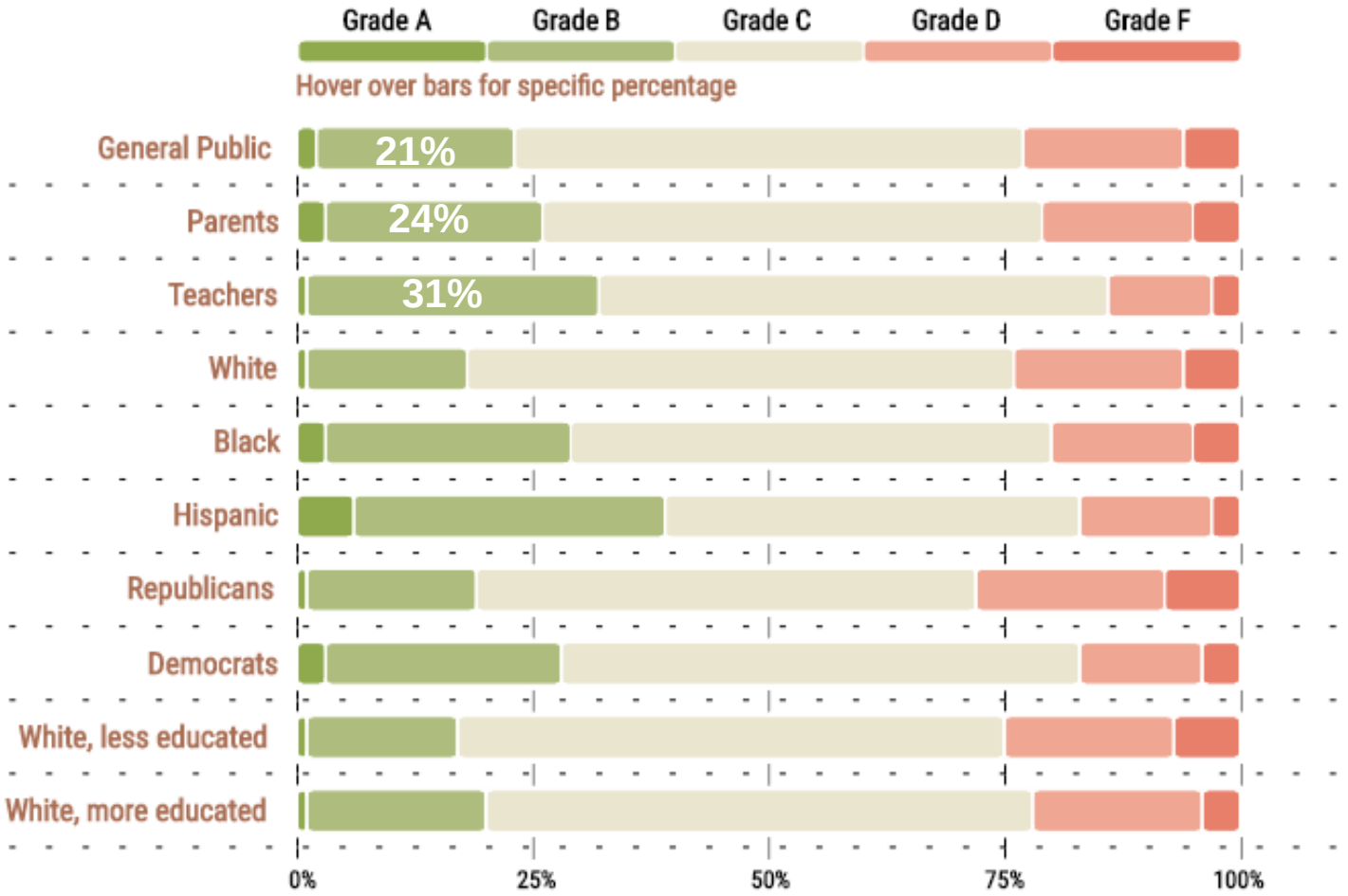
Source: "The 2017 EdNext Poll on School Reform" by Martin R. West, Michael B. Henderson, Paul E. Peterson and Samuel Barrows.

nationally?



CHANGE THE EQUATION™

Source: "The 2017 EdNext Poll on School Reform" by Martin R. West, Michael B. Henderson, Paul E. Peterson and Samuel Barrows.

Stereotypes Start Early

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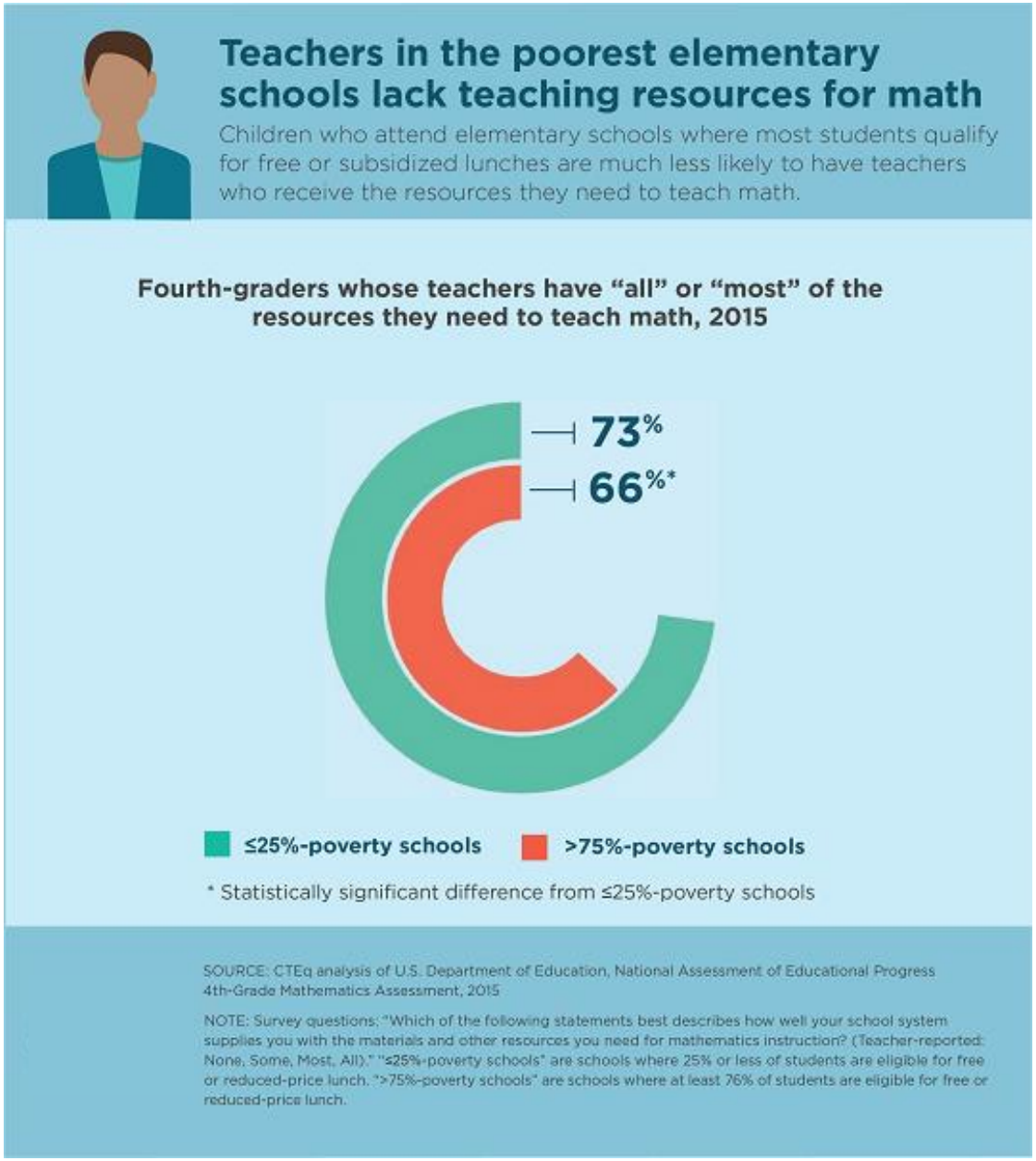
Tools of the trade?



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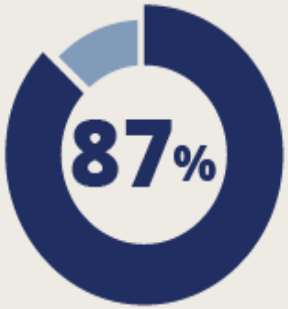
Technology and Engineering Literacy Assessment

Female
students scored
3 pts
higher than
male
students.

NSLP[1] not eligible
students scored
28 pts
higher than
eligible
students.

[1] NSLP = National School Lunch Program.



reported **figuring out why something was not working in order to fix it** outside of their school work.

reported **using a computer to create, edit, or organize digital media** at least once a month in school.

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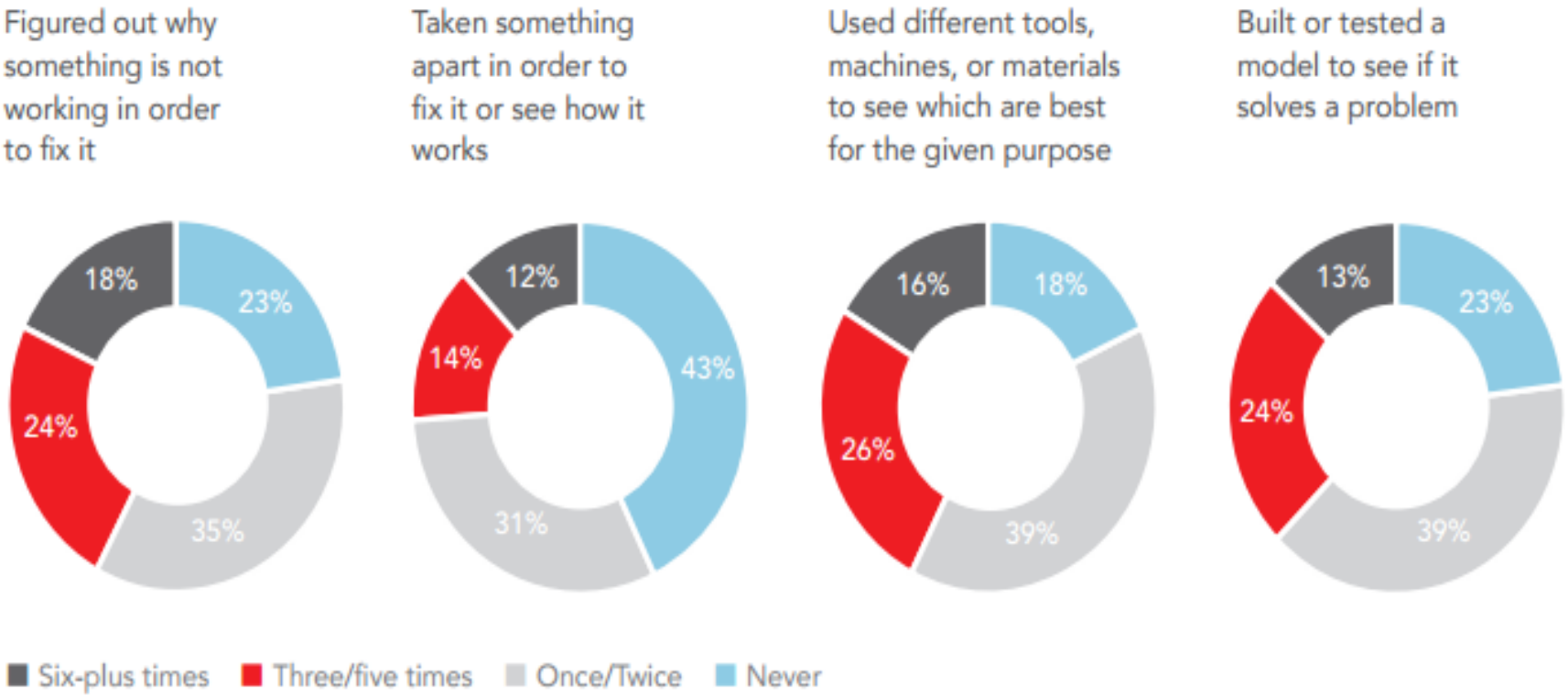
Source: NCES, https://www.nationsreportcard.gov/tel_2014/

Opportunity to Tinker

In school, how often have you ever done the following activities?



Source: Change the Equation analysis of contextual data from The Nation's Report Card: Technology and Engineering Literacy, May 2016

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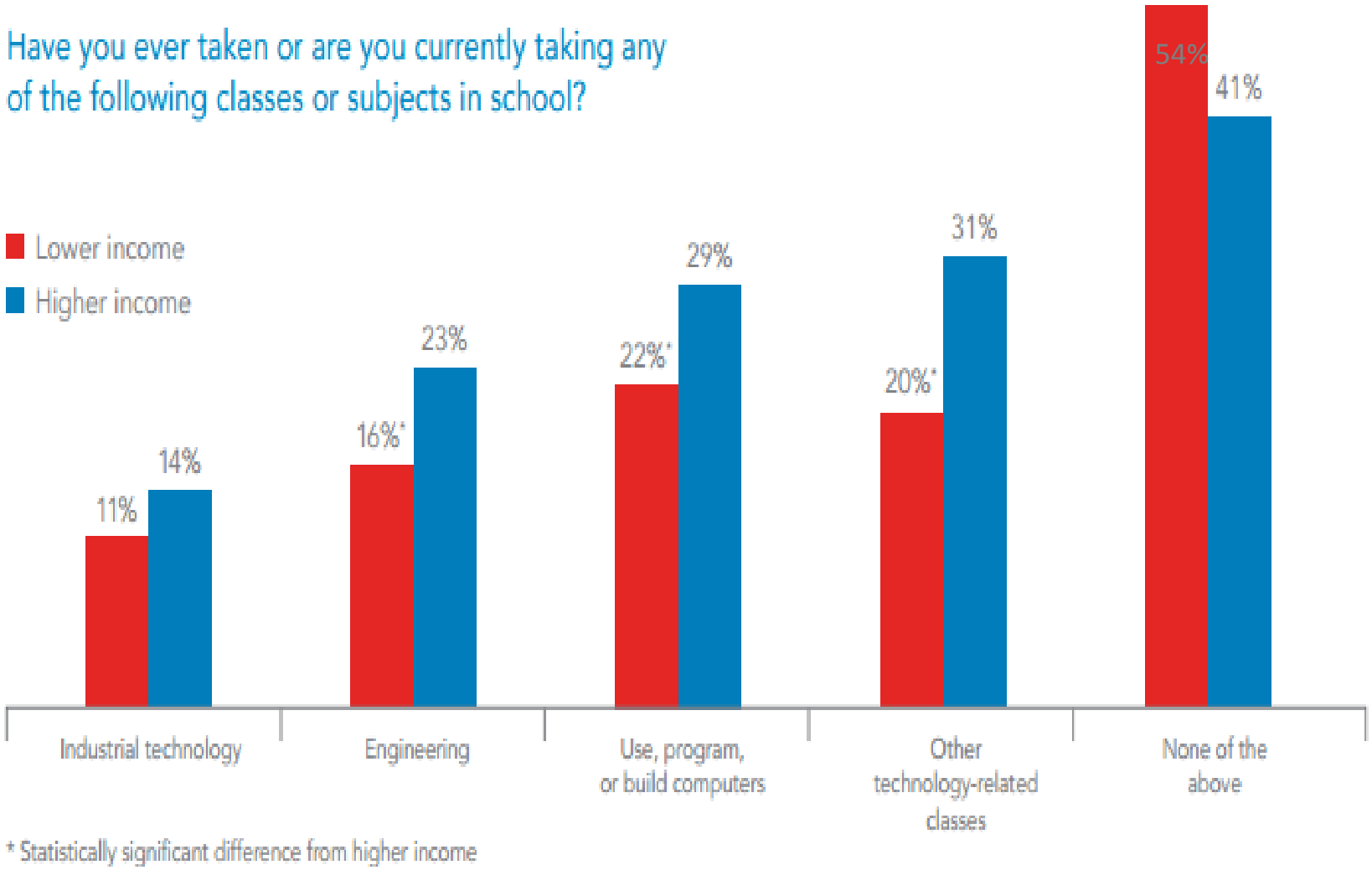
Left to Chance



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Minority talent is squandered

In the high school class of 2014:

- More than 41,000 Black, Latino and Native American students had the potential to succeed on Advanced Placement exams
- About half did not take any

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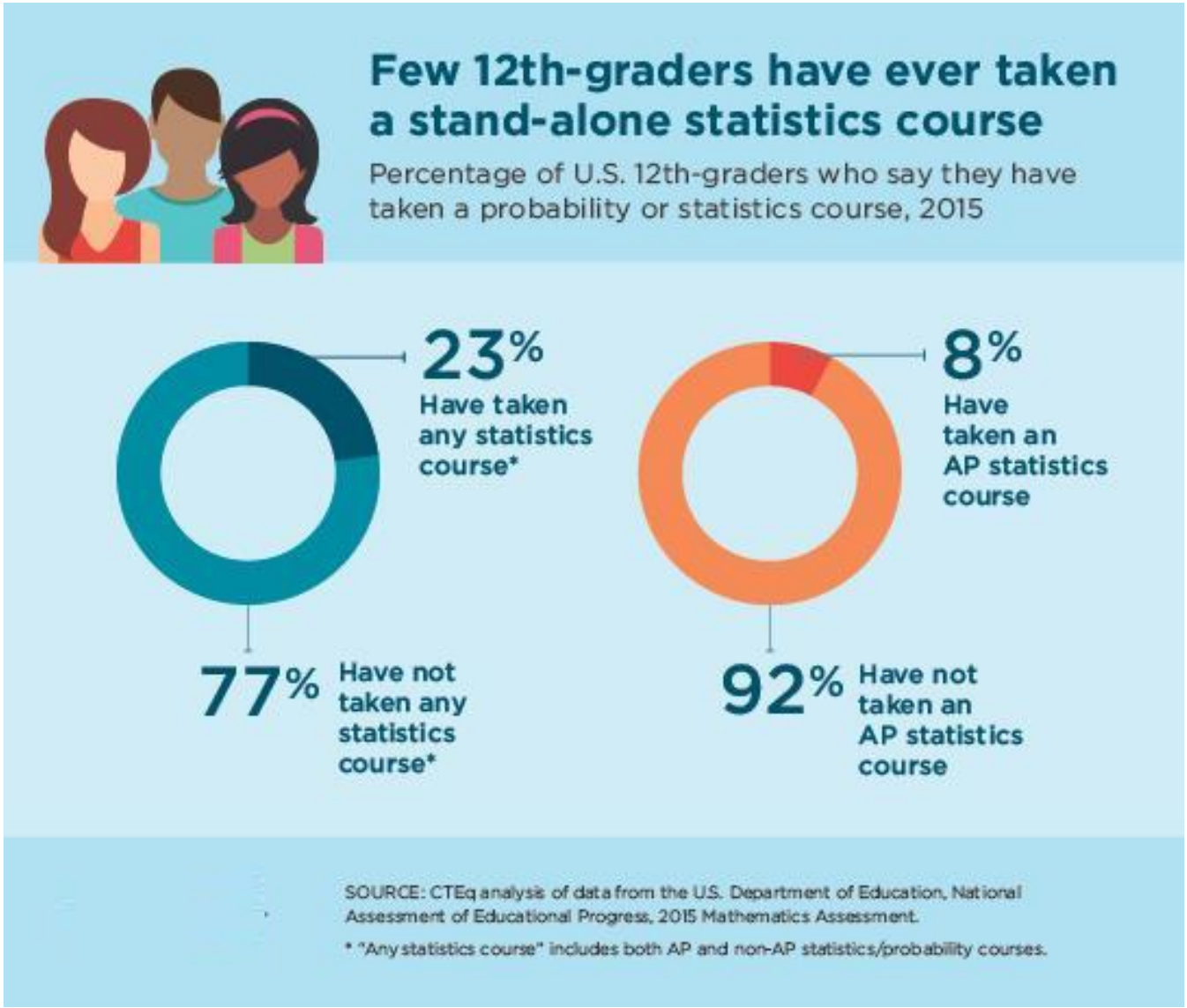
Source: Change the Equation analysis of data supplied by the College Board, 2015

Despite many career opportunities…



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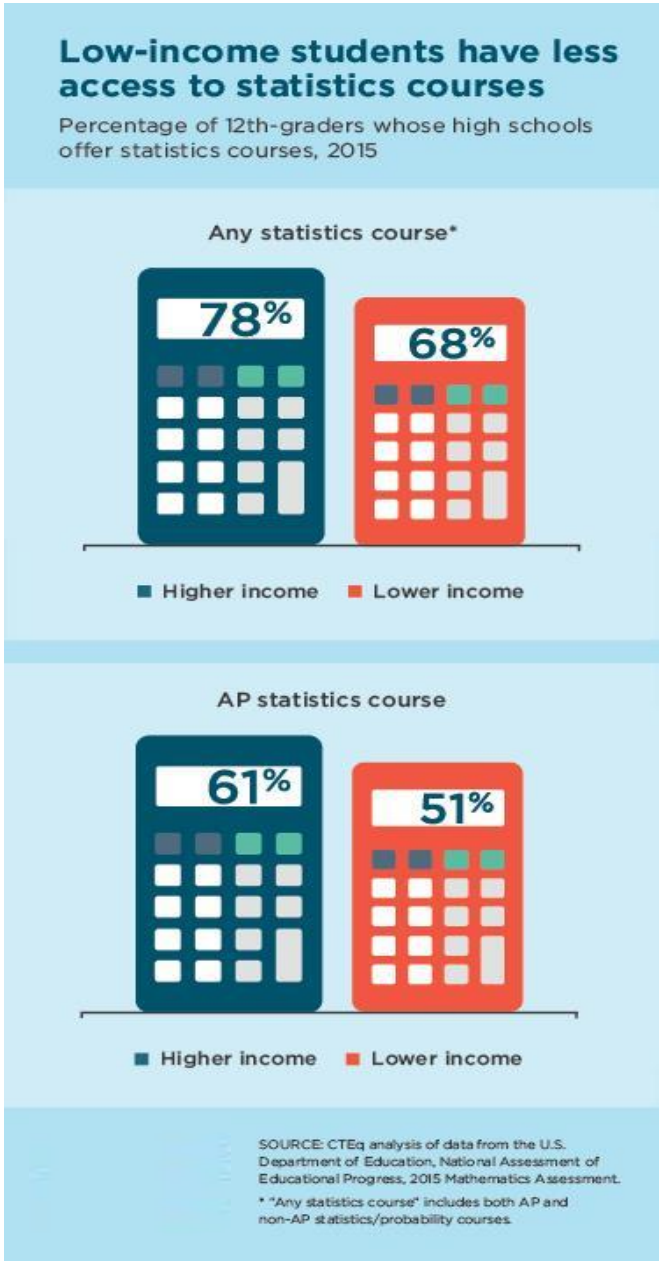
Even worse in low-income communities…



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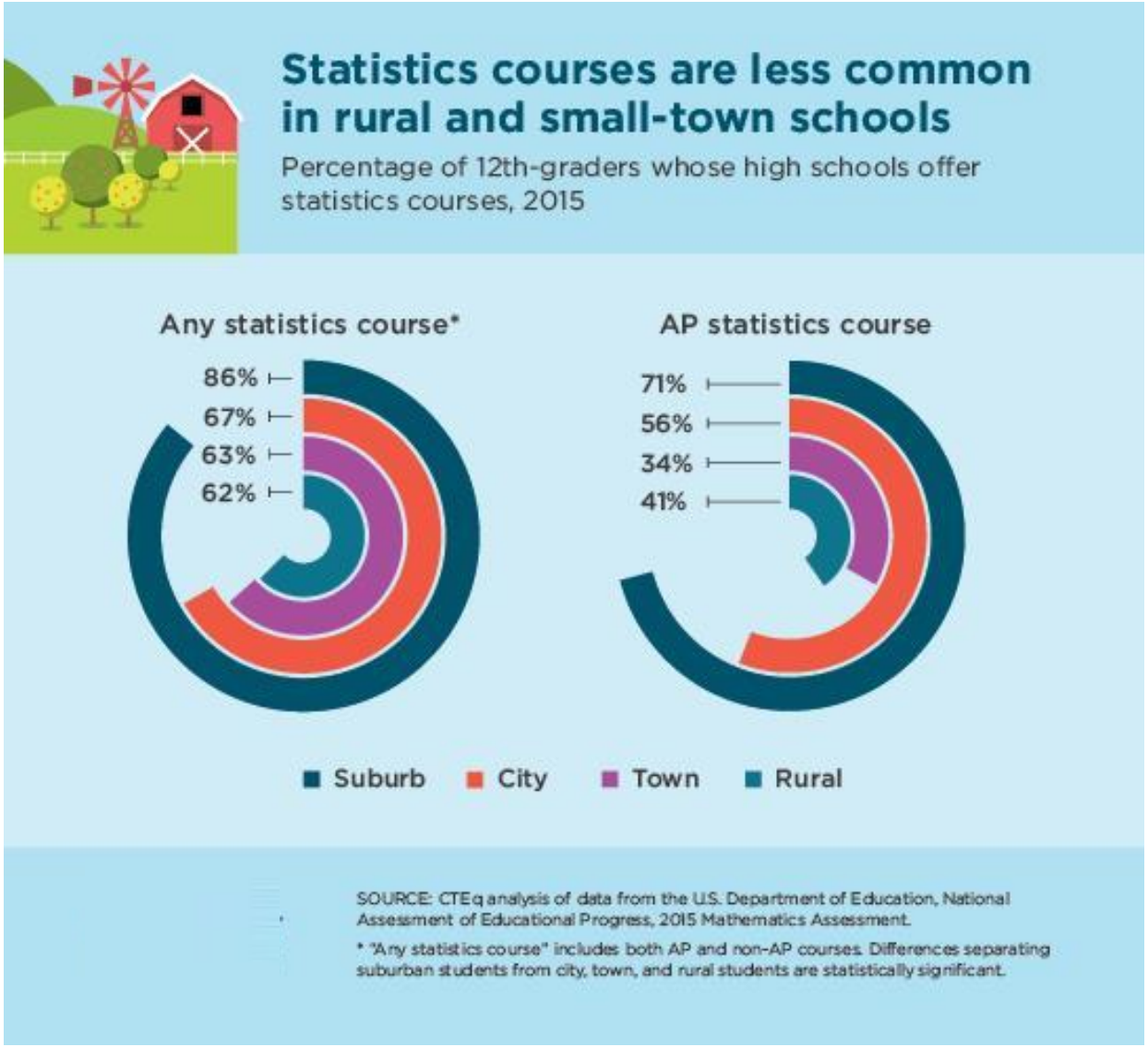
well



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Girls lose interest in computing

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