




ISSUE BRIEF: Q4 2021

HIGH SCHOOL & THE FUTURE OF WORK

 **BUSINESSFORWARD**
FOUNDATION

TWO PROBLEMS: RELATED, DEPENDENT, AND REINFORCING



**WE CANNOT FIX
HIGH SCHOOL
WITHOUT PREPARING
GRADUATES FOR THE
FUTURE OF WORK.**

**WE CANNOT PRODUCE
A FUTURE-READY
WORKFORCE IF WE
WAIT UNTIL YOUNG
AMERICANS ARE IN
COLLEGE OR AT WORK.**

FOUR KEY POINTS

THE CHALLENGE

- 1 Our schools are failing
- 2 Poor schools hurt our economy
- 3 As work evolves, the gap between today's workforce and good jobs grows

THE OPPORTUNITY

- 4 The future of work is a road map for education reform
 - Automation can create more jobs here than it destroys
 - We know what students need: basic technical skills, the ability to learn continuously, teamwork and good judgment, and self-reliance
 - Internships and apprenticeships work
 - More college isn't always necessary

“ As I think about what education means for small businesses and for economic development, there's just no question that having a workforce that is well prepared is essential to the health of our economy. ”

- JOHN KING,
FORMER U.S. SECRETARY
OF EDUCATION

CLICK HERE TO LISTEN TO THE
BUSINESS FORWARD BRIEFING
WITH FORMER SECRETARY KING



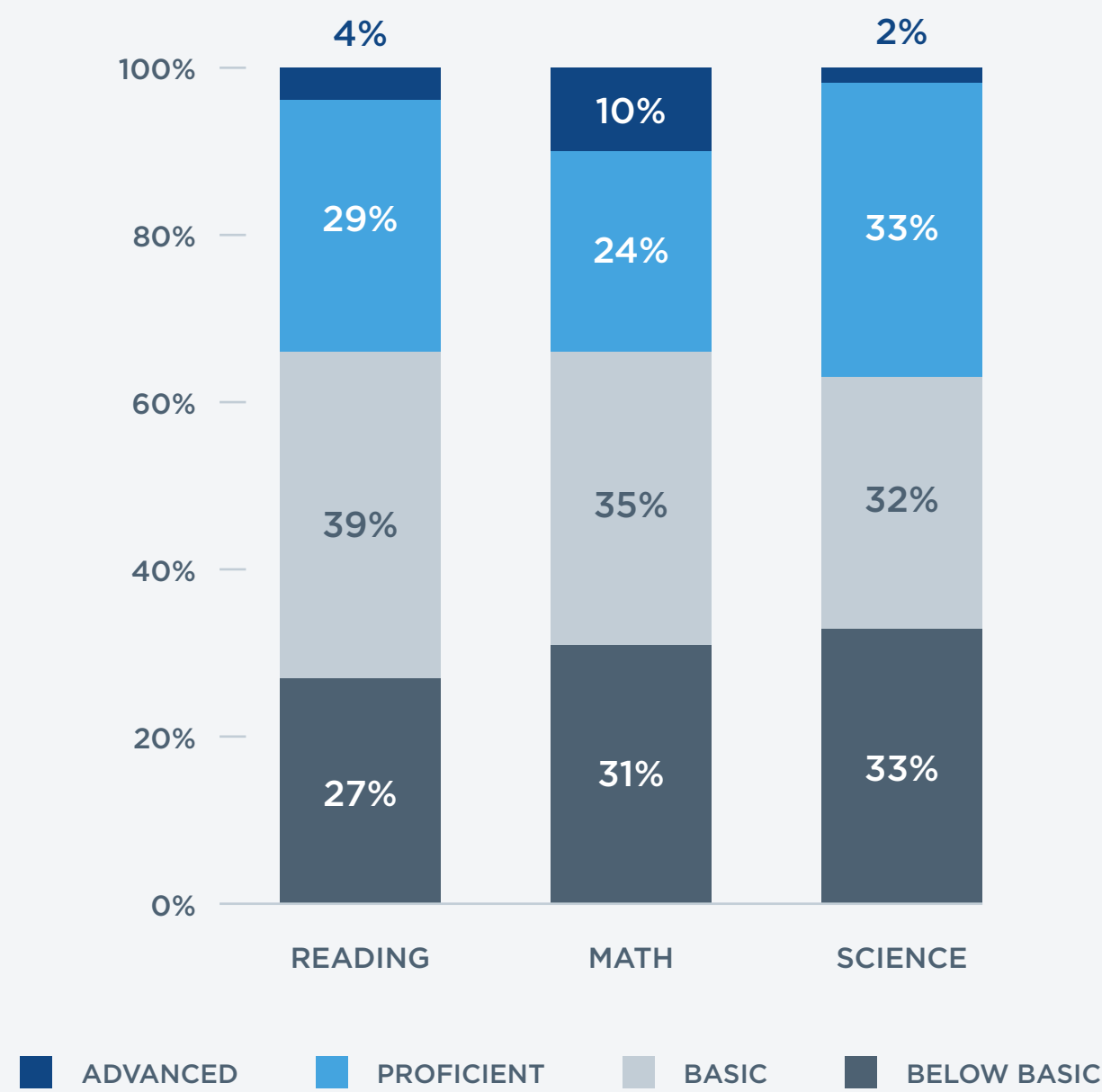
OUR SCHOOLS ARE FAILING

WE ARE FAILING OUR KIDS

LACKING THE BASICS

Only one in three 8th graders is proficient or above in math, science, or reading.

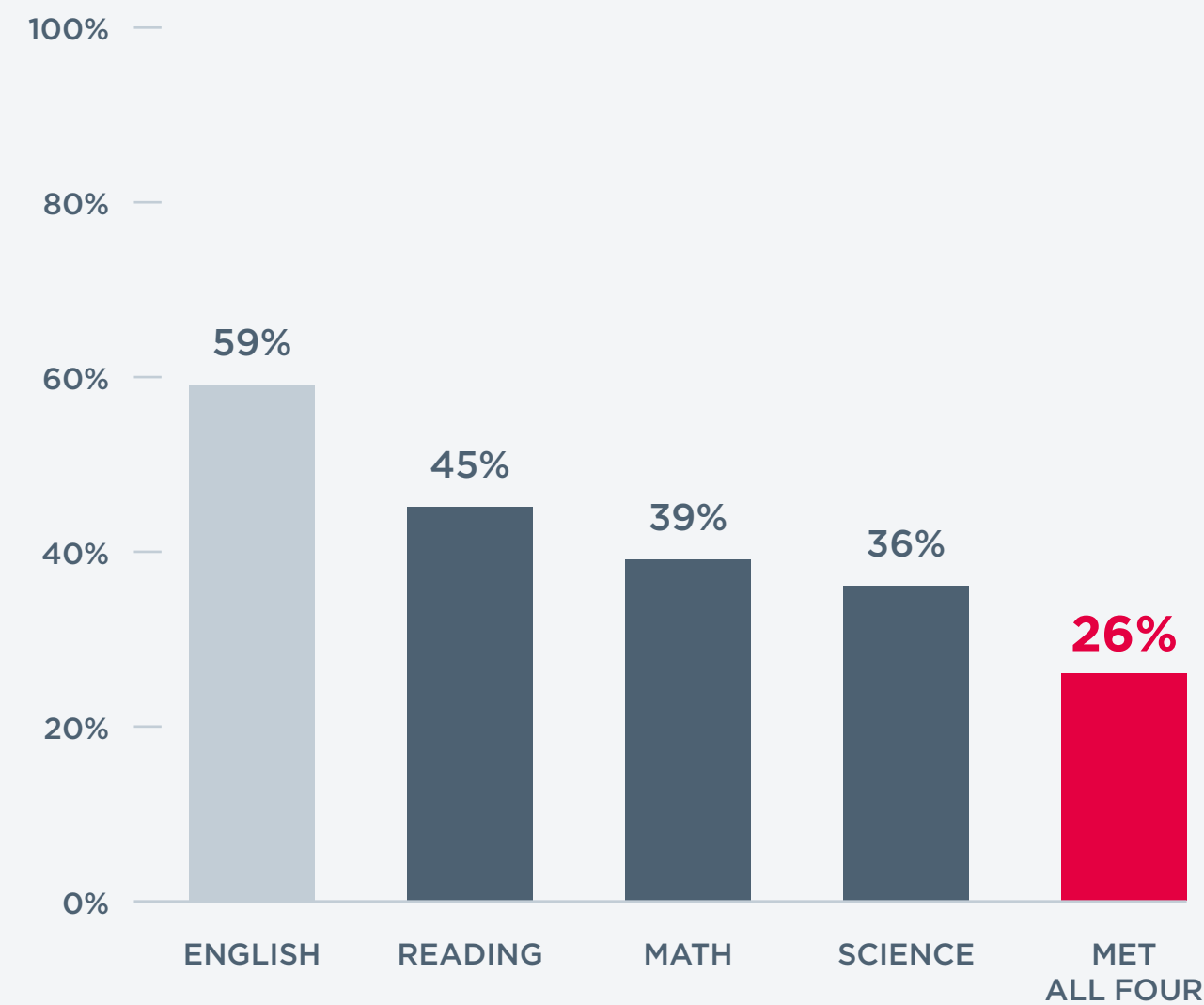
PERCENTAGE DISTRIBUTION OF 8TH GRADE STUDENTS, BY NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS (NAEP) ACHIEVEMENT LEVEL (2019)¹



AN INCOMPLETE EDUCATION

Only one in four high school seniors is “college ready” in math, science, English, and reading.

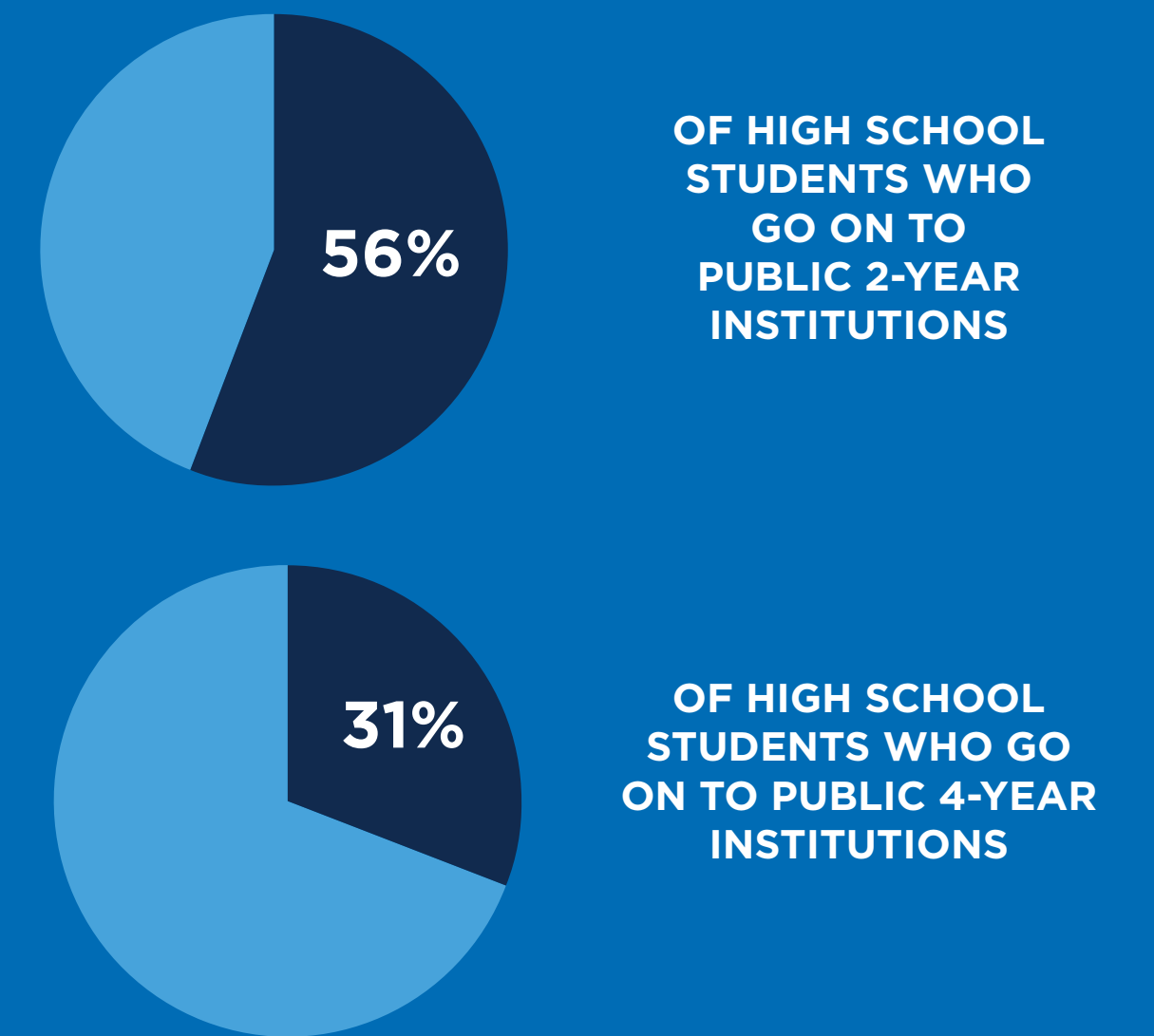
PERCENTAGE OF STUDENTS ACHIEVING BENCHMARK SCORE ON ACT (2019)²



THE COST OF REMEDIAL EDUCATION

More than three in 10 first-year college students require remedial education. These additional classes cost students \$1.3 billion/year. They also make it harder for students to graduate on time.³

PERCENTAGE OF STUDENTS REQUIRING REMEDIAL COURSES⁴

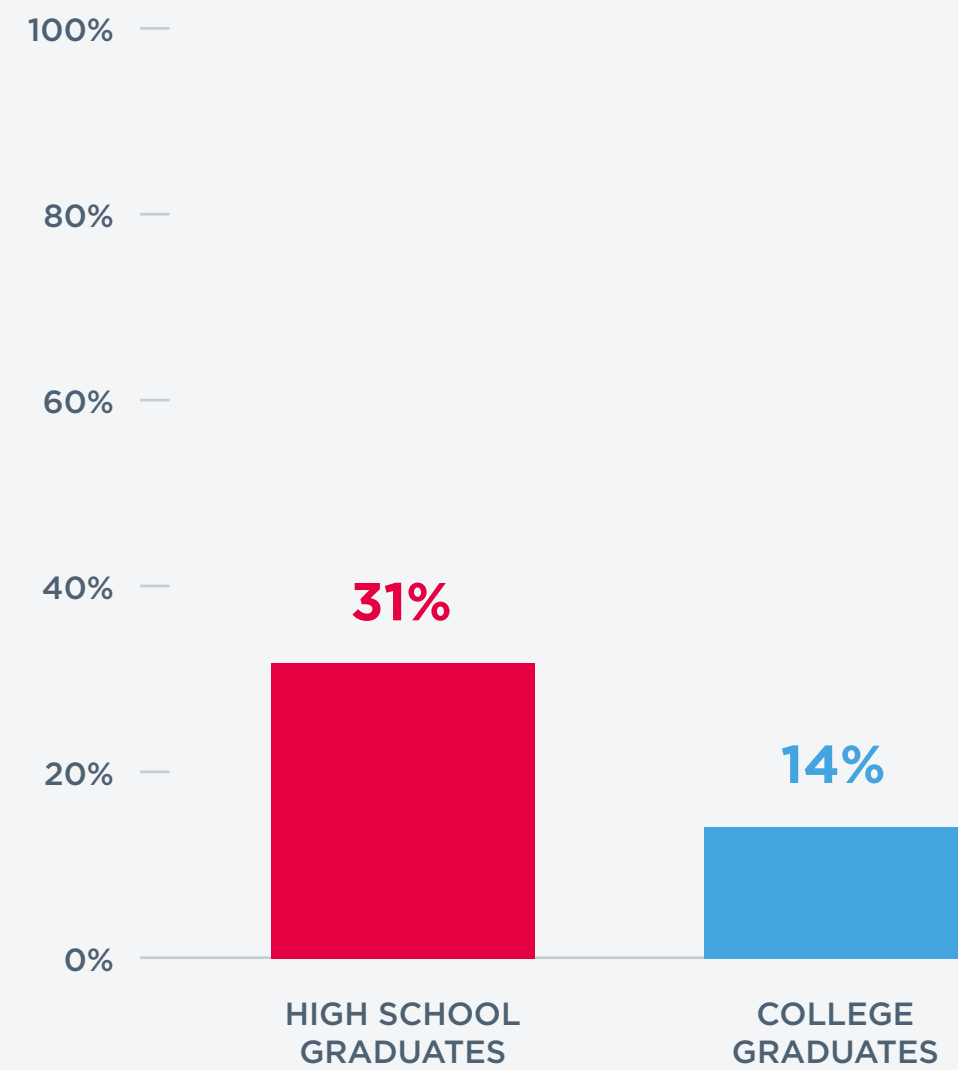


IT'S HURTING THEIR FUTURES

OUR K-12 SYSTEM IS HOLDING GRADUATES BACK

Students with only a high school degree are twice as likely to be unemployed as college graduates.

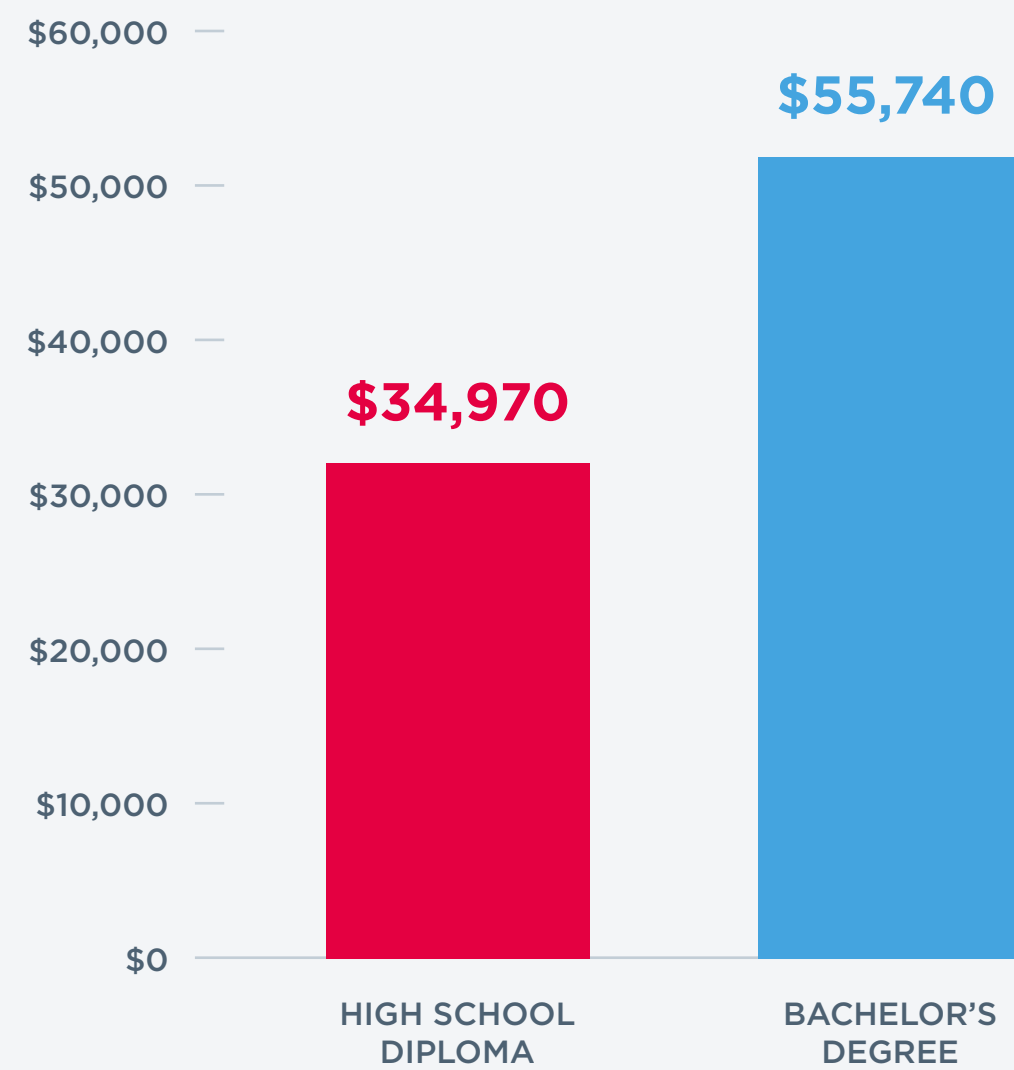
UNEMPLOYMENT RATE FOR WORKERS AGES 25-34, BY EDUCATIONAL ATTAINMENT (2020)⁵



IT'S HURTING UPWARD MOBILITY EVEN FOR THOSE WHO FIND JOBS

Four-year college graduates earn 60% more per year than high school graduates, on average. A college degree is worth about \$2.8 million in lifetime income.⁶

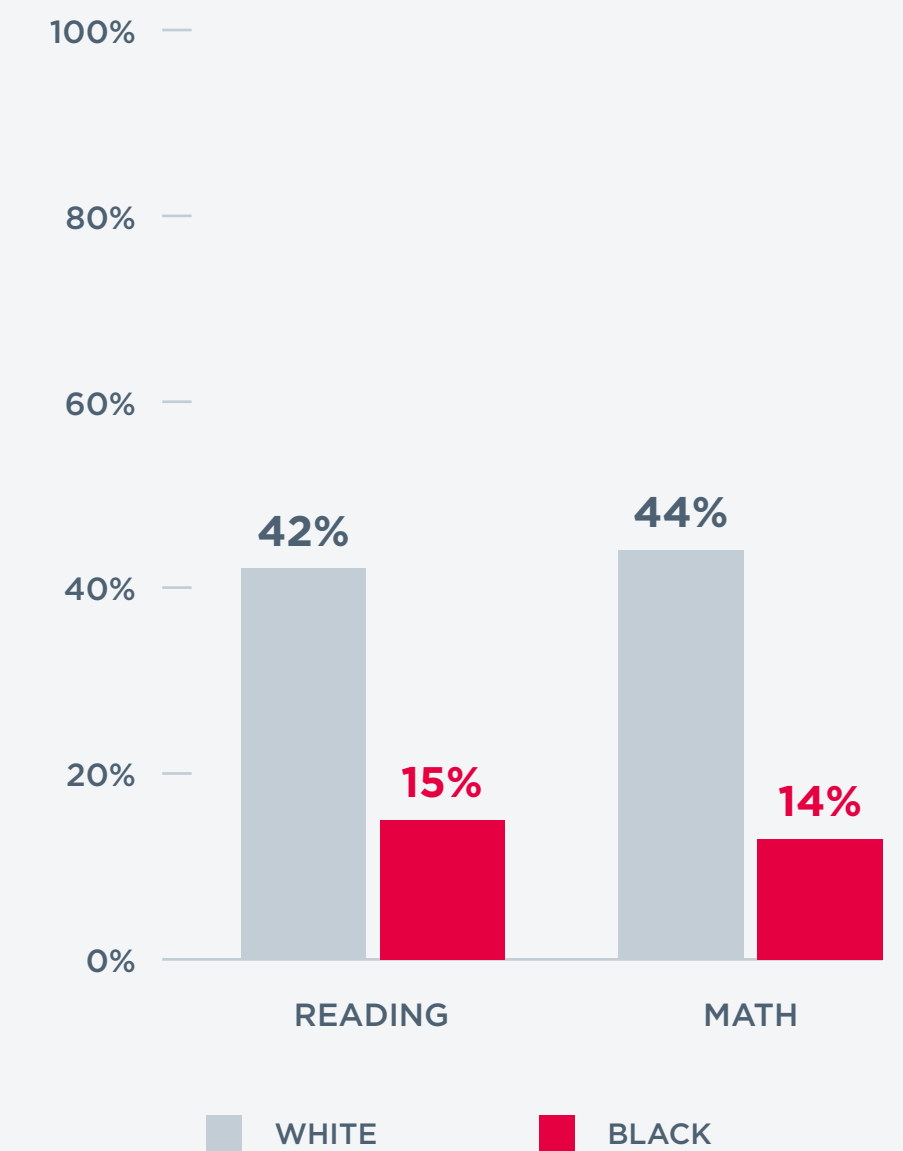
MEDIAN ANNUAL EARNINGS OF FULL-TIME, YEAR-ROUND WORKERS AGES 25-34, BY EDUCATIONAL ATTAINMENT (2019)⁷



THE SYSTEM WORKS EVEN WORSE FOR HISTORICALLY UNDERSERVED STUDENTS

Black 8th grade students are three times less likely to be proficient in reading or math as white students.

PERCENTAGE 8TH GRADERS PROFICIENT OR ABOVE IN READING AND MATH, BY RACE (2019)⁸



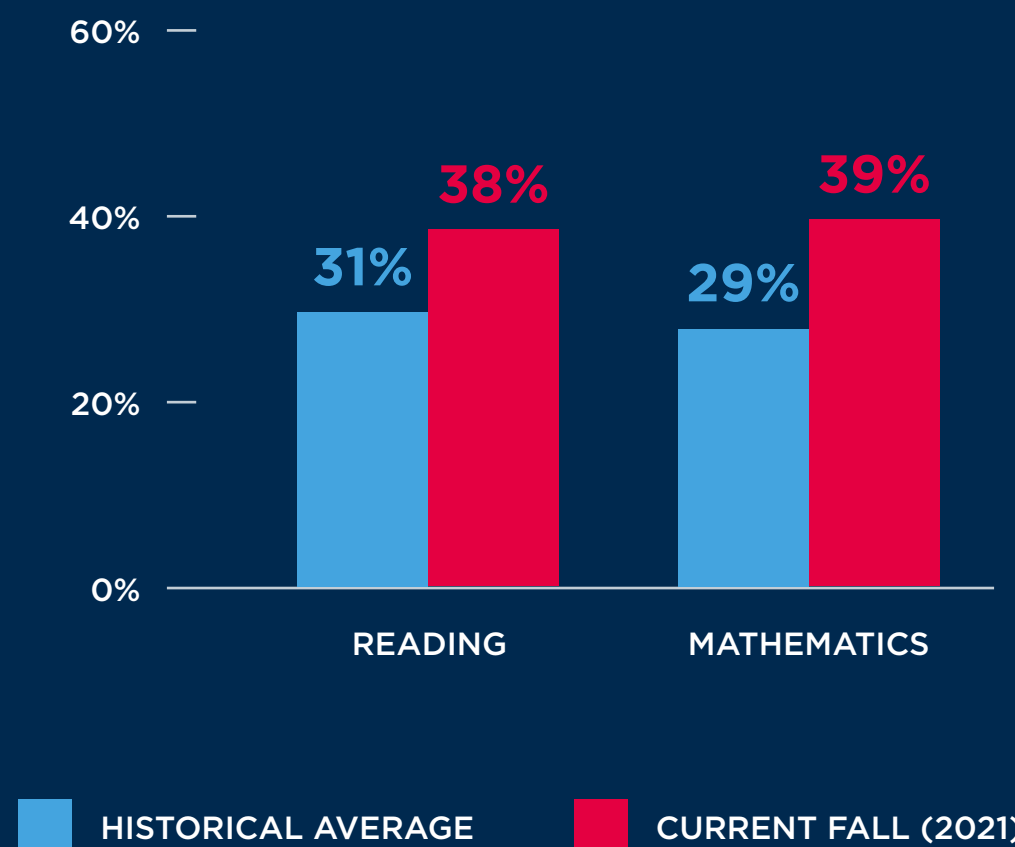
COVID-19 MADE IT WORSE FOR EVERYONE — AND EXACERBATED INEQUITIES

The below findings are from Curriculum Associates’ report, “i-Ready Understanding Student Learning,” which focuses on third grade students, as research has shown grade three performance is a strong predictor of high school outcomes. Note that “Below grade level” means two or more grade levels behind.

MORE STUDENTS ARE BEHIND THEIR EXPECTED GRADE LEVEL

More third grade students across demographics are now below their grade level in reading and math.

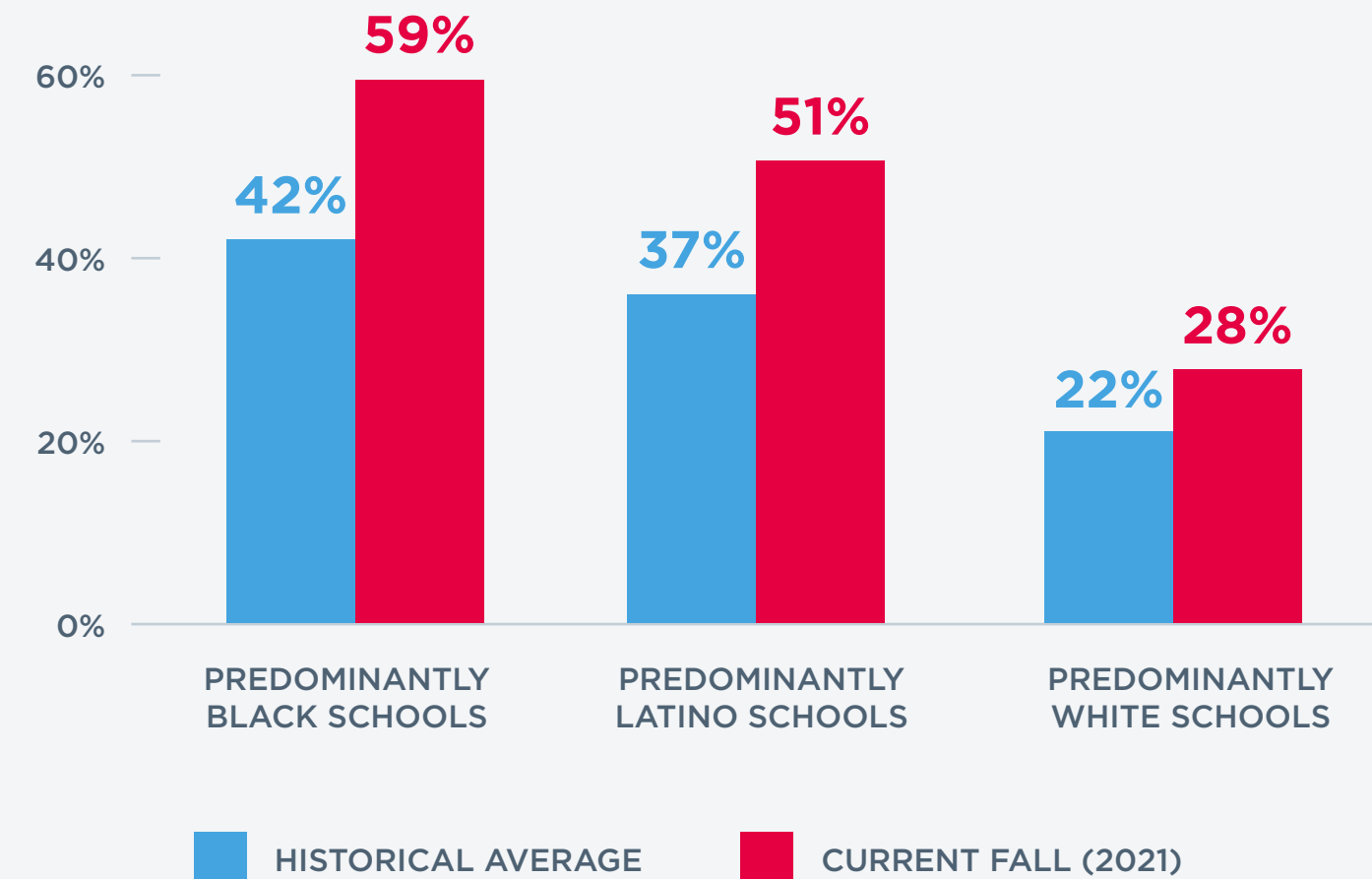
PERCENTAGE OF STUDENTS BELOW GRADE LEVEL (HISTORICAL AVERAGE VS. FALL 2021)⁹



SCHOOLS SERVING PREDOMINANTLY BLACK STUDENTS HAVE SEEN THE WORST IMPACTS

More than 50% of students in schools serving both predominantly Black and Latino students are now two or more grade levels behind in math.

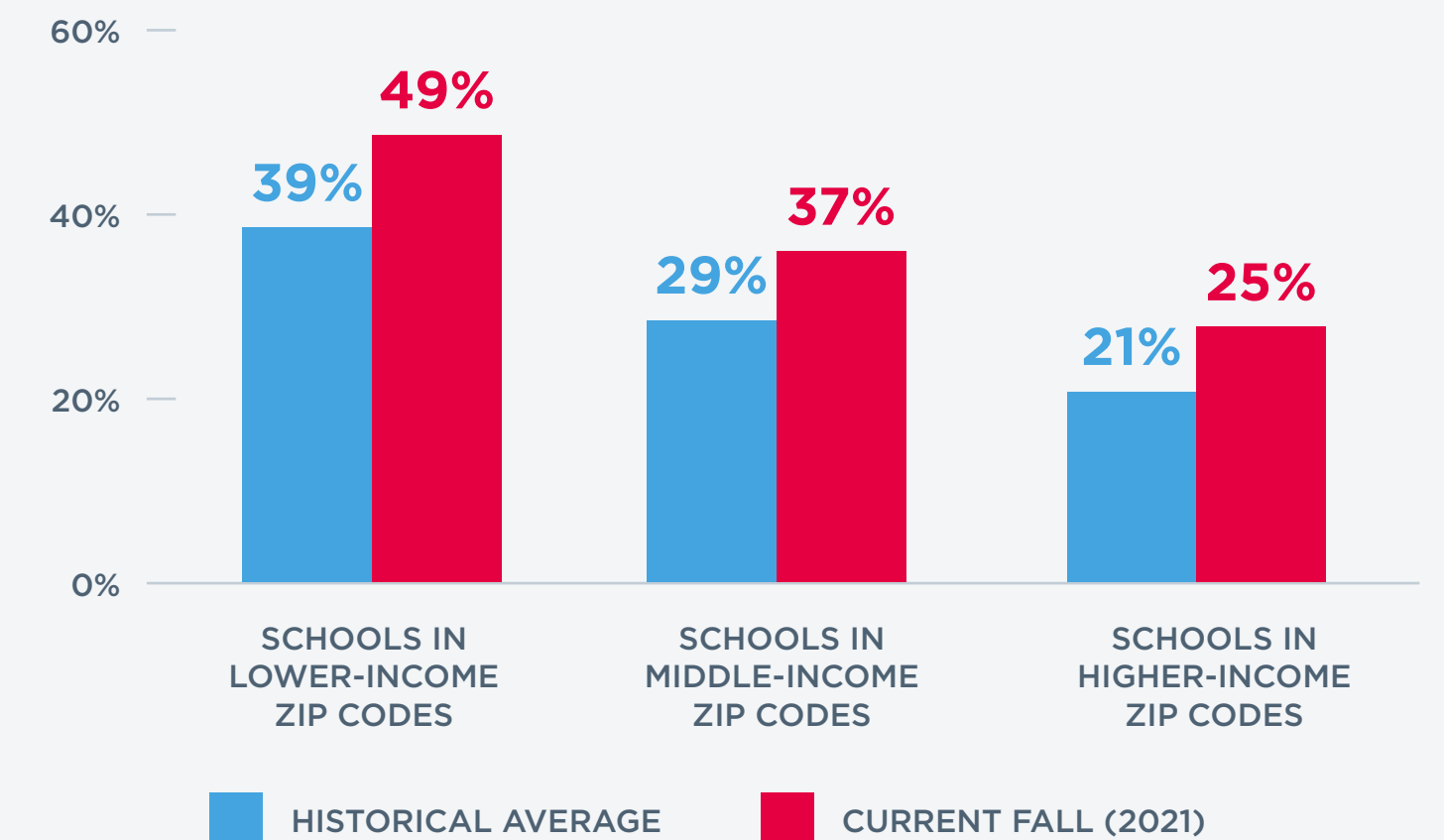
PERCENTAGE OF STUDENTS BELOW GRADE LEVEL IN MATHEMATICS (HISTORICAL AVERAGE VS. FALL 2021)¹⁰



SCHOOLS IN LOWER-INCOME AREAS HAVE ALSO BEEN HIT PARTICULARLY HARD

Compared to pre-pandemic rates, ten percent more third graders in lower-income areas are two or more grade levels behind their expected grade level in reading.

PERCENTAGE OF STUDENTS BELOW GRADE LEVEL IN READING (HISTORICAL AVERAGE VS. FALL 2021)¹¹



POOR SCHOOLS HURT OUR ECONOMY

WE'RE FALLING BEHIND AS A NATION

WE NEED TO SPEND SMARTER

Despite ranking 2nd in per pupil spending for K-12, the U.S. ranks 13th in reading, 37th in math, and 18th in science.¹²

The U.S.'s per pupil spending on K-12 is 37% higher than the average for OECD countries.¹³

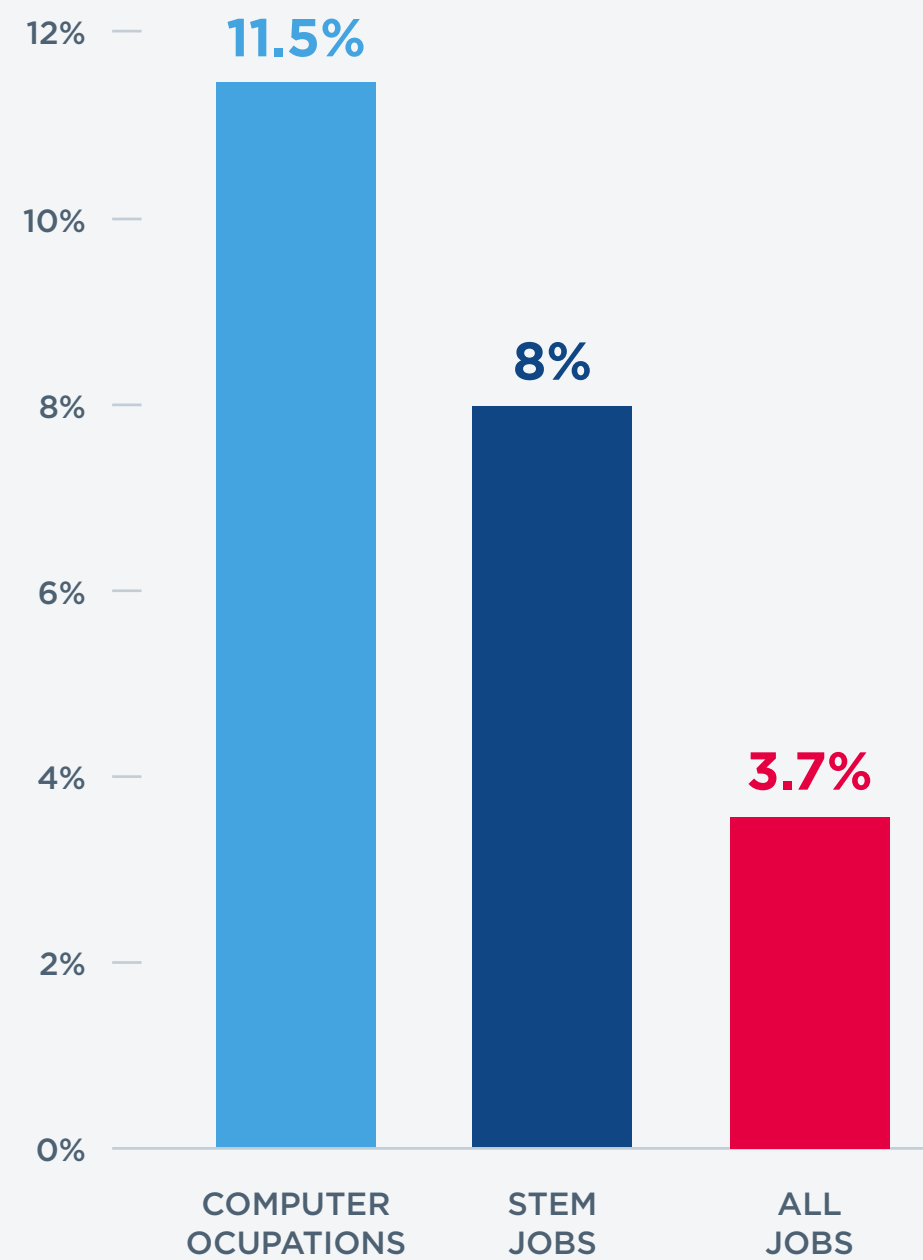
RANK	READING	MATH	SCIENCE
1	B-S-J-Z (CHINA)	B-S-J-Z (CHINA)	B-S-J-Z (CHINA)
2	SINGAPORE	SINGAPORE	SINGAPORE
3	MACAO (CHINA)	MACAO (CHINA)	MACAO (CHINA)
4	HONG KONG (CHINA)	HONG KONG (CHINA)	ESTONIA
5	ESTONIA	TAIWAN	JAPAN
6	CANADA	JAPAN	FINLAND
7	FINLAND	KOREA	KOREA
8	IRELAND	ESTONIA	CANADA
9	KOREA	NETHERLANDS	HONG KONG (CHINA)
10	POLAND	POLAND	TAIWAN
11	SWEDEN	SWITZERLAND	POLAND
12	NEW ZEALAND	CANADA	NEW ZEALAND
13	UNITED STATES	DENMARK	SLOVENIA
14	UNITED KINGDOM	SLOVENIA	UNITED KINGDOM
15	JAPAN	BELGIUM	NETHERLANDS
16	AUSTRALIA	FINLAND	GERMANY
17	TAIWAN	SWEDEN	AUSTRALIA
18	DENMARK	UNITED KINGDOM	UNITED STATES
19	NORWAY	NORWAY	SWEDEN
20	GERMANY	GERMANY	BELGIUM
21	SLOVENIA	IRELAND	CZECH REPUBLIC
22	BELGIUM	CZECH REPUBLIC	IRELAND
23	FRANCE	AUSTRIA	SWITZERLAND
24	PORTUGAL	LATVIA	FRANCE
25	CZECH REPUBLIC	FRANCE	DENMARK
26	NETHERLANDS	ICELAND	PORTUGAL
27	AUSTRIA	NEW ZEALAND	NORWAY
28	SWITZERLAND	PORTUGAL	AUSTRIA
29	CROATIA	AUSTRALIA	LATVIA
30	LATVIA	RUSSIA	SPAIN
31	RUSSIA	ITALY	LITHUANIA
32	ITALY	SLOVAK REPUBLIC	HUNGARY
33	HUNGARY	LUXEMBOURG	RUSSIA
34	LITHUANIA	SPAIN	LUXEMBOURG
35	ICELAND	LITHUANIA	ICELAND
36	BELARUS	HUNGARY	CROATIA
37	ISRAEL	UNITED STATES	BELARUS

IF WE CAN'T FILL JOBS HERE, THEY'LL MOVE OVERSEAS

VACANT POSITIONS

Science, technology, engineering, and mathematics (STEM) jobs are projected to grow more than two times as fast as the total for all occupations over the next decade.

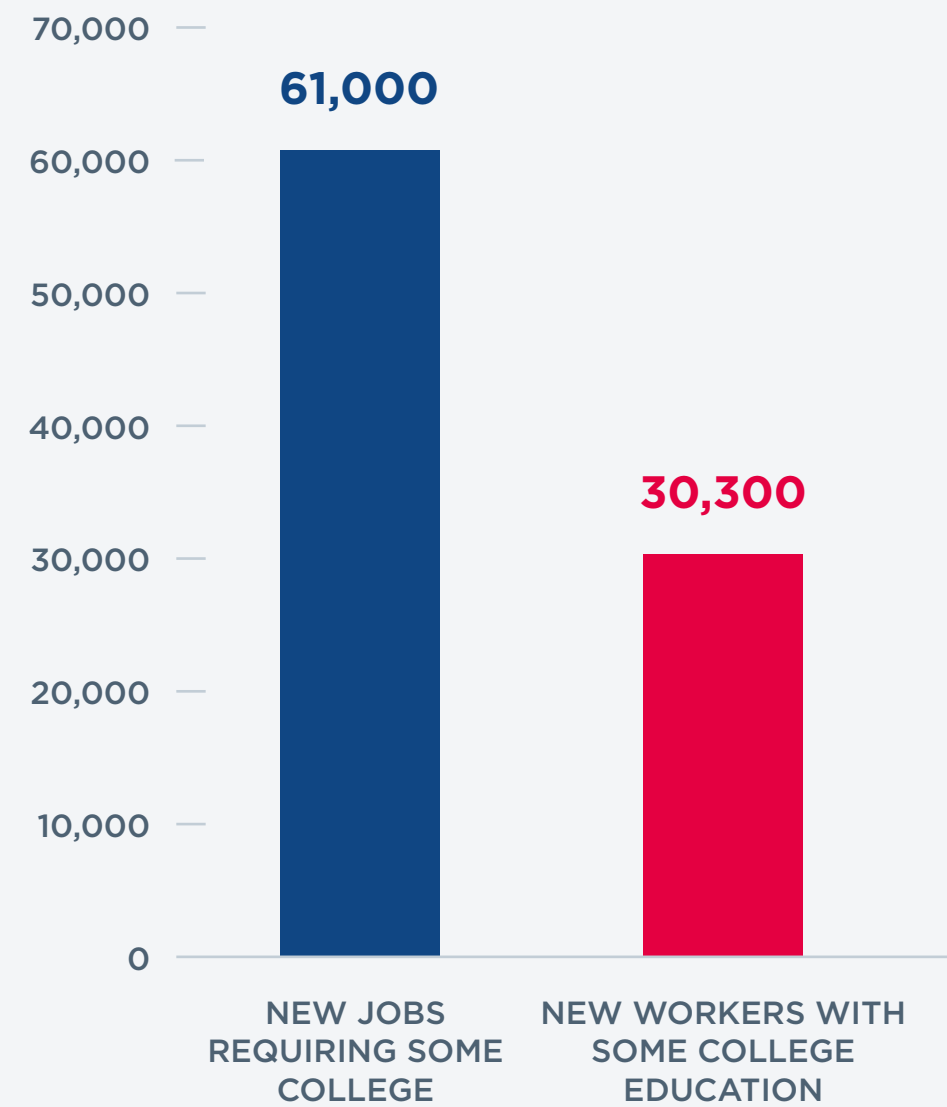
EXPECTED PERCENT JOB GROWTH, 2019 TO 2029¹⁴



LACK OF AGILITY

In fast-growing economies, schools cannot keep up with the growth of demand for skilled workers, creating localized “skills gaps.”

COLORADO'S ANNUAL GROWTH IN SKILLED JOB DEMAND AND SKILLED WORKERS¹⁵

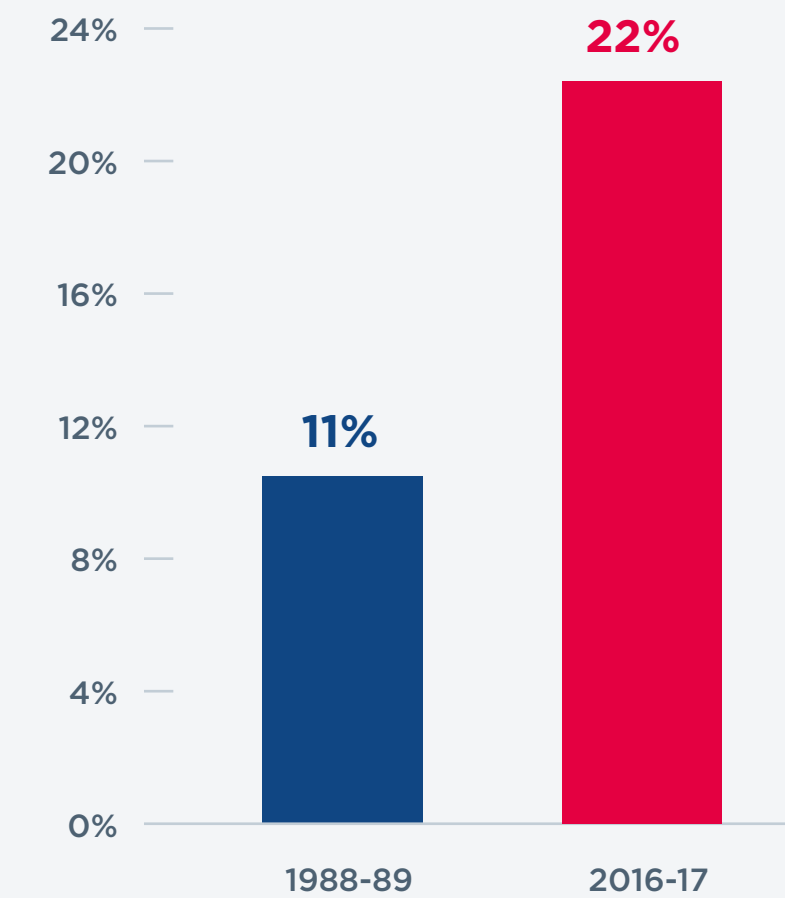


IMPORTING TALENT

As a result, employers in high-growth markets import workers from other states, leaving low-skilled workers underemployed.

Meanwhile, their universities import talent to fill empty seats in STEM classrooms.

FOREIGN STUDENTS AS A PERCENTAGE OF GRADUATE STEM DEGREES, 1988 TO 2017¹⁶



AS WORK EVOLVES, THE GAP BETWEEN TODAY'S WORKFORCE AND GOOD JOBS GROWS

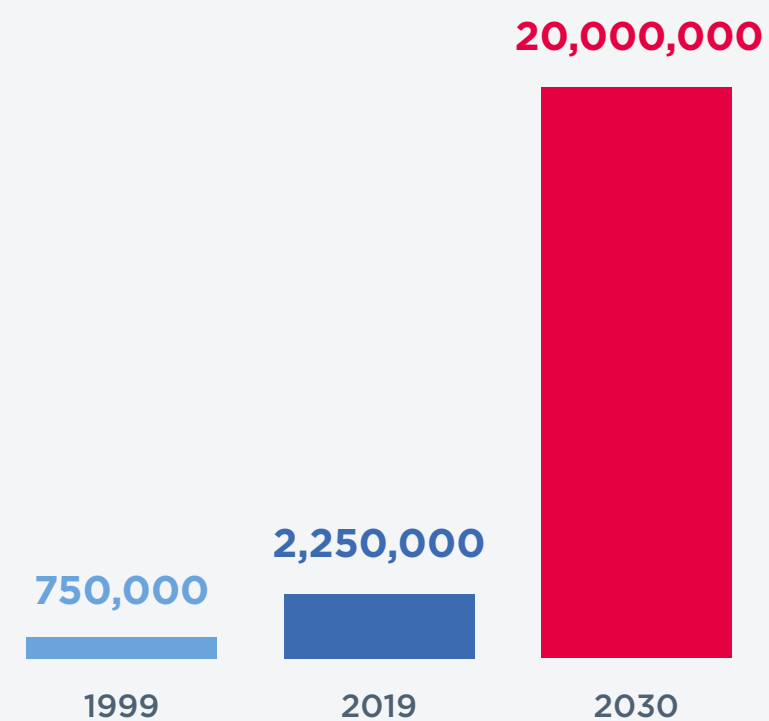
THE DIGITAL REVOLUTION IS CHANGING WORKPLACES

TECHNOLOGY IS DISRUPTING TRADITIONAL OCCUPATIONS

By 2025, time spent on current tasks at work by humans and machines will be equal.¹⁷

And by 2030, there will be nine times more robots than there were in 2019.

NUMBER OF ROBOTS IN THE U.S., 1999 TO 2030¹⁸



MIT Economist Daron Acemolu estimates that every new robot reduces employment by 5.6 workers.¹⁹

AUTOMATION TENDS TO DISPLACE LOWER-PAYING JOBS

New job openings, which will reflect tomorrow's task distribution and pay more, will be filled by workers who upskill and reskill.

Automation is changing the job mix everywhere.

PROJECTED CHANGE IN GLOBAL JOBS BY 2027²⁰

+ 97M JOBS CREATED

- 85M JOBS DISPLACED

= 12M JOBS DEMANDING NEW SKILLS

INDUSTRIAL EMPLOYERS WILL REQUIRE SKILLED WORKERS MORE "THAN EVER BEFORE"

“

As the industry continues to introduce technological innovations, the profile of the workforce will evolve and require higher levels of education and training than ever before.

This is particularly true with the development of “breakthrough”, or next-generation steelmaking technologies that will be low in CO2 emissions and result in significant changes to the way that steel is made. In this context, the demand for engineers, computer scientists, business major, and skilled production workers is expected to remain strong.²¹

”

worldsteel
ASSOCIATION

TOMORROW'S TASK DISTRIBUTION WILL REQUIRE DIFFERENT SKILLS

JOB REQUIREMENTS ARE "CHANGING"

70%

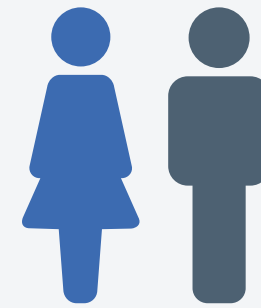
OF BUSINESS LEADERS

indicate there will be significant shifts in the skills required in their workplaces this decade.²²

PERCENT OF BUSINESS LEADERS WHO EXPECT EMPLOYEES TO LEARN NEW SKILLS ON THE JOB²³

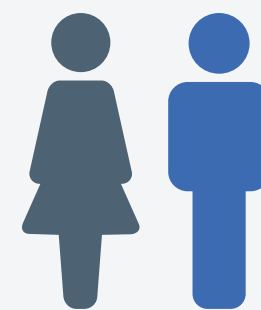
65% **94%**
2018 2020

WORKERS HAVE TO ADAPT — SCHOOLS SHOULD TOO



50%

OF ALL WORKERS WILL NEED TO RESKILL BY 2025²⁴



THE OTHER HALF WILL BE REQUIRED TO UPDATE

40%

OF THEIR SKILL SET²⁵

TOMORROW'S JOBS WILL DEMAND MORE COMPLEX SKILLS

Jobs will require more familiarity with cloud computing, big data, and AI. Employers will increasingly seek out workers who can learn on the job and solve problems as they arise.

BY 2030, WORKPLACE DEMAND WILL INCREASE BY

60%

FOR TECHNOLOGICAL SKILLS

40%

FOR CREATIVITY

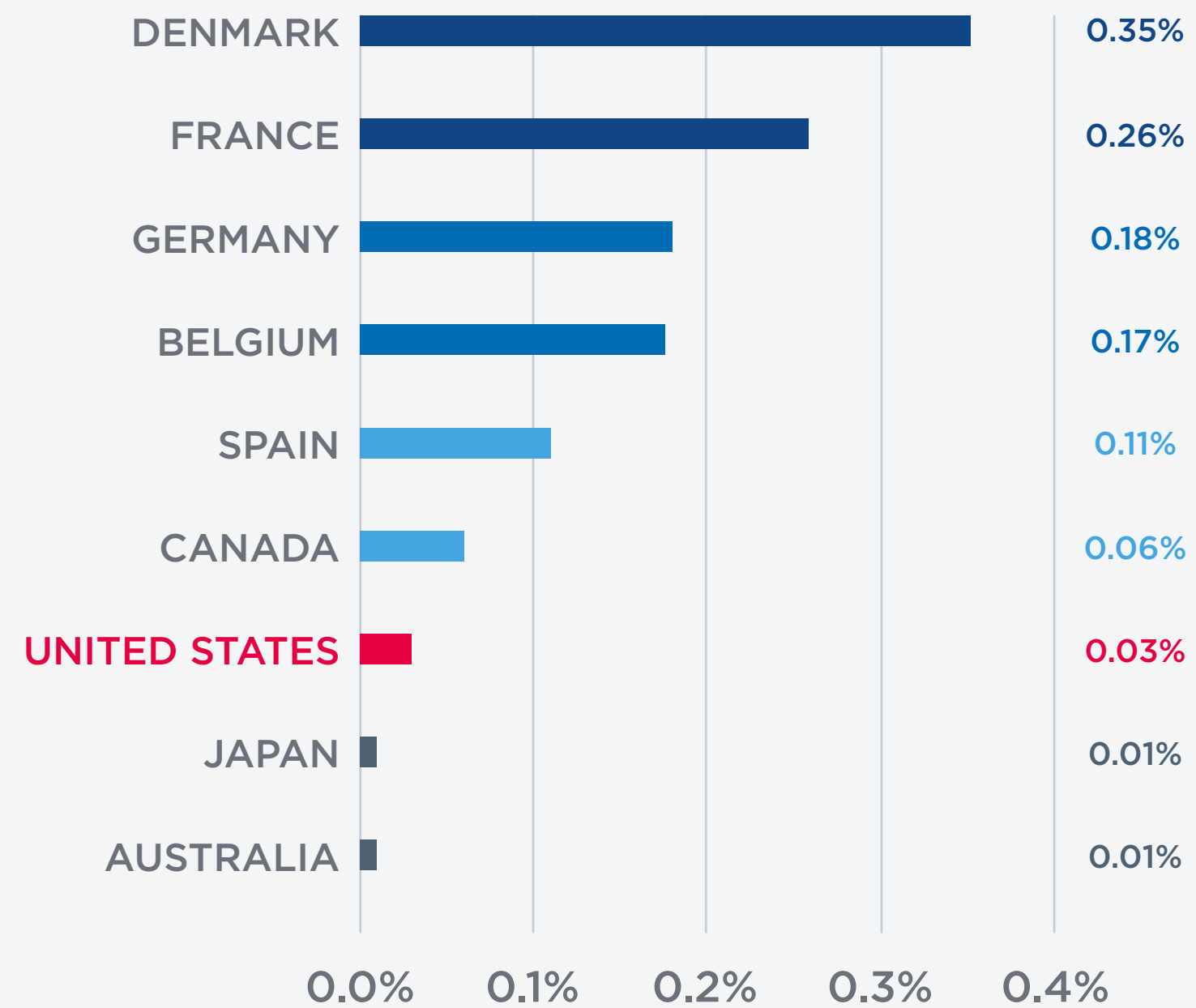
33%

FOR ENTREPRENEURSHIP²⁶

WE'RE BEHIND ON WORKER TRAINING

WE INVEST LESS THAN OUR COMPETITORS

TOTAL PUBLIC SPENDING ON WORKER TRAINING, AS PERCENTAGE OF GDP (2019)²⁷



WE'RE INVESTING LESS THAN WE DID

SPENDING ON WORKER TRAINING AS A PERCENTAGE OF GDP²⁸

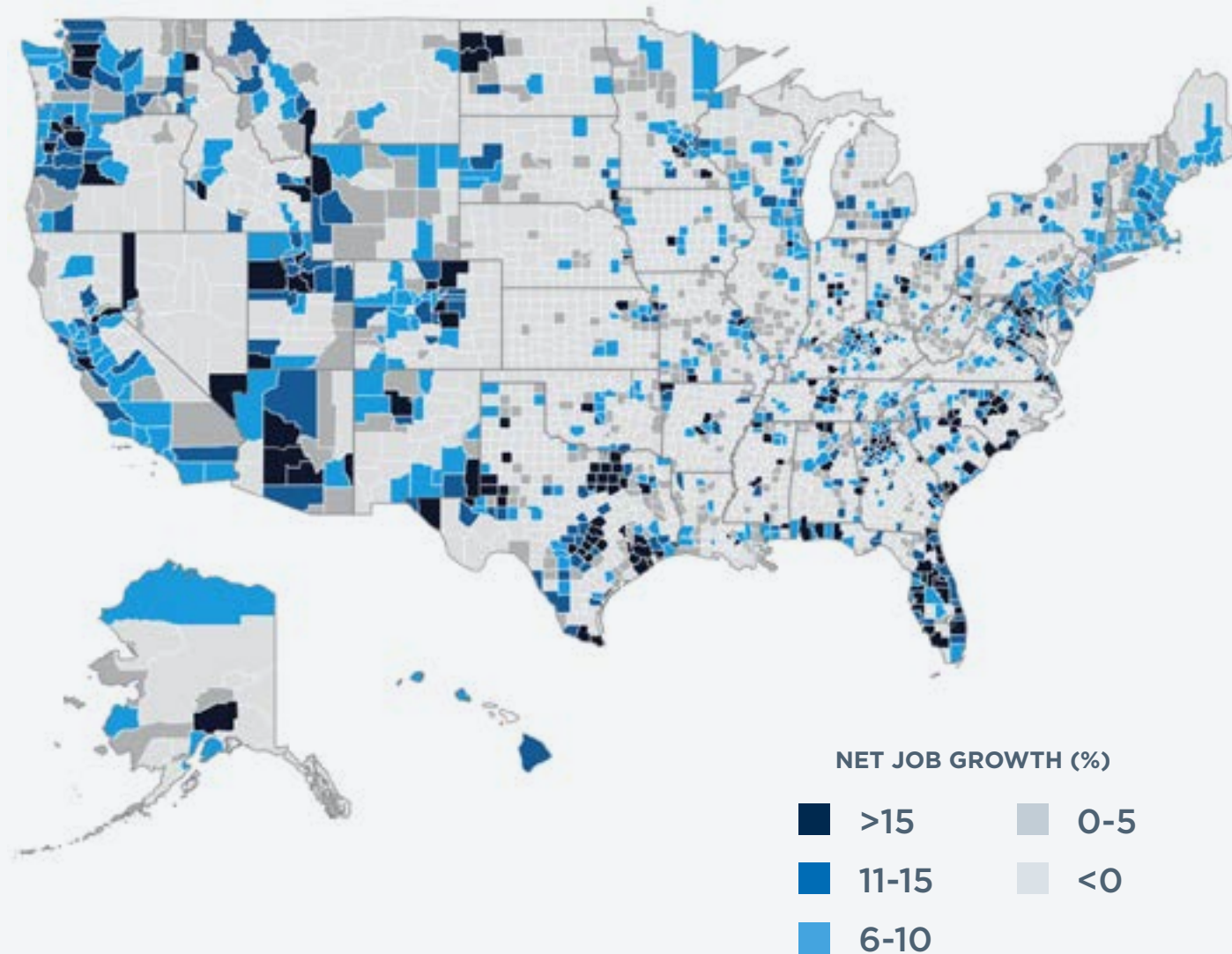


AUTOMATION IMPACTS WORKERS, REGIONS, AND INDUSTRIES DIFFERENTLY, WHICH INCREASES INEQUALITY

GEOGRAPHY

60% of U.S. job growth through 2030 will likely be concentrated in 25 urban areas — despite those areas having only 44% of the population — while rural areas lose jobs.

ESTIMATED PROJECTED NET JOB GROWTH BY COUNTY (THROUGH 2030)²⁹

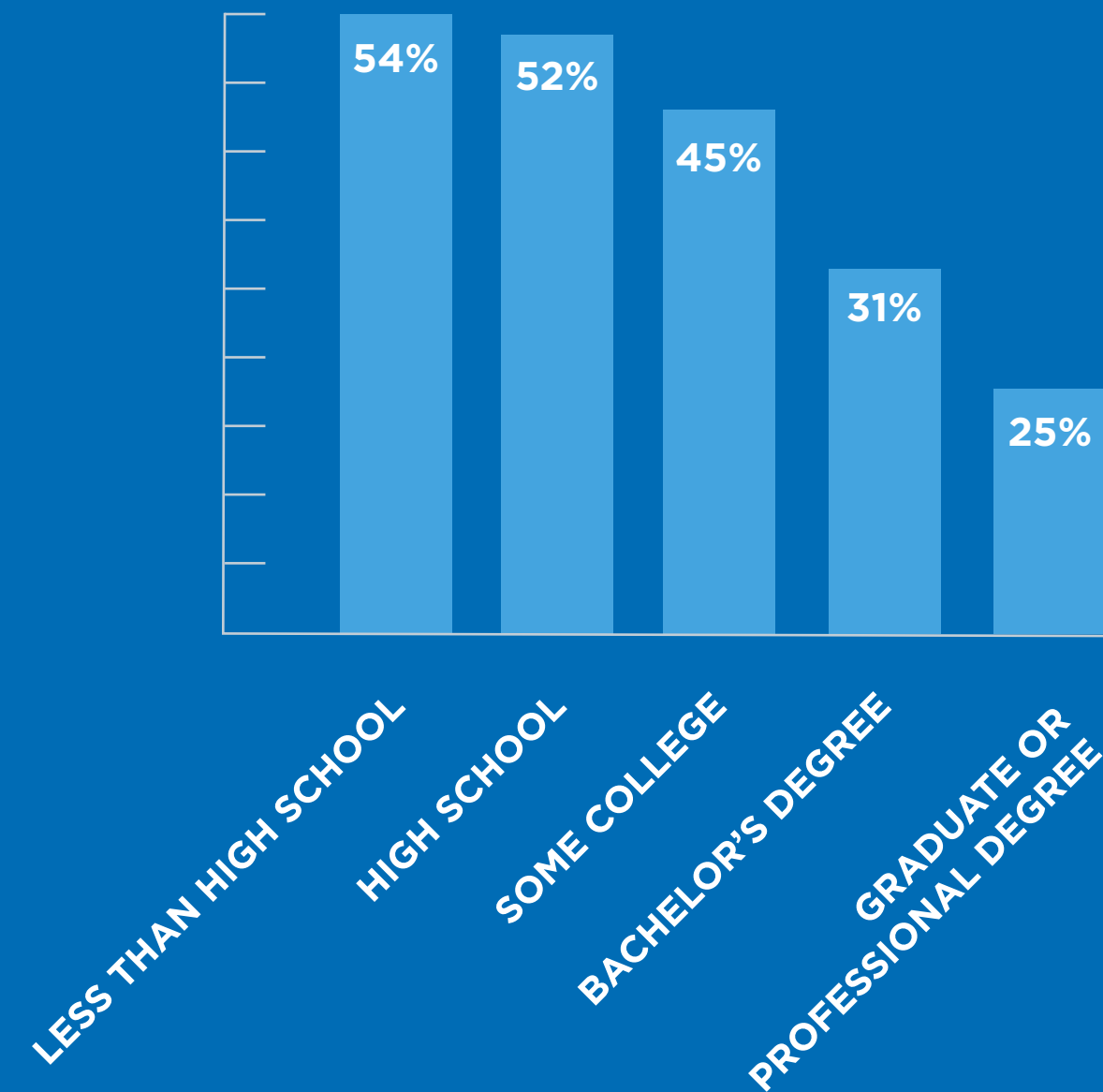


SOURCE: MCKINSEY GLOBAL INSTITUTE ANALYSIS

EDUCATION

Workers without a college education are more likely to see their jobs displaced by automation.

AVERAGE AUTOMATION POTENTIAL BY WORKER EDUCATIONAL ATTAINMENT³⁰



RACE

Hispanic Americans are most likely to work in jobs that have a high potential for automation.

PERCENT OF WORKERS IN JOBS WITH HIGH POTENTIAL FOR AUTOMATION, BY RACE³¹

WHITE	63%
ASIAN	72%
BLACK	75%
HISPANIC	78%

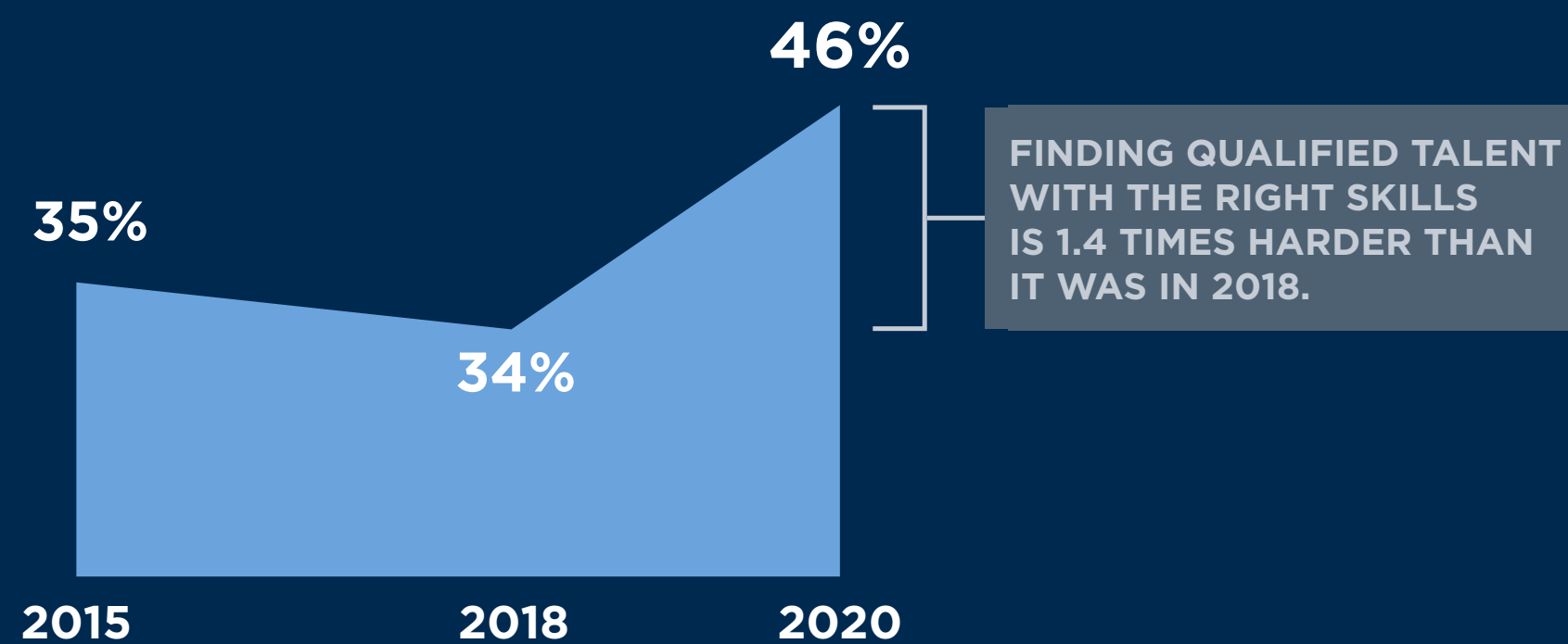
CASE STUDY (1/2): MANUFACTURING JOBS ARE CHANGING FASTER THAN OUR WORKFORCE, CREATING A “SKILLS GAP”

More than two-thirds of manufacturers believe there is a “skills gap” in their industry — and they are not alone: 55% of respondents across sectors identify a skills gap in the labor market as the leading barrier to their company’s adoption of new technologies.³²

MANUFACTURERS AREN'T FILLING OPENINGS

Despite the fact that the unemployment rate doubled the number of available workers between 2018 and 2020, manufacturers reported that finding qualified workers in 2020 was 1.4 times harder than in 2018.

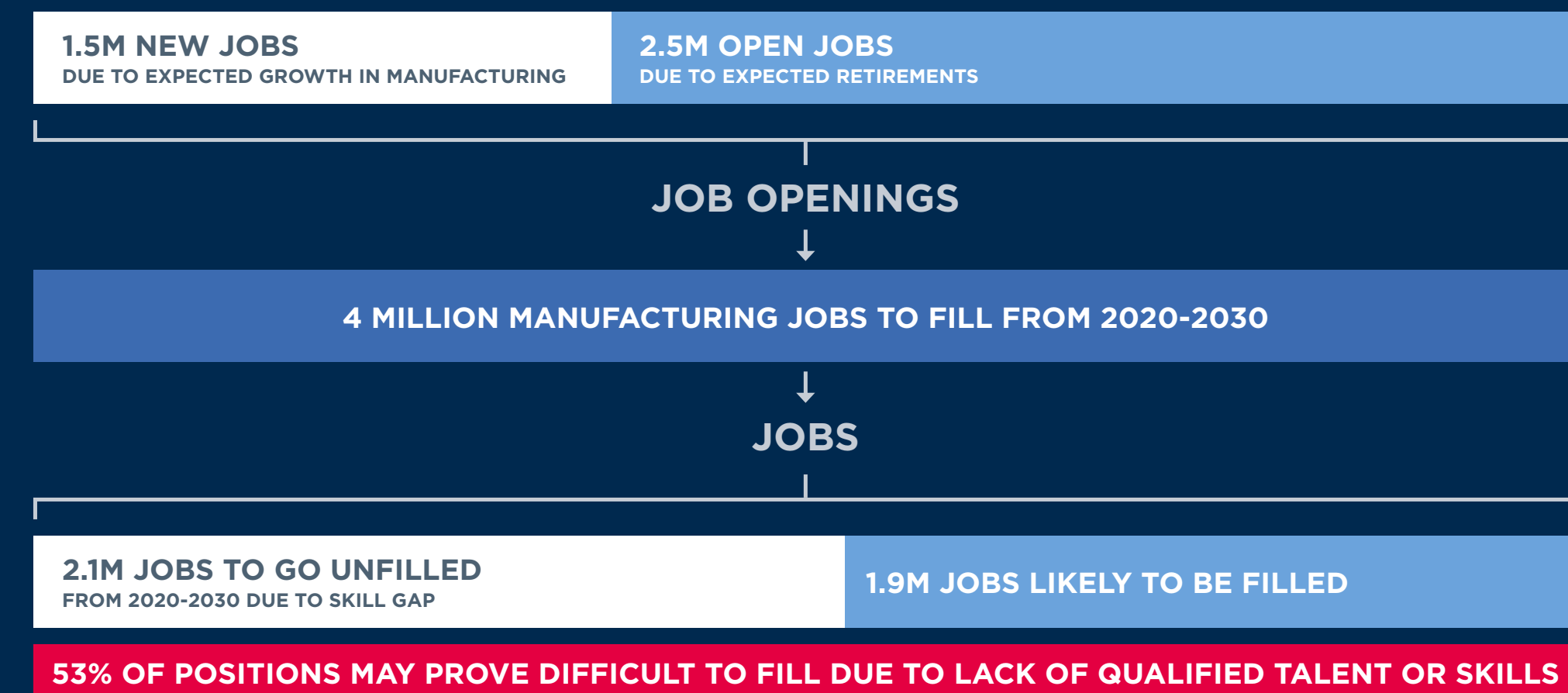
SHARE OF OPEN POSITIONS MANUFACTURERS ARE FINDING DIFFICULT TO FILL DUE TO THE SKILL MISMATCH



BY 2030, INABILITY TO FILL OPEN JOBS COULD COST THE U.S. MORE THAN \$1 TRILLION

American manufacturers could see 4 million jobs open up by 2030, but due to a mismatch of the skills demanded and supplied in our labor market, only 1.9 million are likely to be filled.

2.1 MILLION OPEN POSITIONS COULD GO UNFILLED BY 2030



NOTE: RETIREMENT AGE OF 66 WAS CONSIDERED FOR THE ABOVE ANALYSIS

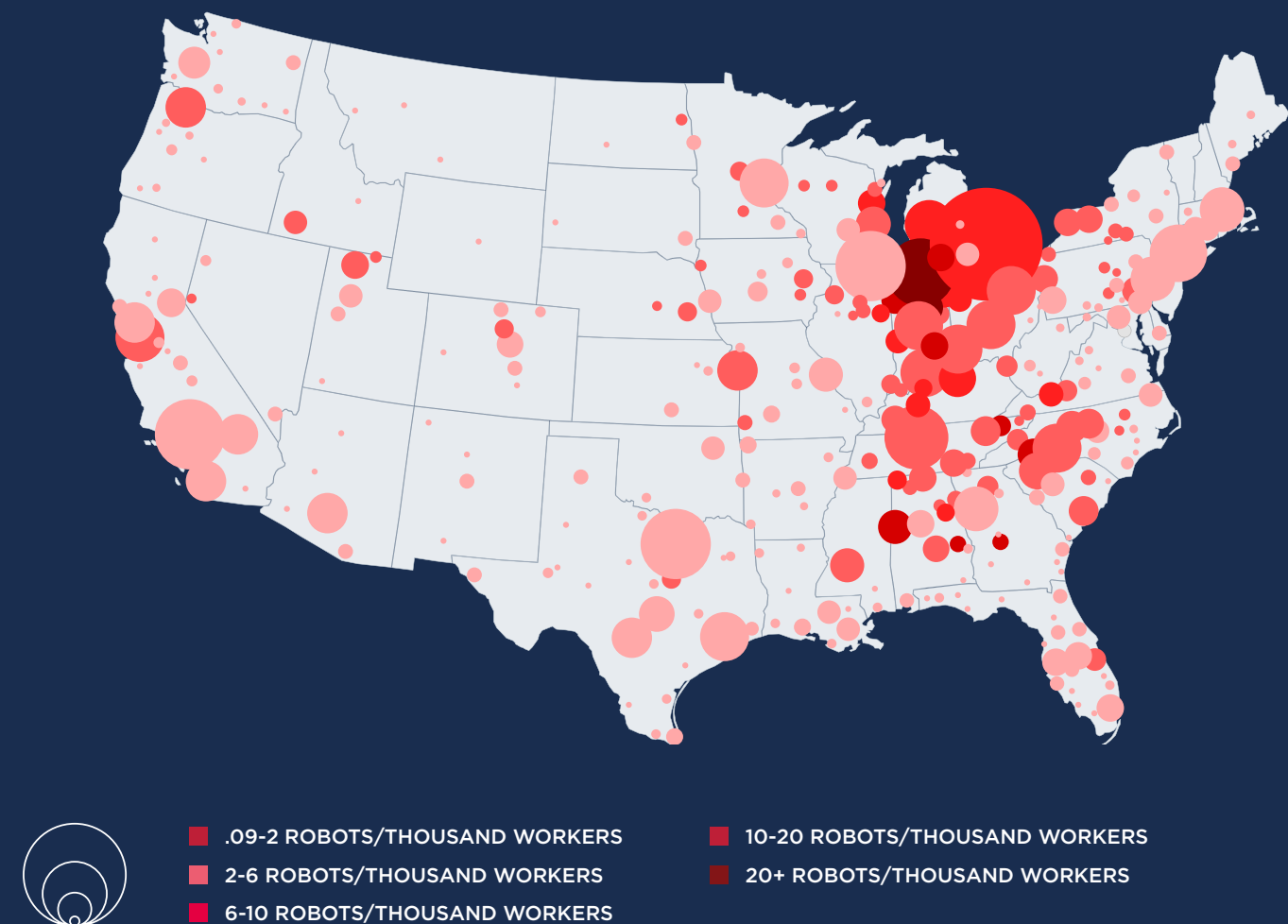
SOURCE: DELOITTE³³

CASE STUDY (2/2): WITHOUT ACTION, JOB DISPLACEMENT WILL CONTINUE HITTING RURAL AREAS HARDEST

AUTOMATION IS DISPLACING LOW-SKILL MANUFACTURING JOBS IN THE MIDWEST

Robots are replacing the traditional manufacturing jobs that have historically defined Midwestern economies. More than 20% of robots in the U.S. are based in Michigan and Ohio alone, largely due to the highly automable processes of the automotive industry.

NUMBER & INCIDENCE OF INDUSTRIAL ROBOTS
(PER THOUSAND WORKERS) BY METROPOLITAN STATISTICAL AREA, 2015³⁴

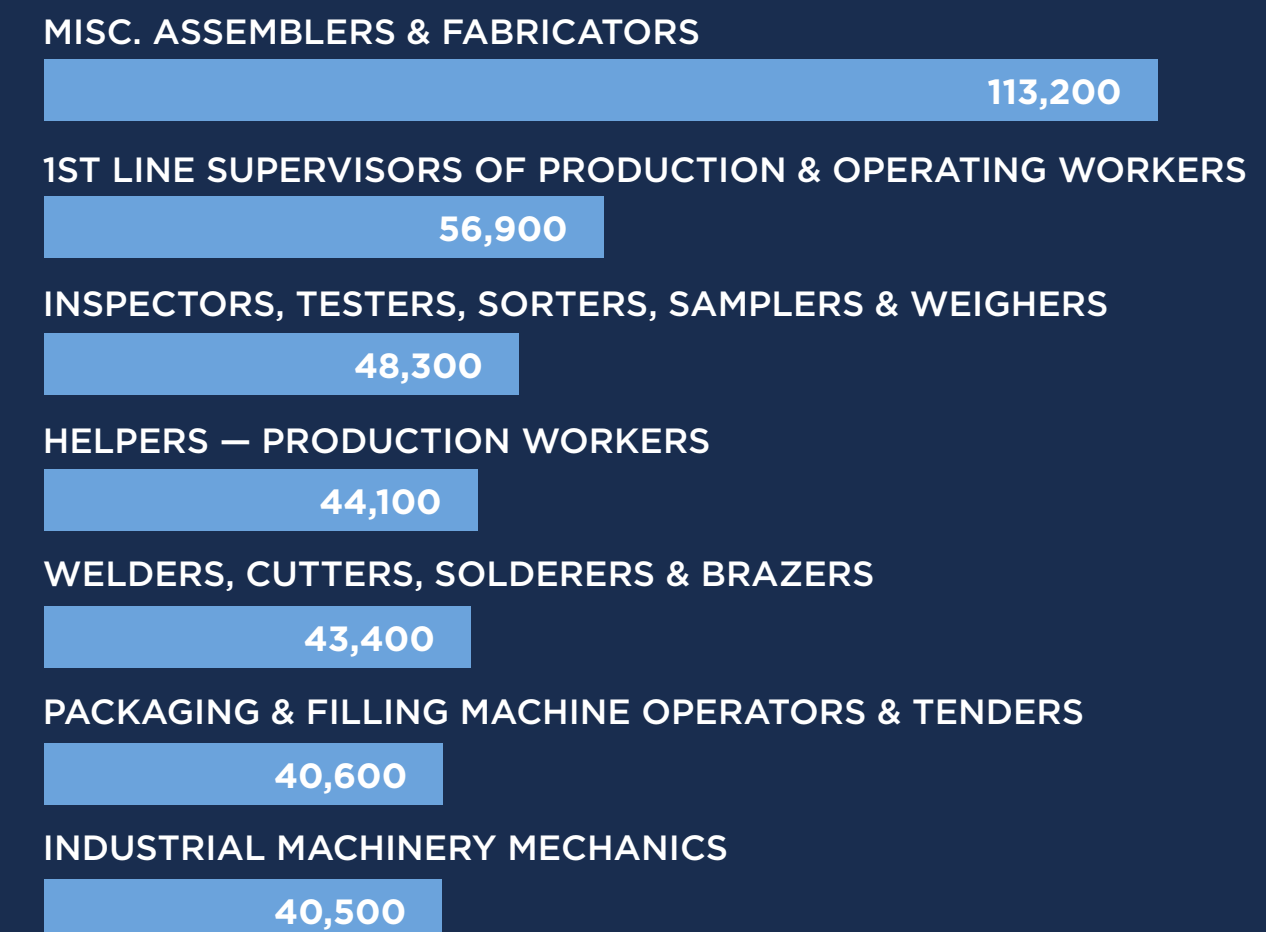


SOURCE: BROOKINGS INSTITUTION

THE GOOD NEWS? CLOSING THE SKILLS GAP COULD FILL POSITIONS CONCENTRATED IN RURAL AREAS

With better education and training programs, we can prepare our workforce to fill thousands of mid-level job openings. These positions are concentrated in rural areas, where automation and population declines are stressing labor markets.

MANUFACTURERS EXPECTED TO STRUGGLE FILLING MIDDLE-SKILL ROLES
MIDDLE-SKILL OCCUPATIONS WITH THE HIGHEST PROJECTED JOB OPENINGS (2019-2029)³⁵



THE FUTURE OF WORK IS A ROAD MAP FOR EDUCATION REFORM

STEP ONE: TECHNICAL AND DIGITAL SKILLS



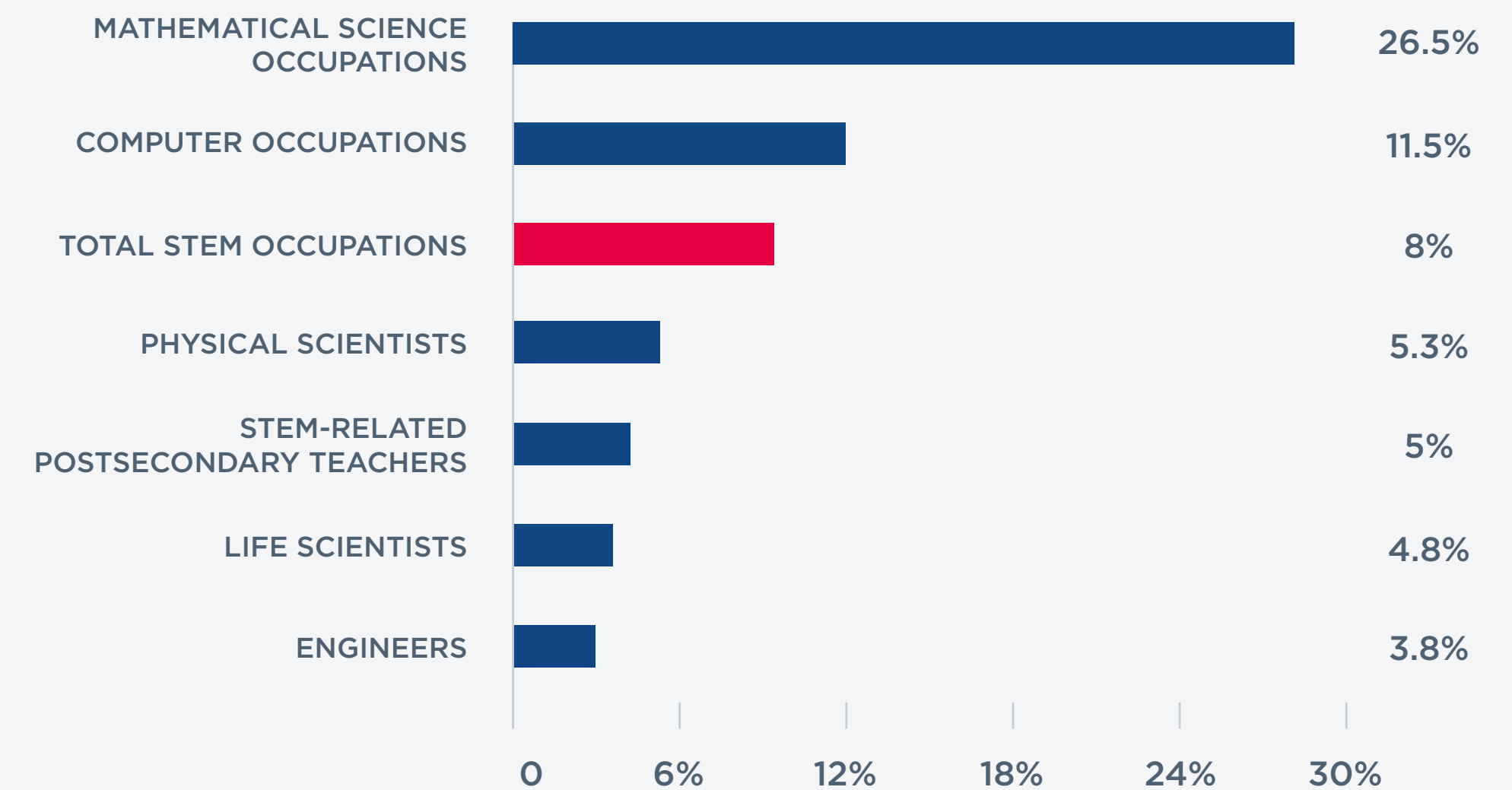
Seven million job openings in 2015 were in occupations that required coding skills.³⁶ But only 35% of U.S. high schools offer computer science classes.³⁷

Programming jobs overall are growing 12% faster than the market average.³⁸

By increasing computer science and other STEM course work, we can help graduates succeed at work — and many of them can do so without college.

PROJECTED JOB GROWTH FOR STEM OCCUPATIONS, 2019 TO 2029

The number of jobs across all STEM occupations is expected to grow by nearly 800,000 by 2029, an 8% growth rate, compared to 3.7% across all sectors.³⁹



SOURCE: U.S. BUREAU OF LABOR STATISTICS

STEP TWO: CONTINUOUS LEARNING



The kinds of technical skills workers need are continuously evolving, so being able to learn quickly is essential.

Most jobs will not be automated out of existence, instead they will integrate new technologies to expedite existing processes, meaning workers need to quickly learn and adapt to new systems, softwares, and machineries.

They also need the ability to understand the engagement, interaction, and collaboration between humans and machines.

THE PRODUCTIVITY REVOLUTION IN STEEL DEMONSTRATES A TREND ACROSS INDUSTRIES

Consolidation and improved processes in the steel industry have increased productivity by more than 6 times since 1980.⁴⁰

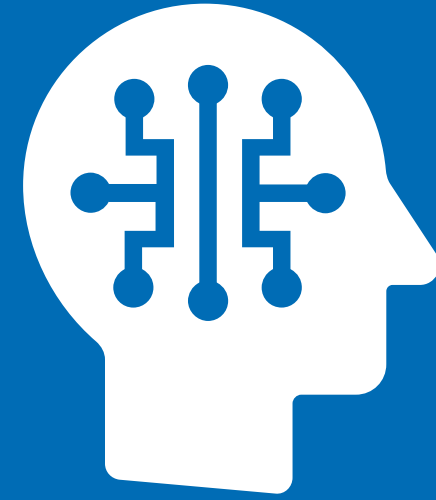
“

As the [steel] industry continues to introduce technological innovations, the profile of the workforce will evolve and require higher levels of education and training than ever before...the demand for engineers, computer scientists, business major, and skilled production workers is expected to remain strong.

”

- WORLD STEEL ASSOCIATION⁴¹

STEP THREE: TEAMWORK AND JUDGMENT



As automation eliminates simple tasks, it increases the value of “human” skills that robots and A.I. cannot handle.

CRITICAL THINKING AND PROBLEM SOLVING

CREATIVITY

SOCIAL AND EMOTIONAL SKILLS

EMPATHY

ENTHUSIASM FOR LEARNING

ABILITY TO EMBRACE CHANGE AND UNCERTAINTY

“ At its core, work in the future will be more networked, more devolved, more mobile, more team-based, more project-based, more collaborative, more real-time, and more fluid. ”

- DELOITTE WHITE PAPER ON THE FUTURE OF WORK⁴²

“ Interpersonal skills are unlikely to be rendered obsolete by technological innovation or economic disruptions. In a changing workforce, it’s having a strong foundation in these versatile, cross-functional skills that allows people to successfully pivot. ”

- WORLD ECONOMIC FORUM⁴³

STEP FOUR: SELF-RELIANCE

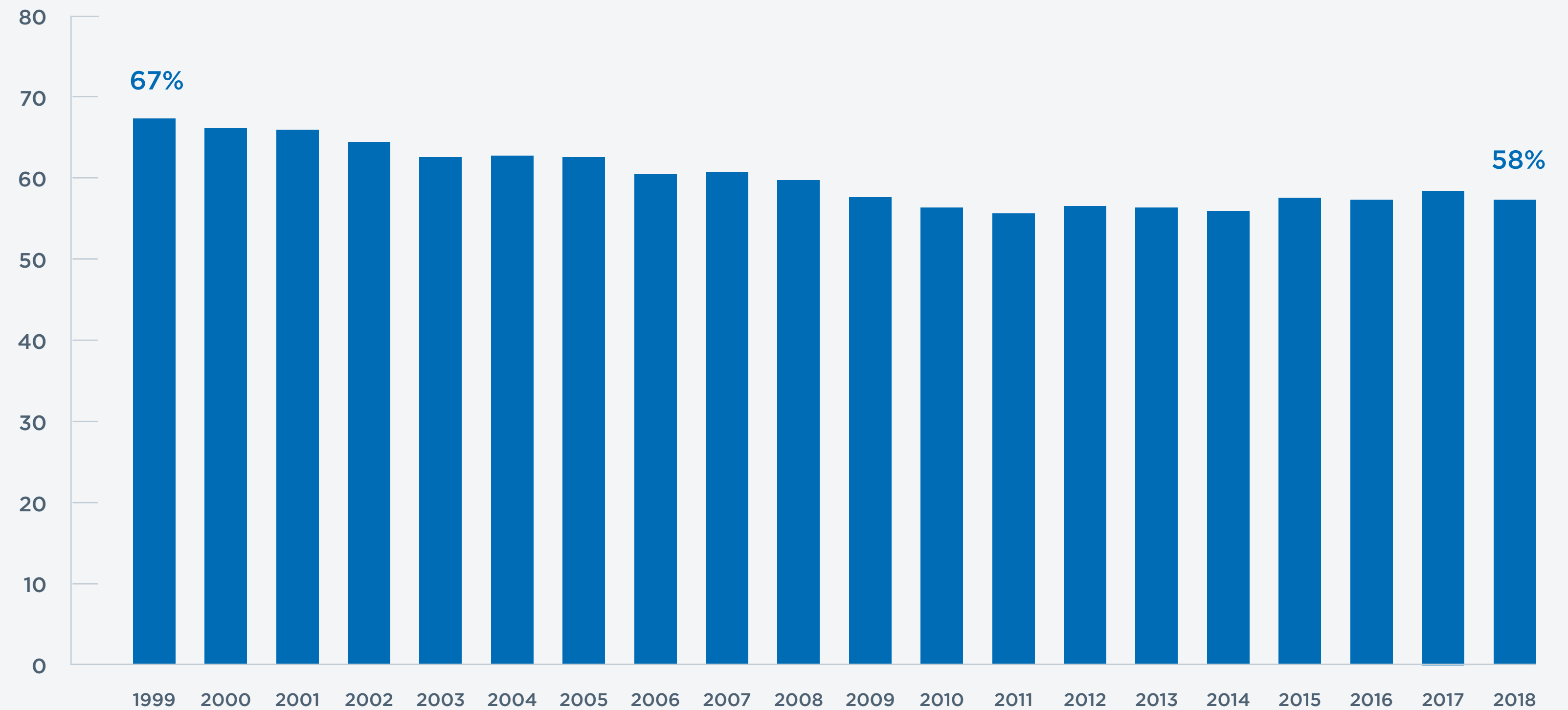


LESS THAN
13%
OF AMERICANS
HAVE PENSIONS

25 years ago, that
figure was 38 percent.⁴⁴

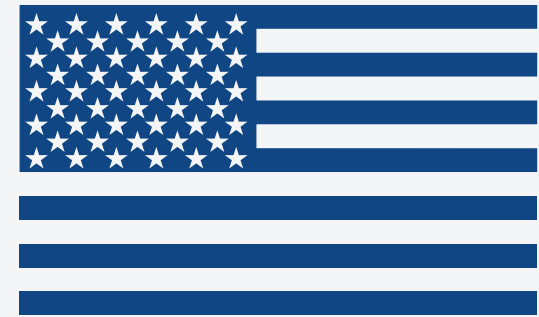
TODAY'S YOUNG WORKERS WILL NEED TO PREPARE FOR THEIR RETIREMENT

The percent of non-elderly Americans with employer-sponsored health insurance has dropped from 67.3% in 1999 to 58% in 2018.⁴⁵



A PLACE TO START: INTERNSHIPS AND APPRENTICESHIPS

Business leaders understand the demands of the market in which they're operating. No group is better suited to help train the employees of tomorrow before they enter the workforce. Their industry knowledge, when coupled with their ability to offer apprenticeships and internships, makes them the real leaders and experts.



More than 80 percent of U.S. companies that sponsor apprentices say that apprenticeship is an effective strategy for helping them meet their demand for skilled labor.⁴⁶



Canadian employers can receive income tax credits for hiring apprentices through Industry Training Authority programs. For every \$1 invested in apprenticeship programs, businesses can expect to receive \$1.47 in return.⁴⁷



In Switzerland, 70 percent of young people enter the workforce through an apprenticeship. Only 25 percent choose to follow a traditional university pathway.⁴⁸

“ We want to make sure we're matching employers with Americans that have those skills and that requires giving everyone the opportunity to gain those skills.

We have to do a much better job of being coordinated and focused on the ways to get our workforce aligned with the jobs that we're talking about... at Commerce through the Economic Development Administration... [we are] supporting registered apprenticeships and other skills programs at community colleges.

”

- DON GRAVES, DEPUTY SECRETARY,
U.S. DEPARTMENT OF COMMERCE

[CLICK HERE TO LISTEN TO THE BUSINESS FORWARD BRIEFING WITH DEPUTY SECRETARY GRAVES ON WORKFORCE DEVELOPMENT](#)



BUSINESSES CAN AND SHOULD PROVIDE SUPPORT

INVESTING IN WORKFORCE DEVELOPMENT IS GOOD FOR EMPLOYERS

In a well-functioning labor market, employers can hire from a talented pool of workers who already have applicable skills and are well-positioned to learn new ones.



EMPLOY A TALENTED WORKFORCE



GROW STAFF AND PROMOTE SKILLED EMPLOYEES



IDENTIFY AND SUPPORT LEADERS



CONTINUOUSLY ADAPT



PRODUCE BETTER PRODUCTS

CASE STUDY: SUNRUN LAUNCHES INNOVATIVE EDUCATION PROGRAM TO UPSKILL AMERICA'S WORKFORCE FOR GREEN CAREERS

One of the country's leading solar, battery storage, and energy services provider launched PowerU, a fully-funded employee education and upskilling program designed to train and develop the clean energy workforce. Sunrun partnered with Guild Education, a private company that helps businesses offer educational programs.⁴⁹

SUNRUN

GUILD

POWERU PROGRAMS

- BACHELOR'S AND MASTER'S DEGREES in sustainability management, electrical engineering, and information technology
- PROFESSIONAL DEVELOPMENT AND GRADUATE CERTIFICATES in sales leadership, solar installation, and supply chain management
- ENGLISH LANGUAGE CLASSES
- HIGH SCHOOL COMPLETION COURSES
- AN EMPLOYER-SPONSORED ELECTRICIAN APPRENTICESHIP PROGRAM



**MORE THAN
900,000
SKILLED WORKERS**

WILL BE NEEDED TO REACH THE BIDEN ADMINISTRATION'S 2035 CLEAN ENERGY TARGET.

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