



Joint Education Interim Committee Education Interim Budget Committee

September 13, 2022

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Jason Dougal, NCEE President & COO

Why Do We Have the System We Have?

The current education system has its roots in the turn of the century – The 20th Century!



Prepared workers for a burgeoning assembly line factory model



Assimilated immigrants into American culture



Provided widespread basic literacy and numeracy



Critical thinking necessary for only a select percentage



Leveraged lessons from across Europe



How Has the Current System Performed?

Actually, quite well...for a long period of time



For almost a century, the U.S. led the world in education attainment and quality



Drove the biggest economy in the history of the world to ever new heights



Fostered an explosion of the middle-class



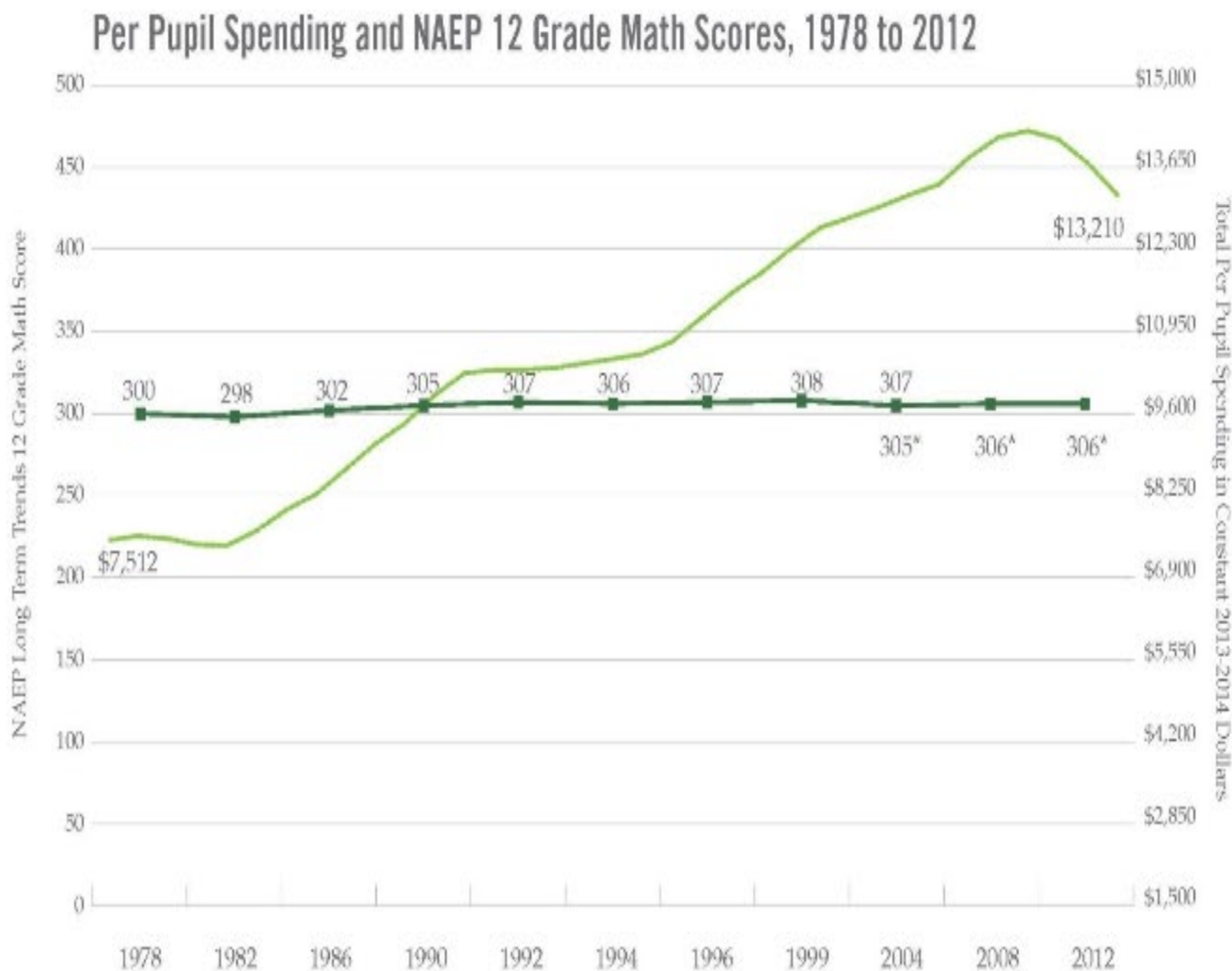
Backbone of a stable democracy



Production engine that helped win 2 world wars



How Has the Current System Performed Recently?

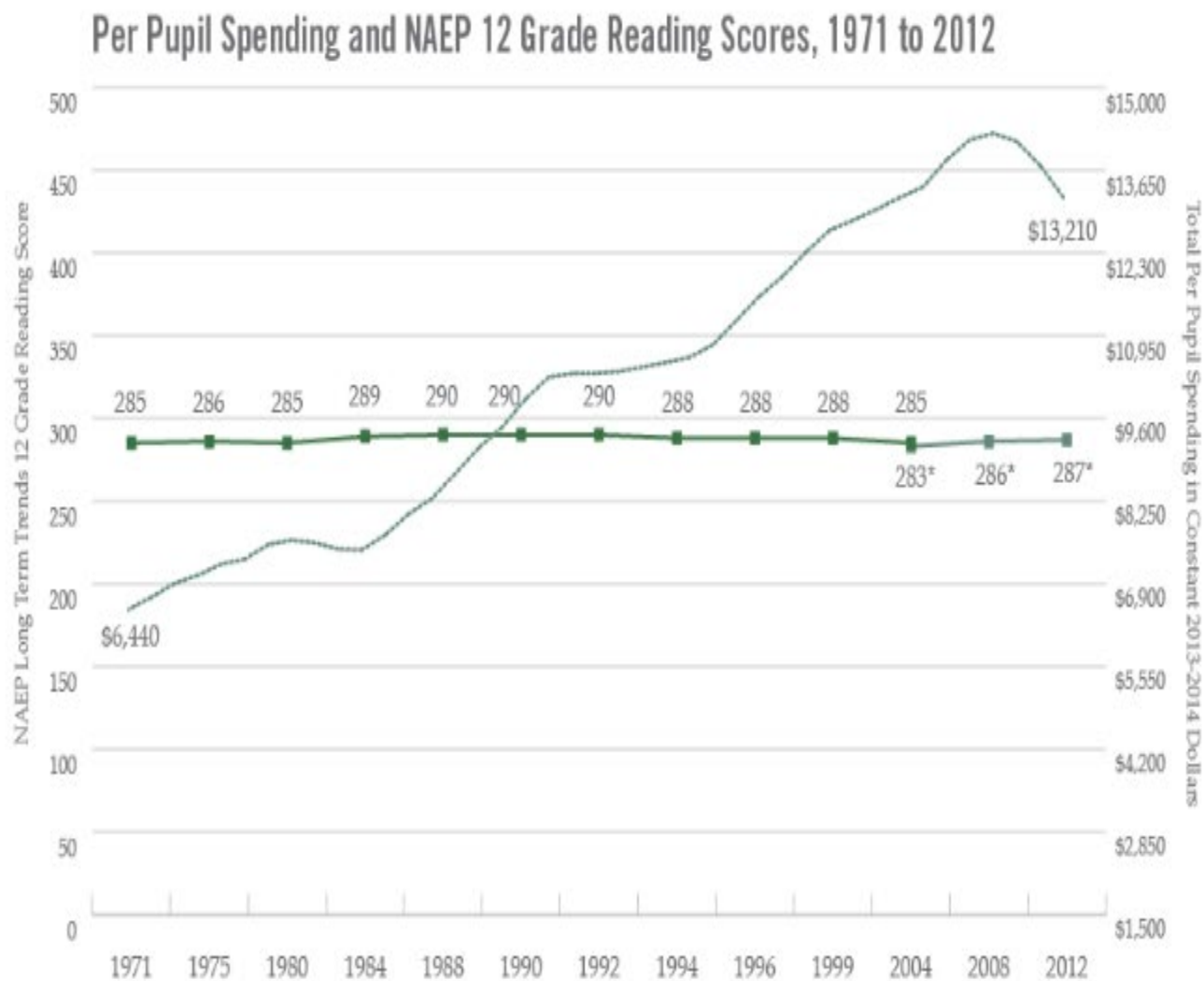


*Revised assessment format

Sources: The Nation's Report Card "NAEP 2012 Long-Term Trends in Academic Progress"; NCES Digest of Education Statistics 2014



What We Spent; What We Got For It



*Revised assessment format

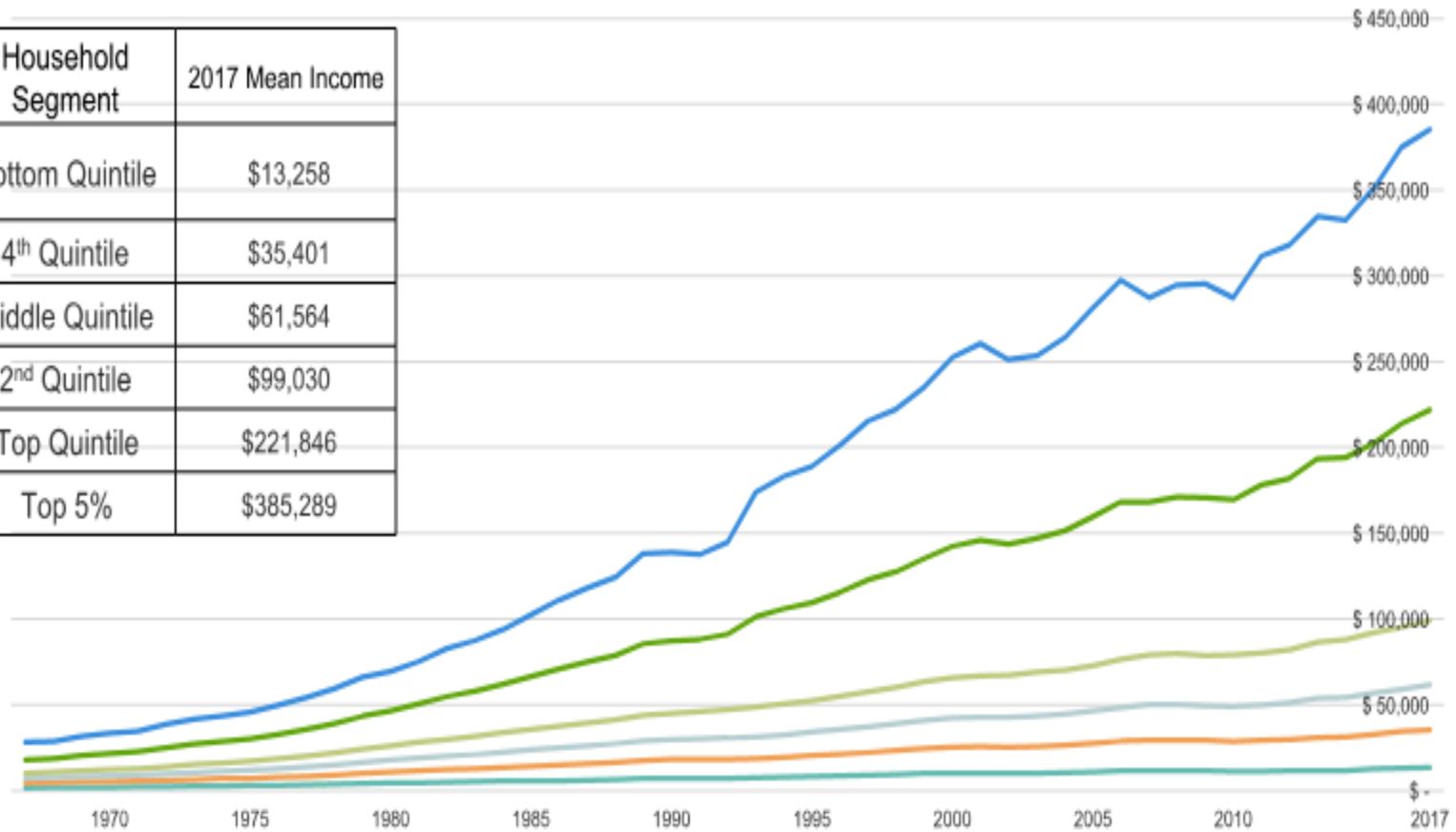
Sources: The Nation's Report Card "NAEP 2012 Long-Term Trends in Academic Progress"; NCES Digest of Education Statistics 2014



Income Distribution: The Last Half Century

Mean (Average) Household Income
by Quintile and Top 5%

Household Segment	2017 Mean Income
Bottom Quintile	\$13,258
4 th Quintile	\$35,401
Middle Quintile	\$61,564
2 nd Quintile	\$99,030
Top Quintile	\$221,846
Top 5%	\$385,289



80s, 90s, and 00s: Global Economic Change



Low wage competition

- Low skill
- High skill
- All skill levels



Automation of jobs involving routine work



Vast extinction of low-skill, routine work jobs in high-wage countries

Bottom line of economic argument...



But it's about much more than economics ...

Morality and ethics

Ability to deal as citizens with a wide range of highly complex existential issues

Much fuller development of those qualities that make us fully human

Ability to interact with a broad range of people all over the globe

Capacity and desire to preserve and defend freedom and democracy



So...What Do Young People Need to Compete in an A.I. World?



Deep understanding of the core concepts underlying the disciplines—the big ideas



Ability to apply those concepts and ideas to wide range of practical problems



Full range of intrapersonal and interpersonal skills



The moral and ethical grounding needed to make wise decisions



How the U.S. Responded

REFORM AGENDA SINCE THE 1970S



More money
(more than
doubled in the
last 20 years)



Lower class
size



School
competition
(charters and
vouchers)



Technology



Tough test-
based
teacher-
accountability
systems



Our Competitors Had a Different Analysis



Rather than modeling their education system on a factory model, they modeled it on a professional working environment



Knew the jobs available to them would rapidly decline



Needed to provide a world-class education to every single student—equitably and efficiently



All of that required a whole new model



Student Learning Results Over Time - Excellence

PISA RESULTS OVER TIME

PISA - % Scoring Proficiency Levels 3+ by Subject and Jurisdiction

	United States			OECD Average			Canada			Singapore		
	Reading	Math	Science	Reading	Math	Science	Reading	Math	Science	Reading	Math	Science
PISA 2009	58.1	52.2		57.2	55.9		69.6	69.8		69.0	77.1	
PISA 2012	58.5	47.9	55.1	58.5	54.4	57.6	69.7	65.2	68.6	73.4	79.5	73.7
PISA 2015	58.1	44.4	54.2	56.7	54.1	54.0	70.3	65.2	68.8	71.9	79.9	75.3
PISA 2018	59.6	48.7	57.8	53.6	53.8	52.2	66.2	62.9	64.1	74.5	81.9	75.9

Data Sources

[Average score data from the PISA Data Explorer](#)

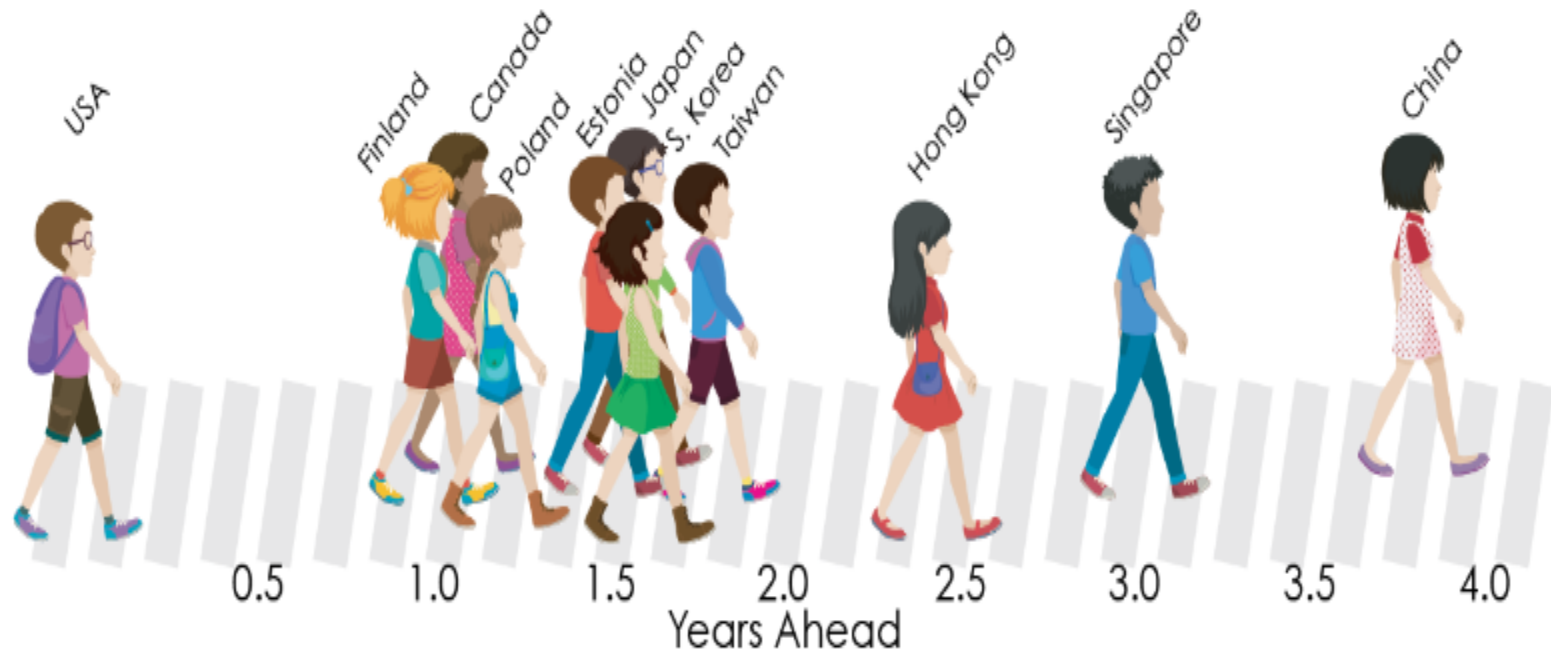
[2012 Massachusetts data from PISA Key Findings](#)

[Participation data from NCES](#)

OECD member country data from PISA reports: [2009](#) [2012](#) [2015](#) [2018](#)

Just How Far Behind?

AVERAGE STUDENT PERFORMANCE IN **MATHEMATICS**, PISA 2018

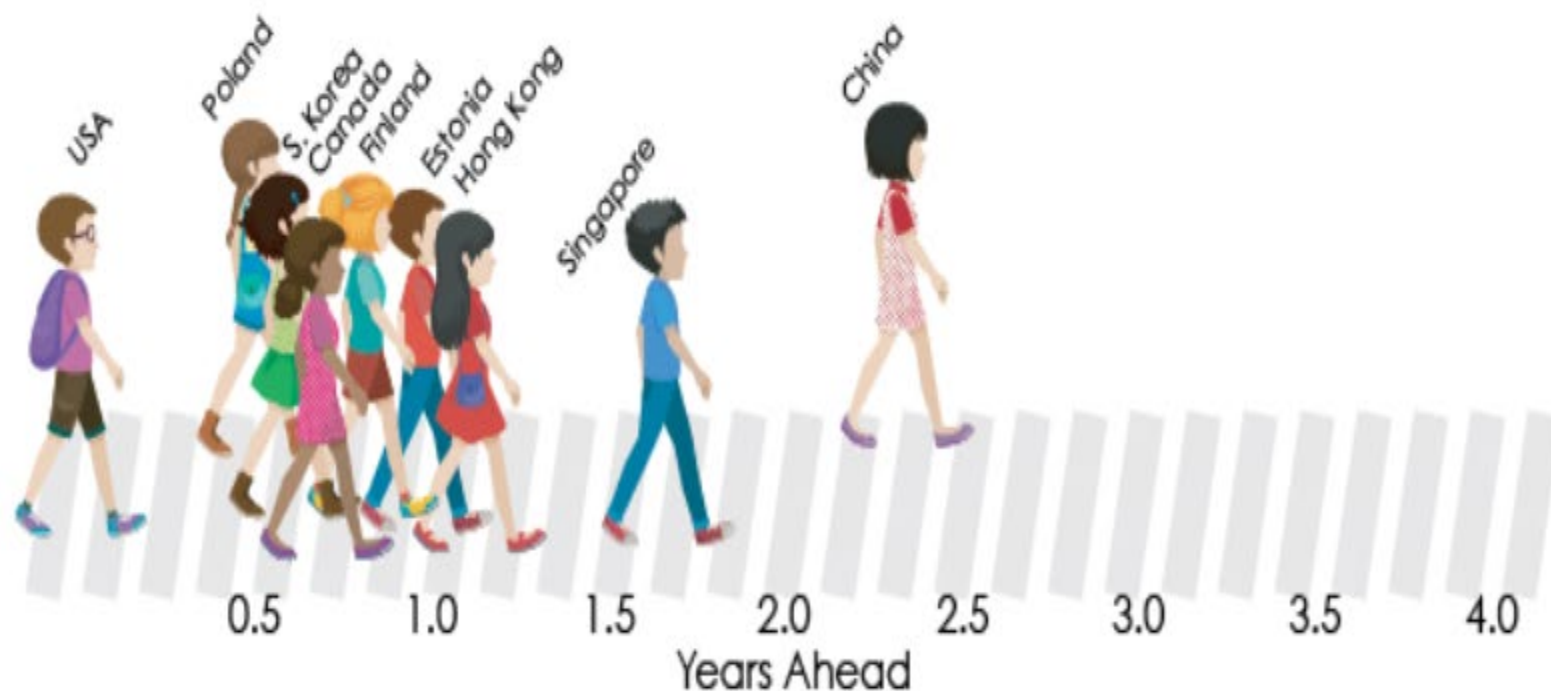


In mathematics performance, average U.S. students are more than a year behind students from the top-performing countries. Students in Hong Kong and Singapore are between 2.5 and 3 full years ahead of average U.S. students in math, while Chinese students are nearly 4 full years ahead of U.S. students.



Just How Far Behind?

LOW-PERFORMING STUDENTS IN READING, PISA 2019



Low-performing students are those in the 25th percentile of performance. In reading, low-performing students from many top-performing countries are around half a year ahead of low-performing U.S. students. Low performers in Singapore are 1.5 years ahead and Chinese low-performing students are almost 3 years ahead of low-performing students in the U.S.



Student Learning Results Over Time - Equity

PISA RESULTS OVER TIME

PISA Equity Metrics

Top Performers = share of those scoring Level 5 or 6 in at least one subject

Low Achievers = share of those scoring below Level 2 in all three subjects

	United States		OECD Average		Canada		Singapore	
	Top Performers	Low Achievers	Top Performers	Low Achievers	Top Performers	Low Achievers	Top Performers	Low Achievers
PISA 2015	13.3%	13.6%	15.3%	13.0%	22.7%	6.4%	39.1%	4.8%
PISA 2018	17.1%	12.6%	15.7%	13.4%	24.1%	5.9%	43.3%	4.1%

Data Sources

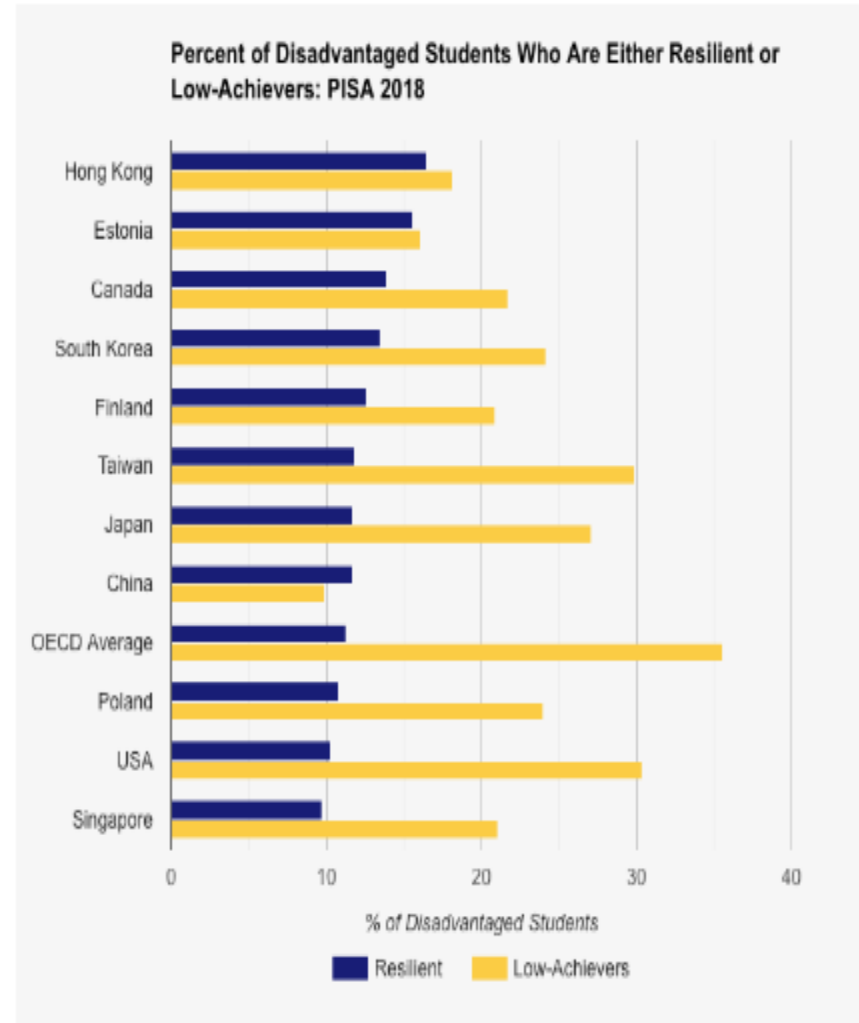
Data source: [OECD, PISA 2018 Executive Summary Table I.1](#)

Data source: [PISA 2015 Results in Focus, Page 5](#)

Measure of Equity: Resilience

This chart shows the percentage of disadvantaged students who perform at the highest levels of achievement on PISA (resilience) compared to those who perform at the lowest levels.

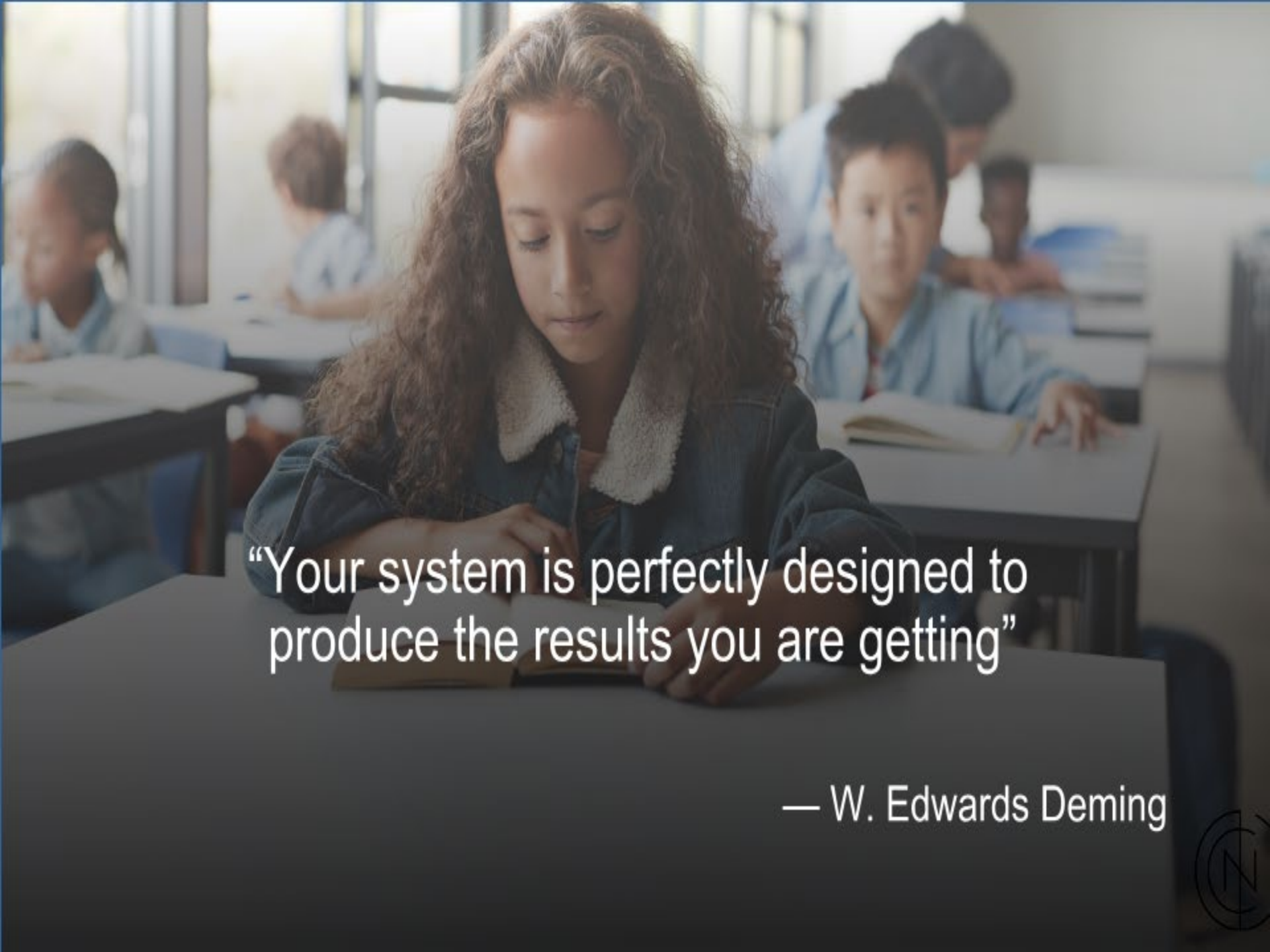
In some countries, disadvantaged students are more likely to perform at higher levels than lower levels.



Interpreting the U.S. Results

- Over **80%** of U.S. students can: ID a main idea, recognize cause and effect, say if conclusions are warranted
- ...But only **60%** can compare distances on roads or convert currencies
- ...Only **14%** can distinguish between fact and opinion
- ...And only **9%** can apply scientific knowledge to unfamiliar situations



A young girl with long, curly brown hair is sitting at a desk in a classroom, focused on writing in a notebook. She is wearing a dark blue denim jacket with a white fur collar. In the background, other students are visible, some working at their desks and others standing, creating a typical classroom environment with large windows in the background.

“Your system is perfectly designed to
produce the results you are getting”

— W. Edwards Deming



Proficiency-Based Learning

PART II

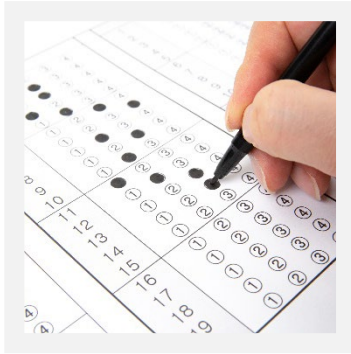


Characteristics of Proficiency/Competency-Based Systems

“Learning outcomes in which learning is constant and time is the variable.”



Students make decisions about learning experiences, how they create and apply knowledge and how they will demonstrate their learning. Student progress is based on evidence of proficiency rather than level of participation, effort or time spent in classroom.



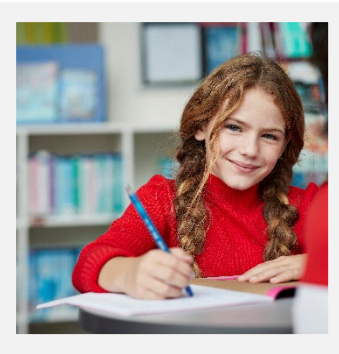
Assessment is meaningful and empowering learning experience of students that yields timely, relevant and actionable feedback.



Students receive relevant, varied instruction and timely, differentiated support based on their individual learning needs. Students learn actively using different pathways and varied pacing.



Strategies ensure equity for all students are embedded in culture, structure and pedagogy of schools and education systems. All students have access to personalized learning opportunities and high-quality instruction.



Learning targets are rigorous, common expectations for learning that clarify what to learn, how to deeply learn it and how to demonstrate evidence of new learning.

FROM

THE KEY SHIFTS
OF COMPETENCY-BASED EDUCATION

TO

1	<ul style="list-style-type: none"> Time is structured by courses with fixed time allocations Students are placed in fixed groups based on age or ability 	SCHEDULING	<ul style="list-style-type: none"> Schedules are modular and flexible Time is structured around competency-based learning outcomes tied to a) specific work products and b) student needs (e.g., intensives, workshops) Schedules allow for personalized, asynchronous learning
2	<ul style="list-style-type: none"> Same age, same page Whole-class lesson plans and delivery, possible "differentiation" of lesson Single classroom configuration, typically print materials and lecture style 	INSTRUCTIONAL DESIGN AND DELIVERY	<ul style="list-style-type: none"> Students working at different places on competency-based learning progressions On-demand instructional decisions based on student needs Learning assets available just-in-time, multiple formats All unit materials are designed to be student-facing Multiple learning configurations across learning spaces
3	<ul style="list-style-type: none"> Assessments of learning Scheduled at same time for all students Traditional testing formats low on Bloom's Taxonomy (recall, comprehension) One opportunity, often punitive 	ASSESSMENT	<ul style="list-style-type: none"> Assessment as learning, for learning, and of learning Assessments available just-in-time Summative are performance-based tasks, requiring application of skills and knowledge Tasks derived from college and career level work Multiple opportunities; revision cycles are central
4	<ul style="list-style-type: none"> Use of grade calculations to sort students Grades typically include behavioral elements (attendance, homework, participation), conflating performance measures and hiding skill/knowledge gaps Expectations for earning a particular grade vary substantially between teachers and schools 	GRADES & REPORTING	<ul style="list-style-type: none"> Transparent and continuous reporting on performance and growth, measured by competency Grades (if necessary) are numerical representations of student performance and/or growth strictly (not conflated by behavioral elements like attendance, participation) Behavioral elements are reported on separately
5	<ul style="list-style-type: none"> Quarterly and/or annual grade reports Crediting and advancement is based on seat-time and "passing" grade Undefined expectations for what skills/knowledge are required for earning credit 	PROMOTION & CREDITING	<ul style="list-style-type: none"> Crediting of competencies or competency bundles upon achieving a specific performance level (can be mapped to traditional courses) Student advancement based on demonstrations of mastery, not seat-time Portfolios help quantify the body of evidence required for showing mastery

Created by Sydney Schaefer (2015)

Source:
Aurora Institute
CompetencyWorks

Field Updates Definition in 2019

Source: Aurora Institute

<https://aurora-institute.org/wp-content/uploads/what-is-competency-based-education-an-updated-definition-web.pdf>

- ❑ Students are empowered daily to make important decisions about their learning experiences, how they will create and apply knowledge, and how they will demonstrate their learning.
- ❑ Assessment is a meaningful, positive, and empowering learning experience for students that yields timely, relevant, and actionable evidence.
- ❑ Students receive timely, differentiated support based on their individual learning needs.
- ❑ Students progress based on evidence of mastery, not seat time.
- ❑ Students learn actively using different pathways and varied pacing.
- ❑ Strategies to ensure equity for all students are embedded in the culture, structure, and pedagogy of schools and education systems.
- ❑ Rigorous, common expectations for learning (knowledge, skills, and dispositions) are explicit, transparent, measurable, and transferable.

Assessment & Measurement Issues

Ü Externally benchmarked and graded exams

Ü Standard set by content and psychometric experts

Ü Transparent exams

Ü Flexible timing of administration of exams



Ways in Which Schools Change

Ü Length of "courses"

Ü The speed at which students progress

Ü Addressing learning gaps early

Ü Student discipline issues decrease

Ü Parental engagement increases

Ü Teacher retention

Teacher Retention Rates for Imagine Prep Surprise

93%

teacher retention over last 5 years

76%

staff retention over last 5 years

>20%

staff have been there for 10+ years



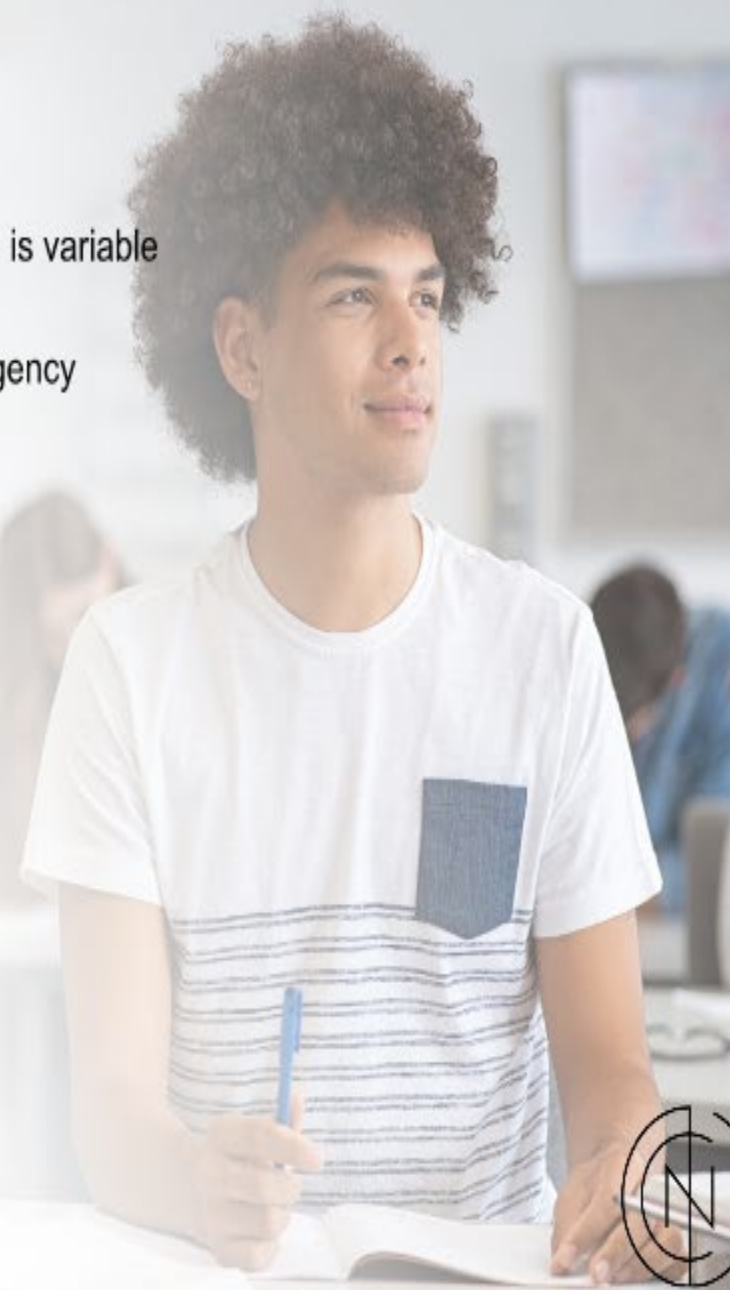
Ways in Mindsets Change

Ü Standard does not change, but the time it takes to meet the standard is variable

Ü Students are not labeled a failure, which drives metacognition and agency

Ü Relationships between teachers and students change

Ü Teachers have the tools they need to work like professionals





Transforming the Teacher Profession

PART 3



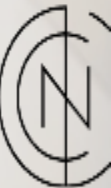
A Professional Work Environment for Teachers

Imagine a school where, teachers have time & opportunities to:



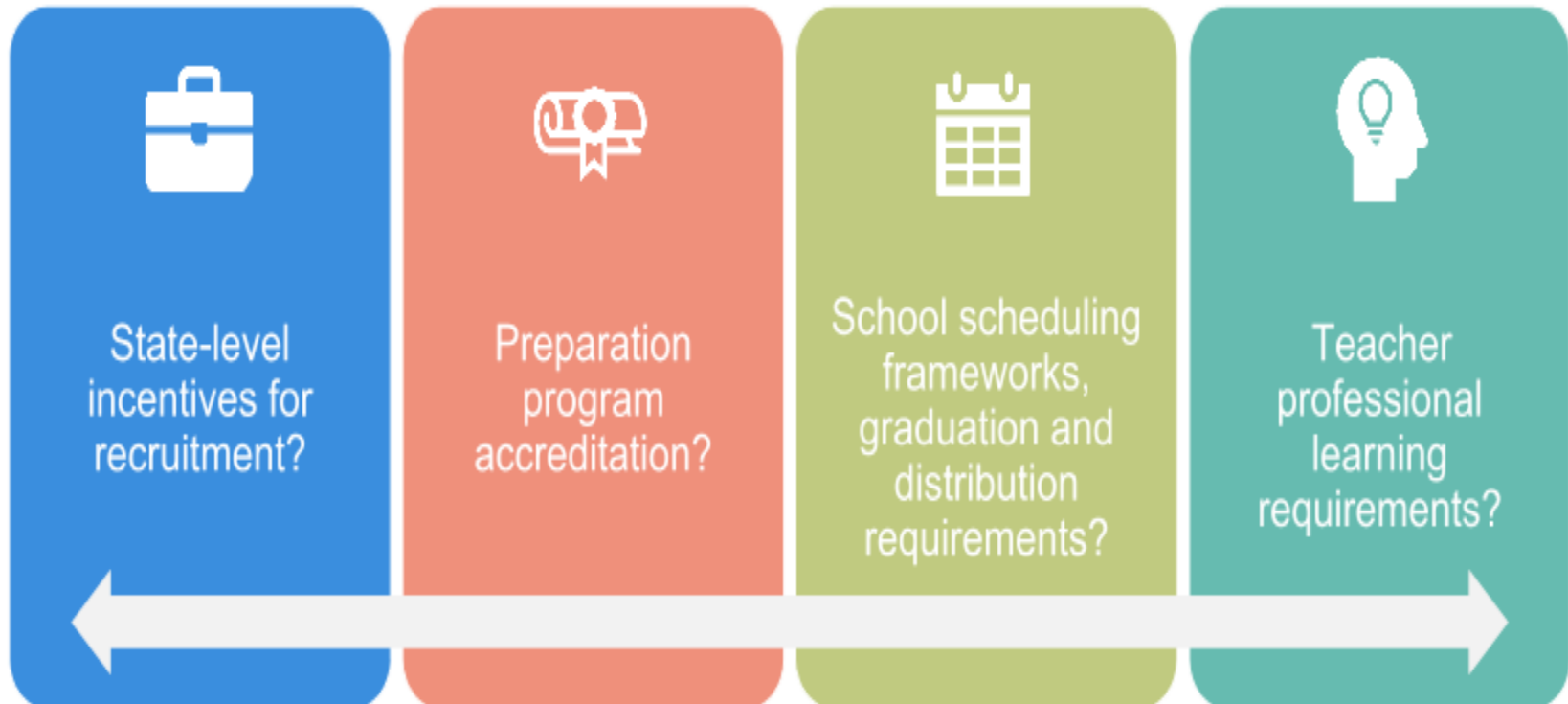
Current Redesign Efforts in CA & MS

- Career progression that allows teachers to stay in the classroom
- Increased compensation with advancement up the ladder
- Best teachers mentor and coach newer or struggling teachers
- Both afforded time to work with mentors/mentees
- Time dedicated to collaborative lesson planning, peer observation, debrief, 1-on-1 and small group intervention, parental engagement
- Addresses both induction and leadership development
- Supportive and evaluative



A Professional Work Environment for Teachers

What are the levers policymakers can use to promote that kind of professional work environment, including:





NCSL 50-State Searchable Tracking Databases

Education Program Tracking Database

<https://www.ncsl.org/research/education/education-bill-tracking-database.aspx>

- At least 316 enactments in 2022 in every state

Shortage Area Information by Year

Use the filters on the left to view state level shortage information by year, grade level, and/or subject area.
 Hover over states on the map to view subject area and location (e.g., statewide, regional, countywide, or district) information.

Introduction

Shortage Area
Information by Year

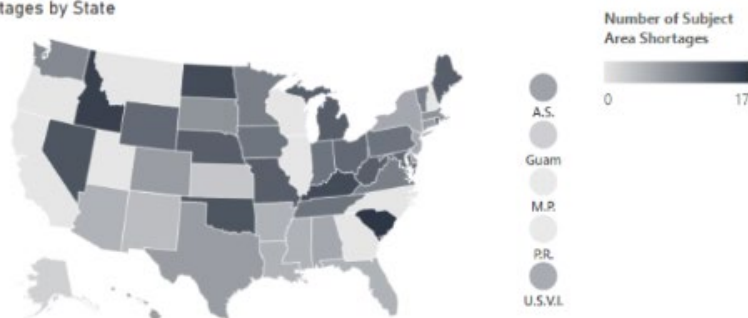
State Level Shortage
Trends

School Year
 2022-2023

Subject Area
 All

Grade Level
 All

Shortages by State



State	Location of Shortage	Subject Area	Grade Levels
Idaho	Statewide	Academically Advanced	Elementary School Grades, Middle School Grades, High School Grades
Iowa	Statewide	Academically Advanced	Early Childhood Grades, Elementary School Grades, Middle School Grades, High School Grades
Kansas	Statewide	Academically Advanced	Early Childhood Grades, Elementary School Grades, Middle School Grades, High School Grades
Kentucky	Regional	Academically Advanced	Early Childhood Grades, Elementary School Grades, Middle School Grades, High School Grades
Maine	Statewide	Academically Advanced	Early Childhood Grades, Elementary School Grades, Middle School Grades, High School Grades
Missouri	Statewide	Academically Advanced	Elementary School Grades, Middle School Grades, High School Grades
Oklahoma	Statewide	Academically Advanced	Early Childhood Grades, Elementary School Grades, Middle School Grades, High School Grades
South Carolina	Statewide	Academically Advanced	Elementary School Grades, Middle School Grades, High School Grades
Idaho	Statewide	Administrative	Early Childhood Grades, Elementary School Grades, Middle School Grades, High School Grades
North Dakota	Statewide	Administrative	Elementary School Grades, Middle School Grades, High School Grades
North Dakota	Statewide	Administrative	Elementary School Grades, Middle School Grades
North Dakota	Statewide	Administrative	Middle School Grades

NCSL Web Resource: <https://www.ncsl.org/research/education/teacher-shortage-areas-by-state.aspx>

State Level Shortage Trends

Use the state filter to view shortage area data over time for individual states or territories.

Introduction

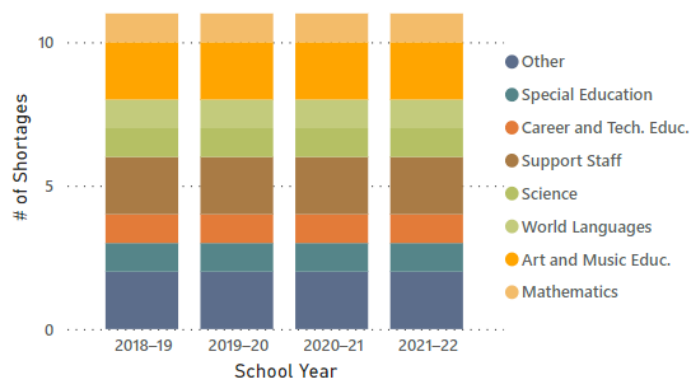
Shortage Area
Information by Year

State Level Shortage
Trends

State

Montana

Shortages by Subject Area and Year



Shortages by Location Type and Year



State	School Year	Subject Area	Discipline	Location of Shortage	Region, County, or School District	Grade Levels
Montana	2018-2019	Art and Music Education	Art	Statewide	Statewide	Grade Level Not Specified
Montana	2018-2019	Art and Music Education	Music	Statewide	Statewide	Grade Level Not Specified
Montana	2018-2019	Special Education		Statewide	Statewide	Grade Level Not Specified
Montana	2018-2019	Support Staff	Counseling	Statewide	Statewide	Grade Level Not Specified
Montana	2018-2019	Support Staff	Library/Media Specialist	Statewide	Statewide	Grade Level Not Specified
Montana	2018-2019	Career and Technical Education		Statewide	Statewide	High School Grades
Montana	2018-2019	Language Arts	English	Statewide	Statewide	Middle School Grades, High School Grades
Montana	2018-2019	Mathematics		Statewide	Statewide	Middle School Grades, High School Grades
Montana	2018-2019	Science		Statewide	Statewide	Middle School Grades, High School Grades

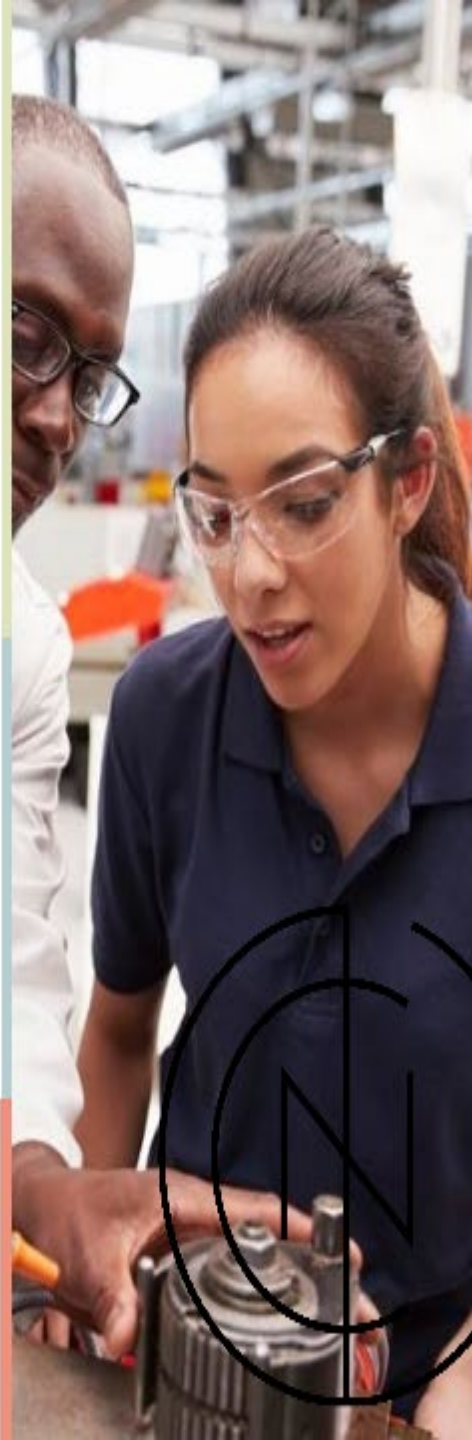
New Mexico Making Progress



- Long-time Partnership with Teacher Preparation Programs
- Tiered-licensure System with Performance Evals for nearly 20 years
- Cultural Competency and Diverse Teachers – 2022 HB 60
- Grow-Your-Own Scholarship - 2021 HB 22
- Teacher Salaries - \$10k raise – 2022 SB 1
- Teacher Residencies - 2022 HB 13
- Recruiting Retired Teachers – 2022 HB 73
- Teacher Prep/PD on Science of Reading in 2023

Career and Technical Education

PART 4



Switzerland Youth Apprenticeship

- Ü 70% Swiss high school students enroll in apprenticeships starting in grade 10
- Ü Employers set the standards, commit to training students in their workplaces, and assess their learning
- Ü Combines school-based learning with paid work hosted by employer
- Ü Three-to-four-year learning experience resulting in nationally recognized credential
- Ü Graduates can access further education in an academic or applied university



Finland Vocational Education and Training

Ü Over 40% of Finnish students participate in upper secondary VET

Ü Academic and VET programs have a common academic core so all students can access further education/university (no dead ends)

Ü Recent efforts have made VET more flexible to encourage greater participation and improve completion rates

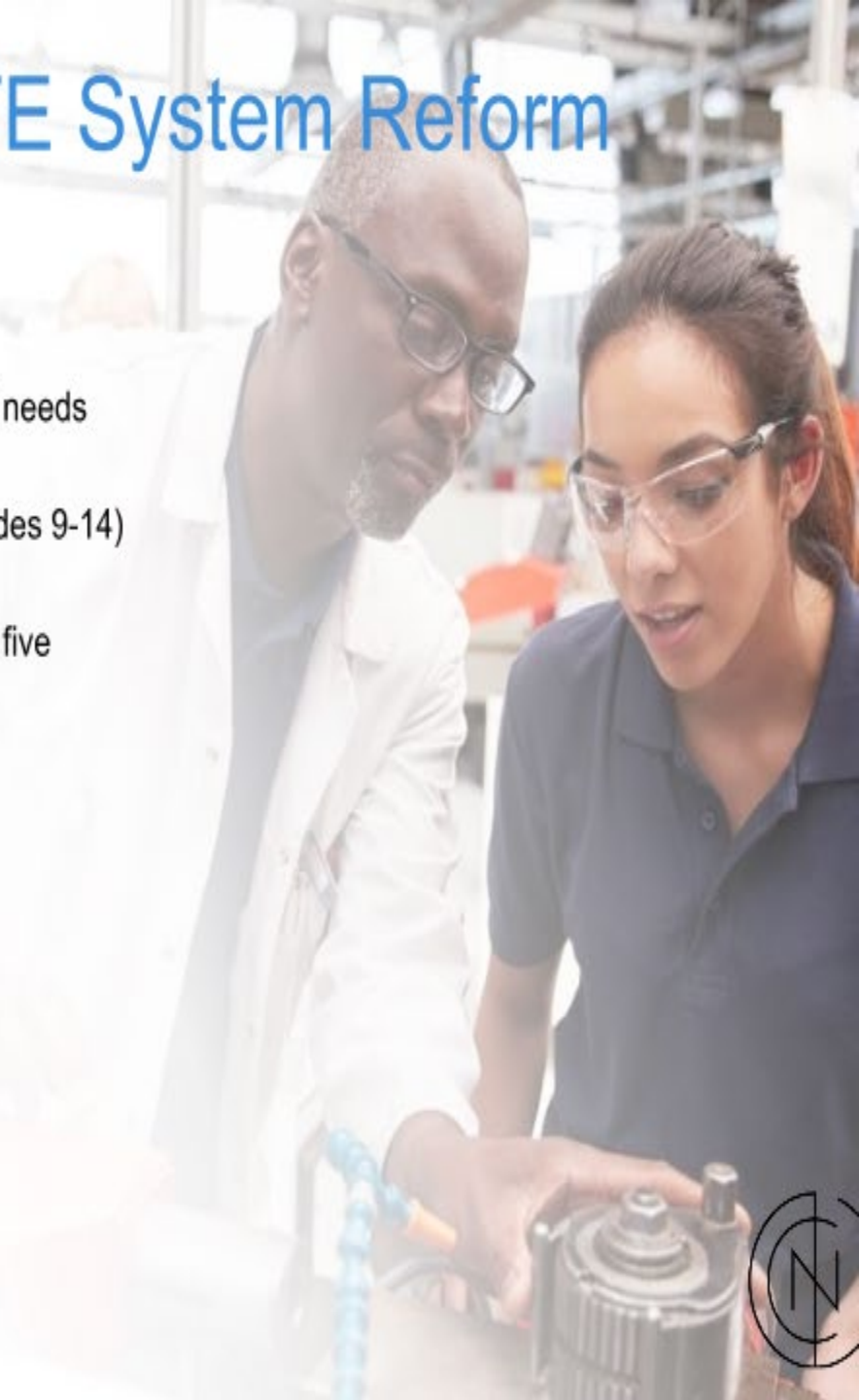
- Modular units of study allow for specialization depending on student interest
- Flexible applied learning delivery options: online, in school, in workplace



Notable US Example: CTE System Reform

DELAWARE PATHWAYS

- Ü Aligned CTE program areas to state economic development needs
- Ü 24 career pathways that extend into community college (grades 9-14)
- Ü Expanded CTE participation – from 10% of HS students just five years ago to more than 50% today and growing
- Ü Delaware Tech (community college) coordinates employer involvement and organizes work-based learning



Notable US Example: CTE System Reform

DELAWARE PATHWAYS

- Ü Brings together employers and school districts
- Ü Youth apprenticeship programs (grades 11-13) based on Swiss model
- Ü Multiple occupations within in-demand industries – advanced manufacturing, healthcare, IT, hospitality, financial services, education
- Ü Currently in CO, DC and communities in IN, NY and PA and expanding nationally



Challenges for Rural Areas Offering CTE

Challenge: Providing all students with substantive work-based learning experiences

Possible solutions:



Virtual options



School-based businesses (serving the school or the surrounding community)



Provide different kinds of WBL experiences within one business



Simulated workplaces

Challenge: Offering a robust mix of CTE options with a small teaching staff

Possible solutions:



Share CTE classes (in person or virtual) across schools/districts



Partner with community colleges to provide technical programming





CareerWise Colorado

NCSL Webinar: <https://www.ncsl.org/research/education/careerwise-colorado-youth-apprenticeship-inspired-by-swiss-vet.aspx>

Indiana Making Progress



- Coordinated Statewide Effort Led by Legislature, Gov, Dept of Education and Workforce Boards
- Graduation Pathways to Ensure College and Career Readiness
- Increased Allowed Assessments for Graduation
- Partnership with Ivy Tech Community Colleges for HS Students
- Partnership with Industry
- Investment from Local Philanthropy
- Studied Swiss Model (Basis for Apprenticeships)
- Created Apprenticeships in Shortage Industries

Early Childhood Education

PART 5



Early Childhood Education and Care



Goal: to ensure a strong foundation for learning

Components:

Ü comprehensive health and social services for families with young children

Ü parenting supports for new and expectant families

Ü high quality and affordable childcare for those families that need it

Ü high quality preschool aligned to K-12

Ü foundational literacy and numeracy



Example: supports for families with young children

Maryland's Patty Centers are a regional network that provide:

- ü parenting support and programming for families with young children
- ü access to needed social, health and job training services for families with young children
- ü information about and referrals to childcare providers in the region
- ü professional development and support for childcare providers in the region

They:

- ü serve all families in the region
- ü are being expanded from 24 to 54 in the state, with priority given to high need communities



Derry Area SD Early Childhood Support

- Ü Developed via a federal Striving Readers grant but has continued through partnerships, particularly with the United Way
- Ü Welcome Baby Package & Imagine Library
- Ü Infant, Toddler & Preschool Storytime
- Ü Teaching Tiny Trojans kindergarten readiness program
- Ü Kindergarten readiness screener
- Ü **Kindergarten readiness tripled** from about 25% to 75% by the end of the initial five-year grant period

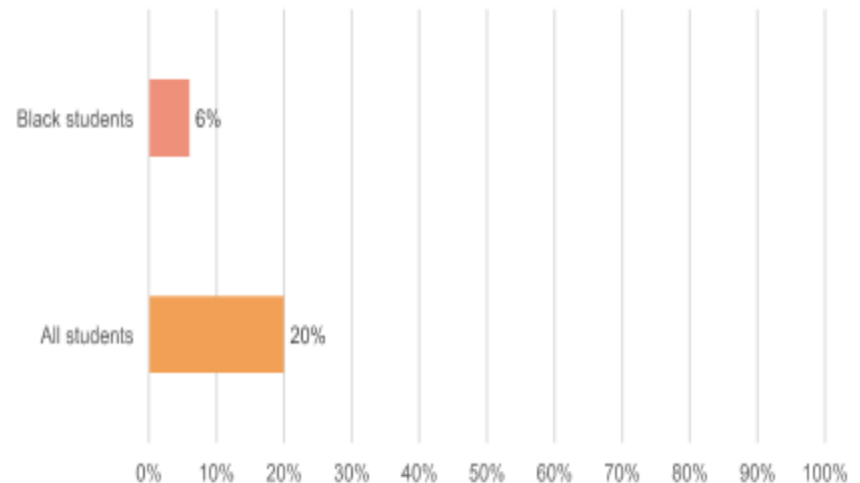


Racine USD Early Reading Initiative

Analysis revealed the problem was systemic:

- ü Poor curriculum alignment & coherence
- ü Limited teacher professional learning
- ü Lack of clarity about roles & responsibilities
- ü Poor monitoring of student growth
- ü Lack of coordination between programs
- ü Competing priorities

3rd Grade Students Who Were On Level for Reading in 2019



Strategy

- ü Adopt a coherent approach based on science of reading and with culturally responsive reading materials
- ü Focus on K & 1 in 2021-22 (add grade 2 then 3 in subsequent years)
- ü Establish a common, instructionally-sensitive measure for monitoring student growth
- ü Clearly establish school leadership responsibility for instruction, supported by other district roles and resources
- ü Prioritize resources to support this initiative



Year 1 Results for Grade 1 by School

DISTRIBUTION ACROSS PERFORMANCE CATEGORIES (SEPT TO MAY) BY SCHOOL

	Sept					May					SEPT Greens	May Greens	Net Change
	Urgent	Needs Focused Instruction	Making Good Progress	Proficiency	Total	Urgent	Needs Focused Instruction	Making Good Progress	Proficiency	Total			
Adams	91%	0%	0%	9%	35	57%	9%	16%	18%	44	9%	35%	25%
Adams	95%	0%	0%	5%	37	44%	6%	22%	28%	36	5%	50%	45%
Adams	93%	4%	0%	4%	28	64%	11%	9%	17%	47	4%	26%	22%
Adams	90%	3%	3%	5%	40	63%	6%	11%	20%	35	8%	31%	24%
Adams	71%	12%	6%	12%	52	42%	14%	12%	32%	38	3%	40%	37%
Adams	92%	0%	8%	0%	13	64%	12%	8%	16%	25	8%	24%	16%
Adams	91%	3%	3%	3%	65	75%	3%	9%	14%	74	6%	23%	17%
Adams	94%	3%	0%	3%	32	61%	0%	8%	32%	38	3%	40%	37%
Adams	68%	10%	10%	13%	31	58%	65	9%	27%	33	23%	36%	13%
Adams	85%	2%	4%	9%	54	48%	12%	13%	27%	60	13%	40%	27%
Adams	75%	2%	7%	17%	60	26%	11%	15%	48%	65	23%	63%	40%
Adams	73%	0%	0%	27%	11	69%	6%	6%	20%	35	27%	26%	-1%
Adams	97%	3%	0%	0%	35	79%	6%	15%	0%	34	0%	15%	15%
Adams	46%	13%	22%	20%	96	35%	15%	11%	39%	92	42%	50%	8%
Adams	100%	0%	0%	0%	30	50%	11%	18%	21%	28	0%	39%	39%
Adams	82%	4%	8%	6%	50	26%	6%	6%	62%	50	14%	68%	54%
Adams	73%	0%	4%	23%	26	43%	0%	20%	37%	51	27%	57%	30%
Adams	68%	9%	9%	14%	44	21%	5%	12%	63%	43	23%	75%	52%

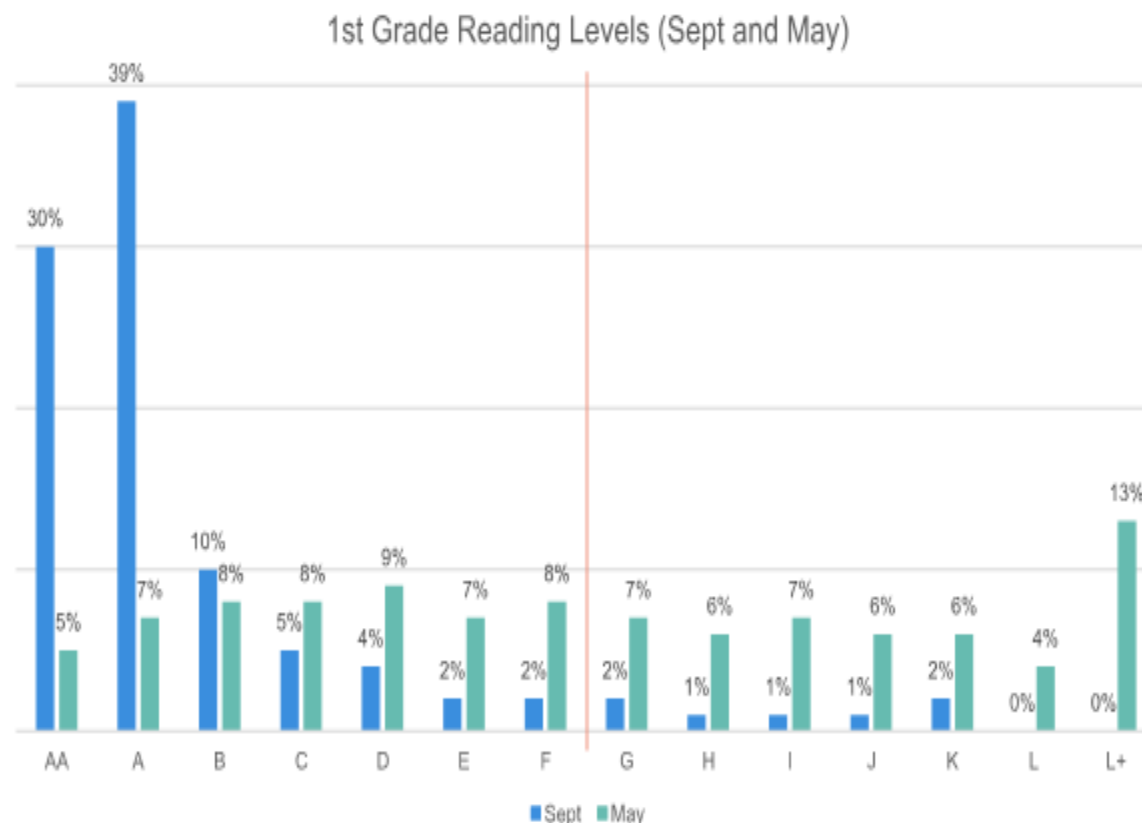
This shows each school's overall gains in achievement from September to May. This data includes monolingual and dual language.

These results generally follow expectations about students' performance in the various schools. However, note Roosevelt, for example, where no students were making good progress toward the goal in September, but 39% had reached or exceeded the goal by May.



Year 1 Results for Grade 1

GROWTH BY STUDENT BASED ON A MATCHED SAMPLE



This chart reflects the reading levels for a *matched sample* of 1st graders with both a Sept. and May data point. The September distribution is in blue and the May distribution is in teal. The vertical red line reflects the 2021-2022 goal of G or higher.

Whereas almost 4 in 5 students began the year barely beginning to read, almost half finished the year meeting or exceeding their reading goal.





NCSL 50-State Searchable Tracking Databases

Early Education Enactment Database

<https://www.ncsl.org/research/human-services/early-care-and-education-bill-tracking.aspx>

- At least 134 enactments in 37 states in 2022

Overview of Early Education and Care Policy

<https://www.ncsl.org/research/human-services/early-childhood-101.aspx>

The Path Forward

NEXT STEPS

