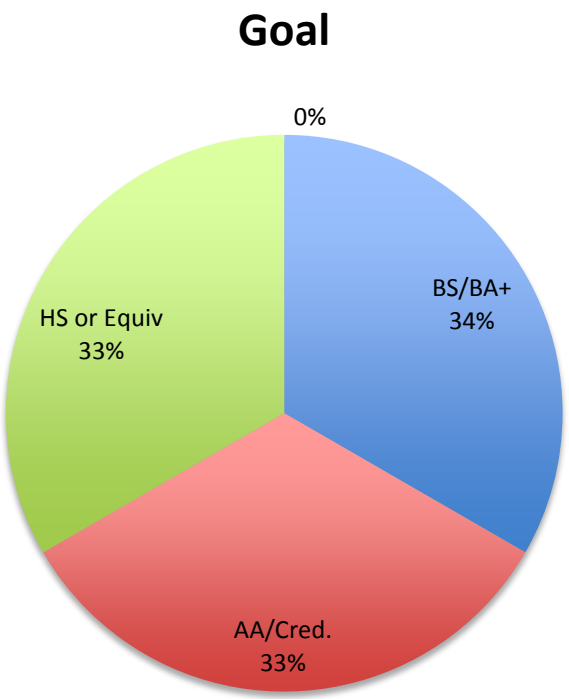
A Partnership Approach to Improvement in K-14 STEM Learning

Larry Flick, dean of Education
Erin Prince, superintendent Corvallis Schools

SB 253 (2011)

Governor: "The mission of education … includes achievement of the following by 2025:"



- **40%** of adult Oregonians will have earned a bachelor's degree or higher (now **30%**)
- **40%** of adult Oregonians will have earned an associate's degree or postsecondary credential (now **18%**)
- **20%** of all adult Oregonians have earned at least a high school diploma, an extended or modified diploma, or the equivalent of a diploma (now **42%**)

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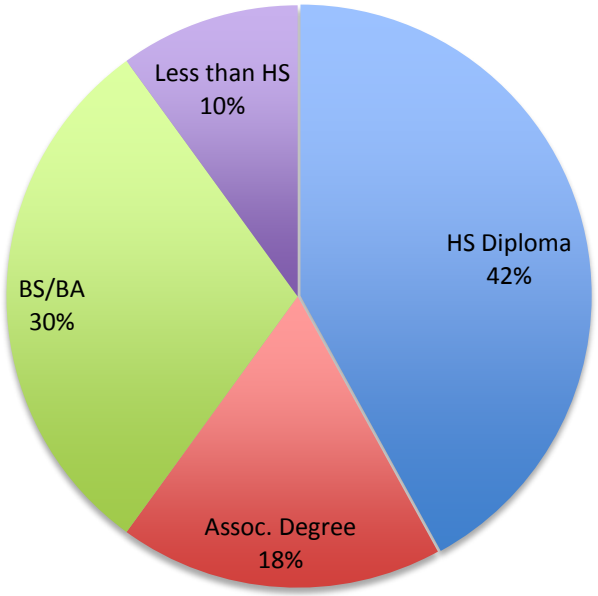
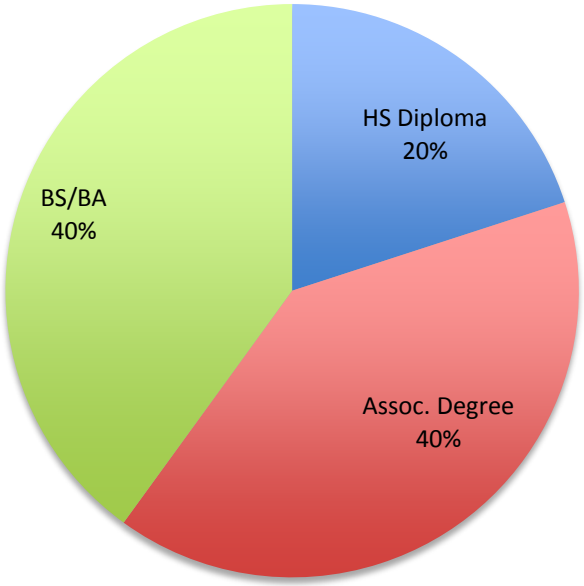
Governor: "The mission of education … includes achievement of the following by 2025:"

Workforce (2011)



GOAL



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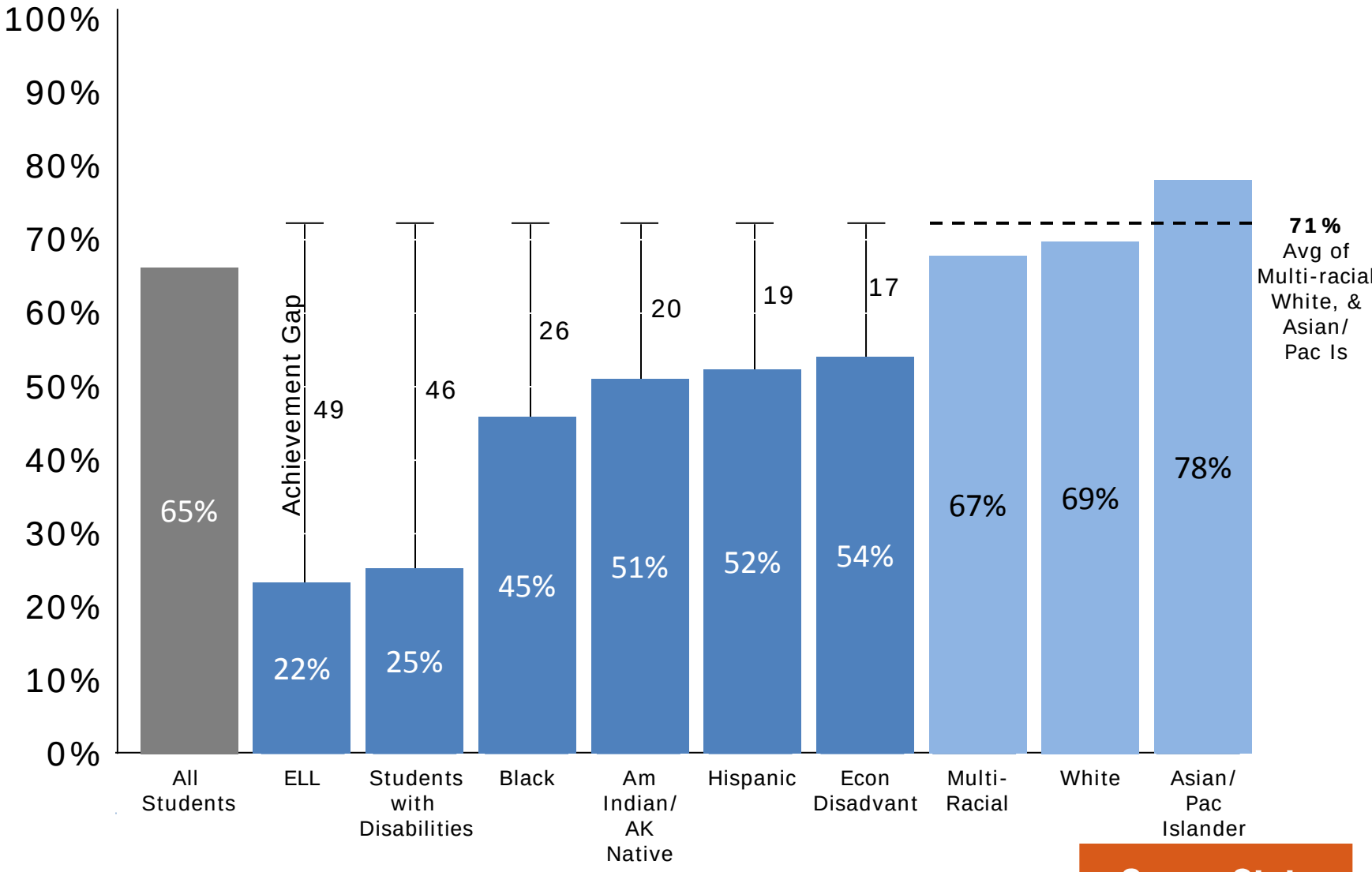
Percent of students who met/exceeded benchmark (8th Grade Math, 2011-12)



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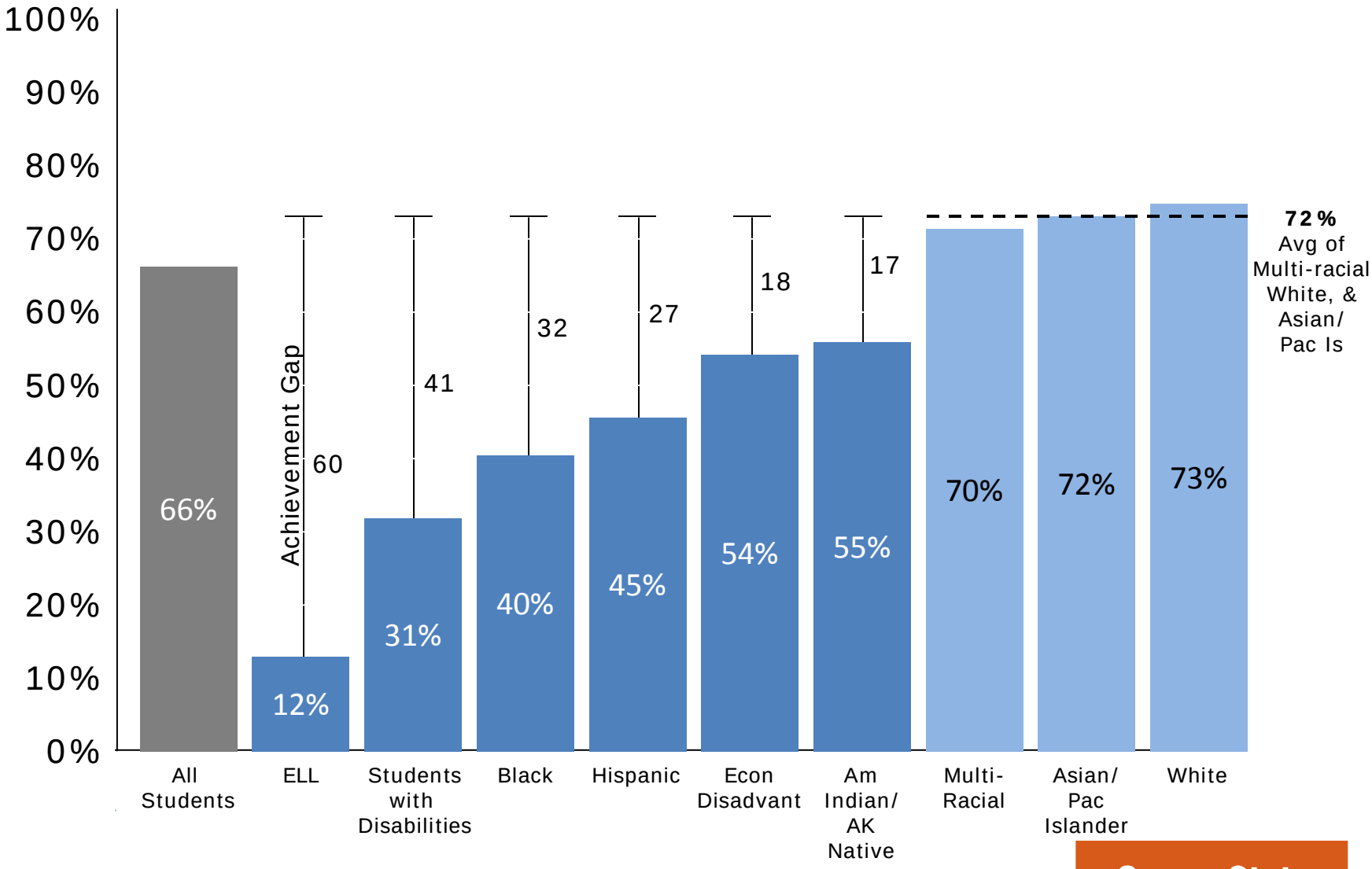
Percent of students who met/exceeded benchmark (8th Grade Science, 2011-12)



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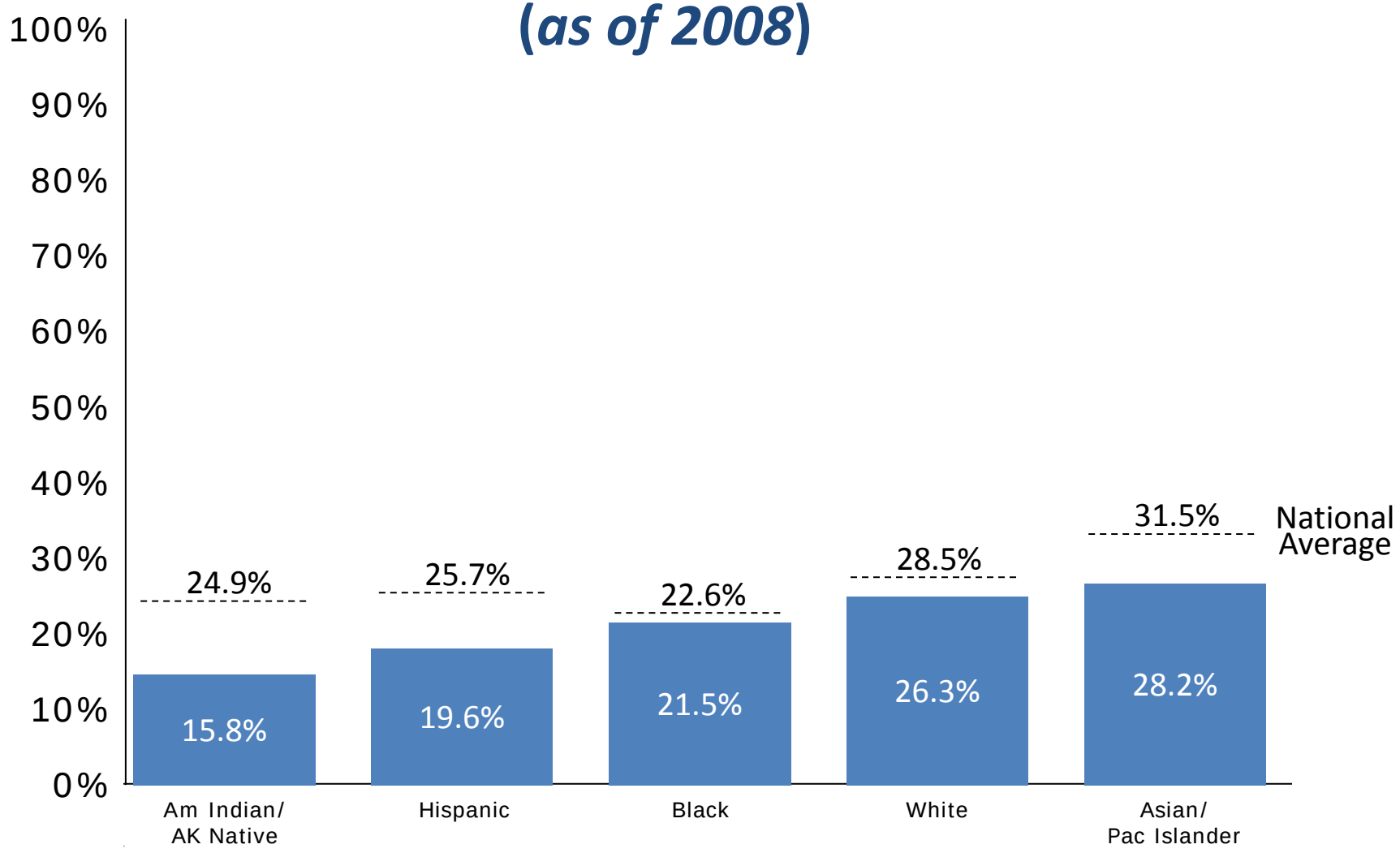
Oregon Three-Year Graduation Rates at Two-Year Colleges (*as of 2008*)



Source: Lee, Edwards, Menson, Rawls, "The College Completion Agenda 2011 Progress Report", CollegeBoard, Advocacy & Policy Center.

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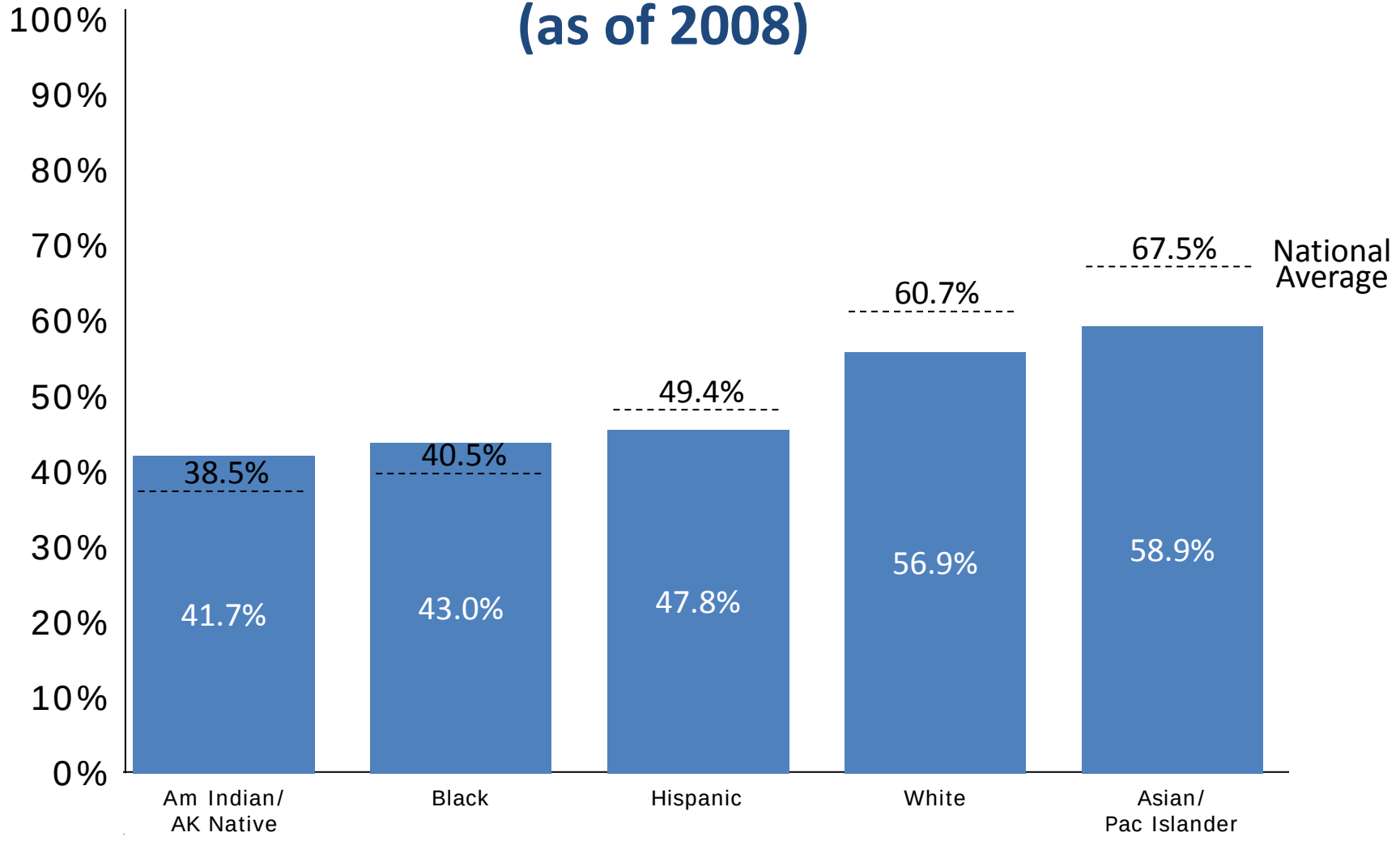
Oregon Six-Year Graduation Rates at Four-Year Colleges (as of 2008)



Source: Lee, Edwards, Menson, Rawls, "The College Completion Agenda 2011 Progress Report", CollegeBoard, Advocacy & Policy Center.

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America's Best-Educated and Worst-Educated States

STATE	BACHELORS DEGREE OR HIGHER	MEDIAN HOUSEHOLD INCOME	BELOW POVERTY LEVEL	
MA	39.10%	$62,859	11.60%	
MD	36.90%	$70,004	10.10%	
CO	36.70%	$55,387	13.50%	
CT	36.20%	$65,753	10.90%	Best
VT	35.40%	$52,776	11.50%	
NJ	35.30%	$67,458	10.40%	
VA	35.10%	$61,882	11.50%	
NH	33.40%	$62,647	8.80%	
NY	32.90%	$55,246	16.00%	
MN	32.40%	$56,954	11.90%	
OR	28.70%	$46,816	17.50%	
OK	23.80%	$43,225	17.20%	
TN	23.60%	$41,693	18.30%	
IN	23.00%	$46,438	16.00%	
NV	22.50%	$48,927	15.90%	
AL	22.30%	$41,415	19.00%	Worst
LA	21.10%	$41,734	20.40%	
KY	21.10%	$41,141	19.10%	
AR	20.30%	$38,758	19.50%	
MS	19.80%	$36,919	22.60%	
WV	18.50%	$38,482	18.60%	

The 24/7 Wall Street Newsletter http://247wallst.com/2012/10/15/164232/

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Preparation for Post-Secondary Education

While many students have ambitions beyond high school, they too often find they are not adequately prepared to successfully enroll in or complete postsecondary aspirations, and the growing achievement gap between students of color, living in poverty and whose first language is not English, and white students is unacceptable.

- The high school graduation rate is **68.5%**

- Four-Year cohort graduation rates for **students in poverty is 61%**
- Students with **limited English Proficiency is 49%**
- **African American, Native American, and Hispanic American students is < 60%**

- The loss of earning from students who did not graduate from Oregon high schools in 2010 is estimated at $3.1billion.

Guidance & Support for Post-Secondary Aspirations

Far too many students enter two- and four-year postsecondary institutions unprepared for college-level coursework.

40% of Oregon's students in two-year colleges

13% of Oregon's students in four-year colleges

…require remediation in math and/or English before starting college

State Board of Education – Oregon Department of Education. 2007 Oregon's New Diploma. www.ode.state.or.us/stateboard/decisionpaper-final-april-29-2007.doc

Connecting to the World of Work

Available jobs in Oregon require an increasing amount of skill and training in Science, Technology, Engineering, and Math (STEM), as well as specific training tied to industry needs, but schools are limited in their ability to provide the essential STEM education.

- **There are 1.7 STEM jobs for every unemployed Oregonian**
- **There are 4.3 unemployed people vying for every one non-STEM job.**
- **Fewer than 10 percent of college degrees awarded in Oregon are in STEM fields**

Oregon STEM Employer Coalition

40 prominent business and education leaders expressed the urgency to elevate science, technology, engineering, and mathematics (STEM) education throughout Oregon's P20 education system.

The STEM Coalition's mission is to mobilize private sector leaders to advocate for actions by Oregon's public, private and non-profit institutions to achieve the following STEM goals:

By 2025, double the percentage of Oregon's 4th, 8th, and 12th graders that are "proficient" and "advanced" as measured by the NAEP.

By 2025, double the number of Oregon STEM graduates.

To reach 40-40-20, we must invest in our educator workforce

While there might be disagreement about the most effective ways to measure and develop effectiveness, educators and policymakers generally agree that ensuring that teachers are capable of improving student learning—and that school leaders are able to help them do so—is perhaps the most significant step they can take to raise student achievement.

Dr. Linda Darling Hammond
Teacher Leader Effectiveness Report

2011 Alliance for Excellent Education and Stanford Center for Opportunity Policy in Education.

Quality Teaching and Learning Network

Support best practices and disseminate evidence-based models across the state that:

- Strengthen and ***connect educator preparation programs***
- Recruit & license high-ability and culturally diverse teachers to work in ***high-need communities and high-need fields***
- ***Coordinate induction and mentoring*** of new teachers and administrators
- Support development and ***implementation of standards-based curriculum, high leverage practices, and assessments*** that promote student learning and improve outcomes for English language learners and students with disabilities

Regional Achievement Collaboratives

- Oregon modestly investing in 11 regional collaboratives to focus on P20 student success
- Measure the value of state resources against regional models
- To transition away from institutional silos and build a statewide culture of collaboration
- To shift focus away from punitive accountability toward support and shared responsibility

Mid-Valley Mid-Coast Partnership

- President, Oregon State University
- President, Linn Benton Community College
- President, Oregon Coast Community College
- Dean of Education, Oregon State University
- Superintendent, Corvallis Schools
- Superintendent, Greater Albany Schools
- Superintendent, Philomath Schools
- Superintendent, Lebanon Community Schools
- Superintendent, Lincoln County Schools
- Superintendent, Linn Benton Lincoln ESD

The Mid-Valley Mid-Coast Partnership has 10-year history of productive work

- **Conducted a longitudinal study of math performance leading to entrance into OSU**
- **Developed a high school pathway to achieve diploma and AA in five years**
- **Created an education track for community college transfers to OSU so that they can receive an AA on their path to a BA/BS**

Starting Point
for Our Regional Achievement Collaborative

- **Student performance in mathematics is lynchpin for P20 student success**
- **The Common Core State Standards in Math pose world-class standards for US students & teachers**
- **OSU Education researchers working with a small group of Corvallis teachers applying research to instruction**

Profile of the Partnership

- Represents over 40,000 students
- 6,000 enrolled in Linn-Benton CC
- Land area of region 4200 sq. miles

Comparison with Milwaukee

- 78,500 students
- Land area 100 sq. miles

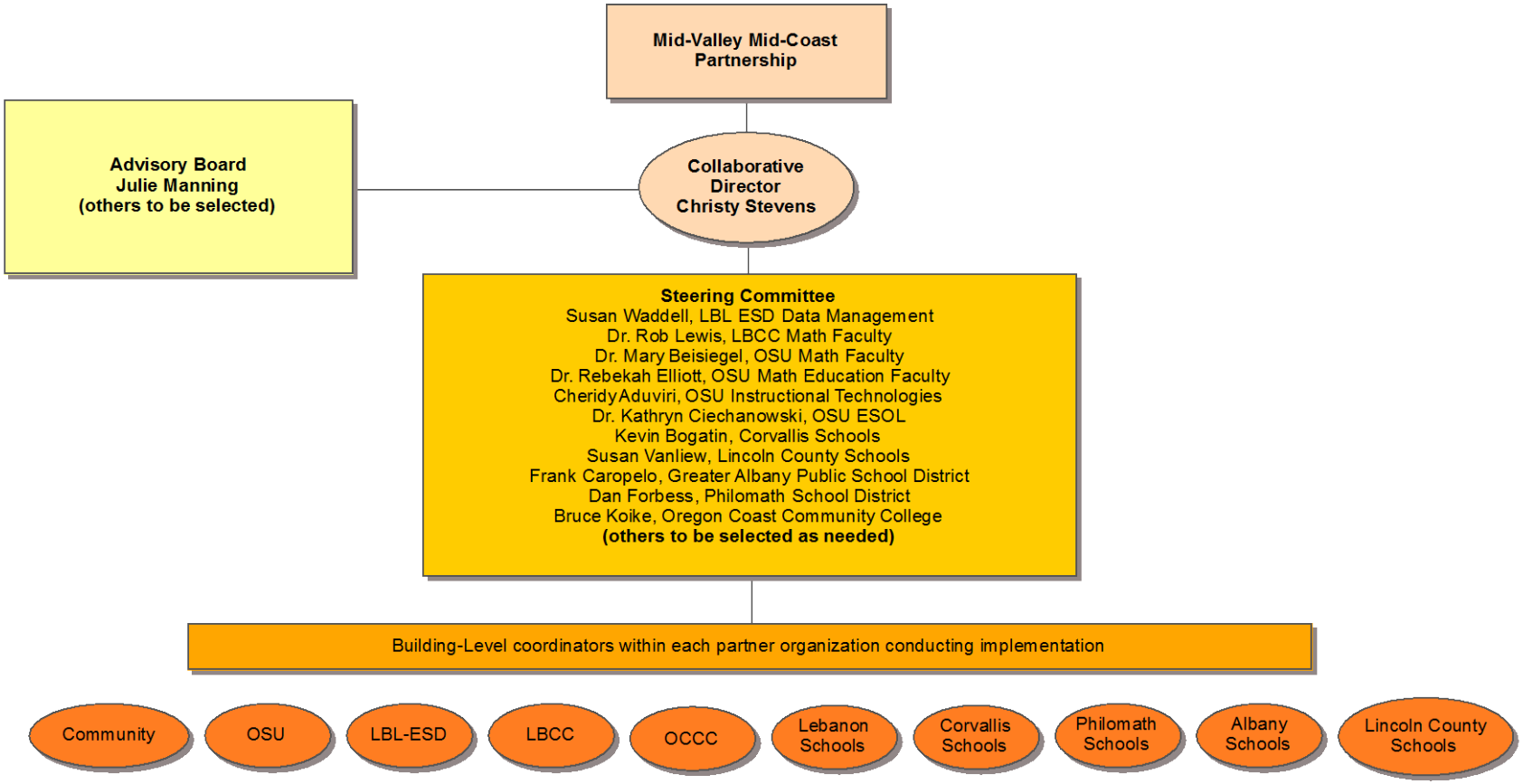
Profile of the Partnership

Number	School Types
47	Elementary & K-8 Schools
1	K-12 Schools
12	Middle Schools
1	6-12 Schools
19	High Schools
17	Alternative Schools

Profile of the Partnership

Percent	Demographics
90%	White
15%	Hispanic
2.3%	African-American
10%	Native American
4.5%	English Language Learners
44%	Free-Reduced Lunch

Mid-Valley Mid-Coast Partnership
Regional Achievement Collaborative
Achieving Success



MVMCP
MID-VALLEY MID-COAST PARTNERSHIP

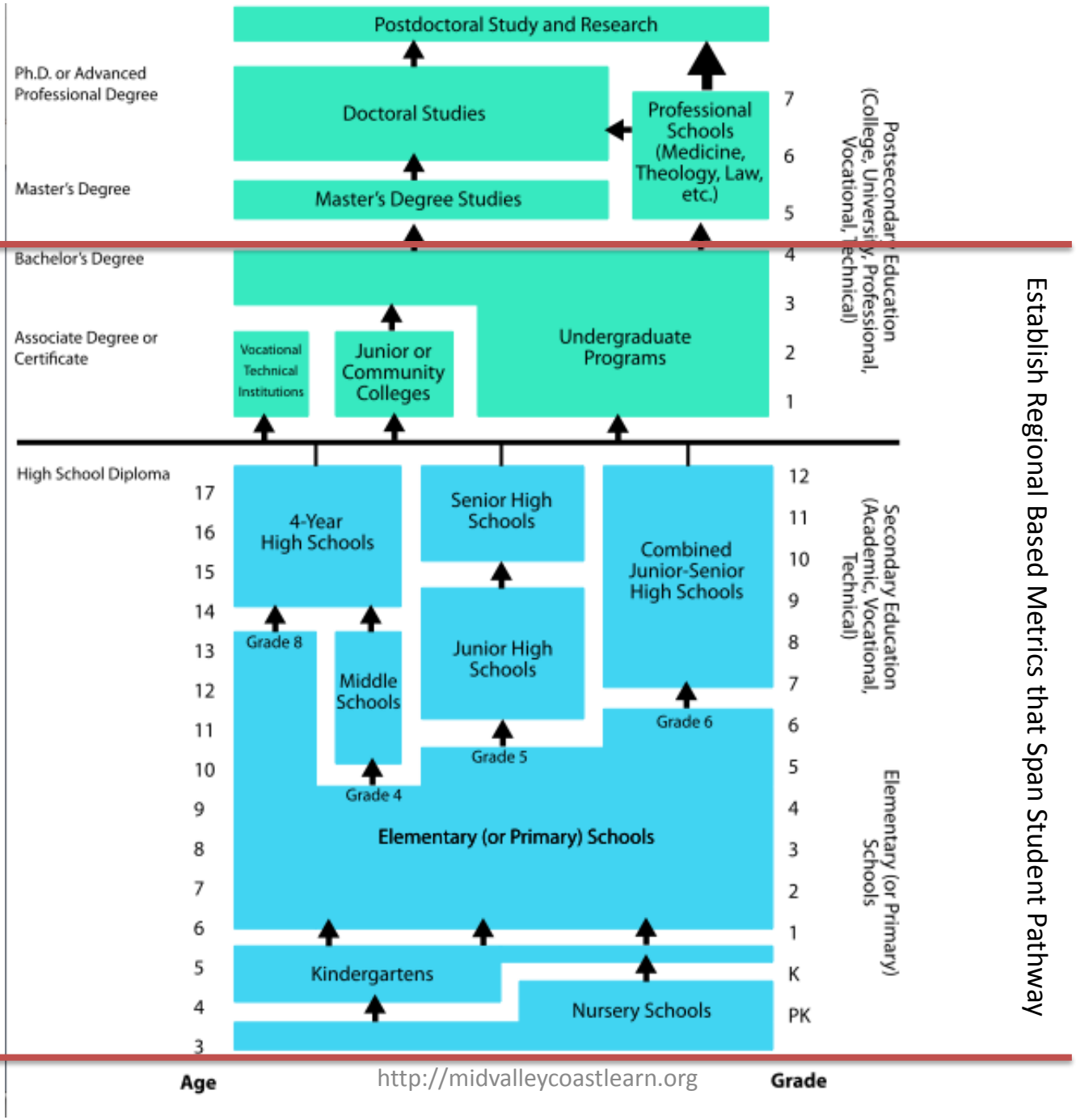
http://midvalleycoastlearn.org

Oregon State University

Guiding Principles for Partnership Development and Work Coordination

- **Investment in teacher knowledge and skills** and in the development of new teachers is foundational to high-performing schools
- **Diversity is not just a demographic characteristic but foundational** to the work of high-performing schools. Excellence is achieved through diversity
- The partnership is focused on student learning and on the **factors influencing student learning that are under the control of the partnership**
- Schools that beat the odds and outperform schools with similar demographics **attend persistently to the details of implementing high-quality programs**

Establish Regional Based Metrics that Span Student Pathway



Establish Regional Based Metrics that Span Student Pathway

Characteristics of these Metrics

- **Relates to and support P20 pathway and its destination**
- **Focuses on effectiveness of the interfaces between institutions/sectors**
- **Requires inter- institution/sector collaboration to make progress toward target**
- **Assesses progress toward the overarching metric of 40-40-20**
- **Disaggregated to enable the assessment of progress through our "Equity Lens"**

You can't change what you can't measure: Long Term Metrics for Long Term Goals

- **Reduce the achievement gap among all student demographic groups**
- **Increase the percentage of students meeting or exceeding reading and math state criteria**
- **Increase the high school graduation rate of students**
- **Increase the number of students prepared for college-level mathematics**
- **Increase completion rates for community college and university**

You can't change what you can't measure: Long Term Metrics for Long Term Goals

- **Match or exceed the percentage of student teachers of color with the percentage of students of color**
- **Ensure that all teachers licensed through OSU have an ESOL endorsement or meet TSPC required competencies**
- **Improve the alignment between the percentages of teachers of color employed by the partnership school districts with the percentage of public school children of color**

You can't change what you can't measure: Interim Metrics to Keep on Track

What data have a high probability of having impact?

- **Opportunity to learn:**
  - **Engaged time on task**
  - **Teacher skills with core teaching practices**
- **Opportunity to demonstrate learning:**
  - **Quality of student tasks**
  - **Ratio of Student talk to Teacher talk**
  - **Use formative assessment aligned with Smarter Balance**
- **Curriculum based on CCSSM**
  - **Curriculum affords development of mathematical practices**
  - **Instructional technologies in the service of learning**
- **Alignment of District & Teacher Education Policy & Practice**
  - **PD experiences**
  - **Mentoring**
  - **Coaching**

Community Engagement

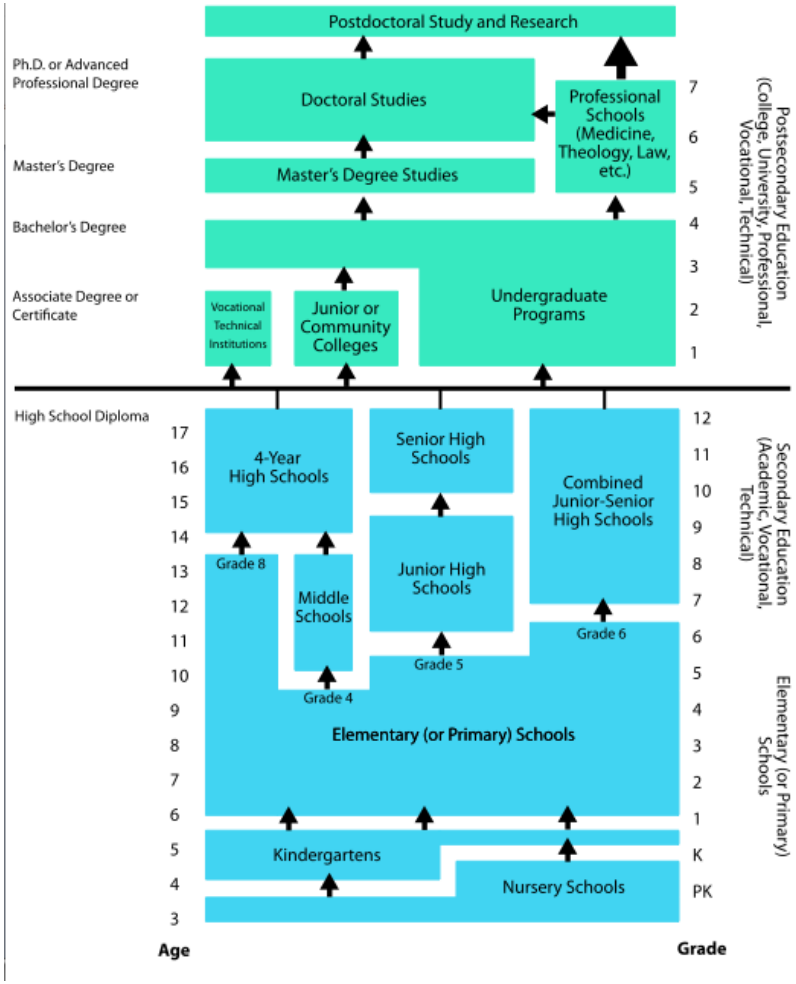
Changing the public's view of math; it's role in life

The public's current view is detrimental to student success:

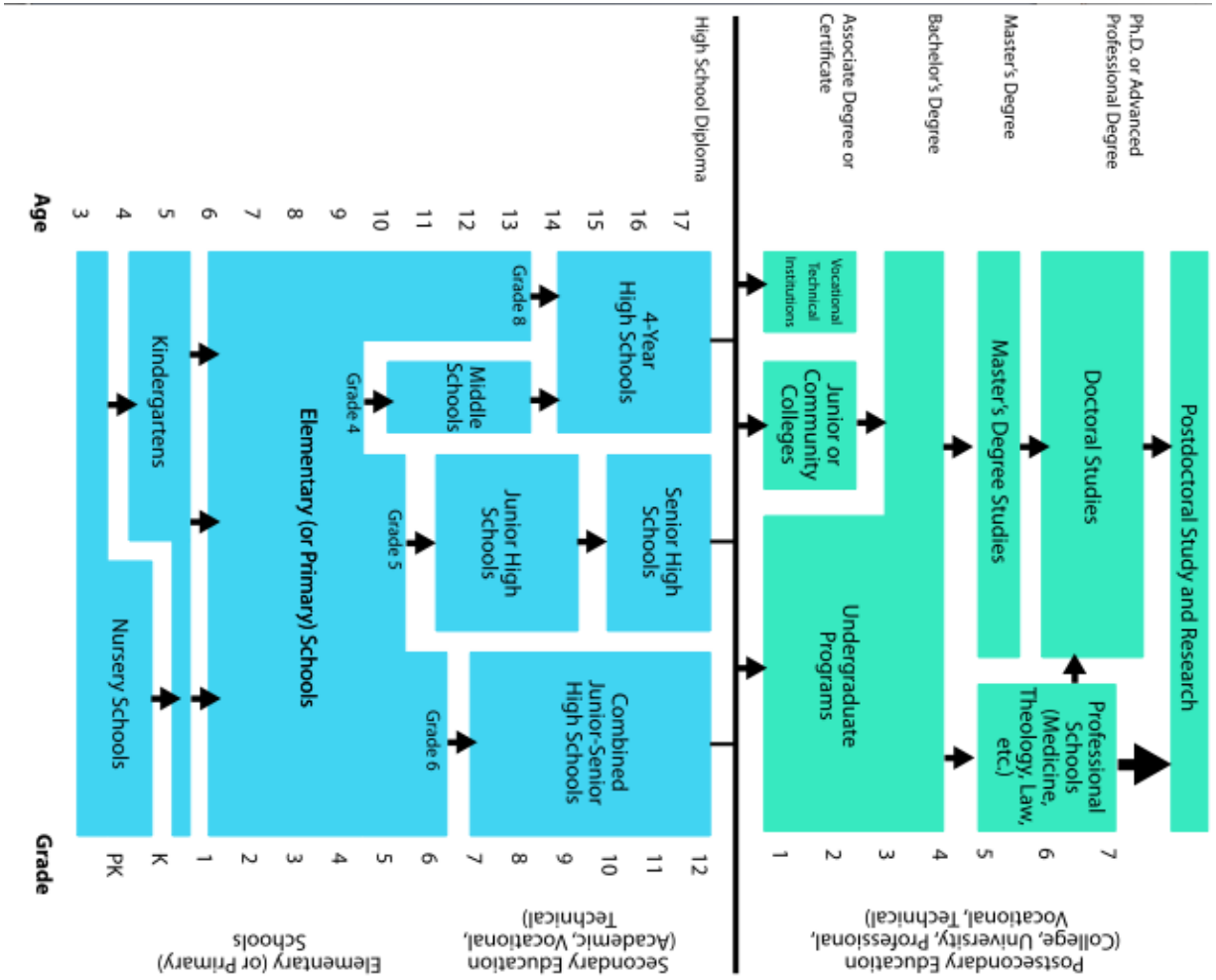
- Math = arithmetic
- "I hate math"
- "I am not a math person"
- "Math is not useful"

Time Spent in Formal Education

(vertical continuum)



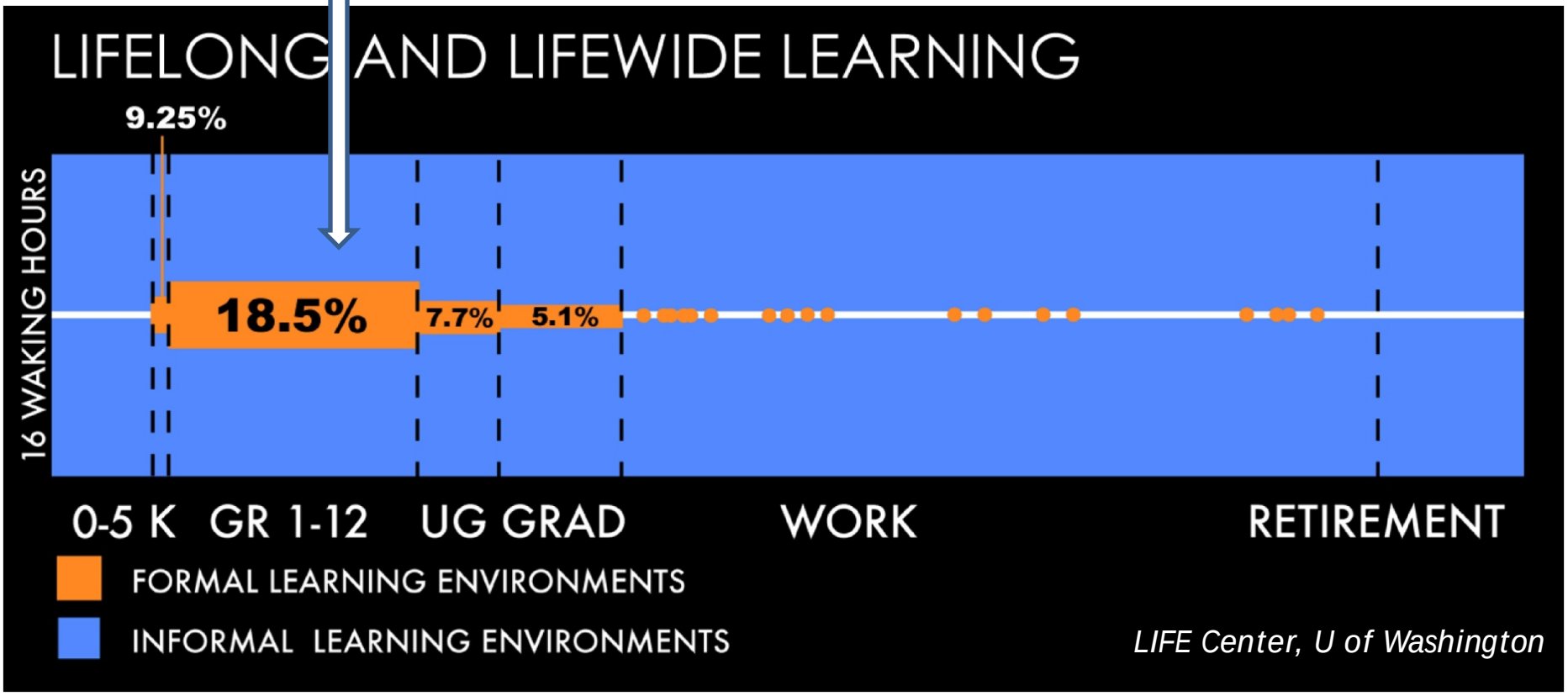
Schooling as a Horizontal Timeline



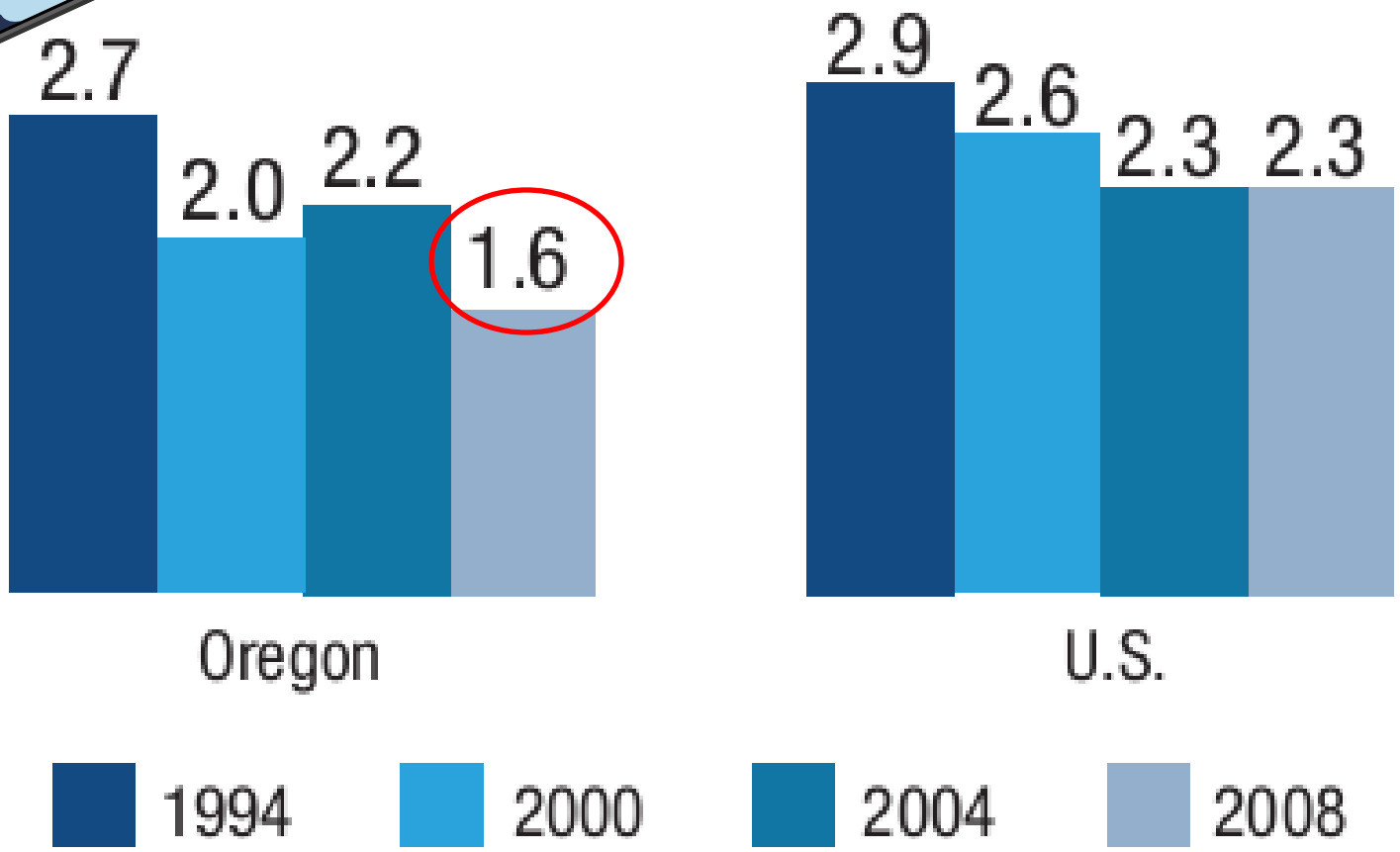
Represents 20%
of the Waking Hours of Students

And a very small percentage of a lifetime of learning

Great opportunity for STEM Learning Outside of School



The average U.S. student clocks 6.5 hours a day 180 days a year — less time than students in almost every other industrialized country



Science time/week gr.1-4

http://midvalleycoastlearn.org

Afterschool Alliance

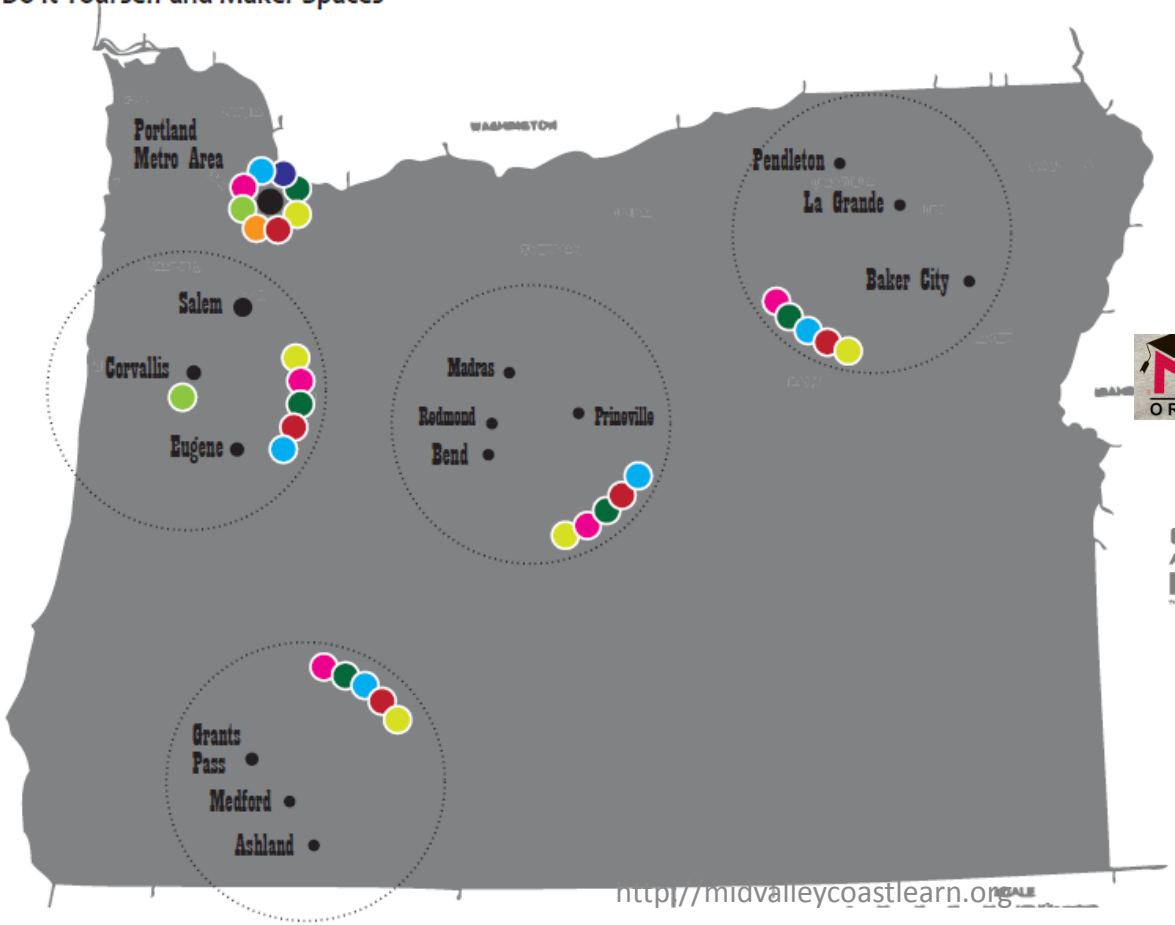
What do we mean by Out of School Time?

Non-school learning environments provide valuable venues for STEM experiences, generating interest, engagement, aptitute, and pursuit of academic and career paths.

Out of School Time is anywhere, anytime outside of the usual classroom activities.

Examples of Out of School time STEM Opportunities State-wide

- Afterschool Programs including robotics, CS and engineering classes
- Science Fairs
- Summer STEM Camps
- Residential Camps, Field Schools, Outdoor School
- Science Museums
- Environmental Tours
- Internships, Career Workshops, Job Shadows
- Do It Yourself and Maker Spaces



Questions & Discussion