

Every Student
Future Ready:

*Prepared for
College*

*Prepared for the
Global Workplace*

*Prepared for
Personal Success*



Science

EL-7: Academic Program

ER 2: Content Knowledge

ER 3: Interdisciplinary Skills and Attributes

Connecting Ends (ERs) and Means (ELs)

End Results specify the results that we want for our students and we expect them to know and be able to do

Executive Limitations specify the strategies and methods that we use to achieve End Results

ER 1: Mission and Vision	ER 2: Content Knowledge	ER 3: Interdisciplinary Skills and Attributes
<p>Mission Each student will graduate prepared to lead a rewarding, responsible life as a contributing member of our community and greater society.</p> <p>Vision Every Student Future Ready:</p> <ul style="list-style-type: none"> • Prepared for College • Prepared for the Global Workplace • Prepared for Personal Success 	<ul style="list-style-type: none"> • Literacy & Language • Mathematical & Scientific Reasoning • Social Studies • Information & Communication Technology • Culture & the Arts • Career Planning & Life Management 	<ul style="list-style-type: none"> • Academic Thinking Skills & Strategies • Communication & Collaboration Skills • Local & Global Citizenship Skills • Personal Attributes

1. Global Executive Constraint
2. Emergency CEO Succession
3. Communication and Counsel to the Board
4. Annual Report and District Calendar
5. Parents and Community
6. Student Learning Environment
7. **Academic Program**
8. Instructional Materials Selection
9. District Staff
10. Budgeting/Financial Planning
11. Financial Administration
12. Asset Protection
13. Facilities
14. Technology

Science

End Results specify what students are expected to know and be able to do

ER 2: Interdisciplinary Content Knowledge	ER 3: Interdisciplinary Skills and Attributes
<ul style="list-style-type: none">• Mathematical & Scientific Reasoning<ul style="list-style-type: none">○ Understands and applies mathematic principles and concepts○ Solves problems, reasons, and communicates mathematically○ Understands and applies science principles and concepts○ Solves problems, reasons, and communicates scientifically	<ul style="list-style-type: none">• Questions Critically and Thinks Creatively• Solves Problems Effectively• Makes Connections<ul style="list-style-type: none">• Understands the connections between and within science and other disciplines• Understands the relationship between effort and achievement.

Executive Limitations specify the strategies and methods used to achieve End Results

EL 7: Academic Program

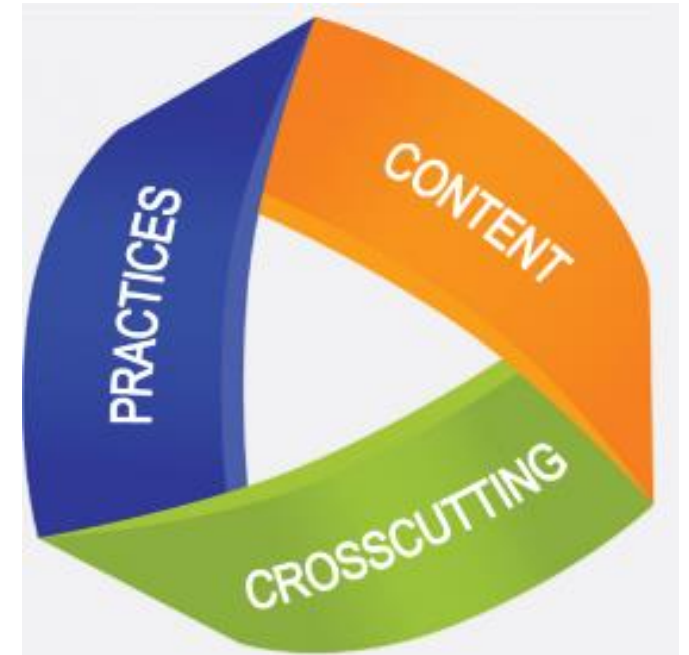
- 7.1 Develop and implement an academic program that specifies:
 - Academic content and technology standards that meet or exceed state and nationally-recognized model standards;
 - Curriculum aligned with and designed to enable students to meet or exceed the established standards;
 - Assessments that will adequately measure each student's progress toward achieving the standards



What is science?

Three Dimensions of Science

- **Science and Engineering Practices**
 - ▣ Behaviors of scientists and engineers (e.g., developing models)
- **Disciplinary Core Ideas**
 - ▣ Science content (e.g., properties of waves)
- **Crosscutting Concepts**
 - ▣ Concepts that apply across science content, (e.g., patterns)



Three Dimensions of Science

Science & Engineering Practices

- Ask questions and define problems
- Develop and use models
- Plan and carry out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating and communicating information

Disciplinary Core Ideas

- Matter and interactions
- Motion and stability
- Energy
- Waves and their applications
- Molecules to organisms
- Ecosystems
- Heredity
- Biological evolution
- Earth's place in the universe
- Earth's systems
- Earth and human activity
- Engineering and design

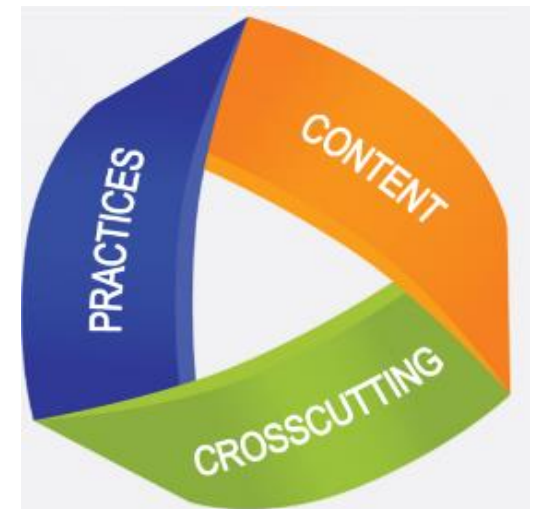
Crosscutting Concepts

- Patterns
- Cause and effect
- Scale, proportion, and quantity
- Systems and system models
- Energy and matter
- Structure and function
- Stability and change

Science Standards Elementary School*

Standards for the Physical Science Disciplinary Core Idea “Motion and Stability: Forces and Interactions”

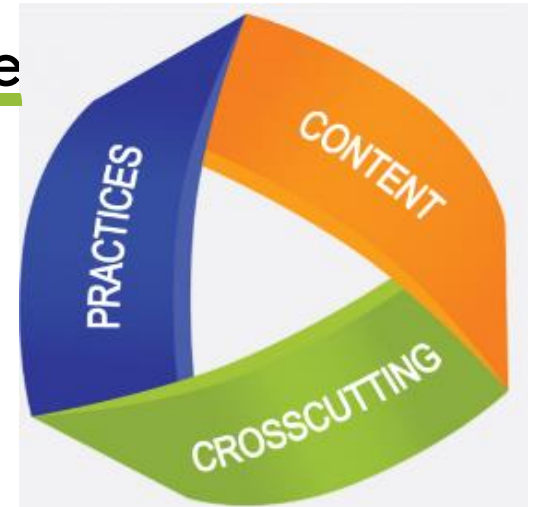
- **Kindergarten:** Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or pull.
- **3rd Grade:** Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
- **5th Grade:** Support an argument that the gravitational force exerted by Earth on objects is directed down.



**Physical, earth, and life science standards from the 12 Disciplinary Core Ideas spiral through the grade levels.*

Science Standards Middle School*

- **6th Grade:** Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
- **7th Grade:** Conduct an investigation to provide evidence that living things are made of cells.
- **8th Grade:** Analyze and interpret data to determine scale properties of objects in the solar system.

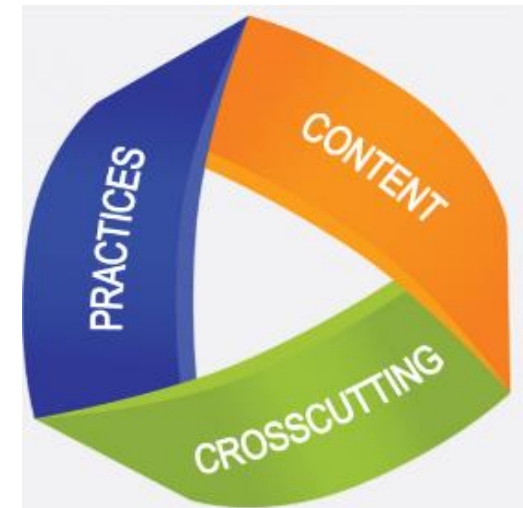


**Physical, earth, and life science standards for the 12 Disciplinary Core Ideas are integrated among the 6th-8th grade curriculum.*

Science Standards High School*

- **Physical Science:** Design, build and refine a device that works within given constraints to convert one form of energy into another form of energy.
- **Biology:** Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.
- **Chemistry:** Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost level of atoms.
- **Physics:** Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.

**Physical, earth, and life science standards from the 12 Disciplinary Core Ideas are aligned to the courses that match the content of the standards.*





What is our science program?

Science: Elementary School



Students at Sandburg Elementary designing a structure to support weighted object.

Weekly Time	2-3 Hours
Core Materials	Full Option Science System (FOSS) Modules/Kits Three science kits/grade level
Supporting Resources	<ul style="list-style-type: none">• Curriculum Alignment Guides• Science Proficiency Scales• Common District Summative Assessments
Last Science Adoption Next Science Adoption	<ul style="list-style-type: none">• 2004 Implementation• 2018 Implementation

Science: Middle School



Students at Kirkland Middle looking for patterns in the periodic table using new print and digital science curriculum materials.

Weekly Time	250 minutes/week
Core Courses	Integrated Science 6, 7 and 8 (Physical, Earth & Life Science content in each grade)
Core Materials	McGraw Hill Integrated iScience Courses 1, 2 and 3 (6, 7 and 8)
Supporting Resources	Curriculum Alignment Guides
Last Science Adoption Next Science Adoption	<ul style="list-style-type: none">• 2016 Implementation• 2026 Implementation

Science: High School



Students at Lake Washington High School determining trajectories using calculations and data collection in physics class.

Courses	<ul style="list-style-type: none">• Three years/credits of required coursework in Science• Grade 9 Physical Science (includes earth science content)• Grade 10 Biology• Grades 11-12 courses include Chemistry and Physics• AP Science courses offered in grades 10-12
Core Materials	<ul style="list-style-type: none">• McGraw Hill Physical Science with Earth Science (9)• Houghton Mifflin Biology (10)• McGraw Hill Chemistry: Matter and Change (11-12)• Pearson Physics (11-12)
Supporting Resources	Curriculum alignment guides
Last Science Adoption Next Science Adoption	<ul style="list-style-type: none">• 2015 Implementation• 2025 Implementation



How students are performing in science?

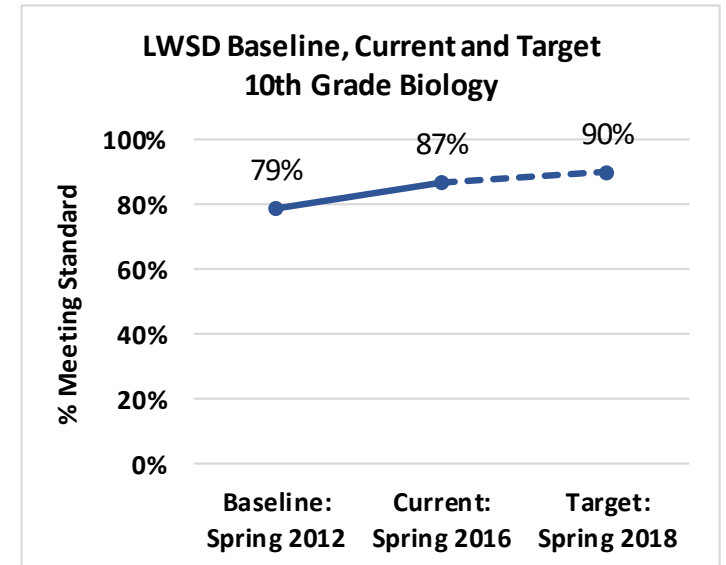
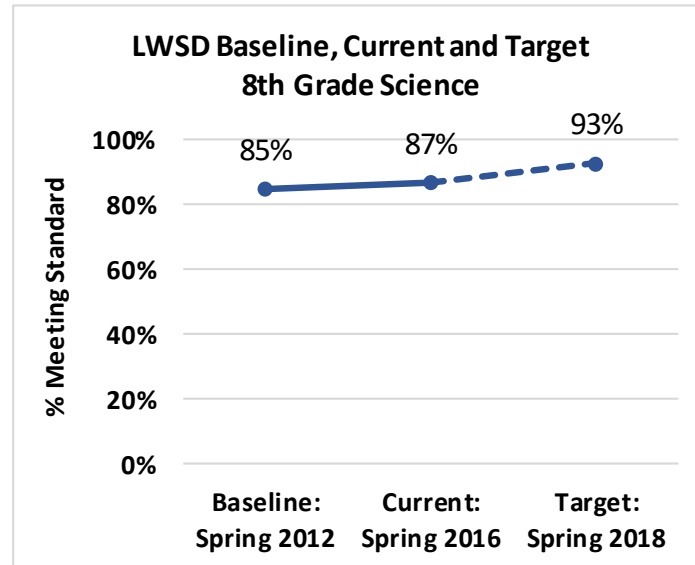
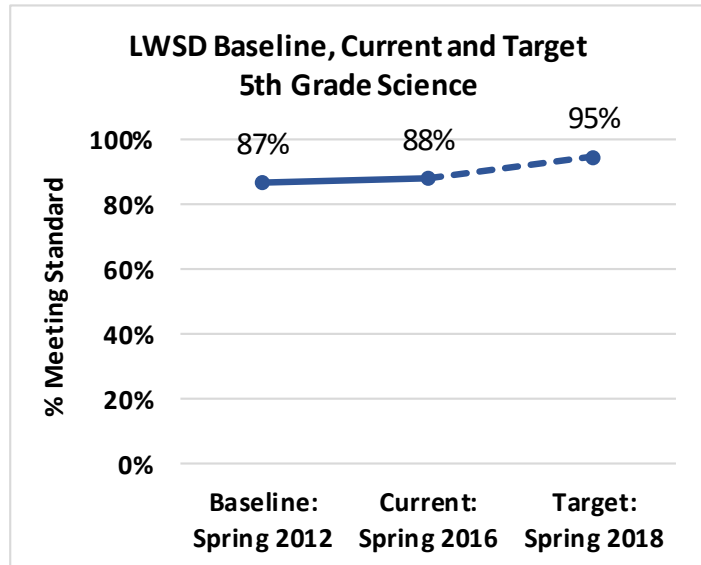
Student Learning Milestones and Performance Targets

Goal 1: Ensure Academic Success for Every Student

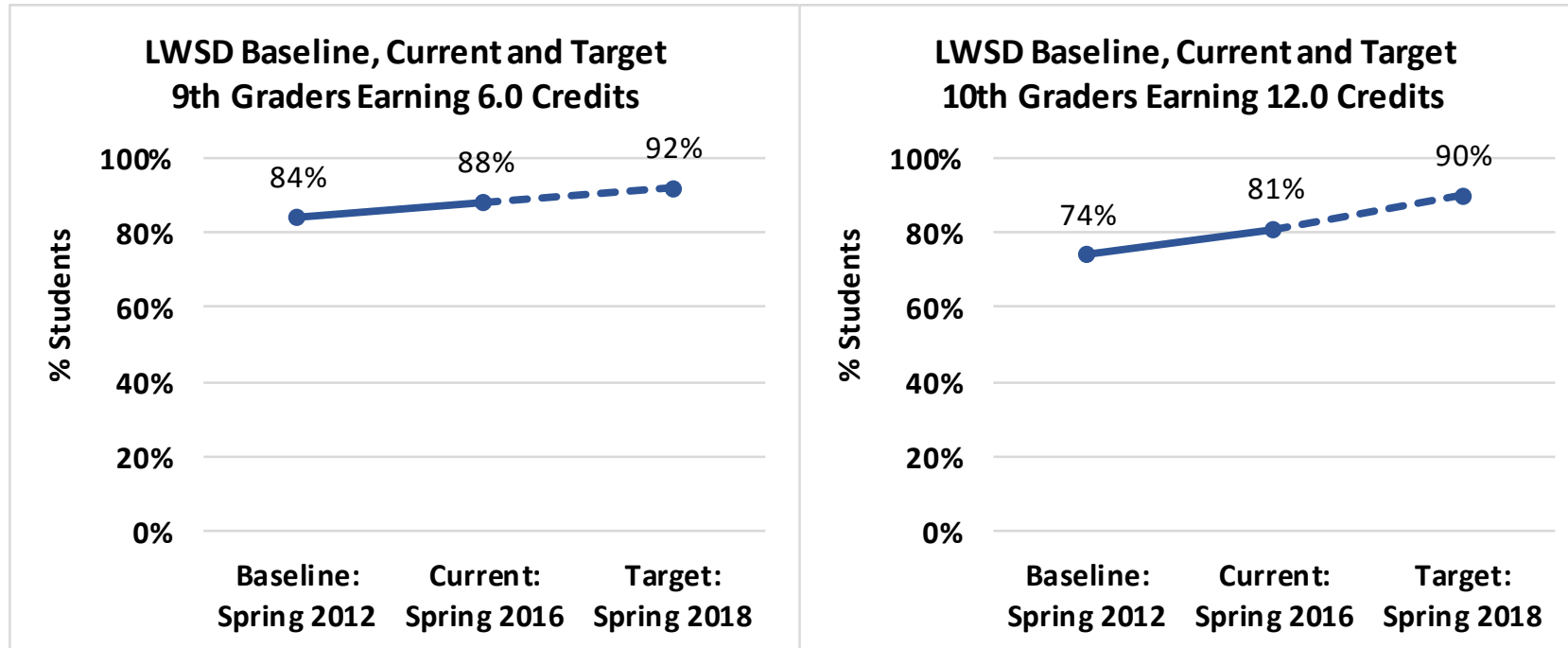
Student Learning Milestone	Indicator	Spring 2012	Spring 2014	Spring 2015	Target 2018
Early Literacy and Reading Skill Development	% of kindergartners at benchmark on End-of-Year Dynamic Indicators of Early Literacy (DIBELS) assessment	87%	85%	85%	95%
3rd Graders on Track for Success	% of 3rd graders meeting or exceeding state standards in English language arts/literacy			79%	91%
	% of 3rd graders meeting or exceeding state standards in math			81%	92%
5th Graders' Overall Academic Readiness for Middle School	% of 5th graders meeting or exceeding state standards in English language arts/literacy			84%	92%
	% of 5th graders meeting or exceeding state standards in math			73%	90%
	% of 5th graders meeting or exceeding state standards in science	87%	85%	87%	95%
8th Graders' Overall Academic Readiness for High School	% of 8th graders meeting or exceeding state standards in English language arts/literacy			81%	92%
	% of 8th graders meeting or exceeding state standards in math			72%	85%
	% of 8th graders meeting or exceeding state standards in science	85%	87%	83%	93%
High School Students on Track for Graduation	% of 9th graders earning 6.0 credits	84%	81%	84%	92%
	% of 10th graders accumulating 12.0 credits	74%	75%	76%	90%
	% of 11th graders meeting or exceeding state standards in English language arts/literacy			15/73%*	97%
	% of 11th graders meeting or exceeding state standards in math			14/66%*	87%
	% of 10th graders meeting or exceeding state standards in biology	79%	91%	87%	90%
High School Students Graduating Future Ready	% graduation rate	80% class of 2013	90% class of 2014	92% class of 2015	100% class of 2018
	% of 11th and 12th grade students enrolled in a dual credit college-level course		91%	95%	95% class of 2018
	% of graduates enrolled in post-secondary institution within 2 years of graduation	81% class of 2012	81% class of 2013	Not available	88% class of 2018

*Note: Many 11th grade students opted to not take the SBA tests since they had passed the HSPE and Math End of Course exams in 10th grade. Students who did not take the test were counted as not making the standard. The first number is the percent of all students who took the SBA and met standard. The second number is the percent of those who took the test who met standard.

Baseline, Current, Target Performance



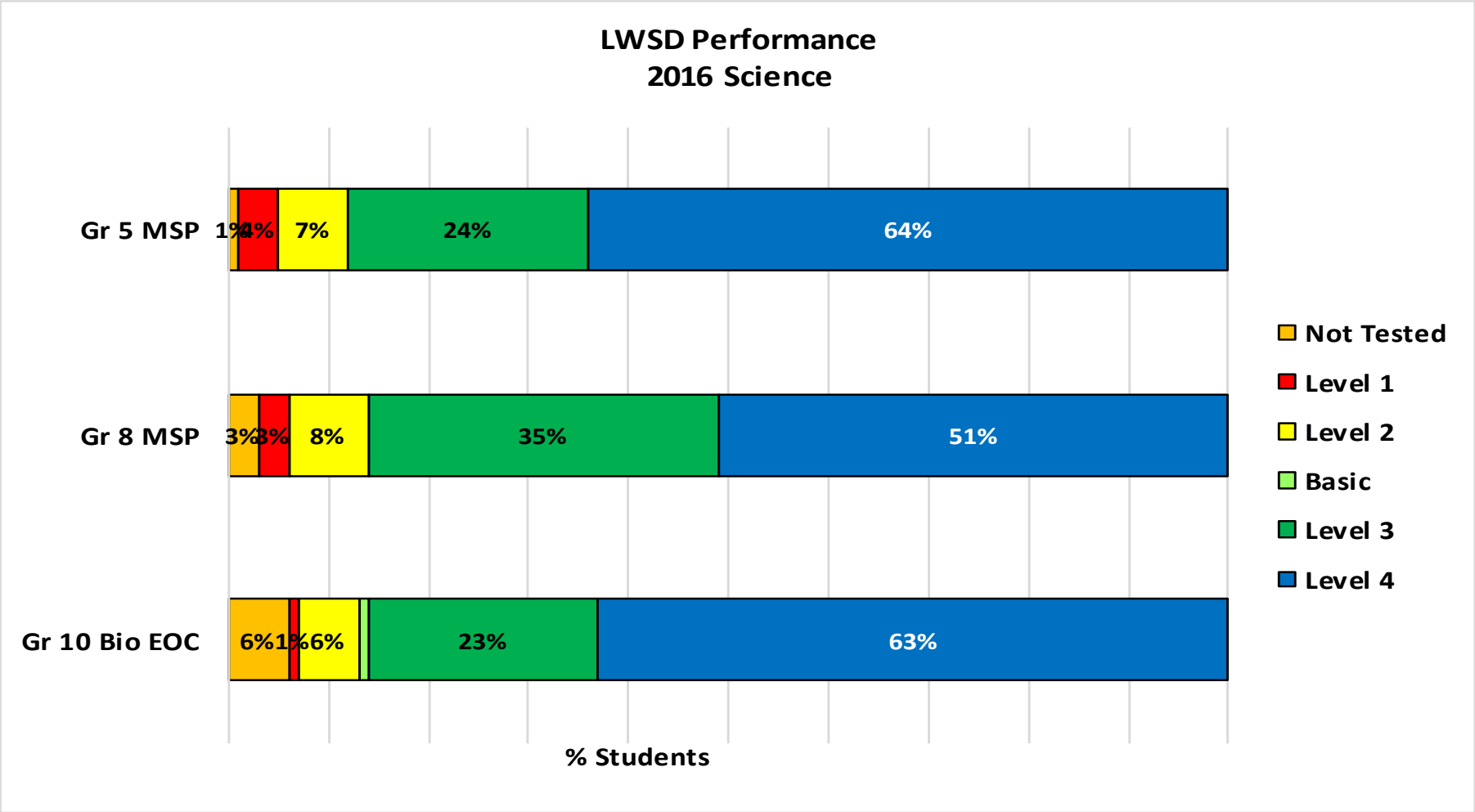
Baseline, Current, Target Performance



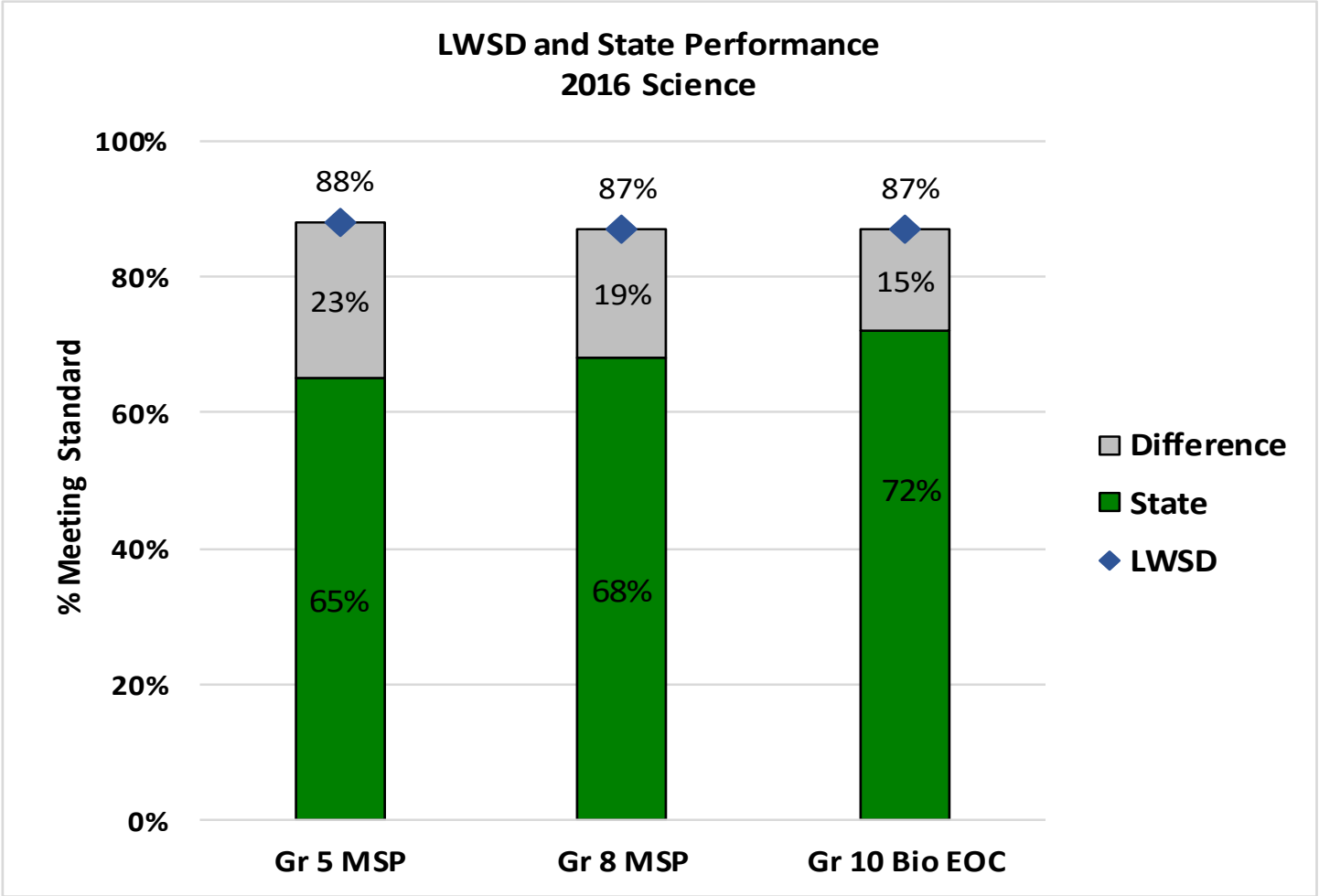
Students earning credit in Science

Indicator	Baseline: Spring 2012	Current: Spring 2016
% of 9th graders earning 6.0 credits (0.5 credit in Science)	84%	88% earning 6.0 credits 97% earning 0.5 Science credit
% of 10th graders accumulating 12.0 credits (1.0 credits in Science)	74%	81% earning 12.0 credits 96% earning 1.0 Science credit

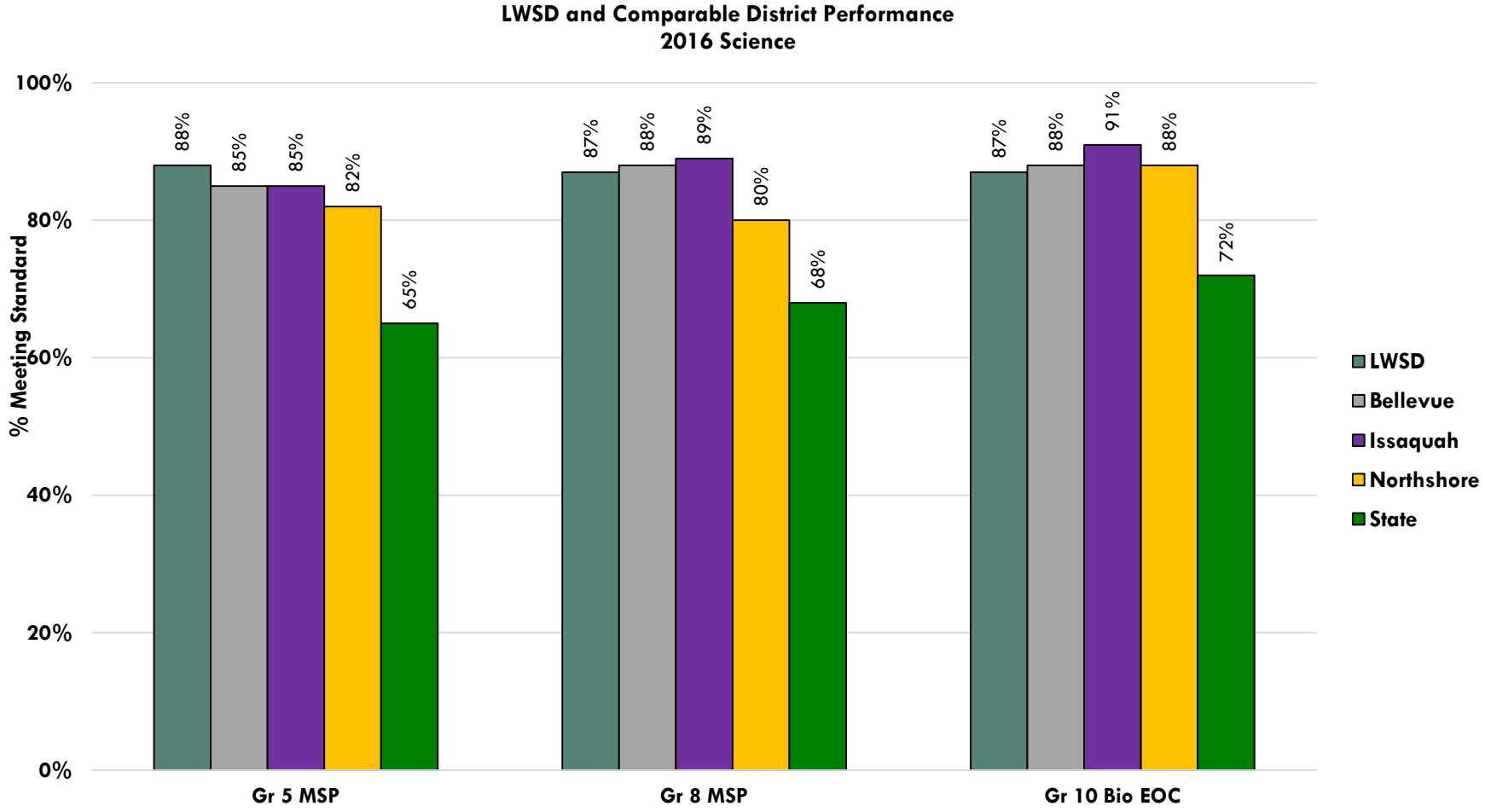
Science Performance



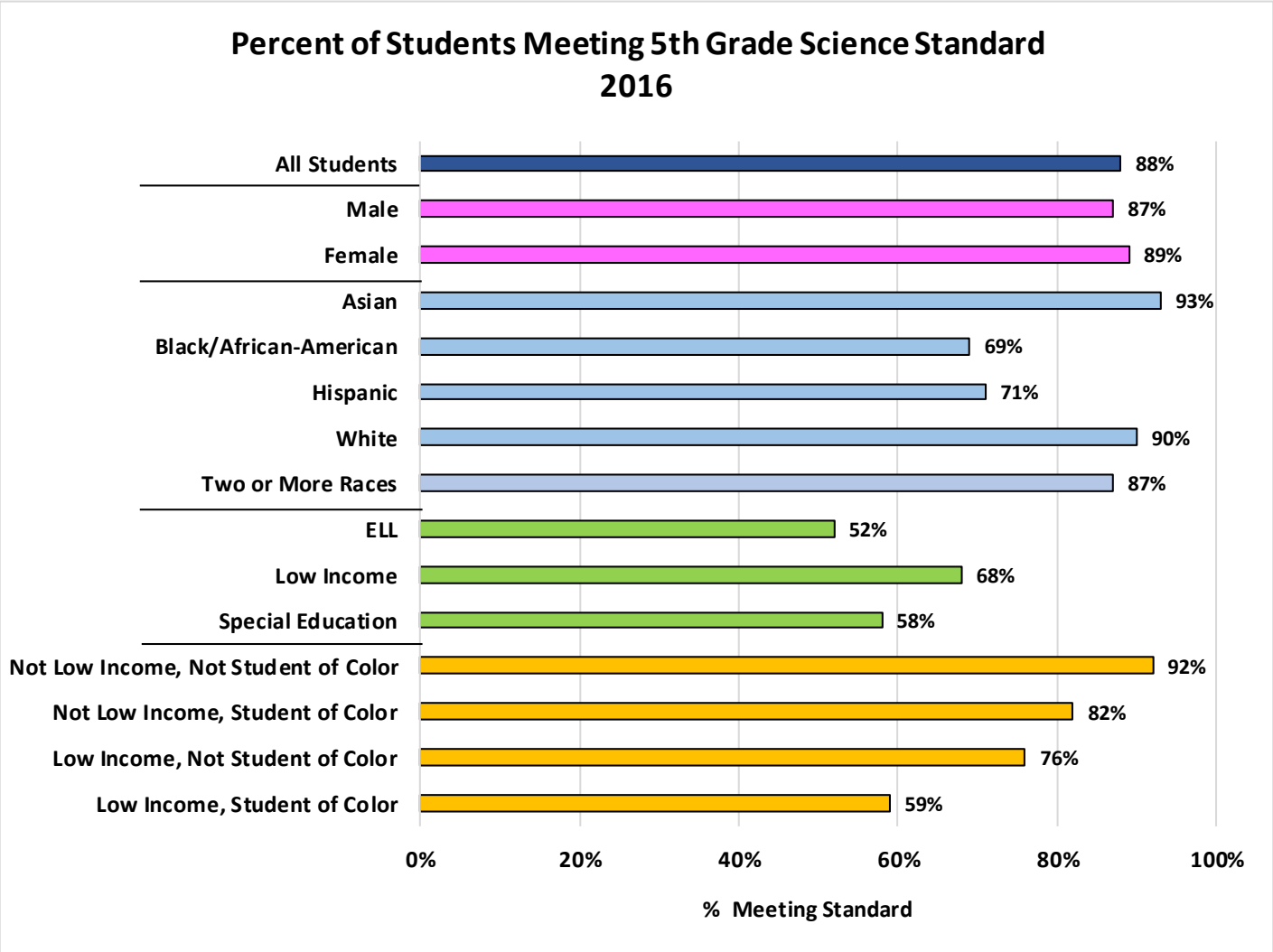
Student Performance Comparison: LWSD and State



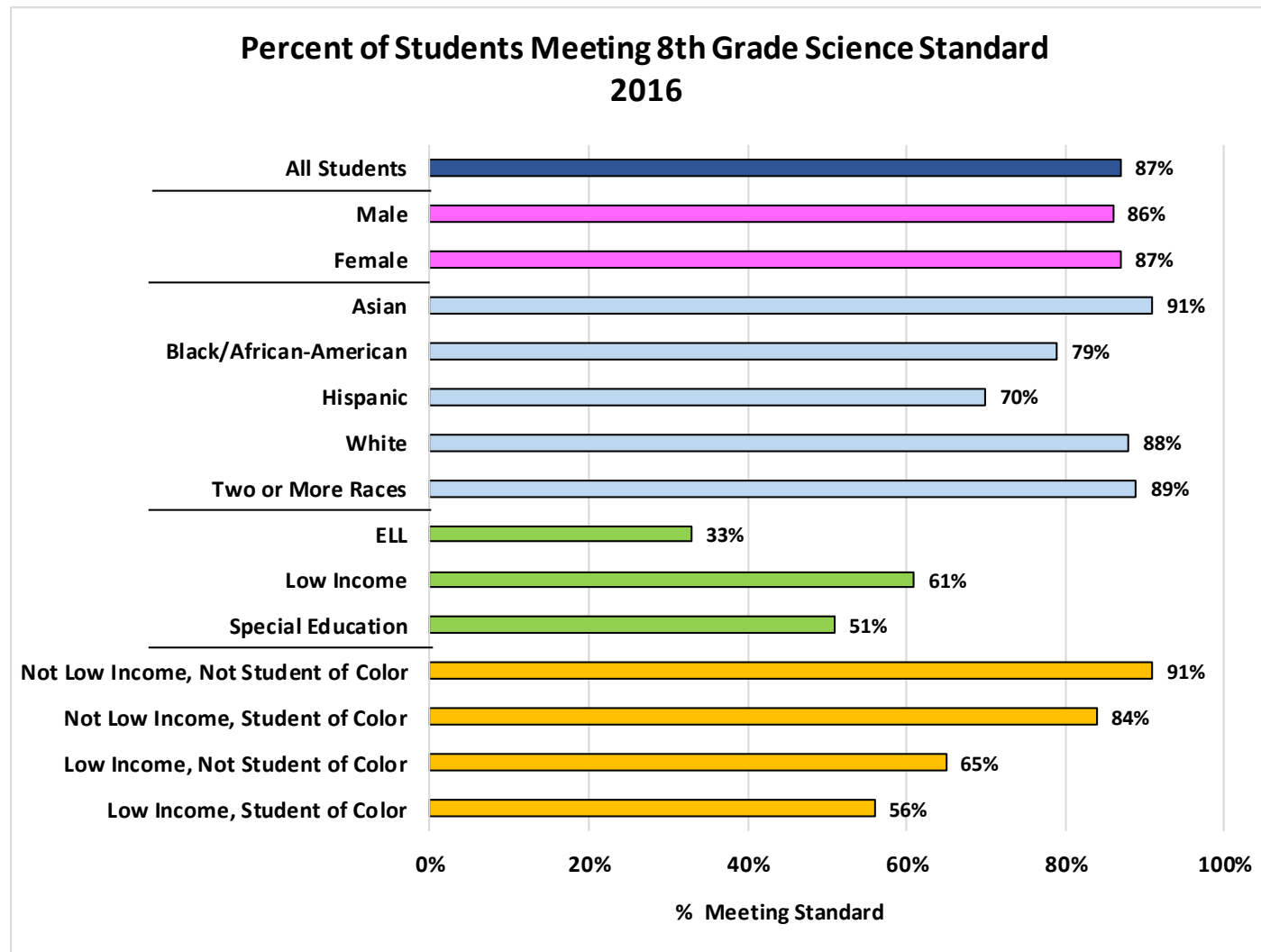
Student Performance Comparison: LWSD and Comparable Districts



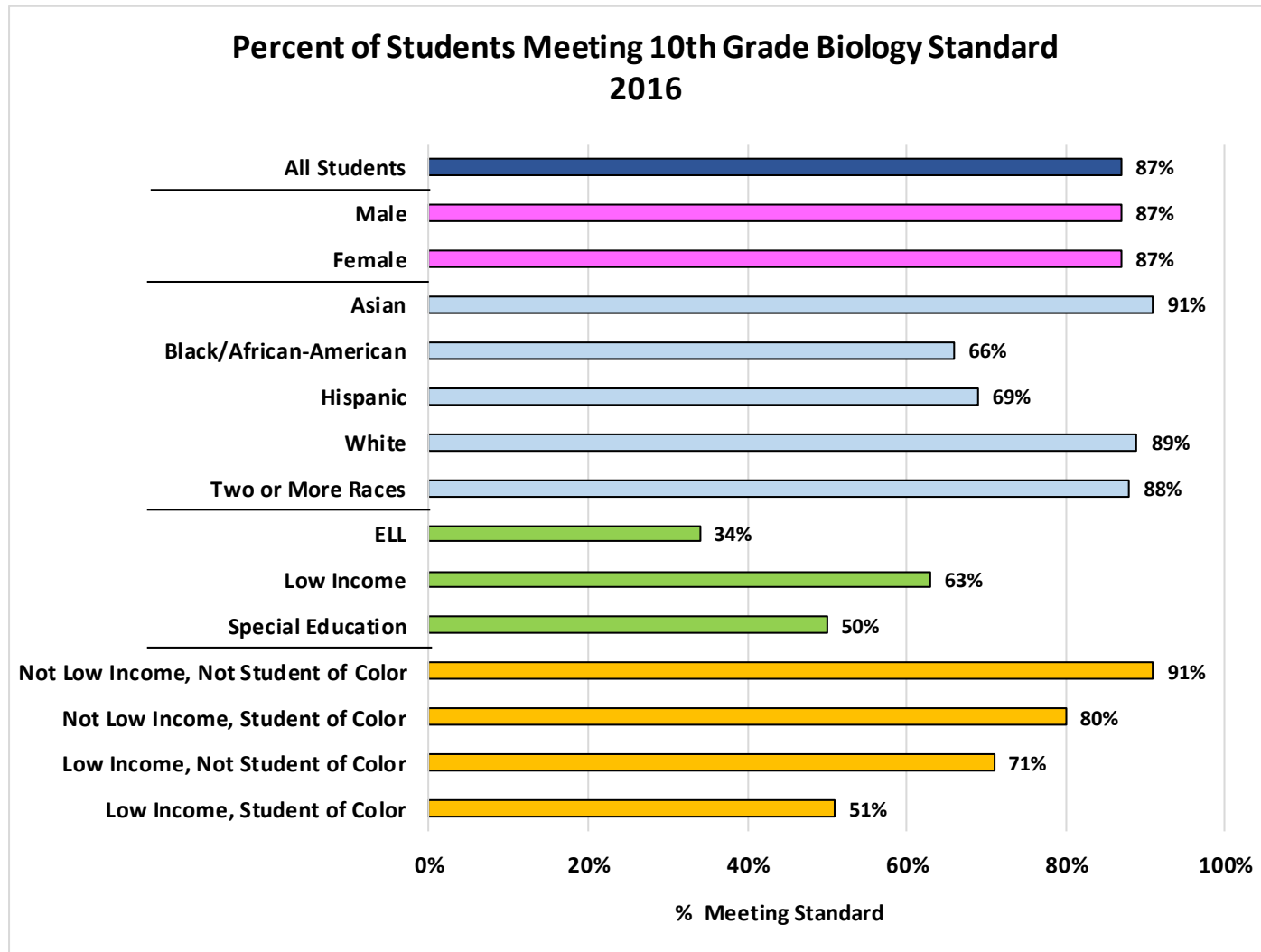
Achievement/Opportunity Gap



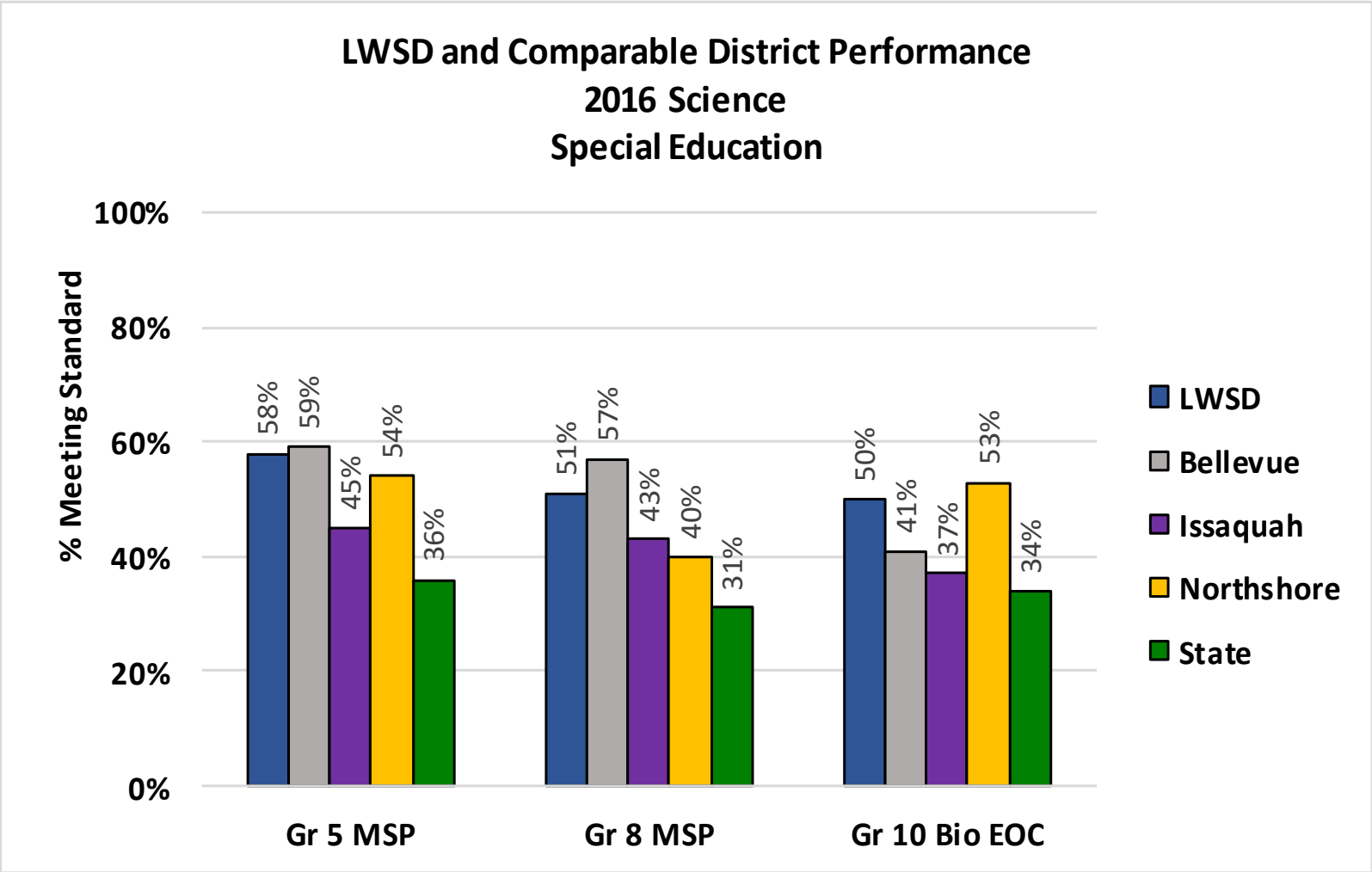
Achievement/Opportunity Gap



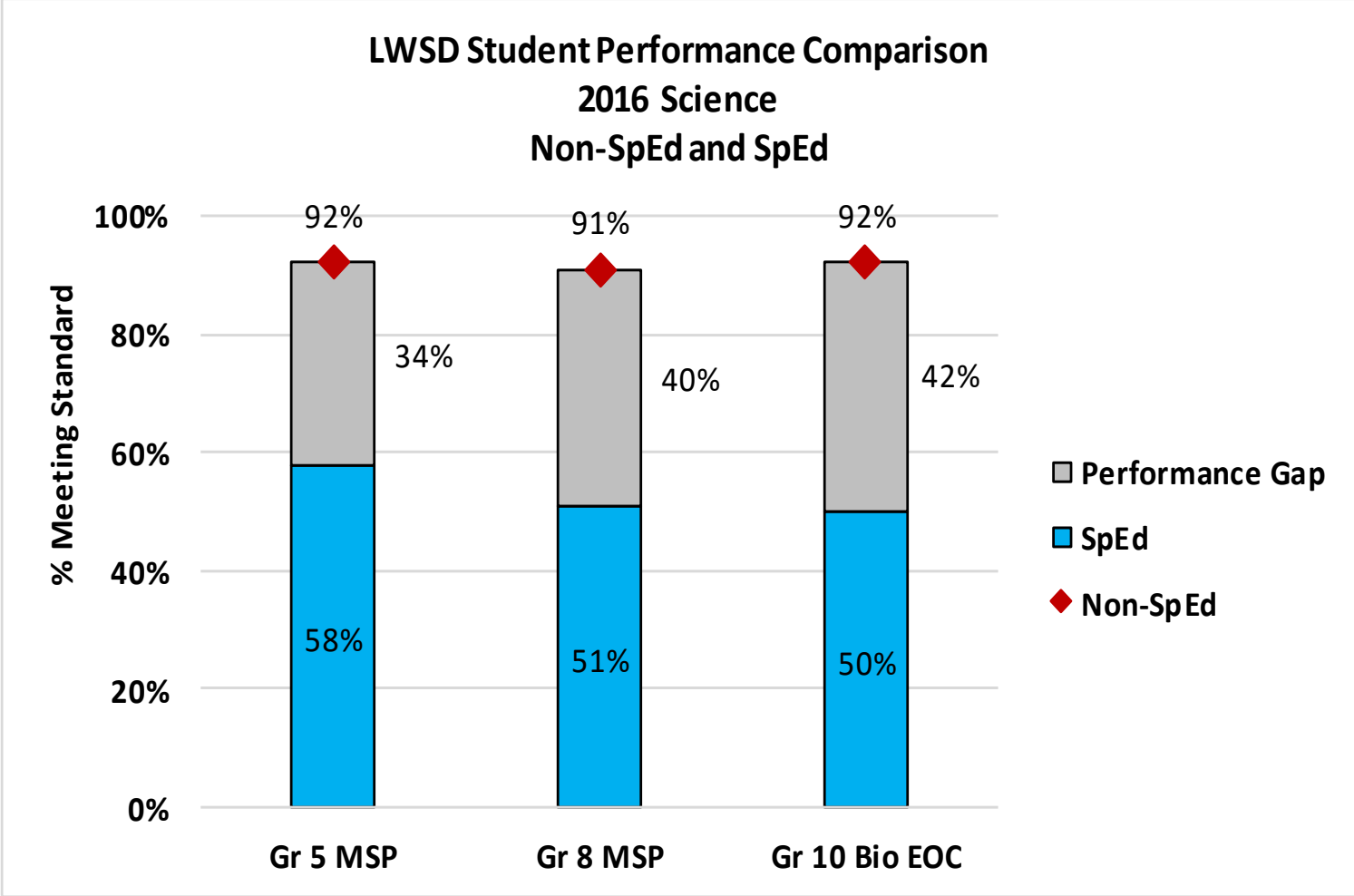
Achievement/Opportunity Gap



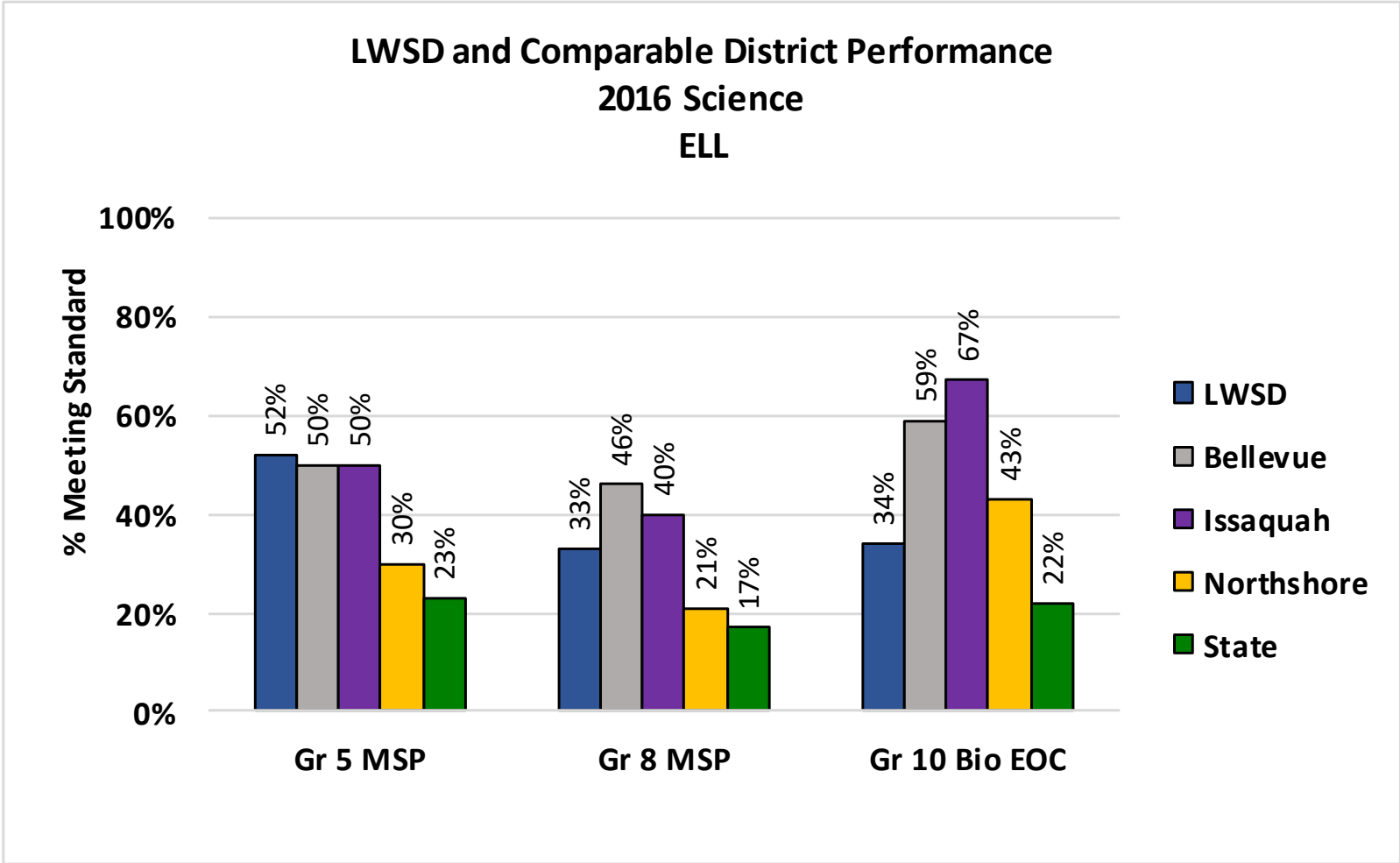
Science Performance



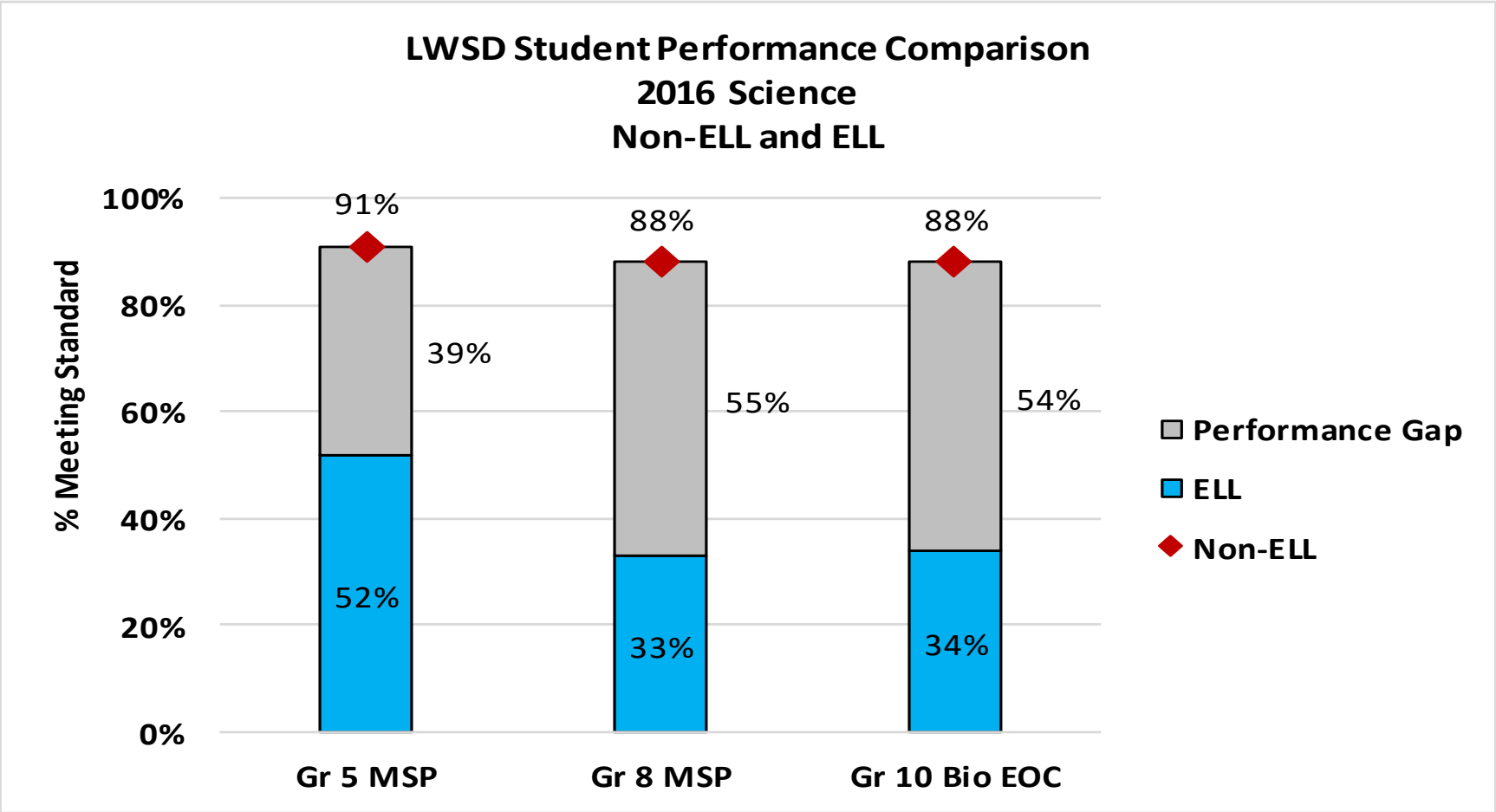
Science Performance



Science Performance



Science Performance





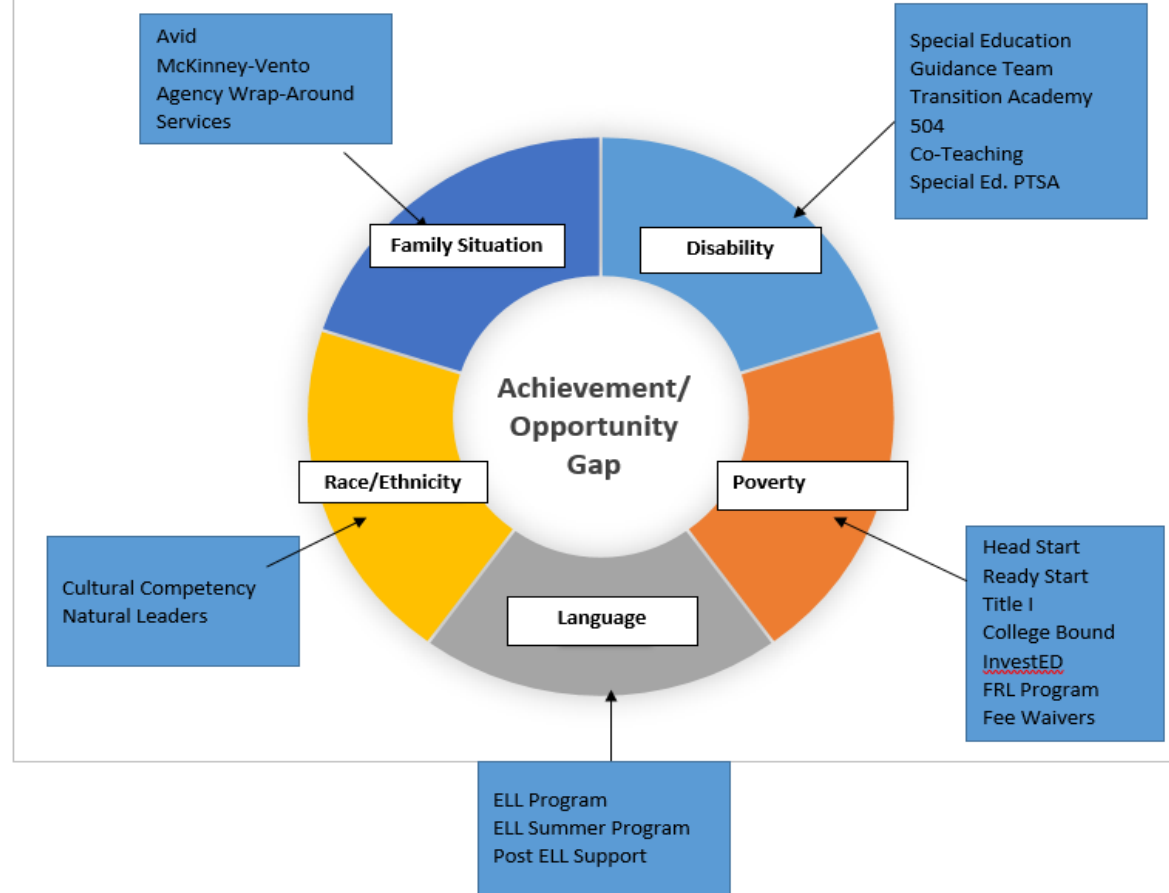
What strategies are we using to improve?

LWSD Efforts

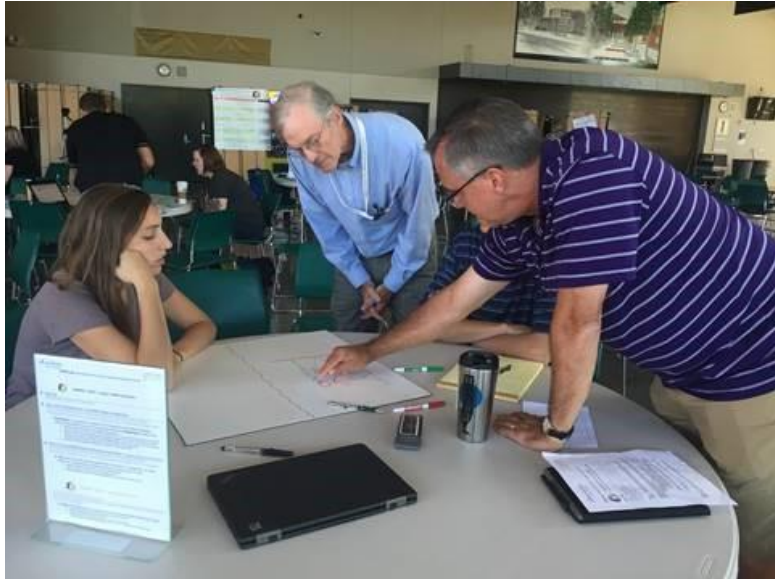
Tier 1: Universal

- Learning Community Organization
- Continuous Improvement Process (CIP) Plans
- Teacher and Principal Professional Growth & Evaluation
- Data Teams/PCCs
- Student Growth Goals
- Professional Learning
- 1:1
- Standards-Aligned Curriculum
- State Standards
- English Language Proficiency Standards
- Restorative Practices
- Alternatives to Suspension
- High School & Beyond Plan

Tiers 2 & 3: Targeted



Improving Student Science Performance



LWSD high school science teachers participate in summer Next Generation Science Standards training facilitated by the Institute for Systems Biology.

Elementary examples

- Standards-Based Teaching and Assessing
- Next Generation Science Standards training to begin with K-5 science curriculum adoption next year.
- Elementary curriculum specialist participating in OSPI/PSESD Science Fellows program to build leadership capacity and a foundation of knowledge and skills to support the instructional shifts in the Next Generation Science Standards.

Secondary examples

- Standards-Based Teaching and Assessing
- Partnered with the Institute for Systems Biology to provide summer training about the Next Generation Science Standards for high school science teachers.
- Implementing new standards-aligned science curriculum materials in middle and high school (replacing materials last adopted in 2003-2004).
- Developing curriculum guides and high school science pathways aligned to the Next Generation Science Standards.
- Providing mandatory training about the new science curriculum and Next Generation Science Standards for all middle school science teachers.
- Secondary curriculum specialist participating in OSPI/PSESD Science Fellows program to build leadership capacity and a foundation of knowledge and skills to support the instructional shifts in the Next Generation Science Standards.