Research Regarding the Academic Effectiveness of Engage NY/Eureka Math

APRIL 24, 2018

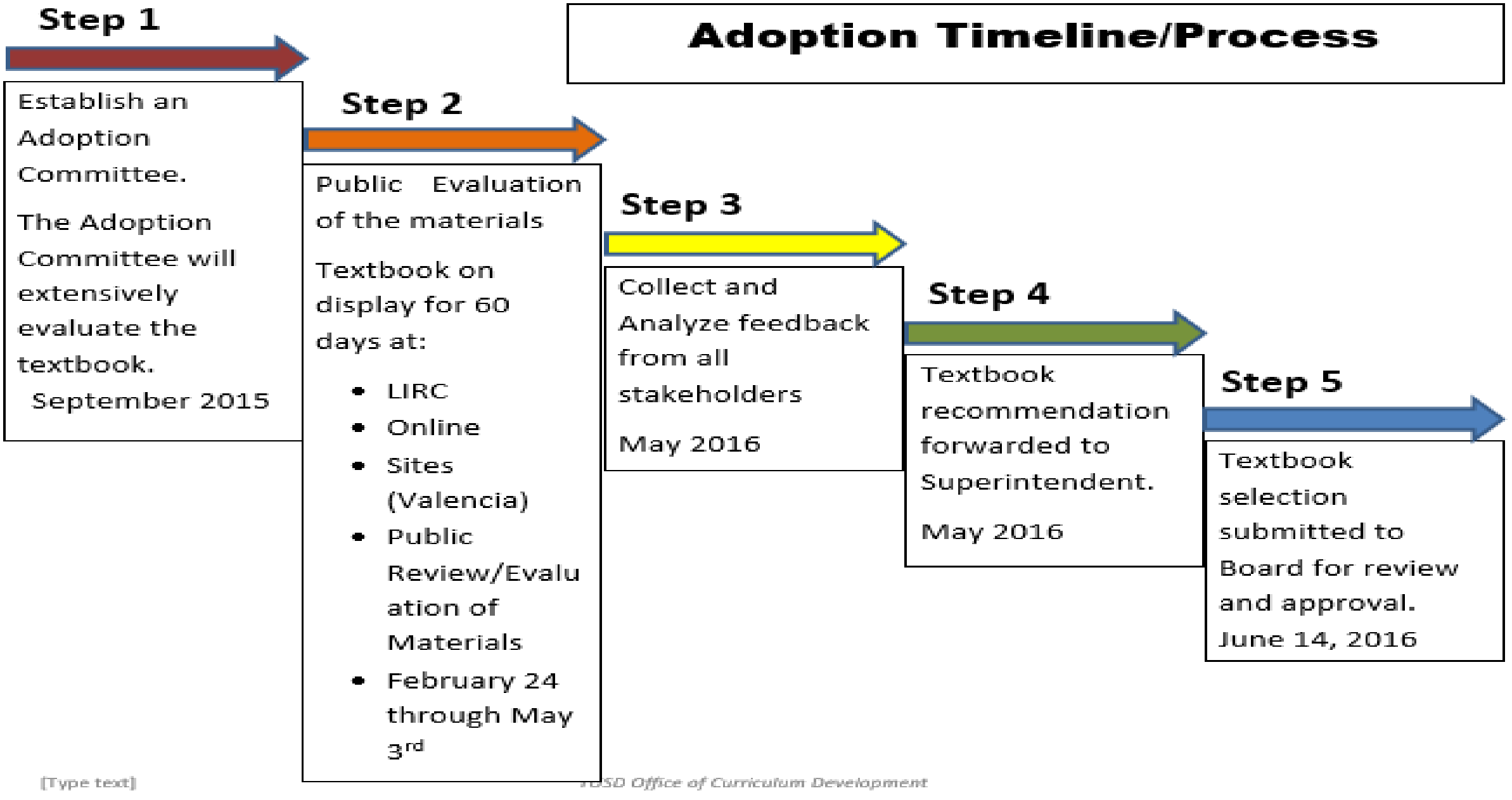
GOVERNING BOARD PRESENTATION

Background on Adoption

Purpose of June 14, 2016 adoption:

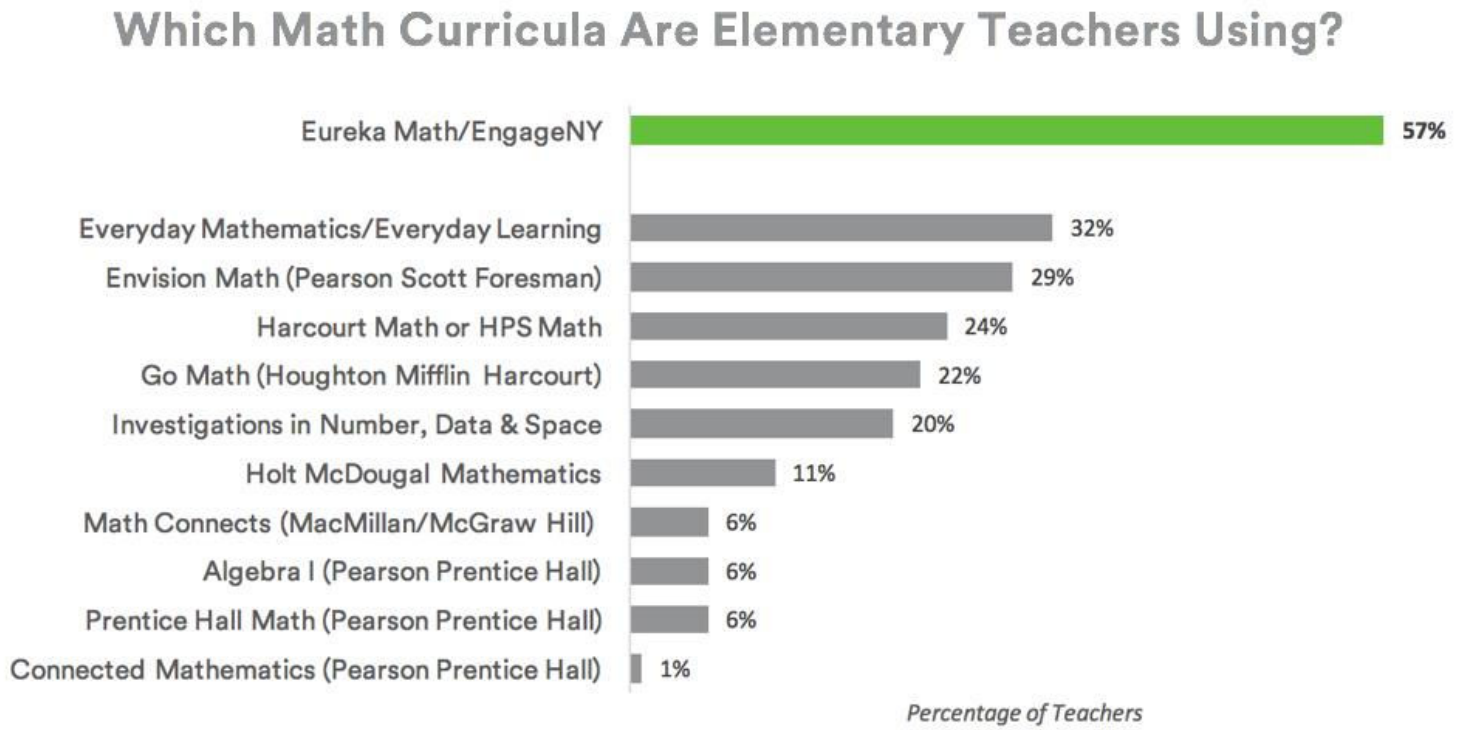
- A need to update textbook resource to alignment with the Arizona College and Career Readiness Standards (AZCCRS) and AzMERIT assessment.
- Teachers were spending additional time and energy identifying supplemental materials.
- TUSD had multiple adoptions at each level, making it difficult to establish a districtwide curriculum.

Adoption Timeline/Process



Background

Eureka Math is the first cohesive math curriculum for grades PK-12 completely aligned to the 2010 standards. It is being used in all 50 states.



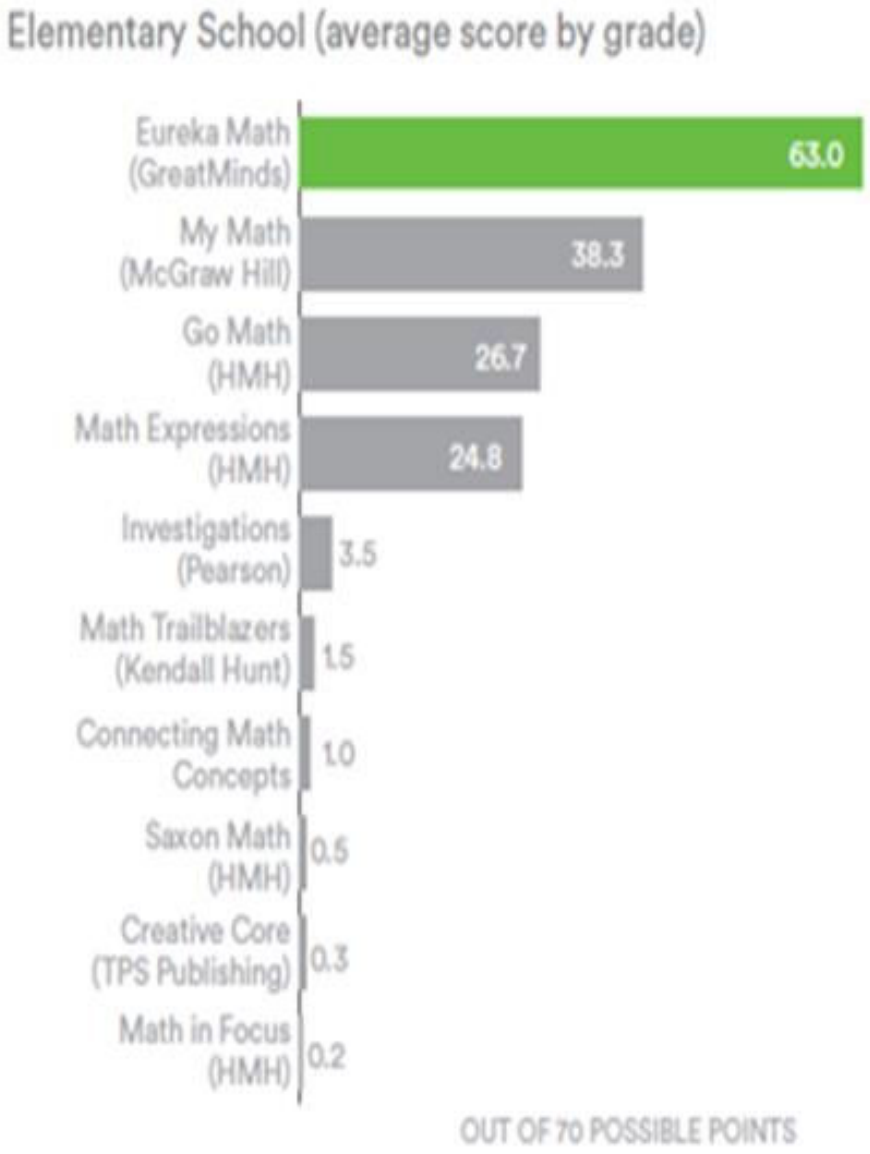
Data from Figure 2.1 of RAND Corporation Report "Implementation of K-12 State Standards for Mathematics and English Language Arts and Literacy"

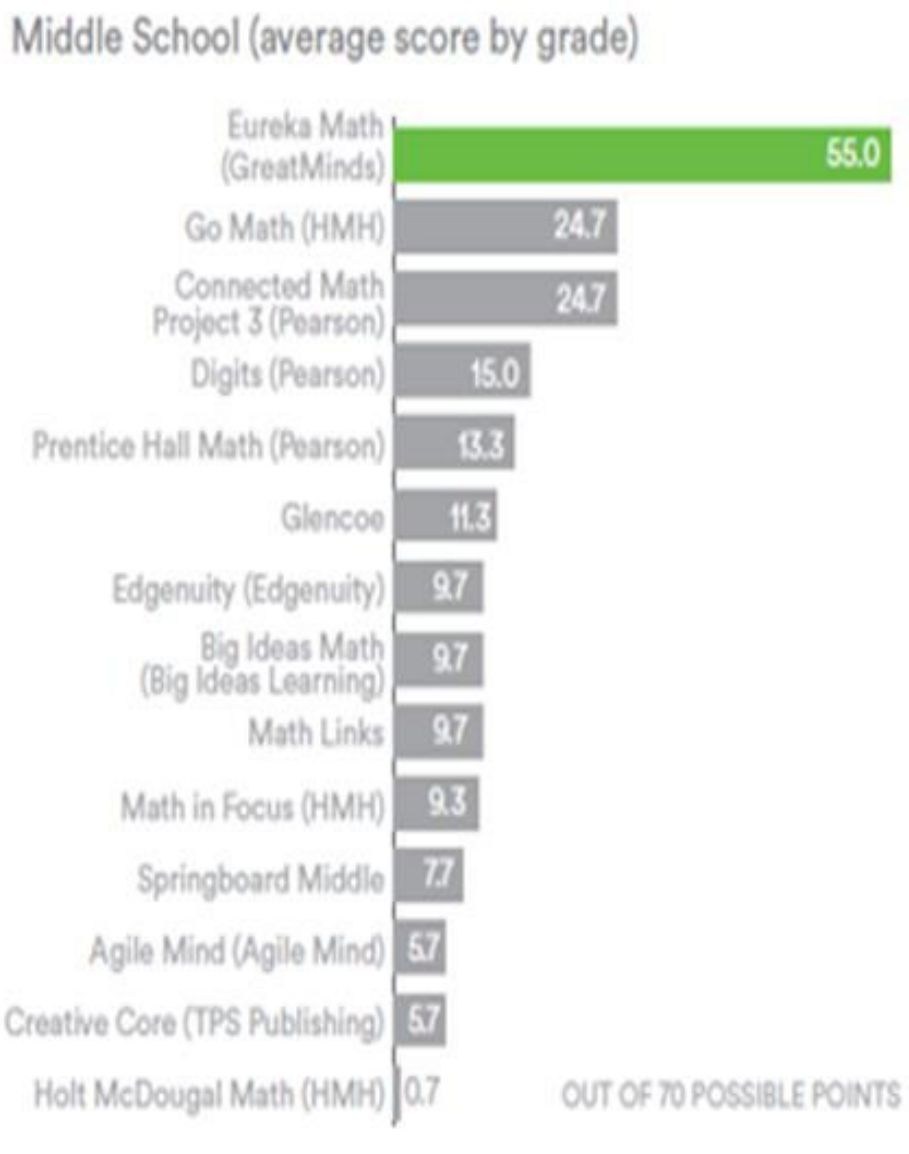
A national survey by The RAND Corporation (April 2016) determined that *Eureka Math* is the most widely used math curriculum in the United States.

Eureka Math Still Top-Rated Curriculum-By Far

- Eureka Math has been evaluated and compared to other Math textbooks 3 times by Ed Reports and each time has remained the top rated curriculum.
- Ed Reports
  - https://www.edreports.org/math/reports/compare-k8.html
- The Eureka textbook outscored their competitors by and average of 24.7 points out of 70 points possible on the evaluation. Eureka averaged 63 points while competitors averaged 38.3.
- Ed Reports rates textbooks on their alignment to standards, focus and coherence across grades and their usability.

RE-REVIEW AND NEW REVIEWS



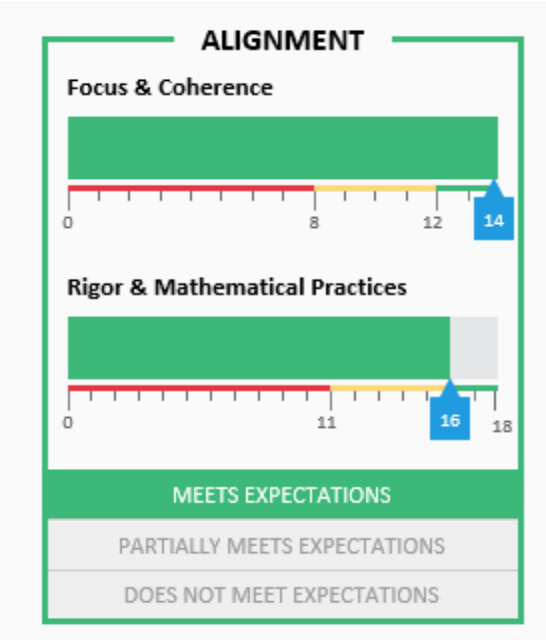


Key Characteristics of the Textbook

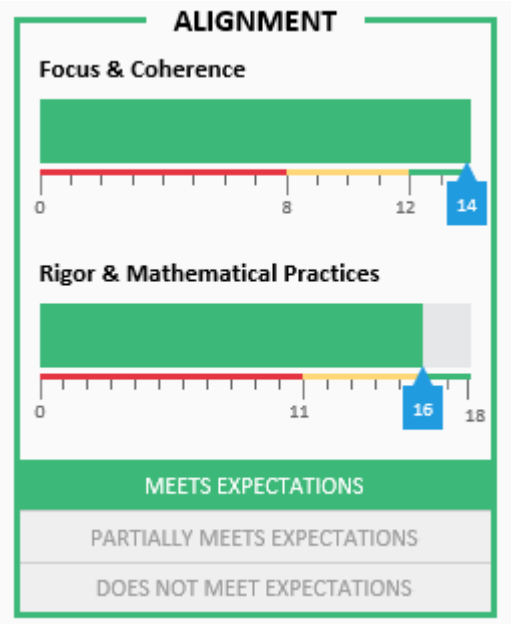
For grades K-8,Eureka received full points for Focus and Coherence. For High School, they met expectations of Focus and Coherence.

K-8 Eureka Math also met expectations for Rigor and Mathematical Practices. High School Eureka received a partially meets due to the areas of Mathematical Modeling and Standards for Mathematical Practices.

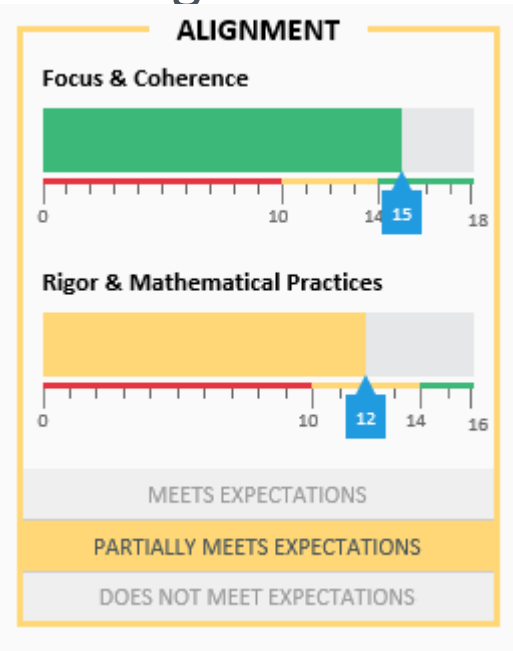
3rd Grade



8th Grade



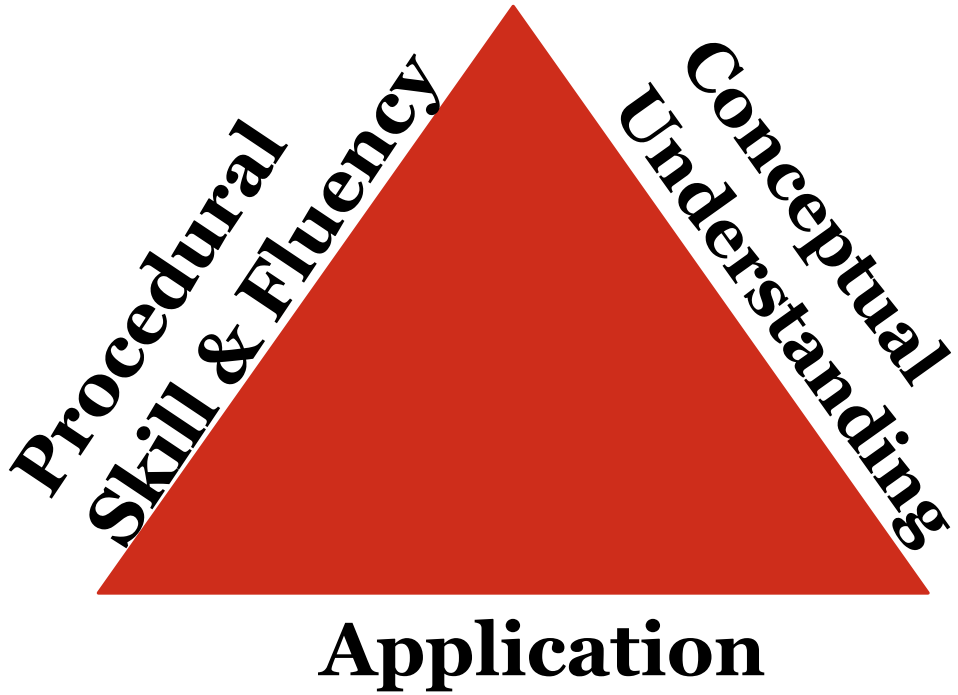
High School



https://www.edreports.org/

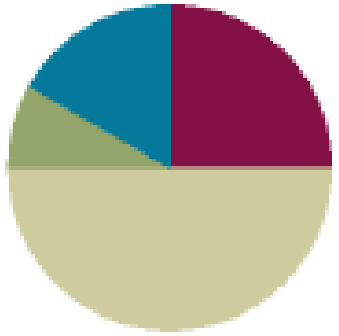
Key Characteristics of the Textbook

The Eureka lessons attend to all three components of a rigorous mathematics program. According to the AZCCRS, rigor is defined as pursuing conceptual understanding, procedural skills and fluency, and application with equal intensity



Suggested Lesson Structure

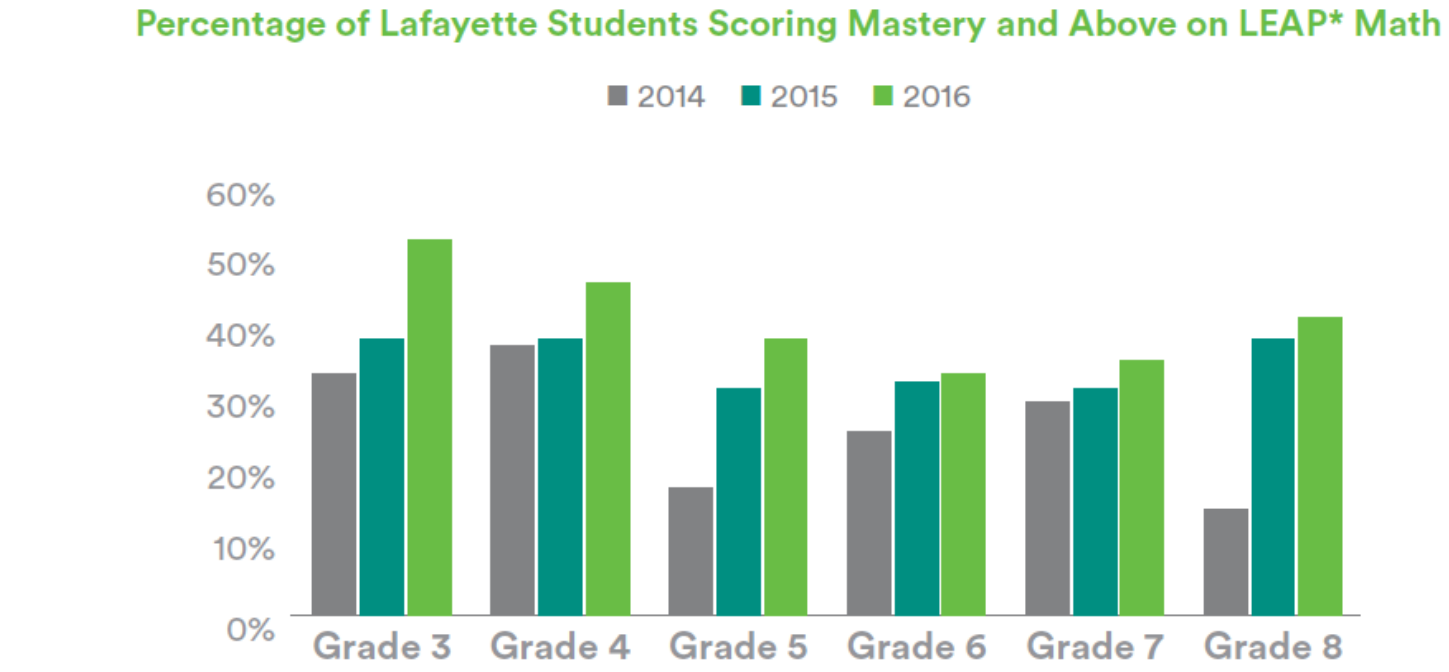
Fluency Practice	(15 minutes)
Concept Development	(30 minutes)
Application Problems	(5 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**



Research: Lafayette Parish, Louisiana

- Louisiana's fifth largest district
- 42 schools- 30,000 students, 70% low-income

Students have made steady progress in math since Eureka was implemented in 2013-14, with average annual gains of 15 percentile points across the grades.

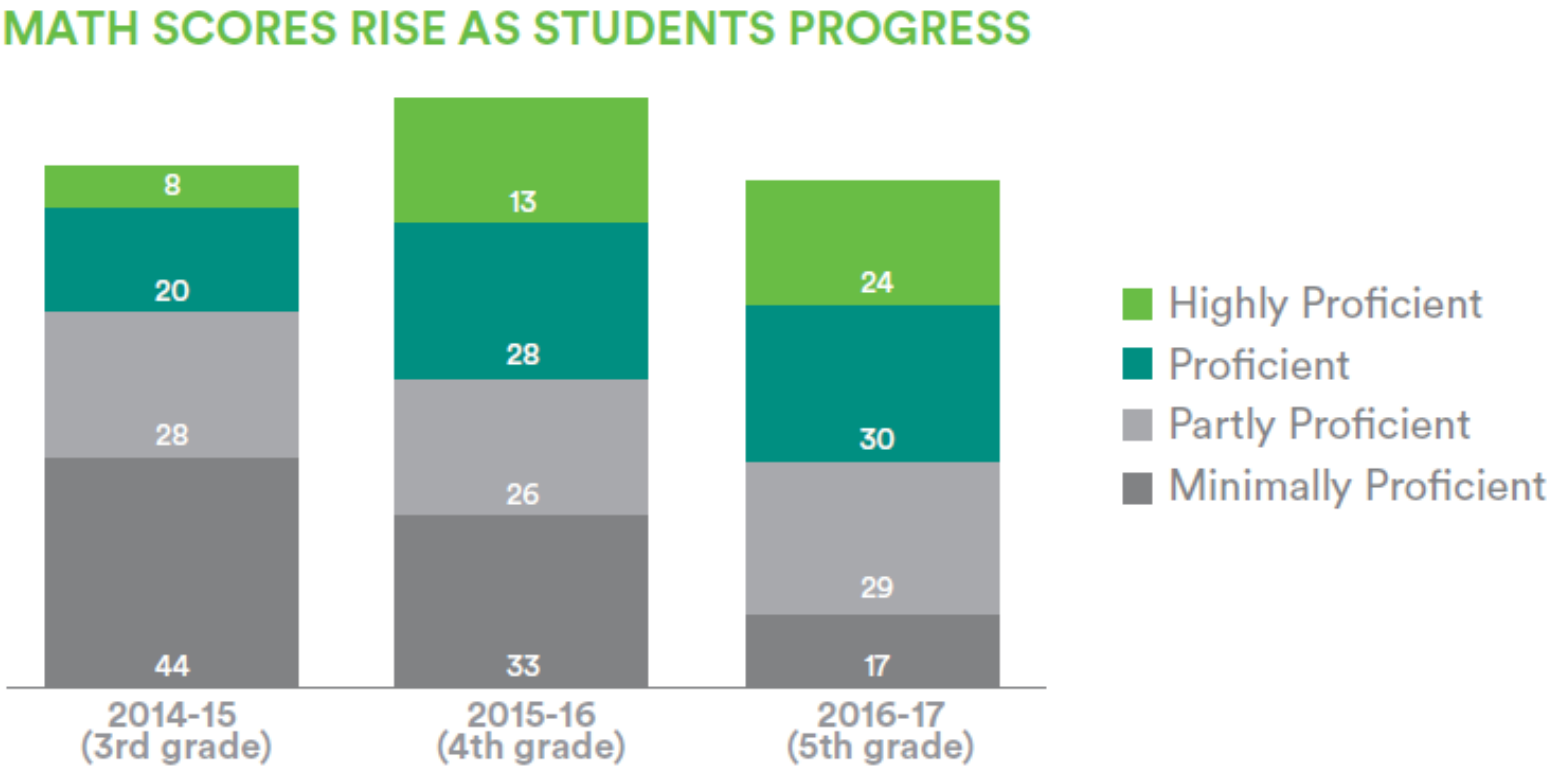


*LEAP is Louisiana's standardized test which is aligned to state standards and taken in grades 3-8. In grades 3, 5, 6, and 7, the test is called iLEAP.

Research: Rancho Santa Fe Elementary, Arizona

- 1 of 14 schools in Litchfield School District
- 650 students
- 53% low income

From Grade 3 to Grade 5 students were three times more likely to score highly proficient on AZMERIT and were nearly twice as likely to receive proficient or highly proficient scores.



District Support: Curriculum

Scope & Sequence documents are aligned to the Engage NY/Eureka Math Modules (with a few exceptions due to AzMERIT or teacher recommendations)

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2017-2018 Math Scope & Sequence Grade 7

1st Quarter[1]	
Unifying Concept: Ratio / Proportional Relationships and Rational Numbers	
Standards for Mathematical Practice Focus: 1, 2, 4, 6, 7	
Target Standards are emphasized during the quarter and used in a formal assessment to evaluate student mastery.	
Highly-Leveraged[2] 7.RP.A.1, 2a-d, 3 7.NS.A.1a-d, 2a-d	**Supporting**[3]
Complementary Standards: (Standards to be taught in classroom and tested on future benchmarks)	
Highly-Leveraged[2] 7.EE.B.4a	**Supporting**[3] 7.G.A.1

2nd Quarter[1]	
Unifying Concept: Expressions/ Equations	
Standards for Mathematical Practice Focus: 2, 4, 6, 7, 8	
Target Standards are emphasized during the quarter and used in a formal assessment to evaluate student mastery.	
Highly-Leveraged[2] 7.NS.A.3 7.EE.A.1, 2 7.EE.B.3, 4a-b	**Supporting**[3]
Complementary Standards: (Standards to be taught in classroom and tested on future benchmarks)	
Highly-Leveraged[2]	**Supporting**[3] 7.G.B. 4, 5, 6

3rd Quarter[1]	
Unifying Concept: Proportional Relationships with Percent/ Statistics and Probability	
Standards for Mathematical Practice Focus: 1, 2, 4, 5, 6, 7	
Target Standards are emphasized during the quarter and used in a formal assessment to evaluate student mastery.	
Highly-Leveraged[2] 7.RP.A.1, 2a-d, 3 *(percent)*	**Supporting**[3] 7.SP.A.1, 2 7.SP.C.5, 6, 7a-b, 8a-c
Complementary Standards: (Standards to be taught in classroom and tested on future benchmarks)	
Highly-Leveraged[2] 7.EE.B.3	**Supporting**[3] 7.G.A.1

4th Quarter[1]	
Unifying Concept: Comparing Populations and Geometry	
Standards for Mathematical Practice Focus: 1, 2, 3, 4, 5, 7	
Target Standards are emphasized during the quarter and used in a formal assessment to evaluate student mastery.	
Highly-Leveraged[2]	**Supporting**[3] 7.SP.B.3, 4 7.G.A.1, 2, 3 7.G.B.4, 5, 6
Complementary Standards: (Standards to be taught in classroom and tested on future benchmarks)	
Highly-Leveraged[2]	**Supporting**[3]

2017-2018 SY Engage NY / Eureka Math Modules Pacing for Scope and Sequence

Sequence of Grade 7 Modules Aligned with the Standards

Q1	Module 1: Ratios and Proportional Relationships (30 days) Aug 3-Sep 14
Q1 & Q2	Module 2: Rational Numbers (30 days) Sep 15–Nov 3
Q2 & Q3	Module 3: Expressions and Equations (35 days) Nov 6-Jan 11
Q3	Module 4: Percent and Proportional Relationships (25 days) Jan 12-Feb 16
Q3 & Q4	Module 5: Statistics and Probability (25 days) Feb 19-Apr 5
Q4	Module 6: Geometry (35 days) Apr 6-May 24

Sequence of Grade 8 Modules Aligned with the Standards

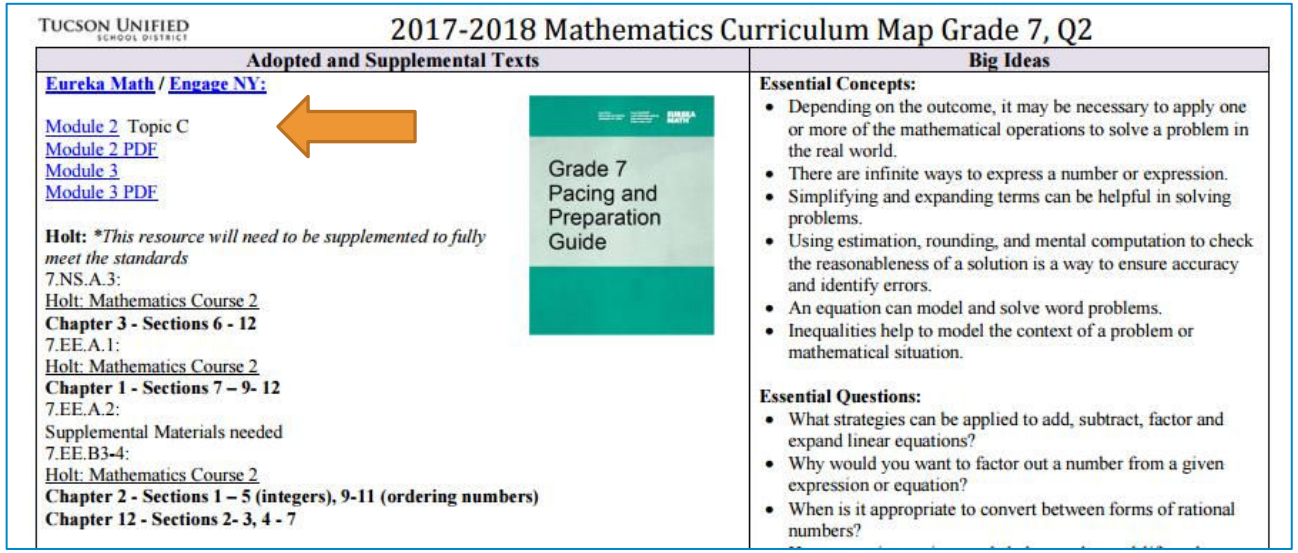
Q1	Module 1: Integer Exponents and Scientific Notation (20 days) August 3-August 30
Q1	Module 2: The Concept of Congruence (25 days) August 31-Oct 5
Q2	Module 3: Similarity (25 days) Oct 16 –Nov 20
Q2 & Q3	Module 4: Linear Equations (40 days) Nov 21-Feb 2
Q3	Module 5: Examples of Functions from Geometry (15 days) Feb 5- Feb 27
Q3 & Q4	Module 6: Linear Functions (20 days) Feb 28-Apr 5
Q4	Module 7: Introduction to Irrational Numbers Using Geometry (35 days) Apr 6-May 24

Sequence of Algebra I Modules Aligned with the Standards

Q1	Module 1: Relationships Between Quantities and Reasoning with Equations and Their Graphs (40 days) (1st Quarter)
Q2	Module 3: Linear and Exponential Functions (35 days) (2nd Quarter)
Q3	Module 4: Polynomial and Quadratic Expressions, Equations and Functions (30 days) (3rd Quarter)
Q4	Module 2: Descriptive Statistics (25 days) (4th Quarter)
Q4	Module 5: A Synthesis of Modeling with Equations and Functions (20 days) (4th Quarter)

District Support: Curriculum

Resources in Curriculum 4.0 documents: Curriculum Maps, Supplemental Tasks and Targeted Learning Session resources show teachers how Engage NY/Eureka Math is aligned to the standards and differentiates instruction.



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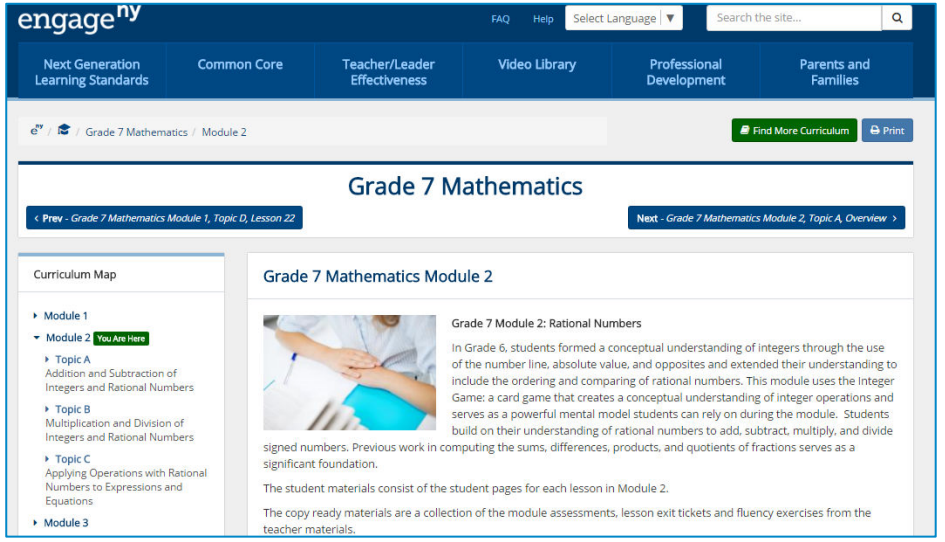
2017-2018 Mathematics Curriculum Map Grade 7, Q2

Adopted and Supplemental Texts	Big Ideas
Eureka Math / Engage NY: Module 2 Topic C Module 2 PDF Module 3 Module 3 PDF **Holt:** **This resource will need to be supplemented to fully meet the standards* 7.NS.A.3: Holt: Mathematics Course 2 **Chapter 3 - Sections 6 - 12** 7.EE.A.1: Holt: Mathematics Course 2 **Chapter 1 - Sections 7 – 9- 12** 7.EE.A.2: Supplemental Materials needed 7.EE.B3-4: Holt: Mathematics Course 2 **Chapter 2 - Sections 1 – 5 (integers), 9-11 (ordering numbers)** **Chapter 12 - Sections 2- 3, 4 - 7**	**Essential Concepts:** • Depending on the outcome, it may be necessary to apply one or more of the mathematical operations to solve a problem in the real world. • There are infinite ways to express a number or expression. • Simplifying and expanding terms can be helpful in solving problems. • Using estimation, rounding, and mental computation to check the reasonableness of a solution is a way to ensure accuracy and identify errors. • An equation can model and solve word problems. • Inequalities help to model the context of a problem or mathematical situation. **Essential Questions:** • What strategies can be applied to add, subtract, factor and expand linear equations? • Why would you want to factor out a number from a given expression or equation? • When is it appropriate to convert between forms of rational numbers?

Grade 7 Pacing and Preparation Guide



District Support: Materials

- 2016-17: Schools were able to order copies to be printed from the TUSD print shop. Binders were provided to teachers to organize copies for student workbooks and teacher manuals.
- 2017-18:
  - 1st semester: Schools continued to order and receive copies of Eureka Math from the TUSD Print Shop.
  - 2nd semester: Transition from printed copies to bound workbooks and teacher editions. Schools that ordered Eureka Math received bound student workbooks and all TUSD teachers received bound teacher's editions for their grade level(s).
- Great Minds website provides teachers access to additional materials, resources, and videos

District Support: Professional Development

Summer 2016 – Engage NY/Eureka Math Institute 454 teachers

- Summer institute planned and implemented by TUSD staff

District Support: Site Based PD

Created, shared and provided professional development on the following topics at sites:

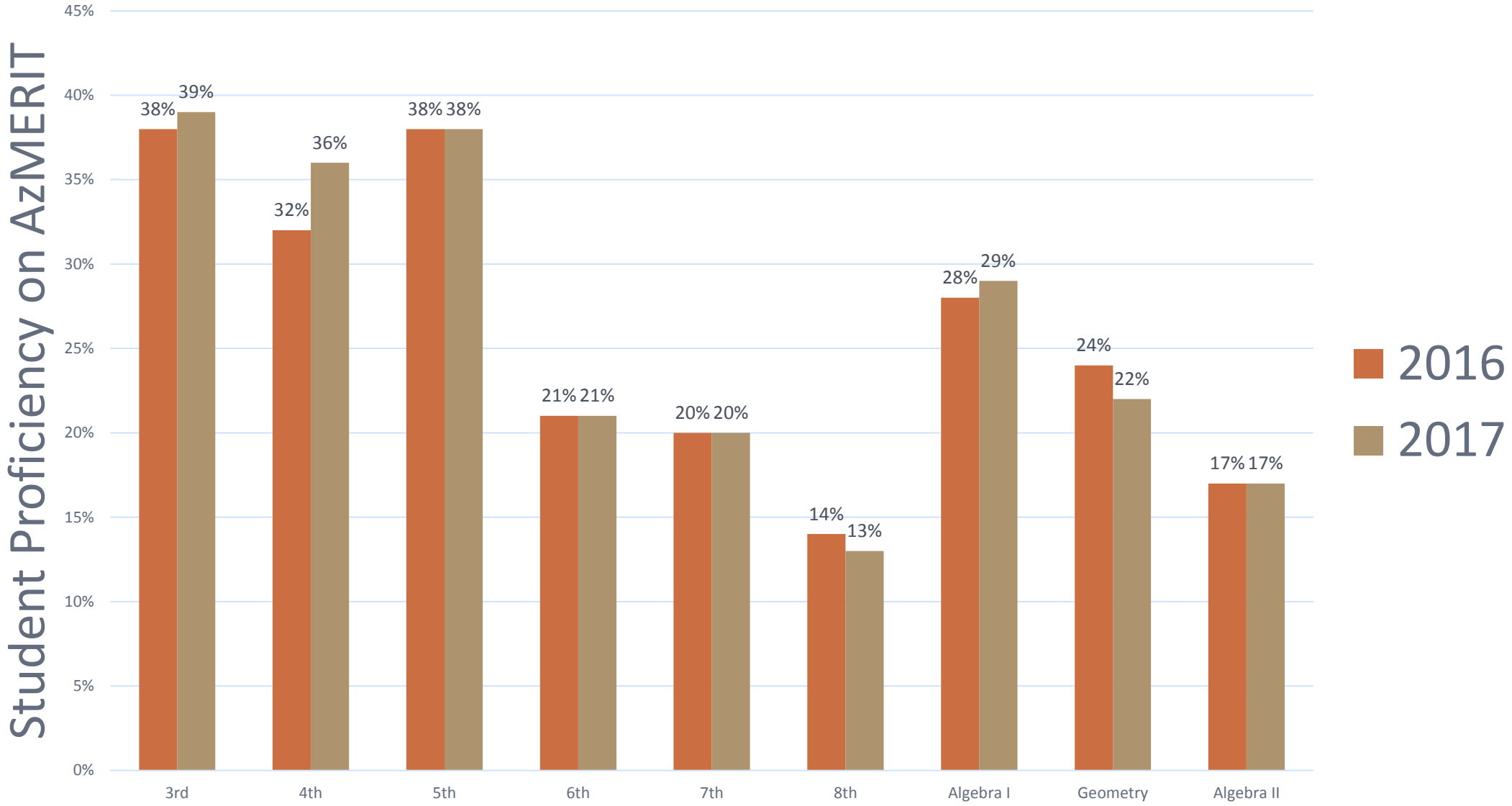
- Eureka Math Navigation
- Usage Quick Guide
- Alignment of TUSD Scope & Sequence with Eureka Math modules
- Differentiation within Eureka Math
- Implementation of Eureka in combo classrooms

District Support: School Sites

- Specific Eureka Math support has been provided at the following sites this school year: Booth/Fickett, Maxwell, Robins, McCorkle, Tolson, Lawrence, Drachman, Davidson, Dunham and Mission View.

- Additionally, ten targeted sites were given the Eureka Digital Suite, which provides teachers additional guidance with implementation as well as a professional development video series for teachers and schools to utilize.

TUSD Mathematics Achievement



Implementation Challenges

- Printing
- Professional Development
- Materials

Next Steps

- Purchase of Student Editions for 2018-2019 SY
- Professional Development sessions by Great Minds for both teachers and curriculum support personnel and administrators
- Professional Development by Math Department
- Job-Embedded Coaching at selected sites
- Continual enhancement of Curriculum and Assessment


QUESTIONS