

**Section one - General info**

Table of contents

Mission, core values for teaching and learning

Framework for Success

Background

***Livermore Valley Joint Unified School District***

# **Mathematics Plan**

***August 1, 2019***

## BACKGROUND

The mission of the Livermore Valley Joint Unified School District (LVJUSD) is to ensure that *“Each student will graduate with the skills needed to contribute and thrive in a changing world.”*

In keeping with that mission, the Board and District affirmed the Core Values for Teaching and Learning to guide our District’s instructional focus.

- LVJUSD schools will be safe, inclusive, and welcoming for all students and their families.
- LVJUSD will provide current, relevant, and engaging instructional materials and strategies that allow students to personalize their educational experience.
- LVJUSD will deliver innovative teaching and professional development that ensures the highest quality instruction that is responsive to each student’s needs.
- All LVJUSD students will have equitable access to a wide range of challenging and inspiring courses and specialized programs that prepare students for college and career.

This document is an action plan for LVJUSD to measurably increase performance of our students in mathematics. The plan is designed using a three-prong approach of support: 1) support for students; 2) support for instructional practices; and 3) support for administrators. Our plan was developed with input from teachers (classroom teachers as well as Teachers Special Assignment with a focus on ~~for~~ math) and administrators, draws on a thorough analysis of relevant data for LVJUSD students.

The LVJUSD mathematics program teaches students the fundamental skills needed for each student to achieve his or her optimum potential by developing the ability to understand and apply mathematics. The curriculum is planned to present the content and structure of mathematics to ultimately prepare students for our career-oriented society, especially in the area of Science, Technology, Engineering, and Math (STEM). Across grades pre-K–12, students build an understanding of the content and the conceptual domains of mathematics:

## California Mathematics Standards

The LVJUSD Mathematics program is aligned with the California Standards for Mathematics that were established based on the following principles:

1. Focus strongly where the standards focus
2. Coherence: Think across grades and link to major topics within grades
3. Rigor: In major topics pursue conceptual understanding, procedural skill, and fluency, and application with equal intensity

The California Mathematics Standards have been divided into Domains and Standards of Mathematical Practices.

### Kindergarten through Grade Eight Domains

Counting and Cardinality, Operations and Algebraic Thinking, Number and Operations in Base Ten, Number and Operations – Fractions, Ratios and Proportional, Relationships, The Number System, Measurement and Data Expressions and Equations, Functions, Geometry, and Statistics and Probability

### High School Domains:

Number and Quantity, Algebra, Functions, Modeling, Geometry, and Statistics and Probability.

According to the California Department of Education, the Standards for Mathematical Practice describe a variety of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important “processes and proficiencies” with longstanding importance in mathematics education. The first of these are the National Council of Teachers of Mathematics (NCTM) process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council’s report *Adding It Up*: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one’s own efficacy).

The Standards for Mathematical Practice are:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.

6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Following are highlights of the California Mathematics Standards:

- The K-5 standards provide students with a *solid foundation in whole numbers, addition, subtraction, multiplication, division, fractions and decimals*, which help young students build the foundation to successfully apply more demanding math concepts and procedures, and move into applications.
- In Kindergarten, the Standards follow successful international models and recommendations from the National Research Council's Early Math Panel report, by focusing Kindergarten work on the number core: learning how numbers correspond to quantities, and learning how to put numbers together and take them apart (the beginnings of addition and subtraction).
- The K-5 Standards build on the best State Standards to provide detailed guidance to teachers on how to navigate their way through knotty topics such as *fractions, negative numbers, and geometry*, and do so by maintaining a continuous progression from grade to grade.
- The Standards stress not only procedural skill but also conceptual understanding, to make sure students are learning and absorbing the critical information they need to succeed at higher levels - rather than the current practices by which many students learn enough to get by on the next test, but forget it shortly thereafter, only to review again the following year.
- Having built a strong foundation K-5, students are prepared for hands on learning in geometry, algebra, and probability and statistics. Students who have completed 7th grade and mastered the content and skills through the 7th grade will be *well prepared for algebra* in grade 8.
- The Middle School Standards are robust and provide a coherent and rich *preparation for high school mathematics*.
- The High School Standards call on students to *practice applying mathematical ways of thinking to real world issues and challenges*; they prepare students to think and reason mathematically.
- The High School Standards set a *rigorous definition of college and career readiness*, by helping students develop a depth of understanding and ability to apply mathematics to novel situations, as college students and employees regularly do.
- The High School Standards *emphasize mathematical modeling*, the use of mathematics and statistics to analyze empirical situations, understand them better, and improve decisions. For example, the Draft Standards state: "Modeling links classroom mathematics and statistics to everyday life, work, and decision-making. It is the process of choosing and using appropriate mathematics and statistics to analyze empirical situations, to understand them better, and to improve decisions. Quantities and their relationships in physical, economic, public policy, social and everyday situations can be modeled using mathematical and statistical methods. When making mathematical models, technology is valuable for varying assumptions, exploring consequences, and comparing predictions with data."

## Section 2 - Data

### STUDENT PERFORMANCE IN MATH

The LVJUSD Mathematics Teaching and Learning Plan was designed to address the fundamental teaching and learning needs in our District. Thorough data analysis shows that Livermore students continue to outperform students within the State and County in the area of mathematics on the California Assessment of Student Performance and Progress (CAASPP). Yet, it is our District's mission to prepare all students to "contribute and thrive" and our achievement gap illustrates that we still have a need for growth. In addition to outlining strategies to reduce this gap, the plan also outlines enrichment opportunities and the support needed to move even our highest performing students to the next level.

CAASPP Test Results				
% of students Standard Met or Exceeded				
	MATHEMATICS			
	2016	2017	2018	2019 Preliminary
<b>Grade 3</b>	62%	60%	66%	61%
<b>Grade 4</b>	46%	57%	56%	59%
<b>Grade 5</b>	43%	44%	48%	48%
<b>Grade 6</b>	43%	47%	46%	46%
<b>Grade 7</b>	45%	51%	49%	48%
<b>Grade 8</b>	42%	42%	48%	47%
<b>Grade 11</b>	48%	49%	46%	42%
<b>LVJUSD</b>	47%	50%	51%	
<b>Alameda Co.</b>	46%	47%	49%	
<b>State of CA</b>	37%	38%	39%	
	MATHEMATICS			
	2016	2017	2018	2019 Preliminary
<b>White</b>	55%	57%	58%	
<b>Black</b>	28%	28%	37%	
<b>Hispanic</b>	28%	31%	31%	
<b>EL</b>	13%	12%	14%	
<b>SED</b>	24%	24%	27%	
<b>Sp Ed</b>	13%	12%	14%	
<b>Female</b>	47%	50%	51%	
<b>Male</b>	47%	50%	51%	

For the past three years, the data shows that our District has continued to perform above both the County and State averages.

Current 7th, 8th, and 11th grade cohorts have remained consistent with regard to the percent of students that met or exceeded grade level math standards.

There is a consistent dip between 3rd grade scores and subsequent 4th grade scores.

Overall, the percentage of 4th and 5th grade students meeting or exceeding math standards has improved from one year to the next.

Overall, the percentage of 11th grade students meeting or exceeding math standards has declined slightly from one year to the next.

English Learners and students with disabilities continue to struggle to meet grade level math standards.

Overall, gender does not have an impact on the percent of students that meet or exceed grade level math standards.

While a gap still exists between white and non-white student groups, there is evidence to support that progress is being made to close the gap.

Students who are Socio-economically Disadvantaged are making steady growth, but there is still an achievement gap.

<b>Grade 5 Math Placement Final Recommendations 2018-2019</b>		
	<b>Math 6</b>	<b>Math 6/7A</b>
<b>LVJUSD</b>	<b>62%</b>	<b>36%</b>
<b>Altamont Ck</b>	<b>66%</b>	<b>34%</b>
<b>Arroyo Seco</b>	<b>67%</b>	<b>33%</b>
<b>Smith</b>	<b>46%</b>	<b>54%</b>
<b>Jackson</b>	<b>73%</b>	<b>27%</b>
<b>Michell K-8</b>	<b>74%</b>	<b>26%</b>
<b>Junction K-8</b>	<b>71%</b>	<b>29%</b>
<b>Lawrence</b>	<b>66%</b>	<b>34%</b>
<b>Croce</b>	<b>72%</b>	<b>27%</b>
<b>Marylin</b>	<b>68%</b>	<b>32%</b>
<b>Rancho</b>	<b>63%</b>	<b>37%</b>
<b>Sunset</b>	<b>52%</b>	<b>48%</b>

<b>Grade 8 Math Placement Final Recommendations 2018-2019</b>			
	<b>Algebra I</b>	<b>Geometry</b>	<b>Algebra II</b>
<b>LVJUSD</b>	<b>72%</b>	<b>20%</b>	<b>3%</b>
<b>CMS</b>	<b>75%</b>	<b>25%</b>	<b>0.5%</b>
<b>East Ave.</b>	<b>76%</b>	<b>24%</b>	<b>0.5%</b>
<b>Michell K-8</b>	<b>63%</b>	<b>33%</b>	<b>4%</b>
<b>Junction K-8</b>	<b>90%</b>	<b>10%</b>	<b>0%</b>
<b>MMS</b>	<b>73%</b>	<b>19%</b>	<b>8%</b>
<b>Vineyard</b>	<b>90%</b>	<b>10%</b>	<b>0%</b>

Based on the most recent 5th grade math placement recommendations (which used data from: class grades, math placement assessment score, and past 2 years of CAASPP scores), 62% of our District students were recommended to take the standard course path by starting with the 6th grade math course. While 36% of students were able to progress to the next level math course (Math 6/7A).

Based on the most recent 8th grade math placement recommendations (which used data from: class grades, math placement assessment score, and past 2 years of CAASPP scores), 72% of our District students were recommended to move to algebra in high school.

Twenty percent of the 8th grade students demonstrated readiness for high school taking Geometry, and 3% will begin high school enrolled in Algebra 2.

<b>Elementary Investigations Unit 5 or 6 Average Percent Correct</b>				
	<b>Gr. 2</b>	<b>Gr. 3</b>	<b>Gr. 4</b>	<b>Gr. 5</b>
<b>LVJUSD</b>	<b>77%</b>	<b>69%</b>	<b>70%</b>	<b>80%</b>
Altamont Ck	75%	69%	84%	75%
Arroyo Seco	77%	72%	66%	79%
Smith	77%	77%	73%	87%
Jackson	86%	70%	68%	70%
Michell K-8	76%	67%	75%	80%
Junction K-8	57%	49%	46%	74%
Lawrence	no data	72%	78%	90%
Croce	79%	63%	65%	72%
Marylin	77%	73%	56%	85%
Rancho	83%	71%	74%	84%
Sunset	79%	75%	83%	88%

This past year, each elementary school site administered a common assessment from Investigations 3 (our currently adopted instructional materials for mathematics). All students in grades 3-5 took the Unit 6 assessment, and grade 2 took the unit 5 assessment.

The data revealed that between 70%-80% of students passed the Common Unit Assessment. Junction's grade level averages were consistently lower than our District average.

In the 2019-20 school year, elementary sites will also administer the Unit 2 & Unit 5 assessments. In addition, math at Junction will be taught in English.



<b>Math Course Passing Rate 2018-2019</b>			
	<b>Grade Level</b>	<b># of Students enrolled</b>	<b>Earned C- or better in "B" portion of course</b>
Algebra I	9th	692	77%
Geometry	9-12	954	78%
Algebra II	9-12	685	84%

<b>Grade 9 Math Course Enrollment</b>		
	<b># of Students</b>	<b>% of Total</b>
Algebra	680	64%
Geometry	215	20%
Algebra II	44	4%
Pre-calculus	5	0%
Other Math course	121	11%
<b>Total</b>	<b>1,065</b>	

Research shows that students who successfully pass Algebra 1 on their first attempt are more likely to complete Algebra 2 (a gatekeeper to college admission). Therefore, we examined the percentage of 9th grade students who passed Algebra 1 as freshmen.

In addition, the 11th grade math CAASPP assessment tests students on concepts from Algebra 1, Geometry, and Algebra 2 courses. Therefore, the more students that complete Algebra 2 by the conclusion of their junior year are more likely to be successful on the 11th grade CAASPP.

Based on the course grades for Algebra 1, 77% of the current 9th grade students passed Algebra 1 on their first time taking the course in high school.

An overwhelming majority of high school students taking Geometry and Algebra 2 passed the respective courses.

### **Section 3 - Plan**

#### THE LVJUSD MATH ACTION PLAN

The math action plan includes the following key features:

1. Improving student achievement as measured by closing the achievement gap and increasing measurable student success, specifically under-performing and/or at-risk students, in college preparatory courses.
2. Enhancing the performance and professionalism of a diverse and high quality faculty with the assistance of math coach(es), teacher experts, site administrators and district leadership to guide professional development to build content knowledge, expand instructional practices, and build internal leadership.
3. Using and analyzing formative assessments; maximize student learning by using assessment data to focus and implement intervention and enrichment.
4. Parent Involvement: Collaborate with parents, guardians, and the early childhood and extended learning communities to enhance math education.
5. Establishing (and where applicable, further cultivating) strong community partnerships fostering long term institutional change.

What follows is a detailed breakdown of strategies that will be implemented by grade span and system-wide, as well as the expected outcomes for each of the key features of the plan.

#### **Curriculum**

<b><u>Action</u></b>	<b><u>Grade Span</u></b>	<b><u>Description</u></b>	<b><u>Timeline</u></b>	<b><u>Who</u></b>	<b><u>Impact</u></b>
Week of Inspirational Math (Youcubed)	✓ PK - 5 ✓ 6 - 8 ✓ 9 - 12	Math lessons with accompanying mindset videos designed to encourage students to challenge themselves	August annually	TK – 12 teachers	Growth Mindset
Silicon Valley Math Initiative (SVMi)	✓ PK - 5 ✓ 6 - 8 ✓ 9 - 12	Supplementary challenge problems, performance tasks, and professional development for teachers and principals	On-going	TK-12 teachers	Offers enrichment & extension options for students

Investigations 3 Big Ideas Math	✓ K - 5 ✓ 6 - 9	Ensure use of adopted curriculum	On-going	Site Administrators	Consistent delivery of standards aligned curriculum
Adopt Updated curriculum in Geometry through Calculus	✓ 9 - 12	Instructional materials aligned to CA Standards are available	Fall 2020	Curriculum department and Pilot adoption committee	Improved instructional materials and student outcomes
Pilot ST Math in SPED and math support classes	✓ K - 5 ✓ 6 - 8	Online math software that offers individualized learning programs	Fall 2019	K-8 teachers	Additional support for struggling students
Early Learning Math Initiative (ELMI)	✓ PK - 3	Counting Collections instructional strategies focused on building numeracy	On-going	PK-3 teachers	Strong foundations are established in mathematical literacy
Additional entry point for advancement and summer Geometry options	✓ 9 - 12	Review math course flow chart and identify ways in which students could progress through a math course while being responsible for the content knowledge	Fall 2019	MS & HS math teachers Math ToSAs Admin	Provide opportunities for students to advance in math
AVID Elementary - Mathematical Discourse	✓ K-5	AVID instructional strategy encourages mathematical student discourse	On-going	Jackson - 3rd-5th Seco - 4th	Students build math vocabulary and confidence by talking

					math problems out loud
--	--	--	--	--	------------------------

**Professional Development (PD)**

Action	Description	Timeline	Who	Impact
Principal professional development	Monthly principal meetings and SVMl	On-going	K-12 administrators	Build instructional leadership capacity
Algebra Task force	Math team members meeting to discuss & explore ways to strengthen and enhance algebra instruction	Monthly	HS & MS Instructional Leadership Team (ILT) math members	Explore ways to improve algebra outcomes
Pacing guides & essential standards	Update and publicize with all teachers	On-going	Math ToSAs	Consistency of math practice
Math postcards	Grade level aligned professional development resource	Monthly	Math ToSAs	Provide grade targeted math strategies
TK – 12 Math collaboration meetings	Convene math leaders from all grades to collaborate on math achievement and provide additional input for math plan	8 per year	Math Leads Math ToSAs Curriculum Admin	Establish math PLC to focus on improving math instruction
Universal Design for Learning focused professional development	Focus area for district-directed professional development	On-going	K-12 teachers	The design of learning environments proactively

				for variability, that anticipates and values the incredible strengths and diversity of our learners
Content knowledge development	Provide ways for teachers to deepen math content knowledge (trainings, conferences)	On-going	PK-12 teachers	Improve math instruction
Revisit / revise common finals	Review 2019 results and conduct an item analysis to ensure standards-aligned questions	Fall 2019	6-12 math teachers	Refine consistent summative assessment tool
Continue professional development of adopted materials	Provide additional training from Pearson and Big Ideas	On-going	K-8 teachers Alg. teachers	Improve instruction and student performance by ensuring the intended use of instructional materials
Silicon Valley Mathematics Initiative Professional Development	Principal as an Instructional Leader and Math Coach workshops	Monthly meetings	K-12 teachers	Develop deeper instructional practices

**Instruction**

Action	Description	Timeline	Who	Impact
Junction – elementary instruction of math in English	For many years students at Junction have learned math in Spanish and been assessed in English. Math Instruction will now be in English.	On-going	Elementary staff	Alignment of math instruction with assessments
Communicate daily time expectations for math instruction	Elementary teachers should have a minimum of 60 minutes of math instruction every school day	Start of year and every trimester	Curriculum Department & elementary teachers	Alignment with requirements of the math curriculum and consistency of math instruction
Math workshop / Math talks	This instructional practice challenges students to deepen mathematical reasoning and exposes them to multiple methods of solving problems	On-going	Math coaches and all math teachers (including elementary)	Improvement in problem solving and mathematical reasoning skills for students
Las Positas College Math tutoring	High school students may take advantage of free tutoring at Las Positas College	On-going	Las Positas math department, HS math teachers, counselors and administrators	Tutoring at no cost in all areas of math
Consider/explore concept of math lab teachers (specialists)	Highly trained teachers to deliver math lab instruction	Fall 2020	Curriculum Department	Deeper student understanding of essential standards
Evaluate and revise as needed the structure of intervention and	Analyze the impact of various existing math intervention systems at school sites.	2019-20 school year	Curriculum Department and K - 12 math task force	Consistent interventions that show measurable

remediation services	Discontinue or restructure those that are not effective. Replicate those that are effective.			improvement in student achievement
Focus on academic discourse and equitable participation	Research shows that mathematical discourse is essential for understanding of complex tasks, especially for English Learners.	On-going	Curriculum Department and all teachers	Measurable improvement in math achievement

**Assessment / Other**

Action	Description	Timeline	Who	Impact
Easy Curriculum Based Measurement (CBM)	Identify gaps with universal screening tool to inform instruction	Three times per year	Multi-tiered System of Supports (MTSS) ToSAs K - 8th grade students	Identify areas of weakness in students
5 x 8 Card for Math Instruction for Principals and Cabinet	Observation tool that focuses on effective instructional strategies	On-Going	Administrators	Focus on strategies to improve students' math performance
Focus for Cabinet and Administrators visits – new teachers and math instruction	Target math classrooms & math instruction on weekly site visits	On-Going	District Office and site administrators	Visitors elevate instruction

School Plan for Student Achievement	Measurable targets for student growth	October / annually	Principals, Site Councils, Educational Services, Board	Measurable increase in math performance based on site data
Family education nights	Provide opportunity to get parents involved in math activities	On-going	School sites with support of Math ToSAs	Increase parent math awareness and engagement with students
Community Partnerships with Math focus	Garner math support within community	On-going	District Office	Increase community support for improving math abilities of our students and the creation of fun activities that students and their families can participate in that demonstrate the real world importance of math in our community
Increase participation in Math Counts event	Increase number of students from each MS involved in rigorous math activities	Winter 2020	Math ToSAs Site Admin	Increase number of students challenging themselves in math
Cohort Model of supporting schools	Data shows us that our schools have unique needs	On-going	Math ToSAs	Accelerated growth for schools that have larger



				achievement gaps
--	--	--	--	------------------

**Section 4 - Timeline and summary**

<b>2019 - 2020 School Year</b>
Week of Inspirational Math (Youcubed)
Pilot ST Math
Research and begin to design additional entry point for advancement and/or summer Geometry
AVID Elementary
Pacing guides and essential standards
TK - 12 Math Collaboration Meetings
Expectations for Math instructional minutes (60 minutes daily)
Evaluate / revise math intervention and remediation
Consider / explore math lab teachers concept
Revisit / revise common finals
Easy CBM universal screening
School Plan for Student Achievement (SPSA)

<b>2020 - 2021 School Year</b>
Adopt updated curriculum for Geometry through Calculus
Implement ST Math if pilot indicates expansion
Implement additional entry point for advancement and/or summer Geometry
Implement revised math intervention and remediation
Possible math lab teachers implementation

Ongoing
SVMl materials use and PD <ul style="list-style-type: none"> <li>• <a href="#">“Building &amp; Sustaining Community in a Mathematically Powerful Virtual Classroom”</a></li> <li>• <a href="#">SVMl Guest Speakers</a></li> </ul>
Monitor use of adopted curriculum and additional PD
ELMI expansion
Principal PD
Algebra Task Force
Math Postcards (PD) <ul style="list-style-type: none"> <li>• <a href="#">6-12 Math PD Opportunity</a></li> </ul>
Universal Design for Learning PD
Content knowledge development
Focus on academic discourse and equitable participation
5 x 8 cards for math observation
Math focus for cabinet and administrator classroom visits
Junction TK - 5 Math instruction in English
Math Workshop / Math Talks
Las Positas College Math tutoring
Family math nights
Community Math partnerships
Cohort model of support

### **Section 5 - Resources**

Easy CBM (Universal Screening / Assessment)

<https://easycbm.com/>

EDSource *10 California districts struggle, and find some success, as they shift to Common Core Math - Evaluation of program offers lessons and guides for improvement*  
<https://edsources.org/?p=615109>

**EducationWeek** *Coronavirus Reveals How Math Instruction Must Change, Math groups Say*  
<https://www.edweek.org/teaching-learning/coronavirus-reveals-how-math-instruction-must-change-math-groups-say/2020/06?cmp=eml-enl-ewpce-mat>

NCTM Newsletter link  
[www.illuminations.nctm.org](http://www.illuminations.nctm.org)

University of Texas at Austin, link for teachers to additional resources and lessons designed to improve student mathematical understanding  
[www.insidemathematics.org](http://www.insidemathematics.org)

National Council of Teachers of Mathematics website  
[www.nctm.org](http://www.nctm.org)

Public Policy Institute of California *Achievement in California's Public Schools - What do Test Scores Tell Us?*  
<https://www.ppic.org/wp-content/uploads/achievement-in-californias-public-schools-what-do-test-scores-tell-us.pdf>

ST Math  
<https://www.stmath.com/>

Visible learning for Mathematics by John Hattie  
<http://us.corwin.com/en-us/nam/visible-learning-for-mathematics-grades-k-12/book255006>

Youcubed link  
<https://www.youcubed.org/week-inspirational-math/>

5 x 8 card for observing math instruction  
<https://math.serpmedia.org/5x8card/>