



Our **vision** is to provide high-quality educational opportunities that inspire a community of learners

WELLNESS • EQUITY • ENGAGEMENT

Our **mission** is to develop engaged, well-balanced learners through collaborative, caring relationships

# Mathematics K-12

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January 26, 2023

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## Presenters

Heather Haines, PK-6 Mathematics Curriculum Coordinator

Kimberly Macey, JH Mathematics Coordinator

Jessica Carabellese, HS Mathematics Department Leader

Dana Labb, Principal, Blanchard

Joanie Dean, Principal, ABRHS

Jennifer Truslow, Director of Special Education

Deb Bookis, Assistant Superintendent for Teaching and Learning

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## District Goal

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## District Goal(#2) and Outcomes

**Goal:** Increase the number of students on a pathway to proficiency in Literacy and Mathematics through implementation of a multi-tiered system of supports (MTSS).

**Outcome:** Increased number of students meeting their stretch goals with particular emphasis on students performing one or more grade levels below benchmark on their baseline (fall) assessment.

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# Universal Screeners and MTSS

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# Family Resources

Beginning of year letter sent to all families

[MTSS website and Family Brochure](#)

MTSS

Acton-Boxborough Regional School District / District / Teaching and Learning / MTSS

- Home
- District
- Teaching and Learning
- DCAP
- Assessment
- MTSS
- Curriculum Standards
- STEAM

**Understanding Multi-Tiered System of Support (MTSS) Website**

Read our [NEW Family Brochure](#)

**Mandarin Chinese**

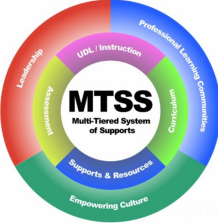
**Telugu**

**Russian**

**Hindi**

**Portuguese**

**Spanish**



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# Supplemental Instruction

Students receiving ongoing, supplemental instruction (support) from a reading specialist or mathematics specialist

- Families contacted by specialist
- Last year - one system-wide letter for math/reading
- Sent to families before supplemental instruction begins

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# Next Steps

**Goal:** Ensure that information shared about universal screening and results matches how we are using them

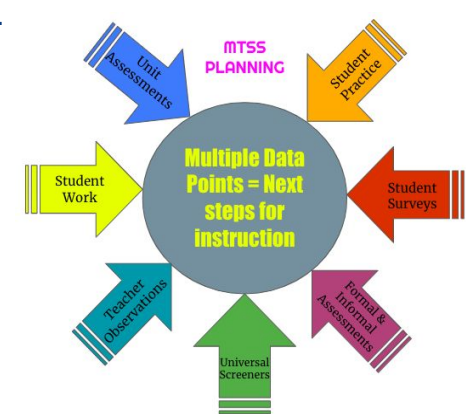
**Adaptive Work** - First year teams of educators using assessments in this way

- Use of screeners - to look more closely at students' skills and progress and to start discussion
- Technical Learning and Data Literacy Learning
- Through an equity lens - improving our inferences - making sure that our inferences are supported by evidence. Identifying the stories in the data.

Gathering input and feedback from school-based teacher teams for communication processes and documentation

Potential small-scale pilot in the spring

Timing aligned with dyslexia amendment for informing parents/caregivers

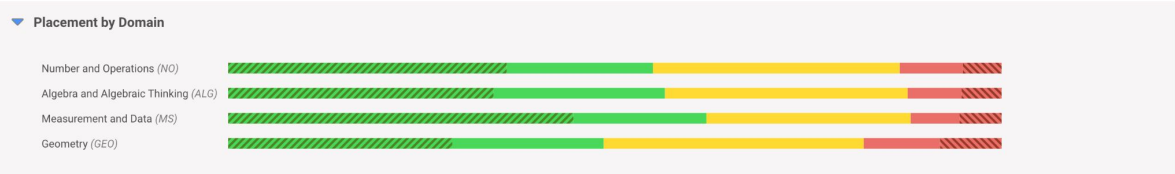
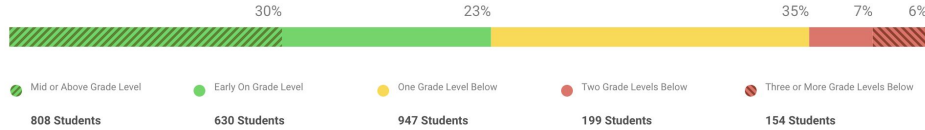


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# iReady and MCAS

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## iReady- Mathematics Grades 1-8



At the first diagnostic window, students who are one grade level below are performing consistently with students who have just begun their academic year.

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# iReady- Mathematics Grades 1-8

**Fall 2022 iReady Assessment: Mathematics**  
**Number of Students Assessed: 2,769**

Grade		1	2	3	4	5	6	7	8	Total
One Grade Level Below	#	54	186	179	140	104	105	99	88	955
	%	2.0%	6.7%	6.5%	5.0%	3.8%	3.8%	3.6%	3.2%	34.5%

**Students**  
**N= 955**  
**35%**

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# iReady- Mathematics Grades 1-8

**Fall 2022 iReady Assessment: Mathematics**  
**Number of Students Assessed: 2,769**

Grade		1	2	3	4	5	6	7	8	Total
Two Grade Levels Below	#	11	45	24	15	21	25	10	15	166
	%	.4%	1.6%	.9%	.5	.8%	.9%	.4%	.5%	6%
Three or More Grade Levels Below	#			19	28	18	33	21	42	161
	%			.7%	1.0%	.7%	1.2%	.8%	1.5%	5.9%

**Students**  
**N= 327**  
**~11.9%**

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# iReady- Mathematics Grades 1-8

Of 327 students assessed that were 2,3 or more grades below	#	%		Of the total student group population assessed	#	%
Multilingual	84	26%		Multilingual	165	51%
Special Education	166	51%		Special Education	407	41%
Economically Disadvantaged	125	38%		Economically Disadvantaged	299	42%
Asian	38	12%		Asian	896	3.6%
Black	40	12%		Black	125	32%
Two or More Races	23	7%		Two or More Races	170	14%
White	225	69%		White	1,572	14%
Hispanic	100	31%		Hispanic	220	45%

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## Assessment - MCAS

### Purpose: System Monitoring (Accountability)

#### How Use:

- DESE strongly encourages districts to focus on **using the results for improvement purposes at the local level.**
- Caution should be exercised when **making comparisons** across Districts and across schools within the same district
- Last 2.5 years **have not been normal**, so the results are going to be different
- Access to instruction for some students **was disrupted**
- Find the **bright spots** and where the recovery has started
- Connect to ongoing to **District initiatives** for challenges
- The bigger picture is student **SEL and Sense of Belonging**

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# MCAS Test Administration 2019-2022

2022 school year was the first full MCAS administration for grades 3-8 since 2019. Grade 10 students in 2022 had not taken an MCAS test since 2019 (grade 7).

Year	Grades 3-8	Grade 10
2019	Full test administration	Full test administration
2020	No tests administered	No tests administered
2021	Half-test administered	Full test administered
2022	Full test administered	Full test administered

Massachusetts Department of Elementary and Secondary Education



## ABRSD 2022 MCAS Data: Mathematics

Grade	2019 % Meeting and Exceeding Expectations	2021 % Meeting and Exceeding Expectations	2022 % Meeting and Exceeding Expectations	Change M/E 19-21	Change M/E 21-22	Cumulative Change M/E 19-22
3	81	70	75	-11	5	-6
4	79	72	76	-7	4	-3
5	79	57	76	-22	19	-3
6	86	71	86	-15	15	0
7	78	75	74	-3	-1	-4
8	80	57	79	-23	22	-1
10	91	85	81	-6	-4	-10



# ABRSD 2022 MCAS Data: Science

Grade	2019 % Meeting and Exceeding Expectations	2021 % Meeting and Exceeding Expectations	2022 % Meeting and Exceeding Expectations	Change M/E 19-21	Change M/E 21-22	Cumulative Change M/E 19-22
5	65	66	66	1	0	1
8	79	69	75	-10	6	-4
10			85			

Note: Grade 10 test was new in 2022; 2019 and 2021 scores not comparable.

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## Student Growth Percentile (SGP)

- Measures achievement over time
- Uses a cohort model - students are compared with all other students in the state who earned a similar score on the previous year MCAS
- Calculated in grades 4-8 and 10, ELA and Mathematics
- 2021 used a different calculation that is not comparable
- SGP score range
  - 1-19 Very Low
  - 20-39 Low Growth
  - 40-59 Typical Growth
  - 60-79 High Growth
  - 80-99 Very High Growth

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# ABRSD 2022 MCAS SGP: Mathematics

Grade	Math Student Growth Percentiles (SGP)	Designation
10	61	High Growth
8	66	High Growth
7	71	High Growth
6	70	High Growth
5	51	Typical Growth
4	53	Typical Growth

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## ABRSD 2022 MCAS Mathematics by Student Group Grades 3-8

	N Students Included		% Meeting or Exceeding		Mean SGP 2022	Designation 2022
	2021	2022	2021	2022		
All	2,373	2,380	65%	69%	63	High
ED	222	278	32%	35%	55	Typical
Students w/Disabilities	407	396	28%	27%	58	Typical
EL	102	287	22%	57%	60	High
Race - Afr. Am/Black	73	64	30%	35%	61	High
Race - Asian	848	799	85%	89%	67	High
Race - Hisp./Latino	158	162	37%	39%	52	Typical
Race- Multi; Non Hisp/Latino	100	121	67%	70%	63	High
Race - White	1,185	1,228	57%	63%	61	High
Gender - Male	1,237	1,221	67%	71%	64	High
Gender - Female	1,134	1,150	63%	67%	62	High

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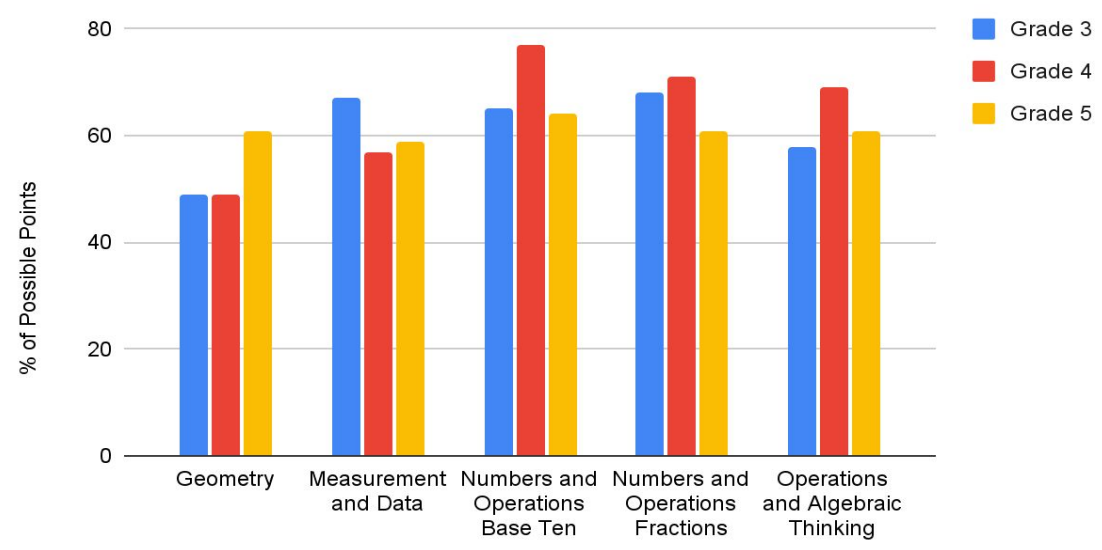
# ABRSD 2022 MCAS Mathematics by Student Group Grade 10

	N Students Included		% Meeting or Exceeding		Mean SGP 2022	Designation 2022
	2021	2022	2021	2022		
All	466	415	84%	87%	61	High
ED	43	40	47%	40%	50	Typical
Students w/Disabilities	57	47	44%	41%	57	Typical
EL	6	16	-----	44%	-----	-----
Race - Afr. Am/Black	19	13	21%	39%	-----	-----
Race - Asian	163	151	94%	95%	63	High
Race - Hisp./Latino	21	28	62%	50%	57	Typical
Race- Multi; Non Hisp/Latino	12	13	75%	93%	-----	-----
Race - White	251	209	84%	91%	61	High
Gender - Male	251	228	82%	87%	62	High
Gender - Female	214	187	87%	87%	59	Typical

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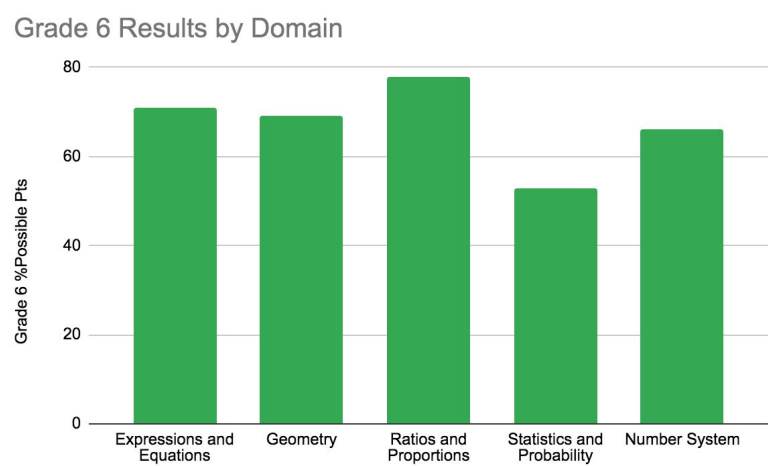
## ABRSD ABRSD 2022 MCAS: Mathematics by Domain

2022 Math MCAS Gr 3-5 by Domain



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# ABRSD 2022 MCAS: Mathematics by Domain

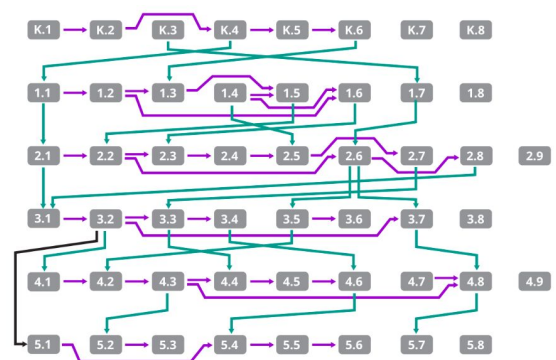


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# MTSS: Supporting Math Learners

## Looking at Prior Grade Skills

- Check for Readiness assessments



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## Student Engagement (Teaching and Curriculum)

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## Standards for Mathematical Practice (SMP)

- SMP 1 Make sense of problems & persevere in solving them.
- SMP 2 Reason abstractly & quantitatively.
- SMP 3 Construct viable arguments & critique the reasoning of others.
- SMP 4 Model with mathematics.
- SMP 5 Use appropriate tools strategically.
- SMP 6 Attend to precision.
- SMP 7 Look for & make use of structure.
- SMP 8: Look for & express regularity in repeated reasoning

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## Strategies for Comparing Fractions

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## Do Some Math: True or False



True



False

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## Do Some Math: True or False

$$\frac{2}{6} = \frac{2}{8}$$

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## Do Some Math: True or False

$$\frac{2}{6} = \frac{2}{8}$$

How do we know which fraction is greater?

I know \_\_\_\_\_ is greater than \_\_\_\_\_ because...

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## Math Language Routines

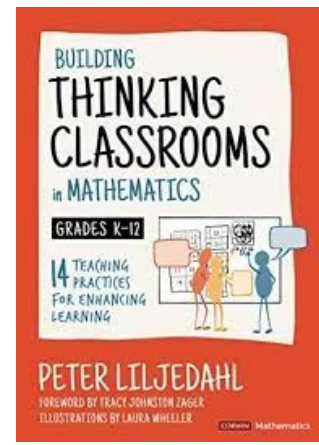
1. Stronger and Clearer Each Time
2. Collect and Display
3. Clarify, Critique, Correct
4. Information Gap
5. Co-Craft Questions
6. Three Reads
7. Compare and Connect
8. Discussion Supports

**SCALE**  
Stanford Center for Assessment, Learning, & Equity

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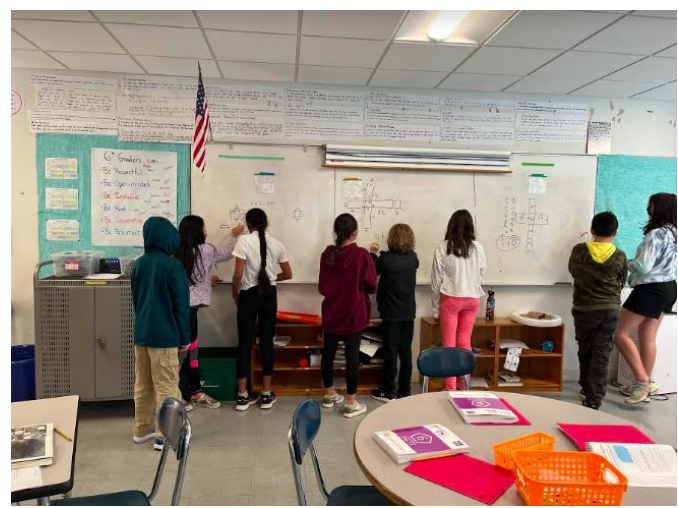


# K-12



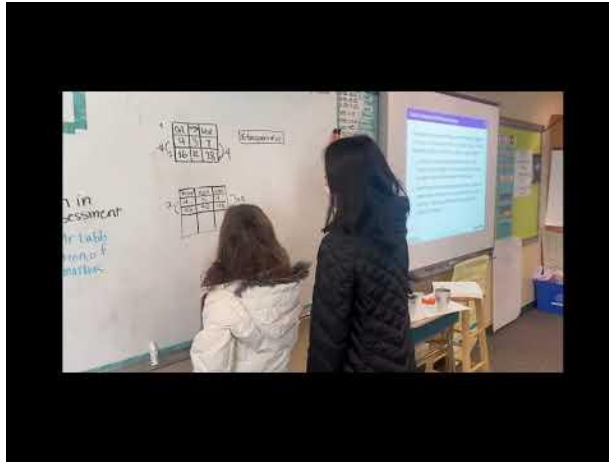
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# Students at Work



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# Students at Work



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# Standards for Mathematical Practice (SMP)

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SMP 4 Model with mathematics.

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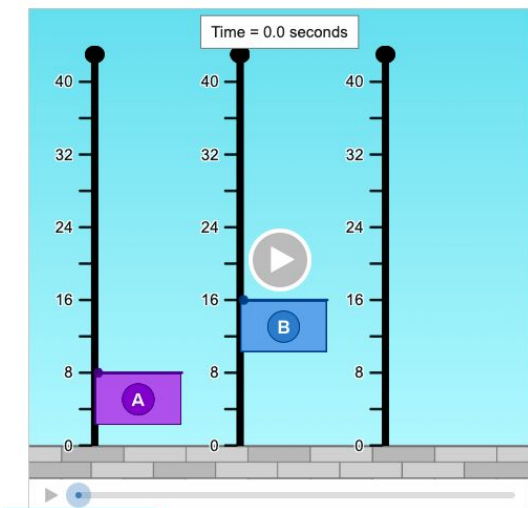
Desmos Math 6–A1



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[Link to Desmos Lesson](#)

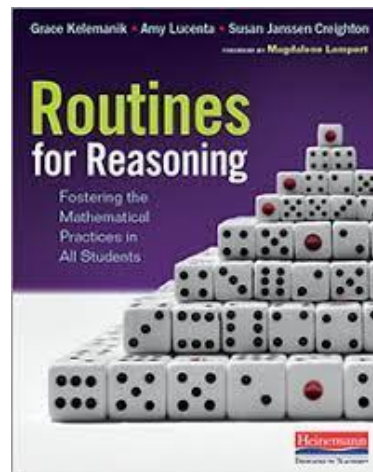
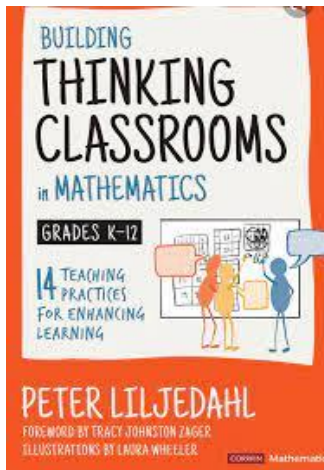
High or Low, Fast or Slow



Can you write a NEW equation for Flag C so it:  
 Starts high? Starts low? Goes fast? Goes slow?  
 Experiment with different equations.  
 Then press play to see what happens.

Flag	Equation
A	$h = 8 + 4t$
B	$h = 16 + 2t$
C	

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## Grades 9–12

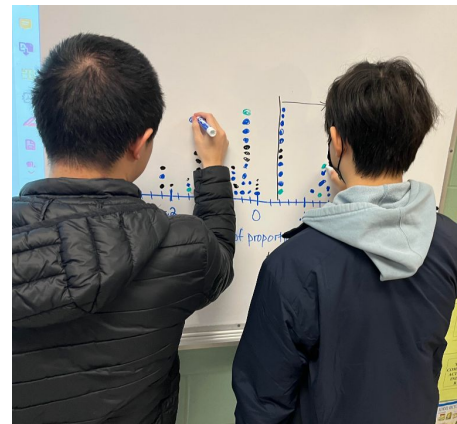
- 1) Opening opportunities to students
- 2) Exploring instructional strategies
- 3) Establishing supports for students in increasingly heterogeneous learning environments

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# Grades 9–12

## 1) Opening opportunities to students

- Widened course recommendations guidelines and implemented more flexible override process
- Increase collaboration with students and families to identify and support math goals

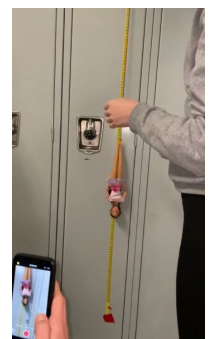


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# Grades 9–12

## 2) Exploring instructional strategies

- Technology incorporation
- Reflection and goal setting
- Questioning strategies
- Collaborative activities and discussion
- Exploration and discussion activities
- Alternative assessment
- Classroom environment



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## Grades 9–12

3) Establishing supports for students in increasingly heterogeneous learning environments

- Instructional strategies
- Essential Concepts
- Math Academic Support Center
- After School Math Extra Help Center
- Student mentors and club peer tutors

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## Professional Learning

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# Professional Learning Highlights 2020-2023

## K-6

- Implementation and adaptation of Illustrative Mathematics
- Structures to support all learners
- Individual and Team Coaching

## 7-8

- Implementation and adaptation of Illustrative Mathematics
- Summer Research and Development: Differentiation Strategies
- New strategies workshops: ex: *Routines for Reasoning* and *Building Thinking Classrooms*

## 9-12

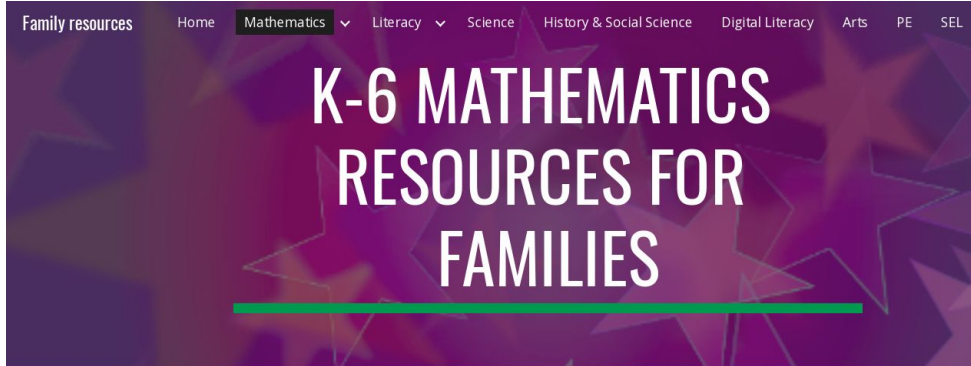
- Alignment within levels of of the same course and along course sequences
- Instructional strategies supporting students in increasingly heterogeneous environments

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Thank you to our educators, staff, school and district leaders for the work you do to support the full talent development of every ABRSD student, every day.

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# Family Engagement - <https://tinyurl.com/k8jh9wwy>



[Overview of the Illustrative Mathematics curriculum](#)

[Grade-level Family Resources](#)

① [Fluency Resources](#)

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## District Goal(#2) and Outcomes

Print data to have as a reference

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## 2019–2022 Mathematics MCAS Results by Grade

Recovery across all grades 3–8 in 2022. About 50% of “loss” from 2021 recovered in grades 3 and 4. Additional loss in grade 10 but slowing as compared to 2021.

Grade	2019 % M/E	2021 % M/E	2022 % M/E	Change M/E 19-21	Change M/E 21-22	Change M/E 19-22
03	49	33	41	-16	+8	-8
04	50	33	42	-17	+9	-8
05	48	33	36	-15	+3	-12
06	52	33	42	-19	+9	-10
07	48	35	37	-13	+2	-11
08	46	32	36	-14	+4	-10
3-8	49	33	39	-16	+6	-10
10	59	52	50	-7	-2	-9

Massachusetts Department of Elementary and Secondary Education



## 2019–2022 Science MCAS Results by Grade

Small recovery in grades 5 and 8 in 2022.

Grade	2019 % M/E	2021 % M/E	2022 % M/E	Change M/E 19-21	Change M/E 21-22	Change M/E 19-22
05	49	42	43	-7	+1	-6
08	46	41	42	-5	+1	-4
10*			47			

\*First administration of the Next-Generation Science MCAS in grade 10 Physics and Biology and not comparable to prior years.

Massachusetts Department of Elementary and Secondary Education

