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Common Core Georgia Performance Standards

7th Grade

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Thank you for being here today.



You will need the following materials
during today's broadcast:

- 7th Grade handouts
- Scissors
- Note-taking materials

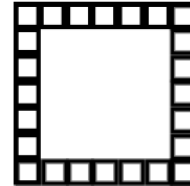


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Activate your brain

Solve real-life and mathematical problems using numerical and algebraic expressions and equations.



1. Given a square pool as shown in the picture, write four different expressions to find the total number of tiles in the border.
2. Explain how each of the expressions relates to the diagram and demonstrate that the expressions are equivalent.
3. Which expression do you think is most useful? Explain your thinking.

Arizona Department of Education



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Why Common Core Standards?



- Preparation: The standards are college- and career-ready. They will help prepare students with the knowledge and skills they need to succeed in education and training after high school.
- Competition: The standards are internationally benchmarked. Common standards will help ensure our students are globally competitive.
- Equity: Expectations are consistent for all – and not dependent on a student’s zip code.



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Why Common Core Standards?



- **Clarity:** The standards are focused, coherent, and clear. Clearer standards help students (and parents and teachers) understand what is expected of them.
- **Collaboration:** The standards create a foundation to work collaboratively across states and districts, pooling resources and expertise, to create curricular tools, professional development, common assessments and other materials.



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Common Core State Standards



Building on the strength of current state standards, the CCSS are designed to be:

- Focused, coherent, clear and rigorous
- Internationally benchmarked
- Anchored in college and career readiness
- Evidence and research based



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Common Core State Standards in Mathematics



K 1 2 3 4 5 6 7 8 9 - 12

Measurement and Data

Statistics and Probability

CC

Number and Operations
Fractions

Ratios &
Proportional
Relationships

Functions

Number and Operations in Base Ten

The Number System

Number and
Quantity

Operations and Algebraic Thinking

Expressions and
Equations

Algebra

Geometry

Modeling



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Standards for Mathematical Practice



1. Make sense of problems and persevere in solving them.
6. Attend to precision.

2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others

4. Model with mathematics.
5. Use appropriate tools strategically.

7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Reasoning and explaining

Modeling and using tools

Seeing structure and generalizing



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(McCallum, 2011)



Expressions and Equations

7.EE

Domain



Use properties of operations to generate equivalent expressions

Standards
Cluster Heading

Standards

MCC.7.EE.1- Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

MCC.7.EE.2- Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how quantities in it are related. *For example, $a + 0.05a = 1.05a$ means that “increase by 5%” is the same as “multiply by 1.05.”*



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While the standards focus on what is most essential, they do not describe all that can or should be taught. A great deal is left to the discretion of teachers and curriculum developers. The aim of the standards is to articulate the fundamentals, not to set out an exhaustive list or a set of restrictions that limits what can be taught beyond what is specified.

corestandards.org



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What's a 7th Grade Teacher to do?



- Read your grade level standards
- Use the CCGPS Teaching Guide found on Georgia Standards.org and Learning Village
- Discuss the standards with your colleagues



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Seventh Grade – At a Glance

Common Core Georgia Performance Standards: Curriculum Map

1 st Semester			2 nd Semester			
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Operations with Rational Numbers	Expressions & Equations	Ratios and Proportional Relationships	Inferences	Geometry	Probability	Show What We Know
MCC7.NS.1a MCC7.NS.1b MCC7.NS.1c MCC7.NS.1d MCC7.NS.2a MCC7.NS.2b MCC7.NS.2c MCC7.NS.2d MCC7.NS.3	MCC7.EE.1 MCC7.EE.2 MCC7.EE.3 MCC7.EE.4a MCC7.EE.4b	MCC7.RP.1 MCC7.RP.2a MCC7.RP.2b MCC7.RP.2c MCC7.RP.2d MCC7.RP.3 MCC7.G.1	MCC7.SP.1 MCC7.SP.2 MCC7.SP.3 MCC7.SP.4	MCC7.G.2 MCC7.G.3 MCC7.G.4 MCC7.G.5 MCC7.G.6	MCC7.SP.5 MCC7.SP.6 MCC7.SP.7a MCC7.SP.7b MCC7.SP.8a MCC7.SP.8b MCC7.SP.8c	ALL
Incorporated Standards						
	MCC7.NS.1 MCC7.NS.2 MCC7.NS.3	MCC7.EE.3 MCC7.NS.1 MCC7.NS.2 MCC7.NS.3	MCC7.NS.1 MCC7.NS.2 MCC7.NS.3	MCC7.G.1		
<p>These units were written to build upon concepts from prior units, so later units contain tasks that depend upon the concepts addressed in earlier units.</p> <p>All units will include the Mathematical Practices and indicate skills to maintain.</p>						

NOTE: Mathematical standards are interwoven and should be addressed throughout the year in as many different units and tasks as possible in order to stress the natural connections that exist among mathematical topics.

Grades 6-8 Key: NS = The Number System, RP = Ratios and Proportional Relationships, EE = Expressions and Equations, G = Geometry, SP = Statistics and Probability



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7th Grade Overview



Unit 1: Operations with Rational Numbers

The Number System

- Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

New Content

- Defining a rational number in terms of a decimal – not specifically mentioned



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7th Grade Overview



Unit 2: Expressions and Equations

Expressions and Equations

- Use properties of operations to generate equivalent expressions.
- Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

New Content

- Solve and graph inequalities in one variable – came from 8th grade



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7th Grade Overview



Unit 3: Ratios and Proportional Relationships

Ratios and Proportional Relationships

- Analyze proportional relationships and use them to solve real-world and mathematical problems.

Geometry

- Draw, construct, and describe geometrical figures and describe the relationships between them.

New Content

- Proportional relationships represented by equations – came from 6th grade
- Graphing proportional relationships explaining within context – came from 6th grade
- Proportional relationships to solve multi-step ratio and percent problems – came from 6th grade
- Introduction of scale factor – came from 6th grade



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7th Grade Overview



Unit 4: Inferences

Statistics and Probability

- Use random sampling to draw inferences about a population.
- Draw informal comparative inferences about two populations.



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7th Grade Overview



Unit 5: Geometry

Geometry

- Draw, construct, and describe geometrical figures and describe the relationships between them.
- Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

New Content

- Derive formulas for circumference and area of a circle – came from 5th grade
- Complementary and supplementary angles and angles formed from intersecting lines – came from 8th grade
- Solve real-life and mathematical problems involving area, surface area, and volume – came from 6th grade



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7th Grade Overview



Unit 6: Probability

Statistics and Probability

- Investigate chance processes and develop, use, and evaluate probability models.

New Content

- Probability of a chance event – came from 6th grade
- Predicting frequency based on probability – came from 6th grade
- Determine basic probability from probability models – came from 8th grade
- Find the probability of compound events – came from 8th grade



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Focus



The student...

- spends more time thinking and working on priority concepts.
- is able to understand concepts and their connections to processes (algorithms).



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Focus



The teacher...

- builds knowledge, fluency and understanding of why and how certain mathematics concepts are done.
- thinks about how the concepts connect to one another.
- pays more attention to priority content and invests the appropriate time for all students to learn before moving onto the next topic.



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Grade	Priorities in Support of Rich Instruction and Expectations of Fluency and Conceptual Understanding
K–2	Addition and subtraction, measurement using whole number quantities
3-5	Multiplication and division of whole numbers and fractions
6	Ratios and proportional reasoning; early expressions and equations
7	Ratios and proportional reasoning; arithmetic of rational numbers
8	Linear algebra
9-12	Modeling



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Critical Areas



In 7th Grade, instructional time should focus on **four critical areas**:

- (1) developing understanding of and applying proportional relationships;
- (2) developing understanding of operations with rational numbers and working with expressions and linear equations;
- (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and
- (4) drawing inferences about populations based on samples.



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Priorities in 7th Grade

- Ratio and Proportional Reasoning
- Arithmetic of Rational Numbers



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Sample focus task



Analyze proportional relationships and use them to solve real-world and mathematical problems.

Use random sampling to draw inferences about a population.

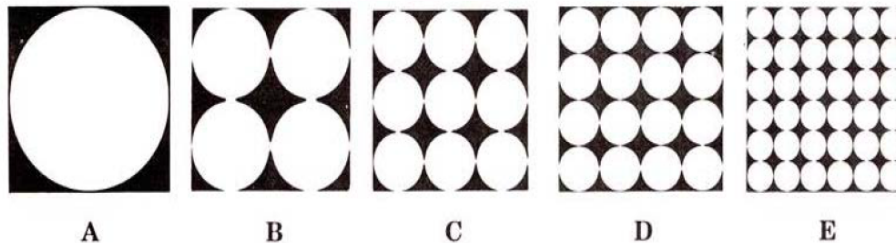
Investigate chance processes and develop, use, and evaluate probability models.



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DART THROWING

Figures A through E represent targets for dart throwing.



Suppose that you can earn points by throwing darts according to these rules:

1 point, if your dart lands inside a circle

0 points, if your dart lands inside a square but outside a circle

Darts thrown outside a square do not count (are thrown again)

What is no longer in 7th grade?



- Transformations
- Similarity
- Two-way Tables
- Introduction to Simplifying Algebraic Expressions
- Introduction to Integers
- Introduction to Absolute
- Introduction to Using Variables
- Introduction to Statistical Variation



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Coherence

The student...

- builds on knowledge from year to year, in a coherent learning progression.



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Coherence

The teacher...

- connects mathematical ideas across grade levels.
- thinks deeply about what is being focused on.
- thinks how those ideas connect to how it was taught the years before and the years after.

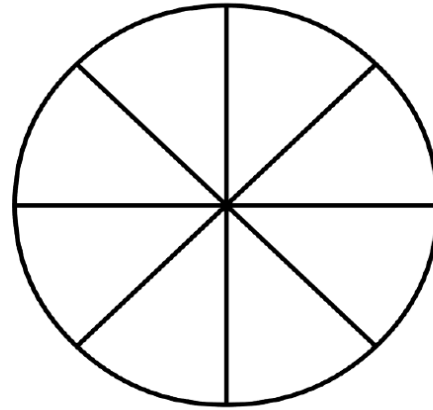


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What do 7th Grade students bring? What are they connecting to later?



Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.



Area of a Circle

Circles and Parallelograms

Cut the sectors of the circle apart and arrange them on the grid paper to form a parallelogram.



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Area Formula Overview



3rd – 5th Grade

- Geometric measurement

6th Grade

- Find area of polygons



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Area Formula Overview



8th Grade

- Volume formulas for cone, cylinder, and sphere

Analytic Geometry

- Arc length and area of sector



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Fluency

The student...

- spends time practicing skills with intensity and frequency.



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Fluency

The teacher...

- pushes students to know skills at a greater level of fluency based on understanding.
- focuses on the listed fluencies by grade level.



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Grade	Required Fluency
K	Add/subtract within 5
1	Add/subtract within 10
2	Add/subtract within 20 & Add/subtract within 100 (pencil and paper)
3	Multiply/divide within 100 & Add/subtract within 1000
4	Add/subtract within 1,000,000
5	Multi-digit multiplication
6	Multi-digit division & Multi-digit decimal operations
7	Solve $px + q = r$, $p(x + q) = r$
8	Solve simple 2×2 systems by inspection
9-12	Algebraic manipulation in which to understand structure. Writing a rule to represent a relationship between two quantities. Seeing mathematics as a tool to model real-world situations. Understanding quantities and their relationships.

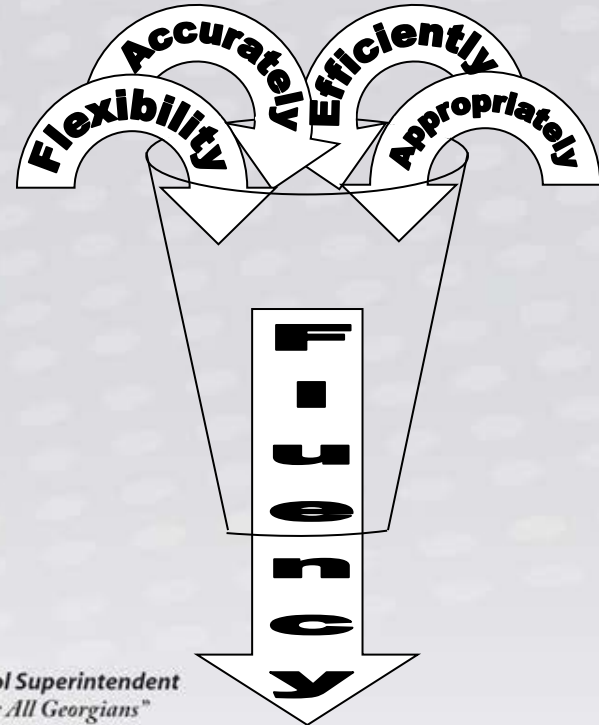


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What does Fluency Look Like in 7th Grade?



- **FLEXIBILITY**
- **ACCURATELY**
- **EFFICIENTLY**
- **APPROPRIATELY**



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Deep Understanding



The student...

- shows mastery of material at a deep level in numerous ways.
- uses mathematical practices to demonstrate understanding of different material and concepts.



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Deep Understanding



The teacher...

- asks what mastery/proficiency really looks like and means.
- plans for progression of levels of understanding.
- spends the time to gain the depth of the understanding.
- becomes flexible and comfortable in own depth of content knowledge.



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What does depth mean in 7th Grade?



Investigate chance processes and develop, use, and evaluate probability models.

Two players each hold between one and three fingers behind their backs, then hold out their hands at the same time:

- Player A wins if the sum of the number of fingers is even.
- Player B wins if the sum of the number of fingers is odd.

Suppose that each player selects randomly among the three choices. Determine whether this game is fair by constructing the possible outcomes.

Learning Math/Learner.org



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Application



The student...

- applies mathematics in other content areas and situations.
- chooses the right mathematics concept to solve a problem when not necessarily prompted to do so.



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Application

The teacher...

- contextualizes mathematics.
- creates real world experiences in which students use what they know, and in which they are not necessarily prompted to use mathematics.



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FAL Structure

- Pre-Assessment / opening
- Collaborative activity
- Whole-class discussion
- Return to the pre-assessment / opening



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Mathematizing 7th Grade

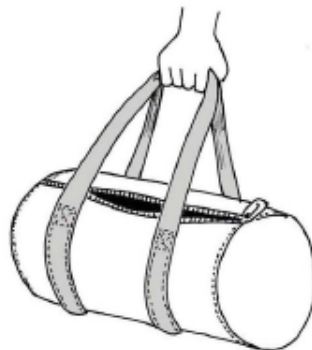


Draw, construct, and describe geometrical figures and describe the relationships between them.

Solve real-life and mathematical problems involving measure, area, surface area, and volume.

Designing a Sports Bag

You have been asked to design a sports bag.



- The length of the bag will be 20 inches.
- The bag will have circular ends of diameter 11 inches.
- The main body of the bag will be made from 3 pieces of material: a piece for the curved body, and the two circular end pieces.
- Each piece will need to have an extra $\frac{1}{4}$ inch hem all around it, so that the pieces may be stitched together.



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Balanced Approach



The student...

- practices mathematics skills to achieve fluency.
- practices mathematics concepts to ensure application in novel situations.



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Balanced Approach



The teacher...

- finds the balance between understanding and practice.
- normalizes the productive struggle.
- ritualizes skills practice.



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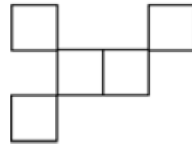


Balanced Approach

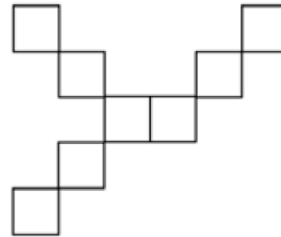
Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Mosaics

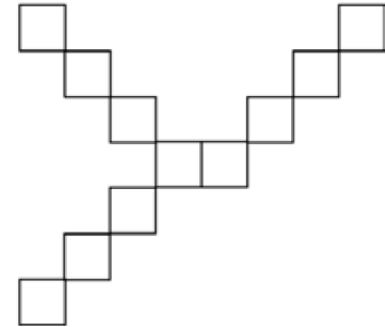
Mosaic 1



Mosaic 2



Mosaic 3





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What's in 7B – 8

- Inferences
 - Use random sampling to draw inferences about a population.
 - Draw informal comparative inferences about two populations.
- Geometry
 - Draw, construct, and describe geometrical figures and describe the relationships between them.
 - Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.
- Probability
 - Investigate chance processes and develop, use, and evaluate probability models.



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What's in 7B – 8

- Transformations, Congruence, and Similarity
 - Understand congruence and similarity using physical models, transparencies, or geometry software.
- Exponents
 - Work with radicals and integer exponents.
 - Analyze and solve linear equations and pairs of simultaneous linear equations.
 - Know that there are numbers that are not rational, and approximate them by rational numbers.



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What's in 7B – 8

- Geometric Applications of Exponents
 - Understand and apply the Pythagorean Theorem.
 - Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.
 - Work with radicals and integer exponents.
- Functions
 - Define, evaluate, and compare functions.



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What's in 7B – 8

- Linear Functions
 - Understand the connections between proportional relationships, lines, and linear equations.
 - Define, evaluate, and compare functions.
- Linear Models and Tables
 - Use functions to model relationships between quantities.
 - Investigate patterns of association in bivariate data.



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CCGPS Suggestions:



1. Review the CCGPS. The teaching guide, curriculum map, and standards can all be found in Learning Village, on the Mathematics Program Page and on Georgia Standards.org
2. View the Fall 2011 Grade Level Webinar if you haven't already seen it.
3. Review this broadcast with your team to identify key areas of focus.



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CCGPS Suggestions:



4. Participate in the unit-by-unit webinars beginning in May.
7th Grade Unit 1: May 3, 2012, 4:30pm
5. Structure time for grade level/content areas to use framework units as a guide for planning.
6. Plan to get together with your colleagues at the end of each CCGPS unit to analyze student work samples and compare how student learning and performance look.



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7th Grade Support:



Now-

- Fall 2011 Grade Level Webinar
- Standards Document
- Teaching Guide
- Curriculum Map

Coming soon-

- Framework Units (posting April 2012)
- Unit-by-unit webinars:

7th grade Unit 1 May 3, 2012, 4:30pm



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Takeaways

3 Things-

1. What's new?
2. What's different?
3. What resources and support are available for CCGPS mathematics?



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“The resources we need in order to grow as teachers are abundant within the community of colleagues. Good talk about good teaching is what we need...”

Parker Palmer
Courage to Teach



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THANK YOU

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Thank you for participating in this CCGPS Professional Learning Session. We value your feedback. Please go to the following website, take the anonymous feedback survey, and complete the participation log to receive a certificate of participation:



<http://survey.sedl.org/efm/wsb.dll/s/1g10a>

If you have questions, feel free to contact any of the English/Language Arts or Mathematics staff at the following email addresses:

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