

Developing Foundational Numeracy Using THE GEORGIA NUMERACY PROJECT

Effectively Assessing
Numeracy to Address
Students' Needs for
Acceleration, Remediation
& Intervention





What is The Georgia Numeracy Project?

The Georgia Numeracy Project is a free, optional, evidence-based resource for schools and districts to use to help students build a solid foundation in numeracy.

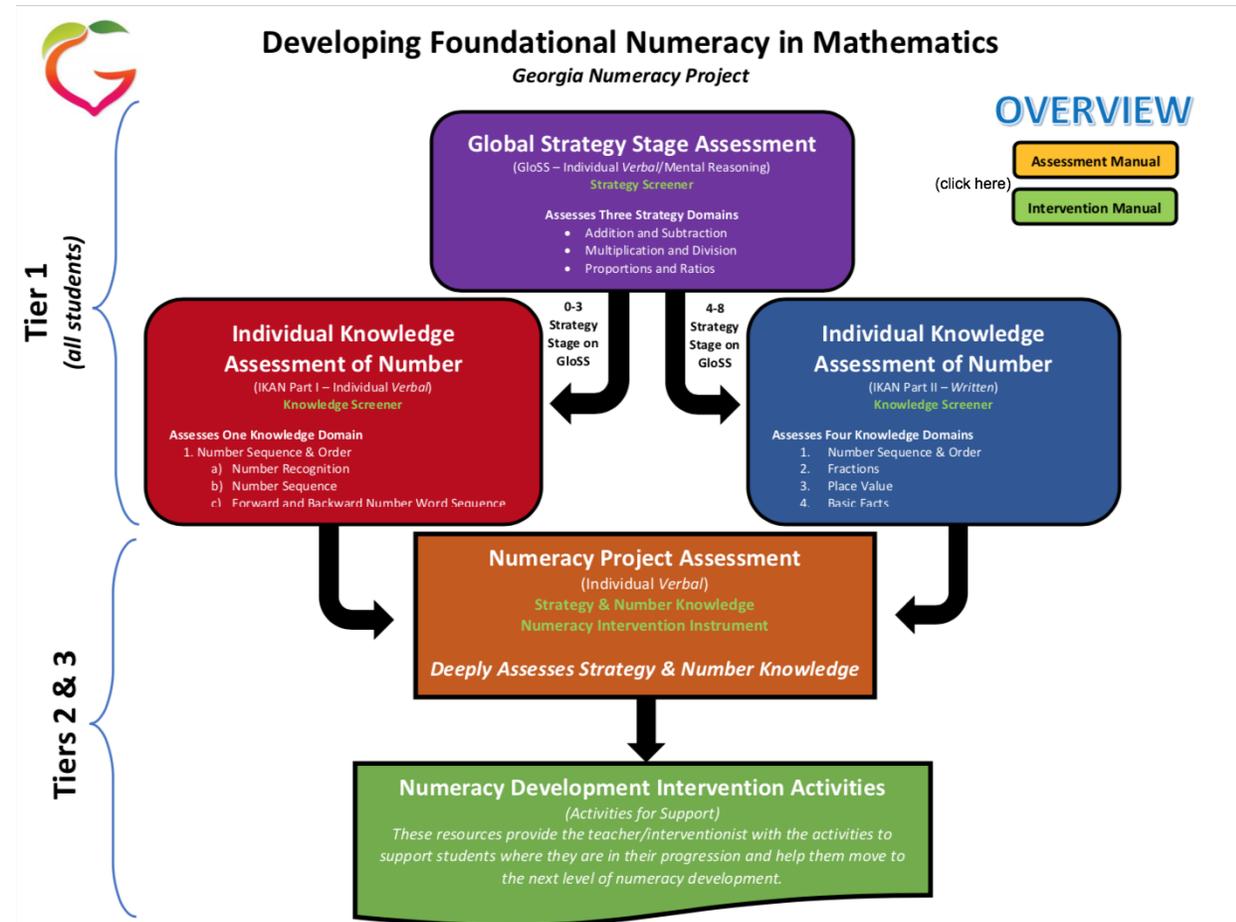


"Mathematics is the queen of the sciences and Number Theory is the queen of mathematics. She often condescends to render service to astronomy and other natural sciences, but in all relations, she is entitled to first rank."

~Carl Friedrich Gauss

The Purpose of The Georgia Numeracy Project

➤ The Georgia Numeracy Project is aligned to Georgia's Tiered System of Supports for Students and is focused on developing students' understanding of numbers, and their ability to use numbers to solve problems. Students may solve number problems by counting, adding, subtracting, multiplying, dividing, or any combinations of these operations. Students should develop strategies that support their use of these operations in real-world and mathematical problems.



Georgia's System of Continuous Improvement



Alignment to Georgia's Tiered System of Support

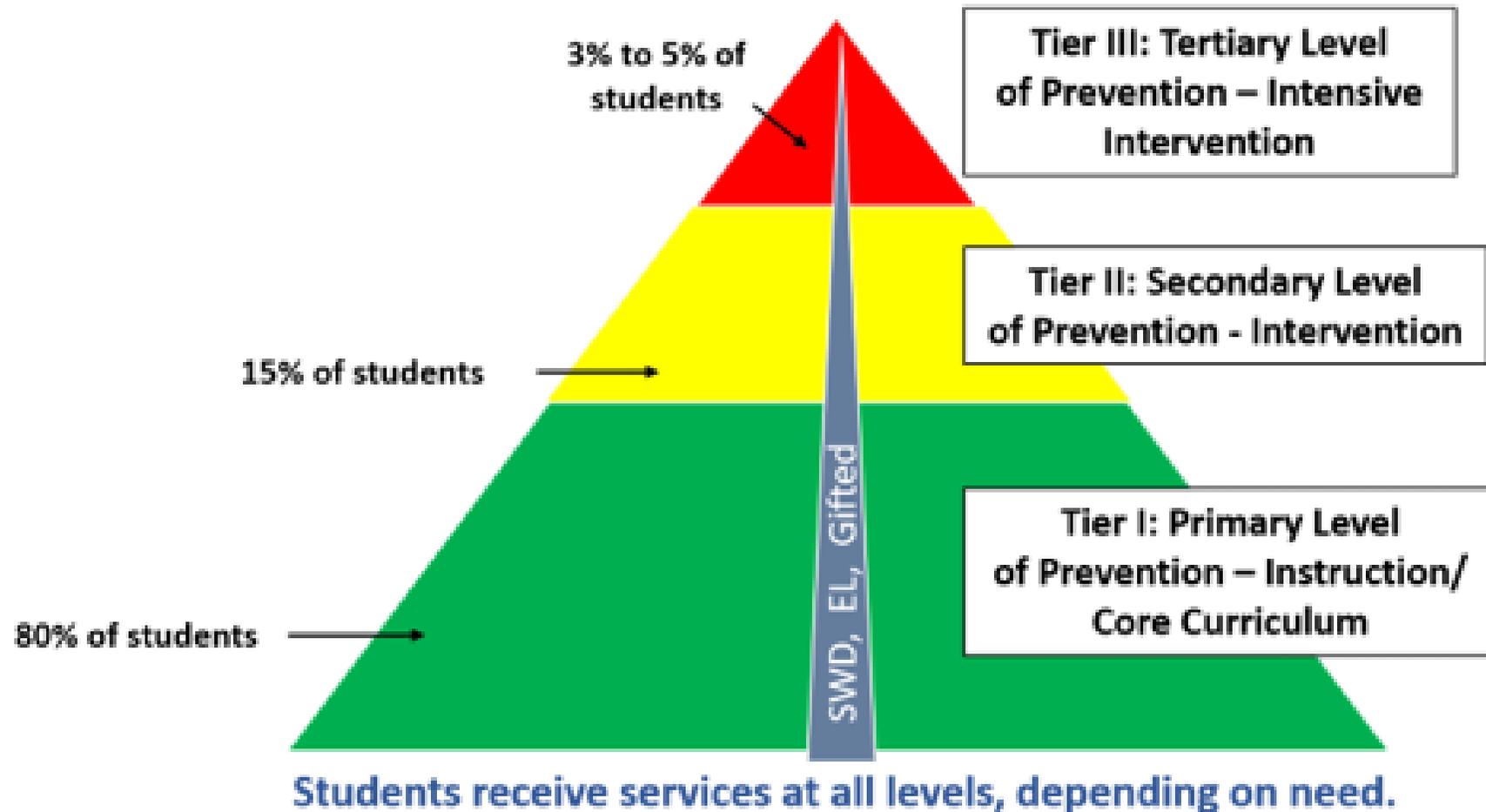
Essential Components of Georgia's Tiered System of Supports for Students



What do you notice? What do you wonder?



Services Provided to Students



4 corners

- Let's divide up into four groups!
- Each group will receive a math toy to pass.
- Continuously pass the item while the music is playing.
- When the music stops, the person holding the item should share the following:
 - (1) something you already know about the Georgia Numeracy Project
 - (2) something you are curious about regarding the Georgia Numeracy Project
- Repeat until the 4 corners session ends.



Fluency without Fear

Learning through memorization

Learning from memory

Research Says

“Data from the 13 million students who took PISA tests showed that the lowest achieving students worldwide were those who used a memorization strategy – those who thought of math as a set of methods to remember and who approached math by trying to memorize steps. The highest achieving students were those who thought of math as a set of connected, big ideas.”

<http://hechingerreport.org/memorizers-are-the-lowest-achievers-and-other-common-core-math-surprises/>



@TinaCardone



number
sense



number
strategy

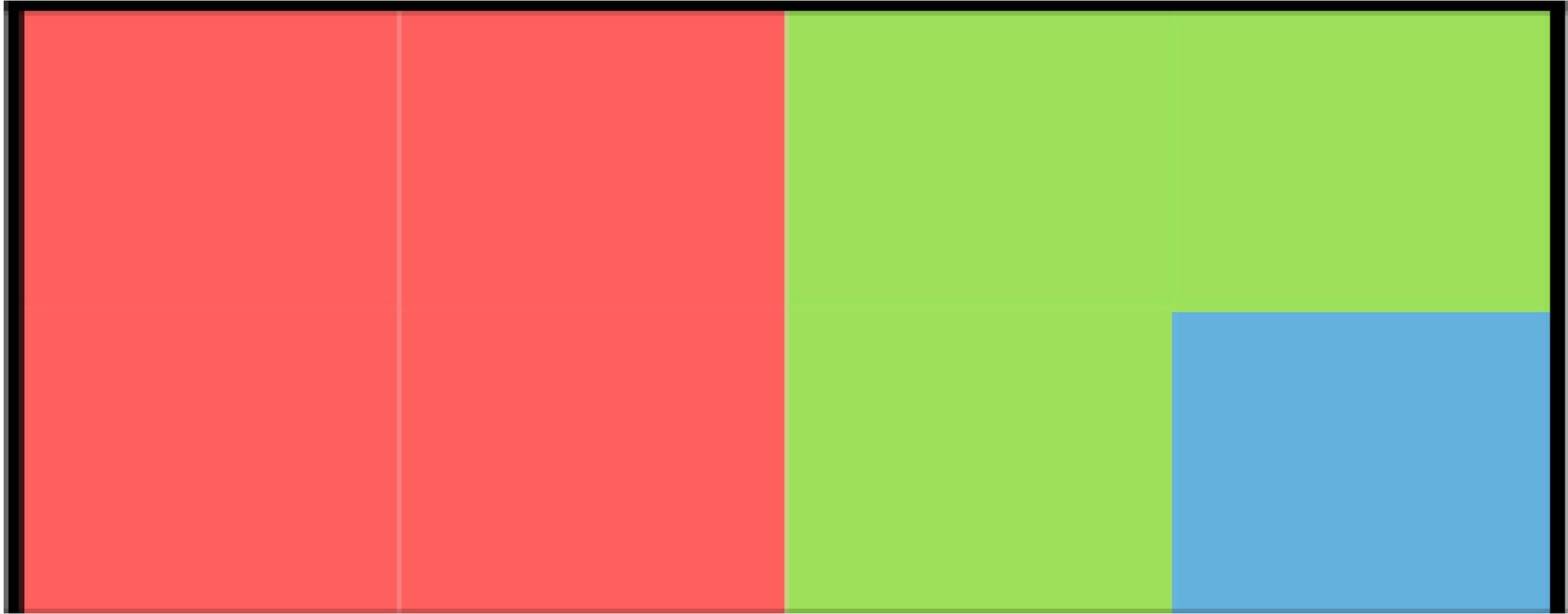


number
knowledge

The Importance Mental Reasoning has on Numeracy Development

Number Talks Exploration

Number Talks Session #1



Take a look at the image above. Determine what fraction of the space is occupied by each color.

3 x 5

1.5 x 10

$$\frac{3}{4} \times 20$$

$$\frac{3}{8} \times 40$$



Number Talks Session #2

2 + 0

2 + 2

$$2 + (-2)$$

$$(-2) + 2$$

$$(-2) + (-2)$$

Student learning is greatest in classrooms where the tasks consistently encourage high-level student thinking and reasoning and least in classrooms where the tasks are routinely procedural in nature (Boaler and Staples, 2009; NCTM, 2017)

THE GEORGIA NUMERACY PROJECT, AN EVIDENCE-BASED INTERVENTION

Research to Support Georgia Numeracy Project

Assisting Students Struggling with Mathematics: Response to Intervention (RtI) for Elementary and Middle Schools (2009)

The Institute of Education Sciences (IES)
National Center for Education Evaluation and Regional Assistance

<https://ies.ed.gov/ncee/wwc/PracticeGuide/2>

Numeracy Project Evidence-Base

	Included in design of Georgia Numeracy Project	Strong Evidence	Moderate Evidence	Minimal Evidence
1. Screen all students to identify those at risk for potential mathematics difficulties and provide interventions to students identified as at risk.	√		◆	
2. Instructional materials for students receiving interventions should focus intensely on in-depth treatment of whole numbers in kindergarten through grade 5 and on rational numbers in grades 4 through 8.	√			◆
3. Instruction during the intervention should be explicit and systematic.	√	◆		
4. Interventions should include instruction on solving word problems that is based on common underlying structures.	√	◆		
5. Intervention materials should include opportunities for students to work with visual representations of mathematical ideas and interventionists should be proficient in the use of visual representations of mathematical ideas	√		◆	
6. Interventions at all grade levels should devote about 10 minutes in each session to build fluent retrieval of basic arithmetic facts.	√		◆	
7. Monitor the progress of students receiving supplemental instruction and other students who are at risk.	√			◆
8. Include motivational strategies in tier 2 and tier 3 interventions				◆

The Georgia Numeracy Project and Secondary Mathematics?

- MS Mathematics Connections Remediation Courses

Can be used to provide additional and ongoing support for students who have struggled with mathematics and have been identified of being at risk for failing mathematics. Connections Remediation courses are available for 6th, 7th, and 8th grade mathematics

The Georgia Numeracy Project and Secondary Mathematics?

- HS Mathematics Support Courses

Developed to provide additional and ongoing support for students who have struggled with mathematics and have been identified of being at risk for failing high school mathematics. Support courses are taught concurrently with student's core mathematics course (Algebra I, Coordinate Algebra, Geometry, Analytic Geometry, Algebra II, & Advanced Algebra)

- HS Foundations of Algebra

Developed to meet the needs of high school students who have completed mathematics in grades 6 – 8 yet will need substantial support to bolster success in high school mathematics

The Georgia Numeracy Project and Secondary Mathematics?

MS Connections courses, HS Support courses, and HS Foundations of Algebra course should:

- Employ diagnostic means to identify deficiencies and offer focused interventions
- Revisit and expand the understanding of foundational algebra concepts (counting strategies, additive thinking, multiplicative reasoning, proportional reasoning)
- Fill gaps in understanding
- Incorporate varied instructional strategies
- Develop a growth mindset; everyone can do well in mathematics
- Provide a safe environment for students to make mistakes and question their own thinking as well as the thinking and explanations of others

The Georgia Numeracy Project and Secondary Mathematics?

Secondary teachers ask, “How do I...?”:

- Employ diagnostic means to identify deficiencies and offer focused interventions
- Revisit and expand the understanding of foundational algebra concepts (counting strategies, additive thinking, multiplicative reasoning, proportional reasoning)
- Fill gaps in understanding
- Incorporate varied instructional strategies
- Develop a growth mindset; everyone can do well in mathematics
- Provide a safe environment for students to make mistakes and question their own thinking as well as the thinking and explanations of others

The Georgia Numeracy Project and Secondary Mathematics?

HS Foundations of Algebra Resources

- The Individual Knowledge Assessment of Number, IKAN, with an instructional manual
- Five Modules which include scaffolded instructional lessons with interventions from the Numeracy Project
<https://www.georgiastandards.org/Georgia-Standards/Pages/Math-9-12.aspx>
- Numeracy Project resources

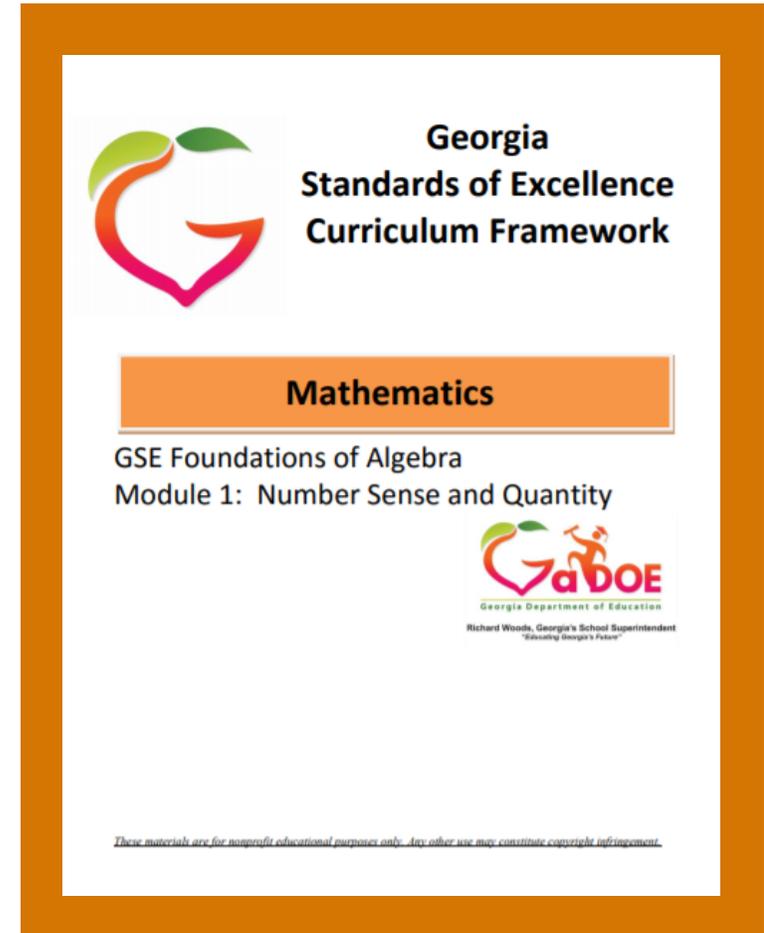
INTERVENTION TABLE

Lesson Name	Name Of Intervention	Snapshot of summary or student I can statement ...	Book, Page Or link
Building Number Sense Activities	Addition & Subtraction Pick-n-Mix	Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages.	Addition & Subtraction Pick-n-Mix
Fact Families	Bowl a Fact	Recall addition and subtraction facts to 20. Recall the multiplication and division facts for the multiples of 2, 3, 5, and 10. Recall multiplication to 10 x 10, and the corresponding division facts.	Bowl a Fact
Is It Reasonable?	Checking Addition and Subtraction by Estimation	Solve addition and subtraction problems by using place value	Checking Addition and Subtraction by Estimation Material Master 8-1
Birthday Cake	Chocolate Chip Cheesecake	Practice multiplying whole numbers by fractions	Chocolate Chip Cheesecake
Fraction Clues	Fractions in a Whole Hungry Birds Fraction Strategies: Wafers	Find unit fractions of sets using addition facts Find unit fractions of sets using addition facts Find unit fractions of sets using addition facts	Fractions in a Whole Hungry Birds Fraction Strategies: Wafers
Multiplying Fractions	Multiplying Fractions	Work through some word problems to help increase fluency of multiplying fractions	Multiplying Fractions

The Georgia Numeracy Project and Secondary Mathematics?

HS Mathematics Support Resources

- Foundations of Algebra resources
<https://www.georgiastandards.org/Georgia-Standards/Pages/Math-9-12.aspx>
- Numeracy Project resources



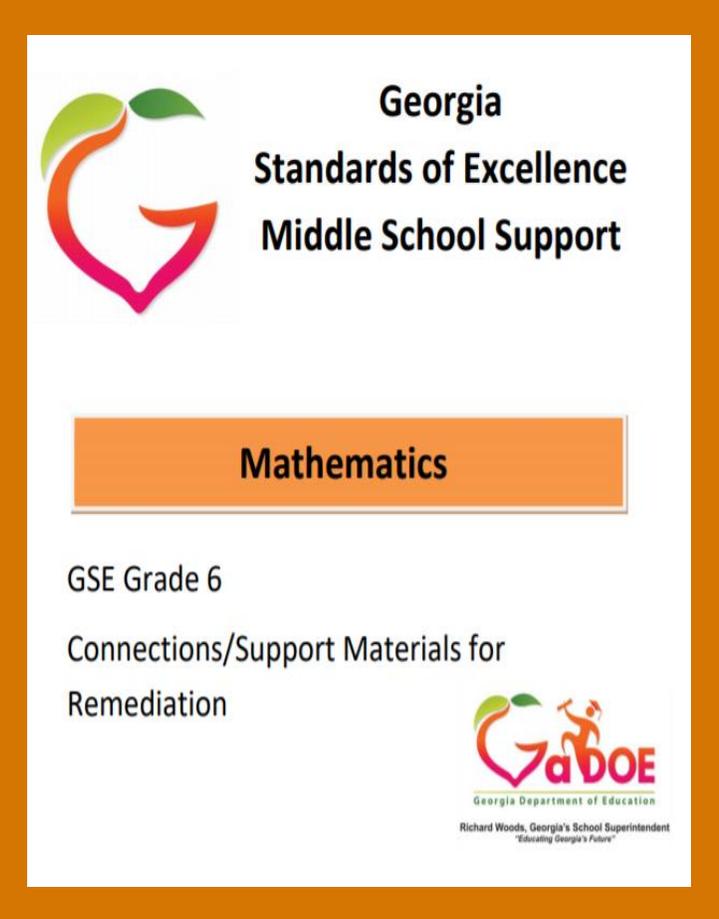
The Georgia Numeracy Project and Secondary Mathematics?

MS Connections Resources

- Grade 6, 7, & 8 Connections/Support Materials were developed from Foundations of Algebra lessons and have been sorted into collections aligned to 6th, 7th, & 8th grade mathematics standards and prerequisite skills.

<https://www.georgiastandards.org/Georgia-Standards/Pages/Math-6-8.aspx>

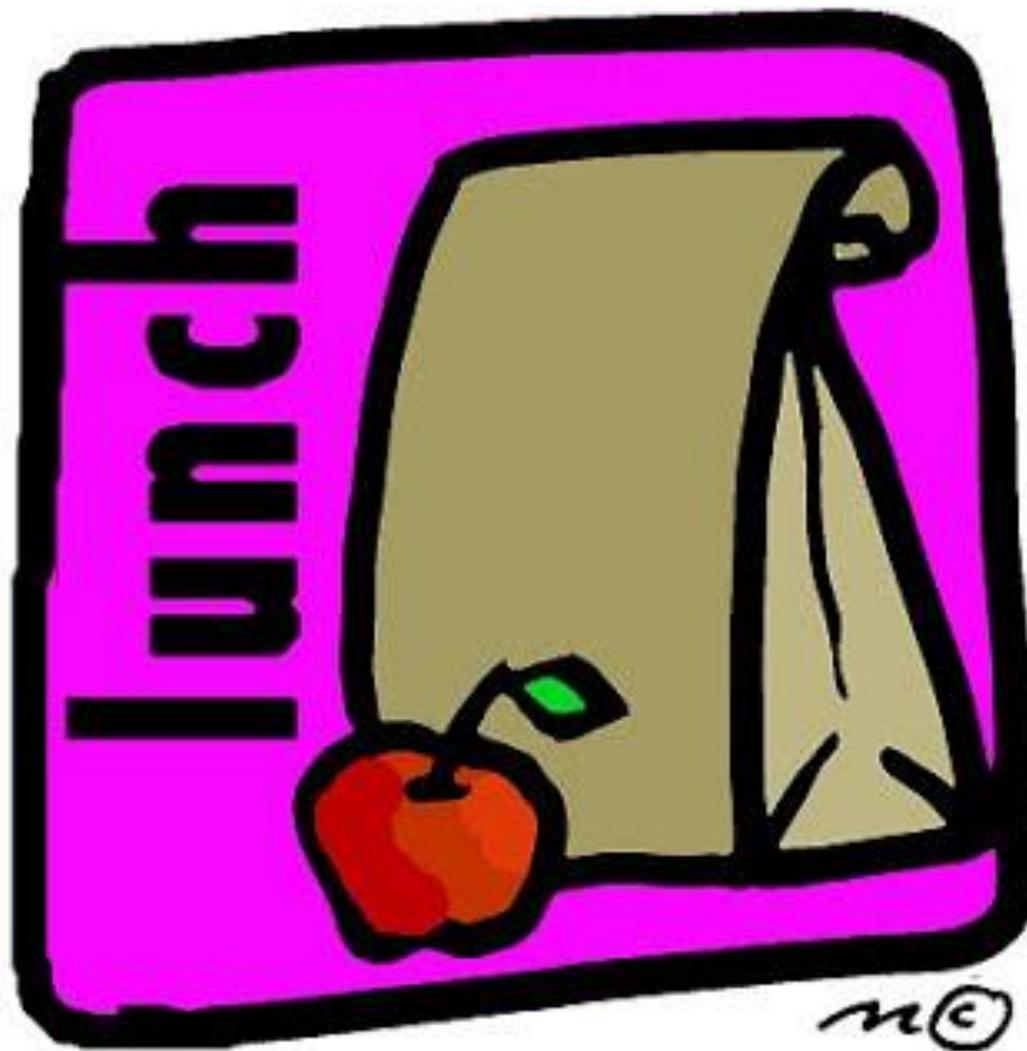
- Numeracy Project resources



The image shows the cover of a resource titled "Georgia Standards of Excellence Middle School Support Mathematics". The cover features a large, stylized logo on the left that combines a green leaf, a red heart, and a blue 'G'. To the right of the logo, the text reads "Georgia Standards of Excellence Middle School Support". Below this, a blue rectangular box contains the word "Mathematics". Underneath the box, it specifies "GSE Grade 6 Connections/Support Materials for Remediation". At the bottom right, there is a smaller version of the logo and the text "Georgia Department of Education" and "Richard Woods, Georgia's School Superintendent 'Educating Georgia's Future'".

Orchestrating Discussion Article

Break Time!



GEORGIA NUMERACY PROJECT QUICK REFERENCE GUIDE

More Details

- The Numeracy Project is a 4-Part Process:
 - Part 1: GloSS
 - Part 2: IKAN
 - Part 3: Numeracy Intervention Instrument
 - Part 4: Intervention Activities
- This process lends itself to customizing the intervention based on each student's needs.
- Not all students will need intensive intervention outlined in Part 3 or Part 4.
- The intervention activities in Part 4 may also be used to support Tier 1 small group instruction, as needed.

Georgia Numeracy Project Quick Reference Guide

- Administer [GloSS](#) assessment interview
- Analyze data from GloSS
- Stages 0-3: Administer [IKAN Counting Interview](#)
- Stage 4 or higher: Administer [IKAN II](#)
- Analyze results from both assessments using the [GloSS and IKAN Expectation Continuums](#)

- If student is:
 - **At Expectations or Above** - Continue Tier I Instruction

 - **Cause for Concern or At Risk** - Begin with Tier II Instruction:
 - [Numeracy Activities](#)

 - **After a specified period of time showing no progress with Tier 2 Instruction** - Begin with Tier III instruction:
 - [Numeracy Intervention Instrument](#)
 - [Material Masters for Intervention Instrument](#)
 - [Numeracy Activities](#)
 - [Progress Monitoring Data Collection](#)

ADMINISTRATION PROTOCOL

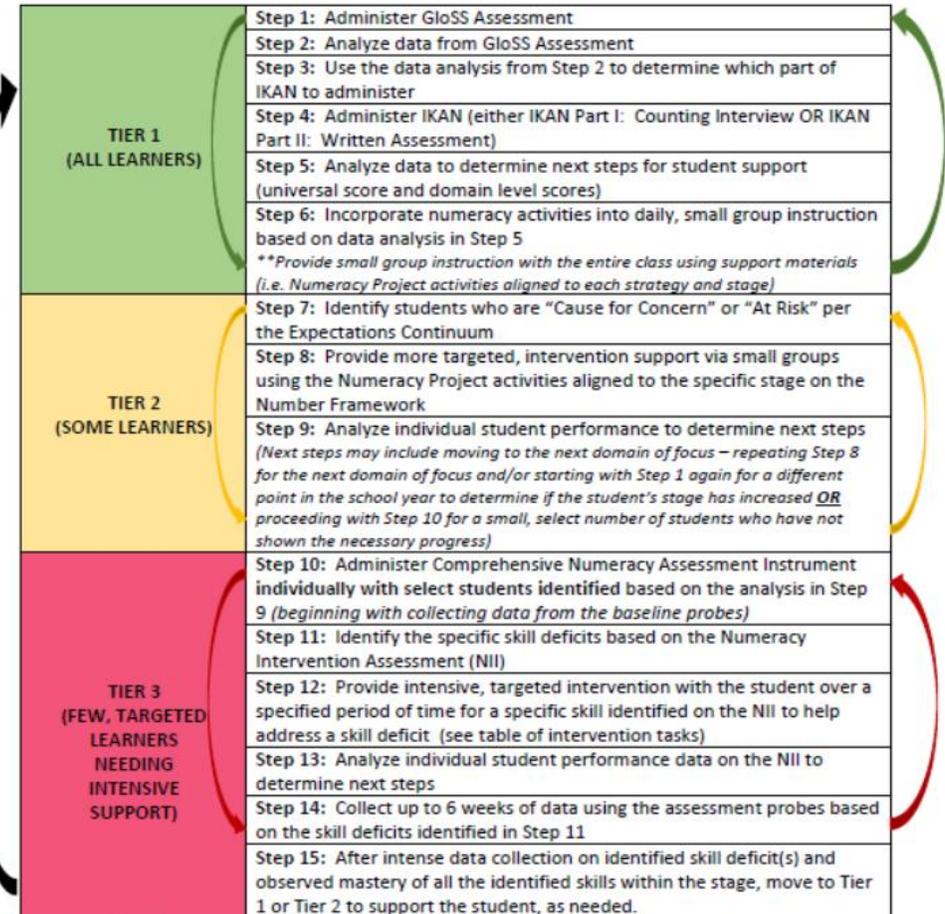
Georgia Numeracy Project Administration Instructions



GEORGIA NUMERACY PROJECT

Steps to Administer Numeracy Intervention Tool

This is an **OPTIONAL**, free Intervention Tool to support mathematics learners.



SPECIAL NOTE: There should be a cycle of support within each tier. The overall goal is to help fill gaps in student understanding and numeracy development so that they adequately access the regular curriculum without deficits. Students should be able to move out of Tier 3 back to Tier 2 and Tier 1 at any point after receiving the necessary intervention.

Developing Foundational Numeracy in Mathematics



Developing Foundational Numeracy in Mathematics

Georgia Numeracy Project

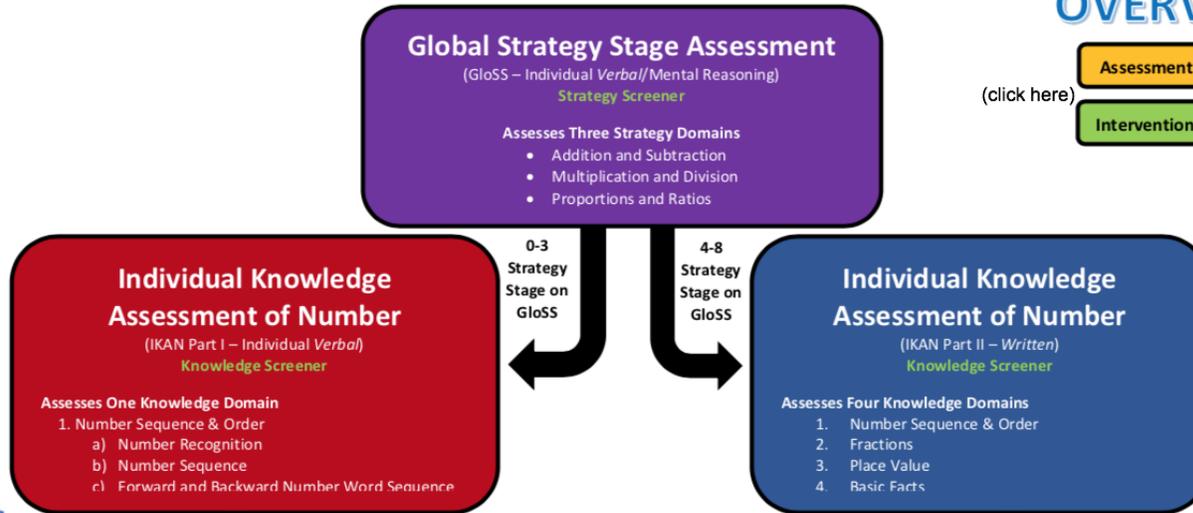
OVERVIEW

[Assessment Manual](#)

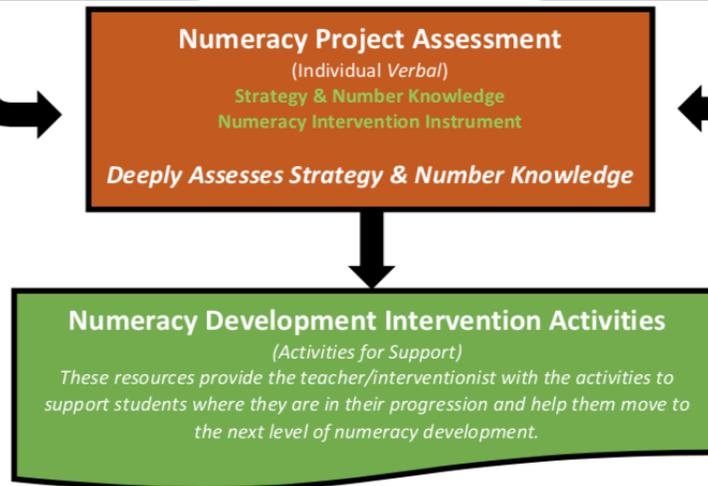
[Intervention Manual](#)

(click here)

Tier 1
(all students)



Tiers 2 & 3



Graphic inspired by Kent ISD, Michigan

Strategy Stages Sort



Part 1: GLOSS

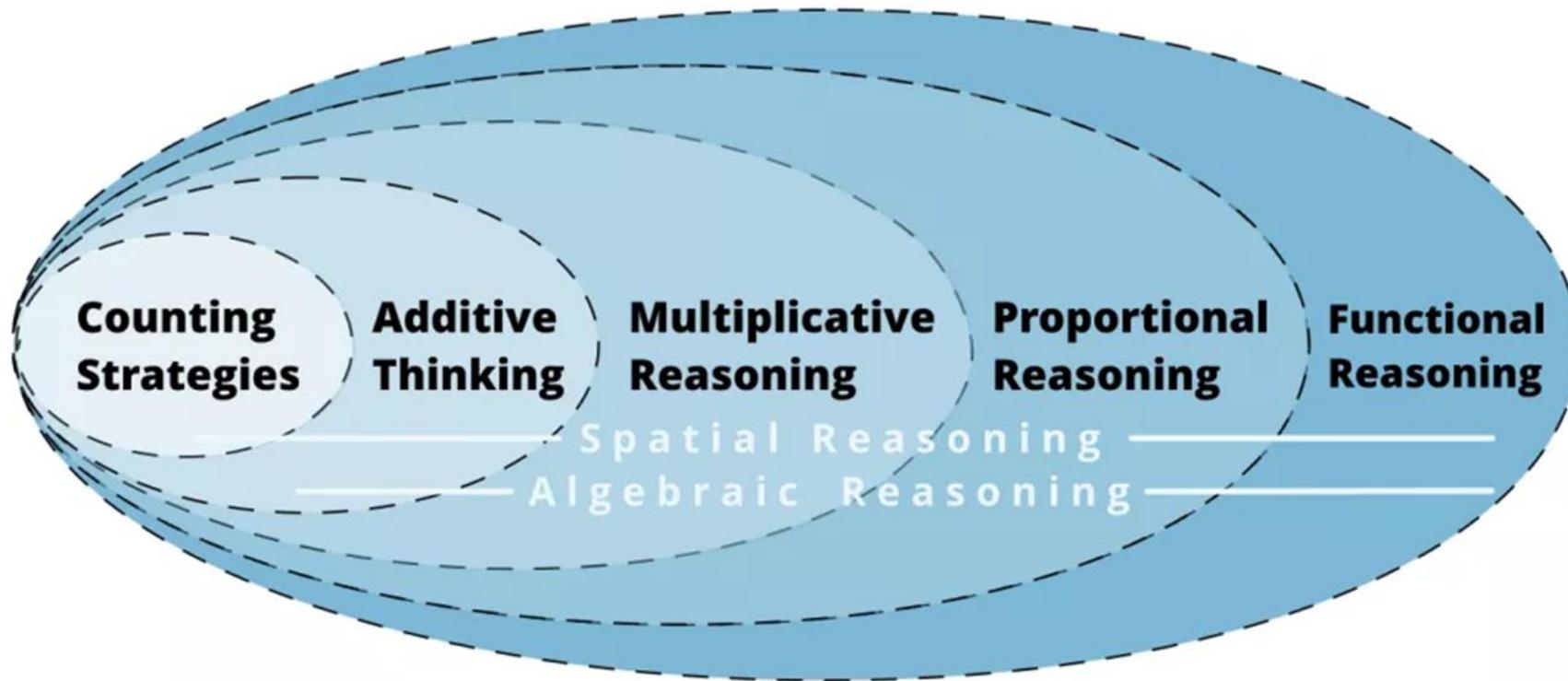
Numeracy Stages

- Stage 0 - Emergent
- Stage 1 - One to One Counting
- Stage 2 - Count from One on Materials
- Stage 3 - Count from One by Imaging
- Stage 4 - Advanced Counting
- Stage 5 - Early Additive Part Whole
- Stage 6 - Advanced Additive Part Whole
- Stage 7 - Advanced Multiplicative Part Whole
- Stage 8 - Advanced Proportional Part Whole

Numeracy Stages

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The Development of Mathematical Reasoning



PAM HARRIS

Numeracy Project

Global Strategy Stages Assessment (GloSS)

Global Strategy Stage Assessment
(GloSS – Individual *Verbal/Mental Reasoning*)

Strategy Screener

Possible Stage Scores 0-8

Assesses Three Strategy Domains

- Addition and Subtraction
- Multiplication and Division
- Proportions and Ratios



End of Year Strategy Stage Expectations



End of Grade Level	At Risk	Cause for Concern	At Expectation	Above Expectation
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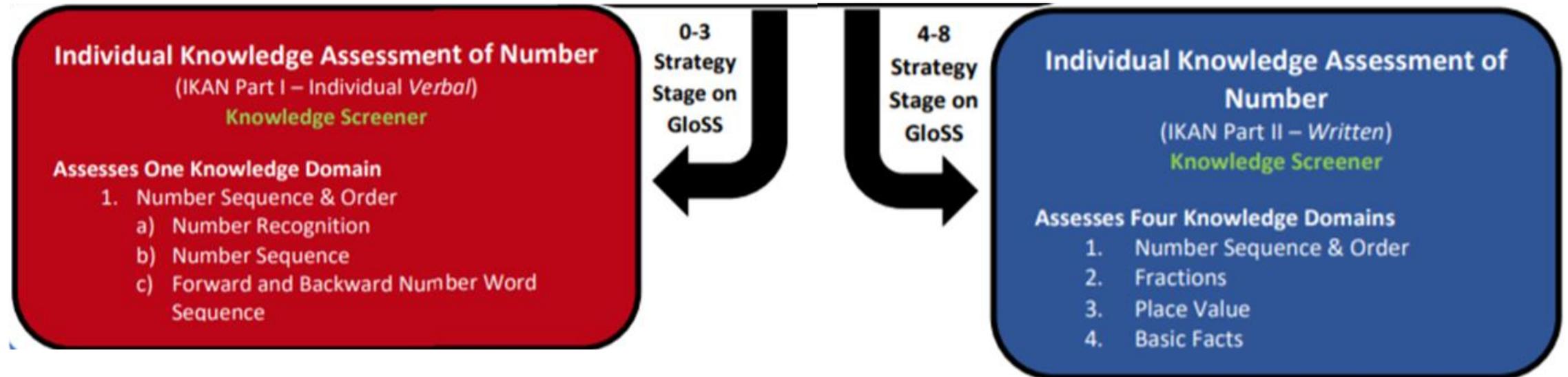
Grade	Stage 0 Emergent	Stage 1 One-to-One Counting	Stage 2 Counting from One using	Stage 3 Counting from One by Imaging	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
Kindergarten	Stage 0 Emergent	Stage 1 One-to-One Counting	Stage 2 Counting from One using	Stage 3 Counting from One by Imaging	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
1 st Grade	Stage 0 Emergent	Stage 1 One-to-One Counting	Stage 2 Counting from One using	Stage 3 Counting from One by Imaging	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
2 nd Grade	Stage 0 Emergent	Stage 1 One-to-One Counting	Stage 2 Counting from One using	Stage 3 Counting from One by Imaging	Stage 4 Advanced Counting	Stage 5 Early Additive <i>*addition/ subtraction</i>	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
3 rd Grade	Stage 0 Emergent	Stage 1 One-to-One Counting	Stage 2 Counting from One using	Stage 3 Counting from One by Imaging	Stage 4 Advanced Counting	Stage 5 Early Additive <i>*multiplication/ division</i>	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
4 th Grade	Stage 0 Emergent	Stage 1 One-to-One Counting	Stage 2 Counting from One using	Stage 3 Counting from One by Imaging	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive <i>*addition/ subtraction</i>	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
5 th Grade	Stage 0 Emergent	Stage 1 One-to-One Counting	Stage 2 Counting from One using	Stage 3 Counting from One by Imaging	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive <i>*multiplication/ division</i>	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
6 th Grade	Stage 0 Emergent	Stage 1 One-to-One Counting	Stage 2 Counting from One using	Stage 3 Counting from One by Imaging	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
7 th Grade	Stage 0 Emergent	Stage 1 One-to-One Counting	Stage 2 Counting from One using	Stage 3 Counting from One by Imaging	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
8 th Grade	Stage 0 Emergent	Stage 1 One-to-One Counting	Stage 2 Counting from One using	Stage 3 Counting from One by Imaging	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional

****By the end of 7th grade, students should have successfully completed through stage 8 of the GloSS. ****

Part 2: IKAN

Numeracy Project

Individual Knowledge Assessment of Number (IKAN)





Developing Foundational Numeracy in Mathematics

IMPLEMENTATION RESOURCES

Georgia Numeracy Project

Tier 1
(all students)

Examiner's Assessment Manual

Videos of Assessments
GloSS & IKAN

[Interview 1](#)
[Interview 2](#)

Global Strategy Stage Assessment
(GloSS – Individual Verbal/Mental Reasoning)
Strategy Screener
Possible Stage Scores 0-8

Assesses Three Strategy Domains

- Addition and Subtraction
- Multiplication and Division
- Proportions and Ratios

[Interview 3](#)
[Interview 4](#)

GloSS Interview Instructions

GloSS Interview Recording Sheet

Grade Level Expectations Continuum
GloSS

Individual Knowledge Assessment of Number
(IKAN Part I – Individual Verbal)
Knowledge Screener

Assesses One Knowledge Domain

1. Number Sequence & Order
 - a) Number Recognition
 - b) Number Sequence
 - c) Forward and Backward Number Word Sequence

0-3
Strategy Stage on GloSS

4-8
Strategy Stage on GloSS

Individual Knowledge Assessment of Number
(IKAN Part II – Written)
Knowledge Screener

Assesses Four Knowledge Domains

1. Number Sequence & Order
2. Fractions
3. Place Value
4. Basic Facts

IKAN Instructions

IKAN Part II Instructions

IKAN Part II Recording Sheet

IKAN Part II Answers

Tiers 2 & 3

Number Cards

Numeracy Project Assessment
(Individual Verbal)
Strategy & Number Knowledge Numeracy Intervention Instrument

Deeply Assesses Strategy & Number Knowledge

- Each of the Strategy and Knowledge Domains on the GloSS and IKAN

Material Masters

Grade Level Expectations Continuum
IKAN

Videos of Interventions
Project Books

Numeracy Development Intervention Activities
(Activities for Support)

These resources provide the teacher/interventionist with the activities to support students where they are in their progression and help them move to the next level of numeracy development.

Data Table & Graph

Numeracy Development Project Books

Student Examples
Strategy Stages

Strategy Stage Descriptions
Stage 0 to Stage 8

Intervention Manual

Individual Knowledge Assessment of Number (IKAN) – PART I

Test Examiner Name: _____

COUNTING INTERVIEW (Early Numeracy)

Student Name: _____

Student Counting Interview

*for students scoring within Strategy Stage 0 - 3

Look for confusion between "teen" and "ty" numbers in questions (1), (3), (9), (10), (11), and (12) and for "dropping back" to find the numbers after and before.

(1) Say: "Start counting from 1. Stop at 32."

Listen for student response: 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32

STUDENT MUST STOP COUNTING AT (32) AND NOT GO BEYOND

(2) Say: "Start counting from 51. Stop at 78."

Listen for student response: 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78

(3) Say: "Start counting from 10 by tens. Stop at 100."

Listen for student response: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

STUDENT MUST STOP AT 100

(4) Say: "Count backwards from 10. Stop at 0."

Listen for student response: 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0

STUDENT MUST SAY "ZERO"

(5) Say: "Count backwards from 23. Stop at 11."

Listen for student response: 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11

STUDENT MUST STOP COUNTING AT (11) AND NOT GO BEYOND

Action: Show each number card. For each number, ask the following three questions:

Questions:	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Show Card	1	5	11	14	31	50	80	100	111	409	870	999
What is this number?												
What number comes after?												
What number comes before?												

Place a check mark in the boxes above for each correct response.

record dates when mastery was achieved FNWS/BNWS/R&S in the space below

FNWS (#1 - #3):

BNWS (#4 & #5):

Number recognition to 1000:

"After" number recognition to 1000:

"Before" number recognition to 998:

FNWS – Forward Number Word Sequence

BNWS – Backward Number Word Sequence

R&S – Recognition and Sequence

Adapted from NZMaths

Overall Number Knowledge Stage Score: _____

Let's review the IKAN Part I: Counting Interview

- For students who scored within Strategy Stages 0 – 3 on GloSS, administer the IKAN Part I: Counting Interview

NUMBER RECOGNITION AND SEQUENCE CARDS



1	5	11	14
31	50	80	100
111	409	870	999



End of Year Number Knowledge & GSE Expectations



End of Grade Level **At Risk** **Cause for Concern** **At Expectation** **Above Expectation**

	IKAN Counting Interview					IKAN Written Assessment				
	Stage 0	Stage E1	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8
Kindergarten	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
1st Grade	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
2nd Grade	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
3rd Grade	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
4th Grade	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
5th Grade	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
6th Grade	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
7th Grade	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
8th Grade	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional

FNWS – Forward Number Word Sequence

BNWS – Backward Number Word Sequence

R&S – Number Recognition & Number Sequence



Developing Foundational Numeracy in Mathematics

IMPLEMENTATION RESOURCES

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Tier 1
(all students)

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Strategy Screener
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[Interview 3](#)
[Interview 4](#)

GloSS Interview Instructions

GloSS Interview Recording Sheet

Grade Level Expectations Continuum
GloSS

Individual Knowledge Assessment of Number
(IKAN Part I – Individual Verbal)
Knowledge Screener

Assesses One Knowledge Domain

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0-3
Strategy Stage on GloSS

4-5
Strategy Stage on GloSS

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IKAN

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Tiers 2 & 3

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Data Table & Graph

Numeracy Development Project Books

Student Examples
Strategy Stages

Strategy Stage Descriptions
Stage 0 to Stage 8

IKAN Individual Knowledge Assessment of Number

This is a Numeracy knowledge test. It is a timed test so the questions come then go quite quickly.

IKAN WRITTEN ASSESSMENT RECORDING SHEET

Individual Knowledge Assessment of Number (IKAN) Written Assessment		*This assessment is for students scoring within Strategy Stages 4 or higher on GloSS.				
		IKAN 1	IKAN 2	IKAN 3	IKAN 4	(Circle the form used)
Student Name: _____		Teacher Name: _____		Grade Level: _____		Date: _____
	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional	
DOMAIN	Part One	Part Two	Part Three	Part Four	Part Five	Domain Stage Score <small>(for classroom use)</small>
Number Sequence and Order	1.	1.	1.	1.		
	2.	2.	2.	2.		
Fractions	3.	3.	3.	3.	1.	
	4.	4.	4.	4.	2.	
Place Value	5.	5.	5.	5.	3.	
	6.	6.	6.	6.	4.	
Basic Facts	7.	7.	7.	7.	5.	
	8.	8.	8.	8.	6. 7. 8.	
Total Correct						

Adapted from NZ Maths Numeracy Project, New Zealand Ministry of Education

Overall Number Knowledge Stage Score: _____

(Last Stage of Consecutive Mastery: Last stage where all items are correct, before student begins missing items)

Let's review the IKAN Part II: Written Assessment

- For students who scored within Strategy Stages 4 – 8 on GloSS, administer the IKAN Part II: Written Assessment



End of Year Number Knowledge & GSE Expectations



End of Grade Level **At Risk** **Cause for Concern** **At Expectation** **Above Expectation**

	IKAN Counting Interview					IKAN Written Assessment				
	Stage 0	Stage E1	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8
Kindergarten	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
1st Grade	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
2nd Grade	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
3rd Grade	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
4th Grade	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
5th Grade	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
6th Grade	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
7th Grade	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional
8th Grade	Stage 0 No Parts Mastered	FNWS/BNWS Mastered but R&S Not Mastered	FNWS/BNWS and R&S to 100 Mastered	FNWS/BNWS and R&S to 120 Mastered	FNWS/BNWS and R&S to 1000 Mastered	Stage 4 Advanced Counting	Stage 5 Early Additive	Stage 6 Advanced Additive	Stage 7 Advanced Multiplicative	Stage 8 Advanced Proportional

FNWS – Forward Number Word Sequence

BNWS – Backward Number Word Sequence

R&S – Number Recognition & Number Sequence

Part 3: Numeracy Intervention Instrument

NEW

Numeracy Project Assessment
(Individual *Verbal*)

Strategy & Number Knowledge
Numeracy Intervention Instrument

Deeply Assesses Strategy & Number Knowledge

- Each of the Strategy and Knowledge Domains on the GloSS and IKAN

Numeracy Project Intervention Assessment

6:7

<p><i>Read decimals with tenths, counts forwards and backwards in tenths, order decimals with tenths</i></p> <p>(4.NF.6)</p>	DP#1	Action: <i>Show the student the problem card. (Material Master 6:7)</i> Say: "What number is this?" (6.9)		X 9/18
	DP#2	Action: <i>Show the student the problem card. (Material Master 6:7)</i> Say: "What number is this?" (29.2)	X 9/25	
	DP#3	Action: <i>Show the student the problem card. (Material Master 6:7)</i> Say: "What number is this?" (87.1)		
	DP#4	Action: <i>Show the student the problem card. (Material Master 6:7)</i> Say: "What number is this?" (21.4)		
	DP#5	Action: <i>Show the student the problem card. (Material Master 6:7)</i> Say: "What number is this?" (18.3)		
	BL	Say: "Start counting by tenths from 1.7. Stop at 2.5."		X 9/12
	DP#1	Say: "Start counting by tenths from 3.2. Stop at 4.8."	X 9/18	
	DP#2	Say: "Start counting by tenths from 23.4. Stop at 24.5."		
	DP#3	Say: "Start counting by tenths from 0.6. Stop at 2.0."		
	DP#4	Say: "Start counting by tenths from 1.0. Stop at 2.5."		
	DP#5	Say: "Start counting by tenths from 129.0. Stop at 130.5."		
	BL	Say: "Count backwards from 8.9 to 7.1 by tenths."		X 9/12
	DP#1	Say: "Count backwards from 9.0 to 8.0 by tenths."	X 9/18	
	DP#2	Say: "Count backwards from 21.4 to 19.8 by tenths."		

Graphical Display of Progress Monitoring Data

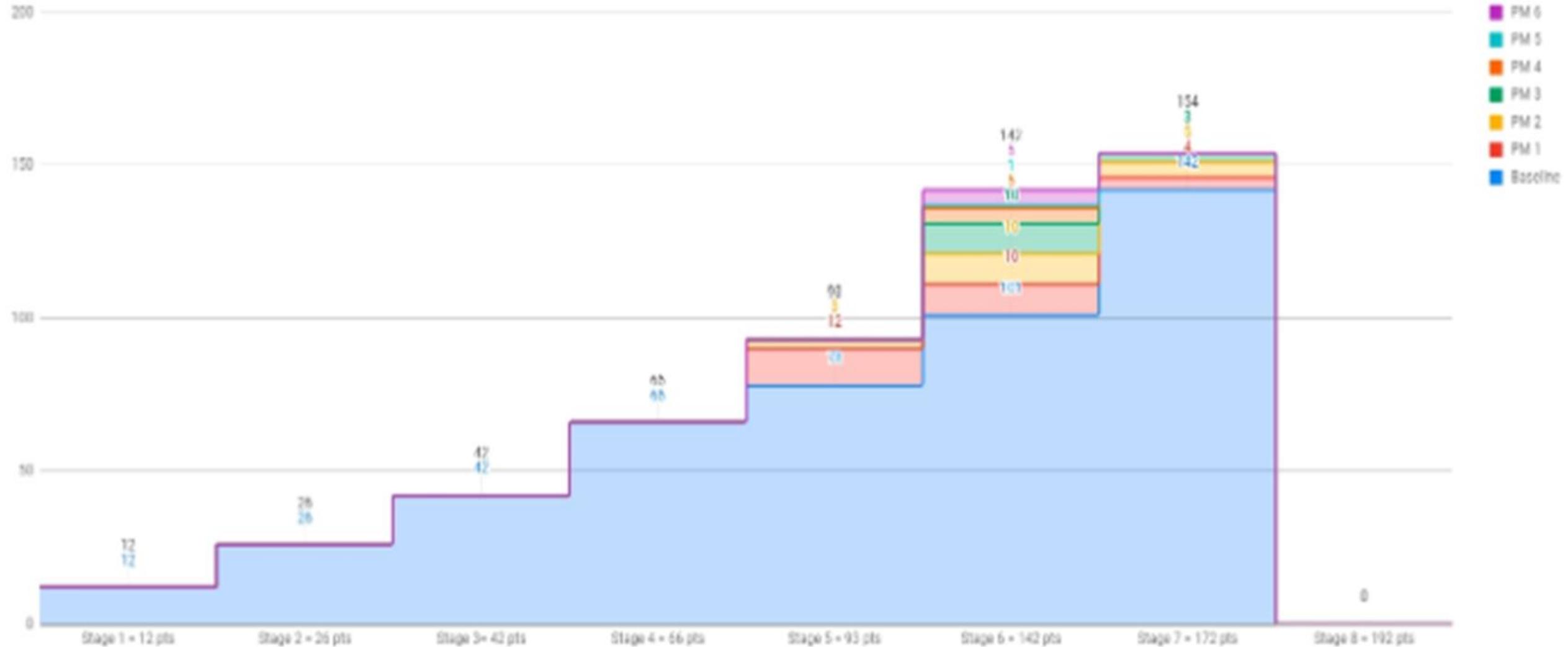
Data
Table
&
Graph

Progress Monitoring

Date	Stage	Baseline	PM 1	PM 2	PM 3	PM 4	PM 5	PM 6	PM 7
8/18	Stage 1 = 12 pts		12						
8/18	Stage 2 = 26 pts		26						
8/18	Stage 3 = 42 pts		42						
8/18	Stage 4 = 66 pts		66						
	Stage 5 = 93 pts		78	12	3				
	Stage 6 = 142 pt		101	10	10	10	5	1	5
	Stage 7 = 172 pt		142	4	5	3			
	Stage 8 = 192 pts								

Data Collection Graph

Numeracy Project Points



Part 4:

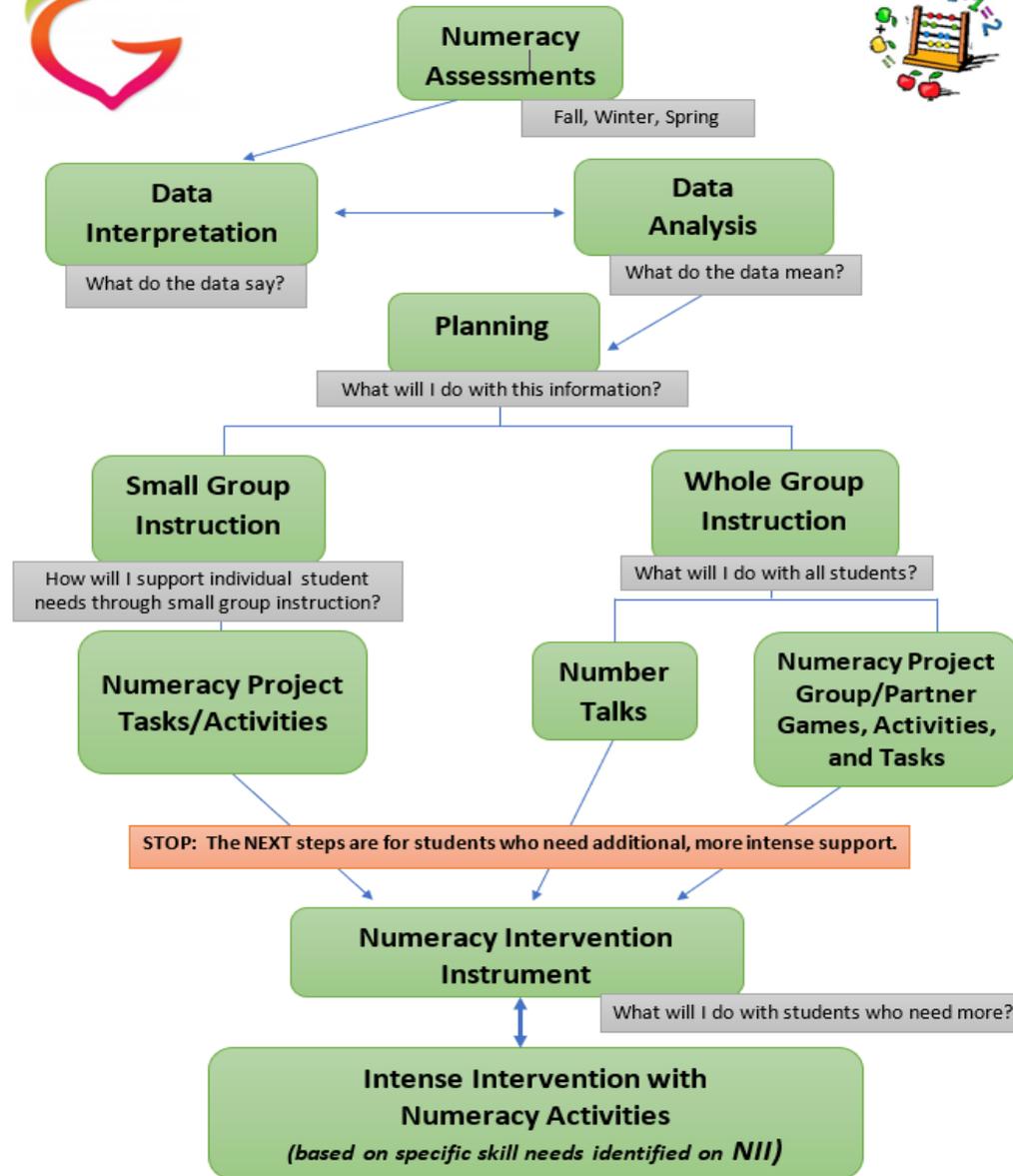
Numeracy

Intervention

Tasks/Activities



GEORGIA NUMERACY PROJECT



Providing Instructional Support at the Stage Level

Numeracy
Project
Intervention
Resources

Numeracy Development Intervention Activities

(Activities for Support)

These resources provide the teacher/interventionist with the activities to support students where they are in their progression and help them move to the next level of numeracy development.

Domain and Skills Alignment

Assessment Domains and Skills Alignment

Gloss Domains			
	Addition and Subtraction	Multiplication and Division	Proportions and Ratios
Stage 0	<i>No tasks are available for this stage.</i> Students scoring Stage 0: Emergent, should work repetitively on one to one counting.		
Stage 1	<ul style="list-style-type: none"> 1:6 Counting sets 0-10 1:7 Forming sets 0-10 1:8 Comparing two sets in the range 0-10 1:9 Recognizing patterns to 5 		
Stage 2	<ul style="list-style-type: none"> 2:6 Counting sets 0-20 2:7 Forming sets 0-20 2:8 Comparing two numbers in the range 0-20 using number cards 2:9 Instantly recognizing patterns to 10 2:10 Solving addition problems to 20 by joining sets and counting all the objects 2:11 Solving subtraction problems from 20 separating sets and counting all the objects 		
Stage 3	<ul style="list-style-type: none"> 3:1 Rote counting 0-50 3:6 Counting up to 50 objects by grouping the objects in tens 3:7 Comparing two numbers in the range 0-50 using number cards 3:8 Instantly recognizing patterns to 10, including doubles 3:9 Recalling facts within 5, and doubles to 10 3:10 Solving addition problems to 20 by counting all the objects in their heads 3:11 Solving subtraction problems from 20 by counting all the objects in their head 3:12 Solving addition and subtraction problems with decade numbers by counting tens in their head 	<p><i>No tasks are available for this stage.</i></p> <p>To move students from Not Rated to Stage 3, students should have multiple exposure to arrays; from counters strategically arranged in arrays to images of arrays. Stage 3 thinking is evident when students use a one to one counting strategy, counting all of the objects presented in the array starting from one.</p>	

Numeracy Development Intervention Activities
(Activities for Support)
 These resources provide the teacher/interventionist with the activities to support students where they are in their progression and help them move to the next level of numeracy development.

Providing Instructional Support at the Individual Skill Level



NUMERACY PROJECT TASKS AND ACTIVITIES

Stage Three

- The following list of activities is designed to be used for a student who scores at Stage Three on the Numeracy Assessment Universal Screener.
- Teachers and interventionists should choose activities in the areas in which the student was unable to demonstrate mastery of a particular skill in order to create an "Intervention Prescription".
- These resources can be found by clicking on the activity name below.

3:1 <i>Rote counting 0-50</i>	3:2 <i>Saying the forwards and backwards number word sequence in the range 0-50, starting and ending with any number</i>	3:3 <i>Numeral recognition 0-50</i>	3:4 <i>Number order: What comes before and after a given number in the range 0-50</i>	3:5 <i>Ordering the numbers in the range 0-50</i>	3:6 <i>Counting up to 50 objects by grouping the objects in tens</i>
<ul style="list-style-type: none"> ❖ Bead Counting ❖ Clapping from 0-50 ❖ Counting As We Go ❖ Outdoor Counting 0-50 ❖ Puppet Counting 0-50 	<ul style="list-style-type: none"> ❖ Backwards, Forwards, and In-Between ❖ Clapping Forwards and Backwards ❖ Walk the Bridge 	<ul style="list-style-type: none"> ❖ Arrow Cards ❖ Birthday Cakes ❖ Caterpillar Legs ❖ Creating Numbers ❖ Lucky Counting ❖ Number Line Flips 	<ul style="list-style-type: none"> ❖ Lily Pads ❖ Number Line Flips – Before and After ❖ Number Wheel 	<ul style="list-style-type: none"> ❖ Clothesline Cards ❖ Who is the Richest? ❖ Rocket-Where will I Fit? 	<ul style="list-style-type: none"> ❖ Bead Strings ❖ Tens and Ones with Ten-Frames ❖ Tens in Tens
3:7 <i>Comparing two numbers in the range 0-50 using number cards</i>	3:8 <i>Instantly recognizing patterns to 10, including doubles</i>	3:9 <i>Recalling facts within 5, and doubles to 10</i>	3:10 <i>Solving addition problems to 20 by counting all the objects in their head</i>	3:11 <i>Solving subtraction problems from 20 by counting all the objects in their head</i>	3:12 <i>Solving addition and subtraction problems with decade numbers by counting tens in their head</i>
<ul style="list-style-type: none"> ❖ Comparisons with Number Cards ❖ Ten-Frame Comparisons ❖ Ten-Frame War 	<ul style="list-style-type: none"> ❖ Both Hands ❖ Compatible Numbers to Ten ❖ Rekenrek Patterns to Ten ❖ Rekenrek Reinforcing Five/Ten Grouping 	<ul style="list-style-type: none"> ❖ Adding and Subtracting with Counters ❖ Adding and Subtracting on One Hand ❖ Bowl A Fact ❖ Making Tens 	<ul style="list-style-type: none"> ❖ Counters in a Row ❖ In and Out of the Cup - Addition ❖ Ten-Frame Addition 	<ul style="list-style-type: none"> ❖ Heads Up ❖ Ten-Frame Subtraction ❖ Visualizing - Imagining Many Hands ❖ What's Hidden? 	<ul style="list-style-type: none"> ❖ Adding and Subtracting Tens ❖ Tens Bingo ❖ Tens Disks

Numeracy Development Intervention Activities
(Activities for Support)
 These resources provide the teacher/interventionist with the activities to support students where they are in their progression and help them move to the next level of numeracy development.

<https://tinyurl.com/NPTasks-Activities>



Diagnostic Math: Filling the GAPS Teacher and Student Support



Our Numeracy Project Journey Floyd County Schools

WHY?

1. No standardized intervention program
2. SST 10 forms indicated 20 minutes per day of interventions using VandeWalle with no explanation of why and what
3. No set curriculum

WHY is it necessary?

- **Reading:** As we teach students to decode, comprehension progresses as students read more and grow in their vocabulary and background knowledge
- **Math:** New Skills are constantly being introduced every year, that build on previous skills, creating larger gaps.

INTERVENTION TABLE

The Intervention Table provides links to interventions specific to this unit. The interventions support students and teachers in filling foundational gaps revealed as students work through the unit. All listed interventions are from New Zealand’s Numeracy Project.

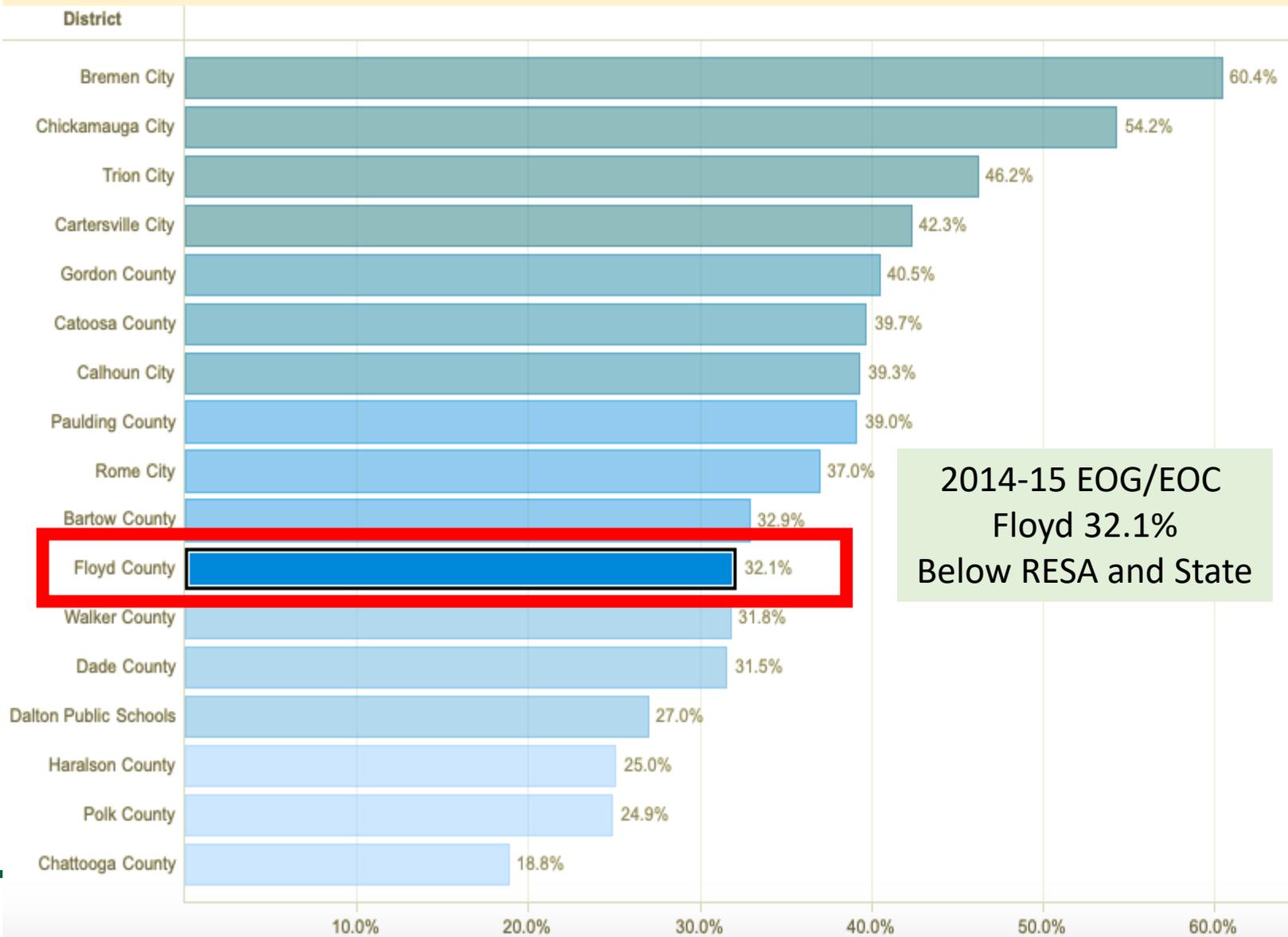
Area of Focus

Description of Intervention Activity

Cluster of Standards	Name of Intervention	Snapshot of summary or Student I can statement. . .	Materials Master
Operations and Algebraic Thinking Solve problems involving the four operations, and identify and explain patterns in arithmetic MGSE3.OA.8 MGSE3.OA.9	Five Sweets Per Packet	Solve multiplication problems by skip counting in twos, fives, and tens.	
	Blank Grids	Students are encouraged to view the multiplication grid in the same way that they would view a hundreds array.	Blank Grid
	Multiplication or Out	Solve multiplication problems by using repeated addition.	MM 5-2 MM 6-2
	Twos, Fives, and Tens	Solve multiplication problems by using repeated addition.	
	A Little Bit More/A Little Bit Less	Derive multiplication facts from 2, 5, and 10 times tables.	
	Fun With Fives	Derive multiplication facts from 2, 5, and 10 times tables.	MM 4-5
	Three’s Company	Solve multiplication problems by using repeated addition.	MM 5-2 MM 6-2
Measurement and Data Geometric Measurement: understand concepts of area and relate area to multiplication and to addition MGSE3.MD.5 MGSE3.MD.6 MGSE3.MD.7	Animal Arrays	Solve multiplication problems by using repeated addition.	MM 5-2 MM 6-2
	Turn Abouts	Solve multiplication problems by using arrays.	MM 5-2
	Number Strips	Solve multiplication problems by skip counting in twos, fives, and tens.	MM 6-1
	Area and Multiplication	Provides a progression: equal groups, arrays, and area.	
	The Great Cover Up	Cover a shape with non-standard area units and count the number used.	The Great Cover Up PDF
	The Array Game	This game allows students to practice their multiplication skills, and reinforces the ‘array’ concept of	

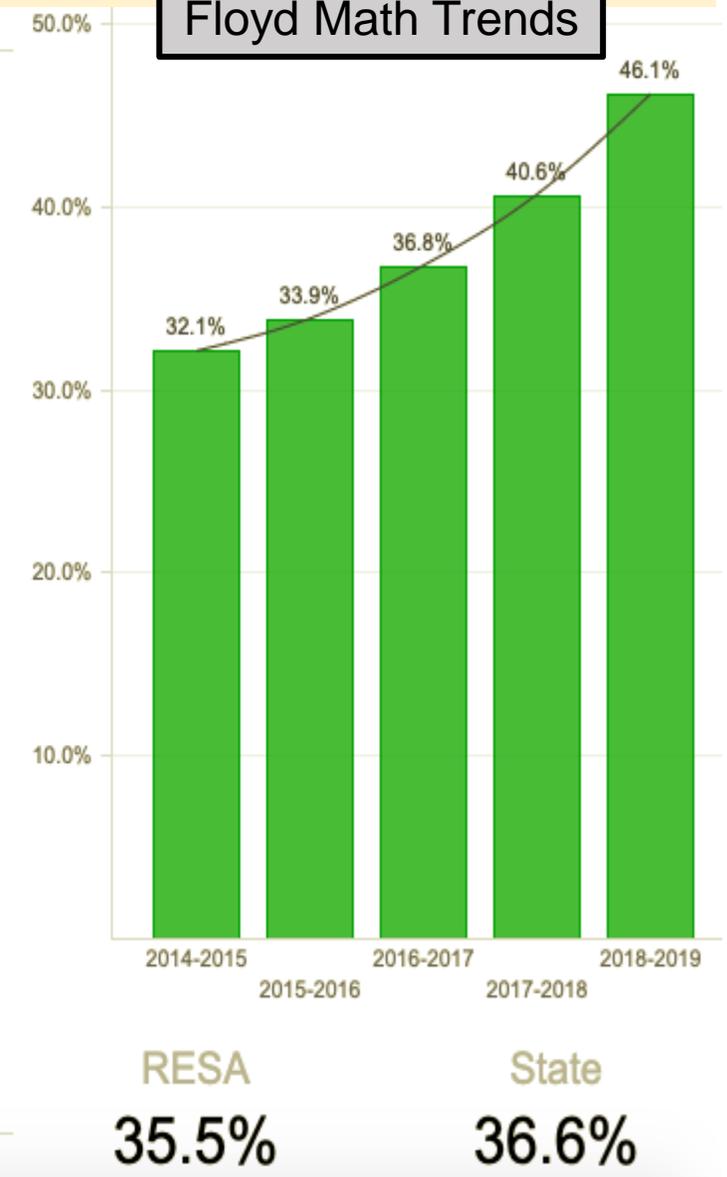
GA Milestones Data Trends in Math for Floyd County

2014-15 FCS GA Milestones EOG/EOC

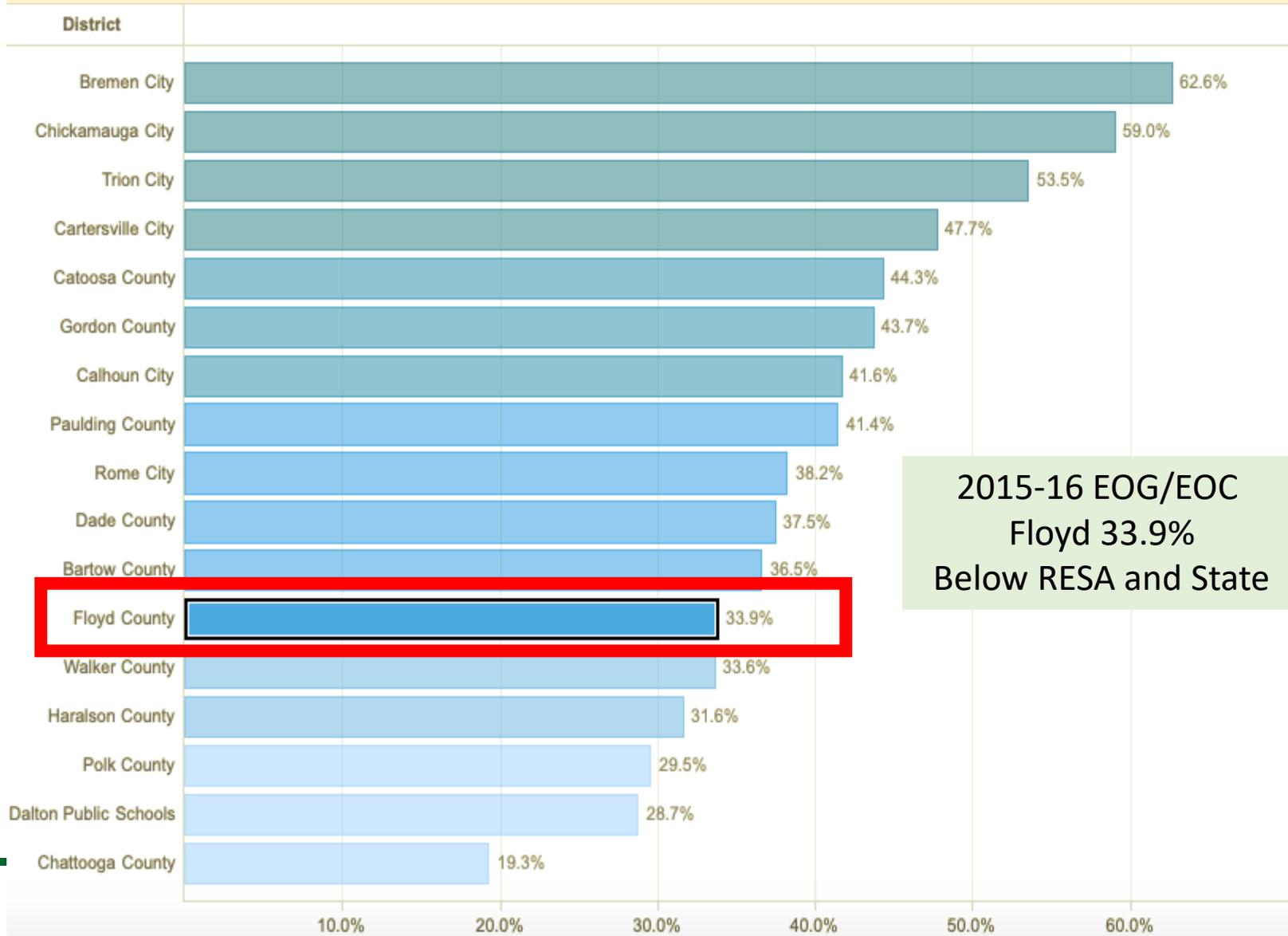


2014-15 EOG/EOC
Floyd 32.1%
Below RESA and State

Floyd Math Trends

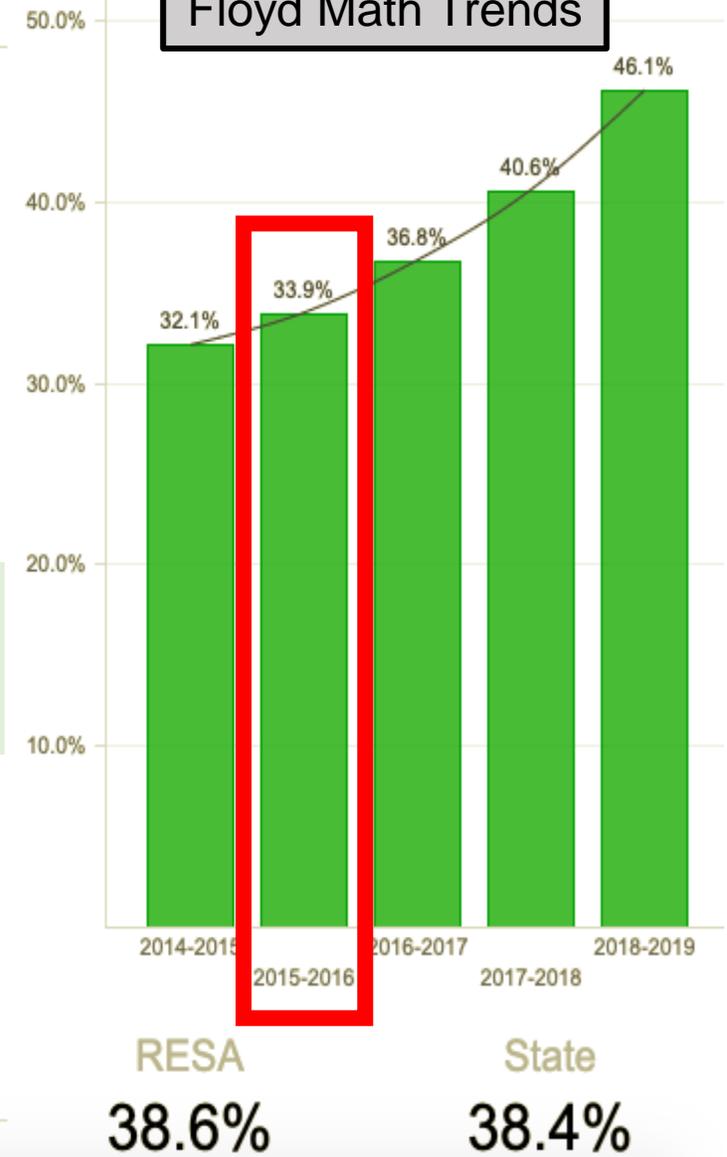


2015-16 FCS GA Milestones EOG/EOC

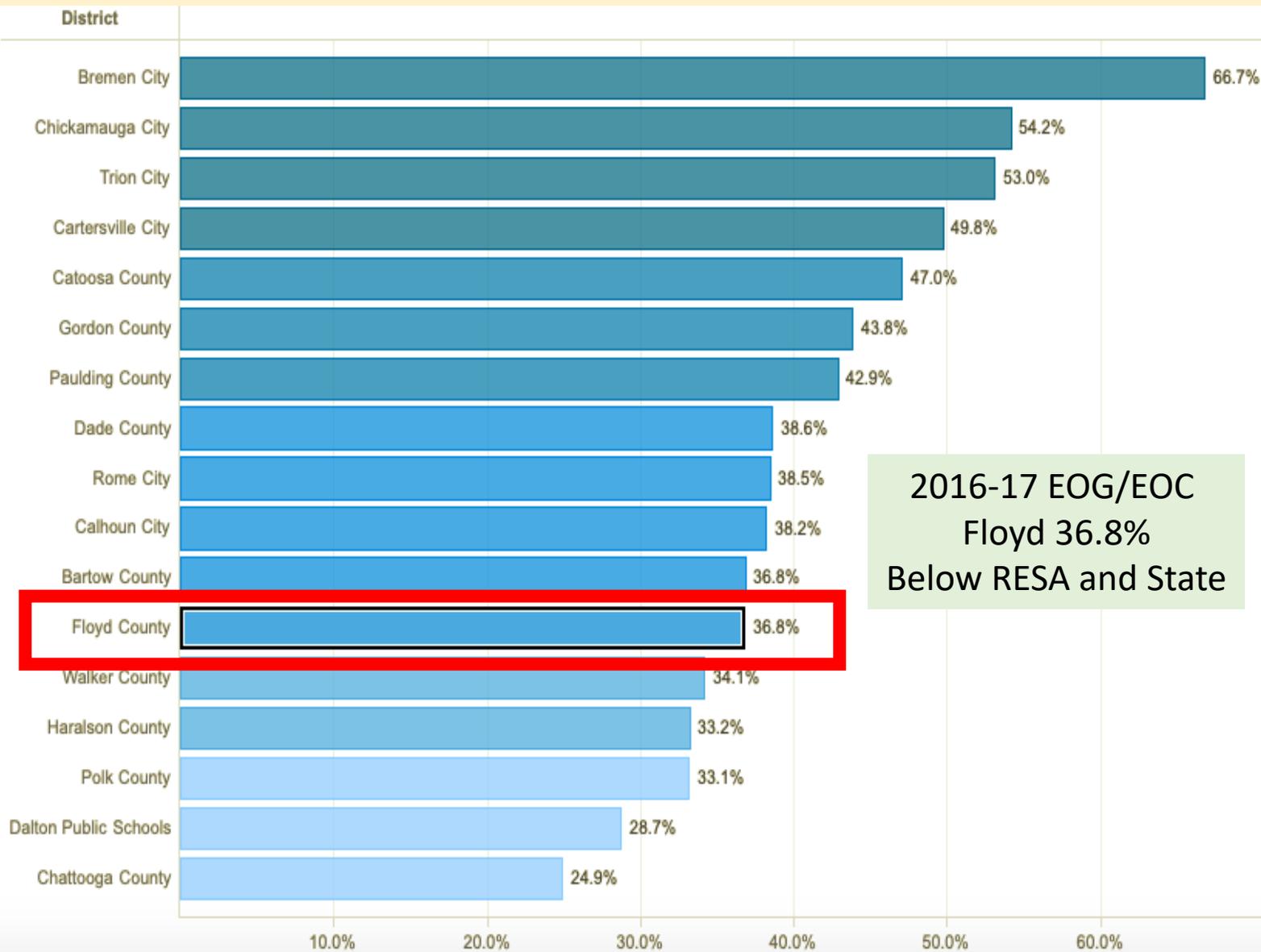


2015-16 EOG/EOC
Floyd 33.9%
Below RESA and State

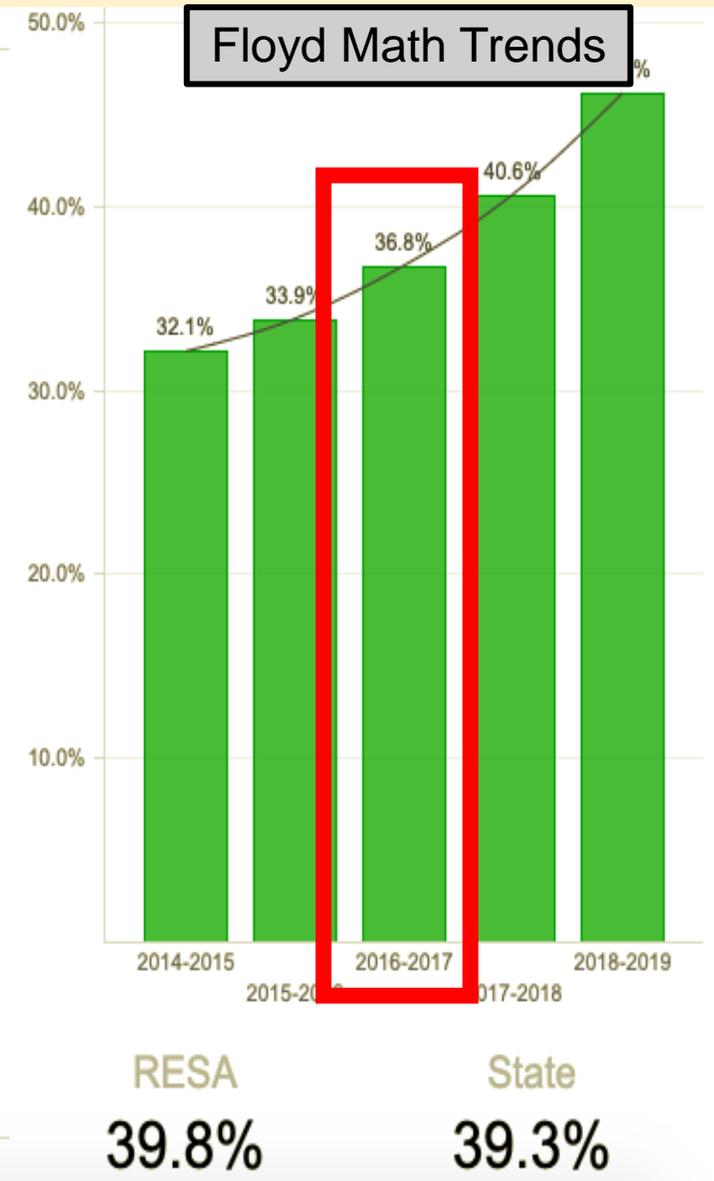
Floyd Math Trends



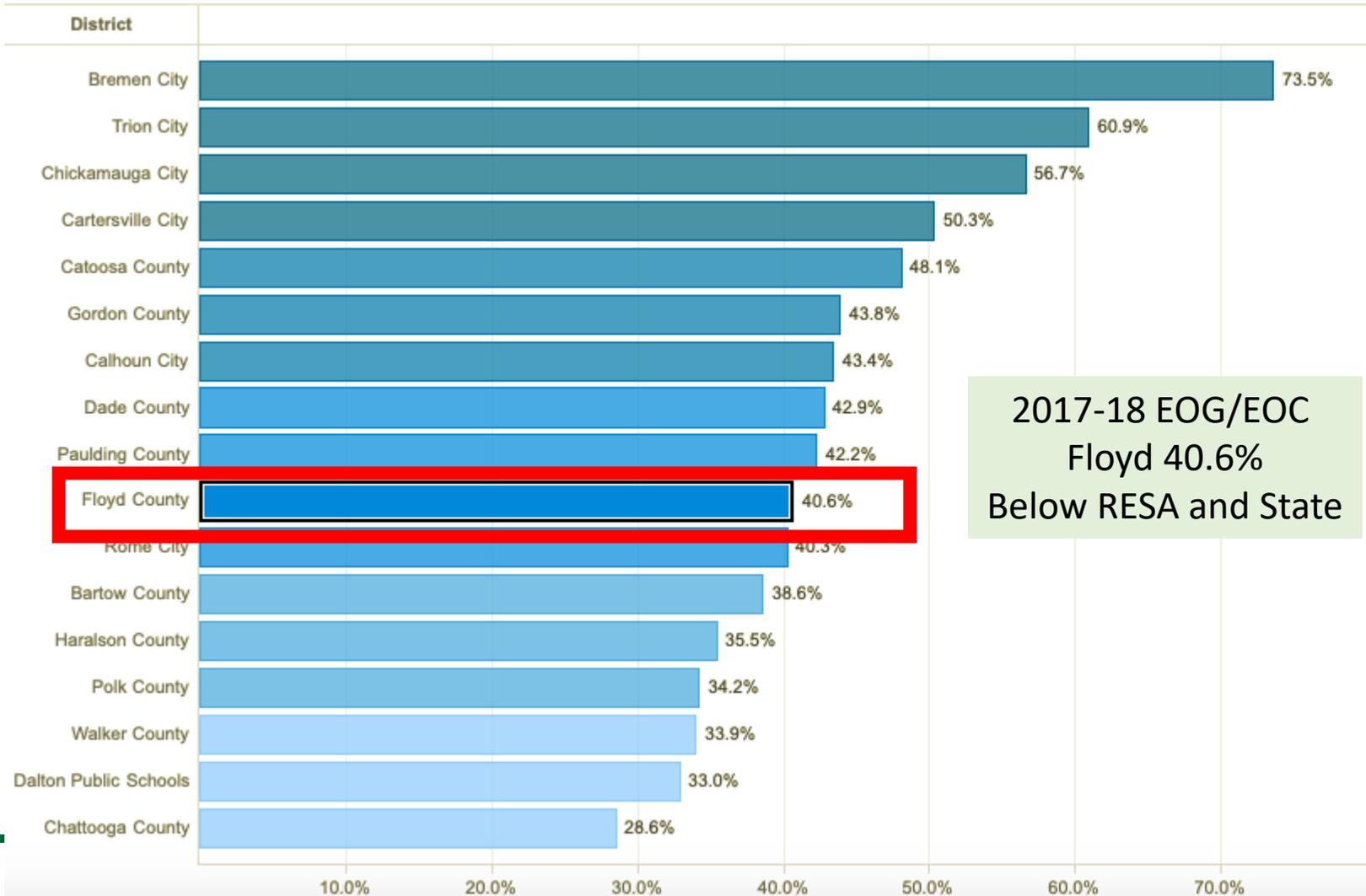
2016-17 FCS GA Milestones EOG/EOC



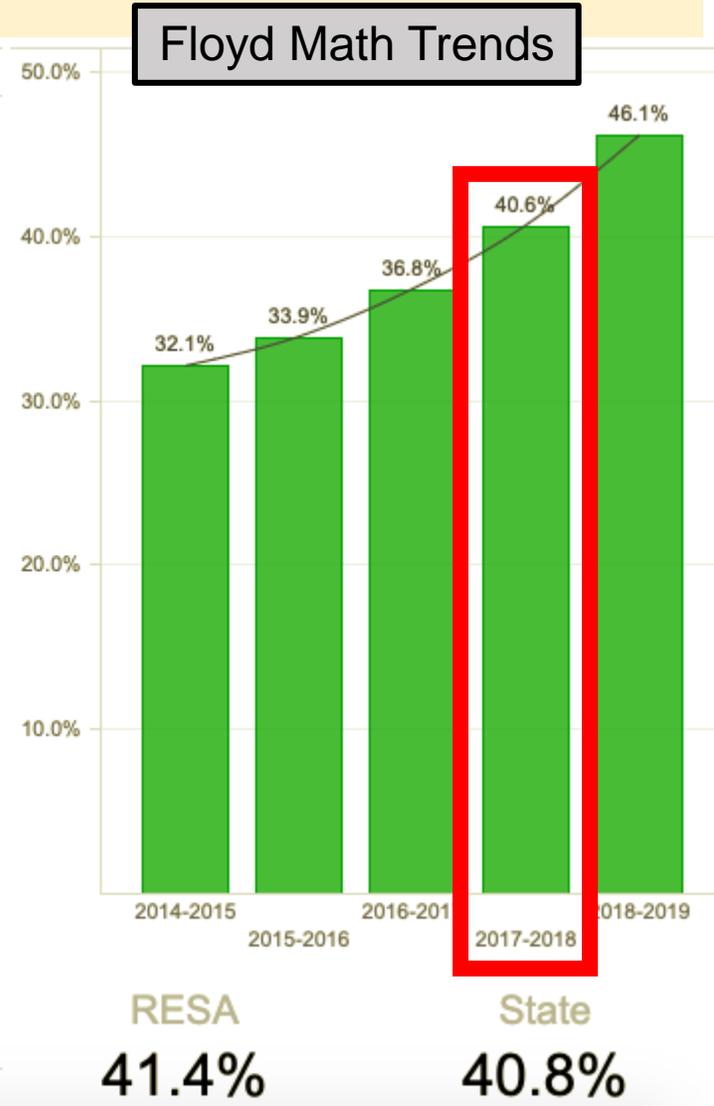
2016-17 EOG/EOC
Floyd 36.8%
Below RESA and State



2017-2018 FCS GA Milestones EOG/EOC

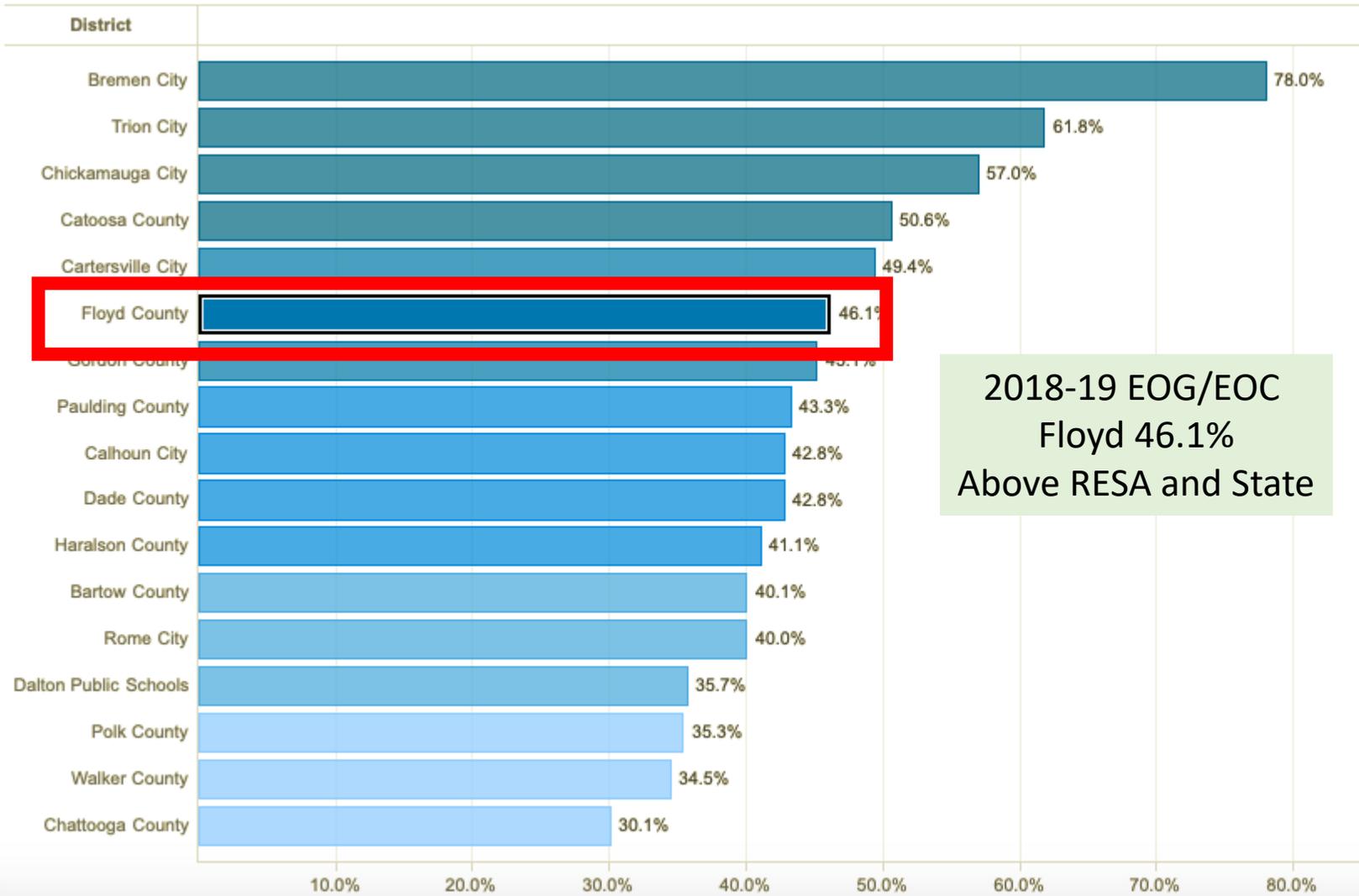


2017-18 EOG/EOC
Floyd 40.6%
Below RESA and State

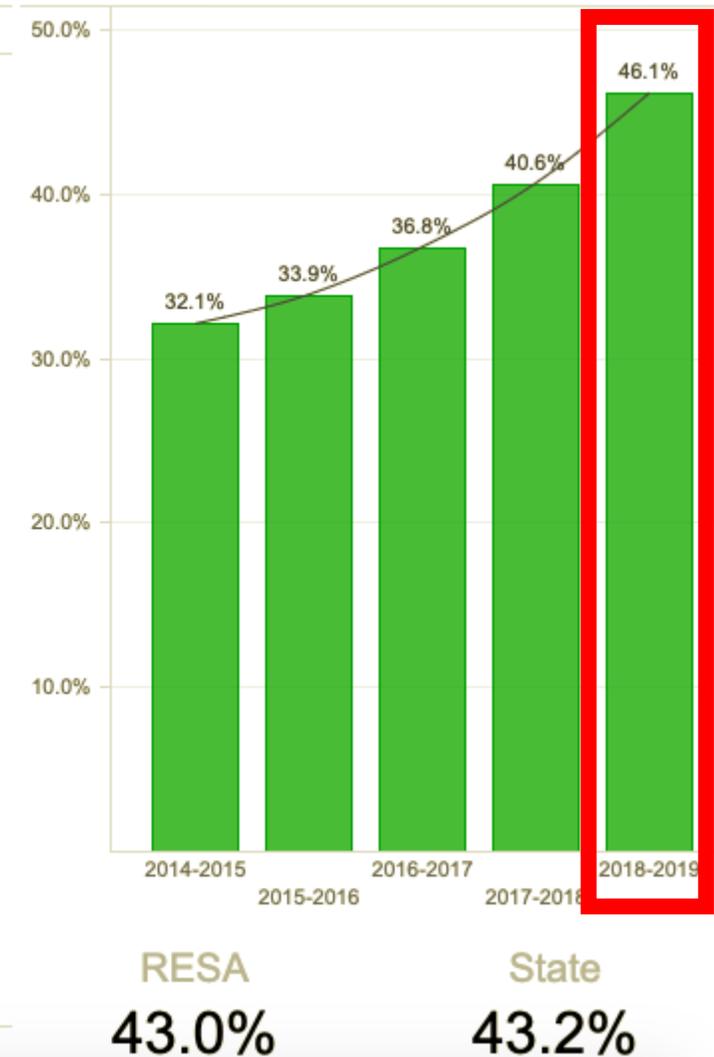


2018-2019 GA Milestones EOG/EOC Math

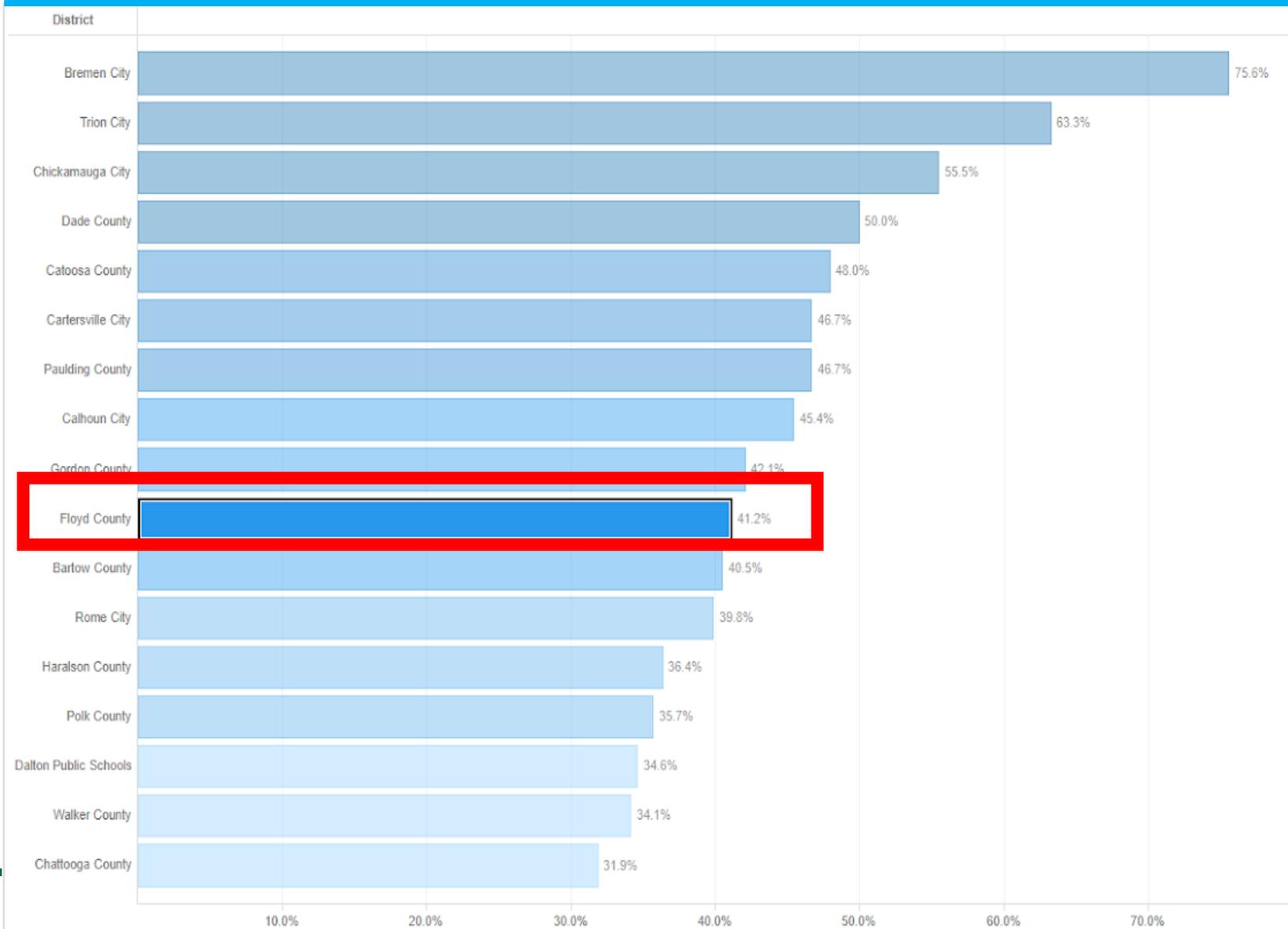
Floyd Math Trends



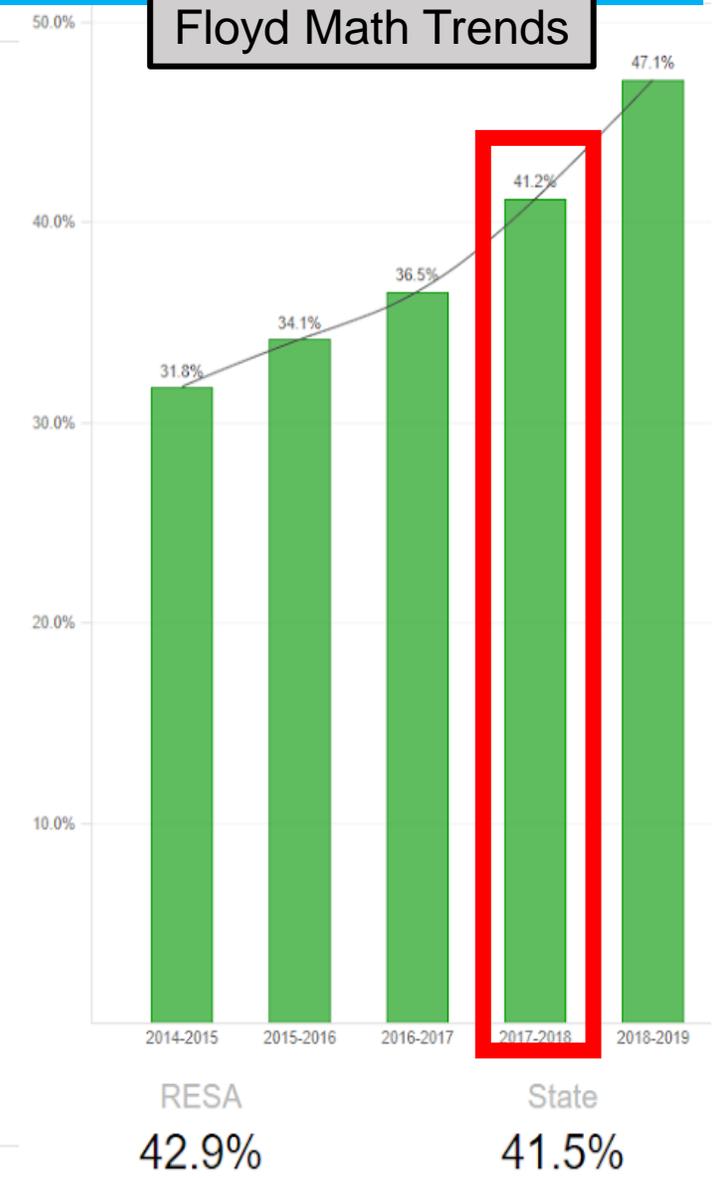
2018-19 EOG/EOC
Floyd 46.1%
Above RESA and State



FCS Total District EOG Math 2018

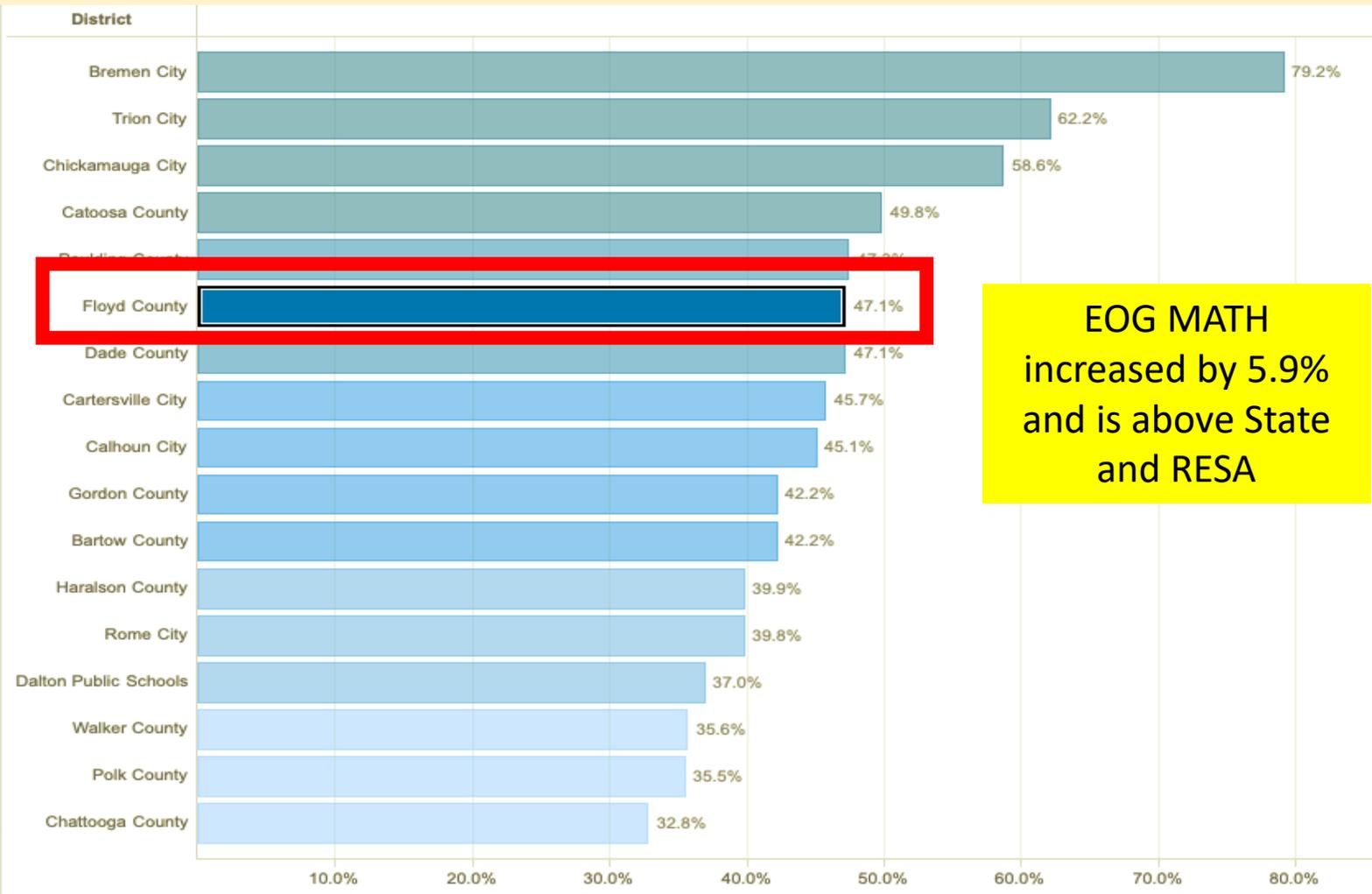


Floyd Math Trends

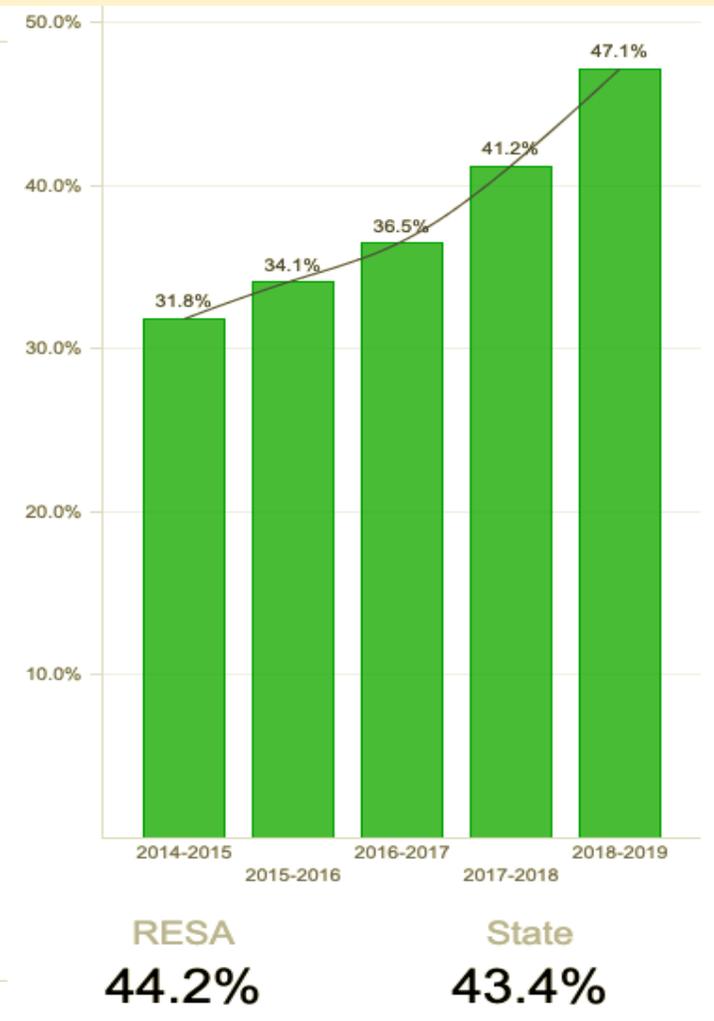


FCS Total District EOG Math 2019

Floyd Math Trends

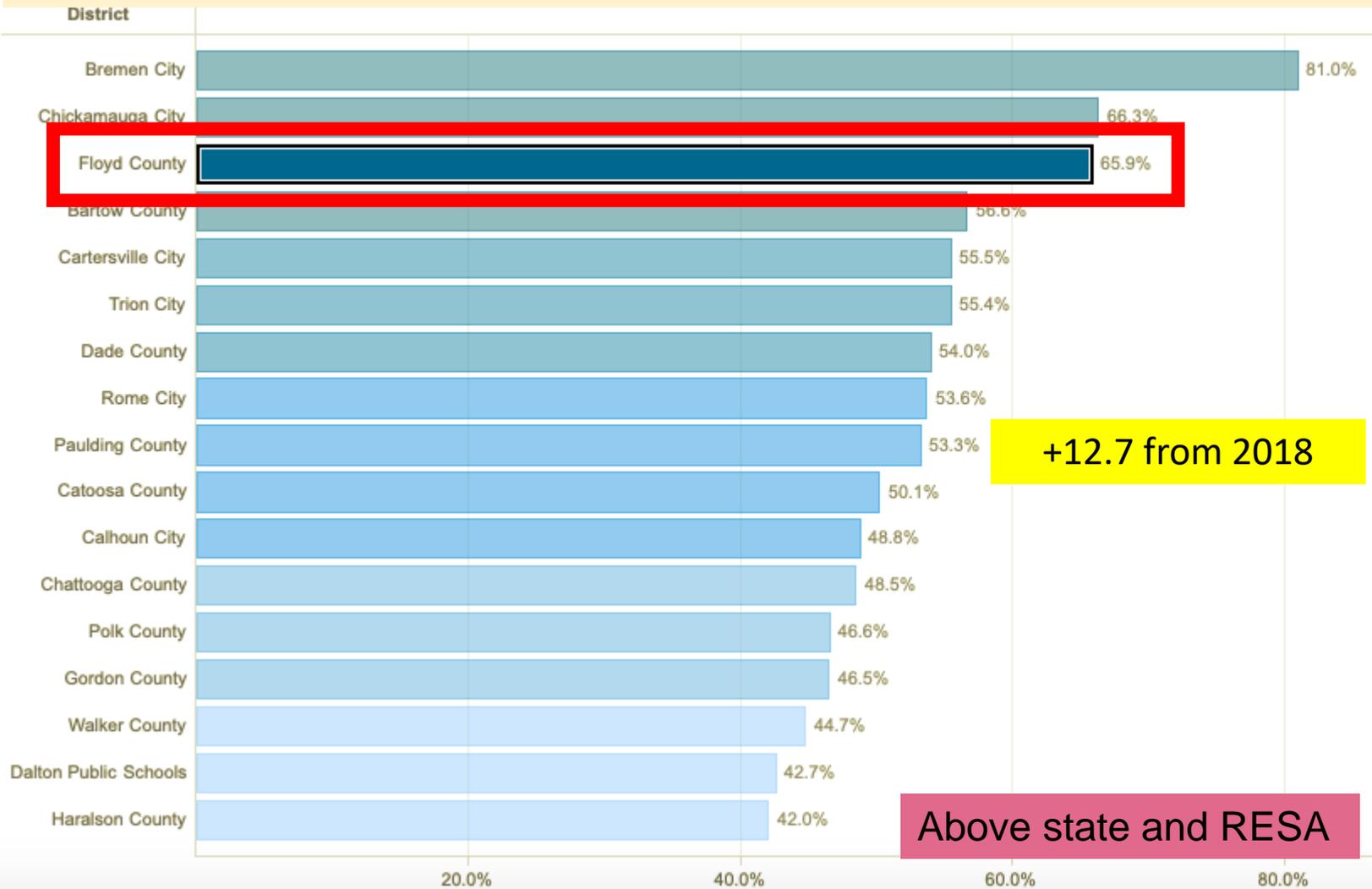


EOG MATH increased by 5.9% and is above State and RESA



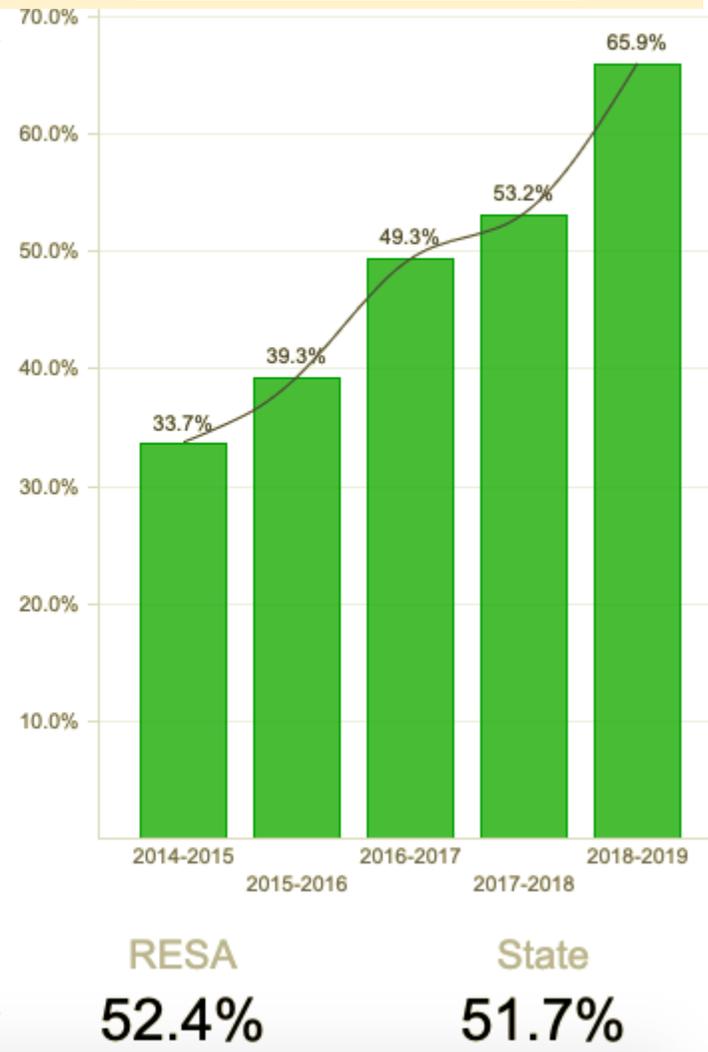
FCS 3rd Grade EOG Math 2019

Floyd Math Trends

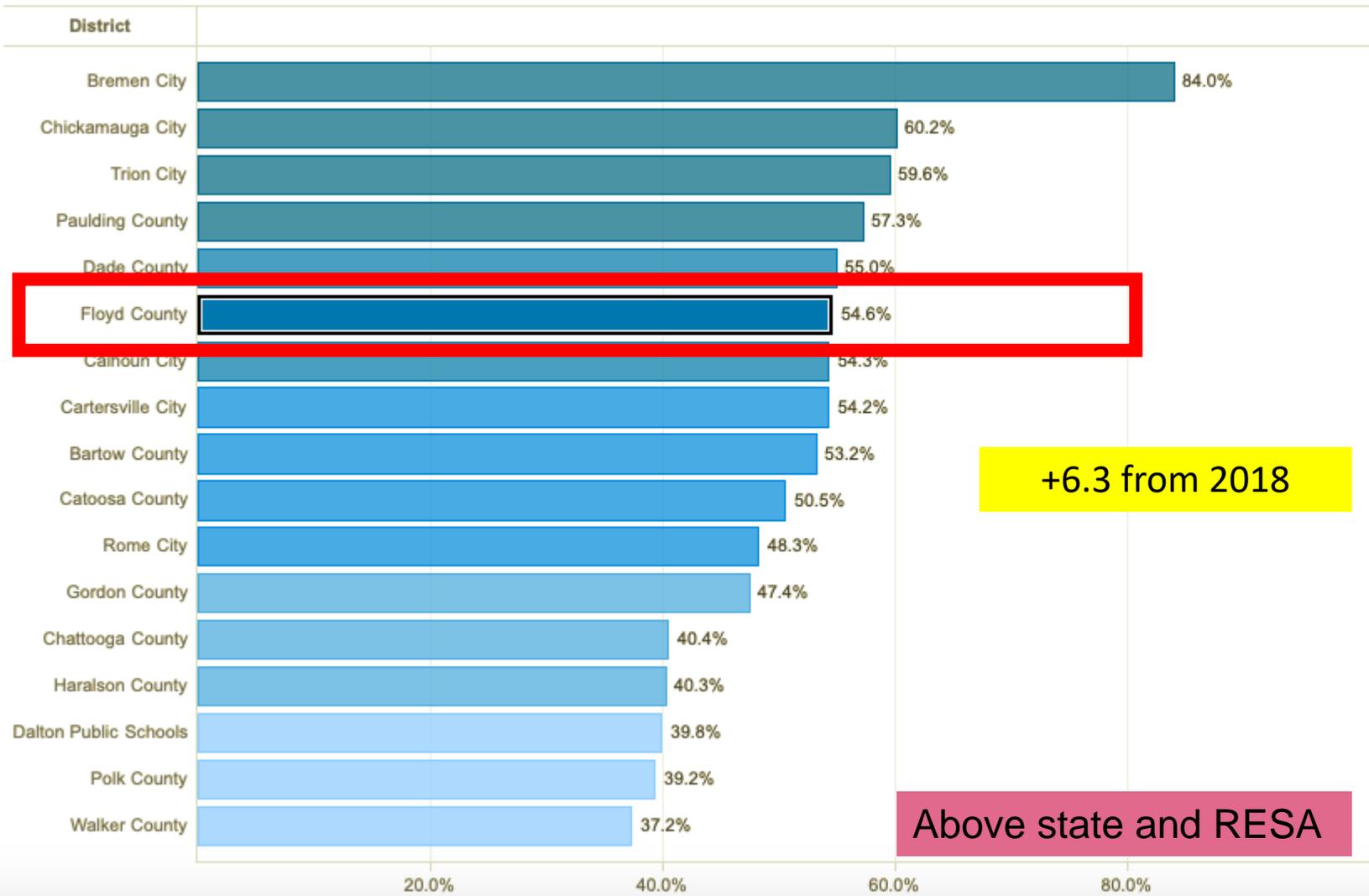


+12.7 from 2018

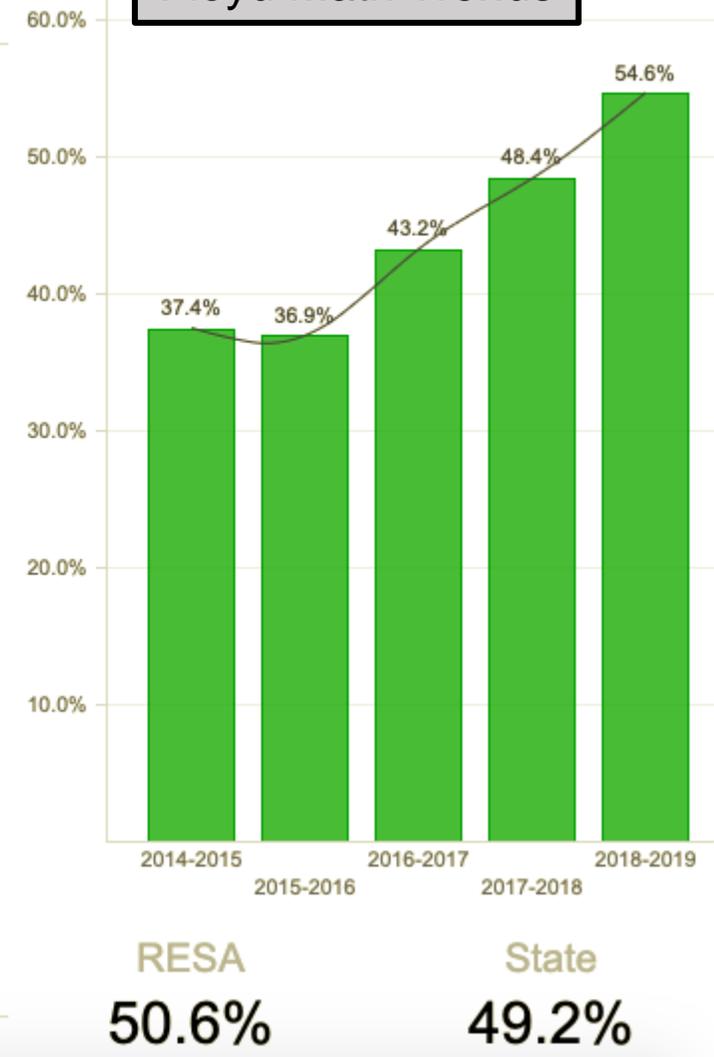
Above state and RESA



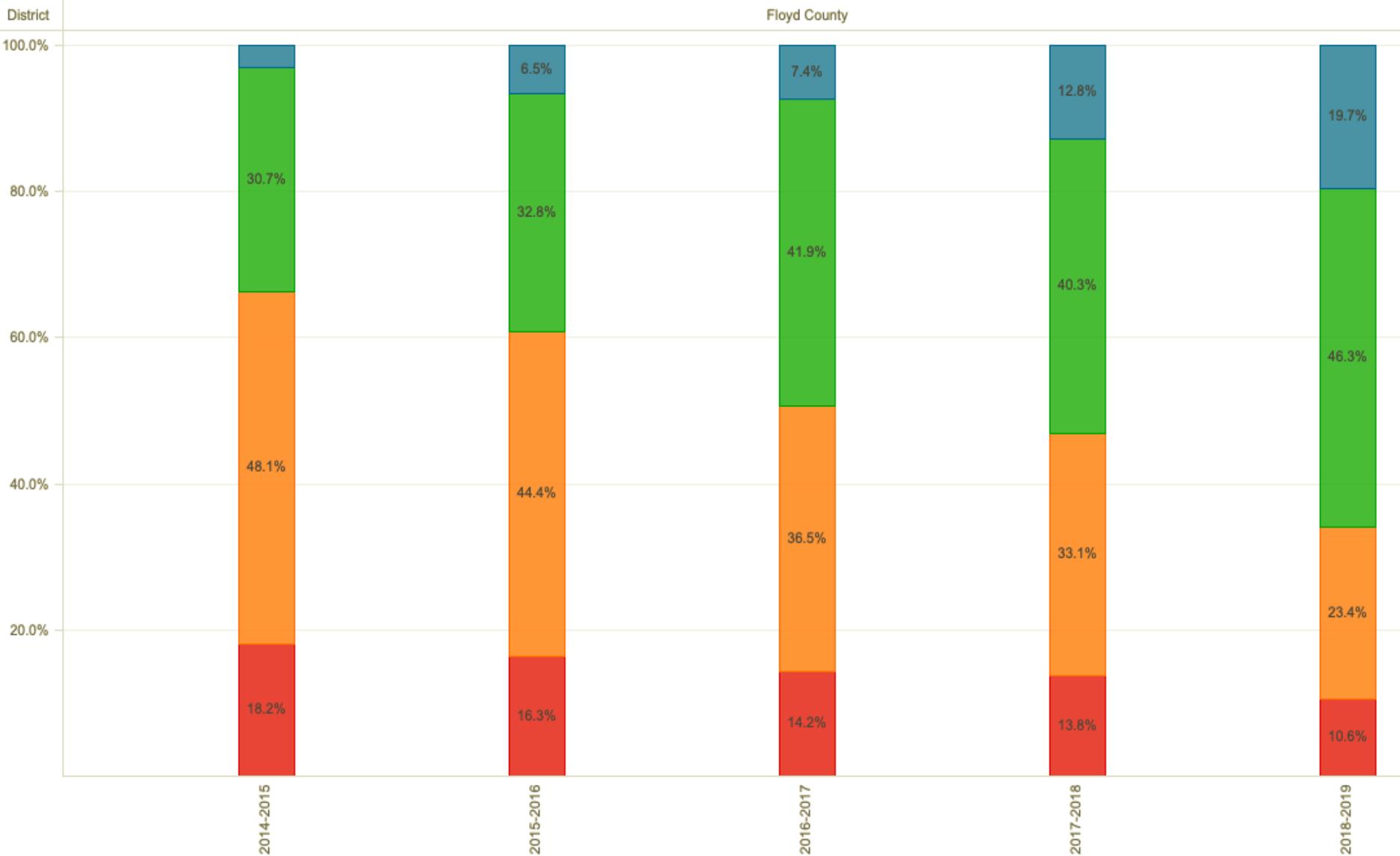
FCS 4th Grade EOG Math 2019



Floyd Math Trends

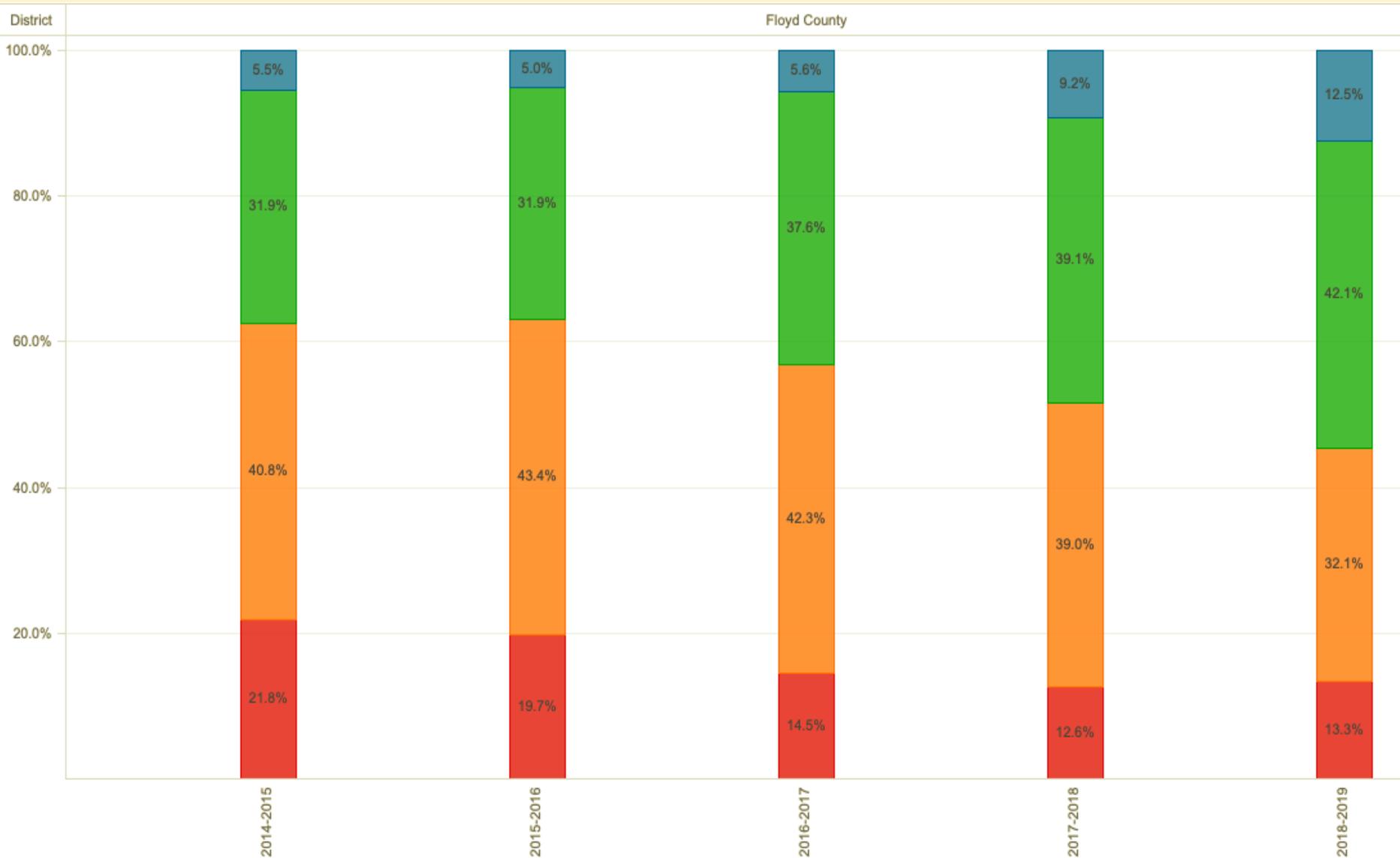


FCS District-Wide Math Data 3rd Grade



- District 3rd grade Math Changes for 2019 as compared to 2018:
- Level 1: Decrease by 3.2%
- Level 3&4: Increase by 12.9%
- Level 4: Increase by 6.9%

FCS District-Wide Math Data 4th Grade



- District 4th grade Math Changes 2019 as compared to 2018:
- Level 1: Decrease by 0.7%
- Level 3&4: Increase by 6.3%
- Level 4: Increase by 3.3%

We are a “work in progress”:

- Focused, consistent Tier I instruction
- Numeracy Project
- GOSA Community Partnership Grant [Focus grades 3-5] with Northwest GA RESA
- Strategic work in K-5 and 6-8 with Diagnostic Team

Numeracy Project Professional Learning

- Numeracy Project Professional Learning
 - Georgia Learns Course (coming soon, in development)
 - Georgia MathTalks Podcast
 - Professional Learning Materials and Presentations available for mathematics leaders via www.gadoe.org/mathematics and www.georgiastandards.org
 - GCSM, RESA Mathematics Mentors, Georgia Mathematics Advisory Council, District Mathematics Supervisors Summit

- Number Talks Professional Learning
 - RESA Mathematics Mentors
 - Professional Learning Materials and Presentations available for mathematics leaders
 - Webinar and Virtual PL available in SLDS Teacher Resource Link
 - Online training materials

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Important Websites to Obtain Additional Information

www.gadoe.org/mathematics Georgia Mathematics Program Updates

www.edweb.net Professional Learning Communities

www.georgiastandards.org Curriculum Resources

Session Evaluation

- Please visit...

www.tinyurl.com/MathPLSurvey

and complete the survey for this session...

Name of Session: Georgia Numeracy Project

Presenter: GADOE Math Team

THANK YOU!!

