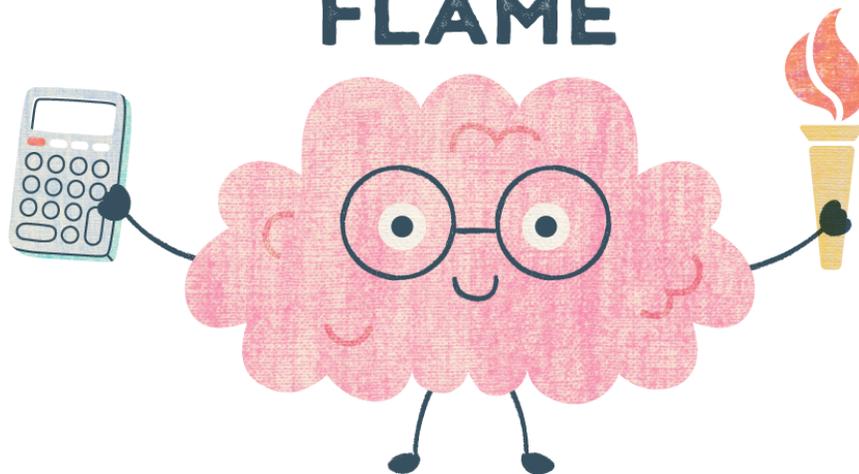# FLAME

Foundational Lessons to Accelerate Math Education (for all students)

FLAME

Unit 3 Teacher's Guide

Grade 4

Foundational Lessons for Accelerating Math Education (FLAME)

Purpose

Foundational Lessons for Accelerating Math Education (FLAME) provides teachers with tools to build, track, and support the development of grade-level math fluency for students in grades K-5. Materials are organized into three units per grade level. Each unit provides teachers with various activities designed to support the development of the expected fluency skills at each grade level. Units also include guidance to help teachers identify students whose skills are fluent, progressing, or emerging. Each unit provides parent reports explaining how families can support their child's learning.

Activities are organized so that students have opportunities to build skill and fluency, supported by the teacher in preparation for more complex mathematics. FLAME activities are designed to be brief, no longer than 10-15 minutes, and include opportunities for students to practice fluency skills independently. Each activity includes formative assessment items to track students' progress toward fluency.

FLAME is not a substitute for strong classroom instruction provided through high-quality instructional materials or meant to replace the fluency-building activities within those materials. These activities complement high-quality instructional materials by building students' accuracy, efficiency, and flexibility with grade-appropriate fluency skills. FLAME activities offer additional support to students as they move through grade-level content.
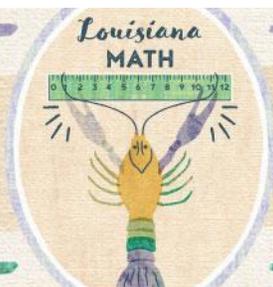
Teachers should anticipate that some of their students will need additional practice with the skills beyond what is provided through the activities. By using the data collected through daily formative assessments and growing understanding of fluency development, teachers have the power to ensure that their students will build grade-appropriate fluency skills.

If you have additional questions or feedback on these lessons, please do not hesitate to contact the Louisiana Math team at STEM@la.gov.

Louisiana's Math Pillars

High-Quality, Grade-Level Math Instruction

Timely, Proactive Interventions

Ongoing Professional Learning

Families

Mathematical Fluency

Students who are fluent in grade-level mathematics are able to compute with accuracy, efficiency, and flexibility using appropriate strategies chosen from a bank of approaches when engaging with various operations. Fluency develops along a concrete to representational to abstract progression. Early learners use manipulatives to build understanding, progress to visual representations, and eventually move into abstractions as they develop automaticity. Students move through the concrete-representational-abstract (CRA) progression continuously while developing skills with more complex numbers. Movement through the progression is not always linear. Concrete and representational strategies become part of the tools students reference and use when they are challenged. Students build comfort in choosing a strategy as they build confidence with multiple approaches.

K.OA.A.1 Represent addition and subtraction with objects, fingers, mental images, drawings*, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
*Drawings need not show details, but should show the mathematics of the problem. (This applies wherever drawings are mentioned in the Standards.)

Concrete	Representational	Abstract
Students use manipulatives and counting to add. 3 + 2 = 5	Students use fingers to add or draw the following picture. 3 + 2 = 5	Solve the problem 3 + 2 3 + 2 = 5

4.NBT.A.2 Read and write multi-digit whole numbers less than or equal to 1,000,000 using base-ten numerals, number names, and expanded forms. Compare two multi-digit numbers based on the meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

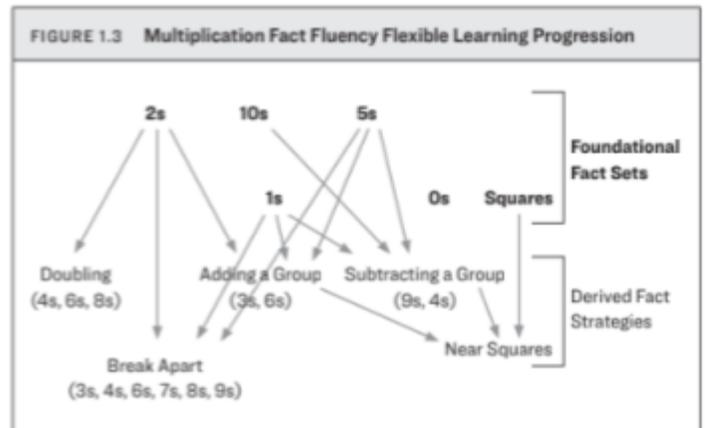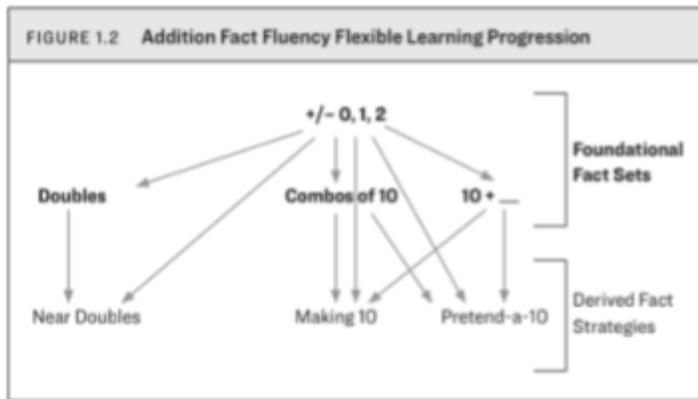| Concrete	Representational	Abstract
Which number is larger? 4,942 or 4,492 4,942 > 4,492	Which number is larger? 4,942 or 4,492 4000 + 900 + 40 + 2 > 4000 + 400 + 90 + 2 4,942 > 4,492	Which number is larger? 4,942 or 4,492 4,942 > 4,492

While speed is definitely a component of fluency, it is not necessarily speed in producing an answer; rather, fluency can be observed by watching the speed with which a student engages with a particular problem. The standards specify grade-level appropriate strategies or types of strategies with which students should demonstrate fluency (e.g., 1.OA.C.6 allows for students to use counting on, making ten, creating equivalent but easier or known sums, etc.). It should also be noted that teachers should expect some procedures to take longer than others (e.g., fluency with the standard algorithm for division, 6.NS.B.2, as compared to fluently adding and subtracting within 10, 1.OA.C.6).

Standards identified as targeting procedural skill and fluency do not all have an expectation of automaticity and/or rote recall. Only two standards, 2.OA.B.2 and 3.OA.C.7, have explicit expectations of students knowing facts from memory. Other standards targeting procedural skill and fluency do not require students to reach automaticity. For example, in 4.G.A.2, students do not need to reach automaticity in classifying two-dimensional figures.

Foundational Facts and Derived Facts

Number sense builds as students begin counting, derive specific facts and move to mastery and therefore automaticity of facts with any operation. Figures 1.2 and 1.3[1] below show the Foundational Fact Sets and those students derive using strategies.

FIGURE 1.2 Addition Fact Fluency Flexible Learning Progression

FIGURE 1.3 Multiplication Fact Fluency Flexible Learning Progression

[1] Bay-Williams, J., & Kling, G. (2019). *Math Fact Fluency*. Association for Supervision and Curriculum Development.
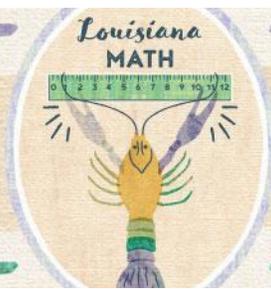
FLAME and Diverse Learners
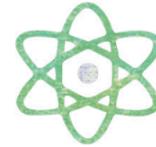
The Special Education Playbook for School and System Leaders (Louisiana Department of Education, 2023) identifies three key instructional best practices as the central drivers of all support provided to students who struggle.


FOCUS ON CORE INSTRUCTION

EXTRA TIME TO LEARN
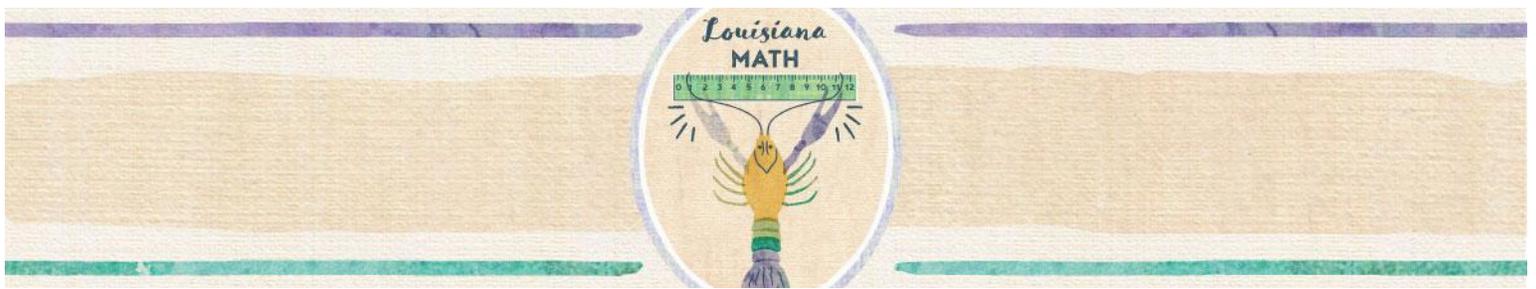
CONTENT STRONG TEACHERS

FLAME resources can be used to support foundational learning for all students including those with diverse learning needs. As educators determine support plans and interventions for students, the following should be considered:
- FLAME does not replace core grade-level instruction.
- Developing fact proficiency does not prevent students from engaging in grade-level instruction.
- No students' engagement with math content should be limited to the resources within FLAME.
- Intervention experiences for all students should occur within a coherent learning experience (TNTP, 2022) including a balance of the three aspects of rigor; conceptual understanding, procedural skill, and fluency and application.
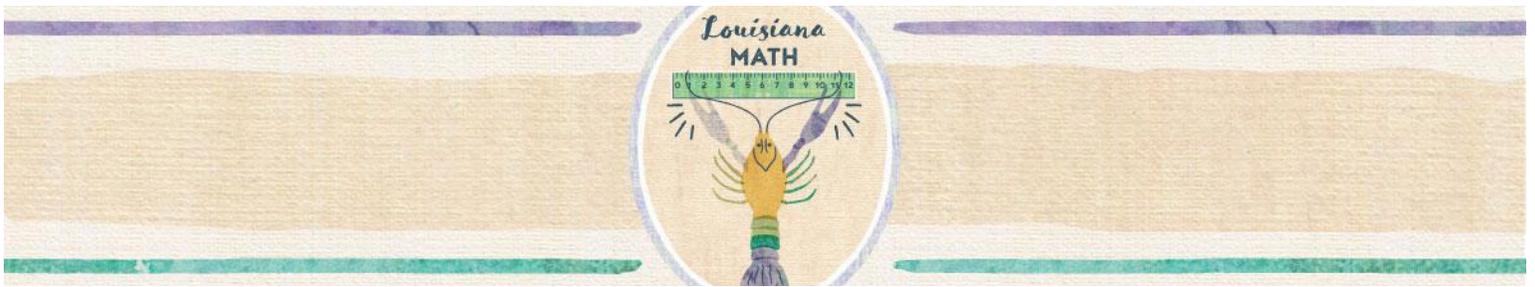
Fluency Across the Grades

Students develop fluency as they build an understanding of the standards. As educators monitor and support students as fluent math learners, it is important to focus on the appropriate expectations at each grade level. The table below lists the topics at each grade where fluency is expected.

Louisiana MATH

K	1	2	3	4	5	6	7	8
Counting								
Count to 100 by tens and ones Count to answer "how many?"	Given a two digit number, mentally find 10 more or 10 less than the number	Count within 100, skip count by 5s, 10s, and 100s Read and write numbers to 1000 Mentally add 10 or 100 to a given number 100-900 Measure to determine how much longer one object is than another						
Add and subtract within 20								
add and subtract within 5 compare numbers between 1 and 10 write numbers 0 to 20	Understand the meaning of the equal sign Determine unknown number in an addition or subtraction equation	Add and subtract within 20 using mental strategies						
		Add, subtract, multiply, and divide						
		Add and subtract within 100 using strategies	Multiply and divide within 100 Add and subtract within 1000	Add and subtract multi-digit whole numbers with sums less than or equal to 1,000,000	Multiply multi-digit whole numbers using the standard algorithm	Add, subtract, multiply, and divide multi-digit decimals using the standard algorithm		
						Fractions and Decimals		
						Interpret and compute quotients of fractions Solve real world problems involving division of fractions by fractions	Solve multi-step problems with rational numbers in any form Add, subtract, multiply, and divide rational numbers	
							Equations	
							Solve equations	Solve linear equations Solve problems involving cones, cylinders, and spheres

Unit 3				
4.NBT.B.4				
Adding 2 Digits without Regrouping Using Standard Algorithm	Adding 3 Digits to 2 Digits without Regrouping Using Standard Algorithm	Adding 2 Digits with Regrouping Using Standard Algorithm	Subtracting 2 Digits without Regrouping Using Standard Algorithm	Subtracting 2 Digits with Regrouping Using Standard Algorithm
Adding 3 Digits without Regrouping Using Standard Algorithm	Adding 4 Digits to 3 Digits without Regrouping Using Standard Algorithm	Adding 3 Digits to 2 Digits with Regrouping Using Standard Algorithm	Subtracting 3 Digits without Regrouping Using Standard Algorithm	Subtracting 3 Digits with Regrouping Using Standard Algorithm
Adding 4 Digits without Regrouping Using Standard Algorithm	Adding 5 Digits to 4 Digits without Regrouping Using Standard Algorithm	Adding 4 Digits to 3 Digits with Regrouping Using Standard Algorithm	Subtracting 4 Digits without Regrouping Using Standard Algorithm	Subtracting 4 Digits with Regrouping Using Standard Algorithm
Adding 5 Digits without Regrouping Using Standard Algorithm	Adding 6 Digits to 5 Digits without Regrouping Using Standard Algorithm	Adding 5 Digits to 4 Digits with Regrouping Using Standard Algorithm	Subtracting 5 Digits without Regrouping Using Standard Algorithm	Subtracting 5 Digits with Regrouping Using Standard Algorithm
Adding 6 Digits without Regrouping Using Standard Algorithm		Adding 6 Digits to 5 Digits with Regrouping Using Standard Algorithm	Subtracting 6 Digits without Regrouping Using Standard Algorithm	Subtracting 6 Digits with Regrouping Using Standard Algorithm
Adding 7 Digits without Regrouping Using Standard Algorithm			Subtracting 7 Digits without Regrouping Using Standard Algorithm	Subtracting 7 Digits with Regrouping Using Standard Algorithm
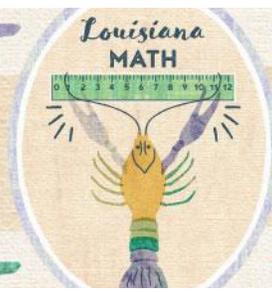
Student Name _____

FLAME Grade 4 Unit 3
Teacher Tracking Tool for Individual Students

Use this tracking tool to track individual students throughout each unit of FLAME.

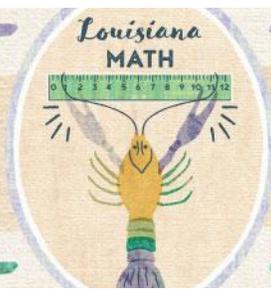| Unit 3									
4.NBT.B.4									
Adding 2 Digits without Regrouping Using Standard Algorithm		Adding 3 Digits to 2 Digits without Regrouping Using Standard Algorithm		Adding 2 Digits with Regrouping Using Standard Algorithm		Subtracting 2 Digits without Regrouping Using Standard Algorithm		Subtracting 2 Digits with Regrouping Using Standard Algorithm	
Adding 3 Digits without Regrouping Using Standard Algorithm		Adding 4 Digits to 3 Digits without Regrouping Using Standard Algorithm		Adding 3 Digits to 2 Digits with Regrouping Using Standard Algorithm		Subtracting 3 Digits without Regrouping Using Standard Algorithm		Subtracting 3 Digits with Regrouping Using Standard Algorithm	
Adding 4 Digits without Regrouping Using Standard Algorithm		Adding 5 Digits to 4 Digits without Regrouping Using Standard Algorithm		Adding 4 Digits to 3 Digits with Regrouping Using Standard Algorithm		Subtracting 4 Digits without Regrouping Using Standard Algorithm		Subtracting 4 Digits with Regrouping Using Standard Algorithm	
Adding 5 Digits without Regrouping Using Standard Algorithm		Adding 6 Digits to 5 Digits without Regrouping Using Standard Algorithm		Adding 5 Digits to 4 Digits with Regrouping Using Standard Algorithm		Subtracting 5 Digits without Regrouping Using Standard Algorithm		Subtracting 5 Digits with Regrouping Using Standard Algorithm	
Adding 6 Digits without Regrouping Using Standard Algorithm				Adding 6 Digits to 5 Digits with Regrouping Using Standard Algorithm		Subtracting 6 Digits without Regrouping Using Standard Algorithm		Subtracting 6 Digits with Regrouping Using Standard Algorithm	
Adding 7 Digits						Subtracting 7		Subtracting 7	

without Regrouping Using Standard Algorithm					Digits without Regrouping Using Standard Algorithm		Digits with Regrouping Using Standard Algorithm	

Performance Summary Key

Code

Beginning	B	Student's performance demonstrates that they are **beginning** to understand the standard.
Progressing	P	Student's performance demonstrates they are **progressing** toward understanding the standard.
Consistent	C	Student's performance demonstrates they are showing **consistent** understanding of the standard.

Standard	Additional Notes/Observations

FLAME Parent Report
Grade 4 Unit 3

To the Parent of _____,

This chart is to update you on _____'s current performance in math. It includes a description of the state math standards addressed in this unit. Please review your child's performance using the **performance summary key** below. Please keep in mind that some standards are listed in multiple quarters because the expectation looks different at different points in the school year. Please reach out to your child's teacher if you have any questions or concerns. There are activities at the end of this report that you can use to continue to support your child at home.

Performance Summary Key

Beginning	Student's performance demonstrates that they are **beginning** to understand the standard.
Progressing	Student's performance demonstrates they are **progressing** toward understanding the standard.
Consistent	Student's performance demonstrates they are showing **consistent** understanding of the standard

Description of Standard	Beginning	Progressing	Consistent
Adding 2 digit numbers without regrouping using standard algorithm	☐	☐	☐
Adding 2 digit numbers with regrouping using standard algorithm	☐	☐	☐
Adding 3-4 digit numbers with regrouping using standard algorithm	☐	☐	☐
Adding 3-4 digit numbers without regrouping using standard algorithm	☐	☐	☐
Adding 5-7 digit numbers with regrouping using standard algorithm	☐	☐	☐
Adding 5-7 digit numbers without regrouping using standard algorithm	☐	☐	☐
Subtracting 2 digit numbers without regrouping using standard algorithm	☐	☐	☐
Subtracting 2 digit numbers with regrouping using standard algorithm	☐	☐	☐
Subtracting 3-4 digit numbers without regrouping using standard algorithm	☐	☐	☐
Subtracting 3-4 digit numbers with regrouping using standard algorithm	☐	☐	☐
Subtracting 5-7 digit numbers without regrouping using standard algorithm	☐	☐	☐

Subtracting 5-7 digit numbers with regrouping using standard algorithm	☐	☐	☐

See the Louisiana Department of Education Family Math Engagement Library for ideas on how to support your child in math at home.