# Math Routines

## Rising Grade 7

Week 1-5

RISE™ by LAVINIA GROUP

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# Implementation Guide

## Guiding Principles

The RISE Math Routines Curriculum is designed to build students' mathematical fluency and conceptual understanding through targeted, discussion-based routines. These routines build fluency not by asking students to memorize a list of math facts or procedures, but rather by developing students' number sense and relational thinking. In this way, students build automaticity with operations and concepts while keeping the "why" behind strategies front and center.

The RISE Math Routines Curriculum is designed as a 15–20 minute block filled with rich discussions and consistent mathematical routines. Teachers should lead at least one routine per day with the entire class, following the suggested scope & sequence below. Teachers can also pull from the Routines Bank to support students either whole class or in small groups with closing particular gaps.

## Rising Grade 7 Scope & Sequence

| | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 |
|---|---|---|---|---|---|
| **Week 1** | Which One Doesn't Belong: 6.RP.1 | Which One Doesn't Belong: 6.RP.2 | Quick Images: 6.RP.1 | Quick Images: 6.RP.1 | Which One Doesn't Belong: 6.EE.4 |
| **Week 2** | Today's Number: 6.NS.7 | Today's Number: 6.NS.7 | Quick Images: 6.NS.6 | Quick Images: 6.NS.6 | Today's Number: 6.RP.2 |
| **Week 3** | Number Strings: 6.NS.1 | Number Strings: 6.NS.1 | Today's Number: 6.EE.1 | Today's Number: 6.EE.1 | Number Strings: 6.EE.1 |
| **Week 4** | Today's Number: 6.EE.3 | Today's Number: 6.EE.3 | Number Strings: 6.EE.4 | Number Strings: 6.EE.4 | Today's Number: 6.NS.7 |
| **Week 5** | Number Strings: 6.NS.1 | Number Strings: 6.NS.1 | Today's Number: 6.EE.3 | Today's Number: 6.EE.3 | Quick Images: 6.NS.6 |

 

## Priority Standards

RISE Summer Program prioritizes **10** key standards per grade to focus on during summer school. These standards have been selected from the major Common Core clusters designated by Achieve the Core. These standards are addressed through a combination of math routines and Story Problems. The Rising Grade 7 prioritized standards are:

- **6.RP.A.1:** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."
- **6.RP.A.2:** Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."
- **6.RP.A.3***: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
- **6.NS.A.1:** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.
- **6.NS.C.6:** Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
- **6.NS.C.7:** Understand ordering and absolute value of rational numbers.
- **6.EE.A.1:** Write and evaluate numerical expressions involving whole-number exponents.
- **6.EE.A.3:** Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression 3 (2 + x) to produce the

 

equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.

- **6.EE.A.4:** Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.
- **6.EE.B.6*:** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

**Designates standards that are covered solely through Story Problems.*

## Program Materials

- Chart paper
- Chart markers
- SmartBoard or projector
- Class set of whiteboards & markers OR notebooks & pencils

 

# Number Strings

## Purpose

Students develop efficient strategies for solving a variety of problems. Students should solve the equations in the strings mentally by using what they know about place value, landmark numbers, and breaking apart numbers to make equations simpler to solve.e.

## Intellectual Preparation

**Lesson Goal:** Based on your student understanding and work, choose the structure and strategy that you want to develop, and solve the string.

**Structure of a Number String:** Strings are crafted with…

- **Helper Problems** — equations that students should know right away and will help them use a specific strategy to solve an equation. For example: *23 + 10 = 33 would be a helper problem for 23 + 9 = 32 because it would encourage students to* ***compensate*** *and add 10 and then take away 1.*
- **Strategy Compare Problems** — equations that show when some strategies are more efficient than others. For example: *comparing strategies for 1,003 - 177 and 1,003 - 999 would encourage students to* ***remove*** *when numbers are far apart & add on when numbers are close together.*
- **Equivalence Problems** — equations that highlight equivalency. For example: *6 x 8 and 3 x 16 would encourage students to realize when they* ***double one factor and halve the other****, their product remains the same.*

**Strategies to Develop**

- Rising 1-3: Using 10 as a landmark number, using doubles or near-doubles, adding on vs. removal, keeping one number whole, compensating
- Rising 4-6: Partial products, using multiplication to solve division, using 5 or 10 as benchmarks numbers, compensating, doubling/halving
- Rising 7-9: Operations with integers, fractions, decimals, exponents

 

## Routine Structure (15 mins)

**Launch:** Show one equation at a time under the document camera, on chart paper, or through a file on the Smartboard. Give students enough time to solve each equation mentally.

- If it's a helper problem, let them know this should be a quick one. If it's a related problem, encourage them to use the previous equations to help them solve!

**Questioning:** As you show each equation, ask students the following questions:

- What does this equal? How do you know?
- Do you agree or disagree? Does anyone have a different answer?
- Did anyone solve the problem in a different way?
- Repeat with the next equation in the string and encourage students to see if any of the previous equations can help them determine the new amount they see.

**Representation:** As students share their thinking, represent how they solved so students can see the model and strategy the student used to solve the equation.

**Check for Understanding:** Assess student understanding by showing one last equation that encourages the use of the targeted strategy. Have students identify the answer and the strategy they used to solve.

 

# DAILY LESSON PLANS

 

# WEEK 3

## Week 3, Day 1 — Number Strings

### Standard

**6.NS.A.1:** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.

### Task

Use understanding of fractions to divide fractions by whole numbers.

### Transferable Takeaway

What big idea will students learn that they can apply to future problems?

 

## Materials

- **Teacher:** chart paper & chart markers OR projector
- **Students:** whiteboard & marker OR notebook & pencil

## Lesson Guide

- Number String:
  - » $\frac{1}{3} \div 2$
  - » $\frac{2}{3} \div 2$
  - » $\frac{2}{3} \div 4$
  - » $\frac{3}{5} \div 3$
  - » $\frac{3}{5} \div 6$
  - » $\frac{3}{5} \div 2$
- Possible discussion questions (after each expression):
  - » What does this equal? How do you know?
  - » Is there a different way we could express the answer (e.g., $\frac{2}{12}$ or $\frac{1}{6}$)?
  - » Did anyone solve it in a different way?
  - » How is this equation similar to or different from the previous equation?
  - » How do the previous equations help you solve this one?
  - » What pattern do you notice? Do you think that will always be true?
- Highlight a variety of models and strategies for dividing fractions by whole numbers.

 

## Anticipated Strategies & Responses

How might students solve or answer the discussion questions? What strategies/ responses will you highlight to help students reach the transferable takeaway?

 