RISING GRADE 2

Math Teacher Guides

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RedThread™
A Lavinia Mathematics Program

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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 2 prioritized standards are:

- **1.OA.A.1*:** Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
- **1.OA.B.3:** Apply properties of operations as strategies to add and subtract. Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known (commutative property of addition). To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12 (associative property of addition).
- **1.OA.C.6:** Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).
- **1.OA.D.7:** Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.
- **1.OA.D.8:** Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = ___ – 3, 6 + 6 = ___.
- **1.NBT.A.1:** Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
- **1.NBT.B.2:** Understand that the two digits of a two-digit number represent amounts of tens and ones.

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- **1.NBT.C.4:** Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
- **1.NBT.C.5:** Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
- **1.NBT.C.6:** Subtract multiples of 10 in the range 10–90 from multiples of 10 in the range 10–90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

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

Program Materials

- Chart paper
- Chart markers
- Document camera (optional)
- Projector
- Class set of Unifix cubes
- Class set of whiteboards and markers OR notebooks and pencils

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Routines Overview

Count Around the Room

Purpose

To develop students' fluency with counting and understanding of place value patterns. This routine also supports students in knowing how to read and write numbers.

Intellectual Preparation

Transferable Takeaway: Based on your students' understanding and work, choose the transferable takeaway that you want to develop through the "Count Around the Room" routine. For example:

- Rising Grades 1–3: I can start at any number to count on by 10s and notice that the digit in the tens place increases by one each time.
- Rising Grades 4–6: I can use what I know about skip-counting to count by fourths and notice patterns in equivalence.
- Rising Grades 7–9: I can use what I know about rational numbers and count by fractional amounts or count on from negative numbers.

Preparation: Strategically choose the number you want to start with and the pattern you want to count by. For example:

- Count forward or backward by 1s, 2s, 5s, 10s, 100s, 1,000s, starting at the number you are skip-counting by OR any number
- Count by fractions (e.g., $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{5}$, $\frac{1}{6}$—highlight whole numbers)
- Count by decimals (e.g., 0.1, 0.2, 0.5, or 0.10)
- Count by coins (e.g., the values of nickels, dimes, or quarters)
- Count by minutes (e.g., 5 min., 15 min., 30 min., or 60 min.)

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Routine Structure (15 min.)

Launch: Choose a number to start with and the pattern you want students to count by. Tell students that they will be counting by that number and point to the student who will start. Ask students to predict which number they will say before the counting begins.

Questioning: As students predict what numbers they will say, ask the following questions:

- What number do you think you will say?
- What number do you think ____ will say?
- What number do you think we'll end on if we go around the circle twice?
- What patterns do you notice emerging?

Representation: Write down the numbers students say, both correct and incorrect, so they can see the number patterns emerging as they count around the circle. Throughout the counting, stop along the way to check to see if students agree or disagree and to see if they are noticing any patterns emerging. As students share what they notice, represent their thinking by writing the number patterns.

Check for Understanding: Assess students' ability to skip-count by having them complete an exit ticket where they identify the pattern in which given numbers are skip-counted and then write down the next few numbers in the pattern.

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Quick Images

Purpose

To encourage students to see amounts in a variety of ways. Through the "Quick Images" routine, students deepen their number sense as they compose and decompose to determine an amount of objects, rather than having to count each individual object.

Intellectual Preparation

Transferable Takeaway: Based on your students' understanding and work, choose a transferable takeaway that you want to develop through the "Quick Images" routine. For example:

- Rising Grades 1–3: I can use what I know about doubles to help determine the amount.
- Rising Grades 4–6: I can identify the amount in an array by knowing the number of rows and columns and using what I know about addition and multiplication.
- Rising Grades 7–9: I can use what I know about coordinate planes and negative numbers to identify the coordinates of a point.

Preparation: Choose a string of about 3 to 5 quick images that will allow students to reach the transferable takeaway through their discussion of how they see a given amount.

- Rising Grades 1–3: dot images, 10-frames, pictures, rekenrek
- Rising Grades 4–6: base-10 blocks, arrays, fractions
- Rising Grades 7–9: number lines, coordinate planes, ratios, data sets

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Routine Structure (15 min.)

Launch: Briefly, for 3 to 5 seconds, show an image under a document camera or by using a projector. Students should have enough time to see but not count the amount.

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

- How many did you see? How did you see the amount?
- Did anyone see a different amount?
- How do you know the amount is correct?
- Did anyone see the amount in a different way?
- Repeat with the next image in the string and encourage students to see if any of the previous images can help them determine the new amount they see.

Representation: As students share their thinking, represent by circling or marking up how they saw the amount on the image so students can see the different ways a number can be composed and decomposed.

Check for Understanding: Assess students' understanding by showing one last image and having students identify on their whiteboards or on sheets of paper how many they see and how they saw the amount.

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Number Strings

Purpose

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

Intellectual Preparation

Transferable Takeaway: Based on your students' understanding and work, choose the structure and strategy that you want to develop through the "Number Strings" routine.

Structure of a Number String: Strings are crafted with:

- **Helper Problems**—number sentences that students should know right away and will help them use a specific strategy to solve it. 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**—number sentences 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 take away when numbers are far apart and add on when numbers are close together.*
- **Equivalence Problems**—number sentences that highlight equivalency. For example: *6 × 8 and 3 × 16 would encourage students to realize when they double one factor and halve the other, their product remains the same.*

Strategies to Develop:

- Rising Grades 1–3: using 10 as a landmark number, using doubles or near-doubles, adding on versus taking away, keeping one number whole, compensating
- Rising Grades 4–6: partial products, using multiplication to solve division, using 5 or 10 as benchmark numbers, compensating, doubling/halving
- Rising Grades 7–9: operations with integers, fractions, decimals, exponents

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Routine Structure (15 min.)

Launch: Show one number sentence at a time under a document camera, on chart paper, or by using a projector. Give students enough time to solve each number sentence mentally.

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

Questioning: As you show each number sentence, 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?
- Did any of the previous number sentences help you solve this one?

Representation: As students share their thinking, represent how they solved so that others can see the model and strategy used to solve the number sentence.

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

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