



Investigations

in Number, Data, and Space®

Unit Guide for Grade 2, Unit 1:
Counting, Coins, and Combinations
Addition, Subtraction, and the Number System 1



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Unit Summary:

Students count and compare quantities, compose and decompose numbers, and deepen understandings about the operations of addition and subtraction. They develop strategies for comparing, combining, and doubling quantities, as well as taking one quantity away. Students achieve fluency with three sets of addition combinations (10s, + 1, + 2). During this first unit of the year, students are introduced to several year-long classroom routines that offer regular practice with composing and decomposing numbers; developing visual images of quantities; counting, collecting, and analyzing data; and telling time.

Materials:

Counting, Coins, and Combinations (1 copy per person)

Class number line and 2 clothespins or clips (See Materials to Prepare, p. 25)

Do the following activities from *Counting, Coins, and Combinations*:

1. Identify the mathematics in the unit

To get an overview of the mathematics students will be doing in this unit, refer to these sections in the unit front matter. As you look at these sections, begin thinking about the main mathematical ideas students work on in this unit.

- Turn to pp. 8-9, *Overview of This Unit*. Look at the title of each Investigation and read the summary for each Investigation.
- Review the *Mathematics in This Unit* essay, pp. 10-13. Look at the Mathematical Emphases and Math Focus Points. (The emphases are numbered, and can be found above bulleted lists of Math Focus Points.)
- Read the “Benchmarks in This Unit” in the table on p. 15, *Assessing the Benchmarks*.

Discuss

- What mathematical ideas and skills are students working on in this unit?
- What mathematics are students expected to know at the beginning of the unit? At the end?

2. Guess My Number on the Number Line (Session 1.3)

In Investigation 1, students are introduced to math tools they will be using, and two of the Classroom Routines they will be revisiting, throughout the year. This session focuses on the number line, which students use to play *Guess My Number*.

- Read the Activity, *Guess My Number on the Number Line*, pp. 42-44, including the Teaching Notes, “Using the Number Line” and “Mathematical Symbols” p. 42, and “Guessing the Number,” p. 43.
- Play several rounds of *Guess My Number* with a partner/small group.

Discuss

- What strategies and questions did you use as you played?
- What strategies and questions would you expect of your students?
- How do you anticipate student strategies will change as they become more familiar with the game? How might you adapt this game as the year progresses?

- Read the Teacher Note, *The Number Line and the 100 Chart: Two Models of Our Number System*, pp. 184-185.

Discuss

- How is a number line similar to, and different from, a 100 chart?
- How comfortable are your students with the number line and 100 chart? Do they prefer one to the other? Choose the tool based on the situation or problem? What issues typically arise with each?

3. Enough for the Class? (Session 2.1)

In addition to introducing another Classroom Routine, Investigation 2 focuses on counting and coins. In this session, students solve and discuss the first of several *Enough for the Class?* problems, which involve finding the difference between two quantities.

- Read the Activity, *Enough for the Class*, pp. 65-66. (See Materials to Prepare, p. 59 for a description of Counting Bag A.)
- Read the Dialogue Box, *Are There Enough for the Class?*, pp. 210-211.

Discuss

- Discuss the range of strategies discussed in the Dialogue Box. What tools or representations did students use to solve the problem?
- How did the teacher in the Dialogue Box structure the discussion? What mathematical ideas did (s) he choose to highlight? What tools and representations/?

4. Addition Combinations (Session 3.5)

In Investigation 3, the final *Classroom Routine* is introduced, and students focus in particular on combinations that make 10. In this session, students are introduced to how they will work on the addition combinations this year.

- Read the Discussion, *Addition Combinations*, p. 130; and the activities *Introducing the Addition Cards*, p. 131 and *Which Combinations Do I Know?*, pp. 131-132. Read the Teaching Note “Addition Combinations” p. 132, and the Algebra Note “Remembering the Combinations”, p. 132.

Discuss

- How does this process for learning and practicing “the facts” compare to your experience when you were a student?

- Read the Teacher Note, *Strategies for Learning the Addition Combinations*, pp. 191-192.

Discuss

- What is the benefit to learning the addition combinations in groups?
- As you work with families, what key ideas about the addition combinations would you hope to convey?

5. An Addition Story Problem (Session 4.1)

Investigation 4 focuses on solving addition and subtraction story problems and doubling. In this session, students solve a problem about combining two groups, record their work, and share their strategies.

- Read the first part of the Activity, *An Addition Story Problem*, p. 139 (up to the red line).

Discuss

- How does asking students to imagine what is happening in the problem, retell the story the story in their own words, and think about whether the answer will be more or less than the starting amount, support students in solving story problems? In understanding addition and subtraction?
- How would you expect your students to solve this problem? To show their work?

- Read the rest of the Activity, *Ongoing Assessment: Observing Students at Work and Differentiation: Supporting the Range of Learners*, pp. 139-140.

- Read the Dialogue Box, *An Addition Story Problem*, pp. 218-219.

Discuss

- What strategies are students using to solve the story problem? To show their work?
- How does the teacher in the Dialogue Box help students differentiate between the tools (e.g., the number line, cubes, the 100 chart) and the strategy (e.g., counted all, counting on) used to solve a problem? Why is this differentiation important?
- How does (s) he encourage students to make complete explanations?

6. Wrap Up

- Look back at the unit overview, pp. 8-9.

Discuss

- How do the activities done during this unit study fit into the mathematics of the rest of the unit?

Other Key Features of *Counting, Coins, and Combinations*

- Algebra Connections in This Unit, pp. 16-19
- Classroom Routines in This Unit, p. 20
 - What Time Is It?*
 - Today's Number*
 - Quick Images*
- Assessment
 - Counting Pennies (Introduced in Session 2.2)
 - Resource Master M12, Assessment Checklist
 - Enough for the Class? (Session 2.8)
 - Teacher Note, pp. 193-194
 - How Many Cans? (Session 4.8)
 - Teacher Note, pp. 199-201
 - End-of-Unit Assessment (Session 4.9)
 - Teacher Note, pp. 202-208