

2:5 Sums of Single-Digit Numbers

Teacher Notes



Central math concepts

Task 2:5 draws on memory and fluency. The table illustrates how the 66 brief problems in task 2:5 map to the addition table.

+	0	1	2	3	4	5	6	7	8	9
0										
1										✓
2			✓	✓	✓	✓	✓	✓	✓	✓
3			✓	✓	✓	✓	✓	✓	✓	✓
4			✓	✓	✓	✓	✓	✓	✓	✓
5			✓	✓	✓	✓	✓	✓	✓	✓
6			✓	✓	✓	✓	✓	✓	✓	✓
7			✓	✓	✓	✓	✓	✓	✓	✓
8			✓	✓	✓	✓	✓	✓	✓	✓
9		✓	✓	✓	✓	✓	✓	✓	✓	✓

Single-digit sums are the building blocks of multi-digit sums. For example, the addition problem shown involves the single-digit sums $1 + 2$, $6 + 7$, and $8 + 4$. Single-digit sums also allow subtracting with the related differences,

$$\begin{array}{r} 861 \\ + 472 \\ \hline \end{array}$$

because of the relationship between addition and subtraction ($C - A$ is the unknown addend in $A + \square = C$). For example, to subtract $13 - 8 = ?$, it is enough if seeing the numbers 13 and 8 prompts recall of the fact that $8 + 5 = 13$; then the difference $13 - 8$ must equal 5. Finally, knowing single-digit sums is also valuable for mental calculation with multi-digit numbers, as in the following examples:

$$37 + 4 = 30 + (7 + 4) = 30 + 11 = 41$$

$$4 \times 8 = 2 \times (2 \times 8) = 2 \times 16 = 16 + 16 = (10 + 10) + (6 + 6) = 20 + 12 = 32.$$

Remembering single-digit sums and being fluent with related differences is an important goal ([CCSS 2.OA.B.2](#)). This goal needs to be reached by an intellectually valid, emotionally supportive learning path. The stages of that path are articulated in the *Progression* document[†], [pp. 14–27](#).[‡]



Relevant prior knowledge

The following mathematics knowledge may be activated, extended, and deepened while students work on the task: Level 2 and 3 strategies as described in the *Progression* document under the heading “Using Level 2 and Level 3 strategies to extend addition and subtraction problem solving beyond 10, to problems within 20” (see [pp. 14–17](#)).

2:5 Write the value of each sum. Use as much time as you need. If you “just knew it,” then draw a check mark, like this: $2 + 2$ 4✓



Click here for student handout 2:5

Answer

[Click here](#) for an answer key. Individual students’ check marks may vary.

[Click here](#) for a student-facing version of the task.

Refer to the Standards

2.OA.B.2; MP.1, MP.6. Standards codes refer to [www.corestandards.org](#).

One purpose of the codes is that they may allow a task to shed light on the Standards cited for that task. Conversely, reading the cited Standards may suggest opportunities to extend a task or draw out its implications. Finally, Standards codes may also assist with locating relevant sections in curriculum materials, including materials aligned to comparable standards.

Aspect(s) of rigor:

Procedural skill and fluency

Additional notes on the design of the task

- The task is designed to be worked on after all the sums in the addition table have been understood and practiced.
- The instructions say, “Use as much time as you need.” Reasons for this include: (1) Differentiating between students on the basis of their speed isn’t the purpose of the task. (2) More generally, speed isn’t an important disciplinary value in mathematics. (3) Emphasizing speed in the mathematical community of the classroom can have negative effects on students’ mathematics identity.

Extending the task

How might students drive the conversation further?

- Students could notice that a certain addend is absent from the student handout, or be asked which addend is absent. What might be the reason why no sums with this addend were included?
- Students could circle several addends they feel they could use more practice with.



Related Math Milestones tasks

2:8

2:8 Write the number that makes each equation true. Use as much time as you need.



2:3

2:3 Write the sums and differences.

36	72	64	82
+ 45	- 17	+ 27	- 55

Task **2:8 Fluency within the Addition Table** includes problems about fact families, such as $12 - 5 = \square$, $\square + 9 = 14$, $\square - 6 = 7$, and $10 - \square = 5$, in which an unknown number is sought that makes an equation true. Single-digit sums and related differences are involved in many calculations in grade 2 tasks, including **2:3 Fluency within 100 (Add/Subtract)** as well as the word problems (see the [Map of Addition and Subtraction Situations in K-2 Math Milestones](#)).

3:10

3:10 Alice forgot what 7×8 equals. Alice knows that $5 \times 8 = 40$ and $2 \times 8 = 16$.
 (1) Write a sentence to tell Alice how she can find the value of 7×8 by using the two facts she knows.
 (2) Draw a diagram that could help Alice understand why your method works.
 (3) Choose two numbers other than 7 and 8, and try using your method to multiply them. Will your method work for any pair of factors? Say why you think so.

3:14

3:14 Write the sums and differences.

351	264	625	831	800	300
+ 472	+ 438	- 261	- 644	240	+ 540
				265	- 165
				412	- 13

3:12

3:12 Write the value of each product. Use as much time as you need. If you "just know it," then draw a check mark, like this:
 $2 \times 2 = 4 \checkmark$

In later grades, fluency with sums and differences plays a role in multiplication strategies; see task **3:10 Alice's Multiplication Fact**. Fluency within the addition table is also a component in multi-digit addition and subtraction; see task **3:14 Fluency within 1000 (Add/Subtract)**. Task **3:12 Products of Single-Digit Numbers** is the analog of task 2:8 for multiplication and division.

1:9

1:9 Write the missing numbers.

$4 + 5 = \underline{\quad}$	$7 - 4 = \underline{\quad}$
$10 - 8 = \underline{\quad}$	$2 + 6 = \underline{\quad}$
$4 + \underline{\quad} = 10$	$7 + \underline{\quad} = 10$

1:10

1:10 Write the sum.

37
+ 46

1:11

1:11 Write the missing numbers. Tell how you got the answers.

$8 + 5 = \underline{\quad}$	$8 - \underline{\quad} = 2$
$13 - 4 = \underline{\quad}$	$\underline{\quad} - 5 = 4$
$7 + 4 = 10 + \underline{\quad}$	$6 + \underline{\quad} = 12$

In earlier grades, tasks **1:9 Fluency within Ten**, **1:10 Two-Digit Addition**, and **1:11 Using Properties and Relationships** focus on addition and subtraction within 20.

Additional notes on the design of the task (continued)

- The instructions say, "If you 'just knew it,' then draw a check mark." This is intended to provide information about which single-digit sums are known from memory.
- The task includes only two sums that involve 1 as an addend, and it includes no sums that involve 0 as an addend. All such sums are instances of the general patterns $1 + n = n + 1 =$ the next number in the count sequence and $0 + n = n + 0 = n$. (See "Extending the task.")

Curriculum connection

1. In which unit of your curriculum would you expect to find tasks like 2:5? Locate 2-3 similar tasks in that unit. How are the tasks similar to each other, and to 2:5? In what specific ways do they differ from 2:5?
2. Thinking about the curriculum unit you identified, at what point in the unit might a task like 2:5 help students converge toward grade-level thinking about the important mathematics in the task? What factors would you consider in choosing when to use such a task in the unit?*

† Common Core Standards Writing Team. (2011, May 29). *Progressions for the Common Core State Standards in Mathematics (draft): K, Counting and Cardinality; K-5, Operations and Algebraic Thinking*. Tucson, AZ: Institute for Mathematics and Education, University of Arizona.


‡ For further discussion of such an interwoven process, see "[Fluency Development Within and Across the Grades in IM K-5 Math™, part 1: Addition and Subtraction](#)" (blog post by Caban and Aminata, 2021).

* Math Milestones™ tasks are not designed for summative assessment. Used formatively, the tasks can reveal and promote student thinking.



Anticipating and responding to student thinking about the task

Imagine how students might think about the task, and what you might see and hear while they work.

On this page, you can write your thoughts on the following questions. 

Solution Paths

- What solution paths might you expect to see?
- What representations might you see? What correspondences between those representations might be noticed by students (or be worth pointing out to students) and discussed by them?
- What misconceptions or partial understandings might be revealed as students work on the task? How could you respond to these positively and productively?

Language

- What might you expect to hear from students engaged with the task? What does that language reveal about their mathematical thinking, and how might you respond to different ways of thinking?
- If students are using early English or using multiple languages in an integrated communication system, how might you help their classmates see those mathematical ideas as valuable?
- Even when using nascent language, students are thinking and communicating their thinking. What might it look like to respond positively and productively to the mathematics in their thinking before giving feedback on the language used?

Identity, Agency, and Belonging

- How can you engage students' interests, experiences, or funds of knowledge?
- How can you build students' self-confidence as learners, thinkers, and doers of mathematics?
- What choices are there for a student to make in the task? How can you build students' agency to the point where they notice and make these choices to solve problems?
- How might one use feedback to build student agency? Where might there be opportunities to build students' self-confidence?