

Moving Students Forward: Formative Assessment in K-2



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Add & Subtract: Algebra

Word Problems: Totals to 10

Card
14a

Common Core Standard

K.OA.A.2 Solve addition ... word problems, and add ... within 10, e.g., by using objects or drawings to represent the problem.

Materials

- Two-Color Counters
- Paper and pencil
- Recording rubric



About the Tasks

- The problems are given in increasing difficulty.

Assessment Coach

- If children only built a model, ask them to draw a picture. If they only drew a picture, ask them to build a model.

TASK A

■ **Say:** Use counters to model and solve the problem. *Austin had 3 toy cars. He got 2 more for his birthday. How many cars does Austin have now?*

■ **Say:** What's the solution to this problem? Now draw a picture to show me how you know.

TASK B

■ **Say:** Use counters or draw a picture to model how to solve the problem. *Sally has 4 markers. Claire gave her 3 more markers. How many markers does Sally have now?*

■ **Say:** What's the solution to this problem? Show me how you know.

GO ON →

Number & Operations

Model Separating as Subtraction –
GK Card 13

Word Problems: Totals to 10 –
GK Card 14

Word Problems: Differences
Within 10 – GK Card 15

Card
14b



Teacher Note

- If children are struggling, use questioning to guide them through Task C. This will ease any frustration and allow you to understand their misconceptions.



Teacher Talk

A problem context helps children develop an understanding of what it means to add: put together and add to. Notice that these tasks contain two different types of addition situations that Kindergartners encounter.

- Tasks A and B represent addition in which objects are added to a group with the result unknown. These problems are action-oriented.
- Task C represents addition in which groups are put together with the total unknown.

TASK C

■ **Say:** I am going to read you a problem. Show me with counters or draw a picture to model how to solve the problem. *There are 6 red and 3 yellow apples in a bowl. How many apples are in the bowl?*

■ **Say:** What is your solution? Tell me how you know.

Model Separating as Subtraction –
GK Card 13

Word Problems: Totals to 10 –
GK Card 14

Word Problems: Differences
Within 10 – GK Card 15

CCSS

K.OA.A. Understand addition as putting together and adding to...

K.OA.A.2 Solve addition ... word problems, and add ... within 10, e.g., by using objects or drawings to represent the problem.

In support of the MATHEMATICAL STANDARDS

	Mathematical Content	Mathematical Practice 1
	Find an accurate solution	Make sense of problems and persevere in solving them
Task A model with counters an add to, total unknown situation	X - ✓ +	X - ✓ +
Task B model or draw a picture to show an add to, total unknown situation	X - ✓ +	X - ✓ +
Task C model or draw a picture to show a put together, total unknown situation	X - ✓ +	X - ✓ +

for more information visit hand2mind.com/hos-assessments

Model Separating as Subtraction –
GK Card 13

Word Problems: Totals to 10 –
GK Card 14

Word Problems: Differences
Within 10 – GK Card 15

Examples of lessons that provide support using hands-on materials –

ON LEVEL

- *Hands-On Standards® Common Core Edition Grade K*, Operations and Algebraic Thinking, Lesson 5: Addition; Sums to 10 (pp. 78–81)



EXTENSION

- *The Super Source®, K–2 Base Ten Blocks*, Feed the Birds (pp. 30–33)



NEXT STEPS

Children who struggle with ...

... finding an accurate solution Mathematical Content	After children model the problem with counters, reread the problem and have them look at their answers. Ask children if what they see makes sense. When they think it does, then have them make a drawing of their answer.
... making sense of problems and persevering in solving them Mathematical Practice 1	Model how to create a drawing of a similar type problem before having children solve independently.

Model Separating as Subtraction –
GK Card 13

Word Problems: Totals to 10 –
GK Card 14

Word Problems: Differences
Within 10 – GK Card 15

Common Core Standard

1.OA.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, ... with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Materials

- Two-Color Counters
- Paper and pencil
- Recording rubric



About the Tasks

- Allow ample space or use a workmat to define each work area.

Assessment Coach

- If children choose to use models, have children also draw a picture.

TASK A

■ **Say:** *I am going to read you a problem. Show me with Two-Color Counters how you might solve the problem. There are 8 children in the pool. 4 more jump in. Now how many children are in the pool?*

■ **Say:** *What is the solution to this problem? Tell me how the counters helped you find the solution.*

TASK B

■ **Say:** *I am going to read you a problem. Show me with Two-Color Counters how you might solve the problem. There are 16 children in the pool. 7 children climb out. How many children are in the pool now?*

■ **Say:** *How do you know that your solution is correct?*

GO ON →



Teacher Note

You can present Task C as a “change unknown” subtraction problem: There are 17 children. Some leave. Now there are 9 children. How many left?



Teacher Talk

- Initially children will model situations with models, objects, or fingers, and count all to solve an addition situation. Over time children will move to counting on, when they no longer count the objects in the first addend, but instead count on from that number. This is easier to do with repeated experiences with sums to 10.
- While children are expected to be able to solve “result unknown” and “change unknown” problems ($A + B = \underline{\quad}$ and $A + \underline{\quad} = C$), “start unknown” $\underline{\quad} + B = C$ problems are conceptually demanding and not assessed until Grade 2.

TASK C

■ **Say:** *I am going to read you a problem. Show me with Two-Color Counters or draw a picture to show how you might solve the problem. 9 of your friends are in the park. Later, some more friends join. There are now 17 of your friends in the park. How many of your friends joined later?*

■ **Say:** *What's the solution to the problem? Show me how you know.*

CCSS

1.OA.A Represent and solve situations involving addition and subtraction.

1.OA.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, ... with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

In support of the MATHEMATICAL STANDARDS

	Mathematical Content	Mathematical Practice 4
	Find an accurate solution	Model with mathematics
Task A create a model to solve an add-to situation; explain the solution	X - ✓ +	X - ✓ +
Task B model a take-from problem; identify the difference	X - ✓ +	X - ✓ +
Task C use models or draw a picture to solve an add-to/change-unknown situation	X - ✓ +	X - ✓ +

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2-Digit Numbers – G1 Card 6

Joining and Separating – G1 Card 7

Putting Together and Taking Apart –
G1 Card 8

Examples of lessons that provide support using hands-on materials—

ON LEVEL

- *Hands-On Standards® Common Core Edition Grade 1*, Operations and Algebraic Thinking, Lesson 1: Addition Sentences (pp. 8–11)

EXTENSION

- *The Super Source®, K–2 Base Ten Blocks*, What Price Lunch? (pp. 78–81)



NEXT STEPS

Children who struggle with ...

<p>... finding an accurate solution</p> <p>Mathematical Content</p>	<p>Children may benefit from practice with other problems of the same type that involve smaller numbers. Use the tasks here as templates for creating new problems for each type of add-to and take-from situations.</p>
<p>... modeling with mathematics</p> <p>Mathematical Practice 4</p>	<p>Encourage children to represent each situation in multiple ways including using objects, drawing a picture, and completing an equation. Ask questions that guide children to connect the different representations. Model this as needed.</p>

2-Digit Numbers – G1 Card 6

Joining and Separating – G1 Card 7

Putting Together and Taking Apart –
G1 Card 8

Common Core Standard

2.NBT.A.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones.

Materials

- Base Ten Blocks
- Paper and pencil
- Place-Value Chart (print at hand2mind.com/hos-assessments)
- Recording rubric



About the Tasks

- Place manipulatives within easy reach of children.

Assessment Coach

- Encourage children to explain their solutions using the manipulatives.

TASK A

■ **Say:** I'm going to read a number for you to show with Base Ten Blocks on your chart: 235.

■ **Say:** Tell me about the blocks you used. Show how you know that they model 235.

TASK B

■ **Say:** I'm going to write a number for you to show with Base Ten Blocks on your chart.

Write the number 350 for children to model.

■ **Say:** Tell me how you are sure that you built 350. Describe the blocks you show by using their place value names: hundreds, tens, and ones. Why did you not use any ones?

GO ON →



Teacher Note

By building a model for the value of each digit, children see that each digit represents a different value, in this case, hundreds, tens, or ones.



Teacher Talk

Children may represent a given number in different ways. It is important for children to realize that 235 can be expressed as 2 hundreds, 3 tens, and 5 ones, as well as as 23 tens and 5 ones or as 2 hundreds and 35 ones.

- Emphasize the language as you read numbers. 235 should be read as “two hundred thirty-five,” though expect children to identify the number as 2 hundreds, 3 tens, 5 ones.

TASK C

■ **Say:** Noah said that he can show the number 203 using only 5 Base Ten Blocks. Use 5 blocks and show how he could do this.

■ **Say:** Tell me how you built 203. Why did you only need 5 blocks to show the number? Is there a way one could build 203 with more than 5 blocks?

CCSS

2.NBT.A Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:

2.NBT.A.1a Understand that 100 can be thought of as a bundle of ten tens — called a “hundred.”

In support of the MATHEMATICAL STANDARDS

	Mathematical Content	Mathematical Practice 3
	Find an accurate solution	Construct and critique arguments
Task A build a three-digit number and explain how it is modeled	X - ✓ +	X - ✓ +
Task B build a three-digit number using place value terms to justify	X - ✓ +	X - ✓ +
Task C build a given three-digit number and justify the model.	X - ✓ +	X - ✓ +

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Represent Numbers to 1,000 – G2 Card 2

Place Value: 3-Digit Numbers –
G2 Card 4

Place Value: Tens and Hundreds –
G2 Card 5

Examples of lessons that provide support using hands-on materials—

ON LEVEL

- *Hands-On Standards® Common Core Edition Grade 2, Number and Operations in Base Ten, Lesson 1: Three-Digit Numbers* (pp. 26–29)



EXTENSION

- *The Super Source®, 3–4 Base Ten Blocks, How Many Ways?* (pp. 38–41)

NEXT STEPS

Children who struggle with ...

<p>... finding an accurate solution</p> <p>Mathematical Content</p>	<p>Children may depend on the structure of the place value chart to help them use the correct place value language. Look for them to move beyond this tool with time.</p>
<p>... constructing and critiquing arguments</p> <p>Mathematical Practice 3</p>	<p>As children talk about their models, they should be comfortable using place value terms first before justifying their thinking.</p>

Represent Numbers to 1,000 – G2 Card 2

Place Value: 3-Digit Numbers –
G2 Card 4

Place Value: Tens and Hundreds –
G2 Card 5