Domain: OPERATIONS AND ALGEBRAIC THINKING	Cluster: Represent and solve problems involving addition and subtraction

2.OA.A.1
Use addition and subtraction within 100 to solve one-and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

(See Glossary, Table 1 of Common Core State Standards for Mathematics for clarification of various types of problems)

Notes to Teacher:

Below are samples of each of the types of addition and subtraction problems outlined for second grade with unknowns in various positions.

Using these, and other similar problems, will provide practice with each type of thinking required for second graders. Keep in mind that the goal of mathematics instruction is to teach children to make sense of mathematics and use it to solve problems. Although each of these problems represents a specific type designated in the standard, there may be multiple ways to approach the solution. Students should be encouraged to make their own sense of the problem and not be penalized if their approach does not line up with the stated type. For example, a student may set up a subtraction problem for one that is designated as an unknown addend. As long as the student uses sound reasoning and can explain his/her approach, he/she should be allowed to proceed in the manner that makes sense to him/her. Allow students ample opportunities to share their reasoning with each other so that they may experience multiple approaches and deepen their own understanding.

Students may need explicit instruction in making mathematical drawings. Point out that these drawings should be quick and simple to draw. They do not need to have details and often will have one drawn object representing multiple actual objects.
For example:

23
cans
to represent 23 cans

OR:

□ □ □ ‖ ...... = 326

Many students may benefit from numerous experiences completing the drawings before attempting to write an equation with an unknown. Once students become familiar with using drawings to solve problems, the drawings may help to clarify their thinking and enhance their ability to use symbols to write an equation.
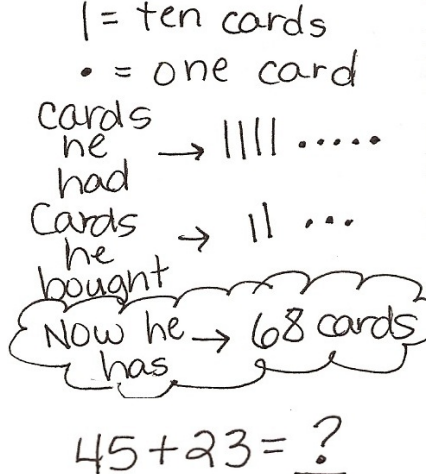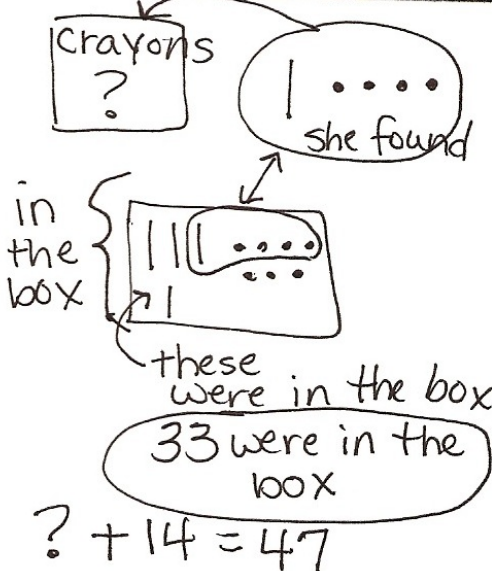
Although the standard states that students will represent the unknown with a symbol, it does not necessarily have to be a letter. It could be a blank, an empty box, a question mark, etc.

GLOSSARY:

Addend + Addend = Sum

Minuend — Subtrahend = Difference

Knowledge of these terms is necessary for the teacher to interpret the different types of problems below. It is **NOT** necessary for students to know the terms addend, minuend and subtrahend.

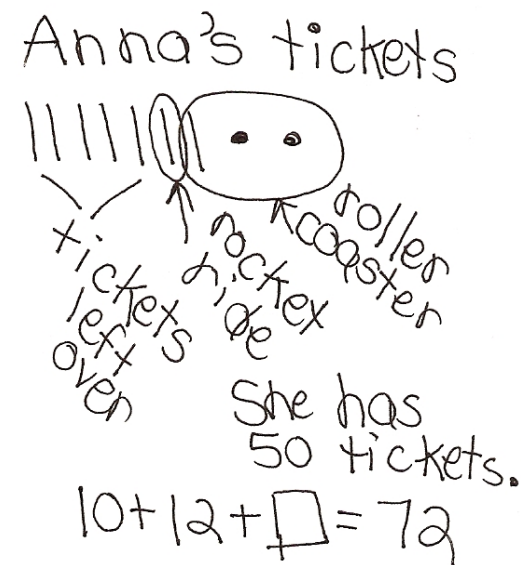| Task	Explanation/Comments	Sample Student Work
Graham had 45 baseball cards in his collection. He bought 23 more at his neighbor's yard sale. How many baseball cards does Graham have now? Draw a picture to help you solve this problem. Write an equation to represent your work.	Example of *Adding to* w/unknown sum	| = ten cards • = one card cards he had → |||| • • • • • Cards he bought → || • • • Now he has → 68 cards 45 + 23 = ?
Aubrey had a box of crayons. She found 14 more crayons when she cleaned out her desk and put them in the box. Now there are 47 crayons in the box. How many were in the box to begin with? Draw a picture to help you solve this problem. Write an equation to represent your work.	Example of *Adding to* w/unknown addend	Crayons ? | • • • • she found in the box | | | • • • • • • • | | these were in the box 33 were in the box ? + 14 = 47

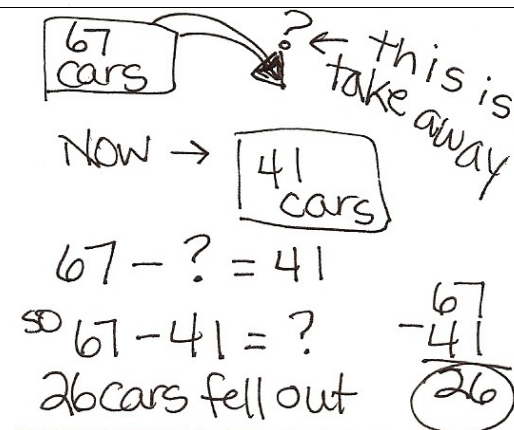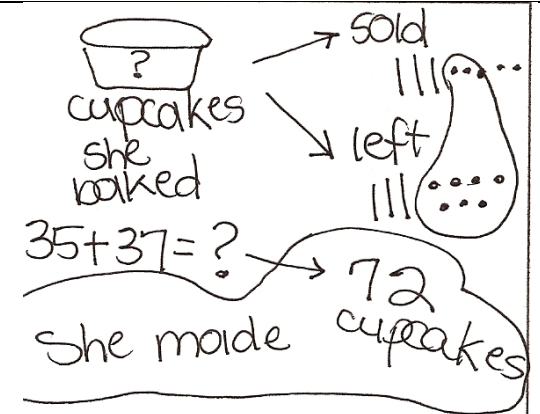|		
Anna had 72 tickets for the carnival rides. She used 10 tickets for the roller coaster and 12 tickets for the rocket ride. How many tickets does Anna have now? Draw a picture to help you solve this problem. Write an equation to represent your work.	Example of *Taking from* w/unknown difference 2-step problem	Anna's tickets $\|\|\|\|$ roller coaster rocket ride tickets left over She has 50 tickets. $10 + 12 + \square = 72$
Isaac had 67 toy cars in a box. Some of them fell out of the box on the way to his grandmother's house. When he opened the box, there were only 41 cars left inside. How many fell out? Draw a picture to help you solve this problem. Write an equation to represent your work.	Example of *Taking from* w/unknown subtrahend	67 cars ? ← this is take away Now → 41 cars $67 - ? = 41$ so $67 - 41 = ?$ 26 cars fell out $\begin{array}{r} 67 \\ -41 \\ \hline 26 \end{array}$

| Molly baked some cupcakes for a bake sale. She sold 35 and had 37 left over. How many cupcakes did Molly bake? Draw a picture to help you solve this problem. Write an equation to represent your work.	Example of *Taking from* w/unknown minuend	
Kaleb and Ethan are building towers with blocks. Kaleb's tower has 23 blocks. Ethan's tower has 45 blocks. How many blocks will there be if they put both towers together to make one big tower? Draw a picture to help you solve this problem. Write an equation to represent your work.	Example of *Putting together* w/unknown sum	

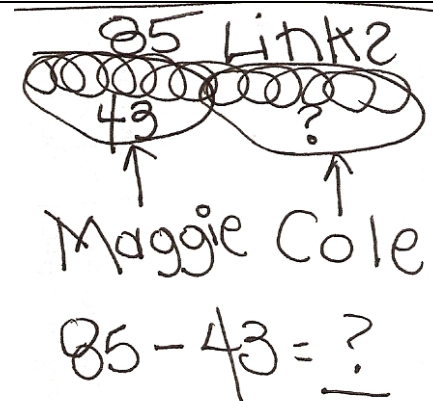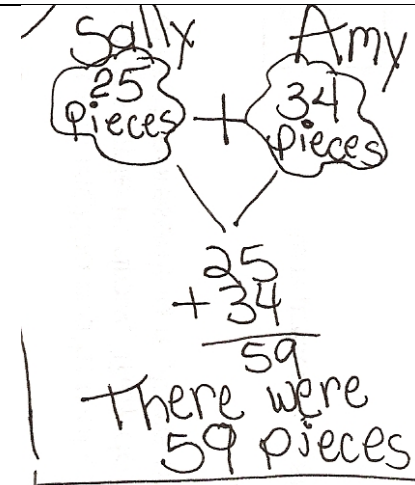| Macon, Parker, and Carson made sandwiches for a picnic. When they put all of the sandwiches in the cooler, there were 52 sandwiches. Macon knows that he made 21 and Parker made 15. How many sandwiches did Carson make?

Draw a picture to help you solve this problem.

Write an equation to represent your work. | Example of *Putting together* w/unknown addend
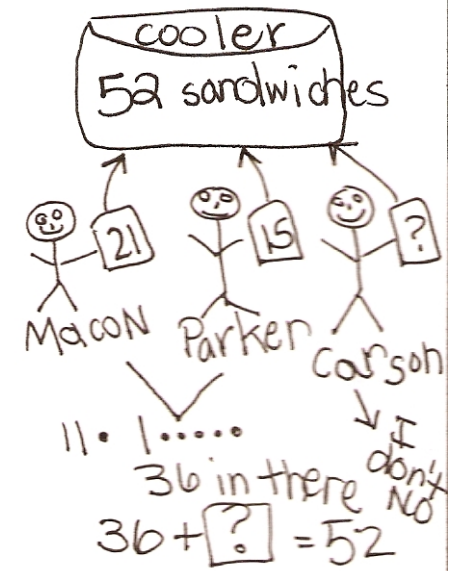
2-step problem | |
| Cole and Maggie worked together to make a paper chain with 85 links. At the end of the day, they each wanted to take home part of the chain. The part Maggie took had 43 links. How many links were in Cole's part?

Draw a picture to help you solve this problem.

Write an equation to represent your work. | Example of *Taking apart* w/unknown difference | |

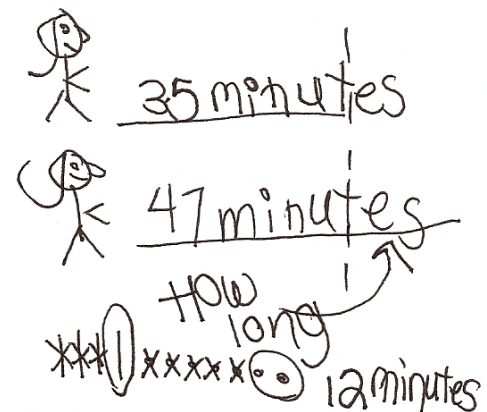|		
Sally and Amy put together a puzzle. When it was time to clean up, Sally took apart 25 pieces and Amy took apart 34 pieces. How many pieces were in the puzzle? Draw a picture to help you solve this problem. Write an equation to represent your work.	Example of *Taking apart* w/unknown minuend	Sally Amy 25 pieces + 34 pieces $\begin{array}{r} 25 \\ +34 \\ \hline 59 \end{array}$ There were 59 pieces
Jacob and Skip took a model airplane apart to put it away. The airplane had 76 pieces. Skip counted 45 pieces that he put away. How many pieces did Jacob put away? Draw a picture to help you solve this problem. Write an equation to represent your work.	Example of *Taking apart* w/unknown subtrahend	76 Pieces 45 ? $45 + ? = 76$ $\begin{array}{r} 76 \\ -45 \\ \hline 31 \end{array}$ pieces for Jacob
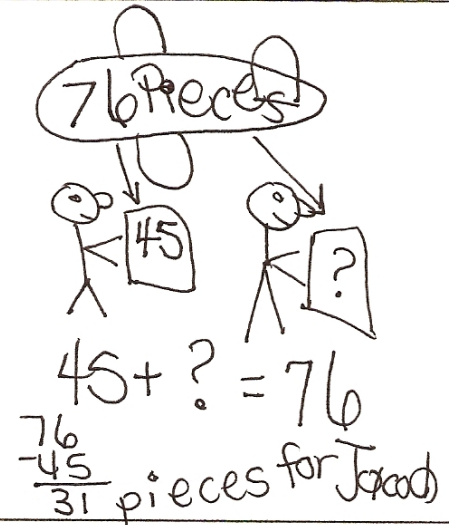
|		
Alexa is practicing for a race. She ran for 35 minutes on Friday and 47 minutes on Saturday. How much longer did Alexa run on Saturday? Draw a picture to help you solve this problem. Write an equation to represent your work.	Example of *Comparing* w/unknown difference	35 minutes 47 minutes How long ✶✶✶○✕✕✕✕✕○ 12 minutes
Tiffany put some birdseed in a feeder on her porch. She counted the birds that came to the feeder each day. She counted 39 birds on Monday. She noticed there were 12 more birds on Monday than there were on Friday. How many birds came to the feeder on Friday? Draw a picture to help you solve this problem. Write an equation to represent your work.	Example of *Comparing* w/unknown subtrahend	Monday 39 birds 11○ ○ ○ ○ ○ 12 more Friday 11 ○ ○ ○ ○ 27 birds 39 - 12 = ? 39 - 12 = 27
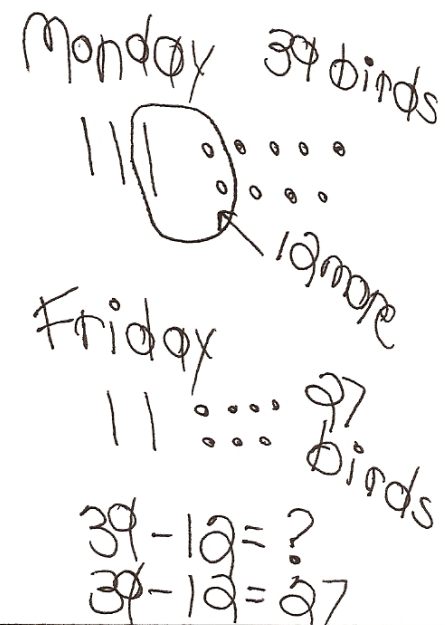
Hunter and Joshua raced to see who could stack more boxes in a minute. Joshua stacked 11 less than Hunter. Joshua's stack had 78 boxes. How many boxes did Hunter stack?

Draw a picture to help you solve this problem.

Write an equation to represent your work.

Example of *Comparing* w/unknown minuend

?

Hunter   Joshua   -11   78 boxes

$? - 11 = 78$

78 Hunter
+11 had
89 89 boxes