Topic C
Strategies for Solving Change or Addend Unknown Problems

1.OA.1, 1.OA.3, 1.OA.4, 1.OA.6, 1.OA.5, 1.OA.7, 1.OA.8

Focus Standard:
1.OA.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.3 Apply properties of operations as strategies to add and subtract. (Students need not use formal terms for these properties.) 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.4 Understand subtraction as an unknown-addend problem. For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.

1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use mental 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).

Instructional Days: 4

Coherence -Links from: GK–M4 Number Pairs, Addition and Subtraction to 10
-Links to: G2–M3 Place Value, Counting, and Comparison of Numbers to 1000
G2–M5 Addition and Subtraction Within 1000 with Word Problems to 100

Topic C provides students with practice solving add to with change unknown, take from with change unknown, put together with addend unknown, and take apart with addend unknown word problems (1.OA.1). Drawing on the momentum gained from Topic B, Lesson 22 allows students to attack put together/take apart with addend unknown word problems such as, “Maria has 15 baseballs, 8 of them are old, and some of them are brand new birthday presents. How many brand new baseballs does Maria have?” Students solve these problems using both the Level 2 counting on strategy and Level 3 subtraction strategies (1.OA.4).

Lesson 23 allows students to use counting on as it relates to subtraction, take from ten strategies, or the get
to ten Level 3 strategy, as they solve *add to with change unknown* problems (1.OA.6). The get to ten strategy has students solving 12 – 3 as 12 – 2 – 1, understanding that decomposing the subtrahend to easily get to the ten yields a simpler, more manageable subtraction problem. It is the way a student can make ten when there is an unknown addend. It is a step away from counting on, where, rather than counting on by ones, students consider how much it takes to get to ten and then add on the rest to the teen number. For many students, the language of get to ten helps them bridge from counting on to a more efficient strategy. Up to this point, make ten for the students has shown both addends, and they are strategic about which number to break apart so that they can bond two numbers to make ten. This is a different, though related, process.

Lesson 24 presents students with *take from with change unknown* problems where they continue to select various strategies for solving. Students again relate various addition strategies to their recently acquired subtraction strategies, but in this new word problem type, the strategies they select and discuss help them better make sense of these problems. Students begin to recognize that although stories may be *take from with change unknown* problems, they can apply many strategies such as counting on, counting back, taking from ten, or getting to ten to accurately solve this challenging problem type.

Topic C closes with Lesson 25, where students move away from the context of story problems, to find matching expressions to create true number sentences. They work solely with equations to show and talk about how they would re-present a given addition or subtraction problem using a Level 2 or Level 3 strategy. For example, when given 9 + 6, students decompose the 6 into 1 and 5, and then can add using their new number sentence 10 + 5, (i.e., 9 + 6 = 10 + 5) (1.OA.7), using pictures and words.

### A Teaching Sequence Towards Mastery of Strategies for Solving Change or Addend Unknown Problems

**Objective 1:** Solve *put together/take apart with addend unknown* word problems and relate counting on to the take from ten strategy.  
(Lesson 22)

**Objective 2:** Solve *add to with change unknown* problems, relating varied addition and subtraction strategies.  
(Lesson 23)

**Objective 3:** Strategize to solve *take from with change unknown* problems.  
(Lesson 24)

**Objective 4** Strategize and apply understanding of the equal sign to solve equivalent expressions.  
(Lesson 25)
Lesson 22

Objective: Solve put together/take apart with addend unknown word problems and relate counting on to the take from ten strategy.

Suggested Lesson Structure

- Fluency Practice (15 minutes)
- Concept Development (35 minutes)
- Student Debrief (10 minutes)
- Total Time (60 minutes)

Fluency Practice (15 minutes)

- Subtract with Hide Zero Cards 1.OA.6 (3 minutes)
- Count by Fives 1.OA.5 (2 minutes)
- Sprint: Missing Addend Within 10 1.OA.6 (10 minutes)

Subtraction with Hide Zero Cards (3 minutes)

Materials: (T) Hide Zero cards (from G1–M1–Lesson 38)

Note: This fluency reviews subtracting 7, 8, and 9 using the Hide Zero cards, which will help prepare students to understand ten as a unit by the module’s end. Since this is the second time students are doing this activity, get volunteers to describe the steps necessary to apply the take from ten strategy.

T: (Show 15.) What do I need to do if I want to subtract 9?
S: Take apart 15.
T: (Break apart the cards to show 10 and 5.) Now what?
S: Take 9 from 10.
T: 10 − 9 = ?
S: 1.
T: What should I do next?
S: Add 1 to the 5.
T: 1 + 5 = ?
S: 6.
T: (Put the cards back together to show 15.) So, 15 − 9 = ?
S: 6.
Continue subtracting 9, 8, and then 7 from teen numbers.

**Count by Fives (2 minutes)**

Materials: (T) 100-bead Rekenrek

Note: Counting by fives promotes fluency with adding and subtracting 5.

Use the Rekenrek to count up and down by fives within 40. Students say the numbers as you move the beads. This time, count both forward and backward on your way up to 40 (e.g., 5, 10, 5, 10, 15, 20, 15, 20, etc.). Alternate between counting the Say Ten and regular way.

**Sprint: Missing Addend Within 10 (10 minutes)**

Materials: (S) Missing Addend Within 10 Sprint

Note: This review fluency is intended to strengthen students’ ability to fluently add and subtract within 10, while preparing students for the problem types that will be presented in today’s lesson.

**Concept Development (35 minutes)**

Materials: (S) Personal white boards

Note: The Application Problem is embedded within the Concept Development since it directly pertains to the objective of today’s lesson.

Students may sit with a partner in the meeting area (or at their seats) with their materials.

T: (Project the following problem: Mark has 14 crayons. Eight of the crayons are on the table and some more crayons are in the box. How many crayons are in the box?)

S: (Students solve, and then share work. Circulate, noticing students’ accuracy with creating a drawing that matches the story, and taking note of the varying ways students solved the problem.)

T: With a partner, explain your Application Problem drawing to your partner, and discuss how you solved the problem.

S: (Share work.)

T: (Circulate, noticing students’ accuracy with creating a drawing that matches the story, and taking note of the varying ways students solved the problem.)

T: (Project today’s Application Problem.) Step 1: When we want to solve a problem, we read or listen to the problem. Let’s read it together again. (Write 1. Read on the board.)

S/T: Mark has 14 crayons. Eight of the crayons are on the table and some more crayons are in the box. How many crayons are in the box?

T: Step 2: Draw as much of the math story as you can. You made some great drawings to match this story. What did you draw? (Write 2. Draw on the board.)
Lesson 22

Lesson 22: Solve put together/take apart with addend unknown word problems and relate counting on to the take from ten strategy.

Date: 7/3/13

Notes on Multiple Means for Action and Expression:
When students are required to draw, remind them to complete math drawings so they do not spend time making beautiful pictures. The use of lines or dots with labels is very efficient.

S: (As students share, project work with a document camera or redraw on the board as they explain their drawing.) I drew 14 lines in a row, like the 14 crayons in the problem. I circled 8 of them and labeled those with a T to show they were the ones on the table. → I started by drawing 8 circles for the 8 crayons on the table. Then I started drawing dark circles until I got to 14.

T: Everyone look at your work. As I read the story, find the part of your math drawing that matches the sentence.

T: (Read from projection.) Mark has 14 crayons. Does your drawing show Mark has 14 crayons? Point to where your drawing shows the 14 crayons. Circle it with your finger.

T: Eight of the crayons are on the table. Where does your picture show the 8 crayons that are on the table?

T: Are these 8 more crayons, or are they a part of Mark's 14 crayons?

S: They are a part of Mark's crayons!

T: How can we tell these crayons from the other crayons in the story?

S: We can make those crayons circles and the other ones dots. → We can label these crayons with a T since they are on the table. → We can circle them.

T: If you didn’t already label them with a T or with the word table, add a label. Let’s put a box around them too, so we can see them together clearly. (Write and label after 2. Draw.)

T: “…and some more crayons are in the box.” Can you find these crayons in your drawing? Point to them and circle them with your finger.

T: What could we label this set of crayons?

S: B for box.

T: If you didn’t label these crayons, add B or the word Box, to show these are the crayons in the box.

T: Now, we come to the question part of the word problem. How many crayons are in the box? Can we find the answer to this question in our drawing?

S: Yes, 6 crayons!

T: What number sentence would match this story? (Write 3. Write a number sentence.)

S: 8 + 6 = 14.

T: Which number in the number sentence is the answer, or solution, to the question?

S: 6.

T: We have to make sure we put a rectangle around this number so we know it is the solution. If you didn’t add a box, do that now.

T: What is the answer to our question? (Write Write or tell a statement of the solution.)

S: There are 6 crayons in the box.
Lesson 22: Solve put together/take apart with addend unknown word problems and relate counting on to the take from ten strategy.

T: When we read the problem and draw the parts of the story, it can help us understand the problem and help us write the number sentence and the answer, or solution, sentence. Let’s try to read, draw, and write (RDW) (point to list of steps now listed on board) to solve more problems.

Use the steps listed on the board as you repeat the process above with three more put together/take apart with addend unknown problems using the suggested sequence of story problems:

- There are 12 milk bottles in the crate. Nine are plain milk bottles and the rest are chocolate milk bottles. How many are chocolate milk bottles?
- Ani adds some pink barrettes in her hair. She already had 7 blue barrettes in her hair. If Ani now has 11 barrettes in her hair, how many pink barrettes did she use?
- Laurie reads 5 books about frogs and then reads some books about toads. Laurie counts and realizes she has just read 13 books! How many books about toads did Laurie read?

Have students project or draw their work on the board as the class shares and discusses each part of the RDW process. Ask students to find in the drawing where they can count on to find the solution, as well as where they can take away, or cover, a part as a method to finding the solution.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Student Debrief (10 minutes)

Lesson Objective: Solve put together/take apart with addend unknown word problems and relate counting on to the take from ten strategy.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.
Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

- Look at Problems 1 and 2. Did you use the same or different strategy to solve? Explain why you chose to use the strategy (or strategies) you did.
- How did drawing the parts of the story help you solve the story problems?
- What new math strategy did we use today to communicate precisely how we solved the story problem (RDW.) Explain what it is and how we used it.

**Exit Ticket (3 minutes)**

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
Lesson 22 Sprint

**Lesson 22:** Solve put together/take apart with addend unknown word problems and relate counting on to the take from ten strategy.

Date: 7/3/13

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Lesson 22 Problem Set

Name ___________________________ Date ______________

Read the word problem.
Draw and label.
Write a number sentence and a statement that matches the story.

1. This week, Maria ate 5 yellow plums and some red plums. If she ate 11 plums in all, how many red plums did Maria eat?

2. Tatyana counted 14 frogs. She counted 8 swimming in the pond and the rest sitting on lily pads. How many frogs did she count sitting on lily pads?
3. Some children are on the playground playing tag. Eight are on the swings. If there are 15 children on the playground in all, how many children are playing tag?

4. Oziah read some non-fiction books. Then he read 7 fiction books. If he read 16 books altogether, how many non-fiction books did Oziah read?

Meet with a partner and share your drawings and sentences. Talk with your partner about how your drawing matches the story.
Lesson 22 Exit Ticket

Name _______________________________ Date ________________

Read the word problem.
Draw and label.
Write a number sentence and a statement that matches the story.
Remember to draw a box around your solution in the number sentence.

1. Some students in Mrs. See’s class are walkers. There are 17 students in her class in all. If 8 students ride the bus, how many students are walkers?

2. I baked 13 loaves of bread for a party but some were burnt, so I threw them away. I brought 8 loaves of bread to the party. How many loaves of bread were burnt?
Lesson 22 Homework

Name ____________________________ Date ______________

Read the word problem.
Draw and label.
Write a number sentence and a statement that matches the story.
Remember to draw a box around your solution in the number sentence.

Strategies:
- Take from 10
- Make 10
- Count on
- I just knew

1. Michael and Anastasia pick 14 flowers for their mom. Michael picks 6 flowers. How many flowers does Anastasia pick?

2. Daquan buys 6 toy cars. He also buys some magazines. He buys 15 items in all. How many magazines does Daquan buy?

3. Henry and Millie baked some oatmeal cookies. If they baked 18 cookies altogether, and 9 were chocolate chip, how many cookies were oatmeal?
4. Felix made 8 birthday invitations with hearts. He made some more with stars. He made 17 invitations in all. How many invitations had hearts?

5. Ben and Miguel are having a bowling contest. Ben wins 9 times. They play 17 games in all. There were no tied games. How many times did Miguel win?

6. Kenzie goes to soccer practice for 16 days this month. Only 9 of her practices were on a school day. How many times did she practice on a weekend?
Lesson 23
Objective: Solve add to with change unknown problems, relating varied addition and subtraction strategies.

Suggested Lesson Structure
- Fluency Practice (15 minutes)
- Application Problem (5 minutes)
- Concept Development (30 minutes)
- Student Debrief (10 minutes)
- Total Time (60 minutes)

Fluency Practice (15 minutes)
- Subtraction with Partners 1.OA.6 (5 minutes)
- Sprint: Missing Addended Within 10 1.OA.6 (10 minutes)

Subtraction with Partners (5 minutes)
Materials: (S) Personal white boards

Note: This fluency reviews subtracting 7, 8, and 9 from teen numbers. Allow students who still require pictorial representations to draw 5-groups to solve.

Assign partners of equal ability. Partners assign each other a number from 11 to 17 (e.g., 12). On their personal white boards, they write number sentences with 9, 8, and 7 as the subtrahend and solve them (e.g., 12 – 9 = 3, 12 – 8 = 4, 12 – 7 = 5). Partners then exchange white boards and check each other’s work.

Sprint: Missing Addend Within 10 (10 minutes)
Materials: (S) Missing Addended Within 10 Sprint

Note: This fluency activity is intended to strengthen students’ ability to fluently add and subtract within 10, while preparing students for the problem types that will be presented in today’s lesson.
Application Problem (5 minutes)

In the morning, there were 8 leaves on the floor under the ficus tree. During the day, more leaves fell on the floor. Now there are 13 leaves on the floor. How many leaves fell during the day?

Note: In today’s lesson, students grapple with an add to with change unknown problem. By giving students time to try this problem type independently, teachers will have the opportunity to see how students are applying the RDW strategy without direct instruction on a specific method to solve.

Concept Development (30 minutes)

Materials: (S) Personal white boards and work from Application Problem

Students may sit next to their partners in the meeting area or at their seats with their materials.

T: (Project today’s Application Problem.) Before we share our Application Problem with a partner, let’s walk through the Read and Draw parts of the Read, Draw, Write strategy. We call this RDW. What does RDW stand for?

S: Read, draw, and write.

T: As I read the problem, find the part of your drawing that matches the story.

T: In the morning, there were 8 leaves on the ground. Point to where your drawing shows these 8 leaves on the ground. Do these leaves have a label so you can find them easily?

T: During the day, more leaves fell on the ground. Touch the part of your drawing that shows these leaves. Label this part if you haven’t yet.

T: Now there are 13 leaves on the ground. Can you find these leaves in your drawing? Is this a part of your leaves or is this the total number of leaves?

S: It’s the total number of leaves. (Touch their drawing to show.)

T: How many leaves fell during the day?

S: 5 leaves!
Lesson 23: Solve add to with change unknown problems, relating varied addition and subtraction strategies.

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T: Talk with your partner. How does your drawing help you see the story situation?
S: (Discuss.)

T: What was missing, a part or the total number of leaves?
S: A part of the leaves.

T: Now that we know we are missing a part, how could we solve this problem?
S: We can start at 8 and then count on until we get to 13. That would be 5. We can draw all 13 and then cover, or take away 8. We would have 5 left. We can draw 13 as 10 and 3, so we can quickly cover the 8 without having to recount them. Then it’s easy to see the 2 and 3 that are left. That’s 5.

T: I saw many of you draw your 8 leaves first and use counting on. How can we use our friendly number 10 to count on in bigger amounts, instead of counting by ones?
S: We can think about how many more we need to get to 10, and then add the rest all at once.

T: Let’s try that here. We have 8 leaves, so how many would we draw to get to 10 leaves?
S: 2 more leaves.
T: From 10 leaves, how many more to get to the total, 13 leaves?
S: 3 leaves!
T: So how many more leaves did we draw altogether?
S: 5 leaves!

T: Now that it’s later in our Grade 1 year we can go a little faster by jumping from 8 to 10, and then jumping to the total. Counting on in this way is a little faster.

T: Once we solve the problem, we have to write our number sentence and our word sentence. Which number sentence best matches what happened in the story? Talk with your partner.
S: (Discuss.)
S: 8 + 5 = 13 matches the story best because there were 8 leaves in the morning, and then 5 leaves joined the pile. There were 13 leaves at the end of the story. The part we did not know was the 5.

T: Which number needs a rectangle around it to show it is our answer, or our solution?
S: 5.
T: What is our solution sentence?
S: 5 leaves fell during the day.
T: Let’s try some more. Remember to think about which number sentence best matches the story.
Present three more add to with change unknown story problems such as those below:

- Eight children were playing on the playground. More children came out to join them. Now there are 14 children on the playground. How many children came out to join them on the playground?
- Some new baby ducks hatched at the farm. There were 5 ducks on the farm, and now there are 12 ducks. How many new baby ducks were hatched?
- Thirteen cars are in the parking lot. Six were already there in the morning. The rest of the cars arrived after lunch. How many cars arrived after lunch?

For each story problem, project and read it aloud. Ask students, “Can you draw something? Listen again and ask yourself, what can I draw?” Read the problem again to allow students to think about what they can draw from the problem. Encourage the students to use the drawing to help them consider a strategy for solving by asking themselves, “What does my drawing show me?” Remind them to write a number sentence that matches the story and a word sentence, or solution statement, to answer the question. Give students approximately three minutes to work. Share one or two students’ work by drawing it on the board or using a document camera. Have students explain their drawing, share their choices of labels, and explain how their number sentence matches the story.

**Problem Set (10 minutes)**

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first.

Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

**Student Debrief (10 minutes)**

**Lesson Objective:** Solve add to with change unknown problems, relating varied addition and subtraction strategies.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson. You may choose to use any combination of the questions below to lead the discussion.

1. Can you draw something? Listen again and ask yourself, what can I draw?
2. What does my drawing show me?
3. Write a number sentence and a solution statement that matches the story.
compare the way you solved problems 1 and 2. how are the strategies you used to solve the same or different?

what do all of the story problems in the problem set have in common? (we always know the total and one of the parts. we had to look for the missing part.)

look at problem 3. how did you use counting on? what did you do? how did that help you solve?

exit ticket (3 minutes)

after the student debrief, instruct students to complete the exit ticket. a review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. you may read the questions aloud to the students.
Lesson 23 Sprint

NYS COMMON CORE MATHEMATICS CURRICULUM

Lesson 23: Solve add to with change unknown problems, relating varied addition and subtraction strategies.

Name ___________________________________________ Date ______________

*Write the missing number.

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| 1 | 2 + ☐ = 3 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 2 + ☐ = 8 |    |    |    |    |    |    |    |    |    |    |    |    |
| 2 | 1 + ☐ = 3 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 4 + ☐ = 8 |    |    |    |    |    |    |    |    |    |    |    |    |
| 3 | ☐ + 1 = 3 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 8 = ☐ + 6 |    |    |    |    |    |    |    |    |    |    |    |    |
| 4 | ☐ + 2 = 4 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 8 = 3 + ☐ |    |    |    |    |    |    |    |    |    |    |    |    |
| 5 | 3 + ☐ = 4 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | ☐ + 3 = 9 |    |    |    |    |    |    |    |    |    |    |    |    |
| 6 | 1 + ☐ = 4 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 2 + ☐ = 9 |    |    |    |    |    |    |    |    |    |    |    |    |
| 7 | 1 + ☐ = 5 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 9 = ☐ + 1 |    |    |    |    |    |    |    |    |    |    |    |    |
| 8 | 4 + ☐ = 5 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 9 = 4 + ☐ |    |    |    |    |    |    |    |    |    |    |    |    |
| 9 | 3 + ☐ = 5 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 2 + 2 + ☐ = 9 |    |    |    |    |    |    |    |    |    |    |    |    |
|10 | 3 + ☐ = 6 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 2 + 2 + ☐ = 8 |    |    |    |    |    |    |    |    |    |    |    |    |
|11 | ☐ + 2 = 6 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 3 + ☐ + 3 = 9 |    |    |    |    |    |    |    |    |    |    |    |    |
|12 | 0 + ☐ = 6 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 3 + ☐ + 2 = 9 |    |    |    |    |    |    |    |    |    |    |    |    |
|13 | 1 + ☐ = 7 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 5 + 3 = ☐ + 4 |    |    |    |    |    |    |    |    |    |    |    |    |
|14 | ☐ + 5 = 7 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | ☐ + 4 = 1 + 5 |    |    |    |    |    |    |    |    |    |    |    |    |
|15 | ☐ + 4 = 7 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 3 + ☐ = 2 + 6 |    |    |    |    |    |    |    |    |    |    |    |    |

Number correct: __________
**Lesson 23 Sprint**

**Common Core Mathematics Curriculum**

**Lesson 23**: Solve add to with change unknown problems, relating varied addition and subtraction strategies.

**Date**: 7/3/13

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*Name ____________________________  Date ____________

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Lesson 23 Problem Set

Name ___________________________ Date ____________

Read the word problem.
Draw and label.
Write a number sentence and a statement that matches the story.

1. Janet read 8 books during the week. She read some more books on the weekend. She read 12 books total. How many books did Janet read on the weekend?

2. Eric scored 13 goals this season! He scored 5 goals before the playoffs. How many goals did Eric score during the playoffs?
3. There were 8 ladybugs on a branch. Some more came. Then there were 15 ladybugs on the branch. How many ladybugs came?

4. Marco’s friend gave him some baseball cards at school. If he was already given 9 baseball cards by his family, and he now has 19 cards in all, how many baseball cards did he get in school?

Meet with a partner and share your drawings and sentences. Talk with your partner about how your drawing matches the story.
Name ___________________________  Date _____________

Read the word problem.
Draw and label.
Write a number sentence and a statement that matches the story.

Shanika ate 7 mini-pretzels in the morning. She ate the rest of her mini-pretzels in the afternoon. She ate 13 mini-pretzels altogether that day. How many mini-pretzels did Shanika eat in the afternoon?
Lesson 23 Homework

Read the word problem.
Draw and label.
Write a number sentence and a statement that matches the story.

1. Micah collected 9 pinecones on Friday and some more on Saturday. Micah collected a total of 14 pinecones. How many pinecones did Micah collect on Saturday?

2. Giana bought 8 star stickers to add to her collection. Now she has 17 stickers in all. How many stickers did Giana have at first?
3. Samil counted 5 pigeons on the street. Some more pigeons came. There were 13 pigeons in all. How many pigeons came?

4. Claire had some eggs in the fridge. She bought a dozen more eggs. Now she has 18 eggs in all. How many eggs did Claire have in the fridge at first?
Lesson 24

Objective: Strategize to solve take from with change unknown problems.

Suggested Lesson Structure

- Fluency Practice (15 minutes)
- Application Problem (5 minutes)
- Concept Development (30 minutes)
- Student Debrief (10 minutes)

Total Time (60 minutes)

Fluency Practice (15 minutes)

- Count by Fives 1.OA.5 (5 minutes)
- Sprint: Missing Subtrahends Within 10 1.OA.6 (10 minutes)

Count by Fives (5 minutes)

Materials: (T) Rekenrek

Note: Counting by fives promotes fluency with adding and subtracting 5.

Use the Rekenrek to count by fives to 40 and back. Students say the numbers as you move the beads. First, have students count the Say Ten way. Then do it again but have students count the regular way.

Sprint: Missing Subtrahends Within 10 (10 minutes)

Materials: (S) Missing Subtrahends Within 10 Sprint

Note: This review fluency is intended to strengthen students’ ability to fluently add and subtract within 10, while preparing students for the problem types that will be presented in today’s lesson.

Application Problem (5 minutes)

Yesterday, I saw 11 birds on a branch. Then, 3 birds joined them on the branch. How many birds were on the branch then?

Note: This problem is intentionally an add to with result unknown problem. Having spent two days on change or addend unknown
situation types, students may be identifying a pattern in solving the problem type presented.

Misconceptions may arise through this Application Problem if students are overgeneralizing. Students will use the context of this problem to transition into today’s lesson, where they will be working with \textit{take from with change unknown} problem. While students are completing the Application Problem, circulate and select a student’s work in which the drawings accurately represent the story situation and are simple, labeled, and aligned in a single row. Use this work as the sample for sharing during the lesson.

\textbf{Concept Development (30 minutes)}

Materials: (S) Personal white boards and work from Application Problem

Students may sit with their partners in the meeting area or at their seats with their materials.

T: (Project today’s Application Problem.) We have been using the RDW process to solve problems. Before we share our Application Problem with a partner, what does RDW stand for again?

S: Read, draw, and write.

T: With your partner, share your solution, or answer. Be sure to discuss your drawings as you explain your idea. If you realize you forgot something or have to change something, you can do so.

T: (Project or redraw chosen student work.) This student’s work uses simple shapes drawn in an organized line, which helps me see what we have. (See Application Problem image as an example.)

T: I need one volunteer to read the problem again for us, and another volunteer to explain how the picture shows each part. (Choose students other than the one whose solution is being shared.)

S1: Yesterday, I saw birds in a tree.

S2: Here are the birds. (Points to the full line of shapes.)

S1: There were 11 birds on a long branch, and then 3 birds joined them.

S2: These 11 birds are the ones on the branch first. I think that’s why she wrote \textit{f} under it. (Points to the first 11 birds.) Here are the 3 birds that joined in. That’s why she wrote \textit{j} under it. (Points to 3 birds at the end.)

S1: How many birds were in the tree?

S2: She wrote $11 + 3 = 14$ and, “You saw 14 birds,” because that matches the story and the question. There were 11, then 3 joined in, and now there are 14. (Points to the number sentence while explaining.)

T: You all did a great job reading, drawing, and writing to solve this problem. Let’s try another problem.

T: (Project the following problem.) Today, I was passing the same tree. There were 11 birds in the tree when I first looked at it. I looked away, and when I looked back there were 5 birds. How many birds flew away?

S: (Begin to solve the problem.)

T: (Reread the question two more times to support struggling readers as students work.)
### Lesson 24

**Lesson 24**: Strategize to solve take from with change unknown problems.

**Date**: 7/3/13

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**T**: (Remind students to think about these questions: Can you draw something? What can you draw? What does your drawing show you? Give students approximately three minutes to RDW. Invite two or more students to solve on the board or on chart paper in pairs.)

**T**: Let’s look at the work these students did. They drew to show the 11 birds in the tree. Oh, and look at this, they drew a circle around 5 birds and wrote an 5 to show that these 5 birds that stayed were a part of all 11 birds that were in the tree. Let’s draw another circle around these birds, the ones labeled 5. These are the birds that flew away. (If neither group has a circle around them, draw a circle around each group.)

**T**: I’m going to use our lines from our number bonds to show that these two parts together make the total of 11 birds.

**T**: 11 – 6 = 5. How many birds flew away? Let’s put a rectangle around the solution.

**S**: Six birds flew away.

**T**: What strategies could you use to solve this?

**S**: I knew there were two parts, so I took away the 5 to find the other part. → I looked at the picture and counted them all. → I drew 11 like 5-group rows, so I put a box around the first 5 circles, and I could see 6 more very quickly. 5 and 1. → I thought of my doubles plus one fact. 5 + 5 is 10, so I needed 5 + 6 to make 11.

Repeat the process above for three more take from with change unknown story problems such as those listed below:

- Mina had 13 ants in her ant farm. Some ants escaped. Now there are 9 ants in the ant farm. How many ants escaped?
- Jamal had 14 trains, but he only found 8 of his trains. How many of his trains are missing?
- June's baby brother hid some of her blocks. She has 7 blocks now. She used to have 15 blocks. How many blocks should June be looking for?

When sharing solutions and strategies, debrief quickly and move to the next problem. The goal is for students to love solving problems and to begin making connections between reading, drawing, and writing as a road to success as a problem solver!
Lesson 24

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Student Debrief (10 minutes)

Lesson Objective: Strategize to solve take from with change unknown problems.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson. You may choose to use any combination of the questions below to lead the discussion.

- Look at Problems 1 and 2. How are your drawings similar? How are they different?
- How was your drawing similar to or different from your partner’s drawing?
- What did today’s problems have in common? How were they the same or different from yesterday’s problems? What was unknown in the problem, a part or the total? What strategies were easier for you to use when a part is missing instead of the total? (Note: Students might find Problem 2 tricky, since the first number given is the part that is left and the whole is given later in the problem.)
- Which problem was tricky for you? What did you draw? How can we add to the drawing with more information from the problem? What does the drawing show you? (Some students might find Problem 2 tricky, as it starts with an unknown amount but tells you what is left. Problems 1, 3, and 4 might prove tricky for students, as the
quantity that is taken away is not known.)

- How did your drawings help you with the problems? Use a specific problem to explain your thinking.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
**Lesson 24 Sprint**

**NYS COMMON CORE MATHEMATICS CURRICULUM**

**Lesson 24:**

State a strategy to solve take from with change unknown problems.

**Date:** 7/3/13

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**Lesson 24 Sprint**

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Lesson 24 Problem Set 1+2

Name ___________________________ Date ______________

Read the word problem.
Draw and label.
Write a number sentence and a statement that match the story. Circle the number sentence and the statement.

1. Jose sees 11 frogs on the shore. Some of the frogs hop into the water. Now there are 8 frogs on the shore. How many frogs hopped into the water?

2. Cameron gives some of his apples to his sister. He still has 9 apples left. If he had 15 apples at first, how many apples did he give to his sister?
3. Molly had 16 books. She loaned some to Gia. How many books did Gia borrow if Molly has 8 books left?

4. 18 baby goats were playing outside. Some went into the barn. 9 stayed outside to play. How many baby goats went inside?

Meet with a partner and share your drawings and sentences. Talk with your partner about how your drawing tells the story.
Read the word problem.

Draw and label.

Write a number sentence and a statement that matches the story. Circle the number sentence and the statement.

There were 18 dogs splashing in a puddle. Some dogs left. There are 9 dogs still splashing in the puddle. How many dogs left?
Read the word problem.
Draw and label.
Write a number sentence and a statement that matches the story. Circle the number sentence and the statement.

1. Toby dropped 12 crayons on the classroom floor. Toby picked up 9 crayons. Marnie picked up the rest. How many crayons did Marnie pick up?

2. Of the students on the playground, 7 went back into the classroom. If 11 students stayed outside, how many were on the playground at first?
3. At the play, 8 students from Room 24 got a seat. If there were 17 children from Room 24, how many children did not get a seat?

4. Simone had a dozen bagels. She shared some with friends. Now she has 9 bagels left. How many did she share with friends?
Lesson 25

Objective: Strategize and apply understanding of the equal sign to solve equivalent expressions.

Suggested Lesson Structure

- Fluency Practice (15 minutes)
- Application Problem (7 minutes)
- Concept Development (28 minutes)
- Student Debrief (10 minutes)

Total Time (60 minutes)

Fluency Practice (15 minutes)

- Make it Equal: Addition Expressions 1.OA.6 (5 minutes)
- Sprint: Make it Equal 1.OA.6 (10 minutes)

Make it Equal: Addition Expressions (5 minutes)

Materials: (S) Personal white boards, counters

Note: This activity builds fluency with the make ten addition strategy and reinforces the meaning of the equal sign, which prepares students for today’s lesson.

Write or project $9 + \square = 8 + \square$. Students find different numbers that make the equation true and check their answers with a partner. If necessary, students can use counters in addition to drawings that they can make on their white boards. In the last minute, ask for volunteers to share the equations they found. Write them on the board and ask if anyone notices a pattern (that the numbers are always consecutive).

Sprint: Make it Equal (10 minutes)

Materials: (S) Make it Equal Sprint

Note: This Sprint uses review addition facts to strengthen students’ understanding of the equal sign.
Application Problem (7 minutes)

Micah had 16 trucks and lost 9 of them. Charles had 1 truck and received 6 more trucks from his mother. Who has more trucks, Micah or Charles?

Note: Students apply their prior understanding of take from with result unknown and add to with result unknown problems as they solve this two-part problem. This provides a context for exploring today’s objective of further understanding the meaning of the equal sign by pairing equivalent expressions and constructing true number sentences.

Concept Development (28 minutes)

Materials: (T) Expression cards (S) Personal white boards and work from Application Problem

Students may sit in the meeting area or at their seats, next to a partner, with all materials.

T: Who has more trucks, Micah or Charles? (Write Micah on the left side of the board and Charles on the right side of the board.)

S: Neither, they both have the same number of trucks!

T: Talk with a partner. Use your drawings to help you prove to your partner that Micah and Charles have the same number of trucks.

S: (Share using their drawings to explain.)

T: (Circulate and listen to ensure that all students see that Micah and Charles have the same amount of trucks.) What number sentence did you write to match Micah’s part of the story?

S: 16 – 9 = 7. (Write 16 – 9 = 7 below Micah.)

T: What number sentence did you write to match Charles’ part of the story?

S: 1 + 6 = 7. (Write 1 + 6 = 7 below Charles.)

T: So Micah and Charles have an equal number of trucks?

S: Yes!

T: (Write 16 – 9 under the Micah section and 1 + 6 under the Charles section.) We can say, then, that 16 – 9 is equal to 1 + 6. (Draw equal sign in between expressions.)

T: How does our story help us see that 16 – 9 = 1 + 6? (Point to each part while reading them the number sentence.) Talk with your partner. (Listen as students explain their thinking to their partner.)

S: Since 16 – 9 is 7 and 1 + 6 is 7, they are equal. 16 – 9 equals 1 + 6. → Once I took the 9 from 10, Micah and Charles both show 1 and 6. They both have 7.
T: Let’s try to make some more cool number sentences like this.

T: Work with your partner to make at least two expressions that equal 12.

S: (Work with partners.) We found 10 + 2 and 11 + 1.

T: Great. I’ll use 10 + 2. Who has another?

S: We found 6 + 6.

T: True or false, 10 + 2 = 6 + 6?

S: True!

T: Let’s all write this cool number sentence on our personal white boards and read it together.

S: (Write number sentence.) 10 + 2 = 6 + 6.

After having generated several similar number sentences, start erasing some addends.

T: If I erase this 6 (erase the 6 after the equal sign), what number goes here to make this equation true?

S: 6! You would need to have two sixes to equal 12.

T: (Distribute an expression card to each student. Odd numbered classes will need to pair two students together.) Solve the expression. You may use linking cubes or another strategy. If you’re using linking cubes, you may need to borrow extras from a neighbor. After you solve it, make a linking cube stick to show your final amount.

T: There is someone in the room who has the same answer. Find that person and create a number sentence together to show that your two expressions make equal amounts.

T: What true number sentences did we make?

**Problem Set (10 minutes)**

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.
Lesson 25: Strategize and apply understanding of the equal sign to solve equivalent expressions.

Date: 7/3/13

Student Debrief (10 minutes)

Lesson Objective: Strategize and apply understanding of the equal sign to solve equivalent expressions.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson. You may choose to use any combination of the questions below to lead the discussion.

- (Write $14 + 2 = 10 + 6$ on the board.) Show how you know these are equal expressions. What do you notice about the numbers when you break apart 14?
- (Point to the number sentence written on the board.) Which of the parts of the number sentence are the expression? What does it mean to use $=$ between the two expressions? Explain the meaning of equal.
- Look at your Problem Set. Which expressions can you solve in your head? How can they help you solve other expressions that might be harder for you?
- Look at the true number sentences we made during today’s partner activity. What did you notice about the expressions that made these number sentences true?
- Which expressions were missing a part? Which expressions were missing the total?
- How did the Application Problem connect to today’s lesson?

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
**Lesson 25 Sprint**

**NYS COMMON CORE MATHEMATICS CURRICULUM**

**Lesson 25**: Strategize and apply understanding of the equal sign to solve equivalent expressions.

<p>| | | | |</p>
<table>
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<tr>
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<td>□ = 4 + 1</td>
<td>16</td>
<td>7 + 3 = 4 + □</td>
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<tr>
<td>2</td>
<td>□ = 4 + 2</td>
<td>17</td>
<td>6 + 4 = 5 + □</td>
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<td>3</td>
<td>□ = 4 + 3</td>
<td>18</td>
<td>5 + 5 = 6 + □</td>
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<td>19</td>
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<td>□ = 5 + 2</td>
<td>20</td>
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</tr>
<tr>
<td>6</td>
<td>□ = 5 + 3</td>
<td>21</td>
<td>4 + 5 = □ + 5</td>
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<td>□ + 6 = 4 + 3</td>
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<td>12</td>
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<td>3 + 4 = □ + 2</td>
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<tr>
<td>13</td>
<td>□ = 7 + 1</td>
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<td>4 + 4 = 2 + □</td>
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<td>14</td>
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<td>29</td>
<td>3 + □ = 2 + 7</td>
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<tr>
<td>15</td>
<td>10 = □ + 8</td>
<td>30</td>
<td>□ + 2 = 2 + 6</td>
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</table>

**Number correct:**

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### Lesson 25 Sprint

**NYS COMMON CORE MATHEMATICS CURRICULUM**

**Lesson 25**: Strategize and apply understanding of the equal sign to solve equivalent expressions.

**Date**: 7/3/13

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**Name** ________________________________  

**Date** ____________________

*Write the missing number.*

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<td>☐ = 3 + 2</td>
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<td>18</td>
<td>3 + 7 = 8 + ☐</td>
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<tr>
<td>4</td>
<td>☐ = 4 + 1</td>
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Use the expression cards to play Memory. Write the matching expressions to make true number sentences.

1. 

2. 

3. 

4. 

5. 

Name ___________________________ Date ________________
6. Write a true number sentence using the expressions that you have left over. Use pictures and words to show how you know that both expressions have the same unknown numbers.

7. Use other facts you know to write at least two true number sentences similar to the type above.

8. The following addition number sentences are FALSE. Change one number in each problem to make a TRUE number sentence and rewrite the number sentence.

   \[ 8 + 5 = 10 + 2 \]
   \[ 9 + 3 = 8 + 5 \]
   \[ 10 + 3 = 7 + 5 \]

9. The following subtraction number sentences are FALSE. Change one number in each problem to make a TRUE number sentence and rewrite the number sentence.

   \[ 12 - 8 = 1 + 2 \]
   \[ 13 - 9 = 1 + 4 \]
   \[ 1 + 3 = 14 - 9 \]
You are given these new expression cards. Write matching expressions to make true number sentences.

\[
\begin{align*}
8 + 9 & = 12 - 7 \\
10 + 7 & = 3 + 2 \\
14 - 9 & = 2 + 15 \\
1 + 4 & = 19 - 2
\end{align*}
\]
1. **Circle “true” or “false.”**

<table>
<thead>
<tr>
<th>Equation</th>
<th>True or False?</th>
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<tbody>
<tr>
<td>a. $2 + 3 = 5 + 1$</td>
<td>True / False</td>
</tr>
<tr>
<td>b. $7 + 9 = 6 + 10$</td>
<td>True / False</td>
</tr>
<tr>
<td>c. $11 - 8 = 12 - 9$</td>
<td>True / False</td>
</tr>
<tr>
<td>d. $15 - 4 = 14 - 5$</td>
<td>True / False</td>
</tr>
<tr>
<td>e. $18 - 6 = 2 + 10$</td>
<td>True / False</td>
</tr>
<tr>
<td>f. $15 - 8 = 2 + 5$</td>
<td>True / False</td>
</tr>
</tbody>
</table>

2. Lola and Charlie are using expression cards to make true number sentences. Use pictures and words to show who is right.

a. Lola picked $4 + 8$ and Charlie picked $9 + 3$. Lola says these expressions are equal but Charlie disagrees. Who is right? Explain your thinking.
b. Charlie picked $11 - 4$ and Lola picked $6 + 1$. Charlie says these expressions are not equal, but Lola disagrees. Who is right? Use a picture to explain your thinking.

c. Lola picked $9 + 7$ and Charlie picked $15 - 8$. Lola says these expressions are equal but Charlie disagrees. Who is right? Use a picture to explain your thinking.

3. For each set of cards, circle the two that are equal.

a. $14 + 5$, $7 + 11$, $11 + 8$

b. $19 - 7$, $15 - 3$, $16 - 7$

c. $5 + 14$, $11 - 7$, $10 - 6$

d. $17 + 2$, $2 + 17$, $9 + 8$
<table>
<thead>
<tr>
<th>12 - 7</th>
<th>3 + 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 + 8</td>
<td>10 + 5</td>
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<table>
<thead>
<tr>
<th>15 - 9</th>
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<tr>
<td>6 + 8</td>
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<td>--------</td>
<td>-------</td>
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<td>10 + 3</td>
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<td>1 + 1</td>
</tr>
<tr>
<td>8 + 9</td>
<td>10 + 7</td>
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Lesson 25: Strategize and apply understanding of the equal sign to solve equivalent expressions.

Date: 7/3/13
### Lesson 25: Strategize and apply understanding of the equal sign to solve equivalent expressions.

<table>
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<th>Expression 1</th>
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<th>Expression 3</th>
<th>Expression 4</th>
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<td>$10 + 8$</td>
<td>$7 + 9$</td>
<td>$10 + 6$</td>
</tr>
<tr>
<td>$11 - 8$</td>
<td>$2 + 1$</td>
<td>$4 + 8$</td>
<td>$10 + 2$</td>
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<tr>
<td>$17 - 5$</td>
<td>$9 + 3$</td>
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<tr>
<td>$11 - 4$</td>
<td>$16 - 9$</td>
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Lesson 25: Strategize and apply understanding of the equal sign to solve equivalent expressions.

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