

Operations with Integers - Subtraction

STRAND: Computation and Estimation

STRAND CONCEPT: Rational Number – Estimation and Operations

SOL 6.6a

Remediation Plan Summary

Students subtract integers, using manipulatives.

Common Misconceptions

- Students may ignore the signs and just subtract the integers.
- Student may think that subtracting two negative numbers results in a negative answer.
- Students may think that subtraction is commutative and start with the “largest” number first instead of subtracting in the order given.

Materials

- 2-color counters or algebra tiles (*The lesson is written using 2-color counters. You will need to modify the lesson accordingly if you use algebra tiles or another manipulative.*)
- Subtracting Integers recording sheet
- Compare and Contrast activity sheet

Introductory Activity

- Pose the following scenario to your students.

There are 9 boys and 15 girls in my math class.
How many total students are in the class?
Are there more boys or girls? How many more?

Ask the students to explain their how they got their answer. How did they know what operation to use?

- Present the following statement to the class.

When you subtract two number, the answer is always a smaller number.

What do you think about this statement? The object is for the students to come up with a counterexample to the statement and make a new conjecture. This activity will give students a chance to share what they know about subtraction, specifically about subtracting integers.

Plan for Instruction

1. Make a chart on the board and write each problem, the model and the answer as you work through the problems below. You will be using this in step 6.

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2. Distribute 2-color counters or Algebra tiles to students. Ask students to read the following expression: $8-4$ (Eight take away 4.) Next, ask them to model it along with you. Start by placing 8 yellow tiles down. (You can use an overhead, document camera or Smartboard file.) Ask a student to read the expression again and ask them what it tells them to do. (Take away 4.) Students will be able to determine the difference without modeling, but it is important for them to begin representing subtraction expressions. *What is the answer? How was the action of taking away represented in the model?* Students should place 8 yellow counters and then *take away* 4, leaving an answer of 4.
3. Present the problem $-4-(-1)$ to students. Ask a student to read the expression for the class. (-4 minus -1 or -4 take away -1). This is important to point out as you model the expression. As you model have students follow along. Begin by placing 4 red counters and then *take away* (which models minus) 1 red counter, leaving an answer of -3.
4. Present the problem $3-5$ to students. Ask a student to read the expression for the class. (Three minus five or three take away five). Model the 3 with students. *How many do I need to take away? Do I have enough counters? What can I do so that I have 5 yellow counters to take away?* If no one comes up with adding zero pairs, then model that for students. As you add zero pairs, ask each time if there are 5 yellow counters to remove. Continue until you have enough. Then model taking the 5 counters away and ask students what you have left and the answer to the problem, $3-5$.
5. Present the problem $2-(-2)$ to students. Ask a student to read the expression for the class. (Two minus -2 or two take away -2). Model the 2 with students. *What do I need to take away? Do I have enough counters? What can I do so that I have 2 red counters to take away?* If no one comes up with adding zero pairs, then model that for students. As you add zero pairs, ask each time if there are 2 red counters to remove. Continue until you have enough. Then model taking the 2 red counters away and ask students what you have left and the answer to the problem, $2-(-2)$.
6. Ask the class to look back at the problems and answers that we have done so far using the chart on the board. *What do you notice? What do you wonder?* Listen to what students observe and use this information to determine if you need more practice or if students are ready to do some problems on their own.
7. Distribute the “Subtracting Integers” recording sheet. Students will be modeling the problems with the counters and recording their actions on the recording sheet. There are three boxes in the modeling section. The first box is to draw the model of the first number in the expression. The second box is to show the action of adding zero pairs or taking counters away. The third box is for the answer. You do not have to use this format with your students as this is just one strategy. Allow students to work on their own or with a partner to complete the activity. Monitor students as they work, answering questions and addressing any misconceptions. Once all students have finished, have students share their solutions using a document camera or allowing them to share their models.
8. Revisit the conjecture/counterexample statement from the warm up:

When you subtract two number, the answer is always a smaller number.

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What do you think about this statement now? Students should realize that the difference is not always smaller than the original numbers in the problem.

Pulling It All Together (Reflection)


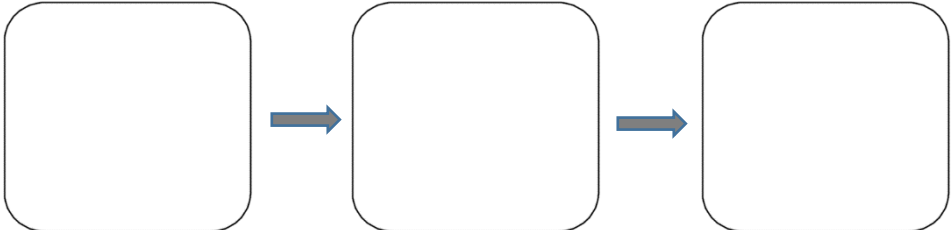
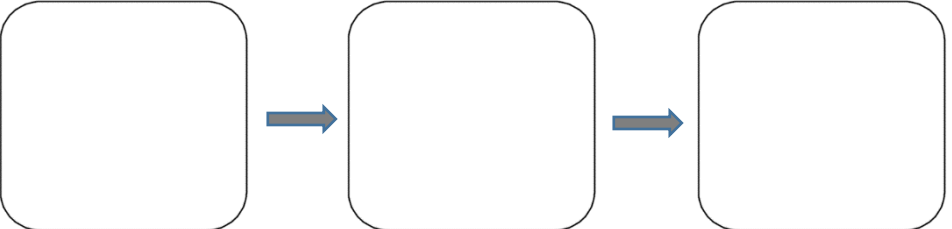
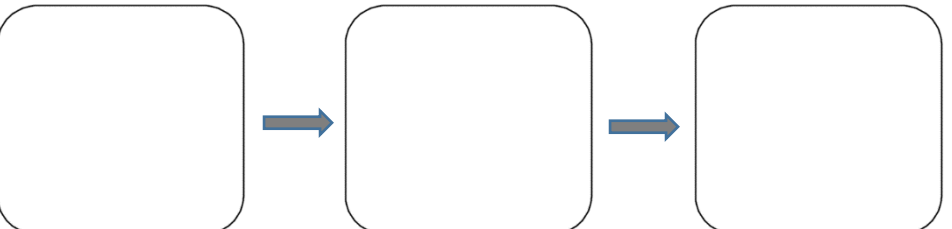
Students will complete the “Compare and Contrast” activity sheet.

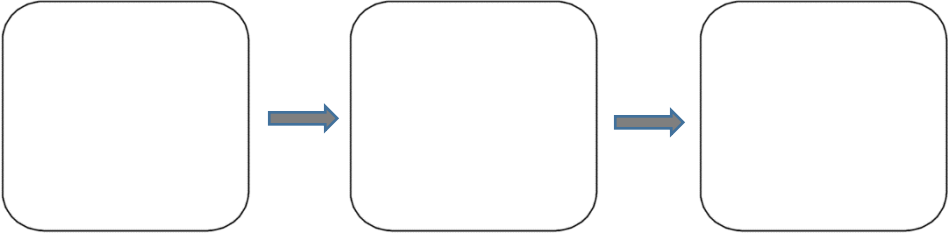
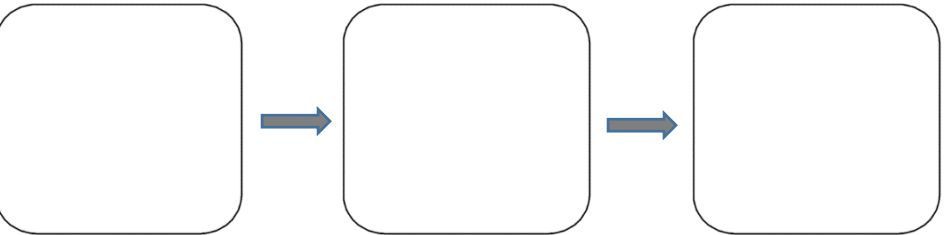
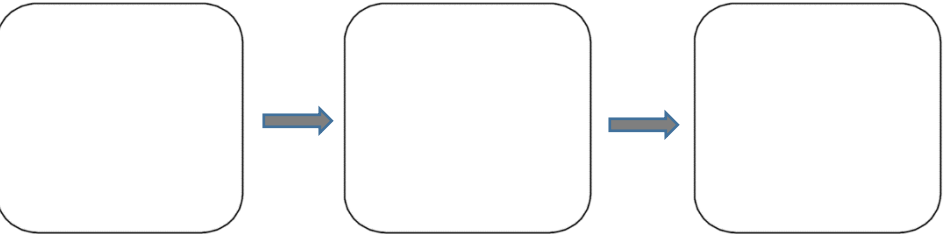
Note: The following pages are intended for classroom use for students as a visual aid to learning.

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Name: _____

Subtracting Integers

Subtraction Sentence	algebra tiles 	Difference
$2 - 5$		
$-6 - (-3)$		
$5 - (-5)$		

$-4 - 3$		
$0 - (-3)$		
$-2 - (-5)$		

Name: _____

Compare and Contrast!

Compare and contrast the two Addition Sentences. How are they alike? How are they different?

$$3 + (-4)$$

$$3 - 4$$

How are they alike?

How are they different??