

**Goals:**

- Define subtraction as taking apart and taking from
  - Define "-" as the mathematical symbol for subtraction
  - Explain that in subtracting two two-digit numbers, one subtracts tens from tens, ones from ones and sometimes it is necessary to decompose tens
  - Explain that in subtracting two three-digit numbers, one subtracts hundreds from hundreds, tens from tens, ones from ones and sometimes it is necessary to decompose tens and/or hundreds
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**Prerequisite Knowledge:**

- Understanding of place value up to hundreds
  - Understanding of numeric representations using base-ten blocks up to the hundreds place
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**Activities**

1. Working with a partner and using blocks:
  - a. Discuss with your partner what '*take three from eight*' would look like. There are different ways to represent this using the blocks. Try to come up with more than one, if possible. Draw your findings below and be prepared to share your thoughts with the class.
  - b. Whole Class Discussion: What are ways to physically represent the problem '*take three from eight*' using the blocks?
  - c. With your partner, create a word problem that represents the math problem '*take three from eight*'. Be prepared to share your problem with the class.

- d. Whole Class Discussion: What English words were used to represent the math problem? Were there any surprising or notable words?

2. Working with a partner,

- a. Given  $5 - 2$ , think of words that would show a subtraction between these two numbers.

- b. Create a word problem for the subtraction problem  $5 - 2$ .

- c. Class Discussion: What words were used to show this subtraction problem? Did anyone think of any new words for subtraction?

3. Working with your partner,

- a. Your instructor will hand you some blocks. Physically take 9 cubes away from 12 cubes. Draw your result below. Was anything needed in order to take 9 cubes away from 12 cubes?

- b. Create a subtraction problem involving one trade. (Try to create a simple math problem.) Draw your problem below. How do you know it involves a single trade?

4. Working with a partner, how would you subtract  $305 - 76$  using the blocks? Draw your result below. Be prepared to post your drawing on the board for the class.



**Goals:**

- Define subtraction as taking apart and taking from
  - Define "-" as the mathematical symbol for subtraction
  - Explain that in subtracting two two-digit numbers, one subtracts tens from tens, ones from ones and sometimes it is necessary to decompose tens
  - Explain that in subtracting two three-digit numbers, one subtracts hundreds from hundreds, tens from tens, ones from ones and sometimes it is necessary to decompose tens and/or hundreds
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**Prerequisite Knowledge:**

- Understanding of place value up to hundreds
  - Understanding of numeric representations using base-ten blocks up to the hundreds place
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**Lesson Materials:**

- Base-Ten Blocks
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**Preparation**

- Sort and organize base-ten unit blocks into baggies of 11 blocks each
  - Sort and organize base-ten unit blocks into baggies of 9 blocks each
  - Sort and organize baggies with 1 base-ten rod and 2 base-ten unit blocks (a total of 12)
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**Lesson Breakdown:**

<b>Activity</b>	<b>Size of Group</b>	<b>Time in Activity</b> <b>Total Time: 55 minutes</b>
Subtract 3 blocks from 8 blocks in 2 different ways	Groups of 2	15 minutes
Create a subtraction word list and use the list to create a subtraction problem	Whole class	10 minutes
Subtract 9 blocks from 12 blocks by breaking or borrowing	Groups of 2	15 minutes
Show an example using a double trade	Whole class	15 minutes

## Activities

5. Working with a partner and using blocks:

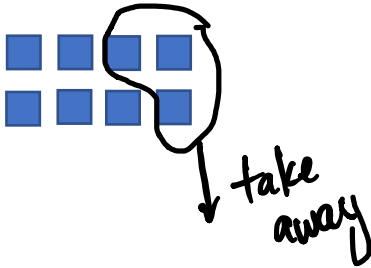
- Discuss with your partner what *'take three from eight'* would look like. There are different ways to represent this using the blocks. Try to come up with more than one, if possible. Draw your findings below and be prepared to share your thoughts with the class.

Make sure they recognize that the number after 'from' is the starting quantity. They should take 3 blocks from the 8 blocks and be left with 5 blocks.

- Whole Class Discussion: What are ways to physically represent the problem *'take three from eight'* using the blocks?

### Two Representations

One way: start with 8 and take 3 away  
This way illustrates the 'take from'



Another way: show 8 minus 3. Line them up and then take away



- With your partner, create a word problem that represents the math problem *'take three from eight'*. Be prepared to share your problem with the class.

Have each group discuss and present their word problem. Suggest asking them, "how do you know that your problem represents subtraction?" We expect some type of language revolving around having some quantity and taking a quantity away from it.

- Whole Class Discussion: What English words were used to represent the math problem? Were there any surprising or notable words?

Discuss students words. Ask them other possible words. Allow them to lead the conversation. If a student's response doesn't make sense, then ask them to expand on their logic. Ask things like, "can you use that word in a problem?" If there is flawed logic present, expand on the logic (words used by students).

Create a list from student thinking.

6. Working with a partner,

- Given  $5 - 2$ , think of words that would show a subtraction between these two numbers.

For example, 'Two less than five', 'Two fewer than five', 'Two subtracted from five', 'Five minus two', 'Five less two', 'Five subtract two'. Ask for any other words that might indicate a subtraction, for example, 'used', 'removed', etc.

- b. Create a word problem for the subtraction problem  $5 - 2$ .

Walk around the room and read the problems. Watch for the correct terminology. Verify that the problem is indeed a subtraction problem. Check the question being asked.

- c. Class Discussion: What words were used to show this subtraction problem? Did anyone think of any new words for subtraction?

Expand on list created by students from earlier.

7. Working with your partner,

- a. Your instructor will hand you some blocks. Physically take 9 cubes away from 12 cubes. Draw your result below. Was anything needed in order to take 9 cubes away from 12 cubes?

Twelve in this context should be shown as 1 rod and 2 unit cubes. If the student is given 12 individual cubes, it will take away from the fact that they must break the rod in order to borrow from ten to take 9 individual cubes away. The point of this problem is to make trades in terms of breaking or borrowing.

The students will need to approach the instructor to trade in the rod. Wait for the students to come to you. This will introduce the concept of breaking/borrowing and trading a rod for 10 cubes.

- b. Create a subtraction problem involving one trade. (Try to create a simple math problem.) Draw your problem below. How do you know it involves a single trade?

A trade is needed when one tries to take a quantity of a certain type away but cannot because of amount/quantity of that type is not available in its current form. One must break a larger quantity of a different type to make the problem doable. For example,  $14 - 8$  would need a trade. 14 consists of 1 ten rod and 4 individual units. We are trying to take 8 individual units away from the 4 but cannot because 8 is larger than 4. Therefore, we must break the 1 ten rod into 10 individual units (the trade) so that we have 14 individual units and thus, we can take away 8 individual units.

8. Working with a partner, how would you subtract  $305 - 76$  using the blocks? Draw your result below. Be prepared to post your drawing on the board for the class.

This will need a double trade. Ask one group to volunteer to show each of the trades on the board.

Represent each number. It would be best to use the small cube as the unit for this problem. The students should draw 3 flats, 0 rods and 5 small cubes and 7 rods and 6 small cubes.

Next the students should show the need to break one of the 3 flats into 10 rods and then one of those rods into 10 small cubes. At this point there are 15 small cubes and we are ready to take 6 from that. We then take 7 rods from the 9 rods present. Then the 2 flats remain. In the end the student will have 2 flats, 2 rods and 9 small cubes.

Note: it may help students to know that 305 is the same as 2 one hundreds, 9 tens, and 15 ones. In this form, we have enough of each type to do the computation.