

# Comparing Discrete Quantities

## Comparing Discrete Quantities

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Summary	Students compare amounts of tokens and unknown amounts of discrete quantities. In both cases they are guided to adopt line segments to represent discrete amounts and the differences between them. They are also asked to discuss composition of measures: "the difference plus the smaller amount is equal to the larger amount" and, "the larger amount minus the difference is equal to the smaller amount".
Goals	<ol style="list-style-type: none"><li>1. Work with differences between two discrete quantities.</li><li>2. Represent discrete amounts as line segments.</li><li>3. Work on the composition of measures.</li></ol>
Materials	Overheads, Handouts
Keywords	Describing Magnitudes Full Class Discussion Interpretation of Symbols Small Group Work
Foci	<ol style="list-style-type: none"><li>1. Reifying differences</li><li>2. Composition of measures (addition and subtraction)</li><li>3. Representing discrete amounts as line segments</li></ol>

## Introduction:

In this lesson we will help children to adopt line segments previously used to represent heights as a legitimate representation for amounts of discrete quantities. We will also start work on the composition of measures.

## Activity Plan:

### Comparing Tokens

#### 1. Comparing amounts of tokens [Whole Class]

Show the overhead on page 1 and ask the class:

*Do we have the same amount of red tokens as green tokens?*

*Which pile has more tokens?*

*Which pile has fewer tokens?*

*How can we make the two piles have the same amount?*

*What is the difference in the number of tokens?*

*How can we compare the two amounts?*

#### 2. Diagramming two amounts [Group Work]

Distribute the handout on page 2, display the corresponding overhead (also page 2), and ask the class to work in pairs and to represent the two amounts and the difference between them on paper.

#### 3. Adopting lines to represent discrete amounts [Whole Class]

Select the work of a few children to show to the whole class. Discuss and determine with the children where, in their drawings, they represented each amount and the difference between them.

Then introduce vertical lines to represent the two amounts using the overhead on page 3:

*What label should go under the longer line?*

*Whose label should go under the shorter line?*

*How can we make the two amounts equal?*

*What is the difference between the two amounts?*

Then assign numbers to these segments on the overhead on page 3. Also, label the segments with subscripts. Ask where the difference lies and how big it is.

Introduce the line segment representation for the difference between the amounts, moving page 4's overhead over page 3's overhead and ask:

*What label should go under this small line?*

*How much is it worth?*

*What do you get if you join this small line to the line that represents the smaller amount of tokens?*

*What do you get if you take away a part of the longer line that is the same size as the small line that represents the difference?*

Assign numbers and label segments on page 4's overhead as children answer the questions above.

#### *4. Introducing other discrete amounts and measuring units [Whole Class]*

Remind the children that the same lines could represent heights (as done in the 3.04 lesson – Comparing Heights).

Ask children to generate other dimensions that could be represented by the two lines.

Move the overhead on page 5 over page 2's overhead and ask:

*What if each little part represents 2 dollars? What would the difference be?*

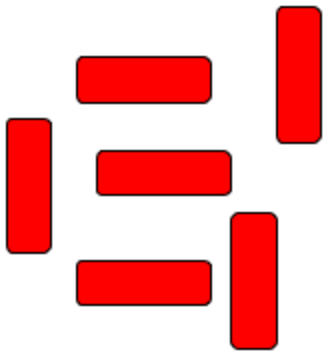
*What if each little part represents 3 children?*

#### 5. Working with other contexts [Whole Class]

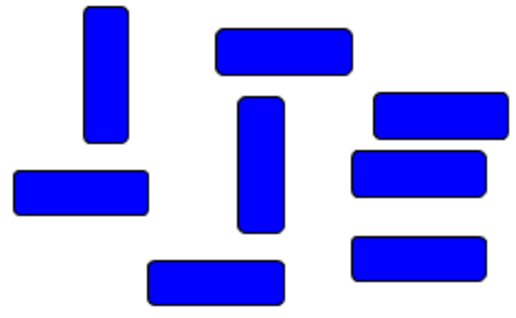
If there is time left, show the overheads from pages 6-8, one at a time, and ask the children to suggest, in each case, how to draw and how to label lines to represent the amounts and the difference between them.

#### 6. Present homework for students [Whole Class] (Page 9)

Show the overhead of page 8 and explain that, for each statement, you expect them to use lines to represent the amounts and the difference between them.



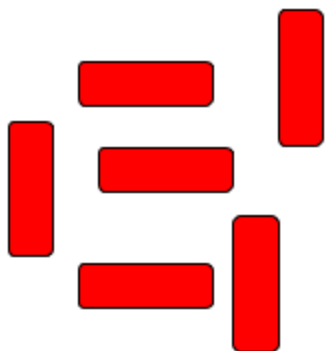
Red Tokens



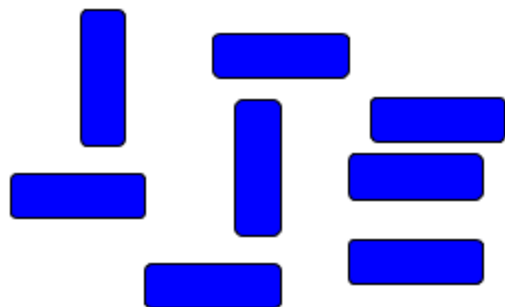
Blue Tokens

**Overhead and Handout: Representing Discrete Amounts** (Page 2)

Name: \_\_\_\_\_ Date: \_\_\_\_\_



Red Tokens



Blue Tokens

Joey does not know how to count.  
Draw a picture below so Joey will **know for sure** whether there are more red or blue tokens.

A large grid area for drawing a picture to compare the number of red and blue tokens. The grid is approximately 20 units wide and 25 units high.

**Overhead: Discrete Quantities as Line Segments**  
**(Page 3)**

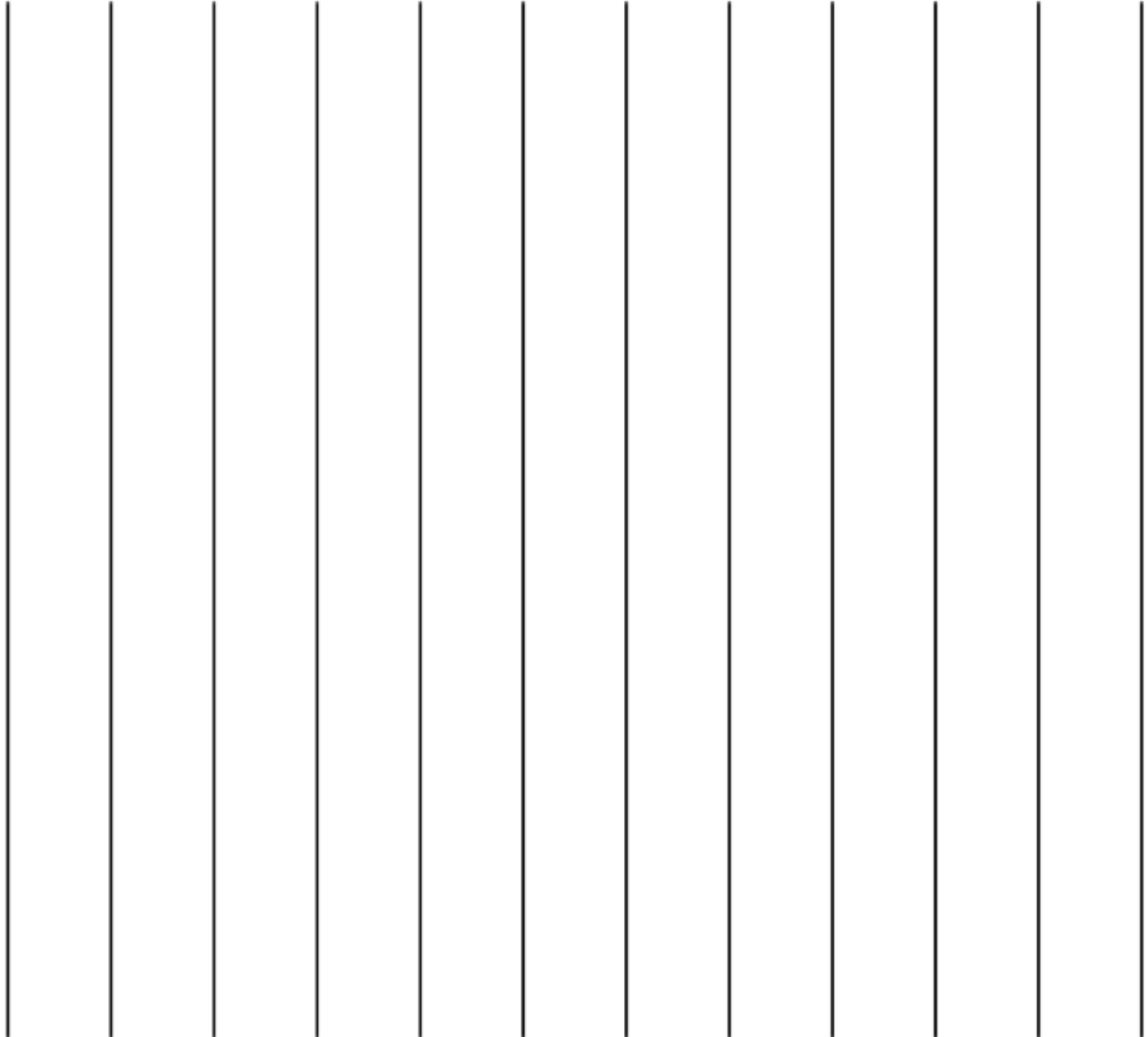


**Overhead: The Difference between the Two Heights as a Line Segment**  
**(Page 4)**



**Overhead: Rulers to show the two line segments as  
quantified amounts (Page 5)**

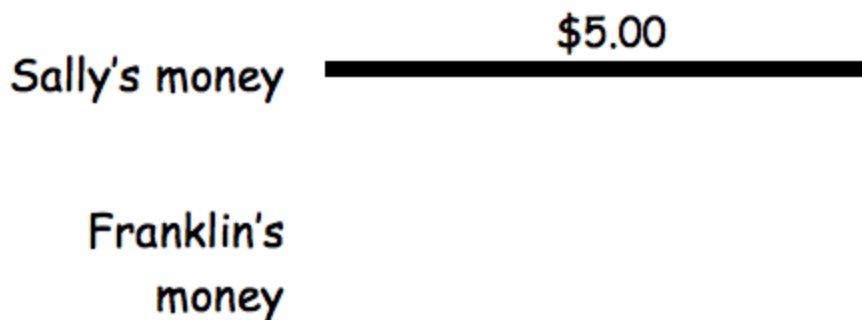
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**Overhead: Line Segments to Represent Quantities**  
**(Page 6)**

Sally has \$5.00.

Sally has \$2.00 more than Franklin.



**Overhead: Comparing Train and Bus Tickets (Page 7)**



How much more it costs to travel by train than by bus.



**Overhead: Line Segments – Another Context (Page 8)**

In Mrs. Jones' class,

- there are 11 girls
- there are 3 more girls than boys.

Use line segments to compare the number of boys and girls in Mrs. Jones' class.



# Overhead and Homework: Line Segments to Represent Quantities (Page 9)

Name: \_\_\_\_\_ Date: \_\_\_\_\_

### Example:

<p>Sally has \$5.00. Franklin has \$2.00 less than Sally. The difference between their amounts is \$2.00</p>	<p>Sally's money <math>\overline{\hspace{2cm}}</math> \$5.00  <math>\hspace{1.5cm}</math> <math>\overline{\hspace{1cm}}</math> \$2.00      Franklin's money <math>\overline{\hspace{1.5cm}}</math>  <math>\hspace{0.5cm}</math> \$3.00</p>
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Complete the following table:

Comparing with words	Comparing with Line Segments
<p>There are 12 red squirrels and 17 gray squirrels in the field. The difference is: _____</p>	
<p>Jean walked for 30 minutes. <u>Silvio</u> walked for 20 minutes. Jean walked _____ minutes more than <u>Silvio</u></p>	<p>Number of minutes Jean walked <math>\overline{\hspace{3cm}}</math></p>

Draw and label the 3 line segments here.

Draw the 3 line segments and label them.