

STRUCTURES OF STORY PROBLEMS

COMPARE

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Compare problems involve **relationships** between quantities rather than actions. The third quantity does not actually exist, but it is the difference between the two amounts. There are three types of compare problems: difference unknown, larger unknown, and smaller unknown. For grades 3 and up, story problems may include “less than” and “more than” versions of the same problem and students are to choose the most effective method (addition or subtraction) to solve the problem.

When drawing compare problems, teachers should use a consistent format. This format has the three steps described below, but only one final diagram. It is important to note that students may draw a variety of diagrams representing what they do with concrete materials, and these (provided they are logical) should be accepted.

SAMPLE DIFFERENCE UNKNOWN

Mary sold 78 candy bars for the school fund raiser. Chantella sold 101. How many more did Chantella sell?

Chantella sold 101 chocolate bars for the school fund raiser. Mary sold 78. How many less did Mary sell?

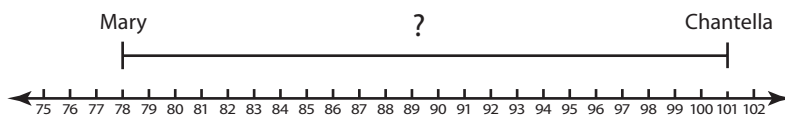
STEP 1:

Start with an appropriate number line.



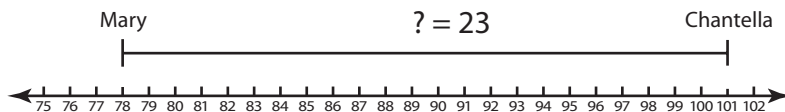
STEP 2:

Mark the two quantities on the number line and show the difference with a line segment running between them. Use a question mark (?) to identify the unknown.



STEP 3:

Fill in the unknown amount.



Step 3, the final diagram, is all that is seen by the teacher.

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The same process is used with all three types of compare questions.

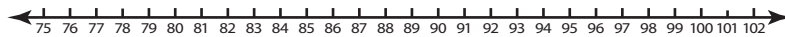
**SAMPLE
LARGER
UNKNOWN**

Mary sold 78 candy bars for the school fund raiser. Chantella sold 23 more than Mary. How many did Chantella sell?

Mary sold 78 candy bars for the school fund raiser. Mary sold 23 less than Chantella. How many did Chantella sell?

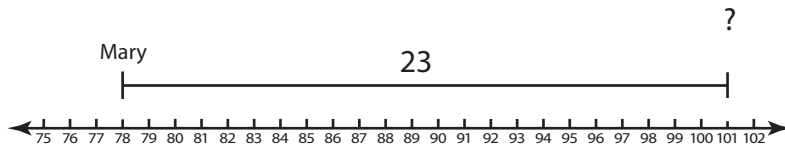
STEP 1:

Start with an appropriate number line.



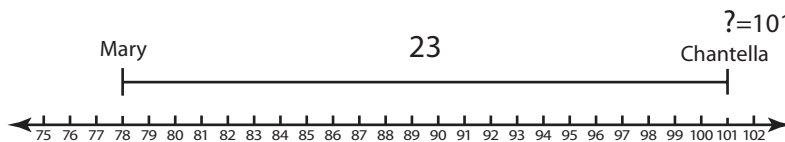
STEP 2:

Mark the two quantities on the number line and show the difference with a line segment running between them. Use a question mark (?) to identify the unknown.



STEP 3:

Fill in the unknown amount.



STRUCTURES OF STORY PROBLEMS

COMPARE

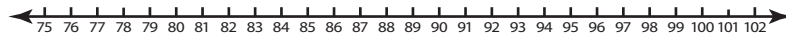
**SAMPLE
SMALLER
UNKNOWN**

Chantella sold 101 candy bars for the school fund raiser. This was 23 more than Mary. How many did Mary sell?

Chantella sold 101 candy bars for the school fund raiser. Mary sold 23 less than Chantella. How many did Mary sell?

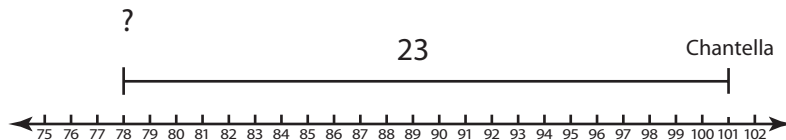
STEP 1:

Start with an appropriate number line.



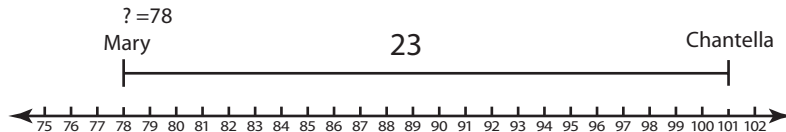
STEP 2:

Mark the two quantities on the number line and show the difference with a line segment running between them. Use a question mark (?) to identify the unknown.



STEP 3:

Fill in the unknown amount.



NOTE:

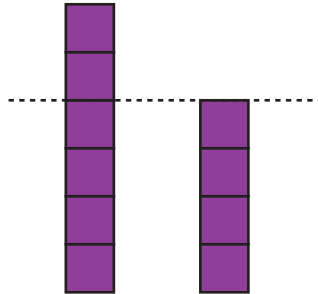
When completed, number line drawings for all three types of compare problems will look the same except for the location of the question mark. All other compare problems will produce identical drawings with two exceptions: the placement the question mark and the placement of the line segment.

ADDITION AND SUBTRACTION GRADE PRIMARY

COMPARE

**DIFFERENCE
UNKNOWN**

Kari Built a tower with 6 blocks and Alex built a tower with 4 blocks. How much taller is Kari's tower?

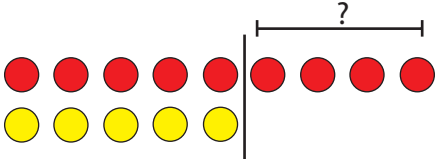
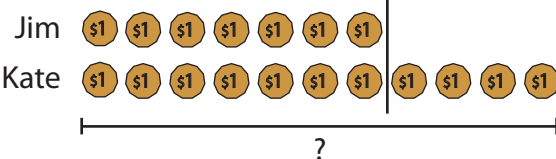
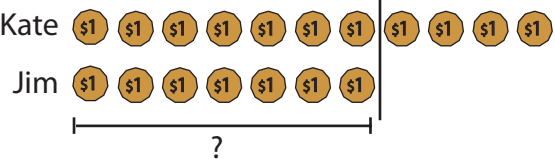


**LARGER
UNKNOWN**

**SMALLER
UNKNOWN**

ADDITION AND SUBTRACTION GRADE 1

COMPARE

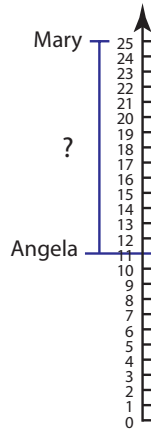
<p>STRUCTURES OF ADDITION AND SUBTRACTION</p>	<p>The remaining structures are introduced as students begin to make the connection between addition and subtraction. Students continue using set models and ten frames should also be used extensively.</p>
<p>DIFFERENCE UNKNOWN</p>	<p>Gillian has 9 red counters and 5 yellow counters. How many more red counters than yellow counters does she have?</p> <div style="display: flex; align-items: center; justify-content: center; margin: 20px 0;">  <div style="margin-left: 20px;"> <p>Think Addition: $5 + 4 = 9$ 5 of the red counters would match the 5 yellow. You would have to add on 4 more to get 9.</p> <p>Think Subtraction: $9 - 5 = 4$ Subtract 5 red counters that match the yellow 5 counters, leaving you with a difference of 4</p> </div> </div>
<p>LARGER UNKNOWN</p>	<p>Jim has \$7. Kate has \$4 more than Jim. How much money does Kate have?</p> <div style="display: flex; align-items: center; justify-content: center; margin: 20px 0;">  <div style="margin-left: 20px;"> <p>Think Addition: $7 + 4 = 11$ If Kate had \$7 she would match Jim. You have to add the 4 more Kate has.</p> </div> </div>
<p>SMALLER UNKNOWN</p>	<p>Kate has \$11. This is \$4 more than Jim. How much money does Jim have?</p> <div style="display: flex; align-items: center; justify-content: center; margin: 20px 0;">  <div style="margin-left: 20px;"> <p>Think Addition: $7 + 4 = 11$ What plus four is eleven?</p> <p>Think Subtraction: $11 - 4 = 7$ Start with the \$11 to match what Kate has, then subtract 4 to get the \$7 Jim has.</p> </div> </div>

ADDITION AND SUBTRACTION GRADE 2

COMPARE

DIFFERENCE UNKNOWN

Angela has 11 cents and Mary has 25 cents. How much more money would Angela need to have as much money as Mary?



Think Addition:

$$11 + 14 = 25$$

Start at 11 and count up to 25, to find the difference of 14.

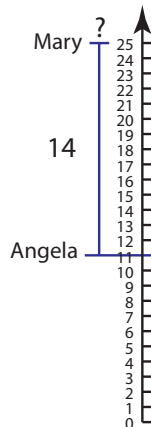
Think Subtraction:

$$25 - 11 = 14$$

Start with 25 and subtract 11, which is the part of Mary's that matches Angela's, to get 14.

LARGER UNKNOWN

Angela has 11 cents. Mary has 14 cents more than Angela. How much money does Mary have?



Think Addition:

$$11 + 14 = 25$$

If Mary had 11 cents, she would match Angela, but she has 14 cents more, so she must have 25 cents.

SMALLER UNKNOWN

Mary has 14 cents more than Angela. Mary has 25 cents. How much does Angela have?



Think Subtraction:

$$25 - 14 = 11$$

If Angela had 25 cents she would match Mary, but she has 14 cents less, so she has 11 cents.

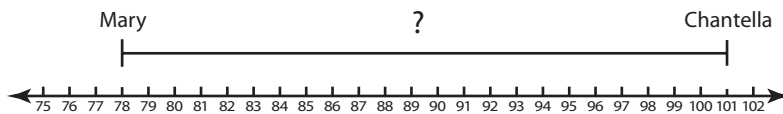
ADDITION AND SUBTRACTION GRADE 3

COMPARE

DIFFERENCE UNKNOWN

Mary sold 78 candy bars for the school fund raiser. Chantella sold 101. How many more did Chantella sell?

Mary sold 78 chocolate bars for the school fund raiser. Chantella sold 101. How many less did Mary sell?



Think Addition:

$$78 + 23 = 101$$

Start at 78 and count up to 101, to find the difference of 23.

Think Subtraction:

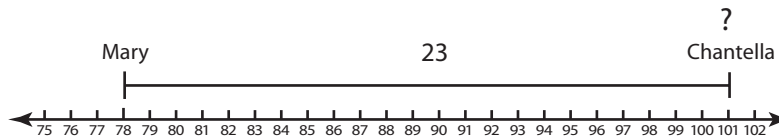
$$101 - 78 = 23$$

Start with 101 and subtract 78, to find the difference 23.

LARGER UNKNOWN

Mary sold 78 candy bars for the school fund raiser. Chantella sold 23 more than Mary. How many did Chantella sell?

Mary sold 78 candy bars for the school fund raiser. Mary sold 23 less than Chantella. How many did Chantella sell?



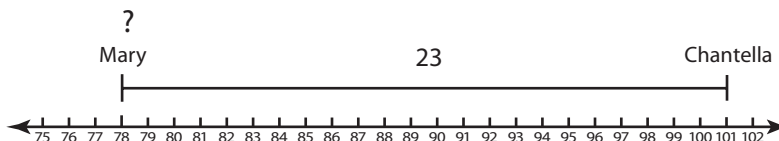
Think Addition:

$$78 + 23 = 101$$

SMALLER UNKNOWN

Chantella sold 101 candy bars for the school fund raiser. Mary sold 23 less than Chantella. How many did Mary sell?

Chantella sold 101 candy bars for the school fund raiser. This was 23 more than Mary. How many did Mary sell?



Think Subtraction:

$$101 - 23 = 78$$

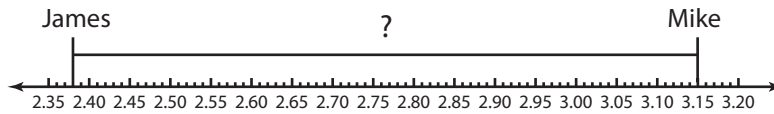
If Chantella sold 23 more you must go back 23 to see that Mary sold 78

ADDITION AND SUBTRACTION GRADE 4

COMPARE

DIFFERENCE UNKNOWN

James has \$2.38 and Mike has \$3.15. How much more money does Mike have?
 James has \$2.38 and Mike has \$3.15. How much less money does James have?

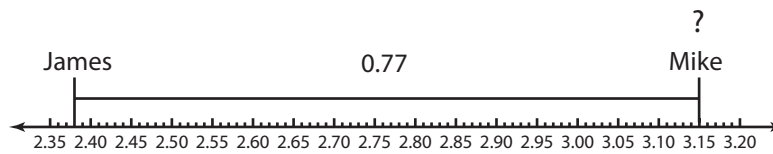


Think Subtraction:

$3.15 - 2.38 = 0.77$
 Start with the larger and subtract the smaller to find the difference.

LARGER UNKNOWN

James has \$2.38. Mike has \$0.77 more than James. How much money does Mike have?
 James has \$2.38. This is \$0.77 less than Mike. How much money does Mike have?

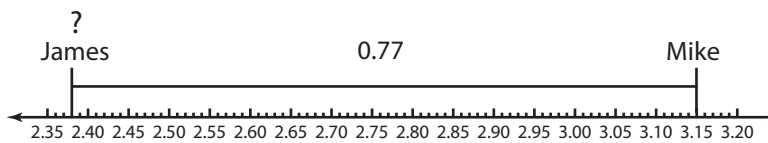


Think Addition:

$2.38 + 0.77 = 3.15$
 Start with the smaller number and count up.

SMALLER UNKNOWN

Mike has \$3.15. James has \$0.77 less than Mike. How much does James have?
 Mike has \$3.15. This is \$0.77 more than James. How much does James have?



Think Subtraction:

$3.15 - 0.77 = 2.38$
 Start with the larger number and subtract the difference to find out how much James has.

ADDITION AND SUBTRACTION GRADE 5

COMPARE

DIFFERENCE UNKNOWN

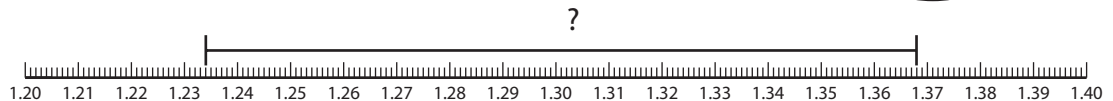
There are two piles of sugar on the table. One pile has a mass of 1.368 kg. The other has a mass of 1.234 kg. What is the difference in their mass?

Think Subtraction:

$$1.368 - 1.234 = \textcircled{0.134}$$

Think Addition:

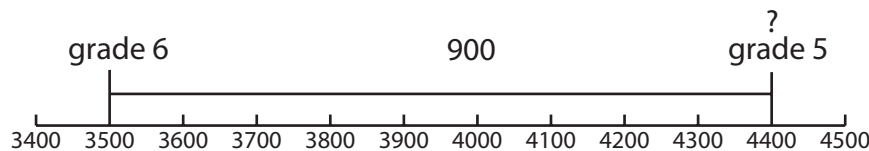
$$1.234 + \textcircled{0.134} = 1.368$$



LARGER UNKNOWN

The grade 6 class read a total of 3500 books this year. The grade 5 class read 900 books more than the grade 6 class. How many books did the grade 5 class read?

The grade 6 class read a total of 3500 books this year. This was 900 books less than the grade 5 class. How many books did the grade 5 class read?



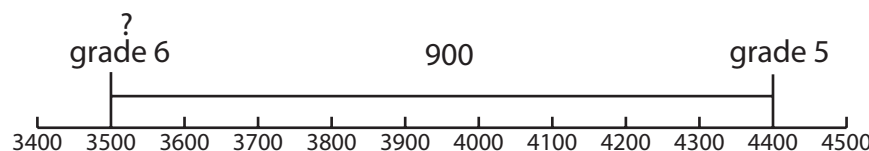
Think Addition:

$$3500 + 900 = \textcircled{4400}$$

SMALLER UNKNOWN

The grade 5 class read a total of 4400 books this year. The grade 6 class read 900 books less than the grade 5 class. How many books did the grade 6 class read?

The grade 5 class read a total of 4400 books this year. This was 900 books more than the grade 6 class. How many books did the grade 6 class read?



Think Subtraction:

$$4400 - 900 = \textcircled{3500}$$

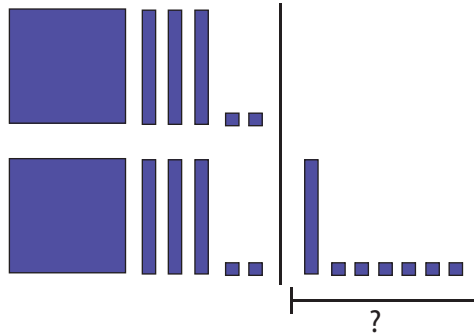
ADDITION AND SUBTRACTION GRADE 6

COMPARE

DIFFERENCE UNKNOWN

Cindy has 1.32 hectares of land. Her friend has 1.48 hectares. How much more land does Cindy's friend have?

Cindy has 1.32 hectares of land. Her friend has 1.48 hectares. How much less land does Cindy have?



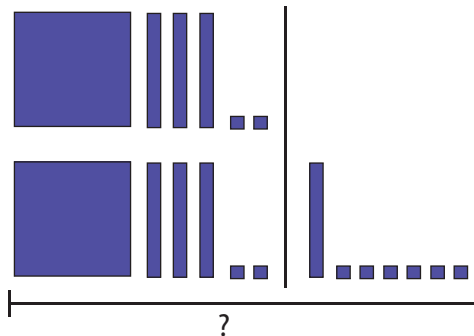
Think Subtraction:

$$1.48 - 1.32 = \textcircled{0.16}$$

LARGER UNKNOWN

Cindy has 1.32 hectares of land. Her friend has 0.16 hectares more. How much land does Cindy's friend have?

Cindy has 1.32 hectares of land. This is 0.16 hectares less than her friend. How much land does Cindy's friend have?



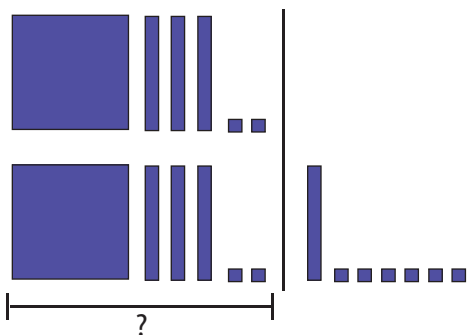
Think Addition:

$$1.32 + 0.16 = \textcircled{1.48}$$

SMALLER UNKNOWN

Cindy's friend has 1.48 hectares of land. Cindy has 0.16 hectares less. How much land does Cindy have?

Cindy's friend has 1.48 hectares of land. This is 0.16 hectares more than Cindy. How much land does Cindy have?



Think Subtraction:

$$1.48 - 0.16 = \textcircled{1.32}$$