

# Strip Models, Tape Diagrams, Bar Models, Oh My!

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## TAPE DIAGRAM

A drawing that looks like a segment of tape, used to illustrate number relationships. Also known as a *strip diagram*, *bar model*, *fraction strip*, or *length model*.



## PROGRESSIONS DOCUMENTS FOR THE COMMON CORE MATH STANDARDS

<http://ime.math.arizona.edu/progressions/>

## TECHNOLOGY

Thinking Blocks: [MathPlayground.com](http://MathPlayground.com) and iPad

Conceptua Math: [ConceptuaMath.com](http://ConceptuaMath.com) (Model tool coming soon!)

Ultimath Modeler: [ultimath.com](http://ultimath.com)

Houghton-Mifflin: Proprietary with curriculum and iPad

## Essential Discussions & Questions:

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*What is the word problem about? What is happening? Can you restate the word problem without any numbers?*

*What are the important facts? Are there any irrelevant facts?*

*What will the answer look like? (Units of measurement, multiple answers, level of accuracy, etc)*

*What information do we need in order to answer the question?*

*How can we draw a picture to solve this problem?*

*What do the bars represent?*

*What do we need to find?*

*What information do we know?*

*Are we given the total? Parts?*

*How do you find a missing part?*

*Is the problem asking for the difference between two numbers or are we given the difference?*

*Are we comparing two amounts?*

*Is there a more efficient strategy to solve this problem? Are there other approaches that would work?*

## Word Problems

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There were 48 chocolates in a box. After eating some of them, Tara found that she had  $\frac{5}{8}$  of the chocolates left. How many chocolates did she eat?

James bought a bag of sourballs.  $\frac{1}{4}$  of the sourballs were cherry,  $\frac{1}{8}$  were apple and  $\frac{1}{5}$  of the remainder were blueberry. If there were 24 blueberry sourballs, how many sourballs did he buy?

A refrigerator costs \$1739. An oven is \$850 cheaper than the refrigerator. Mrs. Coles buys both the refrigerator and the oven. How much does she pay?

On a shopping trip, Joonha spends  $\frac{1}{3}$  of his money at the Sports Plus. He then spends  $\frac{1}{3}$  of the money he has left at Target. Finally, he spends his remaining \$40 on a video game. How much money did Joonha have at first?

## Addition & Subtraction Situations

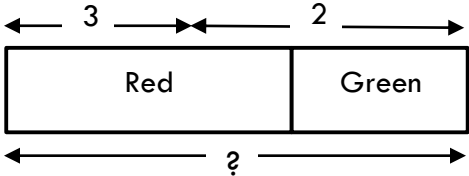
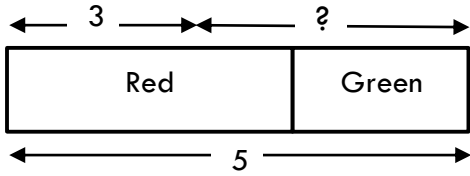
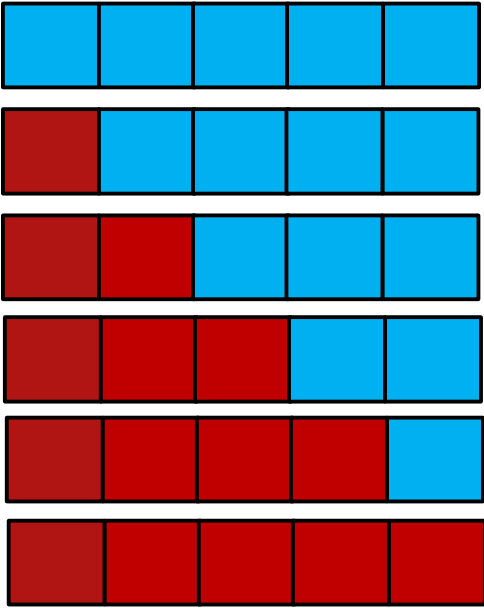
### ADD TO:

<b>Result Unknown</b>	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now?	
<b>Change Unknown</b>	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two?	
<b>Start Unknown</b>	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before?	

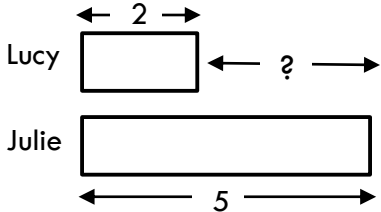
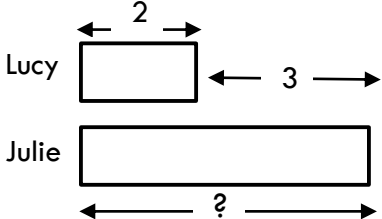
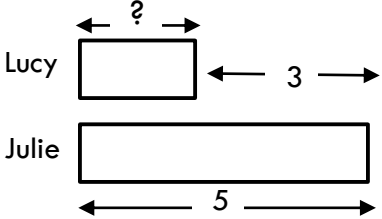
### TAKE FROM:

<b>Result Unknown</b>	Five apples were on the table. I ate two apples. How many apples are on the table now?	
<b>Change Unknown</b>	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat?	
<b>Start Unknown</b>	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before??	

**PUT TOGETHER/TAKE APART**

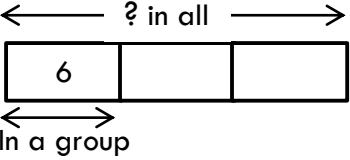
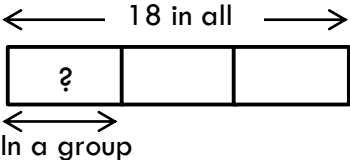
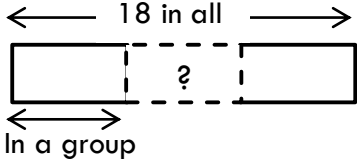
<p><b>Total Unknown</b></p>	<p>Three red apples and two green apples are on the table. How many apples are on the table?</p>	
<p><b>Addend Unknown</b></p>	<p>Five apples are on the table. Three are red and the rest are green. How many apples are green?</p>	
<p><b>Both Addends Unknown</b></p>	<p>Grandma has five flowers. How many can she put in the red vase and how many in her blue vase?</p>	

## COMPARE

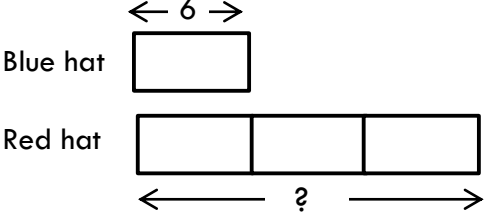
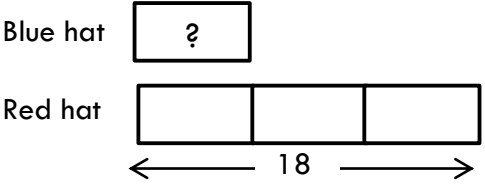
<p><b>Difference Unknown</b></p>	<p>Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy?</p> <p>OR: Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie?</p>	 <p>The diagram shows two horizontal bars. The top bar is labeled 'Lucy' and has a double-headed arrow above it labeled '2'. The bottom bar is labeled 'Julie' and has a double-headed arrow below it labeled '5'. A double-headed arrow between the right ends of the two bars is labeled with a question mark '?'.</p>
<p><b>Bigger Unknown</b></p>	<p>Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have?</p> <p>OR: Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have?</p>	 <p>The diagram shows two horizontal bars. The top bar is labeled 'Lucy' and has a double-headed arrow above it labeled '2'. The bottom bar is labeled 'Julie' and has a double-headed arrow below it labeled with a question mark '?'. A double-headed arrow between the right ends of the two bars is labeled '3'.</p>
<p><b>Smaller Unknown</b></p>	<p>Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have?</p> <p>OR: Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have?</p>	 <p>The diagram shows two horizontal bars. The top bar is labeled 'Lucy' and has a double-headed arrow above it labeled with a question mark '?'. The bottom bar is labeled 'Julie' and has a double-headed arrow below it labeled '5'. A double-headed arrow between the right ends of the two bars is labeled '3'.</p>

## Multiplication & Division Situations

### EQUAL GROUPS:

<p><b>Unknown Product</b></p>	<p>There are 3 bags with 6 plums in each bag. How many plums are there in all?</p> <p>Measurement example: You need 3 lengths of string, each 6 inches long. How much string will you need altogether?</p>	
<p><b>Group Size Unknown</b></p>	<p>If 18 plums are shared equally into 3 bags, then how many plums will be in each bag?</p> <p>Measurement example: You have 18 inches of string, which you will cut into 3 equal pieces. How long will each piece of string be?</p>	
<p><b>Number of Groups Unknown</b></p>	<p>If 18 plums are to be packed 6 to a bag, then how many bags are needed?</p> <p>Measurement example: You have 18 inches of string, which you will cut into pieces that are 6 inches long. How many pieces of string will you have?</p>	

**COMPARE:**

<p><b>Unknown Product</b></p>	<p>A blue hat costs \$6. A red hat costs 3 times as much as the blue hat. How much does the red hat cost?</p> <p>Measurement example: A rubber band is 6 cm long. How long will the rubber band be when it is stretched to be 3 times as long?</p>	
<p><b>Group Size Unknown</b></p>	<p>A red hat costs \$18 and that is 3 times as much as a blue hat costs. How much does a blue hat cost?</p> <p>Measurement example: A rubber band is stretched to be 18 cm long and that is 3 times as long as it was at first. How long was the rubber band at first?</p>	
<p><b>Number of Groups Unknown</b></p>	<p>A red hat costs \$18 and a blue hat costs \$6. How many times as much does the red hat cost as the blue hat?</p> <p>Measurement example: A rubber band was 6 cm long at first. Now it is stretched to be 18 cm long. How many times as long is the rubber band now as it was at first?</p>	