Calculation and Bar Modelling Policy - EYFS (Key Models)

Foundation Stage

Additive Reasoning

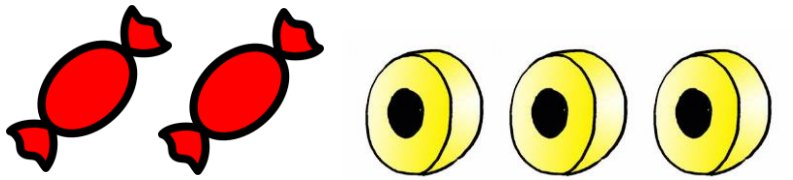
Guidance

Problems involving addition and subtraction have three possible unknowns. When given the value of two unknowns, the third can be found.

Examples of adding when the total is unknown:

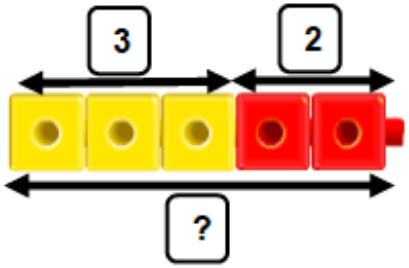
Aggregation (Two quantities/parts are combined)

Concrete experiences



Numicon

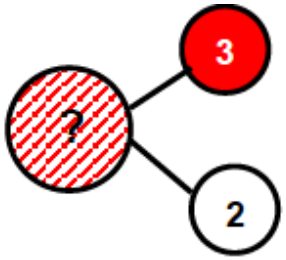
Multilink/ Cuisenaire/Bar model

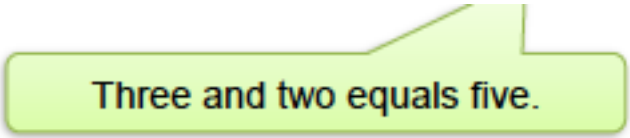


Abstract/Written Method/Language

Three yellow sweets and two red sweets are on the table. How many sweets are on the table?

3 + 2 = 5

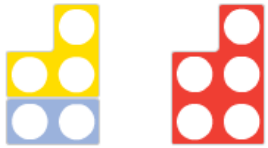




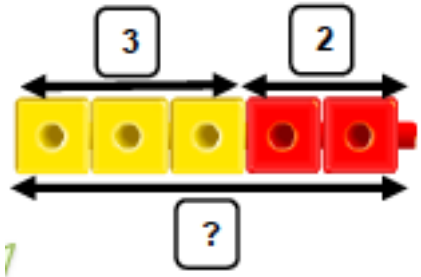
Augmentation (one quantity is increased by a provided amount)

Concrete experiences

Numicon



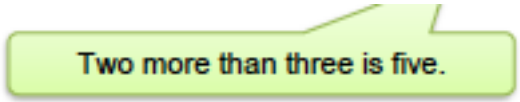
Multilink/ Cuisenaire/Bar model

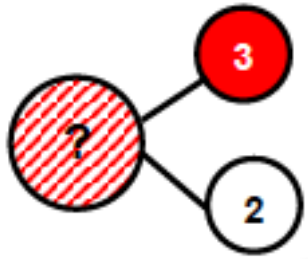


Abstract/Written Method/Language

James has three stickers. He was given two more. How many stickers does he have now?

3 + 2 = 5

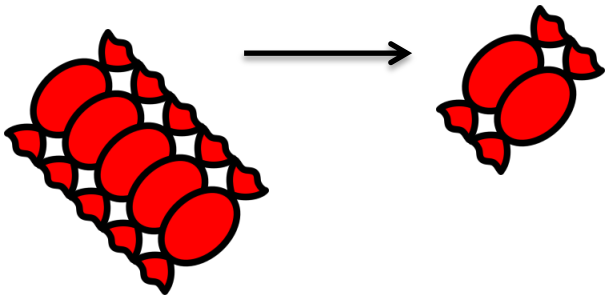




Examples of subtracting (one of the quantities/parts is unknown)

Take away (one quantity is decreased by a provided amount)

Concrete experiences



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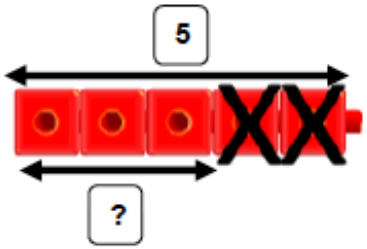
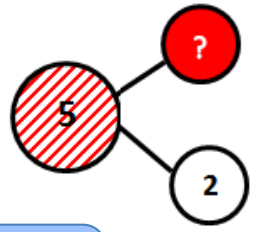
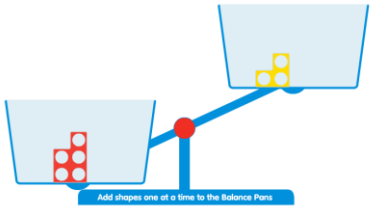
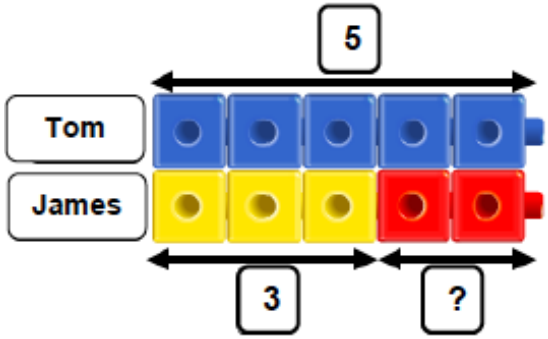
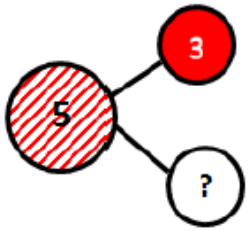
	Multilink/ Cuisenaire/Bar model  	Abstract/Written Method/Language Five sweets were on the table. Tom ate two sweets. How many sweets are on the table now? 5-2=3 3=5-2  Five subtract two equals three Two fewer than five is three. Three is two fewer than five.
	Comparison- find the difference	
	Concrete experiences  	Numicon 

Multilink/ Cuisenaire/Bar model



Abstract/Written Method/Language

Tom has five sweets and Jane has three sweets. How many more sweets does Tom have than Jane?



Five is two more than three.
Three is two fewer than five.

Multiplicative Reasoning (EQUAL GROUPS)

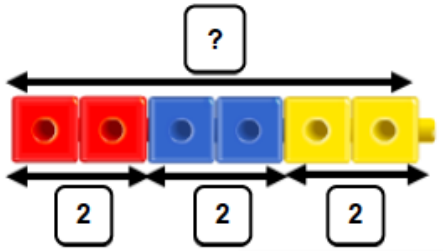
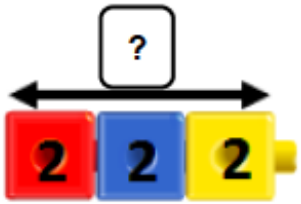
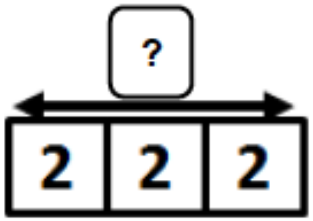
Guidance

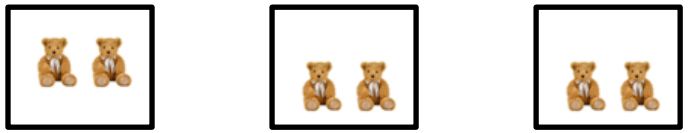
Problems involving multiplication and division have three possible unknowns- product, group size or number of groups. When given the value of two unknowns the third can be found. In bar modeling, all blocks represent the replication of an equal unit.

Multiplication with equal groups – group size and number of groups provided, product is unknown

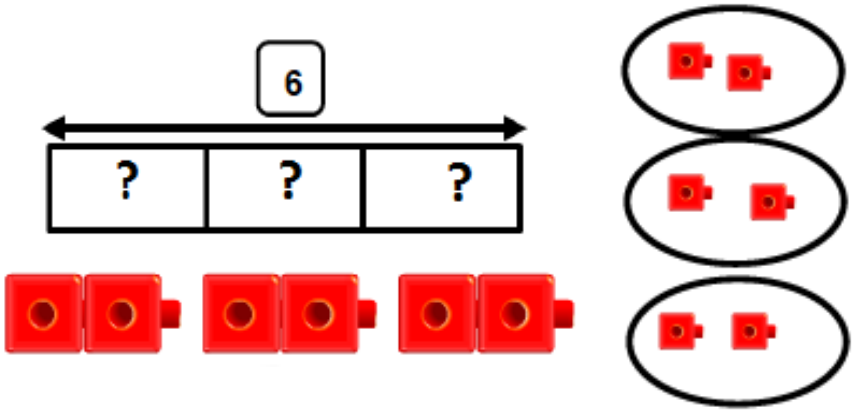
Concrete experiences

Numicon

	Multilink/ Cuisenaire/Bar model    	Abstract/Written Method/Language There are three boxes with two teddies in each box. How many teddy bears are there? $2 + 2 + 2 = 6$ $3 \times 2 = 6$ Three groups of two equals six. Six is equal to three groups of two. Two and two and two equals six. Three groups with two in each group equals six.
	Division with sharing- product and number of groups is known, <u>group size is unknown</u>	
	Concrete experiences 	Numicon  



Multilink/ Cuisenaire/Bar model



Abstract/Written Method/Language

If six teddy bears are shared equally into 3 boxes, how many teddy bears will be in each box?

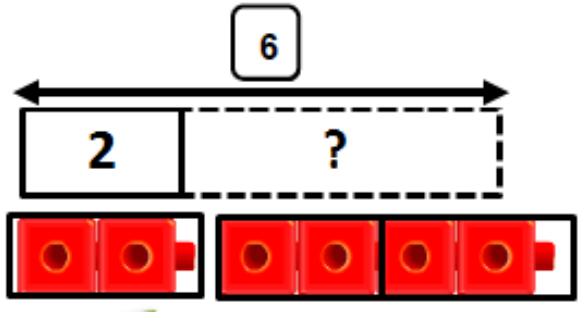
$6 \div 3 = 2$

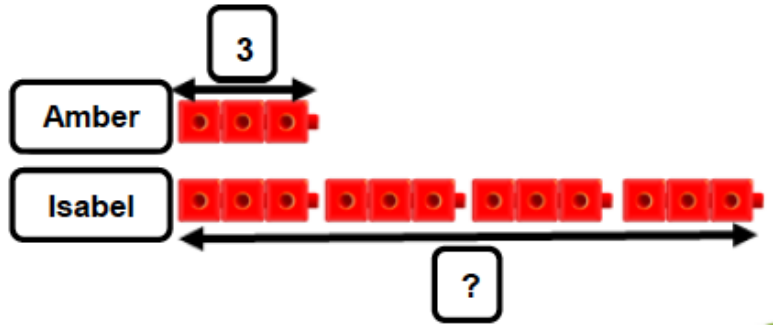
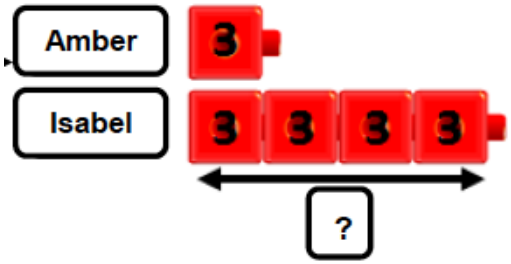
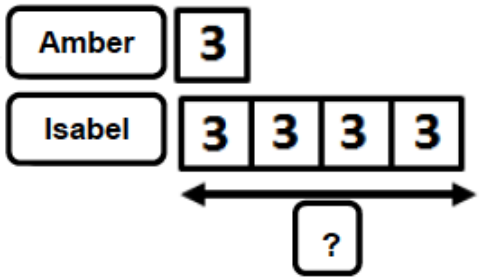
Six is equal to three groups with two in each group.

Division with grouping- product and group sizes is known, number of groups is unknown

Concrete experiences

Numicon

	Multilink/ Cuisenaire/Bar model  	Abstract/Written Method/Language If six teddy bears are to be packed 2 to a box, how many boxes are needed? There are three twos in six. Two can be taken from six, three times. Three equal groups of two are equal to six. $6-2-2-2=0$ $6\div 2=3$
	Multiplicative Reasoning (COMPARISON) Guidance: Problems involving multiplication comparison occur when two or more set are compared by showing one set is a number of times larger or smaller than the other set.	
	Multiplication- the smaller set and the multiplicative relationship is known, the product is unknown	
	Concrete experiences  	Numicon

	<u>Multilink/ Cuisenaire/Bar model</u>    	<u>Abstract/Written Method/Language</u> Amber read three books. Isabel read four times as many books as Amber. How many books did Isabel read? There are five equal groups altogether. Amber has one group and Isabel has four groups. All groups are equal. (1:4) Amber has $\frac{1}{5}$ of all the books. (proportion)

<table>
<tr><td></td><td colspan="2">Division with sharing – the larger set and the multiplicative relationship is known, <u>the smaller set is unknown</u></td></tr>
<tr><td rowspan="2"></td><td><u>Concrete experiences</u>
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 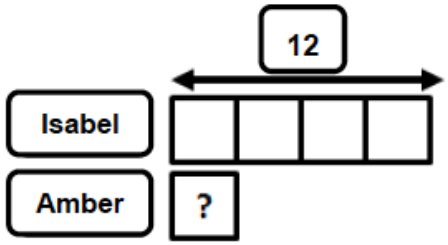
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Isabel read 12 books and that is four times as many books as Amber read. How many books did Amber read?</td></tr>
<tr><td></td><td colspan="2">Division with grouping – the larger set and the smaller set is unknown, <u>the multiplicative relationship is unknown</u></td></tr>
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 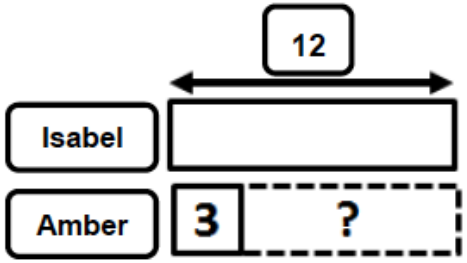
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