Year 1 and 2 Bar Model Progression

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|  | Addition and Subtraction | Practical examples |
| Joining Problems  *Present addition problems in these different ways so that the children become familiar with them.* | Whole unknown  Ben has 5 red marbles and 8 green marbles.  How many marbles does he have altogether?   |  |  | | --- | --- | | ? | | | Red 5 | Green 8 |  |  | | --- | | *Combine two quantities to make a whole.* | | C:\Users\awright\Downloads\IMG_0441.JPGC:\Users\awright\Downloads\IMG_0439.JPG |
| Start Unknown  Ben has some marbles. Jack gave him 5 more. Now he has 13 marbles. How many marbles did Ben have to start with?   |  |  | | --- | --- | | Ben 13 | | | ? | Jack 5 |   *With this bar we know the whole but only one of the parts, children need to identify the missing part (this could be solved by subtraction / counting backwards).* | C:\Users\awright\Downloads\IMG_0449.JPGC:\Users\awright\Downloads\IMG_0446.JPG |
| Part Unknown  Ben has 13 marbles. 5 are red and the rest are blue.  How many blue marbles does he have?   |  |  | | --- | --- | | Ben 13 | | | Red 5 | ? |   *This bar is particularly valuable for seeing the difference between two quantities (this could be solved by counting on).* | C:\Users\awright\Downloads\IMG_0448.JPGC:\Users\awright\Downloads\IMG_0443.JPG |
| Separating Problems  *Present subtraction problems in the different ways so that the children become familiar with them.* | Result Unknown  Ben had 13 marbles. He gave 5 to Jack. How many marbles does Ben have left?   |  |  | | --- | --- | | Ben 13 | | | ? | Jack 5 | | C:\Users\awright\Downloads\IMG_0449.JPGC:\Users\awright\Downloads\IMG_0446.JPG |
| Part Unknown  Ben had 13 marbles. He gave some to Jack. Now he has 5 marbles left. How many marbles did Ben give to Jack?   |  |  | | --- | --- | | Ben 13 | | | Jack ? | 5 | | C:\Users\awright\Downloads\IMG_0449.JPGC:\Users\awright\Downloads\IMG_0446.JPG |
| Start unknown  Ben had some marbles. He gave 5 to Jack, now he has 8 marbles left. How many marbles did Ben have to start with?   |  |  | | --- | --- | | ? | | | 8 | Jack 5 | | C:\Users\awright\Downloads\IMG_0466.JPGC:\Users\awright\Downloads\IMG_0450.JPG |

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| Comparing Problems  This approach is suited to ‘take away’ problems (counting backwards). | Difference Unknown  Ben has 13 marbles. Jack has 5 marbles. How many more marbles does Ben have than Jack?  13   |  |  | | --- | --- | | ? | Jack 5 | | C:\Users\awright\Downloads\IMG_0446.JPGC:\Users\awright\Downloads\IMG_0468.JPG |
| Smallest Part Unknown  C:\Users\awright\Downloads\IMG_0471.JPG  Ben has 13 marbles. He has 5 more marbles than Jack. How many marbles does Jack have?  13   |  |  | | --- | --- | | Jack ? | 5 | | C:\Users\awright\Downloads\IMG_0467.JPG |
| Largest Part unknown  Jack has 5 marbles. Ben has 8 more marbles than Jack. How many marbles does Ben have?  ?   |  |  | | --- | --- | | 8 | Jack 5 | | C:\Users\awright\Downloads\IMG_0466.JPGC:\Users\awright\Downloads\IMG_0450.JPGn |
| Comparing Problems  This approach is suited to ‘find the difference between’ problems by counting on. | Difference Unknown  Ben has 13 marbles. Jack has 5 marbles. How many more marbles does Ben have than Jack?  ?   |  |  | | --- | --- | | Ben 13 | | | Jack 5 | | C:\Users\awright\Downloads\IMG_0463.JPGC:\Users\awright\Downloads\IMG_0458.JPG+ |
| Smallest Part Unknown  Ben has 13 marbles. He has 5 more marbles than Jack. How many marbles does Jack have?  ?   |  |  | | --- | --- | | Ben 13 | | | 5 | | C:\Users\awright\Downloads\IMG_0465.JPGC:\Users\awright\Downloads\IMG_0455.JPG |
| Largest Part unknown  Jack has 5 marbles. Ben has 8 more marbles than Jack. How many marbles does Ben have?   |  |  | | --- | --- | | Ben ?  ? | | | Jack 5 | | C:\Users\awright\Downloads\IMG_0459.JPGC:\Users\awright\Downloads\IMG_0456.JPG |

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| Part-Whole problem  *Present calculations in the different ways so children are familiar with all of them.* | Multiplication and Division | Practical examples |
| Whole Unknown  Pencils cost 4p each. How much do 6 pencils cost?  *Whole*  *Number of parts*   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | ? | | | | | | | 4p | 4p | 4p | 4p | 4p | 4p |   *Size of parts* | C:\Users\awright\Downloads\IMG_0460.JPG |
| Size of Part unknown  Zac bought 6 pencils for 24p. How much does 1 pencil cost?  *Whole*  *Number of parts*   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 24p | | | | | | | ? |  |  |  |  |  |   *Size of parts* | C:\Users\awright\Downloads\IMG_0461.JPG |
| Number of parts unknown  Pencils cost 4p each. Zac bought some pencils for 24p. How many pencils did he buy?  *Whole*  *Number of parts*   |  |  | | --- | --- | | 24p | | | 4p |   *Size of parts* | C:\Users\awright\Downloads\IMG_0462.JPG |

Example bar model problems (NCETM)

Year 1

1. Jack has 5p and Daniel has 8p. How much do they have altogether?
2. A lolly costs 6p. Holly paid with a 10p coin. How much change does she get?
3. Michael says that 16 + 5 = 21. Is he correct?
4. I think of a number. I subtract 5. The answer is 4. What was my number?
5. How many gloves are there all together in 6 pairs of gloves?
6. Twelve people are split into two equal groups. How many are in each group?
7. Mrs Small puts five 5p coins into her purse. How much is in her purse altogether?

Year 2

1. Dylan has 37coloured pencils ad he buys 30 more. How many does he now have?
2. Sophie has 40 beads. She loses 25 of them. How many does she have left?
3. What is the difference between seventy six and thirty five?
4. I think of a number. I subtract 5. The answer is 4. What was my number?
5. Last week Ellie got £1.00 pocket money. She spent half of it. How much has she got left?
6. A tub contains 24 coins. Ali takes 5 coins. Jane takes 10 coins. How many coins are left in the tub?
7. Amelia writes the calculation below as a multiplication. What might she write?

3 + 3 + 3 + 3+ 3 = 15

1. Mr Siddique shares £18 equally between three sons. How much does each son get?
2. Charlotte cuts his pizza into 8 equal slices. He eats ¾ of the pizza and gives the rest to his dog. How many pieces does Charlotte eat?