Strategy Stages

Stage Zero: Emergent

Cannot consistently count a given number of objects

Stage One: One-to-one Counting

Can count and form a set of objects to ten but cannot solve simple problems that involve joining or separating sets

Stage Two: Counting from One on Materials

Count all the objects in both sets to answer the problem "Five lollies and three more lollies. How many lollies is that altogether?"

Stage Three: Counting from One by Imaging

Can image visual patterns of objects in their mind and count them

Stage Four: Advanced Counting (Counting On)

Can count on or backwards to solve addition and subtraction problems

Stage Five: Early Additive Part-Whole

Have begun to recognise that numbers can be partitioned and recombined and use known facts to find answers to problems

Stage Five: Early Additive Part-Whole (continued)

Compensation from known facts

Finding Fives – 9 + 7: 5 = 5 + 4 and 7 = 5 + 2. 5 + 5 = 10 and 4 + 2 = 6. 10 + 6 = 16

Making Ten – 8 + 5: 8 + (2 + 3) and 10 + 3 = 13

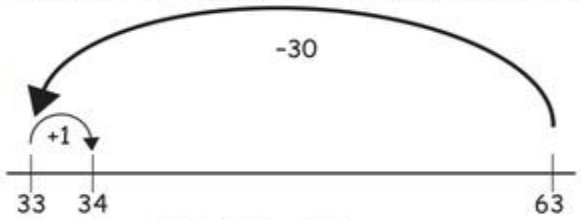
Using Doubles – 7 + 8: 7 + 7 is 14, so 7 + 8 = 15

Stage Six: Advanced Additive Part-Whole

Students can choose appropriately from a number of part-whole strategies to estimate answers and solve addition and subtraction problems. The efficiency of these students in addition and subtraction is reflected in their ability to derive multiplication answers from known facts.

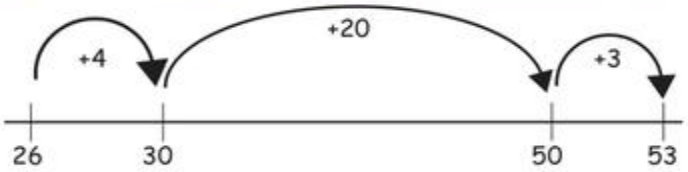
Standard Place Value with Tidy Numbers and Compensation

Example: 63 – 29 as 63 – 30 + 1



Reversibility

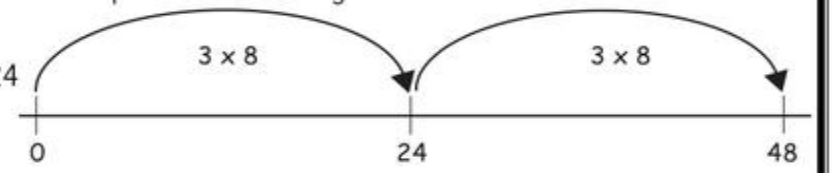
Example: 53 – 26 = ☐ as 26 + ☐ = 53, 26 + (4 + 20 + 3) = 53, so 53 – 26 = 27



Advanced Additive students also use addition strategies to derive multiplication facts. Their strategies usually involve partitioning factors additively. Here are two examples of such strategies:

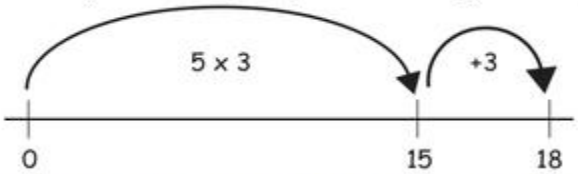
Doubling

Example: 3 x 4 = 12, so 6 x 4 = 12 + 12 = 24



Compensation

Example: 5 x 3 = 15, so 6 x 3 = 18 (three more, compensation using addition)

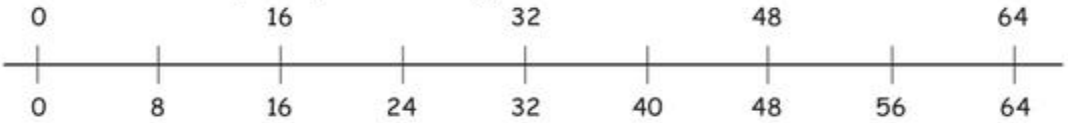


Stage Seven: Advanced Multiplicative Part-Whole

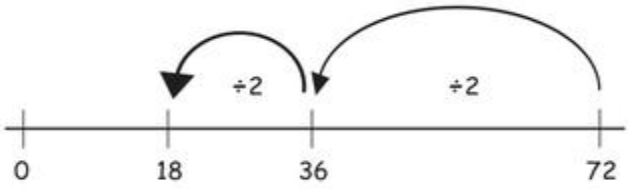
Students can choose appropriately from a number of part-whole strategies to estimate answers and solve multiplication and division problems.

Halving and Doubling or Dividing by Three and Trebling

Example: 16 x 4 as 8 x 8 = 64 (halving and doubling)

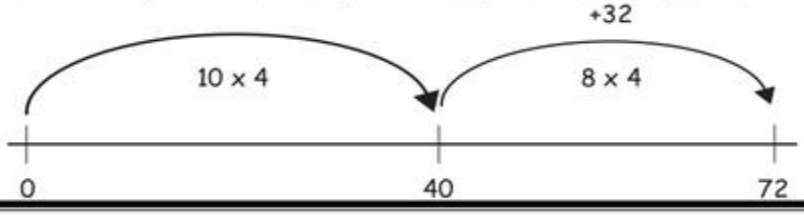


Example: 72 ÷ 4 as 72 ÷ 2 = 36, 36 ÷ 2 = 18
(dividing by four is the same as dividing by two twice).



Reversibility and Place Value Partitioning

Example: 72 ÷ 4, as 10 x 4 = 40, 72 – 40 = 32, 8 x 4 = 32, 10 + 8 = 18, so 18 x 4 = 18



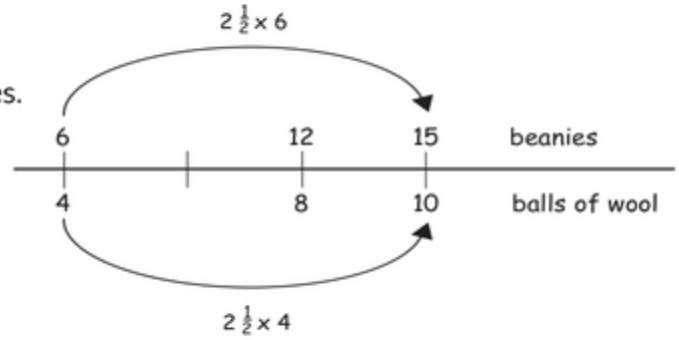
Stage Eight: Advanced Proportional Part-Whole

Students can choose appropriately from a number of part-whole strategies to estimate answers and solve problems involving fractions, proportions, and ratios. They are able to find the multiplicative relationship between quantities of two different measures.

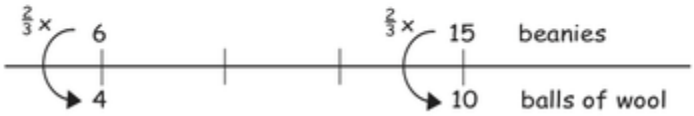
Fractional Multiplication within and between Units

Example: It takes 10 balls of wool to make 15 beanies.
How many balls of wool make 6 beanies?

Within measures: $2\frac{1}{2} \times 6 = 15$, so $2\frac{1}{2} \times \square = 10$



Between measures: $\frac{2}{3} \times 15 = 10$, so $\frac{2}{3} \times 6 = 4$



Using Unit Fractions with Conversion from Percentages

Example: Cayla's Clothing Shop is giving a discount. For a $75 pair of jeans, you only pay $50. What percentage discount is that?

The discount is $75 – $50 = $25. As a fraction of the original price of $75, this discount is $\frac{1}{3}$. So the percentage is $33.\dot{3}\%$.