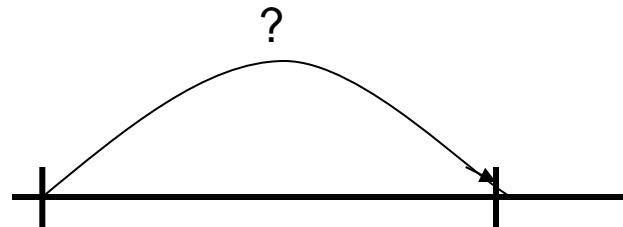
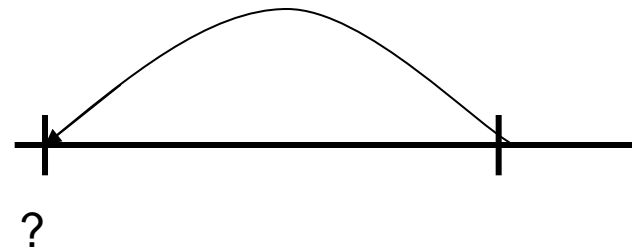
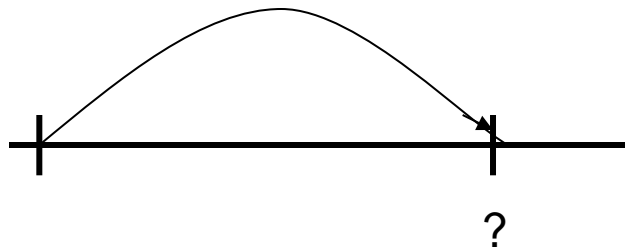


Addition and Subtraction Progression Policy

Visual Images



Children should be selecting one of these three visual images before starting their work. These images reinforce the 'what they are doing', not 'how are they doing it'.

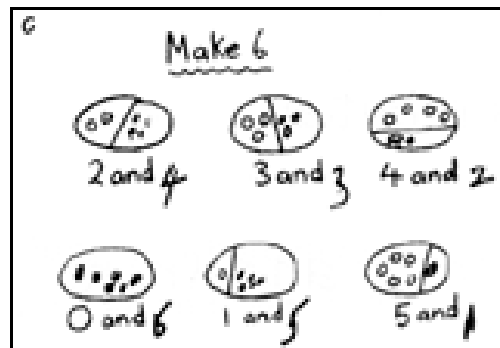
Value Expectations

- Year R - Units
- Year 1 – Units and Tens
- Year 2- Tens and Hundreds
- Year 3-Hundreds to Thousands
- Year 4-Thousands to Tens of Thousands, tenths, unit fractions
- Year 5-Tens of Thousands onto millions, hundredths
- Year 6-Tens of Millions, decimals to increasing small places
- Year 7 and beyond – A wide range of whole and decimal numbers

Written methods then become basis for mental methods the following year.

Early Addition

- I can record calculations using pictures



Make 6

$$2 + 4 = \underline{6}$$

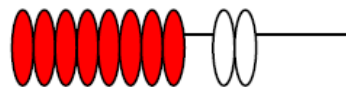
$$3 + 3 = \underline{6}$$

$$1 + 5 = \underline{6}$$



- I can use bead strings to illustrate addition

$$8 + 2$$



$$8 + 2 = \underline{10}$$

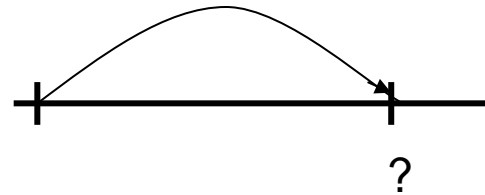
- I can double using objects



$$3 + 3 = \underline{6}$$

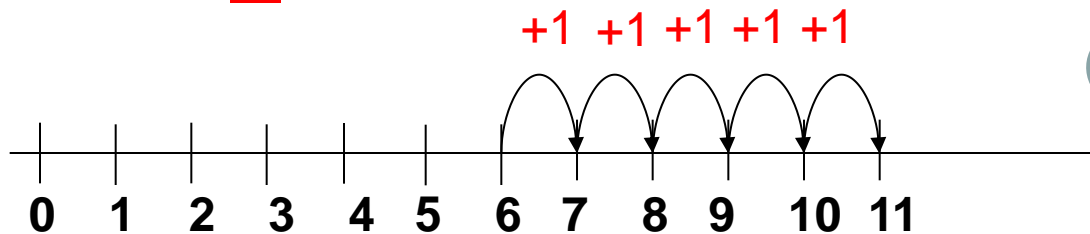
Early Number Line Addition

Visual Image:



- I can use a **structured** number line to count on in units.

$$6 + 5 = \underline{11}$$

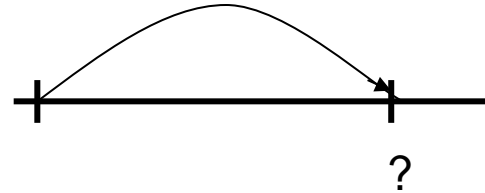


Am I going to have more or less than I started?

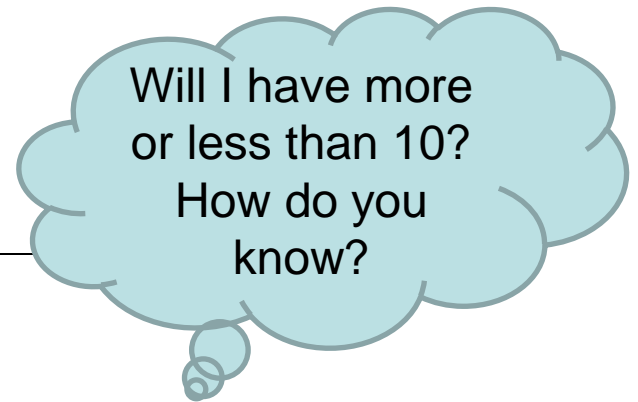
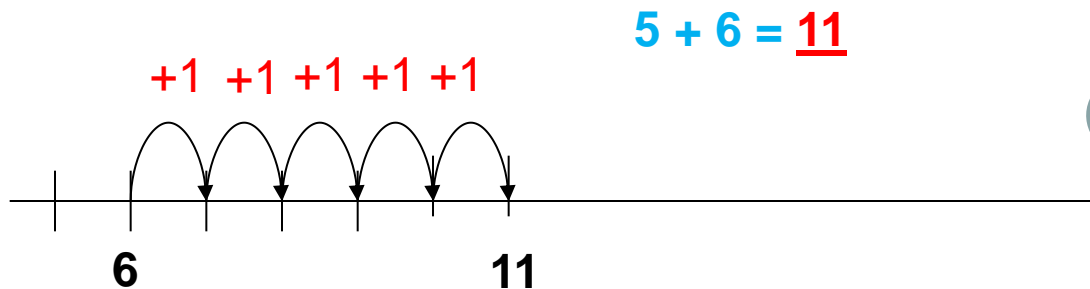
Move on to – adding three single digit numbers
e.g. $4 + 3 + 6 = 13$ Spot useful number bonds
($6 + 4 = 10$ first, then $+ 3 = 13$)

Early Number Line Addition

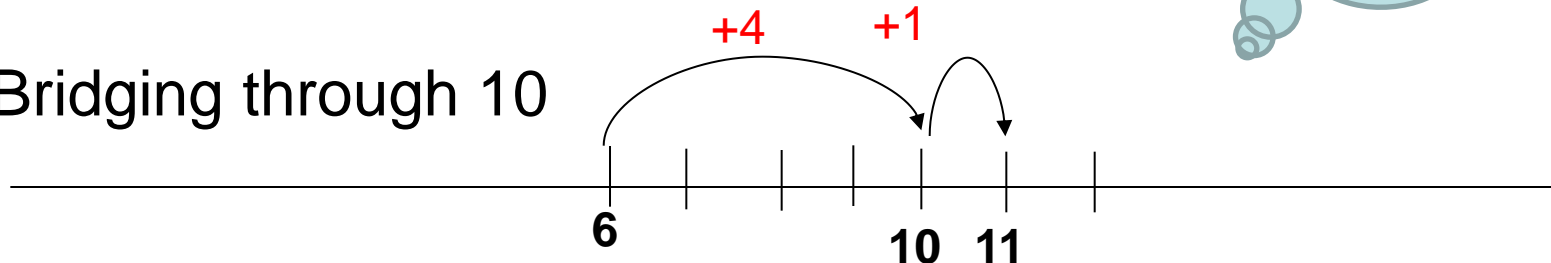
Visual Image:



- I can use a blank number line to count on in units.



- Bridging through 10



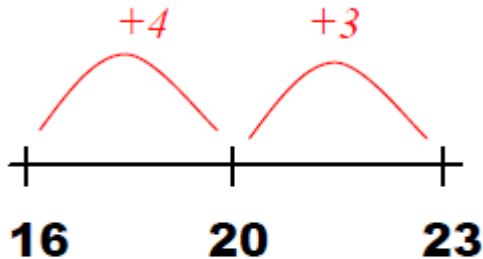
Reinforce— always starting from the larger number.

Early Number Line Addition

- I can use a number line to count on in tens

How can I make 7? Why is $4 + 3$ the best one to use?

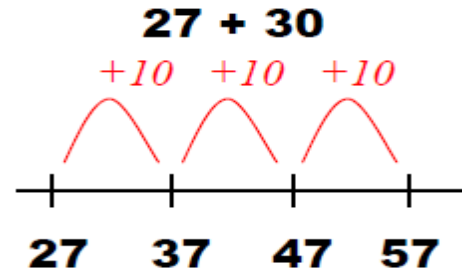
$$16 + 7$$



$$16 + 4 + 3 = 23$$

$$16 + 7 = \underline{23}$$

What pattern can you see? Why does it happen?



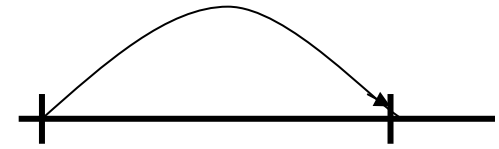
$$27 + 10 + 10 + 10 = 57$$

$$27 + 30 = \underline{57}$$

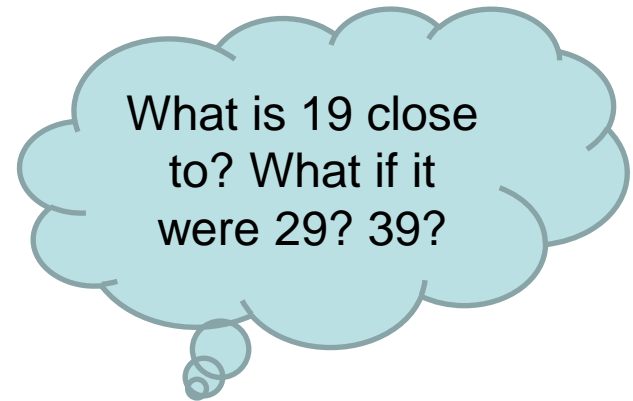
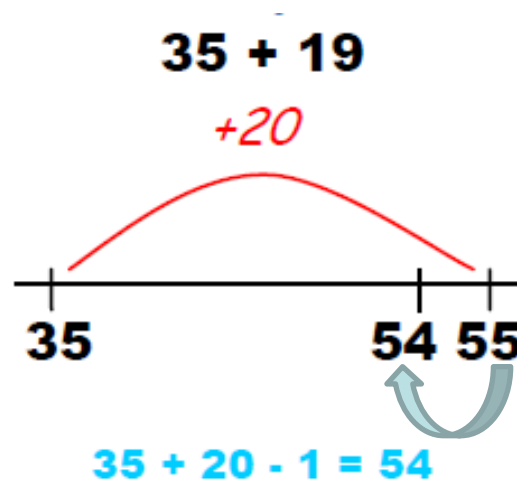
Move on to - counting on, using number bonds and 'bridging' to nearest 10.

(e.g. Use your understanding of number bonds to 7 to split it into $4 + 3$)

Moving on with Number Line Addition



- I can add near multiples of ten by adding in tens and adjusting ?

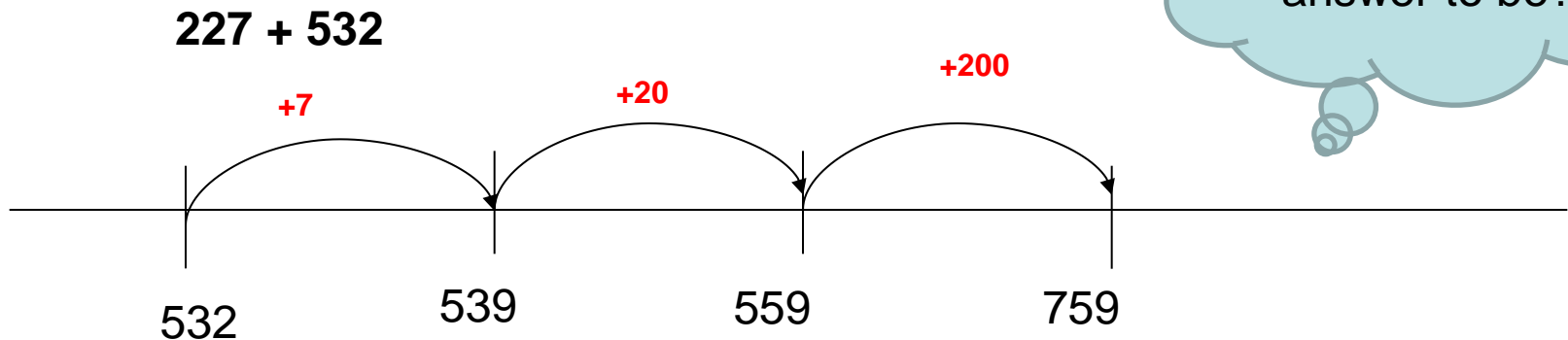


$$35 + 19 = 54$$

Moving on with Number Line Addition

- I can use methods of partitioning to solve more complex addition

Where am I expecting my answer to be?



$$532 + 7 + 20 + 200 = \underline{759}$$

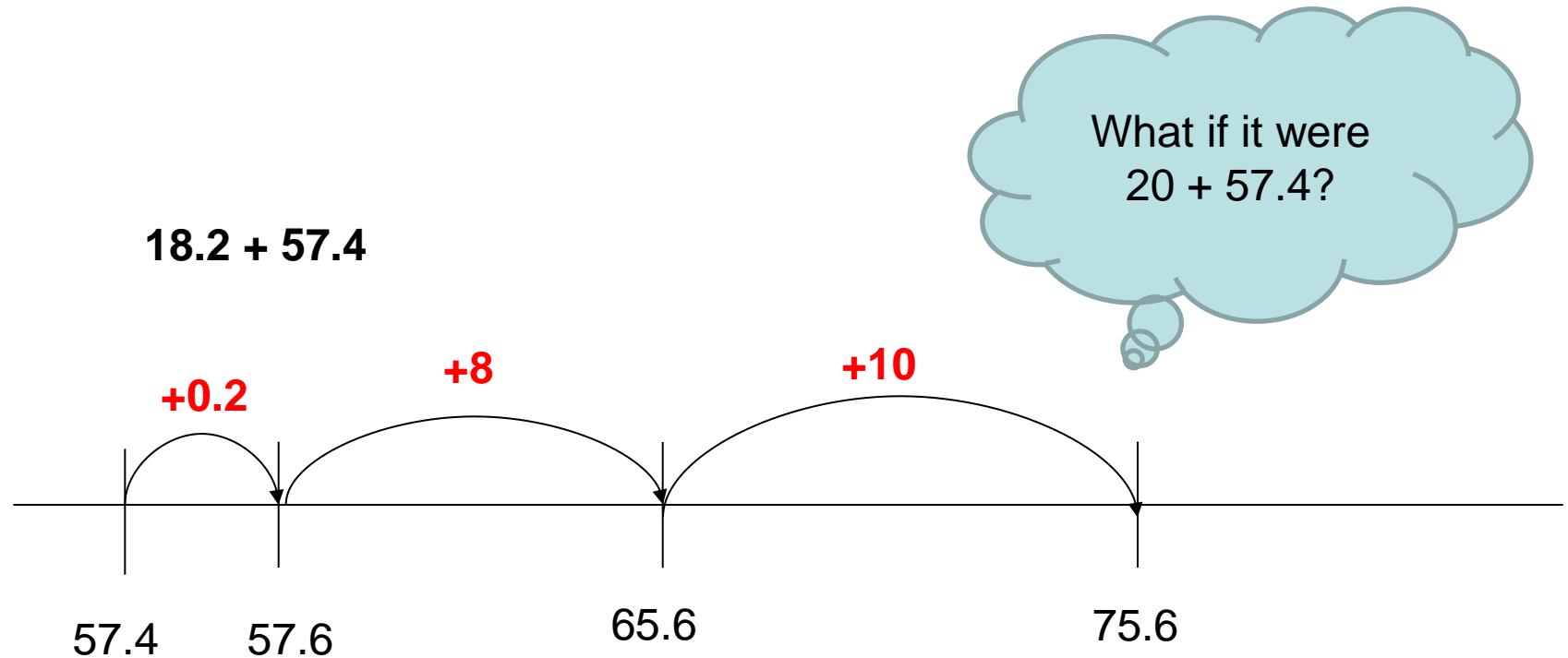
Move on to...

Numbers that use bridging

By starting with the units, this will help when later you are calculating using columns!

Number Lines and Decimals

- I can use number line methods with decimal numbers



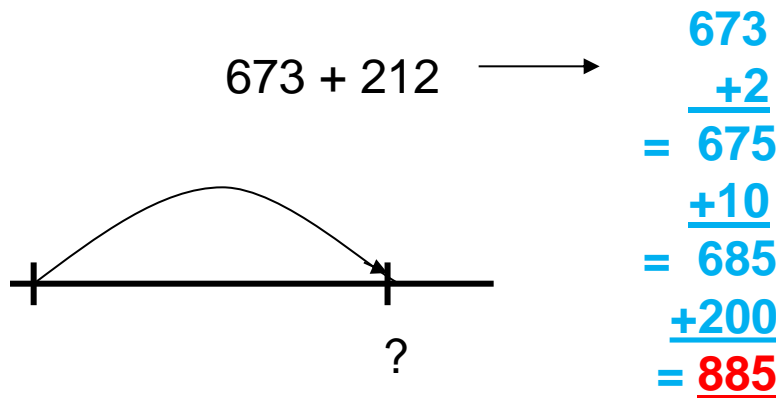
$$57.4 + 0.2 + 8 + 10 = \underline{75.6}$$

Move on to...

Decimals that use bridging

Moving Towards the Compact Method

- I can link the number line method to the expanded method to add amounts



You will first need to show the numberline method so that you link the two methods together.

Compact Addition Method

- I can carry numbers to add using the compact method

Whole Numbers

$$625 + 48$$

$$\begin{array}{r} 625 \\ + 48 \\ \hline 673 \\ \hline 1 \end{array}$$

$$625 + 48 = \underline{673}$$

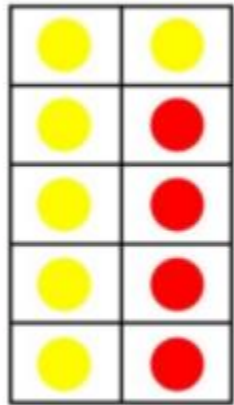
Decimal Numbers

$$16.4 \text{ kg} + 7.68 \text{ kg}$$

$$\begin{array}{r} 16.40 \\ + 7.68 \\ \hline 24.08 \\ \hline 1 \ 1 \end{array}$$

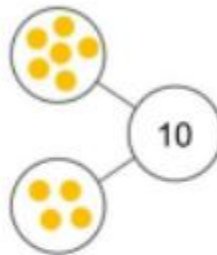
$$16.4 + 7.68 = \underline{24.08} \\ \text{kg}$$

Other Models and Images



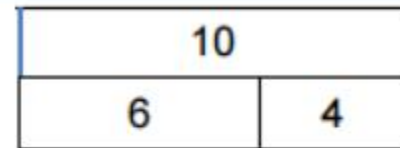
$$\begin{aligned}6 + 4 &= 10 \\4 + 6 &= 10 \\10 - 4 &= 6 \\10 - 6 &= 4\end{aligned}$$

Tens Frame



$$\begin{aligned}6 + 4 &= 10 \\4 + 6 &= 10 \\10 - 4 &= 6 \\10 - 6 &= 4\end{aligned}$$

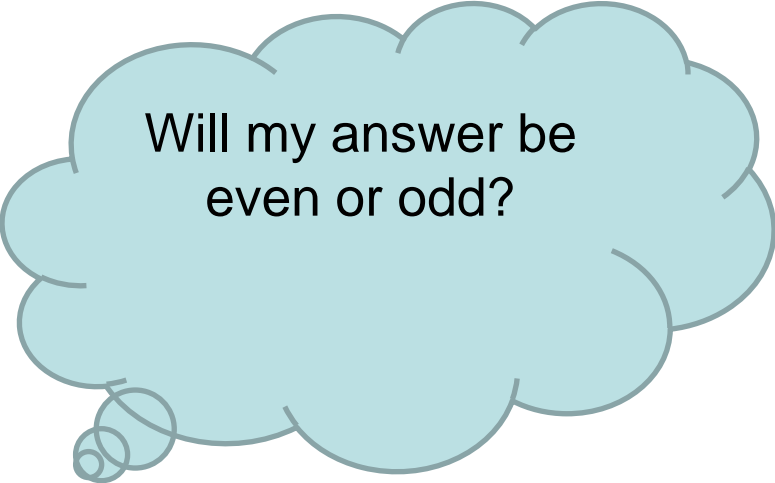
Part Whole Model



$$\begin{aligned}6 + 4 &= 10 \\4 + 6 &= 10 \\10 - 4 &= 6 \\10 - 6 &= 4\end{aligned}$$

Bar Model

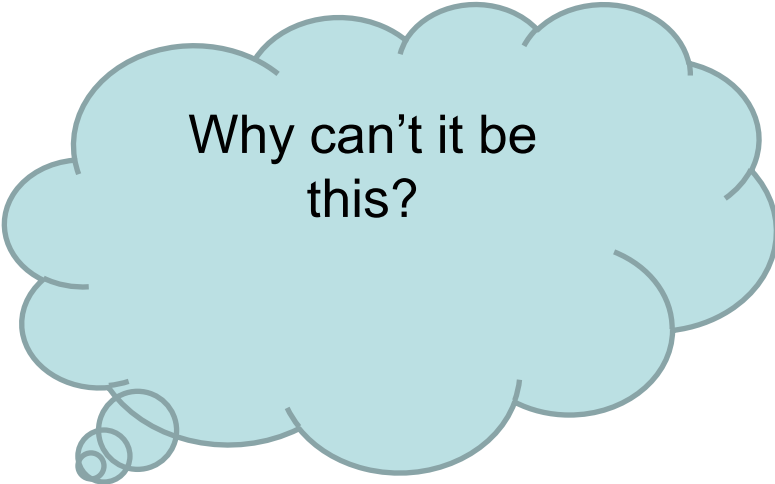
Other Reasoning

A light blue thought bubble with a dark blue outline and two small circles at the bottom left.

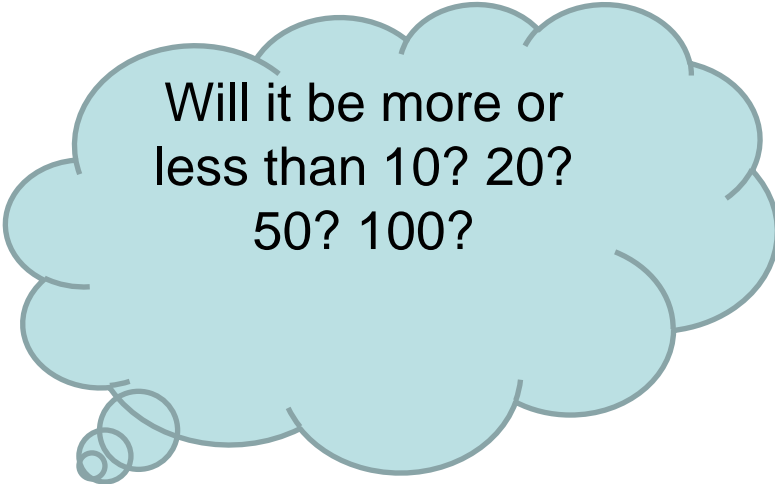
Will my answer be even or odd?

A light blue thought bubble with a dark blue outline and two small circles at the bottom left.

What will it end in?

A light blue thought bubble with a dark blue outline and two small circles at the bottom left.

Why can't it be this?

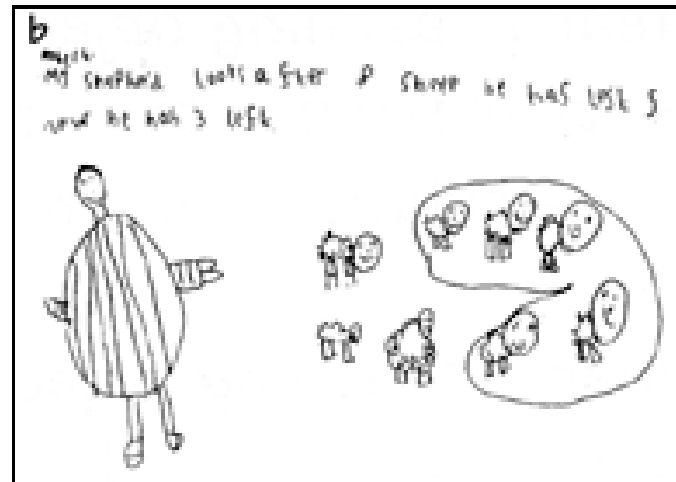
A light blue thought bubble with a dark blue outline and two small circles at the bottom left.

Will it be more or less than 10? 20? 50? 100?

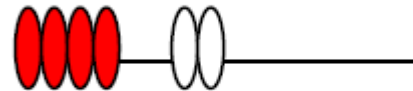
Early Subtraction

- I can record subtraction using pictures

$$8 - 5 = \underline{3}$$
$$8 - 3 = \underline{5}$$



$$6 - 2$$

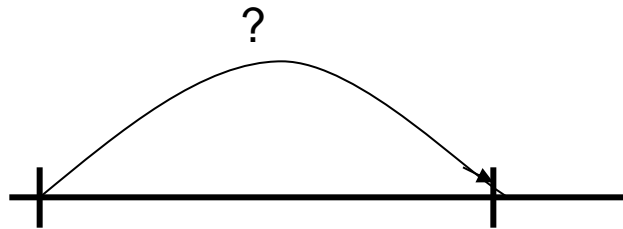


$$6 - 2 = \underline{4}$$

- I can use bead strings to illustrate subtraction

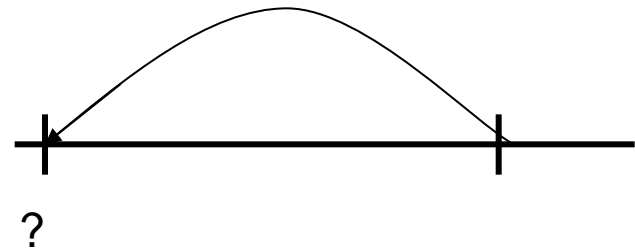
Number Line Subtraction

Two visual images:



Finding the Difference

(How many more than...?)



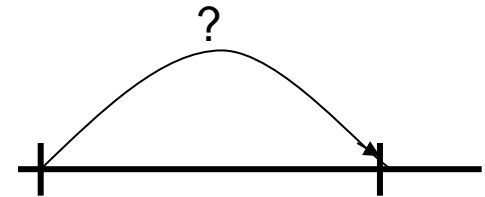
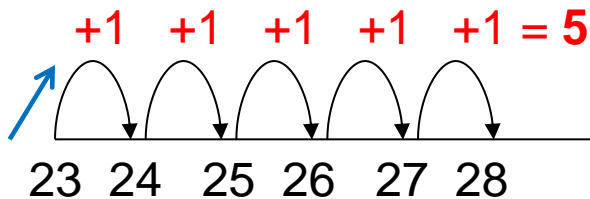
Counting Back

You will need to select which image you need, based on either context or number size.

Early Number Line Subtraction

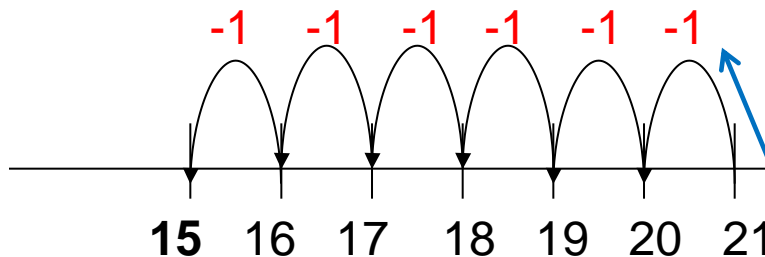
- I can use a number line to find the difference

What is the difference between 23 and 28? 5

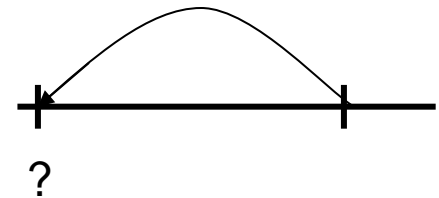


- I can use a number line to count back

What is $21 - 6$?



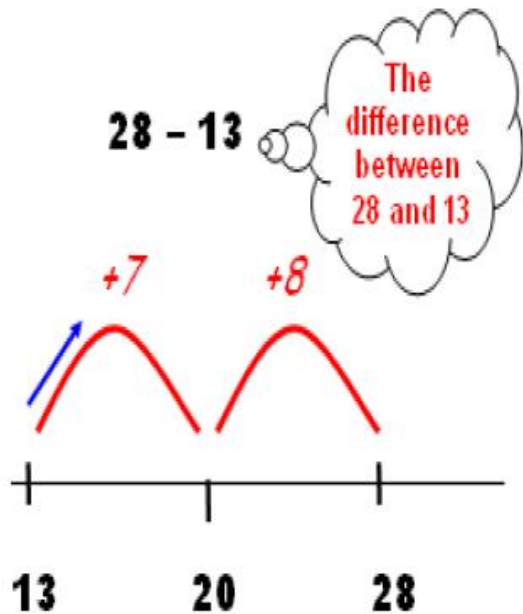
$$21 - 6 = \underline{15}$$



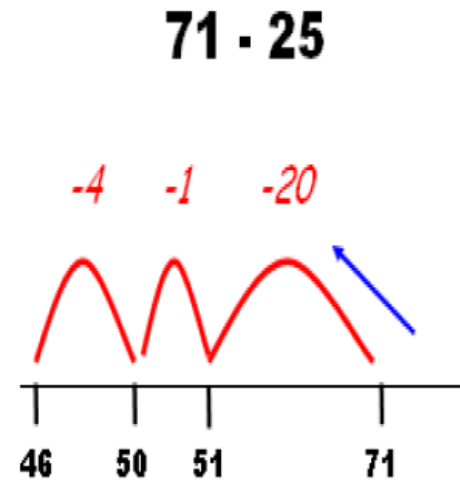
Moving on with Number Line

Subtraction

- I can use partitioning to find the difference
- I can use bridging the ten to count back



$$28 - 13 = \underline{15}$$



$$71 - 20 = 51$$

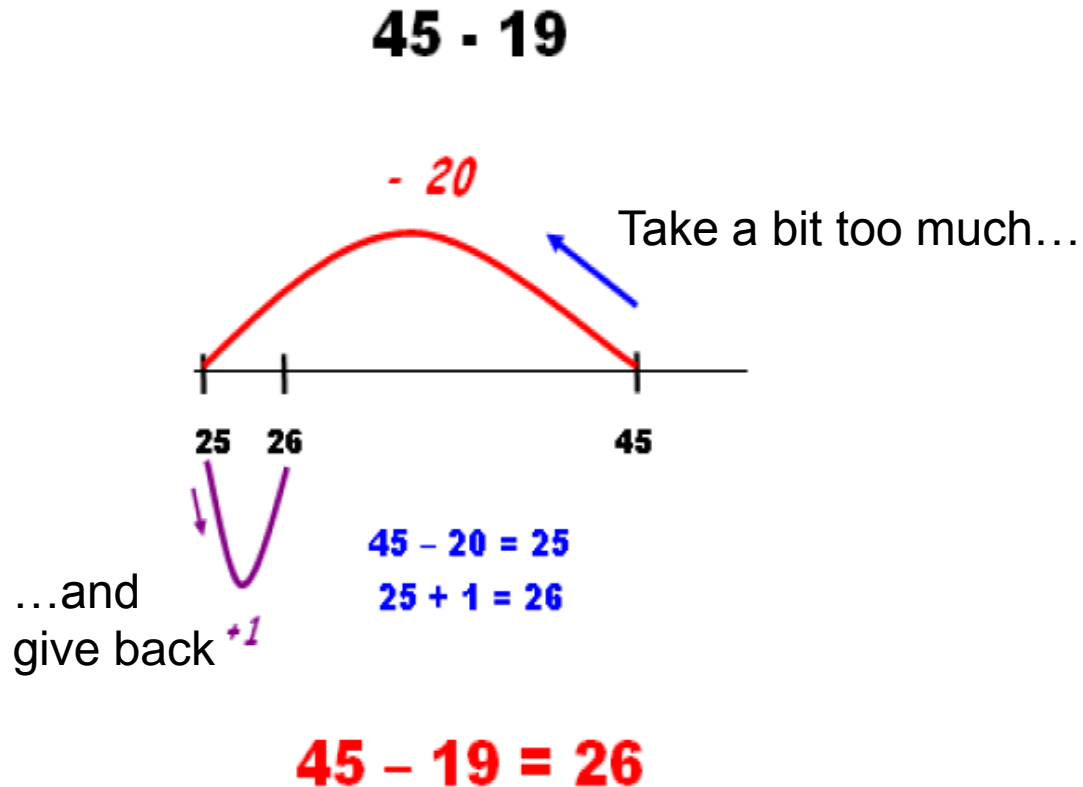
$$51 - 1 = 50$$

$$50 - 4 = 46$$

$$71 - 25 = \underline{46}$$

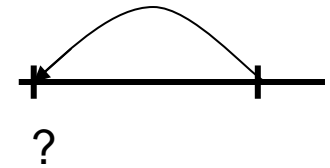
Moving on with Number Line Subtraction

- I can subtract near multiples of ten by counting back in tens and adjusting

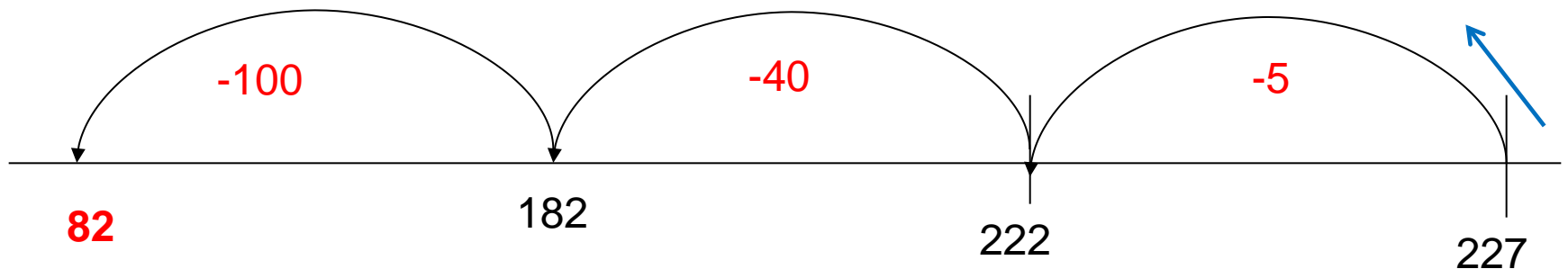


Becoming More Efficient

- I can use place value knowledge to make larger jumps



$$227 - 145 = 227 - 5 - 40 - 100 = \underline{82}$$

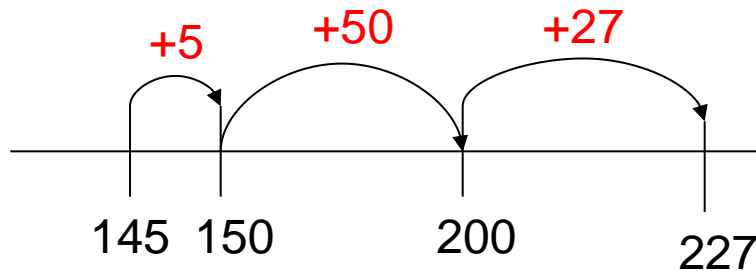
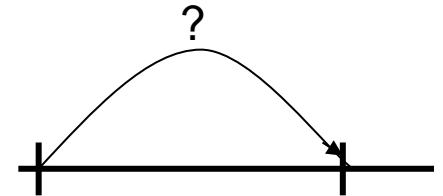


Start with the units as
this helps later!

Becoming More Efficient

- I can use place value knowledge to make larger jumps

$$227 - 145 =$$

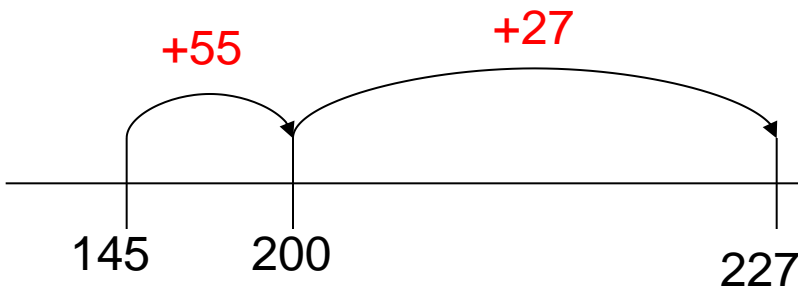


$$5 + 50 + 27 = \underline{82}$$

Use number bonds to help you

Move on to...

$$55 + 27 = \underline{82}$$

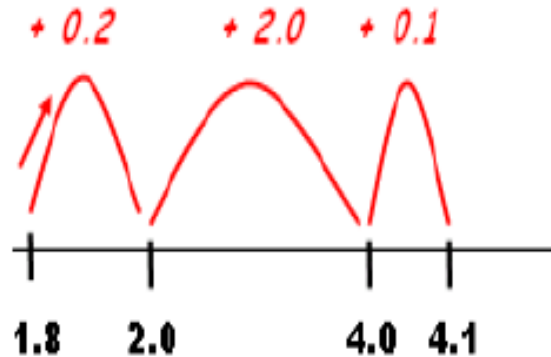


Count up to the nearest multiple of 10 or 100

Number Lines and Decimals

- I can use a number line to find the difference between two decimals

$$4.1 - 1.8$$



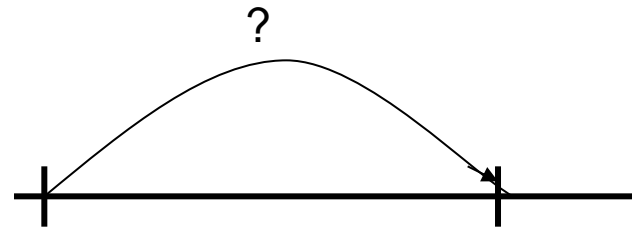
$$1.8 + 0.2 + 2.0 + 0.1 = 4.1$$

Moving Towards the Compact Method

- I can link a find the difference numberline method to an expanded subtraction method

$$227 - 145 = ?$$

$$\begin{array}{r} 227 \\ -145 \\ \hline + 5 \longrightarrow 150 \\ +50 \longrightarrow 200 \\ +27 \longrightarrow 227 \\ \hline 82 \end{array}$$



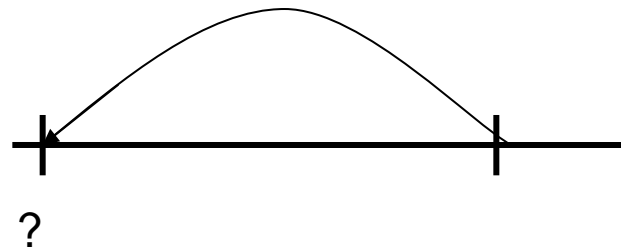
$$227 - 145 = \underline{82}$$

Moving Towards the Compact Method

- I can link a counting back numberline method to an expanded subtraction method

$$227 - 145 = ?$$

$$\begin{array}{r} 227 \\ -145 \\ \hline -5 \\ \hline 222 \\ -40 \\ \hline 182 \\ -100 \\ \hline 82 \end{array}$$



$$227 - 145 = \underline{82}$$

Decomposition

$$227-145 = ?$$

$$227 = 200 + 20 + 7$$

Also, $227 = 100 + 120 + 7$

Flexible partitioning will help you prepare for decomposition.

$$227-145 = ?$$

Start with the units. $7-2=5$, but $20-40$? Can't do (without going into minus numbers), Use flexible partitioning to turn into $100 + 120 + 7$ so that you can do $120-40$.

$$\begin{array}{r} 1 \\ \cancel{2} 12 \ 7 \\ -1 \ 4 \ 5 \\ \hline \ 2 \end{array}$$

Compact Subtraction Method

- I can use compact decomposition to solve whole and decimal number subtractions

$$647 - 286$$

$$\begin{array}{r} \text{5} \cancel{6} \text{1} 4 7 \\ - \quad 2 8 6 \\ \hline 3 6 1 \end{array}$$

$$647 - 286 = \underline{361}$$

$$137.4 - 29.6$$

$$\begin{array}{r} \quad 2 \text{1} 6 \\ 1 \cancel{3} \cancel{7} \text{1} 4 \\ - \quad 2 9 . 6 \\ \hline 1 0 7 . 8 \end{array}$$

$$137.4 - 29.6 = \underline{107.8}$$

Year Group	Objective	Reasoning Tasks		
Year 1	Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods)	Fact families Which four number sentences link these numbers? 12, 15, 3	What else do you know? If you know this: $12 - 9 = 3$ what other facts do you know?	Missing symbols Write the missing symbols (+ - =) in these number sentences: $17 \quad 3 \quad 20$ $18 \quad 20 \quad 2$
Year 2	Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot	Fact families Which four number sentences link these numbers? 100, 67, 33	What else do you know? If you know this: $87 = 100 - 13$ what other facts do you know?	Missing symbols Write the missing symbols (+ - =) in these number sentences: $80 \quad 20 \quad 100$ $100 \quad 70 \quad 30$ $87 \quad 13 \quad 100$
Year 3	estimate the answer to a calculation and use inverse operations to check answers	Making an estimate Which of these number sentences have the answer that is between 50 and 60 $174 - 119$ $333 - 276$ $932 - 871$	Always, sometimes, never Is it always, sometimes or never true that if you subtract a multiple of 10 from any number the units digit of that number stays the same. Is it always, sometimes or never true that when you add two numbers together you will get an even number	Always, sometimes, never Is it always, sometimes or never true that when you add two numbers together you will get an even number

Year Group	Objective	Reasoning Tasks		
Year 4	Estimate and use inverse operations to check answers to a calculation	Making an estimate Which of these number sentences have the answer that is between 550 and 600 1174 - 611 3330 - 2779 9326 - 8777	Always, sometimes, never Is it always sometimes or never true that the difference between two odd numbers is odd.	Encouraging reasoning Convince me Explain Another example True or false Other possibilities What else do you know?
Year 5	Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	Making an estimate Which of these number sentences have the answer that is between 0.5 and 0.6 11.74 - 11.18 33.3 - 32.71	Always, sometimes, never Is it always, sometimes or never true that the sum of four even numbers is divisible by 4.	Encouraging reasoning Convince me Explain Another example True or false Other possibilities What else do you know?
Year 6	Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.	Making an estimate Circle the number that is the best estimate to 932.6 - 931.05 1.3 1.5 1.7 1.9	Always, sometimes, never Is it always, sometimes or never true that the sum of two consecutive triangular numbers is a square number	Encouraging reasoning Convince me Explain Another example True or false Other possibilities What else do you know?