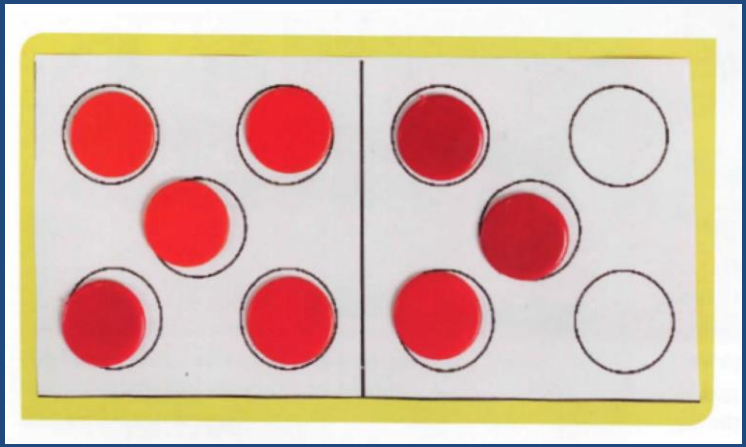
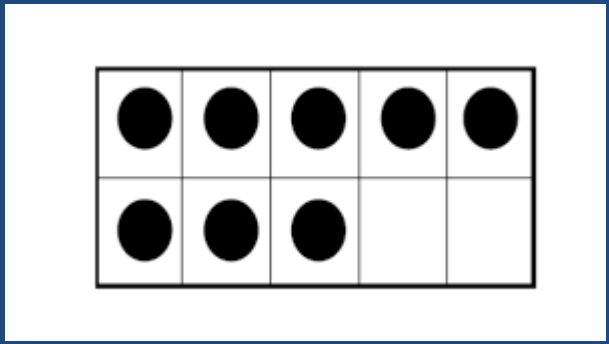
NCETM
NATIONAL CENTRE FOR EXCELLENCE IN THE TEACHING OF MATHEMATICS

Maths: How we teach: Counting, Addition and Subtraction









Counting – Alphabet Land

- The new number names are A,B,C,D etc.
- Count with me
- Can you count by yourself?
- Can you count on from L?
- Can you count back from P?
- Can you count in B's?



Conservation of Number

- Count out 5 bricks
- Cover them up/ mix them around
- How many are there?

- If your child starts counting from 1 they do not have conservation of number!

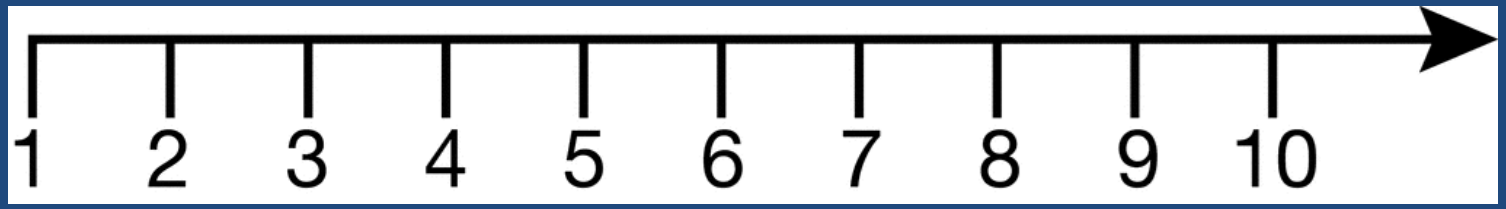
Progression in Counting

- Unbreakable chain
- Breakable chain
- Bi-directional chain



Counting

- Counting on and back from any number
- Continue number sequences
- Bridging the tens and hundreds e.g. 39, 40 or 91, 90, 89…
- Counting in 2s, 5s and 10s and then 3s
  Counting in fractions e.g ½, 1, 1 ½, 2…



Language and Mathematical Vocabulary

- More than, less than, is equal to, equals, is the same as
- Greater than, fewer than
- Most, least
- Before, after, 1st, 2nd, 3rd, last (ordinal numbers)
- Takeaway, subtract, minus, less, count back,

(minuend – subtrahend = difference)

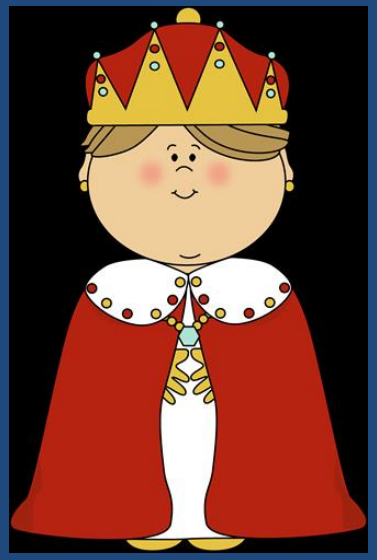
- Difference, how many more to make
- Add, plus, altogether, total, sum, make, more, count on (part, part, whole; addend + addend = sum)
- Number sentence, expressions, equations, calculations

‘teen’ and ‘ty’

- What is the difference between 30 and 13?

- Teen queen
- Cup of tea





- Pronunciation matters!!!

NCETM Maths Mastery

4 daily maths fluency sessions in Year 1 and Year 2 to embed number facts into long term memory and increase automaticity and 1 week of spatial reasoning

Year 1:

Autumn 1: Composition: Subitising, composition of 5, then 6, 7, 8, and 9 as 5 and a bit; comparing sets, ordering numbers to 10, 1 more, 1 less, doubles

Autumn 2: Composition: odd/even, composition of 6, 8 and 10 (linking doubles), number tracks and number lines

Spring 1: Composition: composition of 7 and 9, odd/even, part/part/whole, partitioning

Spring 2: Composition: partitioning of numbers within 10, link 2 equal parts to doubling/halving; Number facts and arithmetic: 1 more/1 less in relation to add/even, adding/subtracting 2, applying knowledge of composition

Summer 1: 11-15 as 10 and a bit, magnitude and positioning of number, + and =, find the total/sum, recall of composition of 6,7,8 and 9

Summer 2: 11-19 as 10 and a bit, - and =, apply knowledge of composition when + or -, recap composition 5-10

NCETM Maths Mastery

Year 2:

Autumn 1: Composition: composition of 6, 7, 8, and 9 as 5 and a bit; comparing numbers within 10, odd/even/doubles, inequality and equals symbols, composition of 6, missing addends, composition of 8 and 10

Autumn 2: Composition: composition of odd numbers, Hungarian number frame/Rekenrek, composition of 7 and 9, composition of 11-19 as 10 and a bit, apply to missing number equations, compare numbers within 20, magnitude on numberlines – using mid points

Spring 1: Doubling numbers to 10; using 5 and a bit, composition of 20, use known facts to find missing parts, apply knowledge to solve +/- within 20, use knowledge of doubles to find near doubles

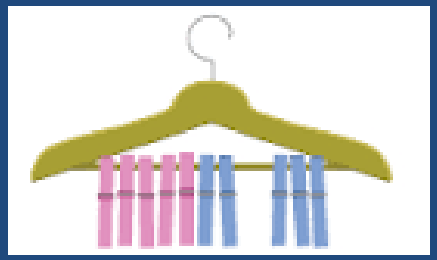
Spring 2: Add 3 numbers using known facts, add 2 numbers bridging through 10, solve missing number problems, subtract bridging through 10

Summer 1: magnitude to 100, inverse – missing number problems, subtract across the 10 using known facts, subtraction within 20, composition of 20

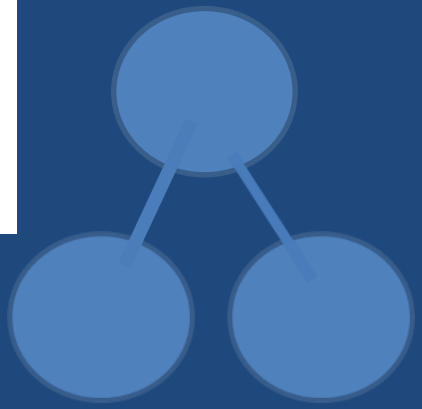
Summer 2: use knowledge of composition to reason about expressions and equation, doubles/near doubles, 2 adjacent odds/evens, fluency of bonds within 10 and apply to calculations, recap

Number Fluency

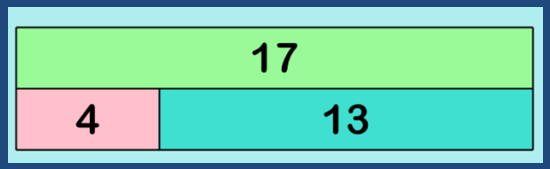
- Number fluency relates to making (combining) and breaking (partitioning) numbers in different ways
- How many different ways can you represent 3? 5? 10?

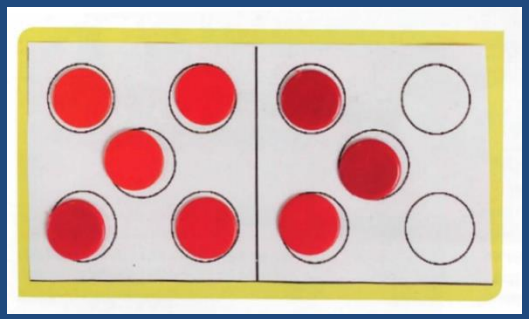










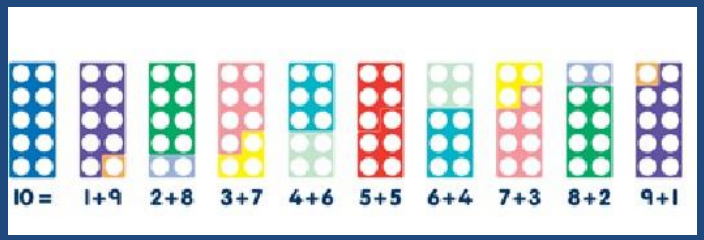


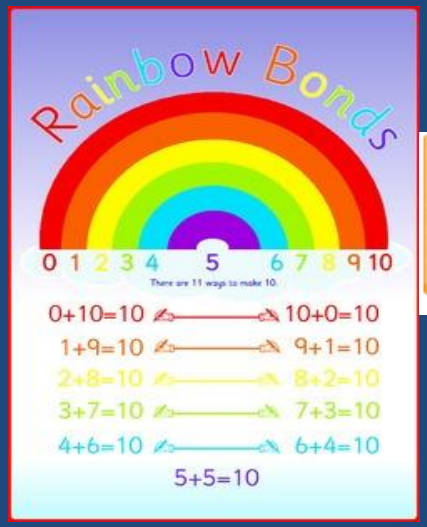
Number Facts

- There are some facts you just need to know!

Children reach automaticity through practice and with the use of representations that show the Maths.

- Number Bonds to 5/10/ all numbers to 10/20/100
- Subtraction Facts from 5/10/all numbers from 10/20/100
- Doubles/Halves

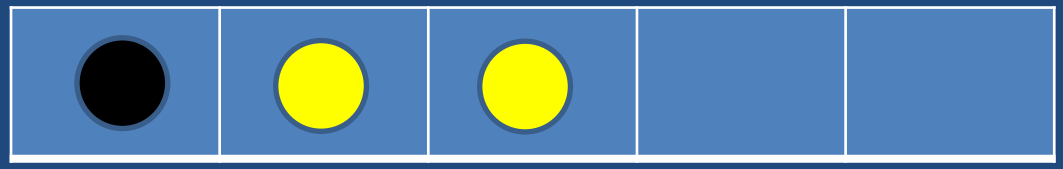


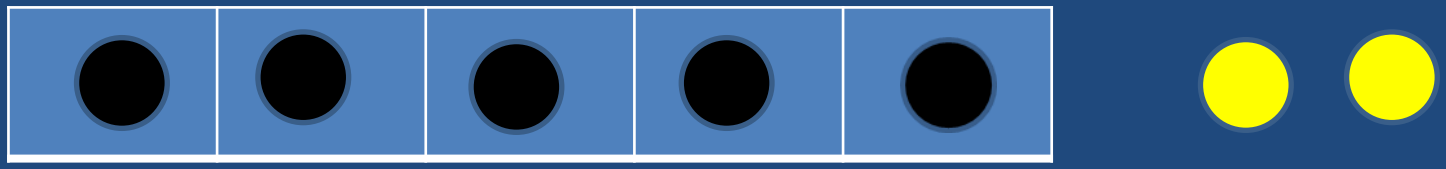




Subitising (recognising an amount without counting): How much is here?

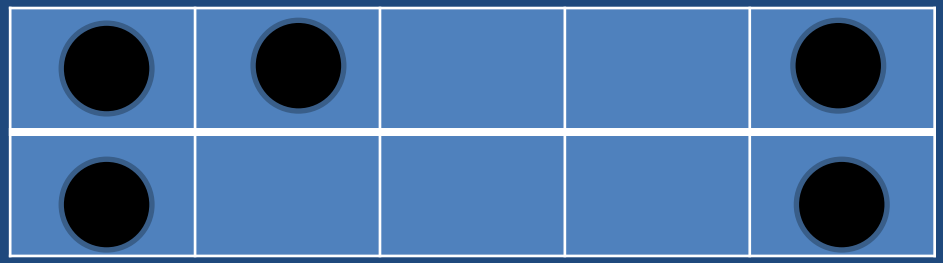
- 5 frames

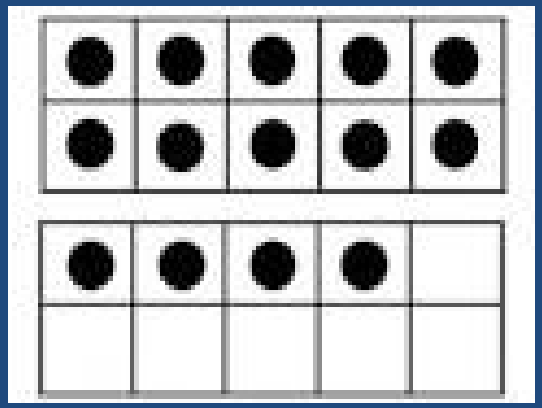




Subitising: How much is here?

- 10 frames





Place Value

- Click Clap Stamp



1



10

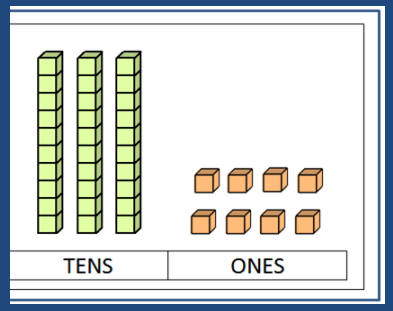


100

Place Value

What is the value of the digits?

- Numicon
- Straws
- Money
- 10s 1s mats
- Gattegno Chart
- Dienes (10s and 1s)



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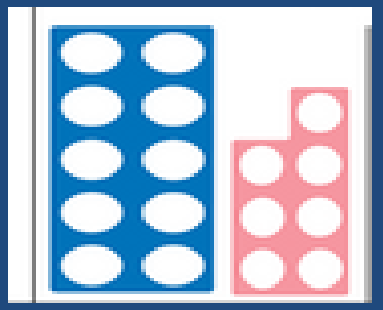
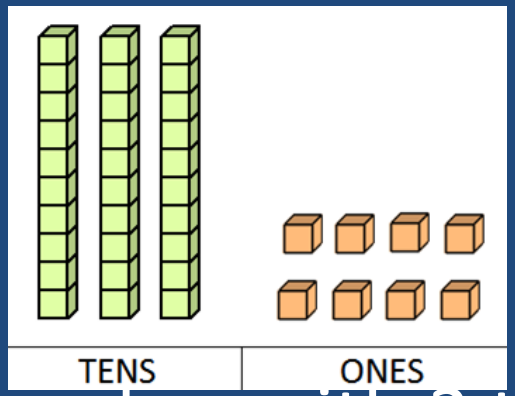


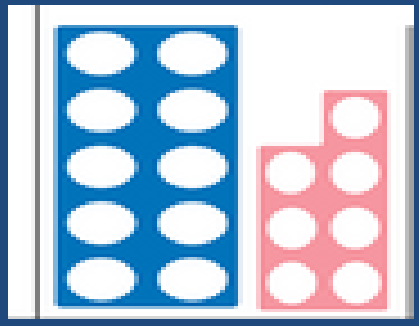
1 7

10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

Place Value

- Can you make these numbers? Use any of the resources available.
- Task 1: 16
- Task 2: 35
- Task 3: I am an even number with 2 tens.







Addition – Count it Altogether

- Using concrete objects, 5 frames, 10 frames etc
- 6+5=

Make both groups (cubes, bricks, counters…)
Count them altogether



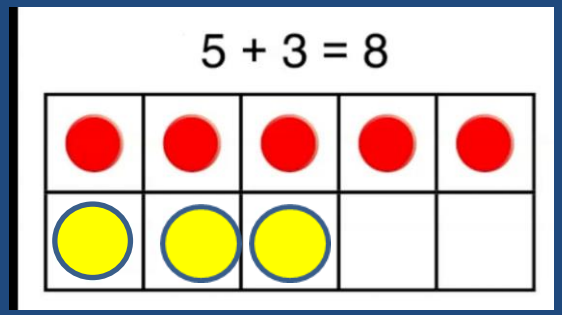
- The children progress from using concrete objects to visual representations to the abstract but manipulatives are always available.

Addition – Count On

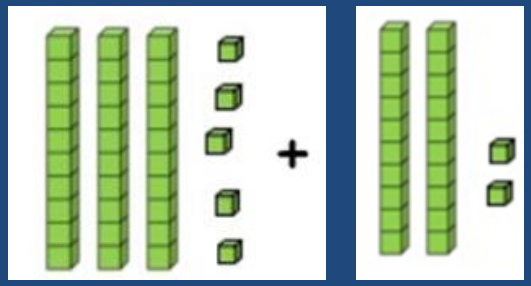
- Put the biggest number first.
- Put the first number in your head.
- Put the second number on your fingers.
- Count on from the number you put in your head.
- Use your fingers to keep track of how many times you have counted on.
- The answer is the last number you say.

Addition – Place Value using Dienes

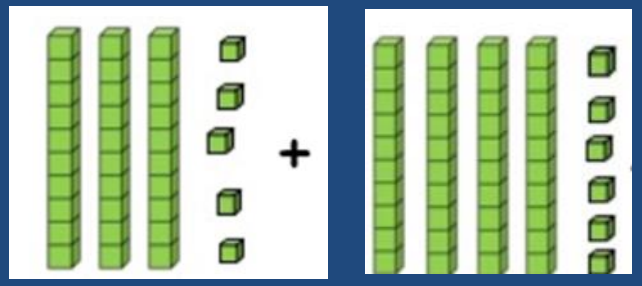
- 5 frames/ 10 frames



- Dienes



- 35 + 22 =



35 + 46 =

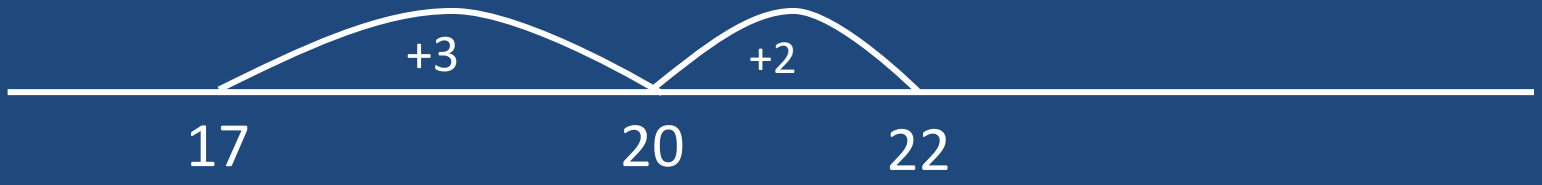
Regroup and make 10

Number Lines - addition

- 12+3=



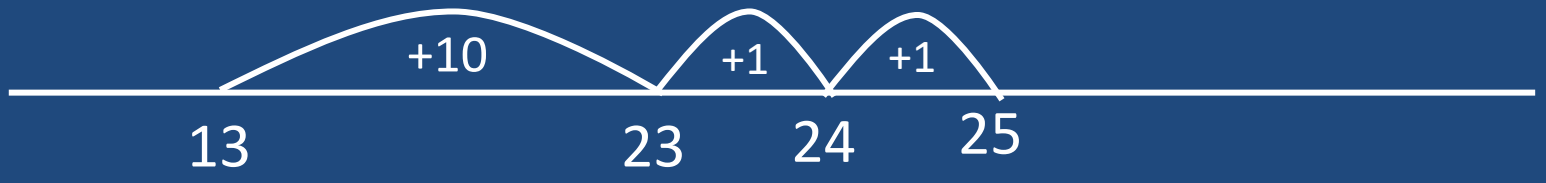
- 17+ 5 =



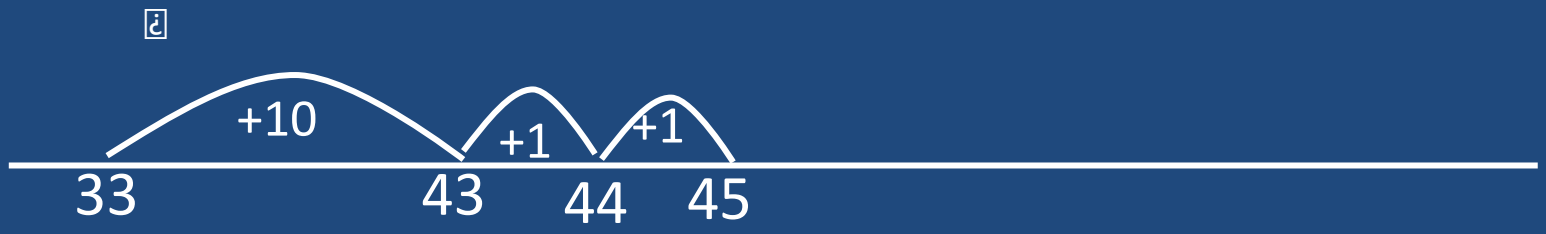
Using and applying known facts.

Number Lines - addition

12+13= →



12+33= →



Number Lines - addition

- Have a go yourself! Use your whiteboards.
- Choose your level of challenge

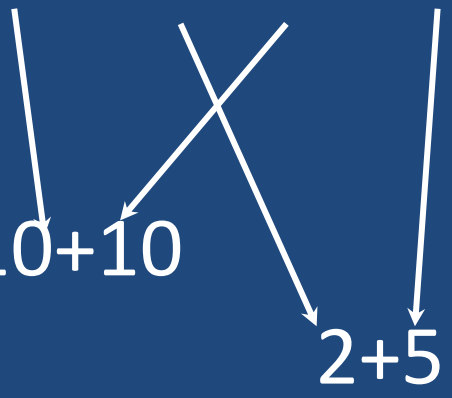
- Task 1 : 15 + 4=
- Task 2 : 16 + 8 =
- Task 3 : 15 + 14 =
- Task 4 : 25 + 34 =

Partitioning – addition

Partition both addends

- 12+ 15

- 10+ 2 + 10 + 5



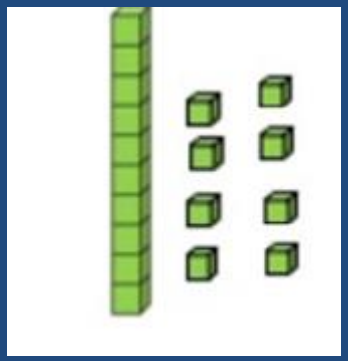
- 10+10
- 2+5
- 20+ 7= 27

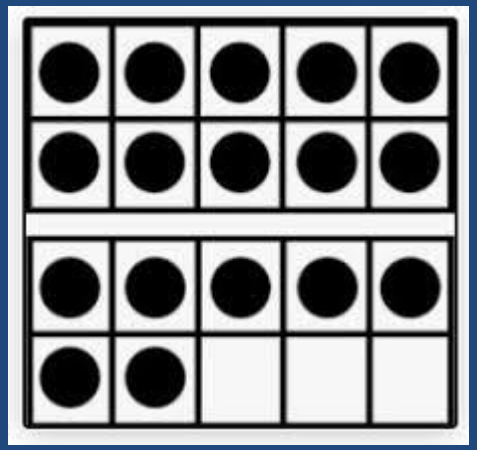
Have a go!

- Task 1
- 3 + 14 =
- Task 2
- 15 + 13 =
- Task 3
- 24 + 31 =

Subtraction by taking away

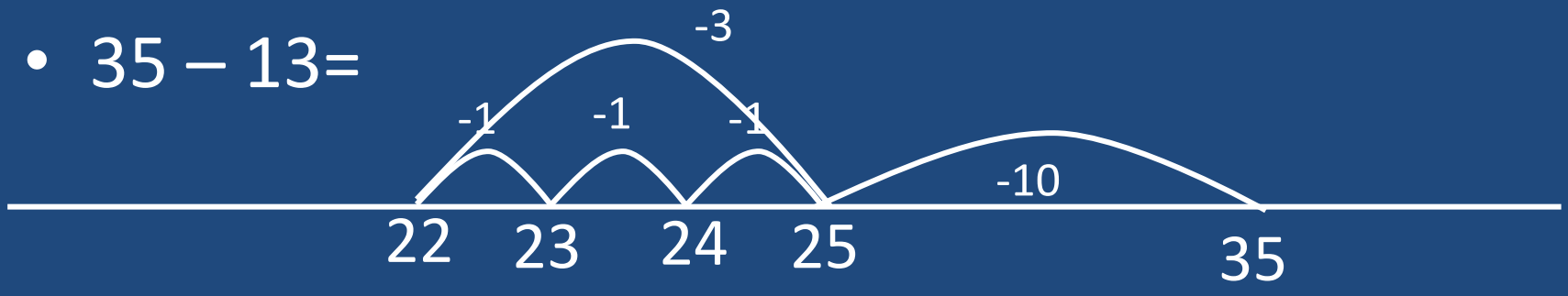
- Practical subtraction using concrete objects



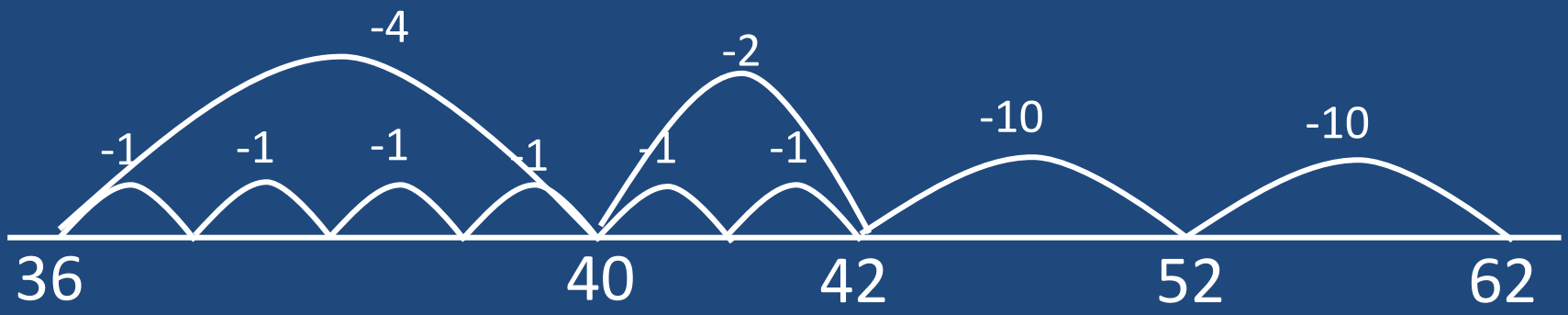


Number Lines - subtraction

- Remember to jump backwards! ←
- 35 – 13=



- 62 – 26= ←



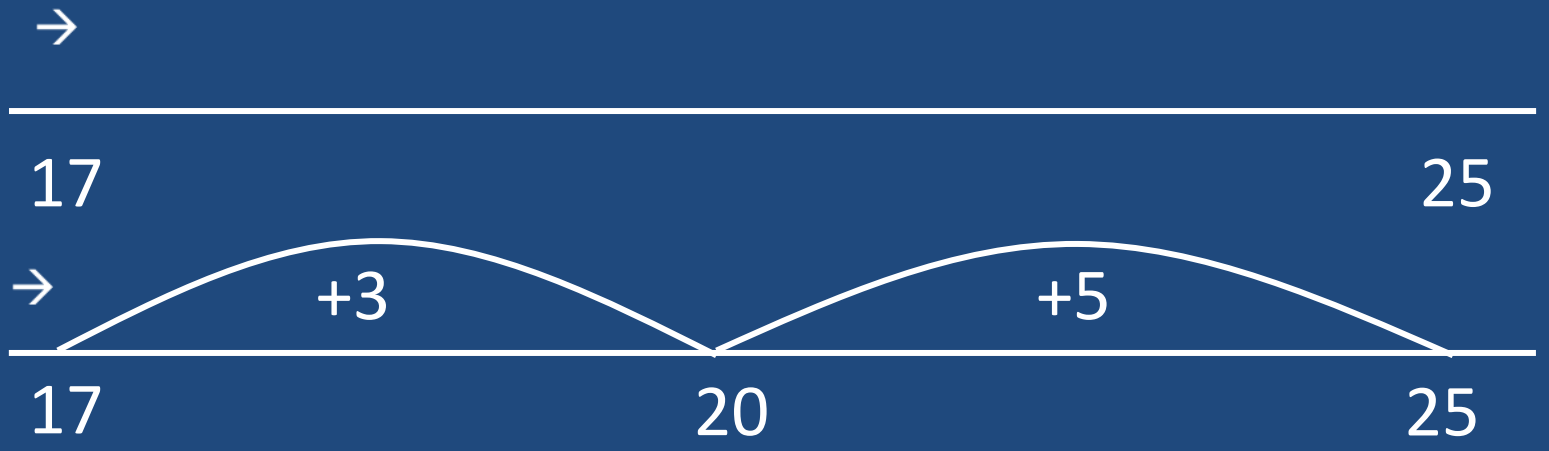
Being Efficient

- 35 + 9 =
- 32 + 33 =
- 53 - 48 =
- 48 - 29 =

- Which strategy did you choose? Why?

Finding The Difference

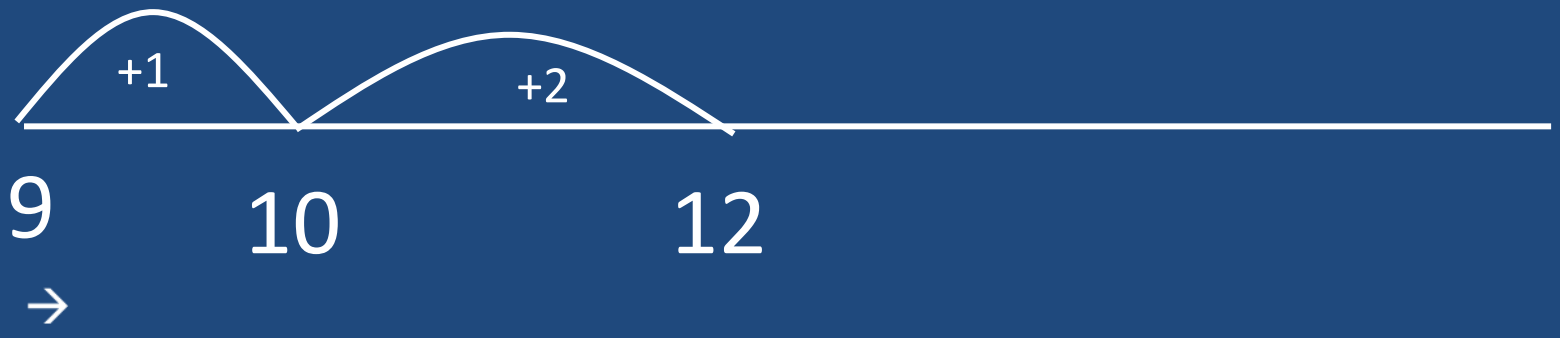
- What is the difference between 17 and 25?



- The difference is 8

Missing Number Problems

- 12- ☐ = 9

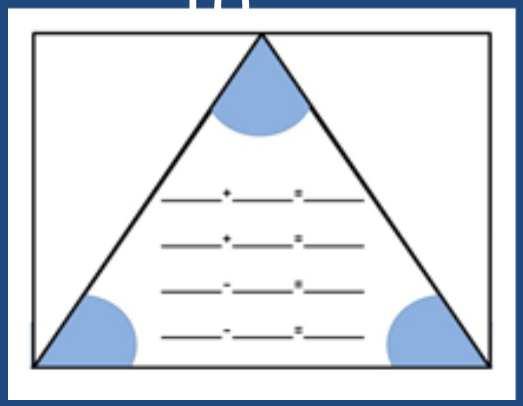


→



Inverse

- If you know this what else do you know?
- 2 + 8 = 10
- 8 + 2 = 10
- 10 - 8 = 2
- 10 - 2 = 8
- 20 + 80 = 100
- 80 + 20 = 100
- 100 - 80 = 20
- 100 - 20 = 80



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