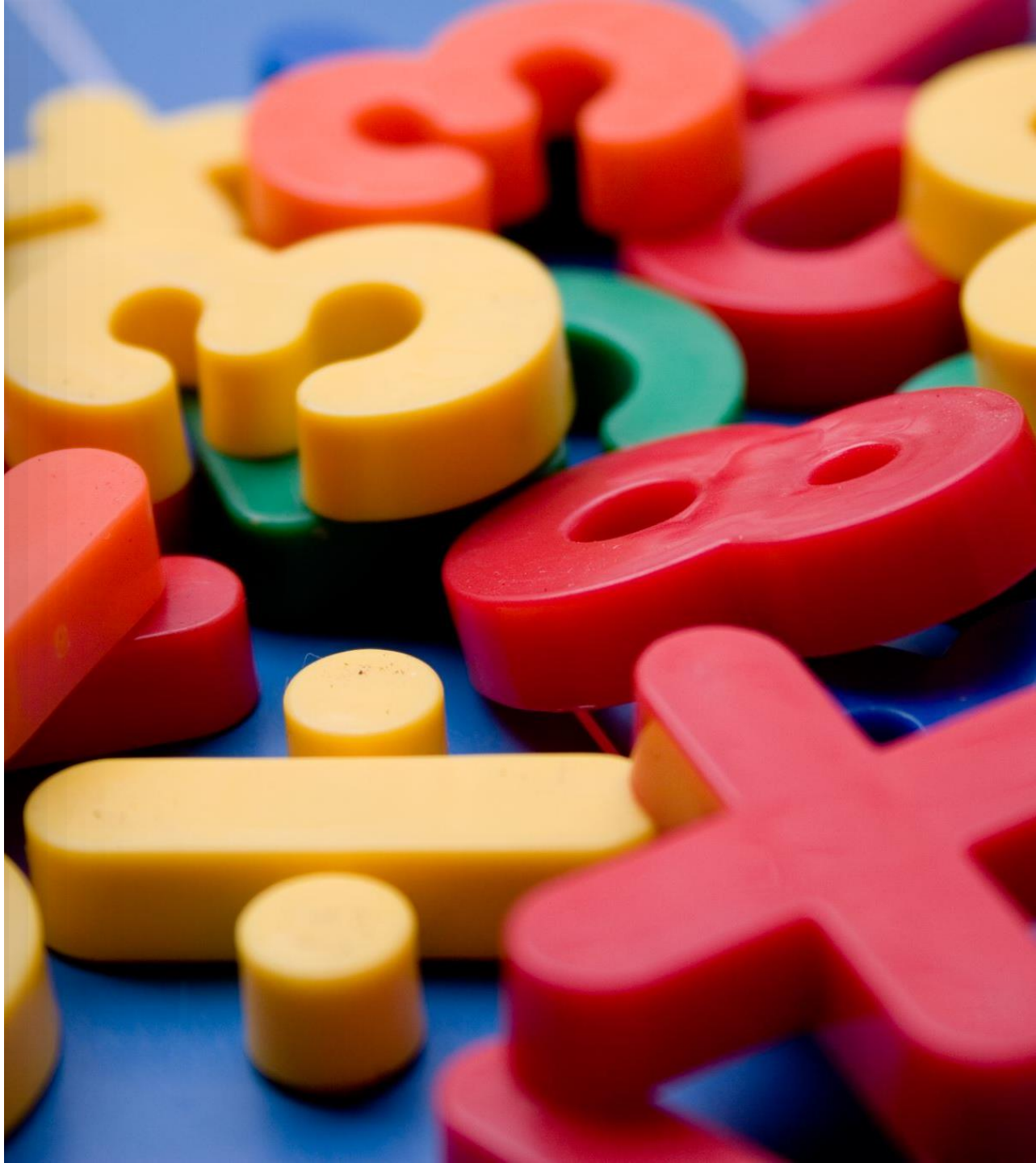
Multiplication at St. Michael and All Angels

The Purpose of Primary Mathematics

- The intention of the mathematics curriculum is to ensure pupils:
- • have conceptual understanding and are **<u>able to recall and apply their knowledge rapidly</u>** and accurately to problems;
- • reason mathematically following enquiries, conjecturing, generalising, justifying and using proof;
- • can solve problems by applying their mathematics to a variety of routine and non-routine problems.



Multiplication Facts - Expectations

YR	
Y1	Count in multiples of twos, fives and tens
Y2	Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
Y3	Count from 0 in multiples of 4, 8, 50 and 100 Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
Y4	Count in multiples of 6, 7, 9, 25 and 1000 Recall multiplication and division facts for multiplication tables up to 12 × 12
Y5	
Y6	

Phases of Basic Mastery of Facts

Phase 1:
Modelling and/or counting to find the answer, e.g. solving 6 x 4 by drawing six groups of 4 dots and skip counting the dots.

Phase 2:
Deriving answers using reasoning strategies based on known facts, e.g. solving 6 x 4 by thinking 5 x 4 = 20 and adding one more group of 4.

Phase 3:
Mastery (efficient production of answers), e.g. knowing that 6 x 4 = 24

Baroody (2006)

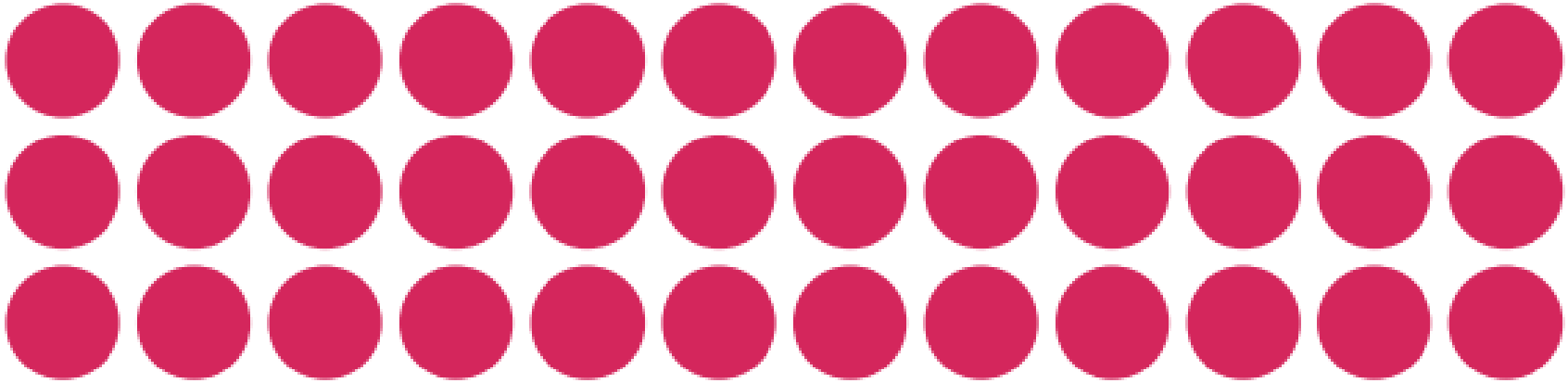
Phase 1: Modelling

To develop this into a more structured approach, it is really important that children understand that times tables link to repeated addition...

0 x 3 = 0	0
1 x 3 = 3	3
2 x 3 = 6	3+3
3 x 3 = 9	3+3+3
4 x 3 = 12	3+3+3+3
5 x 3 = 15	3+3+3+3+3
6 x 3 = 18	3+3+3+3+3+3
7 x 3 = 21	3+3+3+3+3+3+3
8 x 3 = 24	3+3+3+3+3+3+3+3
9 x 3 = 27	3+3+3+3+3+3+3+3+3
10 x 3 = 30	3+3+3+3+3+3+3+3+3+3

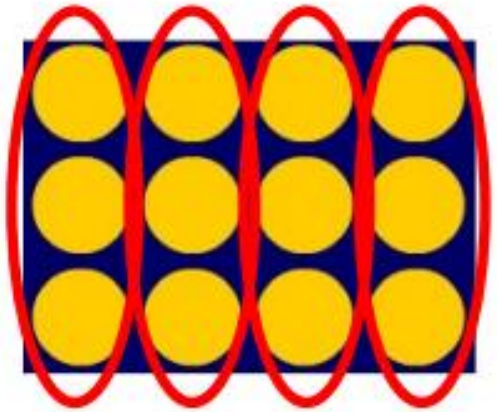
Phase 1: Modelling

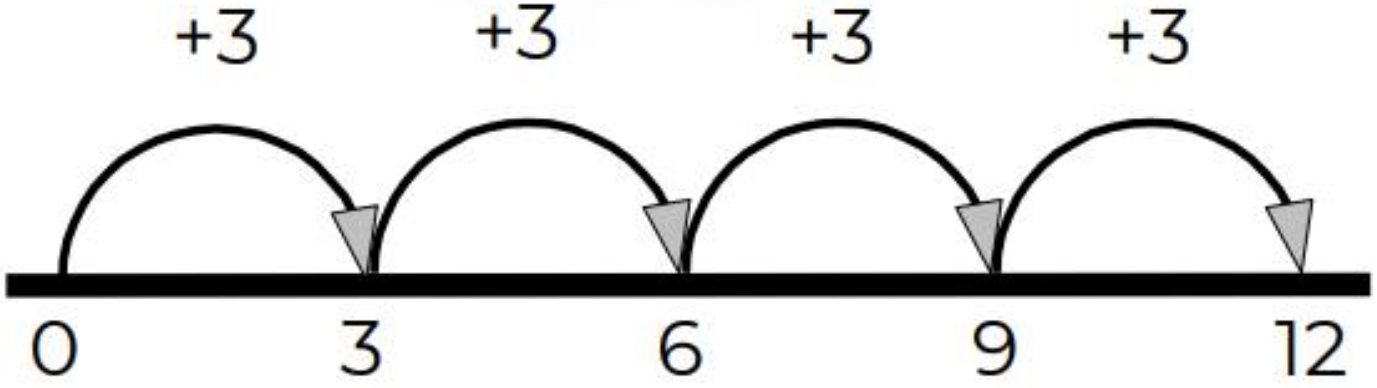
...and that they can see them as an increasing array...



Phase 1: Modelling

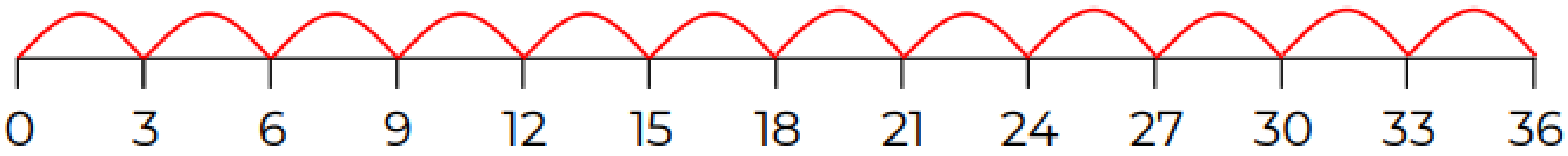
4 x 3= 12





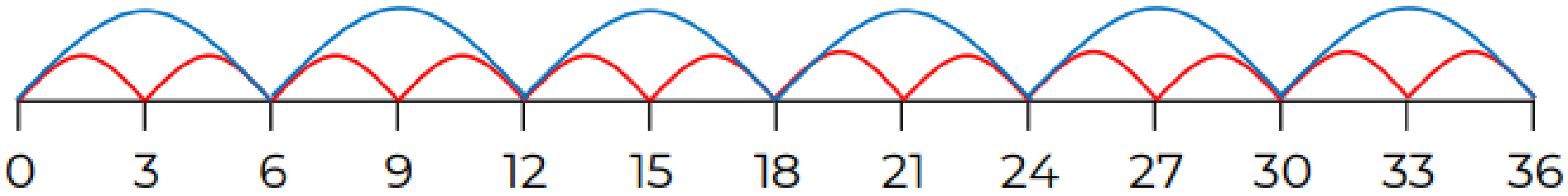
Phase 1: Modelling

...and how they link to counting in steps...



Phase 2: Linking Facts

...and how tables link to one another.



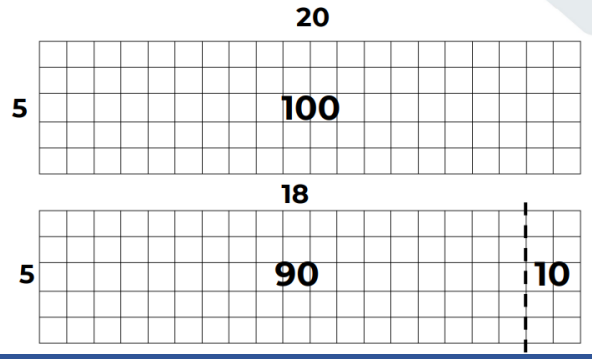
Phase 2: Reasoning about Linked Facts

Children need to be made aware of the relationship between the three numbers in each multiplication calculation and their link to the division, or inverse operation, e.g.

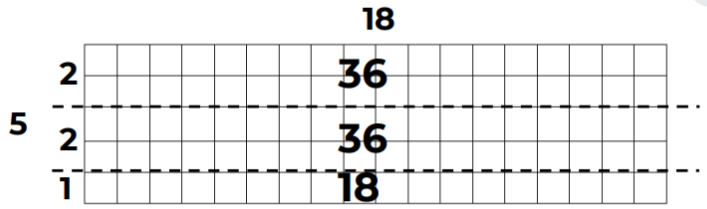
1 x 3 = 3	so	3 ÷3 = 1
2 x 3 = 6	so	6 ÷ 3 = 2
3 x 3 = 9	so	9 ÷ 3 = 3
4 x 3 = 12	so	12 ÷ 3 = 4

Phase 3 Mastery!

18 x 5 = (20 x 5) – (2 x 5)

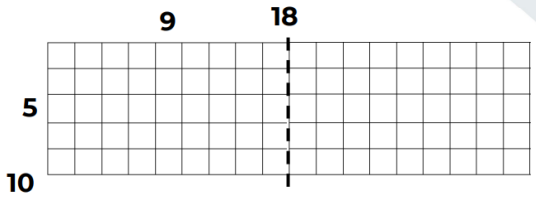


18 x 5 = (18 x 2) + (18 x 2) + (18 x 1)

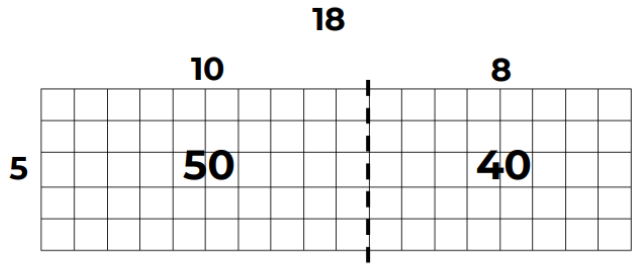


36 + 36 + 18 = 90

18 x 5 = 9 x 10



18 x 5 = (10 x 5) + (8 x 5)

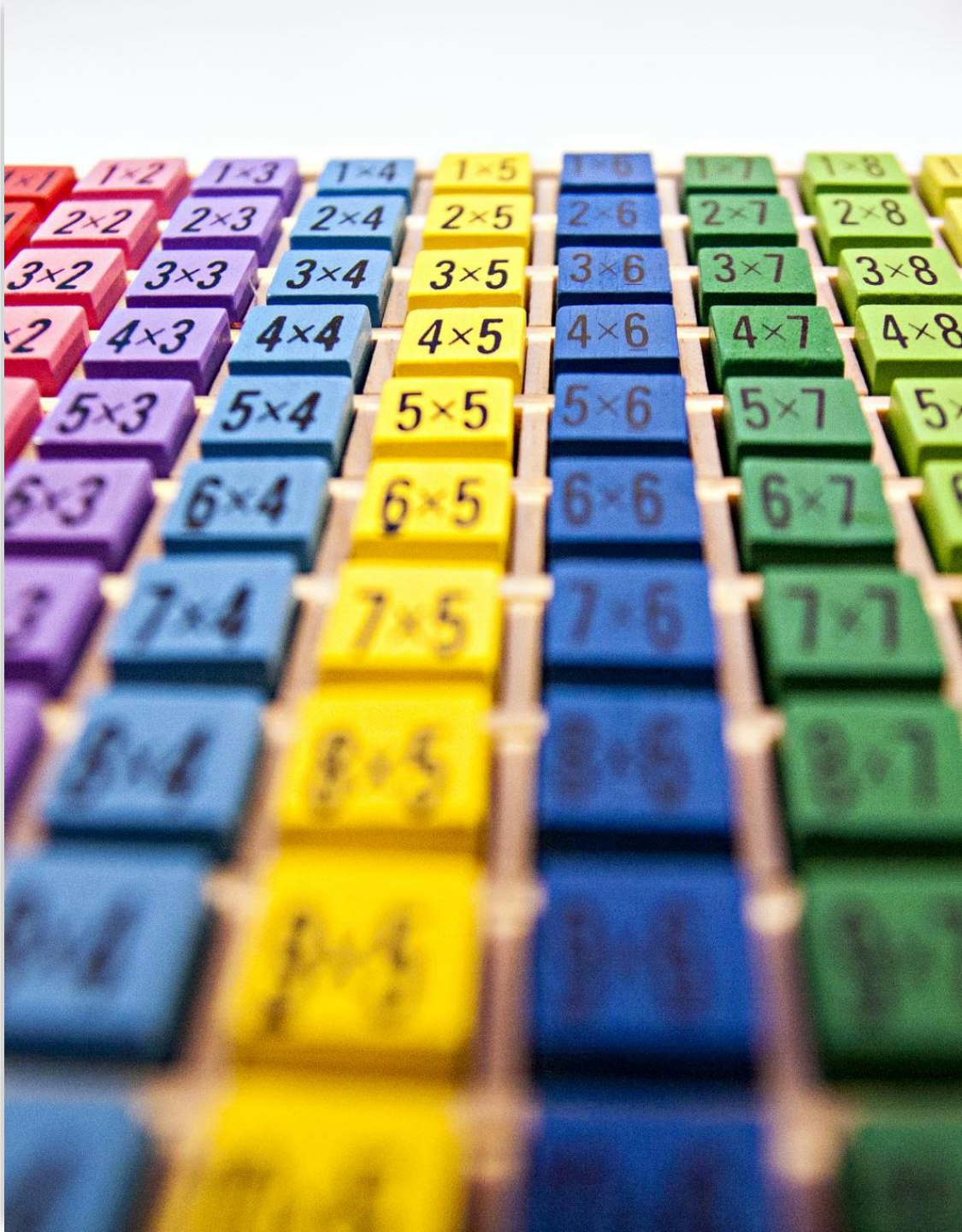


50 + 40 = 90

Multiplication at St. Michael and All Angels School

- Language of multiplication “one number is the group size,” and “one number is the group of numbers.”

- **<u>Recall of multiplication at St Michaels is under 3 seconds.</u>**
- How we practice?
- Whole class chanting
- Identify pattern and relationships
- Recognising why these exist
- Using the facts



We have a consistent approach to reciting multiplications?

- A consistent approach to reciting multiplication tables.
- 0 x 3 = 0 Zero threes are zero
- 1 x 3 = 3 One three is three
- 2 x 3 = 6 Two threes are six
- 3 x 3 = 9 Three threes are nine

Multiplication Facts to learn in each year group

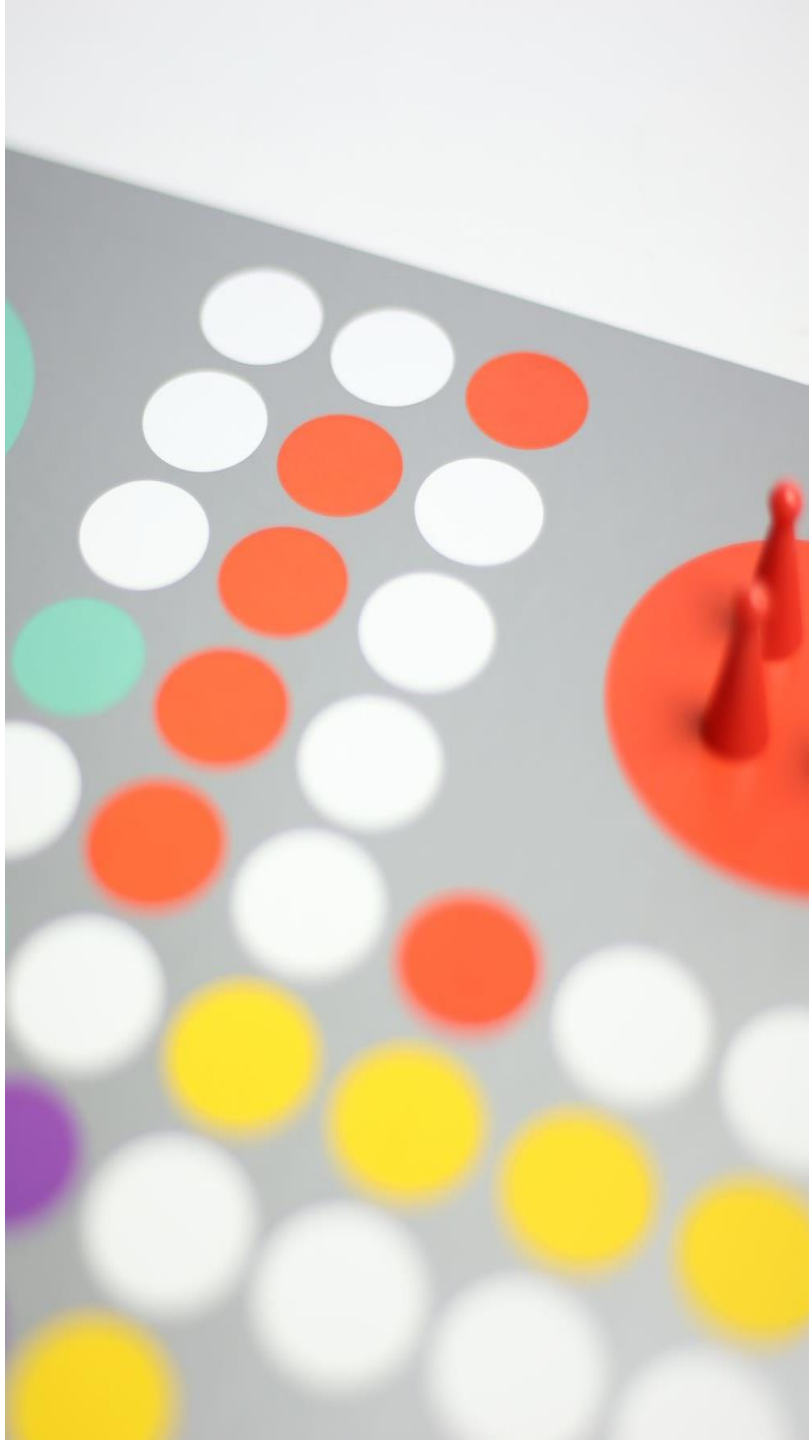
Year 1	Year 2			Year 3			Year 4				
1x	10x	5x	2x	4x	8x	3x	6x	9x	7x	11x	12x
		half 10x		double 2x	double 4x		double 3x	add 6x to 3x		add 10x to 1x	add 10x to 2x
0 x 1 = 0	0 x 10 = 0	0 x 5 = 0	0 x 2 = 0								
1 x 1 = 1											
2 x 1 = 2	2 x 10 = 20	2 x 5 = 10	2 x 2 = 4								
3 x 1 = 3	3 x 10 = 30	3 x 5 = 15	3 x 2 = 6	3 x 4 = 12	3 x 8 = 24	3 x 3 = 9					
4 x 1 = 4	4 x 10 = 40	4 x 5 = 20	4 x 2 = 8	4 x 4 = 16							
5 x 1 = 5	5 x 10 = 50	5 x 5 = 25									
6 x 1 = 6	6 x 10 = 60	6 x 5 = 30	6 x 2 = 12	6 x 4 = 24	6 x 8 = 48	6 x 3 = 18	6 x 6 = 36				
7 x 1 = 7	7 x 10 = 70	7 x 5 = 35	7 x 2 = 14	7 x 4 = 28	7 x 8 = 56	7 x 3 = 21	7 x 6 = 42	7 x 9 = 63	7 x 7 = 49		
8 x 1 = 8	8 x 10 = 80	8 x 5 = 40	8 x 2 = 16	8 x 4 = 32	8 x 8 = 64						
9 x 1 = 9	9 x 10 = 90	9 x 5 = 45	9 x 2 = 18	9 x 4 = 36	9 x 8 = 72	9 x 3 = 27	9 x 6 = 54	9 x 9 = 81			
10 x 1 = 10	10 x 10 = 100										
11 x 1 = 11	11 x 10 = 110	11 x 5 = 55	11 x 2 = 22	11 x 4 = 44	11 x 8 = 88	11 x 3 = 33	11 x 6 = 66	11 x 9 = 99	11 x 7 = 77	11 x 11 = 121	
12 x 1 = 12	12 x 10 = 120	12 x 5 = 60	12 x 2 = 24	12 x 4 = 48	12 x 8 = 96	12 x 3 = 36	12 x 6 = 72	12 x 9 = 108	12 x 7 = 84	12 x 11 = 132	12 x 12 = 144
13 facts in Y1	33 facts in Y2			21 facts In Y3			15 facts In Y4				

Learning one fact per week see multiplication week starting Summer 2024 in year 1 and Autumn 2024 throughout school.

Meaningful practice

- 4 times table with counting stick (youtube.com)
- Rehearsal of multiplication facts is essential for mastering them. • Practice should be embedded in worthwhile, meaningful mathematical activities which also promote problem solving, reasoning and communicating mathematical thinking.

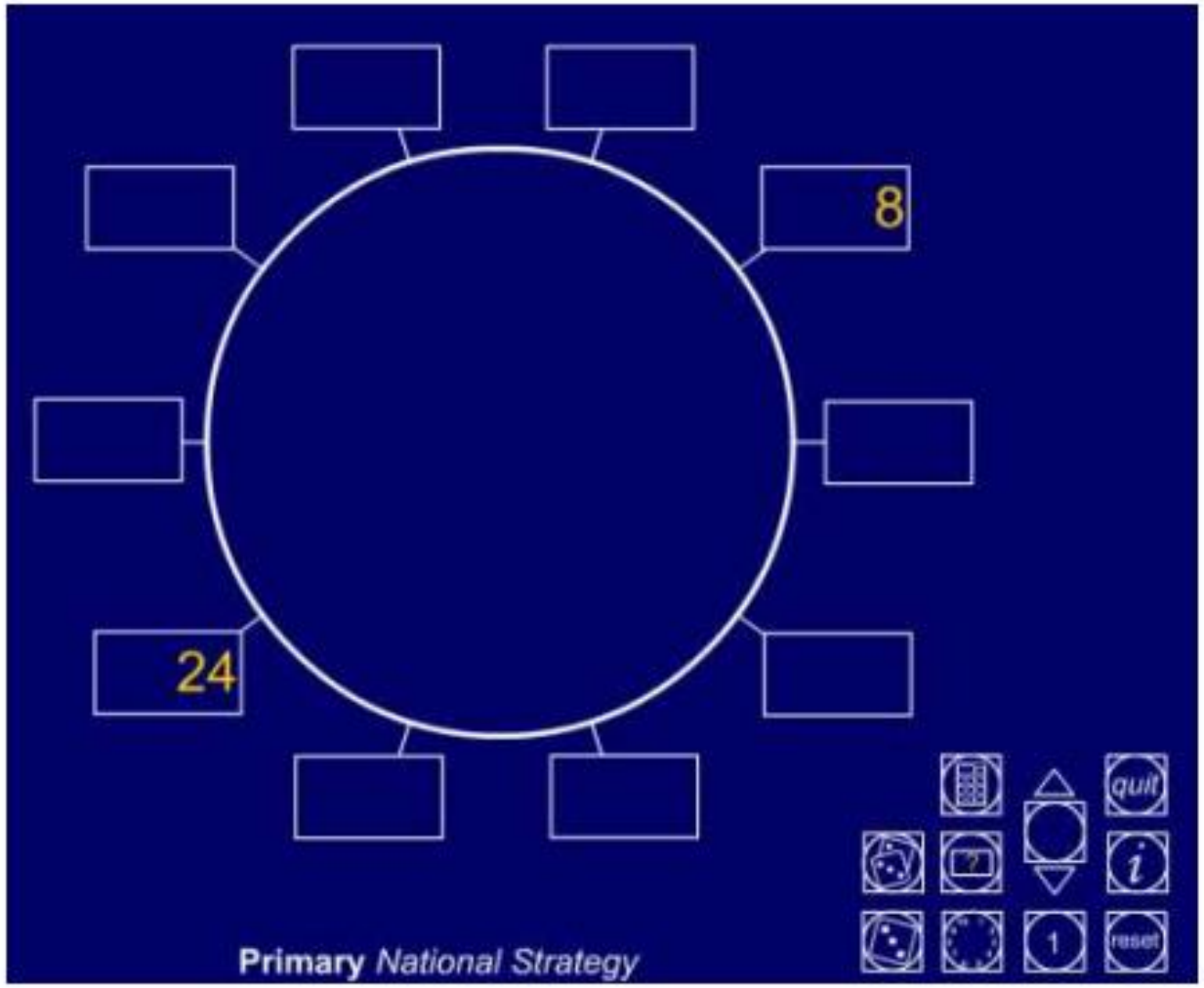
- When learning tables, it is really important that children have the opportunity to visualise and manipulate the facts that they are working with, e.g. when learning the two times table, socks could be pegged on a washing line.



We also use fun games too!

Tables Top Trumps

Number Dials



Multiplication Tables

The learning of multiplication tables is multi-faceted. It involves:

- Counting in equal steps
- Understanding and seeing a picture of what multiplication means
- Reciting tables *four threes are twelve; five threes are fifteen*
- Or Learning individual facts
- Exploring relationships between different multiplication tables
- Deriving new multiplication facts from existing ones
- Practising in different ways
- Using the multiplication facts in different contexts
- Reasoning about multiplication facts