

BASIC FACTS: MULTIPLICATION AND DIVISION MILESTONES

Year 2

Yr 2 ACMNA031: Recognise and represent multiplication as repeated addition, groups and arrays.

The 'Doubles' Addition Facts are learned in Yr 2.

Yr 2 ACMNA032: Recognise and represent division as grouping into equal sets and solve simple problems using these representations.

Groups

Counters may be used to model groups of numbers. Two groups of 3 looks different to three groups of 2.

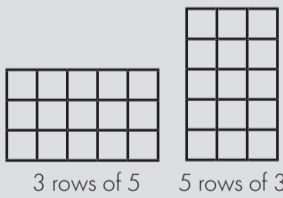


Commutative Property of Multiplication (CPM)

Numbers may be multiplied in any order without affecting the product. Understanding this property almost halves the number of multiplication facts that need to be learned. Understanding **Arrays** will help too.

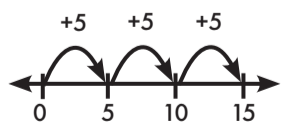
Arrays

Arrays are made up of rows, which go across, and columns, which go down.



Repeated addition

The same number is added (or subtracted for division). This would include skip counting such as 5, 10, 15, 20, 25, ... It can be shown on a number line.



Year 3

x	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

1) Understandings: Properties

Yr 3 ACMNA056: Recall multiplication facts of two, three, five and ten and related division facts.

x	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

2) Facts to Learn (Some Commutative)

Understanding 1

MULTIPLICATION PROPERTY OF ZERO

Facts To Learn: 0×0 , 1×0 , 2×0 , 3×0 , 4×0 , 5×0 , 6×0 , 7×0 , 8×0 , 9×0 , 10×0 and commutative equivalents: 0×1 , 0×2 , 0×3 , ...

Any number multiplied by zero is zero. This can be illustrated through arrays. It is impossible to draw an array $n \times 0$ or $0 \times n$. This pattern needs to be made explicit.

Understanding 2

MULTIPLICATION PROPERTY OF ONE

Facts To Learn: 0×1 , 1×1 , 2×1 , 3×1 , 4×1 , 5×1 , 6×1 , 7×1 , 8×1 , 9×1 , 10×1 and commutative equivalents: 1×2 , 1×3 , 1×4 , ...

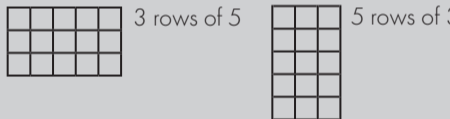
Any number multiplied by one is itself ($n \times 1 = n$). This pattern needs to be made explicit.

Understanding 3

COMMUTATIVE PROPERTY OF MULTIPLICATION

Facts To Learn: Commutative versions of all applicable facts. Numbers may be multiplied in any order without affecting the product.

Teaching Tools: Arrays
• Arrays



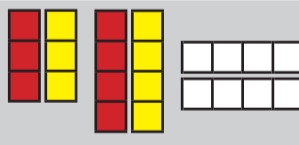
Recall

x2 FACTS

Facts To Learn: 0×2 , 1×2 , 2×2 , 3×2 , 4×2 , 5×2 , 6×2 , 7×2 , 8×2 , 9×2 , 10×2 and commutative equivalents: 2×0 , 2×1 , 2×3 , 2×4 , ...

Link the doubles addition facts learned in Year 2 to the x2 facts. Introduce vocabulary such as double.

Teaching Tools: Joining two sets of Unifix cubes of different colours will help make the links.



Recall

x10 FACTS

Facts To Learn: 0×10 , 1×10 , 2×10 , 3×10 , 4×10 , 5×10 , 6×10 , 7×10 , 8×10 , 9×10 , 10×10 and commutative equivalents.

Pattern: End digit is zero. Later show that they're double the fives facts.

Recall

x5 FACTS

Facts To Learn: 0×5 , 1×5 , 2×5 , 3×5 , 4×5 , 5×5 , 6×5 , 7×5 , 8×5 , 9×5 , 10×5 and commutative equivalents: 5×0 , 5×1 , 5×2 , ...

Pattern: End digit is zero or five. Half the tens facts.

Recall

x3 FACTS

Facts To Learn: 0×3 , 1×3 , 2×3 , 3×3 , 4×3 , 5×3 , 6×3 , 7×3 , 8×3 , 9×3 , 10×3 and commutative equivalents: 3×1 , 3×2 , 3×4 , ...

Use known facts to derive new facts e.g. Use $6 \times 2 = 12$ to work out 6×3 . $6 \times 3 = (6 \times 2) + 6$.

Year 4

Yr 4 ACMNA075: Recall multiplication facts up to 10×10 and related division facts.

Review facts learned in Year 3:

- Multiplication Property of Zero ($\times 0$) facts,
- Multiplication Property of One ($\times 1$) facts,
- Commutative Property of Multiplication ($2 \times 3 = 3 \times 2$),
- $\times 2$ facts,
- $\times 10$ facts,
- $\times 5$ facts
- $\times 3$ facts

x	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
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10	0	10	20	30	40	50	60	70	80	90	100

3) Remaining Facts to Learn in Year 4 (Some Commutative)

Recall

x9 FACTS

Facts To Learn: 0×9 , 1×9 , 2×9 , 3×9 , 4×9 , 5×9 , 6×9 , 7×9 , 8×9 , 9×9 , 10×9 and commutative equivalents.

Show the pattern on a Number Grid. Relate to 10 facts: e.g. $3 \times 9 = (3 \times 10) - 3$

Strategy 1

DOUBLING

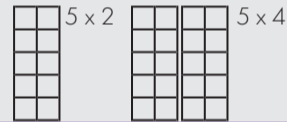
$\times 4$ facts are double $\times 2$ facts. Similarly, $\times 8$ is Double $\times 4$

Recall

x4 FACTS

Facts To Learn: 0×4 , 1×4 , 2×4 , 3×4 , 4×4 , 5×4 , 6×4 , 7×4 , 8×4 , 9×4 , 10×4 and commutative equivalents.

Revise the $2 \times$ facts. Link $\times 2$ facts to $\times 4$ facts. (Doubling Strategy)



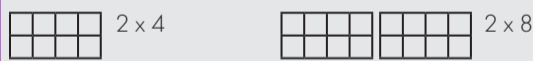
Recall

x8 FACTS

Facts To Learn: 0×8 , 1×8 , 2×8 , 3×8 , 4×8 , 5×8 , 6×8 , 7×8 , 8×8 , 9×8 , 10×8 and commutative equivalents.

Link $\times 4$ facts to $\times 8$ facts. (Doubling Strategy)

or Link $\times 2$ facts to $\times 8$ facts using double-double strategy.



Recall

x6 FACTS

Facts To Learn: 0×6 , 1×6 , 2×6 , 3×6 , 4×6 , 5×6 , 6×6 , 7×6 , 8×6 , 9×6 , 10×6 and commutative equivalents.

Link $\times 3$ facts to $\times 6$ facts. (Doubling Strategy).

Recall

x7 FACTS

Facts To Learn: 0×7 , 1×7 , 2×7 , 3×7 , 4×7 , 5×7 , 6×7 , 7×7 , 8×7 , 9×7 , 10×7 and commutative equivalents.

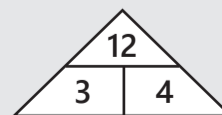
Last fact to learn (7×7). Point out the square numbers already learned.

Recall

DIVISION FACTS

Use known facts to derive new facts

Relate division to multiplication. e.g. show that:
 $4 \times 3 = 12$, $3 \times 4 = 12$
 $12 \div 3 = 4$, $12 \div 4 = 3$



Strategy 2

HALVING STRATEGIES

Divide by 4: halve and halve again ($\div 2$, $\div 2$).
Divide by 8: halve, halve and halve again ($\div 2$, $\div 2$, $\div 2$).

Year 5/6

Yr 5 ACMNA098: Identify and describe factors and multiples of whole numbers and use them to solve problems.

Factors and Multiples.

Apply Simple Divisibility Tests.

Yr 5 ACMNA101: Solve problems involving division by a one digit number, ...
Review all basic division facts.

Continued Practise of Multiplication and Division Facts

To maintain recall.

Factors

For example, 18 not just linked to one fact of 6×3 but has factors of 1, 2, 3, 6, 9 and 18.

Divisibility

End digit rules
 $\div 10$: end digit zero.
 $\div 5$: end digit five or zero.
 $\div 2$: even number.
 $\div 3$: sum of digits is 3, 6 or 9.
 $\div 9$: sum of digits is 9.

Yr 6 ACMNA127: Find a simple fraction of a quantity where the result is a whole number ...
Link to known multiplication and division facts.

$3 \times 4 = 12$
 $4 \times 3 = 12$
 $12 \div 4 = 3$
 $12 \div 3 = 4$
 $1/3$ of $12 = 4$
 $1/4$ of $12 = 3$

An opportunity to review all basic multiplication and division facts

