



Rush Green Primary School

Multiplication Policy

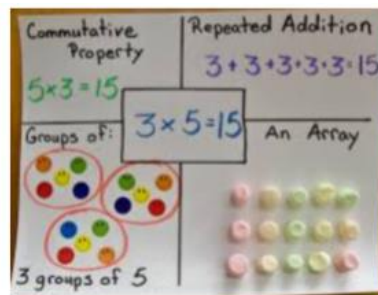


Rush Green Primary

Progression through calculations for Multiplication

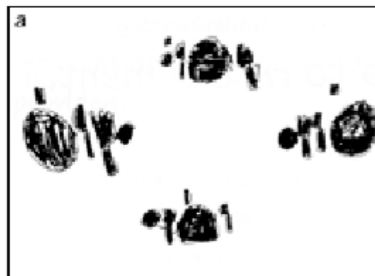
- These standards are age-related expectations and therefore we expect the majority of children to achieve them.
- New learning is likely to be taught to groups rather than the whole class to acknowledge the different learning stages of the children.
- Children need to understand that multiplication is commutative and use this information to rearrange calculations knowing that $4 \times 6 = 24$ gives the same answer as $6 \times 4 = 24$.
- Children need to understand that multiplication is repeated addition.
- Ensure that children understand the = sign means is the same as and that children see calculations where the equals sign is in a different position, e.g. $3 \times 5 = 15$ and $15 = 3 \times 5$.
- Children should be encouraged to approximate before calculating and check whether their answer is reasonable.
- By Year 4 children should know their times tables facts to 12×12 .
- When teaching multiplication, the principles of concrete, pictorial and abstract (CPA) are followed throughout the whole school.
- Children need to understand the language used for multiplication and be able to record their findings in a variety of ways.

For example:



YR

Children are encouraged to develop a mental picture of the number system in their heads to use for calculation. They should experience practical calculation opportunities involving equal sets or groups using a wide variety of equipment, e.g. small world play, role play, counters, cubes etc. They develop ways of recording calculations using pictures, etc.

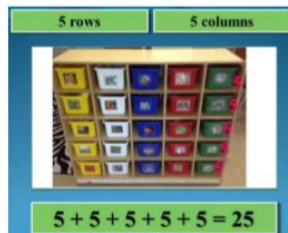
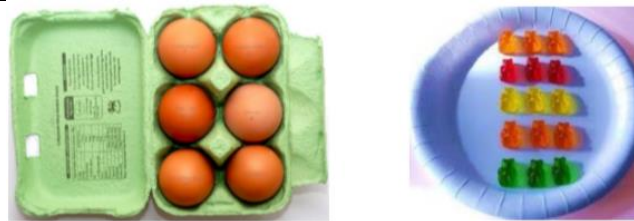


Y1

Children will use practical equipment to make groups of objects to represent multiplication. They should see everyday versions of arrays, e.g. egg boxes, baking trays, ice cube trays, wrapping paper etc and use this in their learning answering questions such as 'How many eggs would we need to fill the egg box? How do you know?'

Children will record their observations in concrete and pictorial representations before moving on to the abstract (recording in a formal way).

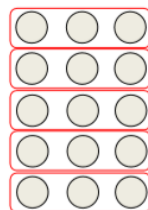
Examples of everyday arrays:



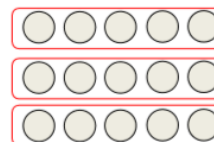
Y2

Children should utilise multiplication as repeated addition - linked to arrays (as this knowledge will support with the development of the grid method). They should also use jottings to support their calculation. These should be supported by the use of counters/cubes.

e.g. 3×5 can be represented as an array in two forms (as it has commutativity):



$3 + 3 + 3 + 3 + 3 = 15$



$5 + 5 + 5 = 15$

$4 \times 7 =$

x	x	x	x	x	x	x	
x	x	x	x	x	x	x	
x	x	x	x	x	x	x	
x	x	x	x	x	x	x	

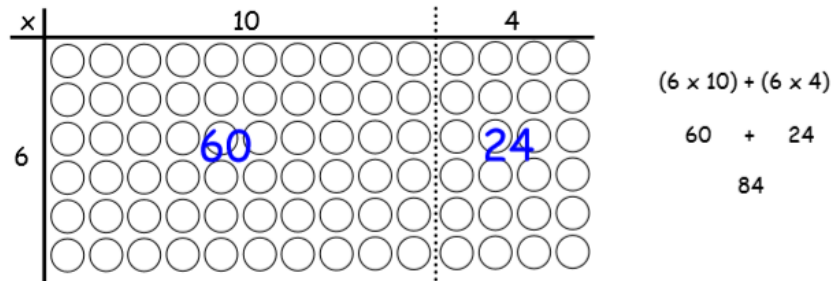
$4 \times 7 = 7 + 7 + 7 + 7 = 28$

(For mathematical accuracy the above example is actually 7×4 → Seven, four times, however, because we use terms such as 'groups of' or 'lots of', children are more familiar with the initial notation. Once children understand the commutative order of multiplication the order is irrelevant).

Y3

Children should continue to utilise multiplication as repeated addition linked to arrays (as this knowledge will support with the development of the grid method) and use jottings to support their calculation.

Children will continue to use arrays where appropriate leading into the grid method of multiplication (the picture below shows the link between arrays and grid method).



Y4

Continuing on from Y3, children will use the grid method to record their work in a formal written way. It will be expected for children to be able to multiply a 2-digit and 3-digit numbers by a 1-digit number.

TO x O (Short multiplication – multiplication by a single digit)

$$23 \times 8$$

$$\begin{array}{r} \times \quad 20 \quad 3 \\ 8 \quad \boxed{160} \quad \boxed{24} \end{array}$$

$$\begin{array}{r} 160 \\ + 24 \\ \hline 184 \end{array}$$

Y5

Children will continue to use the grid method to aid in multiplying numbers up to 4-digits by 1- or 2-digit numbers as well as decimal numbers. They will then move onto using formal written methods including long multiplication.

HTO x O (Short multiplication – multiplication by a single digit)

$$346 \times 9$$

$$\begin{array}{r} \times \quad 300 \quad 40 \quad 6 \\ 9 \quad \boxed{2700} \quad \boxed{360} \quad \boxed{54} \end{array}$$

$$\begin{array}{r} 2700 \\ + 360 \\ + 54 \\ \hline 3114 \\ \quad 11 \end{array}$$

$$4.9 \times 3$$

$$\begin{array}{r} \times \quad 4 \quad 0.9 \\ 3 \quad \boxed{12} \quad \boxed{2.7} \end{array}$$

$$\begin{array}{r} 12 \\ + 2.7 \\ \hline 14.7 \end{array}$$

Y6

Children will continue to use the methods taught in previous years. Children will have to decide which method is most appropriate for the given question.

ThHTO x O (Short multiplication – multiplication by a single digit)

4346×8

4346×8	\times	4000	300	40	6	
	8	32000	2400	320	48	

32000	
+ 2400	
+ 320	
+ 48	
34768	

4.92×3

4.92×3	\times	4	0.9	0.02	
	3	12	2.7	0.06	

12	
+ 2.7	
+ 0.06	
14.76	

TO x TO (Long multiplication – multiplication by more than a single digit)

72×38

72×38	\times	70	2	
	30	2100	60	
	8	560	16	

2100	
+ 560	
+ 60	
+ 16	
2736	

When mathematically ready, children can progress onto HTO x TO and beyond.

Step 1:

$$\begin{array}{r} 329 \\ \times 14 \\ \hline 1316 \end{array}$$

Step 2:

$$\begin{array}{r} 329 \\ \times 14 \\ \hline 1316 \\ 3290 \\ \hline \end{array}$$

Step 3:

$$\begin{array}{r} 329 \\ \times 14 \\ \hline 1316 \\ + 3290 \\ \hline 4606 \\ 1 \end{array}$$

By the end of year 6, children will have a range of calculation methods, mental and written. Selection will depend upon the numbers involved.

Children should not be made to go onto the next stage if:

- 1) they are not ready.
- 2) they are not confident.

Children should be encouraged to consider if a mental calculation would be appropriate before using written methods.