Year 1 - 6

Calculation Policy Multiplication and Division

#MathsEveryoneCan



Notes and Guidance

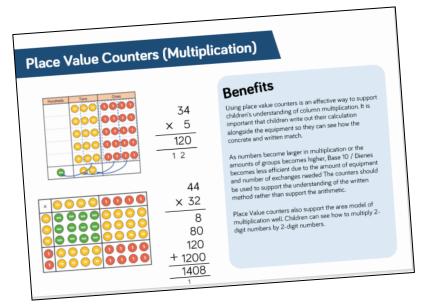


Calculation Policy

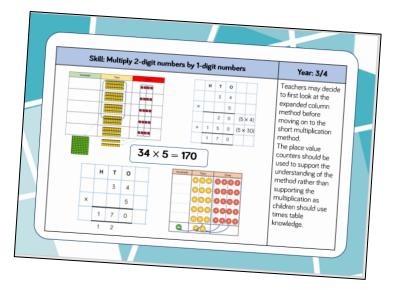
Welcome to the White Rose Maths Calculation Policy.

This document is broken down into addition and subtraction, and multiplication and division.

At the start of each policy, there is an overview of the different models and images that can support the teaching of different concepts. These provide explanations of the benefits of using the models and show the links between different operations.



Each operation is then broken down into skills and each skill has a dedicated page showing the different models and images that could be used to effectively teach that concept.



There is an overview of skills linked to year groups to support consistency through out school. A glossary of terms is provided at the end of the calculation policy to support understanding of the key language used to teach the four operations.

Times Tables

| Skill | Year | Representations and models | |
|------------------------|------|----------------------------|------------------|
| Recall and use | 2 | Bar model | Ten frames |
| multiplication and | | Number shapes | Bead strings |
| division facts for the | | Counters | Number lines |
| 2-times table | | Money | Everyday objects |
| Recall and use | 2 | Bar model | Ten frames |
| multiplication and | | Number shapes | Bead strings |
| division facts for the | | Counters | Number lines |
| 5-times table | | Money | Everyday objects |
| Recall and use | 2 | Hundred square | Ten frames |
| multiplication and | | Number shapes | Bead strings |
| division facts for the | | Counters | Number lines |
| 10-times table | | Money | Base 10 |

| Skill | Year | Representations and models | |
|---|------|---|---|
| Recall and use multiplication and division facts for the 3-times table | 3 | Hundred square Number shapes Counters | Bead strings Number lines Everyday objects |
| Recall and use multiplication and division facts for the 4-times table | 3 | Hundred square Number shapes Counters | Bead strings Number lines Everyday objects |
| Recall and use multiplication and division facts for the 8-times table | 3 | Hundred square Number shapes | Bead strings Number tracks Everyday objects |
| Recall and use multiplication and division facts for the 6-times table | 4 | Hundred square Number shapes | Bead strings Number tracks Everyday objects |

| Skill | Year | Representations and models | |
|--|------|---------------------------------|--------------------------------------|
| Recall and use multiplication and division facts for the 7-times table | 4 | Hundred square Number shapes | Bead strings Number lines |
| Recall and use multiplication and division facts for the 9-times table | 4 | Hundred square Number shapes | Bead strings Number lines |
| Recall and use multiplication and division facts for the 11-times table | 4 | Hundred square Base 10 | Place value counters Number lines |
| Recall and use multiplication and division facts for the 12-times table | 4 | Hundred square Base 10 | Place value counters Number lines |

Multiplication

| Skill | Year | Representations and models | |
|---|------|--|---|
| Solve one-step problems with multiplication | 1/2 | Bar model Number shapes Counters | Ten frames Bead strings Number lines |
| Multiply 2-digit by 1- digit numbers | 3/4 | Place value counters Base 10 | Short written method Expanded written method |
| Multiply 3-digit by 1- digit numbers | 4 | Place value counters Base 10 | Short written method |
| Multiply 4-digit by 1- digit numbers | 5 | Place value counters | Short written method |

| Skill | Year | Representations and models | |
|---|------|---------------------------------|-------------------------------------|
| Multiply 2-digit by 2- digit numbers | 5 | Place value counters Base 10 | Short written method Grid method |
| Multiply 2-digit by 3- digit numbers | 5 | Place value counters | Short written method Grid method |
| Multiply 2-digit by 4- digit numbers | 5/6 | Formal written method | |

Division

| Skill | Year | Representations and models | |
|---|------|--|--|
| Solve one-step problems with division (sharing) | 1/2 | Bar model Real life objects | Arrays Counters |
| Solve one-step problems with division (grouping) | 1/2 | Real life objects Number shapes Bead strings Ten frames | Number lines Arrays Counters |
| Divide 2-digits by 1- digit (no exchange sharing) | 3 | Straws Base 10 Bar model | Place value counters Part-whole model |
| Divide 2-digits by 1- digit (sharing with exchange) | 3 | Straws Base 10 Bar model | Place value counters Part-whole model |

| Skill | Year | Representations and models | |
|---|------|----------------------------------|--|
| Divide 2-digits by 1- digit (sharing with remainders) | 3/4 | Straws Base 10 Bar model | Place value counters Part-whole model |
| Divide 2-digits by 1- digit (grouping) | 4/5 | Place value counters Counters | Place value grid Written short division |
| Divide 3-digits by 1- digit (sharing with exchange) | 4 | Base 10 Bar model | Place value counters Part-whole model |
| Divide 3-digits by 1- digit (grouping) | 4/5 | Place value counters Counters | Place value grid Written short division |

| Skill | Year | Representations and models | |
|--|------|----------------------------------|--|
| Divide 4-digits by 1- digit (grouping) | 5 | Place value counters Counters | Place value grid Written short division |
| Divide multi-digits by 2-digits (short division) | 6 | Written short division | List of multiples |
| Divide multi-digits by 2-digits (long division) | 6 | Written long division | List of multiples |

Glossary

Array – An ordered collection of counters, cubes or other item in rows and columns.

Commutative – Numbers can be multiplied in any order.

Dividend – In division, the number that is divided.

Divisor – In division, the number by which another is divided.

Exchange – Change a number or expression for another of an equal value.

Factor – A number that multiplies with another to make a product.

Multiplicand – In multiplication, a number to be multiplied by another.

Partitioning – Splitting a number into its component parts.

Product – The result of multiplying one number by another.

Quotient - The result of a division

Remainder – The amount left over after a division when the divisor is not a factor of the dividend.

Scaling – Enlarging or reducing a number by a given amount, called the scale factor