

# EFFECTIVE MATHS

Year 2

Block 1

## Multiplication and division (Unit 1)

### UNIT OVERVIEW

In Year 1 children learnt about equal and unequal groups. Work on multiplication involved repeated addition and using language like, '5 + 5 + 5 = 15; 3 lots of 5 makes 15'.

Work on multiplication in Year 2 starts with children recognising equal groups and learning to understand the equivalence between a repeated addition expression and a multiplication expression:  $5 + 5 + 5 = 3 \times 5$ .

Children then develop this knowledge and learn about arrays as they begin to learn the  $5 \times$  table. They describe the arrays they make using repeated addition, in terms of how many groups of 5 and using a multiplication equation:  $5 + 5 + 5$ , 3 groups of 5,  $3 \times 5$ .

Learning about the  $10 \times$  table makes links to the  $5 \times$  table. Children then begin to learn the  $2 \times$  table. Throughout all the lessons there is an emphasis on interpreting pictures and solving problems.

Work on division starts with understanding equal sharing and understanding the meaning of the term 'divide'. The relationship triangle is used to help make links between multiplication and division. Children then learn about another division structure: grouping. (Sharing is sometimes referred to as partitive division and grouping as quotitive division.)

At this point, all work on division has involved sharing between 2 or arranging items into groups of 2. Children then explore dividing by 2 using the context of odd and even numbers and learn that even numbers can be divided exactly by 2.

The unit concludes with learning to divide by 5 and 10. Children do this using both sharing and grouping. The relationship triangle is used to help make links between multiplication and division.

### LESSONS

[1] Groups and equal groups

[2]  $5 \times$  table ◊MQ

[3]  $10 \times$  table ◊MQ

[4]  $2 \times$  table ◊MQ

[5] Division: sharing by 2

[6] Division: making groups of 2 ◊MQ

[7] Odd and even numbers

[8] Dividing by 5 ◊MQ

[9] Dividing by 10 ◊MQ

# EFFECTIVE MATHS

Year 3

Block 1

## Multiplication and division (Unit 1)

### UNIT OVERVIEW

The unit begins with revision of the  $5 \times$  table from Year 2. Children's understanding is deepened as they encounter arrays on blank multiplication grids. As the lesson progresses these arrays become partitioned and children are exposed to the distributive property of multiplication:  
 $12 \times 5 = 10 \times 5 + 2 \times 5$

Children then begin to learn the 4, 8 and 3 multiplication tables (in that order). The lessons continue to develop understanding through use of arrays and the distributive property. Children look for patterns in the ones digits of the products, for example: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40. They also make links between the 4 and 8 multiplication tables.

Work on the 4, 8 and 3 multiplication tables is then applied in a range of problem solving contexts. There is an emphasis on representing problems through drawing bar models and other diagrams.

The unit concludes with learning to divide by 4, 8 and 3. Children are encouraged to use their developing knowledge of multiplication facts to derive division facts. As in Year 2, they encounter two division structures: sharing and grouping. (Sharing is sometimes referred to as partitive division and grouping as quotitive division.)

The relationship triangle is used to help children see connections between facts and children learn to use multiplication grids to obtain division facts.

### LESSONS

[1]  $5 \times$  table (revision)

[2]  $4 \times$  table ◊MQ

[3]  $8 \times$  table ◊MQ

[4]  $3 \times$  table ◊MQ

[5] Solving problems involving 3, 4 and  $8 \times$  tables

[6] Dividing by 4 ◊MQ

[7] Dividing by 8 ◊MQ

[8] Dividing by 3 ◊MQ

◊RTP 3NF-2

2 RTP quizzes: 1 focuses on  $\times$  facts and the other on  $\div$  facts

# EFFECTIVE MATHS

Year 4

Block 1

## Multiplication and division (Unit 1)

### UNIT OVERVIEW

The unit begins with two lessons that aim to secure multiplication facts children should know from Year 2 and Year 3: the 2, 3, 4, 5, 8 and 10 multiplication tables. The initial lesson focuses in depth on the  $8 \times$  table and re-familiarises children with arrays, the distributive property and the multiplication grid. A lesson on reasoning serves to revisit children's recall of other multiplication tables and related division facts.

Children then begin to learn the 6, 9 and 7 multiplication tables. The lessons continue to develop understanding through use of arrays and the distributive property. Children look for patterns in the ones digits of the products, for example: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60.

The unit concludes with learning to divide by 6, 9 and 7. Children are encouraged to use their developing knowledge of multiplication facts to derive division facts. As in Year 3, they encounter two division structures: sharing and grouping. (Sharing is sometimes referred to as partitive division and grouping as quotitive division.)

The relationship triangle is used to help children see connections between facts and children revisit using the multiplication grid to obtain division facts. Problem solving includes interpreting bar models that represent division situations, continuing sequences with embedded division calculations and solving word problems.

### LESSONS

[1]  $8 \times$  table (revision)

[2] Reasoning about multiplication

[3]  $6 \times$  table ◊MQ

[4]  $9 \times$  table ◊MQ

[5]  $7 \times$  table ◊MQ

[6] Dividing by 6 ◊MQ

[7] Dividing by 9 ◊MQ

[8] Dividing by 7 ◊MQ

RTP 4NF-1←

3 RTP quizzes covering Y3 and Y4  $\times$  and  $\div$  facts

# EFFECTIVE MATHS

Year 5

Block 1

## Multiplication and division (Unit 1)

### UNIT OVERVIEW

The unit begins with two lessons that aim to secure multiplication facts children should know from Year 2, Year 3 and Year 4. The initial lesson focuses in depth on the  $9 \times$  table and re-familiarises children with arrays, the distributive property and the multiplication grid. A lesson on reasoning serves to revisit children's recall of other multiplication tables and related division facts.

Children then learn about factors, deriving factor pairs from arrays and open arrays. They also learn how to use the multiplication grid to obtain factors of a number.

Work on division begins with consolidating children's understanding of how division works using arrays to revisit the sharing and grouping structures. Dividing by partitioning the dividend is revised with a focus on partitioning the dividend into parts that are divisible by the divisor. Learning about division is then applied in problem solving contexts and through an investigation about dividing with remainders. A lesson on multiplication arithmagons then provides further opportunities for children to apply their knowledge of multiplication and division facts.

Children then learn how to find common factors and common multiples of small numbers in preparation for simplifying fractions and finding common denominators.

Work on factors is developed further as children learn about prime numbers. Through an investigation, they discover that prime numbers have exactly 2 factors: 1 and the prime number.

The unit concludes with learning to recognise square numbers and use the correct notation (e.g.  $4 \times 4 = 4^2$ ). A range of investigations deepen understanding of square numbers.

### LESSONS

[1]  $9 \times$  table (revision)

[2] Reasoning about multiplication

[3] Factors

[4] Understanding division and recalling division facts ◊RTP 5NF-1←

[5] Division problems ◊MQ

[6] Multiplication arithmagons

[7] Common factors and common multiples ◊RTP 5MD-2←

[8] Prime numbers ◊MQ

[8] Square numbers

# EFFECTIVE MATHS

Year 6

Block 1

## Multiplication and division (Unit 1)

### UNIT OVERVIEW

The unit begins with revision previous learning. A lesson on the  $7 \times$  table re-familiarises children with arrays, the distributive property and the multiplication grid; problem solving includes identifying missing products on parts of a multiplication grid where no factors are present. Children then revisit learning about factors and multiples (this is to support later work in fractions: simplifying fractions and finding common denominators). Finally children revise knowledge about prime numbers, square numbers and cube numbers and apply this knowledge when solving problems.

The next two lessons explore a range of strategies for multiplication and division including partitioning, using factors and finding relationships. Children then develop their understanding of division further in a lesson involving reasoning about division in situations where the dividend remains the same while the divisor is different and in situations where the dividend is different while the divisor remains the same.

The unit concludes by embedding understanding about multiplying a number by a 2-digit number. Children explore a range of methods for doing this, including the formal method for long multiplication. They solve problems involving long multiplication and explore relationships between calculations.

### LESSONS

[1]  $7 \times$  table (revision)

[2] Multiples and factors (revision) ◊MQ

[3] Prime numbers, square numbers and cube numbers (revision) ◊MQ

[4] Efficient strategies for multiplication and solving multiplication problems

[5] Efficient strategies for division

[6] Reasoning about division ◊MQ

[7] Multiplying a 2-digit number by a 2-digit number (revision)

[8] Solving problems involving multiplying a 2-digit number by a 2-digit number

[9] Multiplying a 3-digit number by a 2-digit number