

## Knowledge Organiser

Year Group	Subject	Topic
3	Maths	Multiplication and Division

### The Big Picture

In this unit, pupils develop their understanding of multiplication and division through practical, pictorial and written methods. They learn about equal groups, arrays, repeated addition, multiplication facts, division by grouping and sharing, fact families and scaling. Pupils use multiplication and division to solve problems and explain their mathematical thinking.

### Enquiry Question

What are equal groups?  
 How can arrays help us multiply?  
 How are multiplication and division connected?  
 How can I use the 3× and 4× times tables?  
 What is the difference between grouping and sharing?  
 How can multiplication and division help solve real-life problems?

### Key Vocabulary

**Multiply** - To find the total of equal groups.  
**Division** - Splitting into equal groups.  
**Equal Groups** - Groups with the same amount in each.  
**Array** - Objects arranged in rows and columns.  
**Rows** - Horizontal lines in an array.  
**Columns** - Vertical lines in an array.  
**Product** - The answer to a multiplication calculation.  
**Quotient** - The answer to a division calculation.

**Repeated Addition** - Adding the same number again and again.  
**Commutativity** - Numbers can be swapped when multiplying.  
**Fact Family** - Related multiplication and division facts.  
**Scaling** - Making an amount larger or smaller using multiplication.  
**Grouping** - Finding how many groups can be made.  
**Sharing** - Splitting equally into groups.  
**Operation** - A mathematical calculation such as +, −, × or ÷.

### Core Knowledge

#### 1. EQUAL GROUPS

- Multiplication is made up of equal groups.
- Equal groups have the same number in each group.
- Repeated addition can be used to find the total.

Example:



$$2 + 2 + 2 = 9$$

$$3 \text{ groups of } 3 = 9$$

#### 2. ARRAYS

An array shows multiplication using rows and columns.

Example:



$$3 \times 4 = 12$$

Arrays help us see multiplication clearly.

#### 3. MULTIPLICATION

Multiplication means finding the total of equal groups.

Example:



$$4 \times 3 = 12$$

4 groups of 3 make 12.

#### 4. THE 3 TIMES TABLE

$$\begin{aligned} 3 \times 1 &= 3 \\ 3 \times 2 &= 6 \\ 3 \times 3 &= 9 \\ 3 \times 4 &= 12 \\ 3 \times 5 &= 15 \\ 3 \times 10 &= 30 \end{aligned}$$



#### 5. THE 4 TIMES TABLE

$$\begin{aligned} 4 \times 1 &= 4 \\ 4 \times 2 &= 8 \\ 4 \times 3 &= 12 \\ 4 \times 4 &= 16 \\ 4 \times 5 &= 20 \\ 4 \times 10 &= 40 \end{aligned}$$



#### 6. COMMUTATIVITY

Numbers can change places when multiplying.

Example:

$$3 \times 4 = 12$$

$$4 \times 3 = 12$$

The answer stays the same.

#### 7. DIVISION

Division means splitting into equal groups.

Example:



$$12 \div 3 = 4$$

12 shared into 3 equal groups gives 4 in each group.

#### 8. GROUPING AND SHARING

##### GROUPING

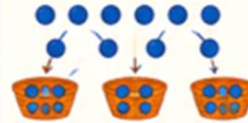
How many groups can be made?



$$12 \div 3 = 4 \text{ groups}$$

##### SHARING

How many are in each group?



$$12 \div 3 = 4 \text{ in each group}$$

#### 9. FACT FAMILIES

Multiplication and division facts are linked.

Example:

$$3 \times 4 = 12$$

$$4 \times 3 = 12$$

$$12 \div 3 = 4$$

$$12 \div 4 = 3$$

#### 10. SCALING

Scaling means making an amount larger or smaller.

Example:



1 bag has 4 apples.



3 times as many as 4 = 12



3 bags have 12 apples.

Multiplication and division help us solve problems in everyday life!

**PRACTICE • THINK • REASON • SOLVE PROBLEMS!**

#### What I Need to Remember

- ★ Multiplication uses equal groups.
- ★ Arrays show multiplication in rows and columns.
- ★ Repeated addition can help solve multiplication.
- ★ Multiplication and division are connected.
- ★ Fact families help us solve calculations quickly.
- ★ Division can be solved by grouping or sharing.
- ★  $3 \times 4 = 12$  and  $4 \times 3 = 12$ .
- ★ Scaling means finding "times as many".

#### Sticky Knowledge

Multiplication means equal groups.  
 Arrays are organised into rows and columns.  
 Multiplication and division are inverse operations.  
 Fact families show the relationship between multiplication and division.  
 Division can be solved by grouping or sharing.  
 Commutativity means numbers can swap places when multiplying.