

Division of Whole Numbers

Division is used to separate objects into groups of equal size.

Division is the inverse of multiplication ($3 \times 4 = 12$ and $12 \div 3 = 4$ and $12 \div 4 = 3$)

We write division in two different ways $12 \div 4$ is the same as $4 \overline{)12}$

Look at the division $4 \overline{)24}$ with quotient 6, we refer to 4 as the divisor, 24 as the dividend and 6 as the quotient. In general, we have

$$\begin{array}{r} \text{quotient} \\ \text{divisor} \overline{) \text{dividend}} \end{array}$$

Also, we can see the relationship between division and multiplication $4 \overline{)24}$ because $4 \times 6 = 24$

Important Division Rules

Any number, except zero, divided by itself equals 1

$$8 \overline{)8} \quad 2 \overline{)2}$$

Any number divided by 1 is the number itself

$$1 \overline{)8} \quad 1 \overline{)27}$$

Zero divided by any number is zero

$$7 \overline{)0} \quad 101 \overline{)0}$$

Division by zero is not allowed

$$0 \overline{)8} \text{ , there is no number whose product with 8 is 0}$$

Dividing single digits into larger numbers

Divide $3192 \div 4$

$4 \overline{)3192}$	4 divides into 31 - 7 times since $4 * 7 = 28$	
$4 \overline{)3192}$ $\underline{-28}$ 39	subtract 28 from 31, bring down the 9	
$4 \overline{)3192}$ $\underline{-28}$ 39 $\underline{-36}$ 3	$4 \overline{)3192}$ $\underline{-28}$ 39 $\underline{-36}$ 3	4 divides into 39 - 9 times since $4 * 9 = 36$, subtract $39 - 36$
$4 \overline{)3192}$ $\underline{-28}$ 39 $\underline{-36}$ 32 $\underline{-32}$ 0	bring down the 2, 4 divides into 32 - 8 times since $4 * 8 = 32$, subtract $32 - 32 = 0$	

Dividing by single digit with a remainder

Divide $3 \overline{)14}$

$3 \overline{)14}$ 4	$3 * 4 = 12$
$3 \overline{)14}$ $\underline{-12}$ 2	subtract $14 - 12 = 2$
$4 r 2$ $3 \overline{)14}$ $\underline{-12}$ 2	so the result is 4 with a remainder of 2 ($3 * 4 + 2 = 14$)

Divide larger numbers

Divide $34 \overline{)1598}$

$34 \overline{)1598}$	Think about $3 * 5 = 15$ but $5 * 34 = 170$, which is larger than 159, so use 4
$34 \overline{)1598} \quad 4$	$4 * 34 = 136$ subtract $159 - 136 = 23$ bring down the 8
$34 \overline{)1598} \quad 4$ $- 136$ <hr/> 238	$7 * 34 = 238$ subtract $238 - 238 = 0$
$34 \overline{)1598} \quad 47$ $- 136$ <hr/> 238 $- 238$ <hr/> 0	So the solution is 37 since $47 * 34 = 1598$

When do we use Division?

There are a couple of key words that indicate the use of division.

Division Key Words

The quotient of	The quotient of 9 and 3	$9 \div 3$
Divided by	6 divided by 2	$6 \div 2$