Weobley High School



Supporting Numeracy Handbook

Introduction

At Weobley High School, we believe all students should feel confident with their numeracy ability, allowing them to feel secure for further education, adult life and employment.

Numeracy is an essential life skill that goes far beyond learning numbers and completing calculations. It is about developing the confidence and ability to use maths in everyday situations, solve problems, make informed decisions and understand the world around us.

Strong numeracy skills play an important role in every child's learning and future success. From telling the time, handling money and measuring, to interpreting information, recognising patterns and thinking logically, numeracy is something we use every day. These skills support learning across all areas of the curriculum and help children develop independence, confidence and resilience.

This handbook is there as an aid for parents/guardians at home. It will provide support for basic number work which provides the foundational knowledge needed for GCSE maths.

Every pupil at Weobley High School is also given a My Maths username and password which is an online resource paid for by the school. It provides online tutorials and extra homework's and tests on every topic area.

CONTENTS PAGE

Key Mathematical Language page 3

Number

WRITING NUMBERS IN FIGURES AND WORDS page 12

ADDITION page 15

SUBTRACTION page 19

MULTIPLES & FACTORS page 23

LONG MULTIPLICATION THE BOX METHOD page 26

LOND DIVISION page 28

PERCENTAGES page 33

FRACTIONS page 35

DECIMALS page 37

RATIO page 41

TIME page 43

ROUNDING page 46

ESTIMATING page 48

AVERAGES page 50

NEGATIVE NUMBERS AND TEMPERATURE page 53

BODMAS page 55

MONEY page 57

ANSWERS page 61

A

Acute – An angle that when measured is less than 90^0

Add/ Addition – Plus the two numbers together, e.g. 1 + 2 = 3

Algebra – Using letters in the space of unknown numbers.

Angle – The space, measured in degrees, between two lines that meet.

Approximate – To estimate using a number, amount or total.

Arc – A section of the circumference of a circle.

Area – The space inside a shape. This is calculated in different ways depending on the shape

Average – Also known as the mean, the average looks at all the results and add them together. You then divide by the total that there is. This gives an average score overall, taking into account all al the data.

B

Base – The bottom of something eg/ shape

BODMAS – The order in which you perform the operations. This stands for Brackets, Indices, Division, Multiplication, Addition and Subtraction

Brackets - These are included in many maths questions and look like these ( ). You must complete the sum inside the brackets first.

C

Capacity – The amount a container can hold

Centre – The middle

Circumference – The distance around the outside of a circle.

Calculate - Work out

Congruent – This fancy word is used when looking at shapes. It means the same.

Consecutive – Numbers that follow each other in an unbroken sequence

Cube – A symmetrical 3D shape made up of 6 equal squares. An example of this shape is a rubix cube.

Cube number – A cube number is a number times by itself 3 times. Eg/ 1 x 1 x 1 = 1, 2 x 2 x 2 = 8 ….

Cuboid – A 3D shape made up of 6 rectangular faces. An example of this shape is a cereal box.

Cumulative Frequency – A running total of the frequencies.

Cylinder – A shape that has a pair of parallel sides and oval/circular bases. An example of this shape is a Pringles tube.

D

Decimal – Not a whole number eg/ 4.2, 5.690

Degree – A unit used for measuring angles

Denominator – The bottom number of a fraction

Diameter – The line that passes through a circle, from edge to edge, through the centre. It is also twice the radius measurement.

Division – Splitting a number into a smaller one.

Discrete – Discrete is a type of data. It can only take certain values. For example, if you are calculating with people, you cannot have $\frac{1}{2}$ of a person.

E

Equation – Usually seen in Algebra. An equation will always have an equals sign. It is showing that one thing is the same as another.

Equilateral Triangle – A triangle with equal sides and angles.

Estimate – To make an approximation (guess)

Even – This can relate to the even numbers 2, 4, 6, 8 …. Or having an even chance in probability. This means you have the same chance as one thing happening than the other.

Expand – Make bigger! An example could be Expand 3(x + 2). This means get rid of the brackets!

Expression – Symbols that represent a number or quantity

Exterior – Outside

F

Factor – A factor is a number that can go into other numbers. Eg. The factors of 6 are; 1,2,3,6 because 1 x 6 = 6 and 2 x 3 = 6

Factorise – This is the opposite of expanding. Factorise means putting the brackets back in by looking for common factors. Eg. $4x + 4 = 4(x + 1)$

Fraction – A fraction is part of a whole. The amount which the whole is spilt up into, in down to the denominator. Eg. 1/5 is 1 out of 5 equal parts.

Frequency – Frequency means the total number.

Formula – A rule defined by symbols. Eg/ The formula for the Area of a rectangle = l x w (Length X Width)

G

> - Means greater than or more than

H

Heptagon – A 7 sided shape

Hexagon – A 6 sided shape

Hypotenuse – The longest side on a right angled triangle.

I

Interior – Inside

Isosceles – A triangle that has two equal sides.

L

< - Means Less than.

M

Median – After putting your data in order, the median is the middle value.

Midpoint – In the middle of a line or two points.

Multiple – A number that can be divided by another number without a remainder. The multiples of 5 are 5, 10, 15, 20 etc. (TRICK: It's the numbers in its times table!)

Mode – The most common data value

N

Numerator – The top number of a Fraction

O

Obtuse – An angle that is greater than 90° but less than 180°.

Opposite Angles – These are equal.

P

Parallel – This is used to describe two lines that will never meet.

Perimeter – The distance area the outside of a shape.

Perpendicular - A straight line at an angle of 90° to another given line. A good example of this is the x and y axis. These 2 lines are Perpendicular to each other.

Pi – A irrational number that is used to calculate the circumference and area of a circle.

Prime – A number that can be divided ONLY by 1 and itself. 1 is not the first prime number!

Prism - A 3D shape with 2 triangular faces. A real life example of a prism is a Toblerone tube.

Probability – The chance of something happening. This can be written as a fraction, decimal or percentage. All probabilities must add up to 1.

Product – The result when two numbers are multiplied together.

Q

Quadrilateral – A word used to describe a 4 sided shape

Qualitative Data – Data categories such as food, sport, hobbies

Quantitative Data – Data that can be counted or measured.

R

Radius – A line inside a circle. It goes from the centre to the edge of the circle, and if half the diameter.

Range – Measures the spread of a data set. This is calculated by taking the lowest number away from the highest number.

Ratio – To split a number/amount/ingredients into parts. Usually in the form n : r which means n to r.

Rational – A real number

Reciprocal – The inverse of a number. One of two numbers whose product is 1 e.g 1/5 and 5, 1/8 and 8

Recurring Decimal – A decimal which has repeating digits

Reflection – A mirror view

Reflex Angle – A reflex angle is greater than 180°.

Revolution – A whole turn (360°)

Right Angle – A right angle is a 90° angle.

Rotation – To turn an object

S

Sample – A selection of a whole group.

Sample Space – All the possible outcomes that could happen from an experiment.

Scale Factor – A number expressing how large or small the enlargement of a shape is.

Scalene – A type of Triangle that has 3 unequal sides.

Sector – A part of circle that is made up of 2 radius measurements and a part of the circumference of a circle.

Segment – A part of a circle bound by a chord.

Sequence – An ordered set of number. This follows a particular pattern

Simplify – Make smaller.

Solve – Work out!

Subtraction – Take Away!

Sum – The total when all the parts are added together.

Surface Area – The total area of all the surfaces on a 3D shape.

Square number – A result of a number times by itself.

Square root – A number when multiplied by itself gives the original number

Symmetry – An object is symmetrical when one half is the mirror image of another half.

T

Tangent - A straight line that touches a curve or curved surface at a point. These can be found touching the outer of a circle.

Term - A number in a sequence.

Tessellation – A pattern of shapes that fit together with no gaps.

Trapezium – a 4 sided shape with no parallel sides.

Transformation – To manipulate a shape. In total, there are four transformations. Can you think of what they are?

Translation – To move a shape left/right then up/down. This is usually given to use in vector form

U

Unlikely – Probably won't happen

V

Variable – A letter than represents a value e.g/ n + 10

Vertically Opposite Angles – These are angles opposite each other, and are equal in size.

Vertex (Vertices) – Points on a shape

Volume – The space inside a 3D shape. This is measured in cubic units.

W

Width – Distance across from side to side

X

X axis – the horizontal axis on a graph

Y

Y axis – The vertical axis on a graph

Z

Zero – Nothing!

NUMBER

WRITING NUMBERS IN FIGURES AND WORDS

Calculate using mental and written methods

Learners are able to:
read and write numbers of any size and use the four operations and the connections between them, e.g. apply division as the inverse of multiplication

To write numbers as words, we need to remember place value:

H Th	T Th	Th	H	T	U	.	1/10	1/100	1/1000
2	3	4	5	2	6	.	0	0	0
Two Hundred Thousand	Thirty Thousand	Four Thousand	Five Hundred	Twenty	Six				

Two hundred and thirty thousand, five hundred and six

Write these numbers in words:

1) 14 _____

2) 357 _____

3) 9862 _____

4) 26791 _____

Write these words as numbers:

1) Thirty five _____

2) Two hundred and sixty three _____

3) Fifty five thousand and two _____

4) Four million _____



Practice Questions

1)

a) Write the number forty five thousand, two hundred and seventy three in figures.

b) Write the number five thousand, one hundred and three in figures.

c) Write the number three hundred thousand, seven hundred and ninety one in figures.

d) Write the number two and a half million in figures.

e) Write the number one and three quarter million in figure's.

2) *Write the following numbers in words*

a) 1250

a) 3 502

b) 72 067

c) 192 040

d) 30 000 000

3)

a) Write down the value of the 7 in the number 3 752.

b) Write down the value of the 6 in the number 56025.

b) Write down the value of the 2 in the number 99 723.

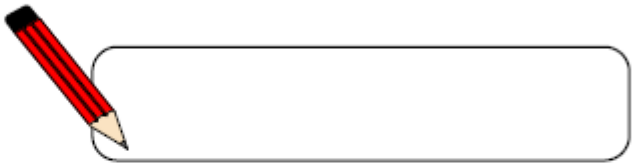
c) Write down the value of the 5 in the number 258610.

d) Write down the value of the 2 in the number 1253 549.

LNF Style Questions

1) Write a number that is **bigger than one thousand** but **smaller than one thousand and one.**

Write the number if figures not words



2) Now write a **decimal** number that is **bigger than zero** but **smaller than one**



ADDITION

Mental strategies



There are a number of useful mental strategies for addition. Some examples are given below.

Example 1 Calculate 54 + 27

Method 1 Add tens, then add units, then add together

50 + 20 = 70 4 + 7 = 11 70 + 11 = 81

Method 2 Split up number to be added into tens and units and add separately.

54 + 20 = 74 74 + 7 = 81

Method 3 Round up to nearest 10, then subtract

54 + 30 = 84 but 30 is 3 too much so subtract 3;
84 - 3 = 81

Written Method



When adding numbers, ensure that the numbers are lined up according to place value. Start at right hand side, write down units, carry tens

.

Example 2 Add 3032 and 589

$$\begin{array}{r} 3032 \\ +\ 589 \\ \hline 1 \end{array} \rightarrow \begin{array}{r} 3032 \\ +\ 589 \\ \hline 21 \end{array} \rightarrow \begin{array}{r} 3032 \\ +\ 589 \\ \hline 621 \end{array} \rightarrow \begin{array}{r} 3032 \\ +\ 589 \\ \hline 3621 \end{array}$$

2 + 9 = 11 | 3+8+1=12 | 0+5+1=6 | 3 + 0 = 3



When adding decimals we make sure all the decimal points are lined up.

Example 3 Add 43.8 + 4 + 23.76

$$\begin{array}{r} 43.80 \\ 4.00 \\ +\ 23.76 \\ \hline 71.56 \end{array}$$

43.8 can be written as 43.80 and 4 as 4.00



Remember you can add as many numbers together in a single sum as you like.



Practice Questions

1) a) $42 + 26$ b) $57 + 38$ c) $96 + 75$

2) a) $637 + 961$ b) $983 + 442$ c) $969 + 758$

3) a) $452 + 38$ b) $147 + 763$ c) $813 + 431 + 38$

4) There were two exhibitions at the NEC one Sunday.
3816 people went to one of the exhibitions and 13427 people went to the other exhibition.
How many people went to the NEC, in total, on the Sunday

5) a) $2.6 + 1.2$ b) $2.74 + 6.81$ c) $45.36 + 6.81$

6) a) $23 + 1.5$ b) $13.6 + 38$ c) $13.2 + 17.82$

7) a) $78 - 42$ b) $74 - 26$ c) $62 - 39$

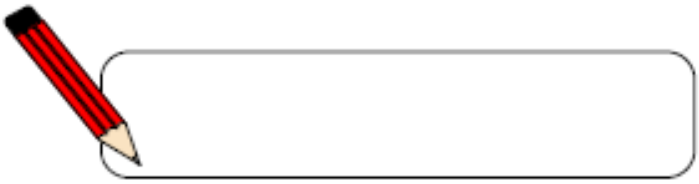
8) a) $485 - 291$ b) $773 - 486$ c) $100 - 34$

9) a) $653 - 48$ b) $362 - 183$ c) $2000 - 461$

10) There were two films showing at a cinema one Saturday.
One of the films was shown in a large room and the other was in a smaller room.
The film in the larger room was watched by a total of 3562 people.
The film in the smaller room was watched by 1671 people.
How many more people saw the film in the larger room.

LNF Style Questions

1) Add together 1740 and 282



2) Now add together 17.4 and 2.82

Can you use part (a) to help you?



3) 3.5 + 2.35 is bigger than 3.3 + 2.1

How much bigger?



Mental Strategies

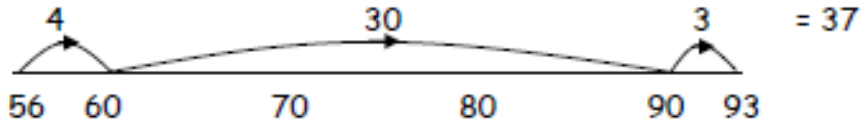


There are a number of useful mental strategies for subtraction.
Some examples are given below.

Example 1 Calculate 93 - 56

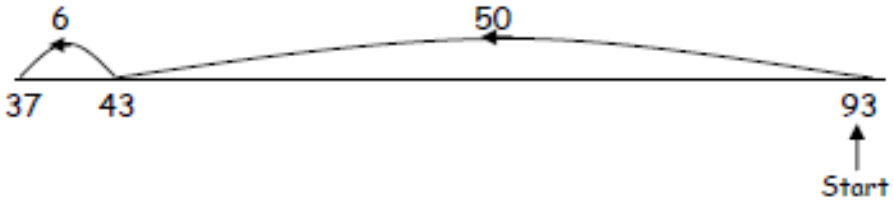
Method 1 Count on

Count on from 56 until you reach 93. This can be done in several ways e.g.



Method 2 Break up the number being subtracted

e.g. subtract 50, then subtract 6 93 - 50 = 43
43 - 6 = 37



Written Method



We use decomposition (borrowing) as a written method for subtraction (see below). Alternative methods may be used for mental calculations.

Example 2 4590 – 386

$$\begin{array}{r} {}^{8}4{}^{1}590 \\ -\ 386 \\ \hline 4204 \end{array}$$

Example 3 Subtract 692 from 14597

$$\begin{array}{r} {}^{3}1{}^{1}4597 \\ -\ 692 \\ \hline 13905 \end{array}$$

Exampl 3 Find the difference between 327 and 5000

$$\begin{array}{r} {}^{4}5\,{}^{1}0\,{}^{9}0\,{}^{1}0 \\ -\ 3\,2\,7 \\ \hline 4\,6\,7\,3 \end{array}$$

We need to "BUMP" our borrow 1 back to the end.



When subtracting decimals we make sure all the decimal points are lined up.

Example 4 Subtract 8.36 from 20.9

$$\begin{array}{r} {}^{1}2{}^{1}0\,.\,{}^{8}9{}^{1}0 \\ -\ 8\,.\,36 \\ \hline 12\,.\,54 \end{array}$$

20.9 can be written as 20.90



Remember you can only have TWO numbers in a single subtraction calculation.



Practice Questions

1) a) 42 + 26 b) 57 + 38 c) 96 + 75

2) a) 637 + 961 b) 983 + 442 c) 969 + 758

3) a) 452 + 38 b) 147 + 763 c) 813 + 431 + 38

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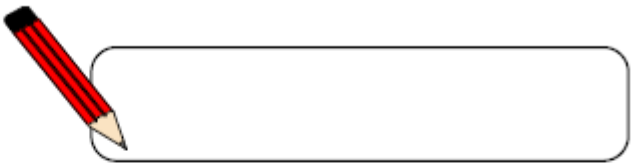
LNF Style Questions

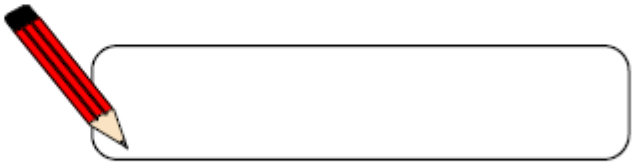
1) **Add** together 1740 and 282



2) Now **add** together 17.4 and 2.82
Can you use part (a) to help you?



3) 3.5 + 2.35 is **bigger** than 3.3 + 2.1
How much bigger?



MULTIPLES AND FACTORS

Key Words:

- Factors are numbers which divide equally into a given number:

  E.g. factors of 33 are 1, 33,11,3

  Factors come in pairs normally with a few exceptions (e.g. factors of 25 are 1, 25, 5)

- Multiples are numbers found in the times table

  E.g. the first 10 multiples of 5 are: 5,10,15,20,25,30,35,40,45,50

Examples to try:

Here is a list of 8 numbers.

4 7 10 16 18 20 21 32

From the numbers in the list write down a number that is

(i) an odd number

(ii) a multiple of 5

(iii) a square number

(iv) a factor of 42

So the answers would be: (i) 7 or 21 (ii)0 10 or 20 (iii) 4 or 16 (iv) 7 or 21



Practice Questions

1) Write the factors of

a) 6 b) 16 c) 18 d) 30

2) In a student's book the factors of 12 are listed as

1 2 3 4 5 12

The above list contains a mistake

Cross it out from the list and replace it with the correct number.

3) The factors of 30 and 40 are listed

30: 1, 2, 3, 5, 6, 10 15, 30

40: 1, 2, 4, 5, 8, 10, 20, 40

Write the common factors of 30 and 40
(the number that are factors of 30 and 40).

LNF Style Questions

1) Henry thinks of a number between 1 and 20

He thinks of the number 12

For each question below, tick (✓) Yes or No for Henry's number.

	Yes	No
Is it an even number?		
Is it a multiple of 3?		
Is it a factor of 18?		



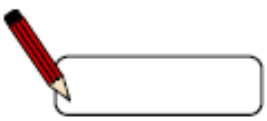
2) Ashraf also thinks of a number between 1 and 20

The table shows information about his number.

	Yes	No
Is it an even number?		✓
Is it a multiple of 3?	✓	
Is it a factor of 18?		✓



What is Ashraf's number?



LONG MULTIPLICATION USING THE BOX METHOD.

Work out 36×24

Times x	20	4
30	600	120
6	120	24

720 + 144

= 864

Work out 4.52×36

Times x	400	50	2
30	12000	1500	60
6	2400	300	12

14400 + 1800 + 72

= 16272

So the final answer = 162.72

Practice Questions

1. Work Out

a) 13 x 18

b) 135 x 27

c) 116 x 41

d) 264 x 43

e) 326 x 24

f) 281 x 59

g) 286 x 48

h) 428 x 34

I) 461 x 45

LNF Style Questions

1) Show that **9 x 28 is 252**

2) What is **27 x 28?**

You can use part (a) to help you

LONG DIVISION

Pupils will be used to applying the 'bus stop' method

N.B we don't finish an answer with remainders, please see example 2.

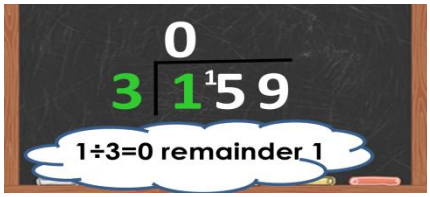
Example 1

159 ÷3

Step 1







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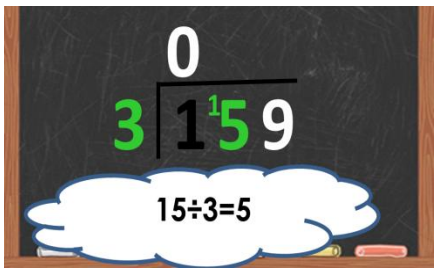

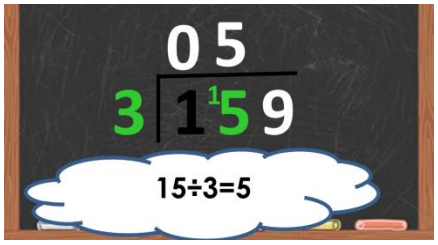

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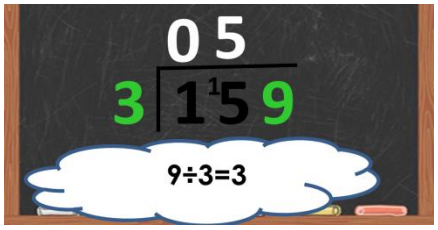
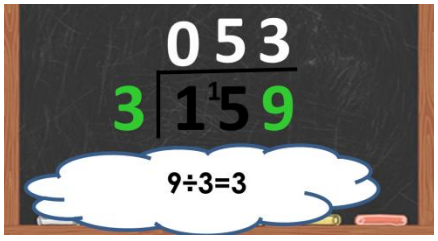


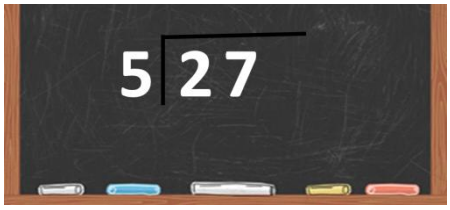


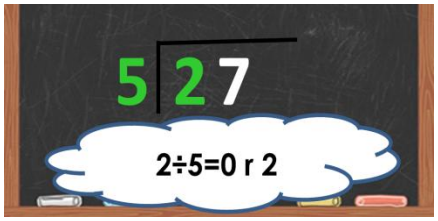
Answer is 53

Example 2

27 ÷ 5

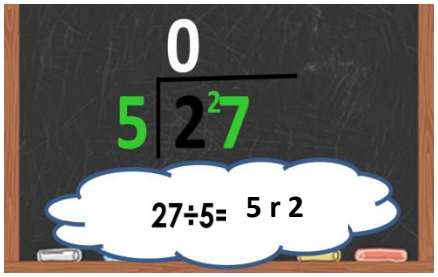
Step 1

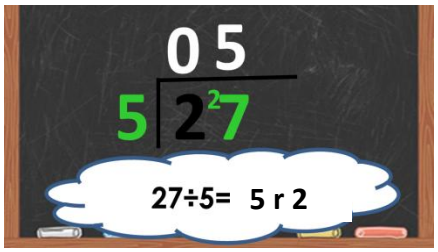




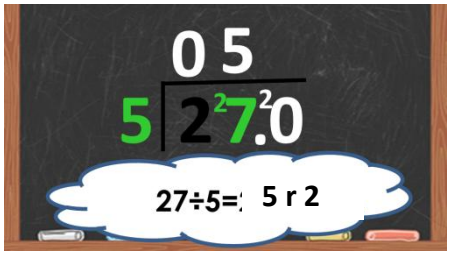


Step 2





Step 3

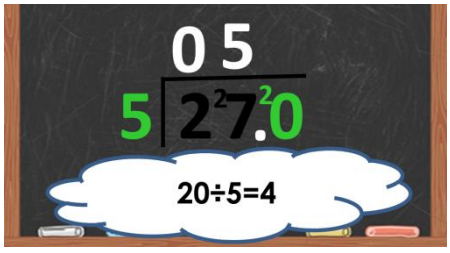


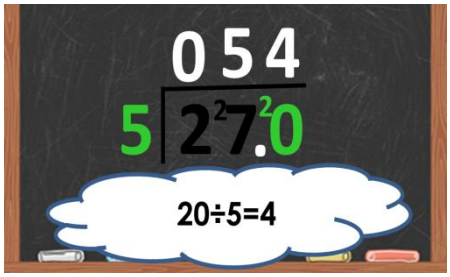
You could put the decimal point in here now if you wanted to. The number on top would read 05.

N.B. 27 IS THE SAME AS 27.0

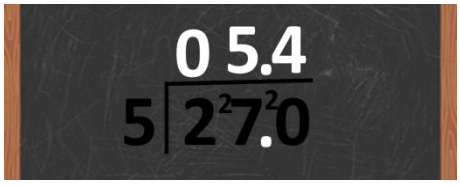
Step 4







Step 5



Answer is 5.4

Here are some questions to try:



Practice Questions

Work Out

a) 325 ÷ 5

b) 448 ÷ 8

c) 221 ÷ 13

d) 377 ÷ 29

e) 27 ÷ 6

f) 123 ÷15

g) 75 ÷ 4

h) 135 ÷ 4

I) 381 ÷ 12

LNF Style Questions

John takes boxes out of his van.
The total weight of the boxes is 4.9kg.
The weight of each box is 0.7kg.
Work out the nuber of boxes in John's van.

Mr Rogers bought a bag of elastic bands for £6.
Each elastic band cost 12p.
Work out the number of elastic bands in the bag.

PERCENTAGES

A % means out of 100

Please see next page for non-calculator and calculator methods.

Non- Calculator Methods

Method 1 Using Equivalent Fractions (use table on previous page)

Example 1 Find 25% of £48

25% of £48

$= \frac{1}{4}$ of 48

$= \frac{48}{4}$

= £12

If we use a more complicated number then the level would go up to 3.

Method 2 Using 1% (1% - 9%)

In this method, first find 1% of the quantity (by dividing by 100), then multiply to give the required value.

Example 2 Find 9% of 200g

1% of 200g

$= \frac{1}{100}$ of 200

$= \frac{200}{100}$

= 2g

so 9% of 200g = 9 x 2g

= 18g

Working out the percentage of an amount (CALCULATOR METHOD)

Calculator Method

To find the percentage of a quantity using a calculator, change the percentage to a decimal, then multiply.

Example 1 Find 23% of £15000

$$\begin{aligned} & 23\% \text{ of } £15000 \\ = & \frac{23}{100} \times 15\,000 \\ = & 0.23 \times £15000 \\ = & £3450 \end{aligned}$$

For example 35% of 72 = 0.35 x 72 = 25.2

3% of 78 = 0.03 x 78 = 2.34

17.8% of 89 = 0.178 x 89 = 15.842

Writing one number as the percentage of another.

For example In a test Mickey scored 18 out of 20 write this as a percentage.

18 ÷ 20 x 100% = 90 %

Facts to remember: 20 % means ÷ by 5;

25% means ÷ by 4;

5% means ÷ by 20;

10% means ÷ by 10;

75% means ÷ by 4 and x by 3.

Please you the conversion table on the previous pages to help you.

Questions to try.

(a) 70% of 100 votes are in favour of a speed limit. How many votes are in favour?
(b) 80% of £25 = ? (Fill in the ?)
(c) What is 18 out of 24 as a percentage?
(d) At a water park 23 out of 92 tickets sold were child tickets. What percentage are child tickets?

FRACTIONS

Adding and subtracting fractions

Same denominator:

$^{2}/_{11} + {}^{3}/_{11} = {}^{5}/_{11}$

Different Denominator

Some pupils may know this as the X factor method

1) $^{7}/_{13} + {}^{3}/_{4}$

$= {}^{(7 \times 4) + (13 \times 3)}/_{(13 \times 4)}$

$= {}^{28 + 39}/_{52}$

$= {}^{67}/_{52}$

2) $^{8}/_{15} - {}^{2}/_{5}$

$= {}^{(8 \times 5) - (2 \times 15)}/_{75}$

$= {}^{10}/_{75}$

3) $^{3}/_{7} + {}^{4}/_{9}$

$= {}^{(3 \times 9) + (7 \times 4)}/_{63}$

$= {}^{55}/_{63}$

Multiplying fractions

$$\frac{2}{3} \times \frac{4}{7} = \frac{2 \times 4}{3 \times 7} = \frac{8}{21}$$

Dividing fractions

Some pupils may recognise the method called KFC – KEEP, FLIP, CHANGE

Method : keep the first fraction the same, flip over the second fraction the multiply top numbers and bottom numbers.

$^{4}/_{9} \div {}^{2}/_{11}$

$= {}^{4}/_{9} \times {}^{11}/_{2}$

= $^{44}/_{18}$

= 22/9

Finding the fraction of an amount

DIVIDE BY THE BOTTOM NUMBER THEN TIMES BY THE TOP NUMBER.

Some pupils may call it the 'peanut' method.

Finding $^{4}/_{9}$ of 81

First work out 81 ÷ 9 = 9

Then work out 9 x 4 = 36

Changing a mixed number into an improper fraction

$4^{2}/_{3} = ^{(4x3)+2}/_{3} = ^{14}/_{3}$

Changing an improper fraction into a mixed number.

$^{28}/_{5}$ = Think how many 5's go into 28

5 with 3 left over . . .

$5\ ^{3}/_{5}$

Denominator is from the denominator in the original question

Questions to try.

(a) Find $^{2}/_{9} + ^{5}/_{9}$

(b) Which one is bigger $^{2}/_{3}$ or $^{3}/_{5}$?

Hint : change the denominators 3 and 5 into the same number

(c) Work out $^{11}/_{12} - ^{5}/_{6}$

(d) Work out $^{5}/_{3} + \frac{1}{2}$

(e) Write the mixed number $7^{5}/_{6}$ as an improper fraction.

(f) Write the improper fraction $^{13}/_{5}$ as a mixed number.

(g) Find $^{2}/_{7}$ of 35

(h) Work out $^{4}/_{5} \times ^{3}/_{8}$

(i) Work out $^{2}/_{3} \div ^{4}/_{7}$

DECIMALS

To work out 0.7 x 0.8

Work out 7 x 8 = 56 first

Then you may like to think of it as moving the decimal point back twice.

Another method is to look at the question and count how many numbers are behind the decimal point (i.e. 2 in this case). This would mean you would need two numbers behind the point in the answer.

Use the information that

$$322 \times 48 = 15\,456$$

to find the value of

(a) 3.22×4.8

(b) 0.322×0.48

(c) $15\,456 \div 4.8$

The answers are:

(a) 15.456 (b) 0.15456 (c) 3220

Questions to try.

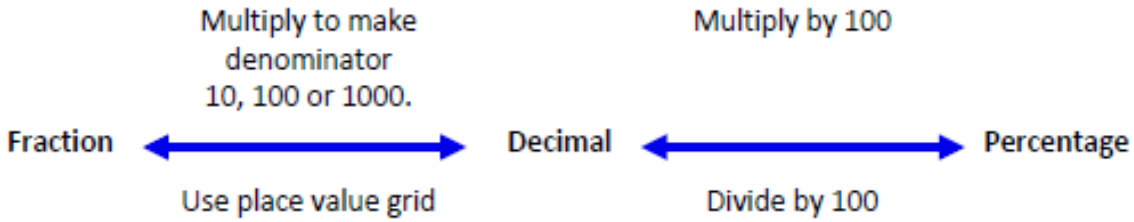
(a) In 0.8 which digit is in the tenths place?
(b) How do you write 0.09 in words?
(c) Write 0.7 as a fraction.
(d) Multiply 3.2 by 100
(e) Write 0.04 as a fraction in it's simplest form.
(f) Write the following decimals in **ascending** order: 0.42, 0.4, 0.398,0.401, 0.39
(g) Divide 567 by 10
(h) Which sign > or < makes this statement true 0.3 is smaller than 0.8?
(i) What is 2.7 rounded to the nearest whole number?

SUMMARY

Fractions, decimals, percentages

Learners are able to:
use equivalence of fractions, decimals and percentages to compare proportions

To convert between fractions, decimals and percentages (F.D.P.'s), you need to remember the following rules:



Example

Write 1/4 as a decimal and a percentage.
1/4 = 25/100 = 0.25 = 25%

Fill in the following table:

Fraction	Decimal	Percentage
	0.04	
		10%
$\frac{1}{2}$		
		45%
$\frac{7}{50}$		
	0.84	



Practice Questions

1. Write the following fractions as decimals and percentages:

eg. $\frac{1}{10} \xrightarrow{1\div10} 0.1 \xrightarrow{0.1\times100} 10\%$

a) $\frac{3}{10}$ =

b) $\frac{1}{5}$ =

c) $\frac{2}{5}$ =

d) $\frac{1}{4}$ =

e) $\frac{3}{4}$ =

f) $\frac{1}{2}$ =

g) $\frac{1}{3}$ =

2. Fill in the blanks in the table below:

Fraction	Decimal	Percentage
$\frac{6}{10}$		
	0.2	
	0.9	
		40%
		25%
	0.3	
		70%

LNF Style Questions

1) Fill in the missing numbers in the boxes

$$\frac{2}{12} = \frac{\square}{6}$$

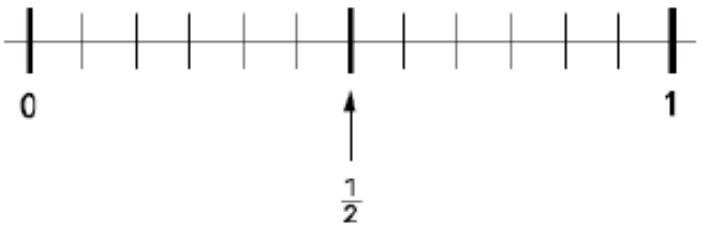
$$\frac{1}{2} = \frac{12}{\square}$$

$$\frac{1}{\square} = \frac{6}{24}$$

2) Look at these fractions

$$\frac{1}{2} \qquad \frac{1}{3} \qquad \frac{5}{6}$$

Mark each fraction on the number line.
The first one is done for you.



RATIOS

Splitting up an amount into a given ratio.

For example, **Laura will share £2700 in the ratio 3 : 1 : 5. Work out how much each part gets.**

First step Total number of parts = 3 + 1 + 5

= 9

Second step Work out one part = £2700 ÷ 9

= £300

Third step Work out the value of each part.

3 x 300 = £900 ; 1 x 300 = £300 ; 5 x 300 = £1500

Questions to try.

(a) Are these fractions equivalent $^{1}/_{5}$ and $^{3}/_{20}$ **yes** or **no**?
(b) 2:5 is like 6: ? (Fill in the ?)
(c) 12 pages in 2 days = ? pages in 5 days
(d) Monica drew a scale drawing of the town library. The sale of the drawing was 1cm = 6m. In the drawing, the car park is 13cm long. How long is the actual car park?
(e) Elena is older than Talia but younger than Omar. Who is older, Omar or Talia?

LNF Style Questions

Joe and Gwen share £840 in the ratio 3 : 4

How much do they get?



Joe gets £

Gwen gets £

2) In a nursery school, the ratio of adults to children is 1 : 4

There are 56 children.

How many adults?

adults

TIME



This clock above will help you change from the 12 hour to the 24 hour clock.

Questions to try.

(a) Find the elapsed time : **start 11: 15 am** **end 3:00 pm**

(b) Write 17:45 as a 12 hour time.

The table shows part of a bus timetable from Shotton to Alton.

Shotton	07 30	08 00	09 00	10 00	11 00
Crook	07 45	08 15	09 15	10 15	11 15
Prudhoe	07 58	08 28	09 28	10 28	11 28
Hexham	08 15	08 45	09 45	10 45	11 45
Alton	08 30	09 00	10 00	11 00	12 00

If I wanted to be in Alton by 10:30 what is the latest bus I can take from Crook?

How long does it take to go from the 07:58 from Prudhoe to Hexham?

Practice Questions

Look at this timetable and use it to answer the questions which follow:

London Paddington	d	1900	1915	1945	2000	2030		2130	2200	2230
Reading	d	1925	1940	2010	2029	2055		2155	2225	2300
Didcot Parkway	d	–	1954	2023	–	2108		2208	2239	2313
Swindon	d	1953	2014	2043	2057	2128		2228	2259	2332
Chippenham	d	–	2027	2056	–	2142		2241	–	2346
Bath Spa	a	–	2039	2108	–	2154		2253	–	2357
Bristol Parkway	d	2020	–	–	2124	–		–	2326	–
Bristol Temple Meads	a	–	2055	2125	–	2208		2306	–	0015
Newport	a	2041	–	–	2145	–		–	2349	–
Cardiff Central	a	2057	–	–	2201	–		–	0014	–
Bridgend	a	2118	–	–	2221	–		–	0036	–
Port Talbot Parkway	a	2131	–	–	2234	–		–	0049	–
Neath	a	2139	–	–	2242	–		–	0057	–
Swansea	a	2157	–	–	2300	–		–	0120	–

a - arrives d - departs

(a) Alan leaves London at 1900. At what time does he arrive at Swansea?

(b) Sarah arrives at Swansea at 2300. At what time did she leave London?

(c) At what time does the last train to Swansea leave London?

(d) Shamil catches the 1915 from London. At what time does he arrive in Reading?

(8 marks)

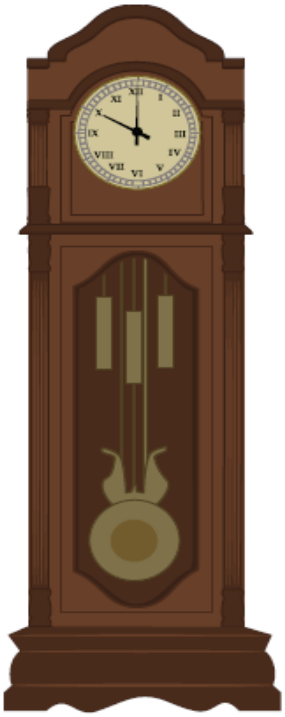
LNF Style Questions

It's August 31st.

My clock is showing the correct time.

That doesn't happen very often!





Every day his clock loses the same amount of time.

	When the real time is 10am, his clock shows
August 31st	10:00
September 1st	9:45
September 2nd	9:30
September 3rd	9:15

When the real time is 10am, his clock will show 10:00 again.

On what **date** will that next happen?

ROUNDING

The rule is "*if it's 5 or above round up if it's below 5 round down*".

Some pupils may be used to the phrase "5 or above give the number a shove, 4 or less give the number a rest".

- *Rounding to a given number of decimal places*

  <u>To 1 decimal place</u>

  Round 3.2345 to 1d.p.

  3.2345 = 3.2

  We want 1d.p. – one number after the decimal point. I draw a squiggly line to show where the cut off point is. I will then look at the 3 (right next to the line). Think is it 5 or more? NO so give the number a rest. 3 will remain the same.

  0.6/78 = 0.7

  <u>To 2 decimal places</u>

  34.67/5 = 34.68 12.32/41 = 12.32 9.76/93 = 9.77

- *Rounding to a given number of significant figures*

  Significant means to look at the most important number. The number with the greatest place value will be the most important.

  <u>To 1 significant figure</u>

  345 ≈ 300

  45 ≈ 40

  0.0789 ≈ 0.08

  Note: Zero's don't count at the start of the number. So the most important number in this case is 7

Questions to try.

Round the following numbers to 1 then 2 then 3 decimal places:

(a) 3.4132
(b) 35.78978
(c) 123.4578
(d) 20.1298
(e) 9.9978



Practice Questions

1) Round the following numbers to 1 significant figure

a) 963 b) 9562 c) 991236

2) Round the following numbers to 1 significant figure

a) 0.005621 b) 0.07756 c) 0.0000523647

3) Round the following numbers to 2 significant figures

a) 752305 b) 147006 c) 296124

4) Round the following numbers to 2 significant figures

a) 0.00036264 b) 0.00045921 c) 0.0003654871

ESTIMATING

For example

- Estimate the sum 7.24 + 1.39

To do this you would round 7.24 to 7 and 1.39 to 1. So, the answer would be 8.

- Work out an estimate for $\frac{7.19 \times 19.7}{0.46}$

To do this you would round 7.19 to 7 and 19.7 to 20 and 0.46 to 0.5

So firstly, work out 7 x 20 = 140 and the divide by 0.5 which is the same as x by 2. So the answer would be 280.

Example Estimate the following

(a) 46 × 175
≈ 50 x 200
≈ 10000

(b) 36.95 × 0.52
≈ 40 x 0.5
≈ 20

LNF Style Questions

Work out an estimate for the value of

a) $\dfrac{547}{4.8 \times 9.7}$

b) $\dfrac{69 \times 398}{207}$

c) $\dfrac{7.5 \times 2.79}{2.71 + 3.19}$

d) $\dfrac{409 \times 5.814}{0.19}$

AVERAGES

FACTS TO REMEMBER !!!

Mean = Find the total and divide by the number of numbers

Mode = Most common or frequent number

Range = Biggest number – smallest number

Median = The middle number

ALWAYS PUT THE NUMBERS IN ORDER OF SIZE FIRST!!

For example,

Alan recorded the numbers of text messages sent by 7 people one day.

6 9 15 4 8 12 6

Put them in order first: 4 6 6 8 9 12 15

The mode = 6

The median = 8

The mean = total ÷ 7

= 60 ÷ 7

= 8.571428

The range = 15 – 4 = 11

Questions to try.

(a) What is the mode of : 5 4 10 5 10 10 10 4

(b) For the following numbers: 8 9 7 7 5 7 2 1
work out (i) the range (ii) the median (iii) the mean.

Practice Questions

Find the mode, range and median of each of these sets of data

a) 3 12 4 6 8 5 4

mode _____ range _____ median _____

b) 7 21 2 17 3 13 7 4 9 7 9

mode _____ range _____ median _____

c) 12 1 10 1 9 3 4 9 7 9

mode _____ range _____ median _____

d) 8 0 3 3 1 7 4 1 4 4

mode _____ range _____ median _____

LNF Style Questions

(a) Look at these three numbers.

9	11	10

Show that the **mean** of the three numbers is **10**

(a) There are two children in the Smith family.

The **range** of their ages is **exactly 7 years**.

What could the ages of the two children be?

Give an example.

..... and .....

1 mark

Here is information about a data set.

There are 100 values in the set.
The median is 90
The mean is 95

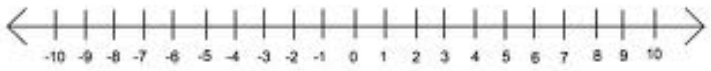
I **increase** the **highest value** in the data set **by 200**

Now what are the median and the mean of the data set?

median = ... mean = ...

2 marks

NEGATIVE NUMBERS & TEMPERATURE

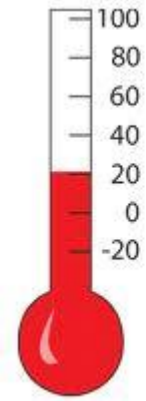


Facts to remember when multiplying and dividing negative numbers ONLY.

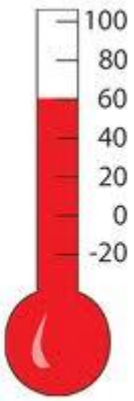
: - and a – is a +

\+ and a + is a +

\- and a + is a -



This is 20◦ C



This is 60 ◦ C

City	Temperature
Cardiff	−2 °C
Edinburgh	−4 °C
Leeds	2 °C
London	−1 °C
Plymouth	5 °C

The table gives information about the temperatures at midnight in 5 cities.

The city with the lowest temperature is Edinburgh.

The city with the highest temperature is Plymouth.

The difference in temperatures between Plymouth and Cardiff = 5◦C - -2◦C = 5◦C + 2◦C = 7◦C

LNF Style Questions

18

Time	7am	11am	3pm	7pm	11pm
Temperature (°C)	3	9	8	2	–2

What is the **range** of the temperatures?

°C

Work out the **mean** of the temperatures.

°C

BODMAS

The **BODMAS** rule tells us which operations should be done first.

BODMAS represents:

(B)rackets	Top level
(O rder	
(D)ivide	Middle level
(M)ultiply	
(A)dd	Bottom level
(S)ubract	

Scientific calculators use this rule, some basic calculators may not, so take care in their use.

Example 1

$15 - 12 \div 6$
$= 15 - 2$
$= 13$

BODMAS says divide first, then subtract

Example 2

$(9 + 5) \times 6$
$= 14 \times 6$
$= 84$

Brackets first then multiply.

Example 3

$18 + 6 \div (5 - 2)$
$= 18 + 6 \div 3$
$= 18 + 2$
$= 20$

Brackets first
then divide
now add

Example 4

$16 + 5^2$
$= 16 + 25$
$= 41$

multiply first (5×5)
then add

LNF Style Questions

$20 - (12 \div 4 - 2) =$ ☐

$18 \times (4 + 6) =$ ☐

$1000 \div (12 + 8) =$ ☐

MONEY

- To calculate SIMPLE INTEREST.

For example,

Say you invested £350 over 8 years at 4% simple interest.

Firstly, you work out 4% of £350 = 0.04 x £350 = £14

Then you simply work out £14 x 8 = £112

Remember 100 pence = £1

Questions to try.

(a) The regular price of a desk is £581. This week it is on **sale** for £ 299 off. What is the sale price?
(b) If a computer cost £168.89, how much would 6 computers cost?
(c) It costs £3.87 to buy 9 golf balls. If the golf balls all have the same price how much does 1 cost?
(d) How much do four buses to hire cost at a price of £299 each?
(e) Divide £815 by 4 without a calculator.
(f) What is the better buy? 2 packs of museum tickets for £ 14.16 of 4 packs of museum tickets for £ 28.40?
(g) Abi has £80 in a savings account that earns 5% **simple interest per annum**. How much does she have in 7 years?

LNF Style Questions

Carys has £120

She spends £49.99

How much is left?

£

£1.98 £2.05 £7.48 £9.90 £4.53

Estimate the total amount.

£

The bill for 5 people at a restaurant is £73.55

They want to divide it equally.

How much for each person?

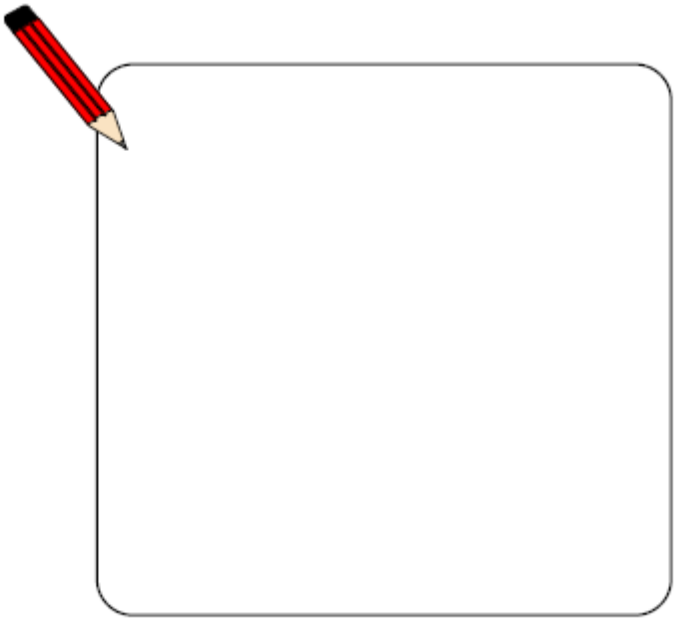


£



How much does it cost to park for 40 minutes?

Show your working



ANSWERS

PERCENTAGES

(a) 70 (b) £20 (c) 75% (d) 25%

RATIOS

(a) $^{1}/_{5} = {}^{4}/_{20}$ No (b) 15 (c) 30 (d) 78m (e) Omar

FRACTIONS

(a) $^{7}/_{9}$ (b) $^{2}/_{3}$ (c) $^{1}/_{12}$ (d) $^{13}/_{6}$ (e) $^{47}/_{6}$ (f) $2\ ^{3}/_{5}$ (g) 10 (h) $^{3}/_{10}$ (i) $^{7}/_{6}$

DECIMALS

(a) 8 (b) zero point zero nine (c) 7/10 (d) 320 (e) 1/25 (f) 0.39, 0.398, 0., 0.401, 0.42

MONEY

(a) £282 (b) £1013.34 (c) £0.43 (d) £1196 (e) £203.75 (f) 2 packs (g) £28