

# Numeracy - numbers

have a sense of the size of a number and where it fits in the number system

## What do I need to be able to do?

- Know the definition of a digit
- Know that the place of a digit gives its value
- Each column of the number system, increases or decreases by a factor of 10
- The importance of the decimal point
- There are positive and negative values, and how they fit onto a number line.

## Keywords

- Digit:** A single figure used in the number system
- Place value:** The columns where the digit is placed, to give its value
- Integer:** a whole number
- Decimal Point:** A mathematical symbol that gives definition to a value less than a whole number
- Positive number:** A value greater than zero
- Negative number:** A value less than zero
- Fraction:** Name given to a part of a whole number

**Digits** There are **TEN** digits The number **10**, uses two digits, 1 and 0

**0** zero **1** one **2** two **3** three **4** four **5** five **6** six **7** seven **8** eight **9** nine

## Place Value

TM	M	HTh	TTh	Th	H	T	o	Decimal point	t	h	th
Ten Millions	Millions	Hundred Thousands	Ten Thousands	Thousand	Hundreds	Tens	Ones		tenths	hundredths	thousandths
10 000 000	1 000 000	100 000	10 000	1000	100	10	1		$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
									0.1	0.01	0.001
Integers are whole numbers. They are before the decimal point									Decimal numbers are after the decimal point		

**2 4 . 7 8** Twenty four, point seven eight

Two tens, four ones, seven tenths, and eight hundredths

**78** or **0.78**

Seventy eight, then zero point seven eight, **not** zero point seventy eight

## Place Value

10 000 000	1 000 000	100 000	10 000	1000	100	10	1	0.1	0.01	0.01
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In this direction,  
each column is 10 times bigger  
 $\times 10$

In this direction,  
each column is 10 times smaller  
 $\div 10$

## Fraction

A value that is less than a whole one

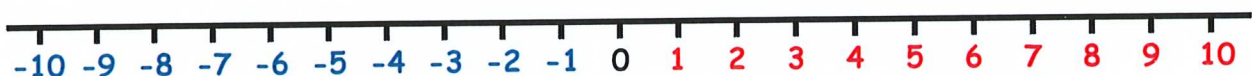
$\frac{1}{2}$ , half of a whole.

A fraction can be written as a decimal number

0.5 is also a half or

5 tenths, using place value

## Positive and Negative Values (NOT minus)



Negative values Less than zero  
< 0

In this direction, numbers get smaller

In this direction, numbers get bigger

Positive values Greater than zero  
> 0

# Numeracy - number facts

Know number facts. Number bonds, times tables, doubles and halves

## What do I need to be able to do?

- Know number bonds up to 10
- Using the inverse of adding, know number families
- Square numbers
- Multiplication tables
- Use strategies to calculate the double of a number, or its half.

## Keywords

**Number bond:** A relationship between 2 numbers that give a known value

**Fact families:** Extending a number bond to include other facts that use the inverse operation

**Inverse operation:** The opposite calculation

**Square numbers:** The answer calculated when a value has been multiplied by itself

**Multiplication tables:** The answers to each value below and including 10, multiplied by each value below and including 10. Usually set into a grid

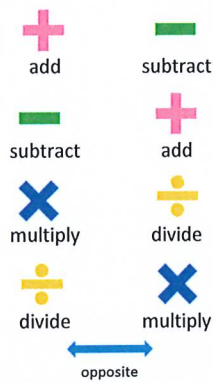
**Calculation strategies:** Use prior knowledge to further calculate an answer

## Number bonds

These all add to 10

$$\begin{array}{l}
 1 + 9 \quad 9 + 1 \\
 2 + 8 \quad 8 + 2 \\
 3 + 7 \quad 7 + 3 \\
 4 + 6 \quad 6 + 4 \\
 5 + 5
 \end{array}$$

## Inverse Operation



## Fact Families

By using the inverse of addition, number bonds using subtraction can extend knowledge to include more facts

$1 + 9 = 10$	$2 + 8 = 10$	$3 + 7 = 10$	$4 + 6 = 10$
$9 + 1 = 10$	$8 + 2 = 10$	$7 + 3 = 10$	$6 + 4 = 10$
$10 - 1 = 9$	$10 - 2 = 9$	$10 - 3 = 7$	$10 - 4 = 6$
$10 - 9 = 1$	$10 - 8 = 2$	$10 - 7 = 3$	$10 - 6 = 4$
$5 + 5 = 10$		$10 - 5 = 5$	

$6 + 4 = 10$	$7 + 3 = 10$	$8 + 2 = 10$	$9 + 1 = 10$
$4 + 6 = 10$	$3 + 7 = 10$	$2 + 8 = 10$	$1 + 9 = 10$
$10 - 6 = 4$	$10 - 7 = 3$	$10 - 8 = 2$	$10 - 9 = 1$
$10 - 4 = 6$	$10 - 3 = 7$	$10 - 2 = 8$	$10 - 1 = 9$
$10 + 0 = 10$		$10 - 0 = 10$	

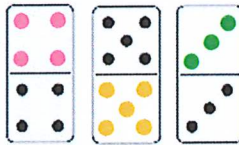
## Double and Half

Double of a number is to multiply by 2 or add  
Double 3,  $2 \times 3$ ,  $3 + 3 = 6$

### Chunk it!!

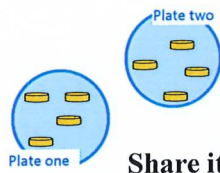
Double 14

$$\begin{array}{r}
 10 + 4 \\
 \times 2 \\
 \hline
 20 + 8 = 28
 \end{array}$$



$$8 \div 2 = 4$$

### Cut in half



## Multiplication Tables

$$3 \times 6 = 18$$

x	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

## Square Numbers

$$\begin{array}{l}
 1 \times 1 = 1 \quad 6 \times 6 = 36 \\
 2 \times 2 = 4 \quad 7 \times 7 = 49 \\
 3 \times 3 = 9 \quad 8 \times 8 = 64 \\
 4 \times 4 = 16 \quad 9 \times 9 = 81 \\
 5 \times 5 = 25 \quad 10 \times 10 = 100
 \end{array}$$

Learn them!!  
Ask your teacher for copies to learn



# Numeracy – accurate calculations

Use a variety of strategies, both written and mental

## What do I need to be able to do?

- Know Place value
- Know the units in measure, including money
- Know how to estimate an answer by rounding

## Keywords

- Exact value:** Always use all the information and give an answer to the same amount of place value. Do not give an estimate
- Appropriate answer:** Give an answer that is appropriate to the units used.
- Estimate:** Giving an approximate will sometimes be enough for the type of question asked. This can be easier for mental calculations
- Rounding:** Use an appropriate point to round the given values to aid with calculations

## Exact Value

Use decimal places ...

Over	t	h	th
ones	tenths	hundredths	thousandths
1	1	1	1
10	100	1000	
0.1	0.01	0.001	

Decimal numbers are after the decimal point

or fractions  $\frac{1}{3} = 0.3333333333 \dots$

A fraction will give a more accurate value than some decimals

## Appropriate Answer

1) Add 3.5m and 4m

Answer **7.5m** NOT 750cm

Use the same unit as the question when given

2) Share £2 between 7 people

200 pence  $\div$  7 = 28.57142857 pence

A small part of a penny would not be appropriate. Round to the nearest whole unit

Answer **28p**

In this example, 28p can be found, but not 29p

## Estimate

Give an estimate to this question  $24.8 + 76.5$

28.7 is nearly 30, 76.5 is nearly 80  $30 + 80 = 110$

## Rounding

Know how to an appropriate cut off point, both with decimals and whole numbers.  
This will give an accurate calculation

### Decimals

Count the number of decimal places. Look at the next digit.  
If this is 5 or more, round up. Less than 5 round down.

ones	tenths	hundredths	thousandths	tens of thousandths
1	3	6		
0	1	5	3	
7	0	3	2	8

Rounding 1.36 to 1 decimal place becomes **1.4**

Rounding 0.153 to 2 decimal places becomes **0.15**

Rounding 7.0328 to 3 decimal places becomes **7.033**

### Whole numbers

Rounding to the nearest 10, 100, 1000 will help with mental calculations

Everything you've learned from before

*'Keep practising'*

This will help with mental calculations