Bluecoat Wollaton
believe in yourself, in others, in God

NUMERACY
C O U N T S

LET'S COMMIT TO GIVING MATHEMATICS THE ATTENTION IT DESERVES.

Numeracy Counts for academic success. It counts for confidence in all content areas, including STEM. It counts for college achievement. It counts for career growth. Numeracy counts for future achievement.

This booklet is intended for parents and pupils to welcome you to Bluecoat Wollaton Maths and prepare you for what is to come.

The first half of this booklet provides advice and resources for parents to help with essential everyday numeracy and ensure that students are Secondary ready.

The second half of the booklet provides examples of the methods that are taught and used at Bluecoat Wollaton Academy, along with some questions to practice.

We hope you find it useful and informative.

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Archway
Learning Trust

The importance of numeracy

Confidence with numbers is an essential part of any child's learning. Not only does it help them with day-to-day problem-solving and practical tasks but it also gives them the building blocks to acquire the later mathematical skills valued by the world of industry and higher education.

If a child feels confident at performing mental arithmetic and is also well practiced at using correct written methods to perform addition, subtraction, multiplication and division then they are more likely to go on to understand and master more complex mathematical ideas.

Demonstrating an enthusiasm for numeracy will encourage your child to think positively about it. One of the easiest ways to do this is by looking for opportunities to use numeracy which naturally occur from day-to-day activities, such as calculating the cost or change when shopping.

Should you have any queries relating to numeracy at Bluecoat Wollaton Academy please contact your child's mathematics teacher or the Head of Mathematics, Mrs Brierley lbrierley@bluecoat.uk.com.

Top tips for parents and families

Be positive about maths. Don't say things like "I can't do maths" or "I hated maths at school"; your child might start to think like that themselves.

Point out the maths in everyday life. Include your child in activities involving maths such as using money, cooking and travelling.

Praise your child for effort rather than talent - this shows them that by working hard they can always improve.

If you struggle with maths yourself - try our free online tool the National Numeracy Challenge to improve your maths level.

General tips

- **If you don't know something, that's OK.** Try and work out the problem together.

- **Set aside some homework time** Start a homework routine, find a quiet place for your child to work and take away any distractions if possible.

- **With younger children, you could set yourself adult "homework" time.** Do 'homework' yourself e.g. shopping list, checking your phone bill. Show them that you are using the skills they're learning.

- **Rephrase questions** using things that your child is interested in

- **If they're doing well, praise them for effort.** Say "well done, you've worked so hard", rather than calling them "clever" or praising talent. This helps children learn that their abilities can develop as long as they work hard.

- **When they get stuck**, ask them to explain what they've done so far and what they're finding hard. Try and help them work out where they've gone wrong.

- **If the homework is too hard** speak to their teacher.

- **With older children, still show interest** but let them be more independent and figure out problems for themselves.

National Numeracy
for everyone, for life

Family Maths Toolkit

Free Numeracy at Home Pack

National Numeracy is offering free activities to help families keep up with their maths together. The activities are aligned to the National Curriculum and support children's learning at school, but do so through a unique emphasis on everyday maths. You don't need to be a numbers expert to enjoy the activities, as they encourage families to have fun together discovering real-life maths.

Visit www.familymathstoolkit.org.uk/activities-for-children for more information and to access the activities below.

10-13 year olds
At this age, children are learning to...

- try different approaches when solving problems
- break down problems into smaller, more manageable tasks
- use mathematical language and symbols
- convert between fractions, decimals and percentages
- investigate and explain number patterns by drawing graphs and charts
- calculate probability, for example, of getting a head and a tail when tossing two coins

Activities for 10-13 year olds

| Around the house | Maths and money | Games | Out and about | Books and TV |

numerise

The simple way to improve your child's maths at home

Secondary Ready is a course that Year 6 learners can access <u>free-of-charge</u> to help them prepare them for starting Year 7 in September.

Being up-to-speed in maths when starting secondary school is really important. Things like core number skills are really vital to make sure that when they start moving on to more challenging concepts, they have a solid foundation. It's also really important to make sure that your child doesn't have any gaps in their knowledge and some regular practice over the summer will help ensure that the core skills don't get forgotten.

Numerise's Secondary Ready course covers topics like geometry and statistics that your child will have covered at primary school to make sure that their learning stays interesting and varied.

Features

- Designed specifically to prepare children for starting Year 7
- Varied questions keep learners engaged and motivated
- Help videos are available for when a child gets stuck
- Use on a desktop, laptop, tablet or mobile – whichever suits you
- Powered by Sparx Maths, which improves progress in maths

If you want to give the full Numerise pilot a go, then visit https://learning.sparx.co.uk/secondary-ready.

The following pages provide a guide to the methods and techniques that are taught and used at Bluecoat Wollaton Academy.
Students should be confident using these key techniques during Year 7.

Addition

Mental calculations

A method that is encouraged when adding double and triple digit numbers is to use partitioning. This breaks numbers up by their place value e.g. into units, tens, hundreds etc.

Examples

45 + 37

= 40 + 5 + 30 + 7

= 40 + 30 + 5 + 7

= 70   + 12

= 82

127 + 215

= 100 + 20 + 7 + 200 + 10 + 5

= 100 + 200 + 20 + 10 + 7 + 5

= 300   + 30   + 12

= 342

Written Calculations

Pupils are taught to use the column method when adding. This involves arranging numbers in columns so that digits of the same place value are lined up. This method is used to add whole numbers and decimals.
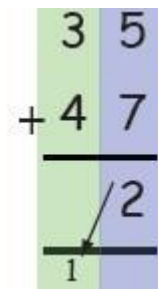
Examples

35 + 47

Always start at the right hand column.

Adding the 5 and 7 gives 12, the 1 digit must be 'carried' into the column on the left.

Add the 3, 4 and carried 1 to give the result 8

The same method can be used to add decimals

e.g. **5.64 + 7.91**

Numbers must be arranged carefully so that the decimal points line up (and the decimal point is put into the answer).

Subtraction

Mental calculations

Like addition, partitioning can be used when trying to subtract mentally. When subtracting, usually only the second number is broken up by its place value e.g. into units, tens, hundreds

Examples

65 - 37

= 65 – 30 – 7

= 35 – 7

= 28

246 - 152

= 246 – 100 – 50 – 2

= 146 – 50 – 2

= 96 – 2

= 94

Pupils sometimes feel more comfortable subtracting units first, then tens (then hundreds..)

Written Calculations

Pupils are taught to use the column method for subtracting. This involves arranging numbers in columns so that digits of the same place value are lined up. This method is used to subtract whole numbers and decimals.

Examples

45 – 21

(as with column addition numbers should be arranged so digits of the same place value are lined up, and always start with the right hand column)

45 - 21 should be set out like this.

Tens	Units
4	5
- 2	1

Subtract the **units.**

5 - 1 = 4

Tens	Units
4	5
- 2	1
	4

Subtract the **tens.**

4 - 2 = 2

Tens	Units
4	5
- 2	1
2	4

32 – 15

This question involves 'borrowing' from the next column which pupils often find challenging.

Subtract the **units.**

2 - 5 =

We can not do.

Tens	Units
3	2
- 1	5

Move 1 **ten** into the **units** column. Take off 1 **ten** in the **tens** column.

Tens	Units
2	1
3̷	2
- 1	5

Subtract the **units.**

12 - 5 = 7

Tens	Units
2	1
3̷	2
- 1	5
	7

Subtract the **tens.**

2 - 1 = 1

Tens	Units
2	1
3̷	2
- 1	5
1	7

Multiplication

Pupils should be able to recall their times tables up to 12 x 12 as this is essential in the methods used to multiply larger numbers. In school, we will reinforce this with 'number rolling' in form time, but practice at home is also valuable.

To multiply 2 digit and 3 digit numbers pupils will be taught the 'grid method'.

Examples

23 x 7   *The 2 digit number is broken up into tens and units and arranged around the grid*

	20	3
7	140	21

$140 + 21 = \underline{\textbf{161}}.$

The multiplications 7 x 20 and 7 x 3 are completed inside the grid.

The results of these two multiplications are added to find the answer

36 x 72   *Again, the 2 digit numbers are partitioned into tens and units*

	30	6
70	2100	420
2	60	12

The multiplications are completed within the grid

(eg. 70 x 20 = 2100)

Column addition is then used to add the results of each multiplication within the grid.

The answer is 2592

```
      2100
       420
        60
+       12
      2592
```

The grid method can also be used for multiplications that involve decimals.

Example

1.7 x 4.1

There a few more steps here because of the decimals but the method that pupils are commonly taught is to:

|	10	7
40	400	280
1	10	7

1. Estimate the answer to the calculation   i.e. 2 x 4 = 8
   (*so we expect the answer to the multiplication to be approximately 8*)

2. Remove the decimal points from the numbers, so we will now calculate 17 x 41 (using the grid method!)

3. The decimal point needs to put back into the answer. Remember we expected the answer to be approximately **8** the decimal point should be inserted between the digits 6 and 9 to get the answer **6.97**
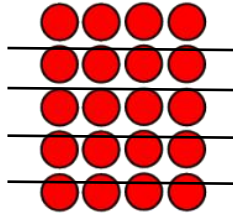
i.e. 1.7 x 4.1 = 6.97

Division

Pupils should be able to recall their times tables up to 12 x 12 as this is essential to help them divide numbers. They are reminded that division is the inverse (opposite) of multiplication.
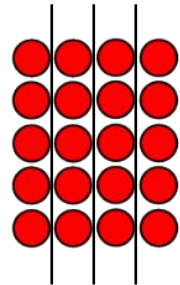
4 x 5 = 20   therefore   20 ÷ 5 = 4 and   20 ÷ 4 = 5
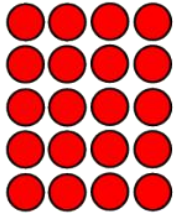
20	*5 lots of 4*	*4 lots of 5*

 Regular reinforcement of the relationship between multiplication and division often helps to improve their ability and confidence.

 Short division (the 'bus stop' method) is used for written division.

Example

1524 ÷ 6

$$6\overline{)1524}$$

There are zero lots of 6 in the 1 – there is a remainder of 1

$$\begin{array}{r} 0 \\ 6\overline{)1^{1}524} \end{array}$$

There are 2 lots of 6 in the 15 – there is a remainder of 3

$$\begin{array}{r} 02 \\ 6\overline{)1^{1}5^{3}24} \end{array}$$

There are 5 lots of 6 in the 32 – there is a reminder of 2

$$\begin{array}{r} 025 \\ 6\overline{)1^{1}5^{3}2^{2}4} \end{array}$$

There are 4 lots of 6 in the 24 – there is a remainder of 0

$$\begin{array}{r} 0254 \\ 6\overline{)1^{1}5^{3}2^{2}4} \end{array}$$

The answer is 254

Short division can also be used when division involve decimals (in the questions or answer).

Example

37 ÷ 4

$$\begin{array}{r} 09 \\ 4\overline{)3^3 7} \end{array}$$

The calculation is started as before

$$\begin{array}{r} 09. \\ 4\overline{)3^3 7.^1 000} \end{array}$$

There is still a remainder when the decimal point is reached.

Add some zeros to the 37 so the calculation can be continued,

and add a decimal point to the answer directly above.

$$\begin{array}{r} 09.2 \\ 4\overline{)3^3 7.^1 0^2 00} \end{array}$$

Continue with the calculation as before

$$\begin{array}{r} 09.25 \\ 4\overline{)3^3 7.^1 0^2 00} \end{array}$$

The answer is 9.25

Try for yourself!

Practice the methods described in the booklet to answer these questions; you can check your answers below.

a) 345 + 456   f) 256 – 125   k) 34 x 23   p) 237 ÷ 3

b) 135 + 79   g) 476 – 231   l) 56 x 17   q) 475 ÷ 5

c) 4.8 + 9.7   h) 378 – 85   m) 2.8 x 5.2   r) 1242 ÷ 6

d) 3.76 + 4.1   i) 1103 – 457   o) 6.7 x 1.2   s) 381 ÷ 6

e) 0.39 + 1.09   j) 231 – 76   p) 4.83 x 7   t) 56.7 ÷ 5

Answers

a) 801	f) 131	k) 782	p) 79
b) 214	g) 245	l) 952	q) 95
c) 14.5	h) 293	m) 14.56	r) 207
d) 7.86	i) 646	n) 8.04	s) 63.5
e) 1.48	j) 155	o) 33.81	t) 11.34

Additional Resources

National Numeracy is an independent charity that promotes the importance of numeracy and "everyday maths".

www.nationalnumeracy.org.uk

Home to 1000's of maths resources: Videos, Worksheets, 5-a-day, Revision Cards and much more. Having problems with any questions/topics, or struggling with methods? Corbettmaths have fantastic video tutorials on all primary & secondary topics.

www.corbettmaths.com

Explore nrich to find rich problems, engaging puzzles, interesting articles and mathematical games to keep the keenest mathematicians busy.

https://nrich.maths.org/

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