

Big Maths Introduction

adapted from BIG MATHS online

Big Maths is a new way of looking at the Primary Mathematics curriculum. It is based on 5 simple principles that are just common sense and self evident (and often under-used). Big Maths is already used in thousands of schools across the UK and internationally because it provides a genuine numeracy framework that blends all 5 of these vital principles into one simple programme.

1. Children become numerate through following a natural sequence of progression: e.g. for a child to know double 70 they need to know double 7 first. We call these steps of progression "Progress Drives".

In summary... use sequences of progression

2. Children need to have basic skills in order to use basic skills: Therefore it is important to separate out the acquisition of core basic skills for Mathematics from the 'using and applying' of those skills. We call the basic skills 'Core Numeracy' and the use of these skills 'Outer Numeracy'.

In summary...prioritise the teaching of Core Numeracy

3. Children acquire the basic skills of Mathematics through the chronology of CLIC: When we look at Core Numeracy in more detail we see that it has a 4 stage process to it;

- [Counting](#) (children learn to count and to 'count on').
- [Learn Its](#) (children then short-cut this counting by recalling their 'counting on' as facts).
- [It's Nothing New](#) (children then 'swap the thing' to realise that the counting fact, or 'Learn It', can be applied to any object, amount or unit of measure).
- [Calculation](#) (the previous 3 phases are combined to provide a calculation structure).

In other words, Core Numeracy is CLIC! Children become numerate through the chronology of CLIC, and therefore we use CLIC as a strong, but simple, vehicle to teach the basic skills of Mathematics.

In summary... teach through CLIC.

4. Children need a structured, and regular, basic skills session: For children to become properly numerate they need a daily CLIC session, i.e. little and often. We might leave other areas of the primary curriculum for a period of time and then return to them, but this does not work for the basic skills. Children need to constantly be nudged up Progress Drives, with plenty of repetition, revisiting and reinforcement as they go.

In summary... provide a daily CLIC session.

5. Schools need to have whole-school organisation and alignment: A child should come through school with a basic skills journey of great continuity. The child should experience this journey as if they were being taught, and tracked, by one teacher. For this to happen, all teachers need to be using the same steps of progression and teaching each individual step in a uniform manner. The CLIC framework therefore provides instantaneous whole-school organisation and alignment.
- In summary... use CLIC across the school.**



It can be seen then that the Big Maths numeracy framework is designed;

- with empathy for the child who is learning to become numerate and then learning to use that numeracy,
- with empathy for the teacher that wishes to plan, teach and assess with great effectiveness and yet with great efficiency, and
- with empathy for the school leader wishing to establish a well embedded, consistent, transparent numeracy learning journey across the school that leads to the highest of standards.

The 5 Big Maths principles:

1. Use Progress Drives

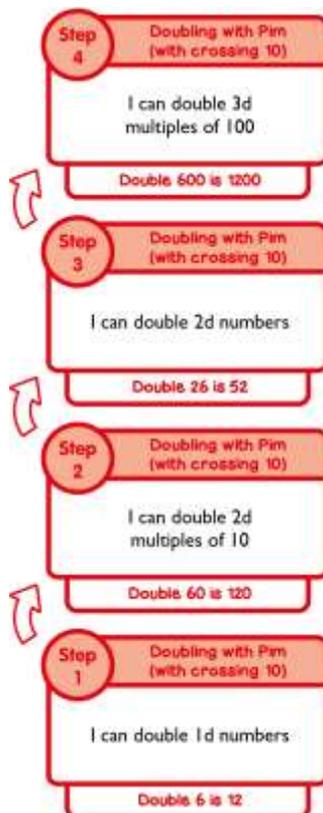
Big Maths harnesses the natural laws of science that apply to maths. This makes maths easy because it is a logical subject that follows a sequence of progression obeying natural laws. For example, you can't count to 40 before you can count to 30. Historically, there has not been sufficient focus on identifying sequences of progression.

Big Maths promotes the use of pre-agreed sequences of progression called 'Progress Drives'.

A Progress Drive is just a sequence of progression for a thread of numeracy. They are very simple and very obvious, but they are also very powerful. In Big Maths we use them to plan from, to teach from, to assess against, to track with, to share, to save time, to celebrate and to gain whole school organisation and alignment!

Many children suffer from low confidence in maths. They either feel negative about maths as a subject or about their ability to cope with maths, or both. Big Maths seeks to address this by showing all children that the next step up the Progress Drive is always easy.

Progress Drive Example



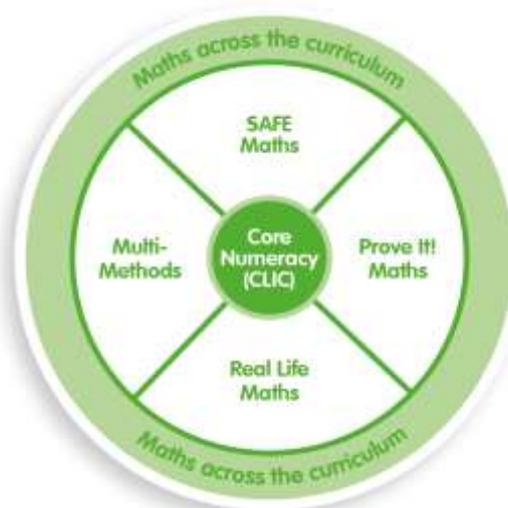
2. Prioritise CLIC

Big Maths clarifies the relationship between core numeracy, which includes the four essential elements of 'Counting', 'Learn Its', 'It's Nothing New' and 'Calculation' (CLIC) that lead to a person becoming numerate, and outer numeracy which is the use of core numeracy across the rest of the maths curriculum.

If we want children to 'use and apply' their numeracy successfully, then we need to get them numerate first! Once a child has a numerate ability then we can easily get them to use it in context. If a child knows $30 + 40$, then $30p + 40p$ is easy!

CLIC (i.e. Core Numeracy) is like a different subject to the rest of the Mathematics curriculum, and it needs to be treated differently. Quite often it needs its own way of teaching.

For example, Core Numeracy is high on understanding but low on creativity. Children learn one core method that is taught the same way across the school, and only later on, as part of Outer Numeracy do we begin to teach and encourage multi-methods (see below).



It can be seen from the diagram that Outer Numeracy has 4 main areas:

1. **SAFE Maths:** this includes wider subject areas within the Mathematics curriculum, such as measures, probability etc.
2. **Prove It! Maths:** these are purely mathematical problems that in Big Maths we rephrase as 'Number Challenges'
3. **Real Life Maths:** these are mathematical problems wrapped up in a real life scenario. In Big Maths we rephrase these as 'Real Life Maths'
4. **Multi-Methods:** here we look at different ways of solving the same Mathematics question. The focus here is on efficiency rather than on understanding, and this leads us to look at the Column Methods for Calculation.

3. Teach Through CLIC

CLIC is fundamental to mathematical development because this is the learning sequence through which we all develop numeracy. It has a natural chronology;

First: Counting (children learn to count and to 'count on').

Second: Learn Its (children then short-cut this counting by recalling their 'counting on' as facts).

Third: It's Nothing New (children then 'swap the thing' to realise that the counting fact, or 'Learn It', can be applied to any object, amount or unit of measure).

Fourth: Calculation (the previous 3 phases are combined to provide a calculation structure).

As numerate adults, we all went through this chronology. This happens by guiding the children through the Progress Drives (sequences of progression) that naturally exist within each of the four elements of CLIC.

CLIC obeys the natural laws of progression and this chronology is logical for us, our brains are 'pre-wired' to accept this logic. For example, it doesn't make sense for a child to try to calculate $47 + 68$ before he or she can add $40 + 60$, and it doesn't make sense for them to learn $40 + 60$ before they have learnt $4 + 6$, and it doesn't make sense for children to learn $4 + 6$ before they can count to 10! Teaching through CLIC is productive and rewarding because it follows the natural sequence of mathematical development.

If we take children through the CLIC framework then they won't accumulate learning gaps in their basic skills.

It is also vital to have a weekly assessment package that assesses specifically against this framework. This weekly assessment should inform us what new learning has taken place during the week, as well as identifying any potential learning gaps that have not been spotted.

This in turn allows for the next week ensuring children make continuous progress and addressing any unwanted learning gaps that may have developed. This is exactly what 'Big Maths Beat That' achieves.

Big Maths Beat That

'Big Maths Beat That' Challenges consist of the CLIC Challenges and Learn Its Challenges, which collectively provide a set of comprehensive questions that assess a child's ability in core maths.

The CLIC Challenges are aligned to a child's journey through Primary School, assessing their knowledge of core maths skills and their position on that journey. This allows teachers and school leaders to keep a constant 'progress check' as the weeks go by... all linked into National Curriculum age expectations!

The Learn Its Challenges assess those essential facts that, once secure, will allow a child to continue their journey, tackling increasingly complex questions more logically and successfully. Teachers must ensure that the child can recall their Learn Its instantly before attempting the next challenge.

There are three parts to Big Maths Beat That:

1. **The Learn Its Challenge:** Covers all the addition and multiplication facts needed.
2. **The CLIC Challenge:** Covers all the basic skills that a child needs to be properly numerate.
3. **The Outer Numeracy Challenge:** Covers the rest of the Maths curriculum (coming soon).

CLIC Test Examples:

From CLIC 1

A worksheet titled 'CLIC 1' with a 'BEAT THAT!' logo. It contains several math problems:

- 1. 1, 2, 3, 4, 5, 6, 7
- 2. 1, 2, 2, 4, 5, 6, 7, 8, 9, 10
- 3. A number line with 1 and 2 marked, and a speech bubble containing '3'.
- 4. A soccer ball icon and the text 'How Many?'.
- 5. A cartoon character with the text 'I think I have 10 fingers'.
- 6. A speech bubble with '2 + 3'.
- 7. A speech bubble with '1 can tell you double 1 and double 2'.
- 8. A speech bubble with 'I can tell you half of 4, half of 2'.
- 9. A speech bubble with '1 add 1'.
- 10. A speech bubble with '2 add 2'.

To CLIC 19

A worksheet titled 'CLIC 19' with a 'BEAT THAT!' logo. It contains several math problems:

- 1. Place in order: 1444, 171, 18
- 2. A number line from 0 to 10 with a character pointing to 4 and the text 'The 10's'.
- 3. A speech bubble with '867 + 98 ='
- 4. $56 - 375 =$
- 5. $438 \div 6 =$
- 6. $1000 \div 100 =$
- 7. $3625 \div 4 =$
- 8. A long division problem: $524 \div 26$
- 9. A long division problem: $22 \overline{) 672}$

Learn Its Test Examples:

From Learn Its 1

A worksheet titled 'LEARN ITS Challenges!' with a 'BEAT THAT!' logo. It shows 'Step 1' with a cartoon character and two simple addition problems:

- $1 + 1 =$
- $2 + 2 =$

To The Ultimate Challenge

A worksheet titled 'LEARN ITS Challenges! ULTIMATE' with a 'BEAT THAT!' logo. It features a grid of multiplication facts for students to recall:

1x1	1x2	1x3	1x4	1x5	1x6	1x7	1x8	1x9
2x1	2x2	2x3	2x4	2x5	2x6	2x7	2x8	2x9
3x1	3x2	3x3	3x4	3x5	3x6	3x7	3x8	3x9
4x1	4x2	4x3	4x4	4x5	4x6	4x7	4x8	4x9
5x1	5x2	5x3	5x4	5x5	5x6	5x7	5x8	5x9
6x1	6x2	6x3	6x4	6x5	6x6	6x7	6x8	6x9
7x1	7x2	7x3	7x4	7x5	7x6	7x7	7x8	7x9
8x1	8x2	8x3	8x4	8x5	8x6	8x7	8x8	8x9
9x1	9x2	9x3	9x4	9x5	9x6	9x7	9x8	9x9

The CLIC Framework

Counting:

There are 10 Progress Drives within Counting.

Step	Progress Drive	Amount	Step	Progress Drive	Amount
1	Saying Numbers	5	6	Actual Counting	6
2	Reading Numbers	11	7	Counting On	5
3	Squiggleworth	5	8	Counting Multiples	9
4	CORE Numbers	10	9	Count Fourways	7 (x4)
5	Counting Skills	5	10	Counting Along	7

Learn Its:

There is a single 15 Step Progress Drive for Learn Its and it looks like this:

Step	Addition	Multiplication	Step	Addition	Multiplication
1	1 + 1, 2 + 2		9	5 + 9, 6 + 9, 7 + 9, 5 + 7, 5 + 8, 6 + 8	x 2 Table
2	3 + 3, 4 + 4, 5 + 5		10		x 3 Table
3	1 + 2, 2 + 3	Multiples of 10 -	11		x 4 Table
4	2 + 8, 3 + 7, 4 + 6	in Counting	12		x 8 Table
5	4 + 2, 5 + 2, 6 + 2, 7 + 2, 9 + 2, 4 + 3, 5 + 3, 6 + 3	Multiples of 5 - in Counting	13		The 6 Fact Challenge
6	6 + 6, 7 + 7, 8 + 8, 9 + 9	Multiples of 2 - in Counting	14		x 11 Table
7	3 + 8, 3 + 9, 4 + 7, 4 + 8, 4 + 9	x 10 Table	15		x 12 Table
8	4 + 5, 5 + 6, 6 + 7, 7 + 8, 8 + 9	x 5 Table			

It's Nothing New:

There are 10 Progress Drives within It's Nothing New and they look like this:

Step	Progress Drive	Amounts
1	The Pim Principle	3
2	Pim's Addition	5
3	Doubling / Halving	5, 5, 6
4	Jigsaw Numbers	5
5	x10 / ÷10	5, 5
6	Smile Multiplication	5
7	Coin Multiplication	5
8	Where's Mully?	5
9	Pom's Words	4
10	Fact Families	5

Calculation:

There are 4 Progress Drives for Calculation and they look like this:

Progress Drive Amounts of Steps

Addition	41
Subtraction	37
Multiplication	19
Division	33

Column Methods:

There are also 4 Progress Drives for the Column Methods.

Progress Drive Amounts of Steps

Addition	14
Subtraction	12
Multiplication	11
Division	10

Big Maths Characters

During their Big Maths journey your child will be introduced to a number of different characters that Big Maths uses to introduce and embed principles.

Meet the Big Maths characters:

	<p>Pim is an alien from the planet CLIC. Pim has 3 arms on one side and 4 arms on the other side. He therefore has 7 arms altogether. Anyone that has learnt that '3 add 4 equals 7' can soon realise that this applies to all 'things'. We can swap 'the thing' and it doesn't change the amount. This 'Big Idea' underpins place value, reading numbers, adding multiples of ten, doubling tenths, multiplying hundredths, dividing in the context of measures, algebra, etc, etc.</p>
	<p>Pim has a pet! Squiggleworth is Pim's pet and he can be used to help children have fun while they practice partitioning numbers. He helps us to know what a 'squiggle' is 'worth'.</p>
	<p>Count Fourways is called Count Fourways since the children simply learn to count out loud in four crucial ways. The 'four ways' are counting in 1s, 2s, 5s and 25s.</p>
	<p>Meet 'Mully Multiple'! He is known as Mully for short. Mully likes to explore and to hide. He likes to hide behind the biggest multiple of a number he can find. What the children don't realise while they are playing 'Where's Mully?' is that they are actually learning to become proficient at division!</p>
	<p>Pom is an alien. He lives with Pim on the planet CLIC. Pom has several features that help children learn 4 key mathematical words: multiple, factor, square and prime. With Pom's help these words can be learnt easily and early.</p>
	<p>Super-FAB reminds children they are challenged to move along the FAB continuum and head towards a brain only method. He is really good at focussing on holding numbers in his head, doing something else, and then coming back to those numbers again!</p> <p>F is for Full: We start off with a full written method that is high on understanding.</p> <p>A is for Abridged: Now we take the writing away, gradually, over time...training the brain to hold numbers in the head.</p> <p>B is for Brain: Finally the child is left with the ability to solve the question with nothing except their mind!</p> <p>This process is called FAB maths since it is a very positive name and it describes the journey along the FAB continuum.</p>
	<p>Speedy Col has a lot of energy! She likes to do everything quickly. She isn't just fast though, she's careful too. She likes everything done properly and is motivated to get the right result! Speedy Col appears when children are doing column methods.</p>

4. Have a Daily CLIC Session

CLIC is a sequential programme of daily basic skills for numeracy. Implementation of this programme ensures that all children have a constant, daily drive to 'up-level' their numeracy. This frequency and focus is an essential element of the approach.

5. Use CLIC across the school

The Benefits

Where schools use the CLIC folders to support Big Maths the following benefits will be felt:

- All children will receive a focussed and personalised daily up-levelling of their numeracy in a simple progressive structure that they can themselves understand. This has the potential to transform levels of numeracy, and levels of numeracy confidence.
- All teachers will be providing common and consistent messages throughout the school. This provides children moving through the school with a smoother numeracy development journey and therefore more rapid progress.
- Children will be able to understand each new step on their journey because the Progress Drives and the teaching methods make the mathematical concepts easily accessible to all.
- Because national curriculum links are made through CLIC on Your Planning it is easier for teachers to relate pupils' learning outcomes to assessment evidence.
- The Progress Drives provide all teachers with the subject knowledge needed for highly effective numeracy teaching. They also provide a common dialogue which enhances the quality of discussions and professional development activities in school.
- Sharing the Progress Drives with children enhances the 'assessment for learning' basis of Big Maths. Pupils can see their next steps and what they need to do next to make further progress. Children can also see the progress they are making and celebrate their achievements.
- Confidence levels for staff and children to understand numeracy development will be very high, and the strong belief that all children can become numerate will be passed on from staff to pupils.