Seeing the bigger picture of the Fluency Journey

In the Fluency Journey it can be seen that every Progress Drive from CLIC has a descriptive commentary each term. In order to give deeper understanding to that commentary it is *always* useful to go back into the journey and read the previous term's commentary, and also to look ahead and reads the next term's commentary. The teacher also has the step by step teacher notes from Big Maths Online to support the detail around each step. Further to this, it is also extremely useful to see the bigger picture of the curriculum design. This final section of the book gives the reader the chance to look 'under the bonnet' and see the classy, finely-tuned engine that is the Fluency Journey!

Here, we take a look at the big picture layout for 10 of the main paths of progression that are taking place across the Fluency Journey. This allows us to see at a glance how differing Progress Drives connect with each other at various times in the school's cohesive journey. Seeing the bigger picture leads to understanding the bigger picture, and this understanding, in turn, allows the teacher to make more insightful and impactive teaching points; making stronger connections and constantly signposting learners to the path ahead.

The 10 bigger picture layouts of progression are:

1. Mastering Whole Numbers
2. Mastering Decimal Numbers
3. Count Fourways
4. Teaching new addition concepts using the 'Dice Learn Its'
5. Using CLIC for every addition fact
6. Teaching new multiplication concepts using the first half of the X3 table
7. Using CLIC for every multiplication fact
8. Finding Multiples (1) (Where's Mully?) for X10, X5, X2
9. Finding Multiples (2) (Where's Mully?) for X3, X4, X8 and the 6 Fact Challenge
10. Coin Multiplication

Please be aware thus is a first draft document.
It has not been set to professional design standards as yet.
Some of the layouts still need refining and further precision added.

1

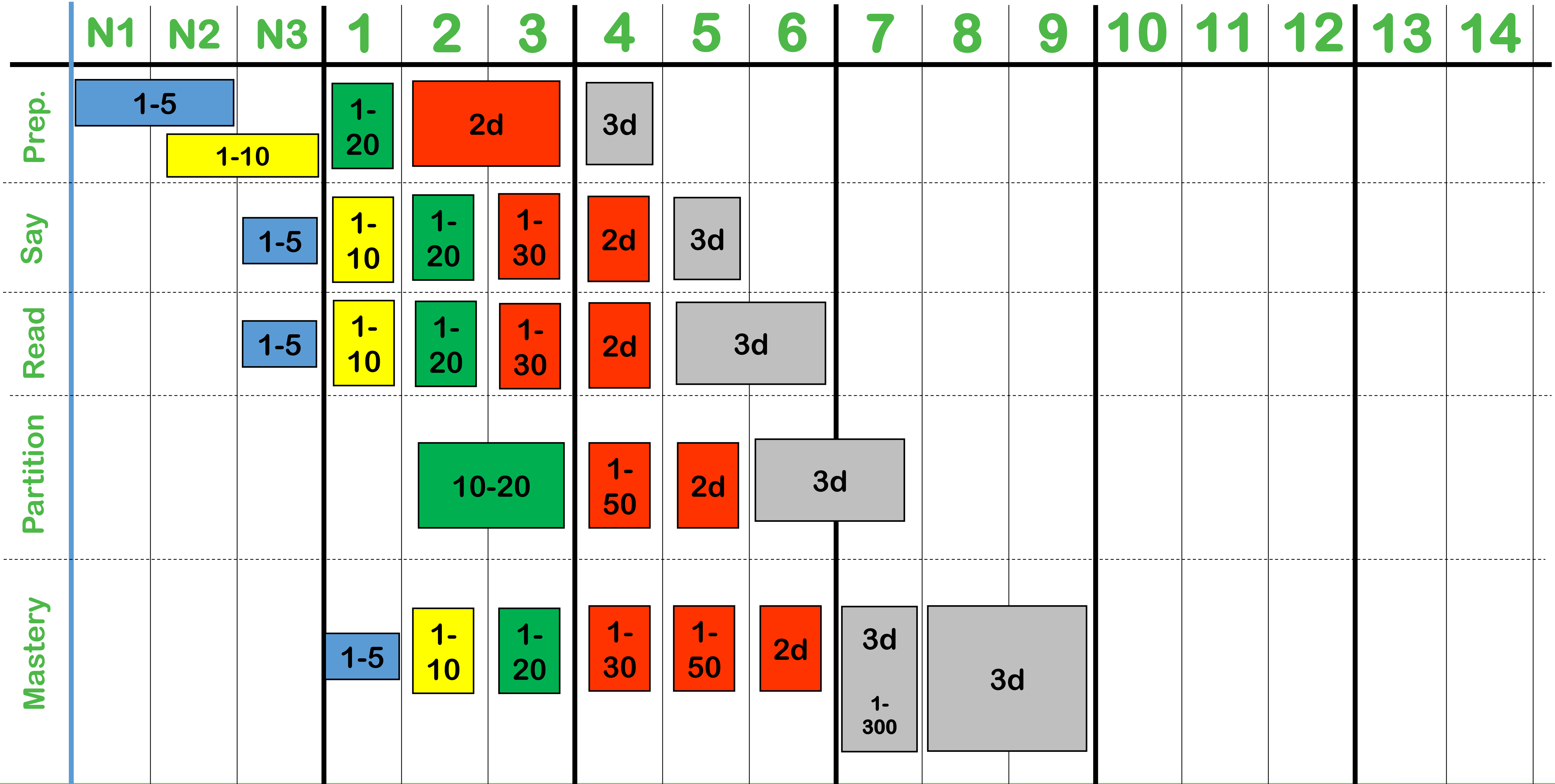
Mastering Whole Numbers

In this big picture layout we can see the relationship between the first four Progress Drives within the Counting phase of CLIC. For example, we can see that for any chunk of the number system (e.g. 2 digit numbers) children will learn to;

- Say those numbers out loud by rote, before they;
- Reading the numbers, and that they will read the numbers before they;
- Partition the numbers using place value, and that they will Partition the numbers using place value before they;
- Master those numbers (e.g. comparing numbers, ordering numbers, rounding numbers, counting on from different numbers in different sizes, rearranging/partitioning the numbers without using place value etc.).

At each transition stage there will be crucial cognitive overlap. For example, once children are growing in fluency with saying 2 digit numbers out loud by rote they will start to read 2 digit numbers alongside this. Once they are growing in fluency with reading 2 digit numbers they will start to partition 2 digit numbers alongside this. Once they are growing in fluency with partitioning 2 digit numbers they will start to explore the features of mastering 2 digit numbers alongside this.

In this big picture layout, not only can we see the relationship between these four Progress Drives, we can also see *when* each of these developments in knowledge are made in the Fluency Journey. We can also see *when* the teacher is preparing the children to get started with the saying of the numbers (e.g. explicitly modelling the rote learning, and/or beginning to break down the first step into smaller steps ready to secure the required knowledge). More detail is given to this in the actual term by term planning notes.


N1
N2
N3
1
2
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Prep.
1-5
1-10
1-20
2d
3d
Say
1-5
1-10
1-20
1-30
2d
3d
Read
1-5
1-10
1-20
1-30
2d
3d
Partition
10-20
1-50
2d
3d
Mastery
1-5
1-10
1-20
1-30
1-50
2d
3d
1-300
3d

2

Mastering Decimal Numbers

This is very similar to the previous view for whole numbers, except this time we can see at a glance how and when decimal numbers are introduced and progressed into various contexts. For example, we can see that tenths are introduced in BM0, hundredths at BM13 and thousandths at BM14. We can also see how these new place value quantities are introduced and progressed;

- Firstly, by children simply counting and 'swapping the thing' (but the things are tenths/hundredths/thousandths). This happens through the 'Counting Fractions' Progress Drive in SAFE Maths.
- Secondly, by counting this as a decimal. This also happens through the 'Counting Fractions' Progress Drive in SAFE Maths.
- Thirdly, by recording this as a decimal, combining this recording with further counting. This too happens through the 'Counting Fractions' Progress Drive in SAFE Maths.
- Finally, partitioning the numbers using place value.

The big picture layout here also shows that, for tenths, once this knowledge is secured then the children progress on to two new pieces of knowledge in the next stage of the Fluency Journey. They are;

- Mastering those numbers (e.g. comparing numbers, ordering numbers, rounding numbers, counting on from different numbers in different sizes, rearranging/partitioning the numbers without using place value etc.).
- Adding by simply 'swapping the thing' (e.g. 3 tenths add 4 tenths must be 7 tenths), progressing to subtracting, and writing out Fact Families.

For hundredths and thousandths this progression happens all in the same stage, since the connections needed have already been made.

We can also see that for tenths/hundredths/thousandths we will then move again into two further pieces of knowledge in the next stage of the Fluency Journey. They are;

- Multiplying by simply 'swapping the thing' (e.g. 3 tenths multiply by 4 tenths must be 12 tenths), progressing to dividing, and writing out Fact Families.
- Calculating with tenths/hundredths/thousandths on the Calculation Progress Drives.

	10	11	12	13	14	15	16	17
Count as a Fraction	Tenths			Hths		Ths		
Count as a decimal	Tenths			Hths		Ths		
Read / Write	Tenths			Hths		Ths		
Partition	Tenths			Hths		Ths		
Mastery		Tenths		Hundredths		Ths		
INN		Tenths +		Hths +		Ths +		
			Tenths X		Hths X		Ths x	
Calculation			Tenths +		Hths +		Ths	
				Tenths X		Hths X		

3

Count Fourways

Both ‘Count Fourways’ and ‘Mastery of Numbers’ are Progress Drives within the Counting phase of the CLIC framework. It is perhaps best to look at the Count Fourways progression in relation to the ‘Mastery of Numbers’ progression. What we see is that children become fluent with the ‘4 ways’ of counting as a very deliberate approach linked to where the children are up to with their mastery of the number system.

Step	1s	2s	5s	25s
7	-1s	-2s	-5s	-25s
6	0.1s	0.2s	0.5s	0.25
5	Tenths	Fifths	Halves	Quarters
4	1000s	2000s	5000s	2.5s
3	100s	200s	500s	2500s
2	10s	20s	50s	250s
1	1s	2s	5s	25s
	1s	2s	5s	25s
Amount of divisions between marked numbers	10	5	2	4

		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Mastery of Numbers		1-10	1-20	1-30	1-50	1-100	100-300	3d whole numbers		1000-2000	4d whole numbers	5d whole numbers	6d whole numbers	7d whole numbers		8d whole numbers
											Tenths		Hundredths		Thousandths	
Count Fourways	Divisions between marked numbers															
1s	10	1s	1s 10s	1s 10s	1s 10s	1s 10s	1s 10s 100s	1s 10s 100s	1s 10s 100s	1s 10s 100s -1s	1s 10s 100s 1000s 0.1s -1s -10s	1s 10s 100s 1000s 10,000s 0.1s -1s -10s	1s 10s 100s 1000s 10,000s 100,000s 0.1s -1s -10s			
2s	5	5s	5s	5s	5s	5s 50s	5s 50s	5s 50s	5s 50s	5s 50s 500s	5s 50s 500s -5s	5s 50s 500s 5000s 0.5s -5s	5s 50s 500s 5000s 50,000s 0.5s -5s			
5s	2	2s	2s	2s	2s	2s 20s	2s 20s	2s 20s 200s	2s 20s 200s	2s 20s 200s	2s 20s 200s 2000s -2s	2s 20s 200s 2000s 20,000s 0.2s -2s	2s 20s 200s 2000s 20,000s 0.2s -2s			
25s	4				25s	25s	25s	25s 250s	25s 250s	25s 250s	25s 250s 2500s	25s 250s 2500s	25s 250s 2500s			

4

Teaching new addition concepts using the 'Dice Learn Its'

In the Fluency Journey the child's working memory is supported when learning new addition and subtraction concepts by teaching all new concepts using only six simple number facts. These are called the 'Dice Learn Its' and they are 2 + 2, 3 + 3, 4 + 4, 2 + 3, 2 + 4 and 3 + 4. This big picture layout shows when those facts are applied to new addition and subtraction concepts. For example, we can see that in BM6 children learn the concept and skill of subtracting a 2 digit multiple of 10 from another 2 digit multiple of 10. However, we can see that this when taught for the first time, it is taught through the Dice Learn Its. The example given is 60 - 40. This itself is an extension of the child recalling 6 - 4 = 2 as a fact that derives from 2 + 4 = 6. Note too, that in BM7 we can see a progression to now subtracting a 2 digit multiple of 10 from any 2 digit number. The example given is 63 – 40, and we will know that the child is already fluent with the 60 – 40 part from the earlier stage. The point being that all new concepts are taught through the same 6 Dice Learn Its. For each new concept, the child is given time to practise the skill (the doing/procedure) that accompanies that concept, so that other Learn Its can then be injected into an already fluent concept and skill.

What we don't see in this layout is the move into using 3d digit whole numbers and decimal numbers for addition. This phase of the journey starts at BM10 but continues to use the 6 Dice Learn It as entry points into each new skill, although this becomes less important since all addition Learn Its will now be equally secure with total recall.

1 2 3 4 5 6 7 8 9

C

'Counting On'
for 'Dice Learn Its'

L

2 + 2
3 + 3
4 + 4

2 + 3

2 + 4
3 + 4

Step 5
Learn Its

I

Switcher

Fact Family

Objects | **tens** | **20 + 30** | **FF**

Obs | **hundreds** | **200 + 300** | **FF**

C

42 + 3

42 + 23

342 + 3

60 - 40

74 - 2

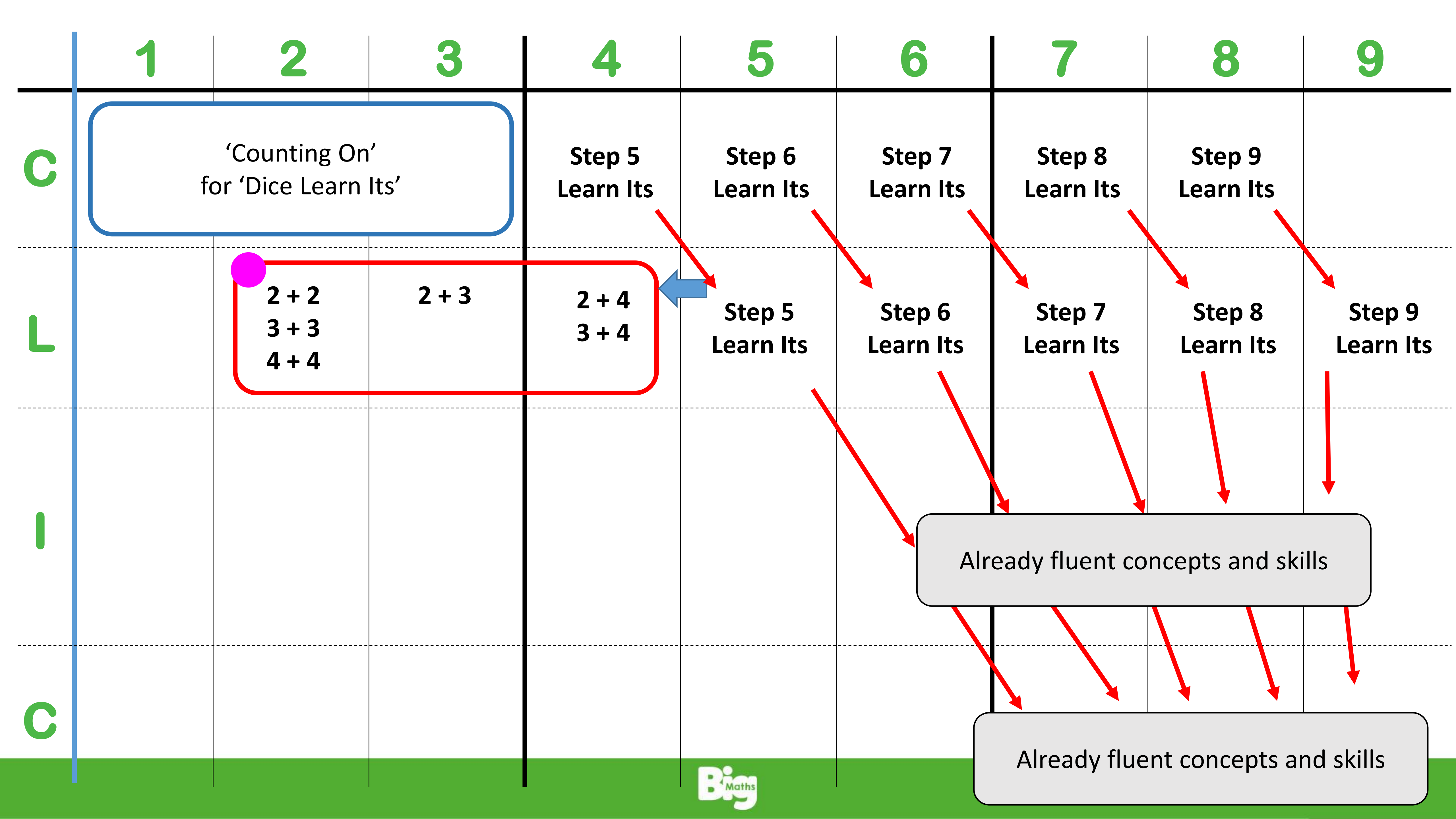
374 - 2

63 - 40

5

Using CLIC for every Addition Fact

In the Fluency Journey every child secures the instant recall of every Learn It by going through the CLIC chronology in a very deliberate and explicit chronology. In this big picture layout we can see when each bank/step of Addition Learn Its are counted out first in the Counting phase of CLIC, then given time to develop instant recall in the Learn Its phase of CLIC and then when they are moved from Learn Its into INN and then on to Calculation. If this is seen in conjunction with the previous big picture layout for acquiring new addition/subtraction concepts using the 6 Dice Learn Its, then we can see that the Learn Its from Step 5 onwards are always being simply revisited in the context of already fluent concepts and skills in both INN and Calculation. This makes for a very efficient curriculum since there is less actual teaching needed here, and the focus is more on gaining even greater fluency and applying the system of shuffling every individual new Learn It (from Steps 5 to 9) through the CLIC chronology for *every* child. Notice how the arrows gradually become more vertical as the terms progress. This is because the child is becoming increasingly familiar with the process. In other words, they are becoming increasingly knowledgeable and fluent with every skill, and so it takes less time for a Learn It to journey through the CLIC chronology (i.e. to be processed cognitively - through the natural chronology of CLIC - by the child).


1
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'Counting On'
for 'Dice Learn Its'
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Learn Its
Step 6
Learn Its
Step 7
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Step 8
Learn Its
Step 9
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3 + 3
4 + 4
2 + 3
2 + 4
3 + 4
Step 5
Learn Its
Step 6
Learn Its
Step 7
Learn Its
Step 8
Learn Its
Step 9
Learn Its
Already fluent concepts and skills
Already fluent concepts and skills
Big Maths

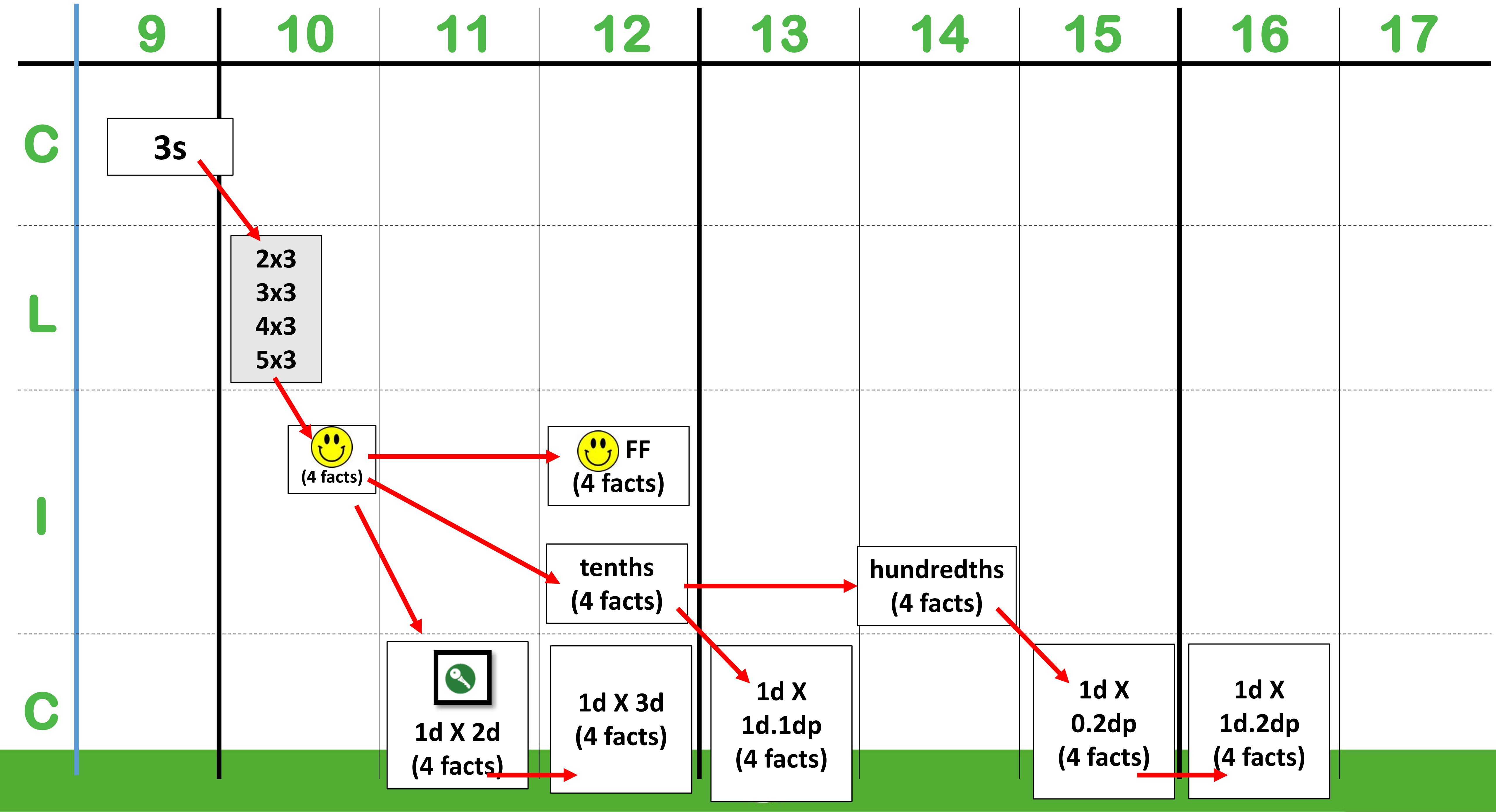
6

Teaching new multiplication concepts using the 'first half of the X3 table'

In the Fluency Journey the child's working memory is supported when learning new multiplication concepts. This happens by teaching all new concepts using only four simple number facts. These are come from the first half of the X3 multiplication table and they are 2X3, 3X3, 4X3, and 5X3. This big picture layout shows when those facts are applied to new concepts. We can see that in BM9 the children become fluent counting out the first 10 multiples of 3. In the first half of BM10 this is re-seen as a multiplication table and the children learn the recall of the four Learn Its mentioned above (as well as the rest of the X3 table by the end of BM10). We now use these 4 facts to teach new multiplication concepts:

- In the second half of BM10 children learn to apply these facts to 10s (i.e. Smile Multiplication, 3 X 50 = 150 because 3 X 5 = 15).
- In BM11 children learn 1 digit X 2 digit for the first time using only these 4 facts.
- In BM12 children learn 1 digit X 3 digit for the first time using only these 4 facts. They also apply these facts to Smile Multiplication Fact Families. They also apply these facts to tenths.
- In BM13 children learn 1 digit X 1 digit and 1 dp for the first time using only these 4 facts.
- In BM14 children also apply these facts to hundredths.
- In BM15 children learn 1 digit X 0.2dp for the first time using only these 4 facts.
- In BM16 children learn 1 digit X 1d.2dp for the first time using only these 4 facts.

The point being that all new concepts are taught through the same 4 Learn Its. For each new concept, the child is given time to practise the skill (the doing/procedure) that accompanies that concept, so that other Learn Its can then be injected into an already fluent concept and skill.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5x3
(4 facts)
FF
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hundredths
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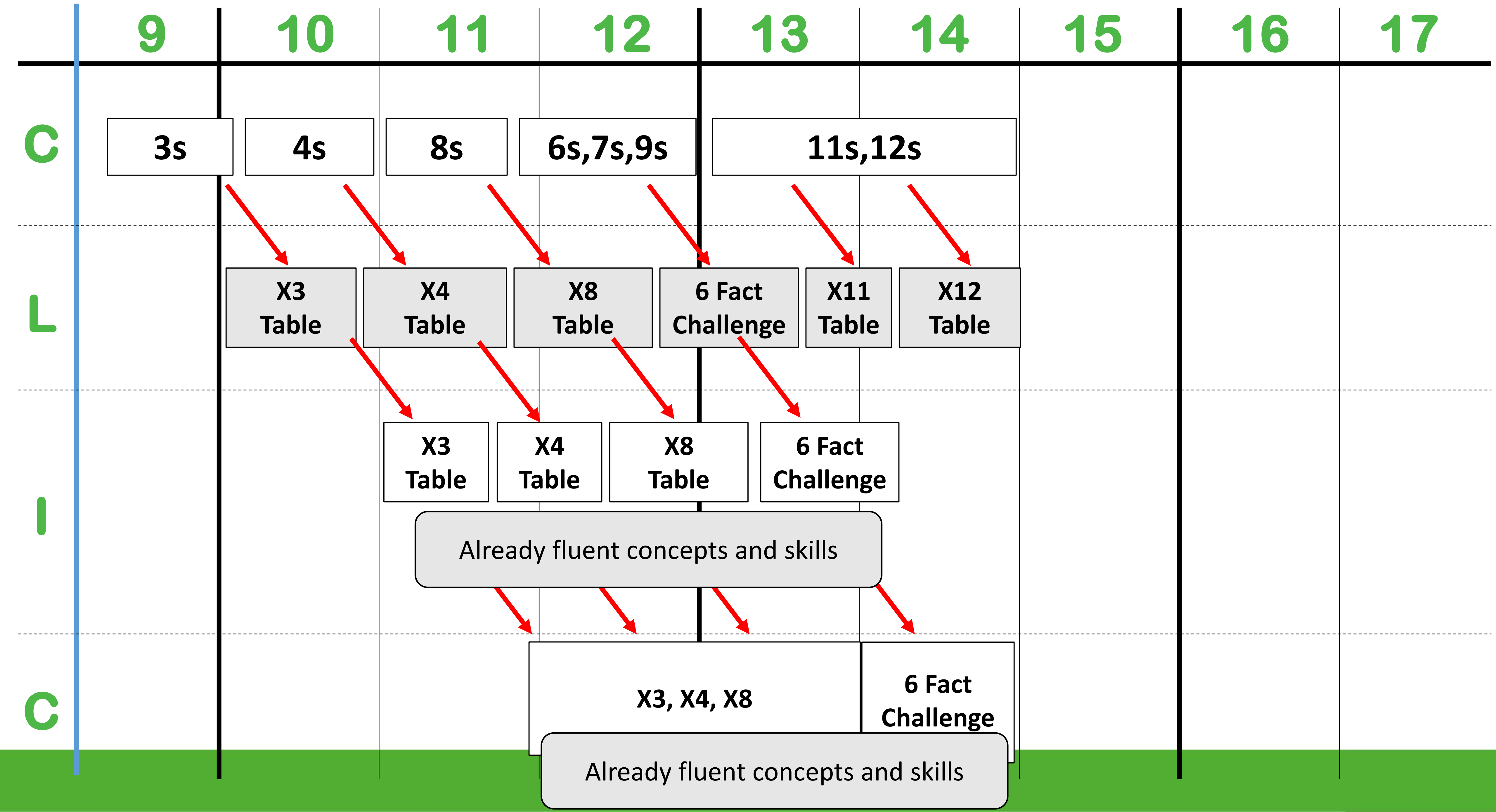
1d X 2d
(4 facts)
1d X 3d
(4 facts)
1d X
1d.1dp
(4 facts)
1d X
0.2dp
(4 facts)
1d X
1d.2dp
(4 facts)

7

Using CLIC for every Multiplication Fact

In the Fluency Journey every child secures the instant recall of every Learn It by going through the CLIC chronology in a very deliberate and explicit chronology. In this big picture layout we can see when each multiplication table is counted out in the Counting phase of CLIC, and then when those multiples become a set of facts within a multiplication table, and then when the Learn Its move into INN and then on to Calculation (Multiplication). If this is seen in conjunction with the previous big picture layout for acquiring new multiplication concepts using the 4 Learn Its from the first half of the X3 table, then we can see that the Learn Its from Step 10 onwards are always being simply revisited in the context of already fluent concepts and skills in both INN and Calculation. This makes for a very efficient curriculum since there is less actual teaching needed here, and the focus is more on gaining even greater fluency and applying the system of shuffling every individual new Learn It (from the X3 to X9 tables) through the natural chronology of CLIC for *every* child.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10
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14
15
16
17
C
L
I
C
3s
4s
8s
6s,7s,9s
11s,12s
X3 Table
X4 Table
X8 Table
6 Fact Challenge
X11 Table
X12 Table
X3 Table
X4 Table
X8 Table
6 Fact Challenge
Already fluent concepts and skills
X3, X4, X8
6 Fact Challenge
Already fluent concepts and skills

8

Finding Multiples (1) (Where's Mully?)

In the Fluency Journey, every child secures the ability to fluently recite the first 10 multiples of each 1 digit number with a full understanding (Counting Multiples). This can then be used to play 'Where's Mully?' and therefore quickly find the highest multiple of that number without going past a given number. Once the list of multiples has been seen and memorised as a multiplication table in Learn Its, then we can also ask children 'Which multiple was it…the 5th, the 7th etc.?'. In the Division part of CLIC (part of Calculation) we then position this activity as a division question. This bigger picture layout shows how and when this journey fits together across the school. In effect, children are brought to fluency with 2 digit divided by 1 digit questions (using Steps 1 and 2 of the Finding Multiples Progress Drive), and then we build on this knowledge to bring children to fluency with 3 digit divided by 1 digit questions (using Steps 3 and 4 of the Finding Multiples Progress Drive). This may, at first sight, seem to place a huge cognitive load on the child's working memory when they start to learn the first 10 multiples of 6, 7 and 9 in a short space of time (and then apply to Where's Mully? and then Division), but we should note that the only new knowledge is actually the 6 Fact Challenge (see Learn Its Step 13).

What we don't see in this bigger picture layout is the application of 2 digit whole numbers to this process. Instead, this is included in the Coin Multiplication layout that follows.

There are two layouts for this part of the Fluency Journey. This first one shows only the journey for X10, X5 and X2. Notice that our focus switches to merely X5 as dividing by 10 is progressed through the multiplying/dividing by 10 Progress Drive, and dividing by 2 is progressed through the halving Progress Drive.
The next layout shows the journey for X3, X4, X8 and the 6 Fact Challenge (the remaining facts from X6, X7 and X9).

		N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Counting Multiples	10s		Prep	Prep	10-100												
	5s	Hi 5s Prep	Hi 5s 5,10	Hi 5s 5,10,15	Hi 5s 5-30	5-50											
	2s	2-8 Prep	2-10 Prep	2-10 Prep	2-10 2-20 Prep	10- 20	2-20										
Where's Mully? (Step 1)							5-25	5-50	Division (÷5)	10-100 Division (÷10)	2-20 Division (÷2)						
Where's Mully? (Step 2)										50-100		Division (÷5)					
Where's Mully? (Step 3)														5s			Division Steps 24&25 (3 digit÷1 digit)
Where's Mully? (Step 4)															5s		Division Steps 24&25 (3 digit÷1 digit)

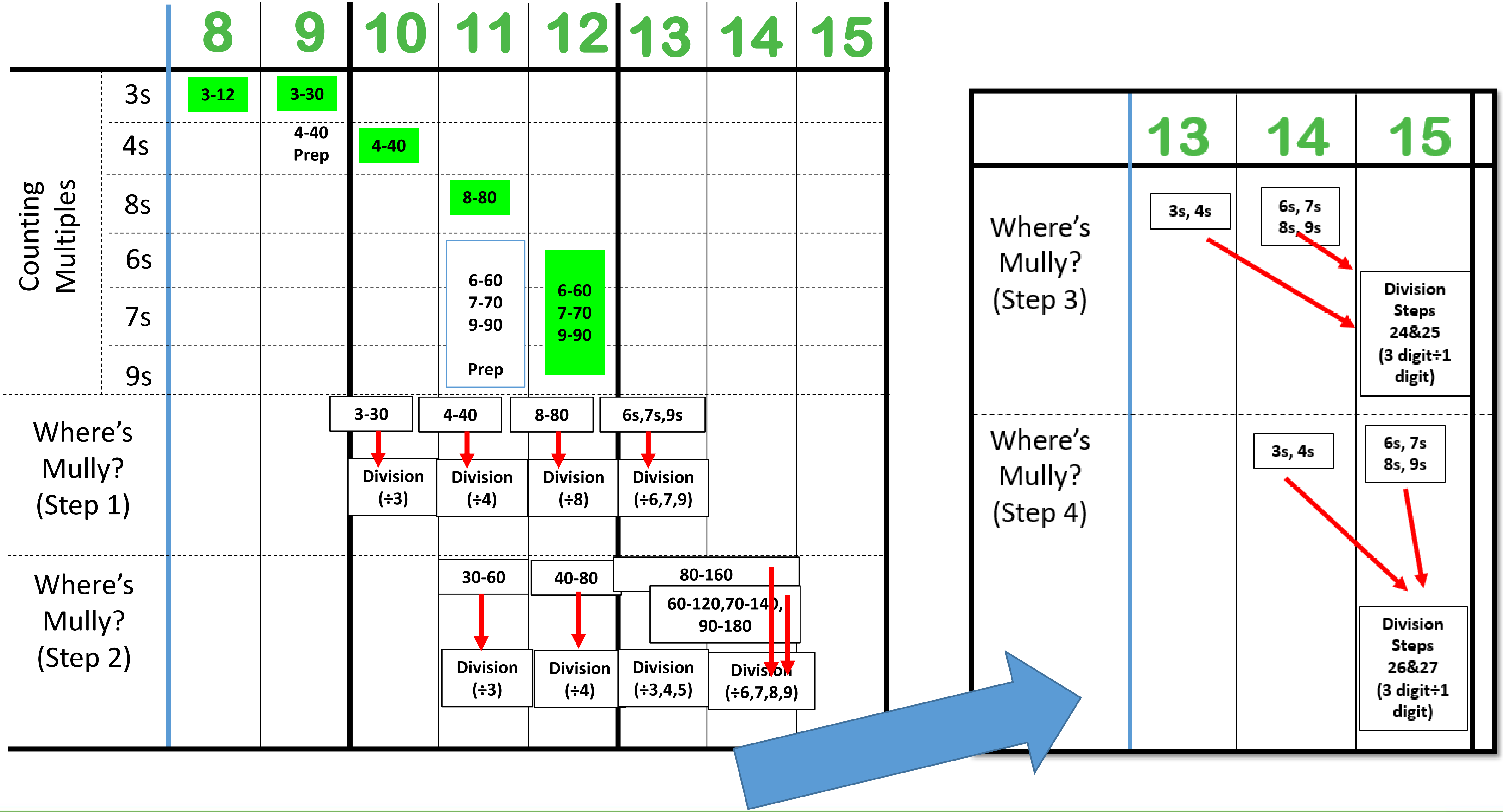
9

Finding Multiples (2) (Where's Mully?)

In the Fluency Journey, every child secures the ability to fluently recite the first 10 multiples of each 1 digit number with a full understanding (Counting Multiples). This can then be used to play 'Where's Mully?' and therefore quickly find the highest multiple of that number without going past a given number. Once the list of multiples has been seen and memorised as a multiplication table in Learn Its, then we can also ask children 'Which multiple was it…the 5th, the 7th etc.?'. In the Division part of CLIC (part of Calculation) we then position this activity as a division question. This bigger picture layout shows how and when this journey fits together across the school. In effect, children are brought to fluency with 2 digit divided by 1 digit questions (using Steps 1 and 2 of the Finding Multiples Progress Drive), and then we build on this knowledge to bring children to fluency with 3 digit divided by 1 digit questions (using Steps 3 and 4 of the Finding Multiples Progress Drive). This may, at first sight, seem to place a huge cognitive load on the child's working memory when they start to learn the first 10 multiples of 6, 7 and 9 in a short space of time (and then apply to Where's Mully? and then Division), but we should note that the only new knowledge is actually the 6 Fact Challenge (see Learn Its Step 13).

What we don't see in this bigger picture layout is the application of 2 digit whole numbers to this process. Instead, this is included in the Coin Multiplication layout that follows.

There are two layouts for this part of the Fluency Journey. This previous layout showed only the journey for X10, X5 and X2.
This layout shows the journey for X3, X4, X8 and the 6 Fact Challenge (the remaining facts from X6, X7 and X9).


8
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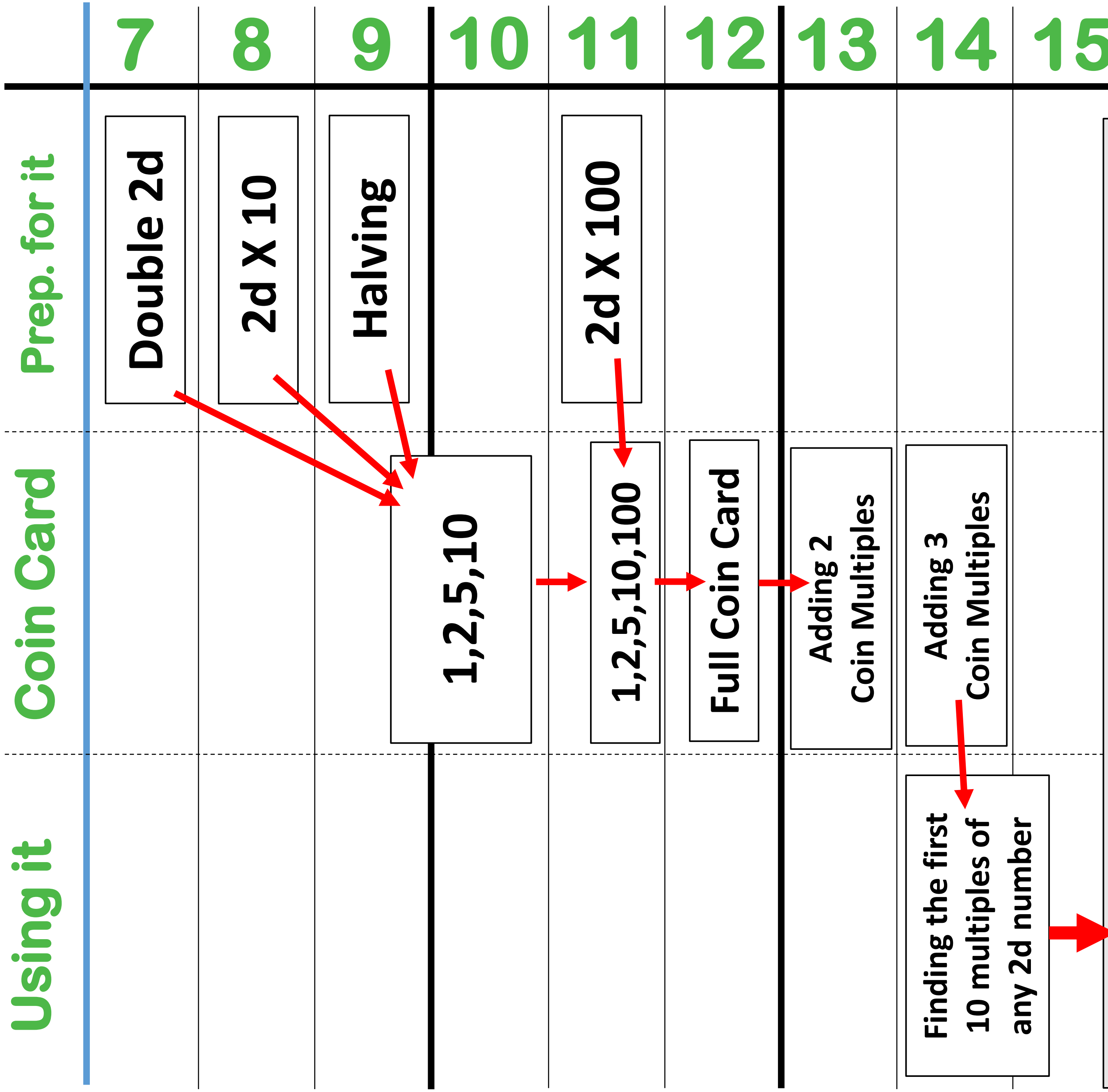
Counting Multiples
3s
4s
8s
6s
7s
9s
3-12
3-30
4-40 Prep
4-40
8-80
6-60 7-70 9-90 Prep
6-60 7-70 9-90
Where's Mully? (Step 1)
3-30
4-40
8-80
6s,7s,9s
Division (÷3)
Division (÷4)
Division (÷8)
Division (÷6,7,9)
Where's Mully? (Step 2)
30-60
40-80
80-160
60-120,70-140, 90-180
Division (÷3)
Division (÷4)
Division (÷3,4,5)
Division (÷6,7,8,9)
13
14
15
Where's Mully? (Step 3)
3s, 4s
6s, 7s 8s, 9s
Division Steps 24&25 (3 digit÷1 digit)
Where's Mully? (Step 4)
3s, 4s
6s, 7s 8s, 9s
Division Steps 26&27 (3 digit÷1 digit)

10

Coin Multiplication

Coin Multiplication in itself demonstrates excellent fluency in number, but most importantly it gives a super-strong platform (with high understanding) to take learners effortlessly into many other skills and concepts that are crucial for the ending of the primary maths journey. In this bigger picture layout we can see how and when the child becomes fluent with doubling any 2 digit number at BM7 (we could also back-track to see how this fluency was developed), and with multiplying any 2 digit number at BM8, and with halving any 3 digit multiple of 10 at BM9. This allows the teacher to then blend these already fluent part-skills into a ‘1, 2, 5, 10 Card’ later on in BM9. This layout also shows us how and when this is extended into a ‘Full Coin Card’ and beyond that into SAFE Maths.



Multiplication: Children can now multiply any 2d X 2d/3d by adding coin multiples together.

Long Division: Children can now search for the highest multiple of a 2d number by playing 'Where's Mully?', leading into long division. This can be combined with the ability to complete a standard column/compact method for long division (see Column Methods: Division: Steps 8&9).

Percentages: Children can now be taken to easily find any percentage of any number (see SAFE: Fractions: Percentages: Step 4 onwards).

Pie Charts: Steps 6 to 11 from the Pie Charts Progress Drive (SAFE Maths: Explaining Data) all use Coin Cards to guide children to fluency in finding missing angles, percentages and proportions.

Conversions: Step 11 from the Ratio Progress Drive (SAFE Maths: Fractions) draws together many uses of Coin Cards to convert amounts into a different unit of measure.

Line Graphs: Step 13 from the Ratio Progress Drive (SAFE Maths: Fractions) shows children how to use Coin Cards to see the relationship between the values as coordinates that can then form straight line graphs to then interpret and use to find unknown values.

Ratio and Proportions: Steps 6, 7 & 8 from the Ratio Progress Drive (SAFE Maths: Fractions) builds children's fluency with maintaining proportions into new sizes of quantities.

Speed/Distance/Time: Steps 34-38 from the Amounts of Distance Progress Drive (SAFE Maths: Amounts) use Coin Cards to ensure children can fluently see the relationship between the values, using the Coin Card as a fluent structure to then find unknown values.

Rates: Step 5 from the Line Graphs Progress Drive (SAFE Maths: Explaining Data) teaches children to use Coin Cards to maintain a rate, and therefore find unknown values.

Coordinates: Step 5 from the Line Graphs Progress Drive (SAFE Maths: Explaining Data) also shows children how to use Coin Cards to maintain relationships as coordinates and then use the coordinate to graph the relationship.