Number Fluency and Times Tables Progression Map

Our approach to teaching fluency in number

Introduction

The National Curriculum states that pupils should become fluent in the fundamentals of mathematics through varied and frequent practice. By the end of Year 4, pupils are expected to be capable of recalling all 12 times tables up to 12x12. At Fielding we ensure this is consistent throughout all maths mastery lessons and through our additional programme offering to develop pupils' number sense through weekly repetition and targeted fluency focus.

Fluency in calculation is practised and revised through the following programmes:

- NCETM Mastering Number (Reception – Year 2)
- Maths Circle NumBots (Year 1 – Year 2)
- Maths Circle Times Tables Rock Stars (Year 2 – Year 6)
- Sherry Parish's Number Talks (Reception – Year 6)
- NCETM Mastering Number at KS2 (Year 4 – 5)

Fielding's programme offering focuses on the development and revision of number sense and fluency in calculation to ensure children can:

- Subitise;
- Understand place value and relationships between operations;
- Rapidly recall number bonds and times tables;
- Develop automaticity in multiplication and division facts;
- Secure firm foundations in multiplicative relationships;
- Solve complex problems where the retrieval of basic maths is embedded within.

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NCETM Mastering Number

This project aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2. The aim over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number. The programme requires:

- A daily teaching session for all children of 10 to 15 minutes, in addition to their normal maths lesson;
- Use of a rekenrek, Numberblocks, visual structures and Hungarian number frames.

NCETM Mastering Number at KS2

This project focuses on the knowledge of multiplication and division and its applications in the KS2 curriculum to support the learning of mathematics into secondary school. Pupils in Years 4 and 5 will develop fluency in multiplication and division facts, and a confidence and flexibility with number that develops good number sense.

NumBots and Times Tables Rock Stars

NumBots and TT Rock Stars are online maths mastery EdTech platforms created by Maths Circle. NumBots equips each pupil with the set of core maths skills they require:

- Subitising;
- Number bonds;
- Addition and subtraction.

Children achieve stronger understanding, recall and fluency in mental addition and subtraction so they move from counting to calculating with greater confidence. Both programmes require:

- A log in for each pupil;

- A log in for staff members where they will monitor pupil progress, leader boards and auto-populated certificates to celebrate achievements;
- 1 play session in school at the beginning of weekly Computing lessons for at least 5 minutes;
- 3 play sessions at home for at least 5 minutes a day.

NumBots

There are two play modes in NumBots that serve different purposes.

1. Story Mode for understanding
2. Challenge Mode for recall

Story Mode

In Story Mode, the emphasis is on mathematical concepts and is underpinned by a mastery approach to teaching. Story Mode features visual representations, procedural variation, exposure to different calculation strategies and interleaved material all in very carefully sequenced order.

The levels in Story Mode follow a natural mathematical progression and move the pupil through the game automatically. Story Mode is set out as a series of Stages (Rust, Tin, Iron, etc).

Aim for pupils to play in Story Mode for three minutes four to five times a week, to get the best out of NumBots. Little and often is key (spaced practice is more effective than blocked practice).

Challenge Mode

In Challenge Mode, the emphasis is on rapid responses to essential facts and simple sums, against the clock.

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Challenge Mode is locked for new users and is unlocked once players reach a certain level on Story Mode. It's currently set to unlock part way through Tin stage. There are 20 Challenge levels and only the first is unlocked to begin with. To unlock the next Challenge, players must correctly answer 12 questions in a minute.

Challenge Mode Key Skills

Number	Key Skill	Example
1	Adding and subtracting 1 or 2 within 10	1 + 3, 8-2
2	Number bonds to 5	3 + ? = 5
3	Doubles within 10 (i.e. up to 5+5)	4 + 4
4	Adding and subtracting 1 and 2 within 20	17 + 2, 11 – 1
5	Number bonds to 10	3 + ? = 10
6	Adding and subtracting 10 within 20	3 + 10, 16 - 10
7	Doubles within 20 (i.e. up to 10 + 10)	8 + 8
8	Adding two 1-digit numbers	5 + 7
9	Number bonds to 20	8 + ? = 20

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10	Subtracting 1-digit numbers within 20	14 – 6
11	Adding and subtracting 1, 2 and 10 within 100	1 + 74, 51 – 2, 38 + 10
12	Adding and subtracting 2-digit numbers to/from multiples of 10	20 + 64, 83 – 20
13	Addition by bridging a multiple of 10	25 + 6, 47 + 5
14	Subtraction by bridging a multiple of 10	25 – 6, 42 - 5
15	Number bonds to 100	52 + ? = 100
16	Using compensation to add and subtract within 100	35 + 19, 35 - 19
17	Adding by partitioning two 2-digit numbers	64 + 25, 10 + 64
18	Subtracting by partitioning two 2-digit numbers	64 – 23, 47 – 31
19	Adding any two 2-digit numbers	63 + 56, 63 + 58
20	Subtracting any two 2-digit numbers	76 – 43, 76 - 47

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Times Tables Rock Stars

TT Rock Stars is a carefully sequenced programme of daily times tables practice. The programme is accessible in both paper form or online.

Paper Version Model

The "recall" worksheets boost students' memory of the tables, while helping them see relationships within them. They all follow the following sequence: **“baseline > practice > check”** model:

- They start with a **baseline**
- The next few sheets are for pupils to **practise.**
- Then pupils will complete a **check** sheet.

With elements of low stake quizzing, spaced repetition, depth and breadth, inverse operations, commutativity and more, the sheets complement our “teaching for mastery” approach.

Worksheets are available by going to – Paper > Worksheets > Selecting your class. All tables are available per class, work through these in the order presented.

Worksheets Tracking

The worksheets practice is to be completed **4 times per week as part of mental maths sessions**. To monitor progress, the following sheets require inputting onto the website:

- Baseline score
- Check 1
- Check 2

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The practice is conducted by:

1. Start pupils off together
2. Display the TT Rock Stars website 3-minute timer
3. Record finishing time
4. Mark answers
5. Type into TOTAL times and scores at the end of the week.

Times Tables Termly Planner

The National Curriculum expectation for Primary Schools across the UK is that, by the end of Year 4, pupils are capable of recalling all 12 times tables up to 12x2.

The Times Tables Termly planner provides a schema to ensure that all pupils are capable of this by Year 4.

Year 1	
Autumn 1 & 2	Count in 2's up to 24, linking with even numbers and supporting doubles. Count in multiples of 10 in order up to 120.
Spring 1 & 2	Focus on counting in multiples of 5 up to 60, linking with knowledge of counting in 10s. Continue to develop fluency of counting in 2s and 10s.
Summer 1	Count in multiples of 10, 2 and 5 in order with growing fluency.
Summer 2	Count in multiplies of 10, 2 and 5 in order fluently.

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Teaching Methodologies	• Count pairs of objects • Count straws bundled in tens • Sing counting songs • Hundred square • Number lines • Pictorial representations on working wall / display • Rolling numbers

Number Fluency and Times Tables Progression Map

Year 2	
Autumn 1	Consolidate counting in steps of 2, 5 and 10 in order from 0 up to 12x.
Autumn 2	Count in steps of 2 and 5 from 0 up to 12x fluently. Recall multiples of 10 up to 12x10 in any order, including missing numbers and related division facts with growing fluency.
Spring 1	Recall multiples of 2 up to 12x2 in any order, including missing numbers and related division facts. Recall multiples of 10 up to 12x10 fluently.
Spring 2	Recall multiples of 5 up to 12x5 in any order, including missing numbers and related division facts. Recall multiples of 2 up to 12x2 in any order, including missing numbers and related division facts with growing fluency.
Summer 1	Count in multiples of 3 to 12x3 in order from 0. Recall multiples of 2 up to 12x2 in any order, including missing numbers and related division facts fluently. Recall multiples of 5 up to 12x5 in any order, including missing numbers and related division facts with growing fluency.
Summer 2	Count in multiples of 3 to 12x3 in order from 0 with growing fluency. Recall multiples of 5 up to 12x5 in any order, including missing numbers and related division facts fluently.

Number Fluency and Times Tables Progression Map

Teaching methodologies	• Count in objects in groups of 2, 5, 10 & 3 • Sing counting songs • Hundred square • Number lines • Array with concrete resources and pictorial representations • Pictorial representations on working wall / display • Rolling numbers

Number Fluency and Times Tables Progression Map

Year 3	
Autumn 1	Count in multiples of 3 to 12x3 in order from 0 fluently.
Autumn 2	Recall multiples of 3 up to 12x3 in any order, including missing numbers and related division facts with growing fluency. Count in multiples of 4 to 12x4 in order from 0 with growing fluency. Introduce (relating to x4) and begin to count in multiples of 8 from 0 to 12x8.
Spring 1	Recall multiples of 3 up to 12x3 in any order, including missing numbers and related division facts fluently. Count in multiples of 4 to 12x4 in order from 0 with growing fluency. Count in multiples of 8 to 12x8 in order from 0 with growing fluency.
Spring 2	Recall multiples of 4 up to 12x4 in any order, including missing numbers and related division facts with growing fluency. Count in multiples of 8 to 12x8 in order from 0 fluently.
Summer 1	Recall multiples of 4 up to 12x4 in any order, including missing umbers and related division facts fluently. Recall multiples of 8 up to 12x8 in any order, including missing numbers and related division facts with growing fluency.
Summer 2	Recall multiples of 8 up to 12x8 in any order, including missing numbers and related division facts fluently.

Number Fluency and Times Tables Progression Map

Teaching methodologies	• Counting objects in groups of 3, 4 and 8 • Hundred square • Number lines • Array with concrete resources • Pictorial representations on working wall / display • Rolling numbers

Number Fluency and Times Tables Progression Map

Year 4	
Autumn 1	Recall multiples of 3,4 and 8 up to 12x in any order, including missing number and related division facts fluently. Fluently count in 6's in order up to 12x6, using multiples of 3 to support.
Autumn 2	Recall multiples of 6 in any order, including missing numbers and related division facts with growing fluency. Fluently count in 7's in order up to 12x7.
Spring 1	Recall multiples of 6 in any order, including missing numbers and related division facts fluently. Recall multiples of 7 in any order, including missing numbers and related division facts with growing fluency.
Spring 2	Recall multiples of 7 in any order, including missing numbers and related division facts fluently. Fluently count in 9s in order up to 12x9. Fluently count in 11s in order up to 12x11.
Summer 1	Recall multiples of 9 in any order, including missing numbers and related division facts with growing fluency (using 10x and adjusting by 1 group to find 9x as a strategy). Recall multiples of 11 in any order, including missing numbers and related division facts fluently. Fluently count in 12s in order up to 12x12.
Summer 2	Recall multiples of 9 in any order, including missing numbers and related division facts fluently.

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	Recall multiples of 12 in any order, including missing numbers and related division facts with growing fluency (using 10x and adjusting by 2 more groups).
Teaching methodologies	• Hundred square • Number lines • Pictorial representations on working wall / display • Rolling numbers

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Year 5	
Autumn Term	Recall multiples of 12 in any order, including missing numbers and related division facts fluently. Recall multiples of all times tables up to 12x12 in any order, including missing numbers and related division facts with growing fluency.
Spring Term	Recall multiples of all times tables up to 12x12 in any order, including missing numbers and related division facts with growing fluency.
Summer Term	Recall multiples of all times tables up to 12x12 in any order, including missing numbers and related division facts fluently.
Teaching methodologies	• Pictorial representations on working wall / display • Rolling numbers

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Year 6	
Autumn Term	Recall multiples of all times tables up to 12x12 in any order, including missing numbers and related division facts fluently.
Spring Term	Recall multiples of all times tables up to 12x12 in any order, including missing numbers and related division facts fluently.
Summer Term	Recall multiples of all times tables up to 12x12 in any order, including missing numbers and related division facts fluently.
Teaching methodologies	• Pictorial representations on working wall / display • Rolling numbers

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Number Talks

Number Talks are short (10-20 minutes) daily exercises which are implemented from Year 3 to Year 6 three to four times a week as a mental maths activity to build fluency. Each session provides pupils with opportunities to learn and develop number sense. Problems designed are designed so pupils use specific strategies that focus on number relationships and number theory. Pupils are encouraged to explain their strategy verbally and explain why their strategies make sense and are efficient. In a short span of time, teachers are able to provide pupils with great opportunities to:

- Learn and develop number sense and mental maths skills;
- Engage them in creative, open mathematics;
- Share different perspectives;
- Create a learning environment where ***all*** pupils feel safe sharing their mathematical ideas;
- Help pupils develop social and mathematical independence;
- Build conceptual understanding and the ability to explain this;
- Build and use mathematical vocabulary with clear understanding and confidence.

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Year 3 to 5 Number Talks Planning Guide
Based on *Number Talks* by Sherry Parish

Addition			
Unit	**Category**	**Description**	**Example of string**
Making Landmark or Friendly Numbers	Category 1: Making Landmark or Friendly Numbers	The following number talks are carefully designed to use numbers that are one away from a landmark or friendly number.	9 + 8 19 + 5 9 + 26 16 + 19
	Category 2: Making Landmark and Friendly Numbers	The following number talks consist of one addend that is two away from a multiple of ten or a landmark number	8 + 5 8 + 13 8 + 24 18 + 7
	Category 3: Making Landmark or Friendly Numbers	The following number talks consist of computation problems with two- and three-digit addends. The addends are one or	99 + 38 98 + 47 98 + 99 99+ 99 + 5

Number Fluency and Times Tables Progression Map

		more away from a multiple of ten or landmark number. The further the addends are from the landmark numbers, the more challenging the strategy.	
Doubles / Near Doubles	Category 2: Doubles / Near-Doubles	The following number talks use doubles with two-digit numbers. (Category 1 consists of doubles up to twenty)	20 + 20 19 + 19 19 + 18 19 + 17
	Category 3: Doubles / Near-Doubles	The following number talks use doubles with two- and three-digit numbers.	100 + 100 99 + 99 98 + 99 97 + 99
Breaking Each Number into Its Place Value	Category 1: Breaking Each Number into Its Place Value	The following number talks consist of smaller two-digit numbers. Problems will require either no regrouping or regrouping.	28 + 11 14 + 35 22 + 15 18 + 31

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	Category 2: Breaking Each Number into Its Place Value	The following number talks consist of two- and three- digit numbers, some of which require regrouping.	74 + 18 58 + 28 37 + 26 46 + 38
	Category 3: Breaking Each Number into Its Place Value	The following number talks consist of computation problems with three-digit number that require regrouping.	365 + 247 138 + 292 168 + 254 292 + 139
Adding Up in Chunks	Category 1: Adding Up in Chunks	The following number talks build gradually from adding multiples of ten to a number to adding in chunks.	16 + 10 16 + 20 16 + 40 16 + 42
	Category 2: Adding Up in Chunks	The following number talks consist of adding multiples of ten while keeping one number whole and then breaking apart the ones into friendly combinations. For example, 28 + 24 could	18 + 10 18 + 13 18 + 20 18 + 23

		be chunked as 28 + 20 = 48; the 48 + 4 could be added by breaking the 4 apart into 2 + 2. The problem could then be solved as (48 + 2) + 2 =50 + 2 = 52.	
	Category 3: Adding Up in Chunks	The following number talks consist of adding multiples of ten and one hundred while keeping one number whole.	56 + 40 56 + 50 156 + 40 156 + 43

Subtraction			
Unit	**Category**	**Description**	**Example of string**
Adding Up	Category 1: Adding Up	The following number talks include computation problems that foster the Adding Up strategy by incorporating two ideas: 1) the whole is a multiple of ten or one hundred, and 2) the subtrahend is close	20 – 15 20 – 14 20 – 9 20 – 8

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		to a multiple of ten or a landmark number.	
	Category 2: Adding Up	The following number talks include computation problems where the whole is a multiple of ten or one hundred, and the subtrahend is close to a multiple of ten or a landmark number.	100 – 89 100 – 69 100 – 49 100 – 37
	Category 3: Adding Up	The following number talks consist of computation problems where the whole is no longer an exact multiple of ten or one hundred, and the subtrahend is a farther distance from the whole.	50 – 29 55 – 29 55 – 48 55 – 37
Removal	Category 2: Removal	The following number talks include computation problems with two-digit numbers that require regrouping or decomposing.	23 – 10 23 – 14 23 – 18 23 - 15
	Category 3: Removal	The following number talks utilise two- and three-digit	100 – 50 100 – 52

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		numbers; some require decomposing.	100 – 60 100 – 64
Place Value and Negative Numbers	Category 1: Place Value and Negative Numbers	The following number talks consist of computation problems that begin the discussion of what happens when you remove a larger number from a smaller quantity. The number line will be an important tool to use when reasoning with this strategy	5 – 5 5 – 6 5 – 7 5 – 8
	Category 2: Place Value and Negative Numbers	The following number talks consist of two-digit computation problems to continue the work with this strategy. A deliberate sequence is used to support thinking for the initial problem in each section. The last problem in each section allows students to test their thinking with a similar problem.	20 – 10 4 – 6 24 – 16 23 – 15

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Adjusting One Number to Create an Easier Problem	Category 1: Adjusting One Number to Create an Easier Problem	The following number talks consist of smaller quantities- even basic facts- to help students consider what happens when numbers are adjusted in a subtraction problem. The following problems focus on adjusting the whole or the minuend.	9 – 4 10 – 4 19 – 14 20 – 14
	Category 2: Adjusting One Number to Create an Easier Problem	The following number talks include problems that focus on adjusting the subtrahend- the part being removed- to create an easier problem.	20 + 10 20 – 9 20 – 11 21 - 9
	Category 3: Adjusting One Number to Create an Easier Problem	The following number talks require students to make decisions about which number might be adjusted to create an easier problem.	49 – 28 50 – 30 50 – 28 53 – 28
Keeping a Constant Difference	Category 1: Keeping a Constant Difference	The following number talks consist of computation problems that use numbers up to one hundred and are focused on adjusting both	14 – 10 13 – 9 14 – 7 15 – 6

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		numbers by adding or subtracting one or two.	
	Category 2: Keeping a Constant Difference	The following number talks include computation problems with numbers above one hundred.	101 – 50 99 – 48 100 – 49 109 - 51
	Category 3: Keeping a Constant Difference	The following number talks consist of computation problems that do not build one upon the others. Instead, each problem offers opportunities for students to choose the best method for keeping a constant difference. Many of the problems can be adjusted up or down to create easier problems.	111 – 56 134 – 68 127 – 88 122 – 77
Multiplication			
Unit	**Category**	**Description**	**Example of string**
Making Landmark or Friendly Numbers	Category 1: Making Landmark or Friendly Numbers	The following number talks consist of 1 x 2-digit problems and have a connection. The problems in each section are	2 x 25 4 x 25 6 x 25

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		purposefully ordered to help students build their knowledge from one problem to the next. This allows them to use the relationships from the initial problem in the final problem in the sequence. For example, 6 x 25 could be solved by using (2 x 25) + (4 x 25), or by using 4 x 25 twice and then removing 2 x 25 from that product	
	Category 2: Making Landmark or Friendly Numbers	The following number talks are intentionally ordered to help students use relationships from the sequence to solve the final 1 x 3-digit problem.	4 x 25 4 x 200 4 x 250 4 x 249
	Category 3: Making Landmark or Friendly Numbers	The following number talks consist of computation problems that are ordered to help students use relationships from the sequence to solve the final 2 x 2-digit problems.	6 x 20 30 x 20 36 x 20 36 x 19

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Partial Products	Category 1: Partial Products	The following number talks are ordered by section to help students use relationships from the sequence to solve the final 1-digit by 1-digit and 1-digit by 2-digit problems.	2 x 7 4 x 7 4 x 8 3 x 8 8 x 7
	Category 2: Partial Products	The following number talks are ordered so that students can use the relationships from the sequence to solve these 3-digit problems.	2 x 125 4 x 25 6 x 100 6 x 20 6 x 125
	Category 3: Partial Products	The following number talks consist of multiplication problems designed to help students use the relationships from the sequence to solve the final 2-digit by 2-digit problems.	3 x 15 10 x 15 13 x 10 13 x 5 13 x 15
Doubling and Having	Category 1: Doubling and Halving	The following number talks investigate doubling and halving with basic facts.	1 x 16 2 x 8 4 x 4 8 x 2 16 x 1

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	Category 2: Doubling and Halving	The following number talks investigate doubling and halving with 1-digit by 3-digit numbers.	8 x 16 4 x 32 2 x 64
	Category 3: Doubling and Halving	The following number talks investigate doubling and halving with 2-digit by 2-digit numbers.	3 x 60 6 x 30 12 x 15
	Category 4: Doubling and Halving	The following number talks are included for classes who may wish to investigate what happens with you third and triple or quarter and quadruple numbers. The problems also provide an opportunity to investigate whether halving and doubling will work with odd numbers. While these strategies are not common for children, they afford an opportunity to investigate why this principle works.	9 x 12 3 x 36 1 x 108
Breaking Factors into Smaller Factors	Category 1: Breaking Factors into Smaller Factors	The following number talks consist of problems that focus	2 x 3 x 4 4 x 3 x 2 6 x 4

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		on breaking basic facts into smaller factors.	
	Category 2: Breaking Factors into Smaller Factors	The following number talks use the associative property to solve 1-digit by 2-digit multiplication problems.	3 x 5 x 4 2 x 2 x 15 15 x 4
	Category 3: Breaking Factors into Smaller Factors	The following number talks use the associative property to solve 2 * 2-digit multiplication problems.	3 x 4 x 25 5 x 12 x 5 5 x 2 x 25 12 x 25

Division			
Unit	**Category**	**Description**	**Example of string**
Partial Quotients	Category 1: Partial Quotients	The following number talks consist of computation problems that help students to build on multiples of ten find easy multiples of the divisor within the dividend. The following problems focus on	40 ÷ 4 16 ÷ 4 56 ÷ 4

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		double-digit numbers with a single digit divisor.	
	Category 2: Partial Quotients	The following number talks include problems that encourage students to build on multiples of ten and one hundred and fund easy multiples of the divisor within the dividend. The problems that follow focus on three-digit numbers with a single-digit divisor.	300 ÷ 3 120 ÷ 3 420 ÷ 3
	Category 3: Partial Quotients	The following number talks include computation problems that help students build on multiples of ten and one hundred to find easy multiples of the divisor within the dividend. These problems focus on three-digit numbers with a two-digit divisor.	100 ÷ 25 250 ÷ 25 500 ÷ 25
Multiplying Up	Category 1: Multiplying Up	The following number talks consist of computation problems that build on using multiples of ten with two-digit	4 x 10 4 x 5 4 x 4 56 ÷ 4

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		numbers with single digit divisors.	
	Category 2: Multiplying Up	The following number talks include three-digit numbers with single-digit divisors that encourage student's build on multiples of ten and one hundred.	3 x 100 3 x 50 3 x 1 453 ÷ 3
	Category 3: Multiplying Up	The following number talks consist of three-digit numbers with two0digit divisors that build on using multiples of ten and one hundred.	50 x 2 50 x 5 50 x 10 900 ÷ 50
Proportional Reasoning	Category 1: Proportional Reasoning	The following number talks consist of division problems that can be solved using proportional reasoning.	100 ÷ 4 200 ÷ 8 400 ÷ 16