



British Forces School Naples

Mathematics Policy

March 2021

SLT Lead: LW

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At BFS Naples, our mathematics curriculum follows the Programme of Study and Aims of the National Curriculum.

Mathematics is a tool for everyday life. It teaches us how to make sense of the world around us through developing a child's ability to calculate, to reason and to solve problems. It is a whole network of concepts and relationships which provide a way of viewing and making sense of the world and provides the materials and means for creating new imaginative worlds to explore. Through their growing knowledge and understanding, children learn to appreciate the contribution made by many cultures to the development and application of mathematics. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

Aims

The National Curriculum for mathematics aims to ensure that all pupils:

- to become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- to **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- to **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Our Vision for Mathematics

- to promote enjoyment and enthusiasm for learning in all pupils through practical activity, exploration and discussion;
- to foster positive attitudes towards Mathematics by developing pupils' confidence, independence, persistence and co-operation skills;
- to promote confidence and competence with numbers and the number system;
- to develop the ability to solve problems through decision-making and reasoning in a range of contexts and to promote a growth mind set in all pupils, particularly when Problem Solving;
- to promote fluency in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems;
- to develop a practical understanding of the ways in which information is gathered and presented;
- to explore features of shape and space, and develop measuring skills in a range of contexts;
- to become mathematically literate and understand the importance of mathematics in everyday life and enable all pupils to find links between mathematics and other areas of the curriculum, including Science;
- to use a wide range of concrete, pictorial and abstract representations to develop all pupils' relational understanding of mathematics.

Planning and Organisation

Long term planning

The National Curriculum for Mathematics 2014, Development Matters and the Early Learning Goals (Number, Shape Space & Measure) provide the long term planning for mathematics taught in the school.

Medium term planning

EYFS and Years 1-6 use the White Rose Maths Hub schemes of learning as their medium-term planning documents. These schemes provide teachers with exemplification for maths objectives and are broken down into fluency, reasoning and problem solving, key aims of

the National Curriculum. They support a mastery approach to teaching and learning and have number at their heart. They ensure teachers stay in the required key stage and support the ideal of depth before breadth. They support pupils working together as a whole group and provide plenty of time to build reasoning and problem-solving elements into the curriculum.

Short term planning

The above schemes of learning support daily lesson planning which are monitored. EYFS planning is based on the medium-term plans and delivered as appropriate to individual children with thought to where the children are now and what steps they need to take next.

Delivery

Daily lessons

All classes have a daily mathematics lesson where possible. In key stage one lessons are 45-60 minutes and in key stage two at least 60 minutes. Teachers of the EYFS ensure the children learn through a mixture of adult led activities and child-initiated activities both inside and outside of the classroom.

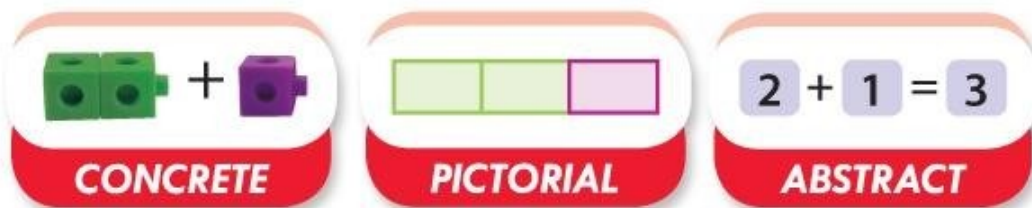
Delivering a Unit of Work

Step 1 –Beginning the Learning Journey

Children are given a learning journey at the start of a unit of work (Annex A). They are also given a mini assessment task to complete before they receive any teacher input. The mini assessment task allows pupils to identify their starting point on the Learning Journey. Pupils use the traffic light system to indicate their starting point on the learning journey.

Step 2 – Developing the Learning Journey

The teaching and learning of mathematics at BFS Naples should include aspects of the following Mastery approach strategies in every lesson and/or over a series of lessons:



‘Concrete, pictorial, abstract (CPA) is a highly effective approach to teaching that develops a deep and sustainable understanding of maths.’ (Maths - no problem!)

CONCRETE

Concrete is the “doing” stage, using concrete objects to model problems. Instead of the traditional method of mathematics teaching, where a teacher demonstrates how to solve a problem, the CPA approach brings concepts to life by allowing pupils to experience and handle physical objects themselves. Every new abstract concept is learned first with a “concrete” or physical experience.

For example, if a problem is about adding up four baskets of fruit, the pupils might first handle actual fruit before progressing to handling counters or cubes which are used to represent the fruit.

PICTORIAL

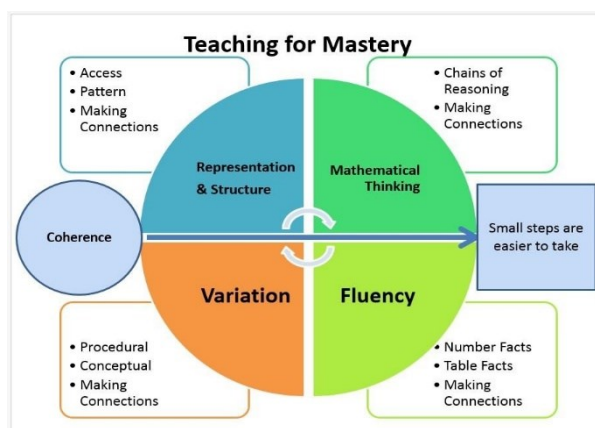
Pictorial is the “seeing” stage, using representations of the objects to model problems. This stage encourages pupils to make a mental connection between the physical object and abstract levels of understanding by drawing or looking at pictures, circles, diagrams or models which represent the objects in the problem.

Building or drawing a model makes it easier for pupils to grasp concepts they traditionally find more difficult, such as fractions, as it helps them visualise the problem and make it more accessible.

ABSTRACT

Abstract is the “symbolic” stage, where pupils are able to use abstract symbols to model problems (Hauser).

Only once a child has demonstrated that they have a solid understanding of the “concrete” and “pictorial” representations of the problem, the teacher will introduce the more “abstract” concept, such as mathematical symbols. Pupils are introduced to the concept at a symbolic level, using only numbers, notation, and mathematical symbols, for example $+$, $-$, \times , \div to indicate addition, subtraction, multiplication, or division.



Fluency

Fluency comes from deep knowledge and practice. This is the first stage of pupils' understanding. Fluency includes: conceptual understanding, accuracy, rapid recall, retention and practice.

When pupils are fluent they will demonstrate the ability to work accurately, carefully completing calculations with no or few careless errors. They are able to quickly recall the appropriate strategy to solve the calculation and progress through a number of questions at an age appropriate pace. Pupils will be able to retain their knowledge and understanding on a separate occasion to when the concept was first introduced.

The key to fluency is deep knowledge and practice and making connections at the right time for a child.

Reasoning

Verbal reasoning demonstrates that pupils understand the mathematics. Talk is an integral part of mastery as it encourages students to reason, justify and explain their

thinking. You might, for example, get young learners to voice their thought processes. Older students could take part in class debates, giving them the space to challenge their peers using logical reasoning.

A mastery classroom is unlikely to be a quiet classroom. The way pupils speak and write about mathematics transforms their learning. Mastery approaches use a carefully sequenced, structured approach to introduce and reinforce mathematical vocabulary. Pupils should be able to say not just what the answer is, but how they know it's right. This is key to building mathematical language and reasoning skills. This gives pupils the confidence to communicate their ideas clearly, before writing them down.

At BFS Naples, our teachers maintain a high expectation upon pupils to repeat and use the correct mathematical vocabulary to explain their understanding verbally and in their reflection comments. By also displaying the vocabulary during the lesson, pupils will be able to use this independently.

Problem Solving

Mathematical problem solving is at the heart of the Mastery Approach at BFS Naples. Pupils are encouraged to identify, understand and apply relevant mathematical principles and make connections between different ideas. This builds the skills needed to tackle new problems, rather than simply repeating routines without a secure understanding.

Mathematical concepts are explored in a variety of representations and problem-solving contexts to give pupils a richer and deeper learning experience. Pupils combine different concepts to solve complex problems, and apply knowledge to real-life situations. Through problem solving, pupils are required to select their mathematical knowledge and apply this to a new concept.

Step 3 – Reflecting on the Learning Journey

Pupils then refer to their learning journey throughout the unit of work, using it to track their progress over time and also to select appropriate tasks during their lessons. At the end of the unit, children complete an end of unit assessment and use the traffic light system to reflect on their learning on the learning journey.

Recording Progress and Presentation Expectations

We encourage all pupils embrace our high expectations of presentation in their books. To achieve this we expect:

- The name of the child, class, year group and subject should be written neatly in pen on the front of the books
- The marking code should be stuck on the inside front cover of the book (Annex B – Marking and Feedback Book Insert)
- Short date written in the top right corner and underlined using a ruler
- Clear Learning Intention (for EYFS, Year 1 and where appropriate Year 2– this will be printed out using the Nelson font and stuck into pupil books)
- One digit per box when setting out calculations

- Incorrect number formation quickly identified and addressed
- Staff feedback in compliance with the Marking and Feedback Policy
- Evidence of self and peer assessment
- When worksheets are used, they should be marked and filed in the pupils' individual folders rather than stuck in books
- There should be a balance between learning completed in books and learning completed on worksheets.

Assessment

Assessment is an integral part of teaching and learning, is a continuous process and should include a variety of modes of presentations, operations and responses.

Formative Assessment

Teachers make assessments of children daily through;

- regular marking of work
- analysing errors and picking up on misconceptions
- asking questions and listening to answers
- facilitating and listening to discussions
- making observations

These ongoing formative assessments ensure responsive planning. Lessons are adapted readily and short-term planning evaluated in light of these assessments.

Summative Assessment

All pupils will undertake White Rose beginning and end of unit assessments. These assessments will inform future planning and should be filed in individual pupil folders.

All pupils will undertake termly White Rose assessments during our whole school assessment weeks. These results together with previous end of unit assessments will enable staff to make their progress judgment in Target Tracker and will inform future planning in addition to highlighting pupils who require additional support or interventions.

Y2 and Y6 complete the annual national tests (SATs) in May.

Tracking Individual Progress

Teachers track the detailed progress of children in mathematics against the Target Tracker Statements which cover the mathematics objectives for each year group. Teachers are expected to update Target Tracker weekly. This careful tracking ensures that all teacher planning is responsive and that individual progress and attainment is continually tracked. All assessment data is discussed with the HT and SENDCo at the termly Pupil Progress Meetings.

Pupils Self-Assessment

From KS1 Children should be self-assessing their own learning regularly through the use of traffic lighting or reflections on their learning. Regular opportunities should be provided for

children to complete corrections and respond to next step marking as appropriate for their age.

The learning journey is underpinned by a set of principles for the way things are taught and learnt in our school. Through the learning journey children are encouraged to take responsibility for their own learning, they are aware of where they are in relation to the current learning journey, and what they still need to achieve to complete the learning journey.

EYFS

In the EYFS, planning for and monitoring of the learning journey is done through a collection of different documents that provide a picture of a child's development in relation to the mathematical concepts being covered. This may consist of photos, art-work, mark-making etc. and is interspersed with observations made by practitioners and is recorded on Target Tracker. This collection of documents is used to build a unique picture of what each child knows, feels and can do as well as his / her particular interests and learning style. This picture can then be used to pinpoint learning priorities and plan relevant and motivating learning experiences to challenge and help children to progress along their learning journey

Times Tables

All Year 4 pupils complete the National Times Tables check. Times Tables are a mathematics 'Non-negotiable' for all pupils and must be taught and then practised. TT Rockstars is available for the practice of times tables and Maths Frame can be accessed online. The 'Sound Check' programme on TT Rockstars follows the exact structure of the 2020 Year 4 Times Table Test and should be used in Year 3/4 as preparation for the test. Pupils are expected to log onto TT Rockstars at home for at least 10 minutes per week as part of their home learning.

Resources

Each class has a stock of core resources that are age appropriate. Additional mathematical equipment and resources are stored centrally in the resources room. We also have access to a wide range of online subscriptions and text books to support learning and teaching.

Children in Year 1-6 are expected to have access to a 'Maths Toolkit' in the back of their books. The toolkit is an envelope containing additional resources that a child can access independently during their learning. It may include: times tables grids, knowledge organisers, number lines, vocabulary mats. (See Appendix C)

Monitoring and Review

Monitoring of the standards of children's work and of the quality of teaching in mathematics is the responsibility of the SLT and the mathematics subject leader. The work of the mathematics subject leader also involves supporting colleagues in the teaching of mathematics, ensuring that everyone is informed of current developments in the subject, and providing a strategic lead and direction for the subject in the school. The mathematics subject leader gives the head teacher and SLT termly and annual summaries in which they evaluate strengths and weaknesses in the subject and indicates areas for further and future

improvement.

Teachers meet regularly to review individual examples of work and assessment judgements are moderated and monitored termly.

Home Learning

It is important that children's learning in mathematics is supported at home by the regular setting of home learning activities. See Home Learning Policy.

Special educational needs & disabilities (SEND)

Daily mathematics lessons are inclusive to pupils with special educational needs and disabilities. Where required, children's ILPs (Individual Learning Plans) incorporate suitable objectives from the National Curriculum for Mathematics or development Matters and teachers keep these in mind when planning work. These targets will be worked upon within the lesson as well as during additional interventions outside the mathematics lesson if appropriate.

Challenging the More Able

Within the daily mathematics lesson teachers have a responsibility to provide sufficient challenge for our more able children. Teachers are expected to plan carefully crafted lessons where work is pitched accurately to foster deep conceptual and procedural knowledge. Pupils who grasp concepts rapidly will be challenged through rich and sophisticated problems before any acceleration through new content to encourage a deeper and broader understanding. It is the teachers' responsibility to ensure that all children are challenged at a level appropriate to their ability.

Equal Opportunities

Positive attitudes towards mathematics are encouraged, so that all children, regardless of race, gender, ability or special needs, including those for whom English is a second language, develop an enjoyment and confidence with mathematics. The aim is to ensure that everyone makes progress and gains positively from lessons and to plan inclusive lessons. Lessons involving lots of visual, aural and kinaesthetic elements will benefit all children including those for whom English is an additional language (EAL). Differentiated questions are used in lessons to help children and planned support from Learning Support Assistants and other adults.

Related Documents

- Marking and Feedback Policy
- Home Learning Policy
- Calculation Policy
- SEND Policy
- Assessment Policy
- FS, KS1 and KS2 Planning Formats

Solve problems involving number up to three decimal places.

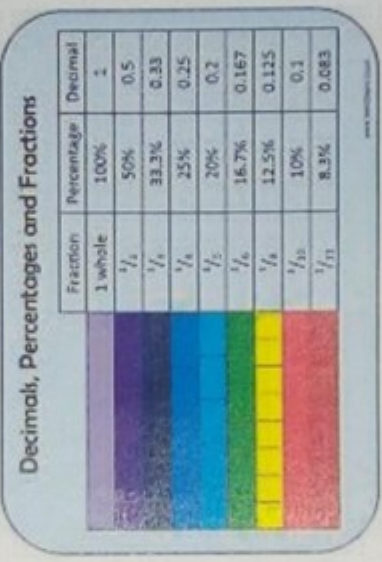
Read, write, order and compare numbers with up to three decimal places.

Recognise the per cent symbol (%) and understand that it relates to 'number of parts per hundred'.

Write percentages as a fraction with denominator 100, and as a decimal.

Solve problems which require knowing decimal equivalents of some fractions

Decimals and percentages



Year 5 Objectives

Round decimals with two decimal places to the nearest whole number and to one decimal place.

Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.

Read and write decimal numbers as fractions.

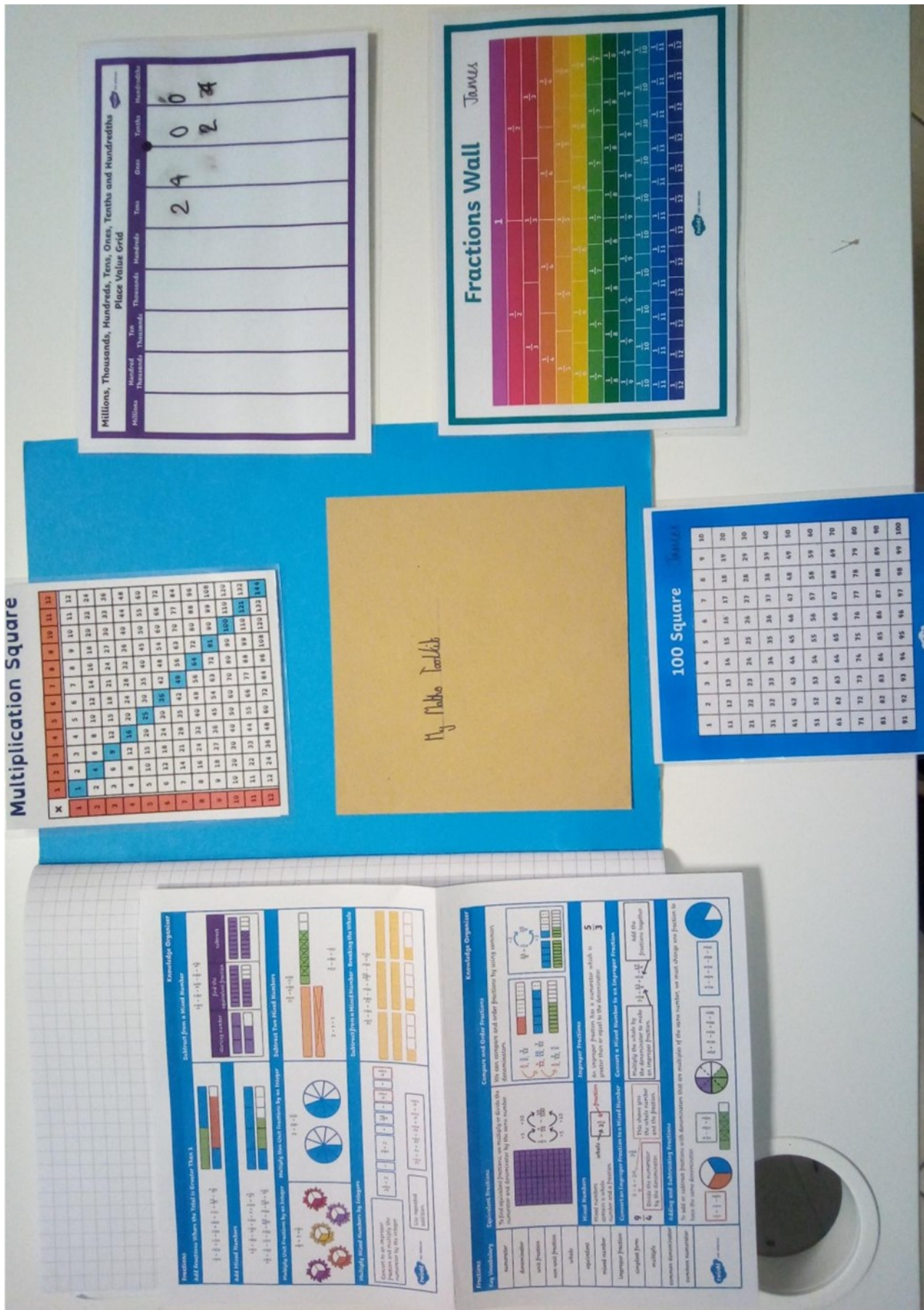
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Maths Books (KS2)

<u>How my learning will be presented:</u>	<u>How my learning will be marked:</u>	
<ul style="list-style-type: none"> ● write the short date at the top ● write the learning intention underneath ● underline the date and the LI using a ruler ● use a ruler for all straight lines ● show all your workings ● one digit should go inside each square ● use a red/orange/green circle, or a sentence to show how your learning went ● write any questions or messages for the teacher on your page so they can help you in another lesson ● respond to marking comments with blue pen 	✓	Correct
	✓ ✓	Learning Intention Met
	?	Incorrect – doesn't make sense
	^	Missing word
	(c)	Capital letter
	(●)	Full Stop
	<u>Word</u> <u>underlined</u> SP	Key spelling error
	//	Start new paragraph
	→ ←	Indent reminder
	Assessment Prompts	
	LI	Learning intention
	I	Independent Work
	S	Supported Work
	VF	Verbal Feedback
	<u>EM</u> -	Initials of marker
green pen or highlighter	Next <u>steps</u> (Green for growth)	
Pink pen or highlighter	Wow (Tickled pink)	
Different Coloured pen or highlighter	Independently corrected work (used by children)	

Appendix C – Maths Toolkit Example (Year 5)



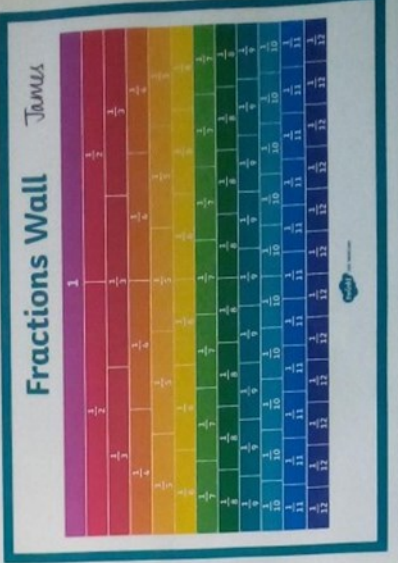
Multiplication Square

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

My Maths Toolkit

Millions, Thousands, Hundreds, Tens, Ones, Tenths and Hundredths Place Value Grid

Millions	Thousands	Hundreds	Tens	Ones	Tenths	Hundredths
			2	4	0	0
					0	2
						0



100 Square

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Equivalent Fractions
 1/2 = 2/4 = 3/6 = 4/8 = 5/10 = 6/12 = 7/14 = 8/16 = 9/18 = 10/20 = 11/22 = 12/24 = 13/26 = 14/28 = 15/30 = 16/32 = 17/34 = 18/36 = 19/38 = 20/40 = 21/42 = 22/44 = 23/46 = 24/48 = 25/50 = 26/52 = 27/54 = 28/56 = 29/58 = 30/60 = 31/62 = 32/64 = 33/66 = 34/68 = 35/70 = 36/72 = 37/74 = 38/76 = 39/78 = 40/80 = 41/82 = 42/84 = 43/86 = 44/88 = 45/90 = 46/92 = 47/94 = 48/96 = 49/98 = 50/100

Adding and Subtracting Fractions
 To add or subtract fractions with different denominators, we must change one fraction to have the same denominator.

Equivalent Fractions
 To find equivalent fractions, multiply or divide the numerator and denominator by the same number.

Equivalent Fractions
 To compare and order fractions by using common denominators.

Equivalent Fractions
 An improper fraction is a fraction with a numerator which is greater than or equal to the denominator.

Equivalent Fractions
 To multiply the whole by the denominator to make the denominator to make the fraction regular on improper fractions.

Equivalent Fractions
 To add the numerator to make the denominator to make the fraction regular on improper fractions.

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