Miers Court
Primary School

Mathematics

At Miers Court Primary School, our aim is that all of our pupils develop into independent mathematicians through developing the knowledge, skills and confidence to tackle problems. We want to ensure that our curriculum is made accessible to all of the children all of the time.

Through taking a mastery approach to learning, we would like our children to become fluent in their Maths, solve problems in varying contexts and reason their understanding. Children will have the opportunity to select and use a variety of manipulatives that best suits them as a learner.

Teaching staff will ensure gaps in children's learning are addressed through interventions and children are moved on at an appropriate pace. Subject knowledge will be secure amongst class teachers and support will be given where appropriate.
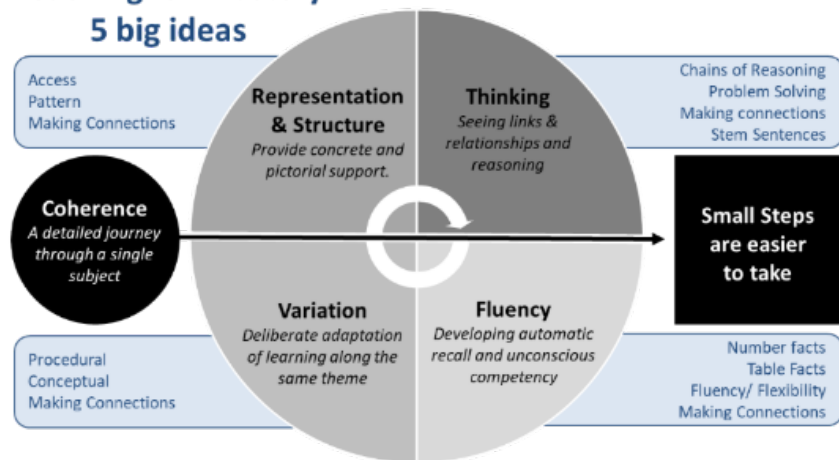
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Shining Bright, Aiming High

Our Miers Court curriculum underpins our school values in the follow way:

Self-belief   For pupils to see themselves as confident mathematicians able to apply their knowledge well.

Togetherness   Maths should be seen as an opportunity to work collaboratively - sharing and challenging mathematic reasoning.

Ambition   All children are equipped with the tools to succeed in all aspects of mathematics and therefore have the drive to be the best they can be.

Resilience   For pupils to be resilient when problem solving and using their mathematics – really mastering their understanding.

Success   Children will leave Miers Court with at least the Expected standard in Mathematics.

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How Do We Teach Mathematics?

Teaching for Mastery
5 big ideas

Access
Pattern
Making Connections

Representation & Structure
Provide concrete and pictorial support.

Thinking
Seeing links & relationships and reasoning

Chains of Reasoning
Problem Solving
Making connections
Stem Sentences

Coherence
A detailed journey through a single subject

Small Steps are easier to take

Variation
Deliberate adaptation of learning along the same theme

Fluency
Developing automatic recall and unconscious competency

Procedural
Conceptual
Making Connections

Number facts
Table Facts
Fluency/ Flexibility
Making Connections

The Five Big Ideas of Mastery

As a school, we follow the Teaching for Mastery approach which has 5 big ideas.
These are developed in all lessons:

1.   Coherence

The strand of maths needs to flow through the whole unit of maths teaching following the route-map for that narrative and carried through **small steps**. The children follow the series of lessons on a single strand of maths such as 'Addition & subtraction' or 'Property of shape'.

Coherence between lessons

It is important that the series of maths lessons are seen as a coherent flow of learning steps, rather than separate lessons. Where the learning finishes on a certain day, the next lesson should continue the learning from that point so that learning continues. If a child does not reach the final step of the first session, there is no point moving on unless they have understood this step. We need to 'Plan Backwards' from the end points of the strands or lesson.

I do – We do – You do

Within the lesson, the lesson will be planned in a series of small steps with the model of '*I do- We do – You do*' being used. This must be used by taking small steps in the learning.

The structure of the lesson should include a coherent progression of activities. Step 1 starts with the most basic of concepts which all children understand. The learning will then progress in steps that take the learning onwards, developing the complexity and deepening this learning.

Groups may progress through these steps at their own/the teacher's pace. Some children may need to stay on a step for longer than others so the others may have activities to deepen the learning.

2. Representation & Structure

Concrete, Pictorial and abstract *(CPA)*

Children need to experience maths through concrete, pictorial and abstract representations. Manipulatives must be used at the concrete stage for children to grasp an understanding of the concept. Every day, resources and manipulatives should be clearly stored in the maths cupboard. Maths resources are also available for day to day use in the classroom along with other useful resources.
Pictorial and abstract must not be moved onto until children are confident representing the concept with manipulatives. Children are encouraged to represent their work how they choose at the pictorial stage, enabling the teacher to use this as an assessment tool to explore the children's thinking.

Fluency
Children need to develop fluent understanding of number. To be successful in later learning, they need to have a solid grasp of this and be able to recall facts effectively. The Mastering Number block of maths focuses on this fluency in EYFS & KS1.

TT Rock Stars & Numbots
These are online learning tools for school and parents/guardians. It is a competitive and engaging website that allows children to learn their number facts and times tables and secure to memory. Each child has their own username and login to access their personalised learning. Teachers should allow time in school to check children's understanding and to support families who do not have access to the internet at home.

Variation

Variation is planning with the common thread running through activities, highlighting the essential features of the concept or the idea. In learning, we keep a common thread running, changing one thing at a time and drawing attention to the underlying structure of the concept. This is useful to look at what is the same and what is different.

Thinking
Children need to be able to discuss their thinking; spot patterns and make generalisations or patterns.

Stem Sentences
Using representation and structures allow us to 'see the maths' and therefore understand and reason, but also the use of stem sentences allows the children to develop mathematical thinking. Using the 'I do – You do' approach, we teach how to phrase thinking so they can explain their thinking. Staff model these stem sentences and the pupils use them. These should be displayed for the children when in use.

Assessment
As in any learning, the teachers' assessments of the lesson and the activities needs to be used in planning the next session of maths. Where possible, same day interventions needs to be carried out for those pupils who need to keep up.

How do we support pupils in **Mathematics**?

1. Various ways to record information – videos, voice notes, drawings
2. Use of manipulatives e.g. multilink, Numicon, Cuisenaire rods, algebra discs.

Cognition and Learning

Subject Challenges	Provision for SEND
Retaining information/meaning of vocabulary	Retrieval questions to be used at the beginning of each lesson and within lessons where suitable
	clear vocabulary explanations to prepare for reasoning and problem solving
	use of concrete and pictorial representations during teaching and when working independently to aid their understanding.
	dual coding to reduce their cognitive load.
	use of manipulatives e.g. multilink, numicon, Cuisenaire rods, algebra discs.

Communication and Interaction

Subject Challenges	Provision for SEND
Difficulties using language/expressing themselves	Scaffolding, such as number lines, hint sheets and writing frames so pupils have a clear understanding of the expectations.
	Visual cues Visual words/ phrases
Difficulties with processing language.	personalised pupil learning journeys that detail objectives and the knowledge needed to approach them
	Lots of reinforcement and lots of repetition
	Use of simple, step by step instructions

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Literacy skills – ability to read information	adapted lesson structure, e.g. more paired/ discussion work or increased mini-plenaries	Careful and appropriate modelling to support understanding
		Videos of examples and practice
	Key words displayed Use of shorter/less complex sentences in resources given	

Physical and Sensory

Subject Challenges	Provision for SEND
Visual difficulties.	Ensure documents are enlarged Magnifier used Online resources to zoom in and out
Recording information	Provide additional ways to record
Other sensory Needs	Physical resources eg coloured overlays
	A specific seat in lessons to meet a sensory or a learning need.

Social Emotional and Mental Health

Subject Challenges	Provision for SEND
Low self esteem – often withdraw from challenges	One to one interaction and targeted intervention by the teacher Use of ICT to support access Providing appropriate resources so that children can access the lesson Access to a quiet space to ensure they can be supported to meet their potential.
Children's mental health and wellbeing may impact on their ability to access their learning	Providing a safe space for the children within the lesson if needed- breakout spaces Teach with empathy and understanding Consider cognitive overload and children's ability to manage this

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How is **Mathematics** Sequenced Over The Year?

	YR	Y1	Y2	Y3	Y4	Y5	Y6
TERM 1	Getting to Know You	Place Value	Place Value	Place Value	Place Value	Place Value	Place Value
TERM 2	Just like me! *Match & Sort* *Compare amounts* *Compare size* *Explore pattern*			Addition & Subtraction	Addition & Subtraction	Addition & Subtraction	Addition, Subtraction, Multiplication & Division
	It's me 1, 2, 3! *Representing 1,2,3* *Comparing 1,2,3* *Composition of 1,2,3* *Circles & triangles* *Positional language*	Addition & Subtraction	Addition & Subtraction			Multiplication & Division	
					Measurement		
	Light & Dark *Representing numbers to 5* *One more & less* *Shapes with 4 sides* *Time*	Shape	Shape	Multiplication & Division	Multiplication & Division	Fractions	Fractions
		Consolidation					Fractions
					Consolidation		Converting units
TERM 3	Alive on 5! *Introducing 0* *Comparing numbers to 5* *Composition of 4 &5* *Compare mass* *Compare capacity*	Place Value	Money	Multiplication & Division	Multiplication & Division	Multiplication & Division	Ratio
							Algebra
	Growing 6,7,8 *6,7 & 8* *Comning two amounts* *Making pairs* *Length & height* *Time*	Addition & Subtraction	Multiplication & Division	Length & Perimeter	Length & Perimeter	Fractions	
					Fractions		Decimals

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TERM 4	**Building 9 & 10** *Counting to 9 & 10* *Comparing numbers to 10* *Bonds to 10* *3D shapes & Spatial awareness* *Patterns* **20 & Beyond** *Building beyond 10* *Counting patterns beyond 10* *Spatial reasoning* *Match, rotate, manipulate*	Place Value Length & Height Mass & Volume	Length & Height Mass, Capacity & Temperature	Fractions Mass & Capacity	Decimals	Decimals & Percentages Perimeter & Areas Statistics	Fraction, Decimals & Percentages Area, Perimeter & Volume Statistics
TERM 5	**First Then Now** *Adding more* *Taking away* *Spatial reasoning* *Compose & decompose* **Find my Pattern** *Doubling* *Sharing & grouping* *Even & odd* *Spatial Reasoning* *Visualise & Build*	Multiplication & Division Fractions Position & Direction	Fractions Time	Fractions Money Time	Decimals Money Time	Shape Position & Direction	Shape Position & Direction
TERM 6	**One the Move** *Deepening understanding* *Patterns & relationships* *Spatial Reasoning* *Mapping*	Place Value Money Time Consolidation	Statistics Position & Direction Consolidation	Shape Statistics Consolidation	Consolidation Shape Statistics Positions & Direction	Decimals Negative Numbers Converting Units Volume	Themed Projects, Consolidation & Problem solving

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What are the End Points in Mathematics?

Assessment Question 3. What can the pupils apply?

	Number & Place Value	Number Facts	Addition & Subtraction	Multiplication & Division	Fractions	Measurement & Geometry
R	**Have a deep understanding of number to 10, including the composition of each number** **Subitise (recognise quantities without counting) up to 5** R.1. Subitise (recognise quantities without counting) up to 5. R.2. Link the number symbol (numeral) with its cardinal number value. **Verbally count beyond 20, recognising the pattern of the counting system;** R.3. Verbally count beyond 20	**Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.** R.4. Automatically recall number bonds up to 5 and some number bonds to 10 **Automatically recall some double facts**	**Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;** R.5. Understand the 'one more than/one less than' relationship between consecutive numbers.	**Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.** R.6. Demonstrate how quantities can be distributed equally	R.7. Automatically recall some double facts	R.8. Continue, copy and create repeating patterns. R.9. Compare length, weight and capacity
1	1.1 Count within 100, forwards and backwards, starting with any number. 1.2 Reason about the location of numbers to 20 within the linear	1.4 Develop fluency in addition and subtraction facts within 10. 1.5 Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count	1.7 Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers. 1.8 Read, write and interpret equations containing addition (+),	1.11 solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	1.12 recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity 1.13 recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity	1.14 Recognise and compose common 2D and 3D shapes presented in different orientations, 1.15 know that rectangles, triangles, cuboids and pyramids are not always similar to one another. 1.16 Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating

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	number system, including comparing using < > and = 1.3 Read and write numbers from 1 to 20 in numerals and words	forwards and backwards through the odd numbers 1.6 Automatically recall number bonds up to 5 and many number bonds to 10	subtraction (-) and equals (=) symbols, and relate additive expressions and equations to real-life contexts. 1.9 Add and subtract one digit and two digit numbers to 20, including zero 1.10 solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? – 9			shapes to place them in particular orientations. 1.17 Tell the time to the hour and half past (indicating these times on an analogue clock face). 1.18 recognise and use language relating to dates, including days of the week, weeks, months and years 1.19 Recognise and know the value of different denominations of coins and notes. 1.20 Sequence events in chronological order using language, for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon, evening.
2	2.1 Recognise the place value of each digit in two-digit numbers 2.2 compose and decompose two-digit numbers using standard and nonstandard partitioning. 2.3 Reason about the location of any two-digit number in the linear number system, including identifying the previous and next multiple of 10.	2.4 Read scales in divisions of ones, twos, fives and tens 2.5 Automatically recall number bonds up to 5 and all number bonds to 10	2.6 Add and subtract across 10. 2.7 Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more…?". 2.8 Add and subtract within 100 by applying related one-digit addition and subtraction facts 2.9 add and subtract only ones or only tens to/from a two-digit number. 2.10 Add and subtract within 100 by applying related one-digit addition and subtraction facts add and subtract any 2 two-digit numbers.	2.11 Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the **2 multiplication** tables. 2.12 Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the **5 multiplication** tables. 2.13 Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the **10 multiplication** tables. 2.14 Relate grouping problems where the number of groups is unknown to multiplication equations	2.15 recognise, find, name and write fractions $^1/_3$, ¼, $^2/_4$ and $^4/_4$ of a length, shape, set of objects or quantity 2.16 write simple fractions, for example $^1/_2$ of 6 = 3 and recognise the equivalence of $^2/_4$ and ½.	2.17 Use precise language to describe the properties of **2D shapes and** compare shapes by reasoning about similarities and differences in properties 2.18 Use precise language to describe the properties of **3D shapes and** compare shapes by reasoning about similarities and differences in properties. 2.19 Read the time on a clock to the nearest 15 minutes.

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3				with a missing factor, and to division equations (quotative division).		
	3.1 Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three digit multiples of 10 3.2 Recognise the place value of each digit in three-digit numbers and compose and decompose three-digit numbers using standard and non-standard partitioning. 3.3 Reason about the location of any three digit number in the linear number system, including identifying the previous and next multiple of 100 and 10 3.4 Divide 100 into 2, 4, 5 and 10 equal parts and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts.	3.5 Secure fluency in addition and subtraction facts that bridge 10, through continued practice. 3.6 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number 3.7 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10).	3.8 Calculate complements to 100 3.9 Add and subtract up to three-digit numbers using columnar methods. 3.10 Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part–part–whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.	3.11 Apply known multiplication and division facts for the **3 times tables** to solve contextual problems with different structures, including quotative and partitive division. 3.12 Apply known multiplication and division facts for the 4 **times tables** to solve contextual problems with different structures, including quotative and partitive division. 3.13 Apply known multiplication and division facts for the 8 **times tables** to solve contextual problems with different structures, including quotative and partitive division.	3.14 Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts. 3.15 Find unit fractions of quantities using known division facts (multiplication tables fluency). 3.16 Add and subtract fractions with the same denominator, within 1.	3.17 Recognise right angles as a property of shape or a description of a turn and identify right angles in 2D shapes presented in different orientations. 3.18 Draw polygons by joining marked points and identify parallel and perpendicular sides. 3.19 Measure the perimeter of simple 2D shapes 3.20 Read and write time from analogue clock, including using Roman numerals and 12-hour and 24-hour clocks, with increasing accuracy to the nearest minute.

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		Number & Place Value		Number Facts		Addition & Subtraction		Multiplication & Division		Fractions		Measurement & Geometry
4	4.1	now that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100.	4.5	Recall multiplication and division facts up to 12x12, and recognise products in multiplication tables as multiples of the corresponding number.	4.8	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	4.11	Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size.	4.14	Reason about the location of mixed numbers in the linear number system.	4.17	Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant.
	4.2	Recognise the place value of each digit in four-digit numbers, and compose and decompose four-digit numbers using standard and non-standard partitioning.	4.6	Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, and interpret remainders appropriately according to the context.	4.9	estimate and use inverse operations to check answers to a calculation	4.12	Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication.	4.15	Convert mixed numbers to improper fractions and vice versa.	4.18	Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons
	4.3	Reason about the location of any four digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each.	4.7	Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100)	4.10	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	4.13	Understand and apply the distributive property of multiplication	4.16	Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers	4.19	Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry
	4.4	Divide 1,000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1,000 with 2, 4, 5 and 10 equal parts.									4.20	read, write and convert time between analogue and digital 12- and 24-hour clocks
5	5.1	Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and	5.6	Secure fluency in multiplication table facts, and corresponding division facts,	5.8	add and subtract whole numbers with more than 4 digits, including using formal written methods	5.12	Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1	5.16	Find non-unit fractions of quantities.	5.19	Compare angles, estimate and measure angles in degrees (°) and draw angles of a given size.
									5.17	Find equivalent fractions and understand that they have the same value and	5.20	Compare areas and calculate the area of rectangles (including squares) using standard units

that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01.	through continued practice. 5.7 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth).	(columnar addition and subtraction) 5.9 add and subtract numbers mentally with increasingly large numbers 5.10 use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy 5.11 solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	hundredth times the size. 5.13 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors. 5.14 Multiply any whole number with up to 4 digits by any one-digit number using a formal written method. 5.15 Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.	the same position in the linear number system. 5.18 Recall decimal fraction equivalents for ½, ¼, 1/5 and 1/10 and for multiples of these proper fractions	
5.2 Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and nonstandard partitioning. 5.3 Reason about the location of any number with up to 2 decimals places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each. 5.4 Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts. 5.5 Convert between units of measure, including using common decimals and fractions.					

| 6 | 6.1 Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000). 6.2 Recognise the place value of each digit in numbers up to 10 million, including decimal | 6.6 Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. | 6.8 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, | 6.12 Recognise when fractions can be simplified, and use common factors to simplify fractions. 6.13 Express fractions in a common denomination and use this to compare | 6.17 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems. 6.18 Draw and translate simple shapes on a coordinate plane (in all 4 |

fractions, and compose and decompose numbers up to 10 million using standard and nonstandard partitioning.

6.3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.

6.4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.

6.5 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).

6.7 Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

and place-value understanding.

6.9 Solve problems involving ratio relationships.

6.10 Solve problems with 2 unknowns.

6.11 Multiply and divide numbers up to 4 digits by a two-digit whole number using formal written methods (long multiplication, long division, short division).

fractions that are similar in value.

6.14 Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy

6.15 Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.

6.16 Multiply and divide pairs of simple proper fractions (writing the answer in its simplest form).

quadrants) and reflect them in the axes.

6.19 Express proportion using ratio.

6.20 Calculate and interpret the mean as an average.