



Saint Joseph's Catholic Voluntary
Academy

How we teach Maths at Saint Joseph's

A Lesson Handbook: Guidance and Resources for Teaching Staff

<p>Vision: Intention, Implementation, Impact</p>	<p>Intent:</p> <p>At St Joseph's, our intention is to provide all children with full access to a broad and ambitious mathematics curriculum, enabling them to achieve confidence and competence in mathematical fluency, reasoning, and problem-solving. We want all pupils to enjoy Maths and have a growing belief in their abilities.</p> <p>Our approach aims for pupils to acquire a deep, long-term, secure and adaptable understanding of the subject. The mathematics curriculum at St Joseph's is carefully designed to build sequentially in small steps which allow children to make connections to prior learning. Each unit and each year group have defined endpoints that all children are expected to achieve which is in line with the National Curriculum and results in increasing proportions of pupils attaining the age-related-expectation or better whilst making good progress.</p> <p>The phrase 'teaching for mastery' describes the elements of classroom practice and school organisation that combine to give pupils the best chances of mastering maths. For further details on the essence of mathematics teaching for mastery, see this document from the NCETM.</p> <p>Implementation:</p> <p>The Five Big Ideas underpin teaching for mastery in our school.</p> <p>Our lesson planning begins with what we want our pupils to think and notice, rather than what we want them to do.</p> <p>We base our lessons on a maths mastery scheme called "Maths - No Problem!" We researched and trialled various approaches before choosing this system. We like it because it is child-centred and fun to teach, as well as having been assessed by the DfE as a high-quality textbook to support teaching for mastery. Importantly, we find it to be a very inclusive approach where all children achieve.</p> <p>We embed mathematical thinking through our engaging wider curriculum subjects to ensure concepts and procedures can be applied to real-life situations.</p> <p>Impact:</p> <p>Children are enthusiastic about learning and can apply their mathematical knowledge and skills to a range of problems, including those in a real-life context.</p> <p>Teachers have high standards of the teaching of the mathematics curriculum: this is evident in books, working walls and in lessons.</p> <p>Mathematical language is used consistently and is explicitly taught throughout the structure of Maths lessons.</p> <p>Teachers assess regularly and gaps in understanding are addressed systematically to prevent pupils falling behind.</p>
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Medium Term Planning: Steps in books

Use the Maths No Problem! (MNP) overviews to help you to populate long and medium-term plans.

White Space: Please bear the following in mind, taken from an email from MNP:

“Quick maths lesson: the number of MNP lessons is less than the number of available teaching days, especially in Years 1 and 2. Why?

It’s because the MNP approach is designed to include **white space**.

White space is a big help when it comes to lesson planning. When you anticipate your pupils will struggle with a concept, you can slow down and cover the lesson over two days.

More white space in Years 1 and 2 helps pupils build a strong foundation of understanding. It decreases as your learners progress through primary school and have prior knowledge to build upon.

We’ve heard from teachers time and time again that knowing about the concept of white space is *life-changing*.”

Here’s what it should look like for each year group:

Year	Lessons	White Space Days	White Space %
1	85	110	56%
2	123	72	37%
3	178	17	9%
4	151	44	23%
5	140	55	23%
6	141	54	28%

Lesson Approach Weekly Planning Adapted Learning

At the core of the mastery approach is the belief that the vast majority of children can learn the same maths at the same time, without some pupils falling behind while others race ahead. This requires carefully structured planning, thoughtful support and effective assessment for learning.

Differentiation is provided through additional support or questioning, and ideas for what this may look like included by MNP on the Teacher Hub for each lesson, using the Differentiation button at the top of the page.

Inside this Guide



Lesson Approach



Assessment



Differentiation

To begin this lesson, show pupils the In Focus task and ask them if Emma is correct. How can we check? What strategies can we use? Allow them some time to begin working on the problem. Tell them your friend says that it is definitely possible because 100 ten thousands make 10 000 000. Is this true? How can we represent this to check? Provide pupils with various number discs to choose from.

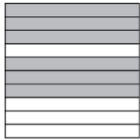
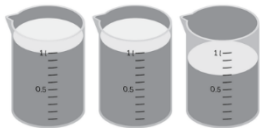
Reading and Writing
Numbers to 10 Million

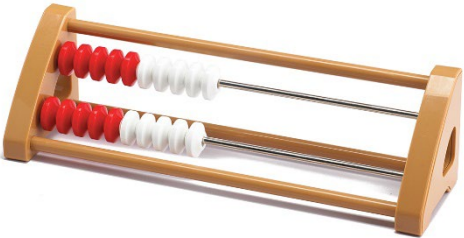
Lesson
1

See also *Digging Deeper* later in this handbook.

For each lesson, the Lesson Approach section of the MNP Teacher Hub should be copied, pasted **and amended as required** onto a slide. This ensures that whoever is teaching the lesson has access to the detailed plan for the session, including any key questions.

The Lesson Approach may need adjusting carefully in light of your prior knowledge of your pupils. It may be that your class will need an additional step before or within the Explore to help them to access the learning. This should be noted on the planning.

	<p>Sometimes, it may be necessary for a single lesson to last more than the allocated session time. This is ok, and the lesson can be completed the following day.</p>
<p>Prior Learning/Recap</p>	<p>To start the lesson, there should be a recap of prior learning.</p> <p>At the start of a new unit of work, there should be five minutes spent where children have the opportunity to explore questions on this topic from previous year groups (using the review from the previous year group). This will highlight any gaps that need revisiting before starting the unit, and will also inform interventions.</p> <p>Review 8</p> <p>1 The square below represents 1. What decimals do the shaded and unshaded parts represent?</p>  <p>shaded parts = <input type="text"/></p> <p>unshaded parts = <input type="text"/></p> <p>2 Use > or < to fill in the blanks.</p> <p>(a) 2.78 <input type="text"/> 7.28 (b) 17.34 <input type="text"/> 17.09</p> <p>3 What is the total volume of water in the beakers? Write your answer as a decimal in litres.</p>  <p><input type="text"/> l</p>
	<p>In Rec/KS1, we have “Reken’roll time”, which is explained below.</p> <p>In KS2, a recap is completed at the start of every lesson and should refer back to prior learning from earlier in the current year. These questions should be sequenced to become progressively harder. Please see the example below:</p> <div style="background-color: #fff9c4; padding: 10px; text-align: center;"> <p>1. $14 + 2 =$</p> <p>2. $23 + 5 =$</p> <p>3. $31 + 9 =$</p> <p>4. $56 + 8 =$</p> <p>5. $47 + 10 =$</p> </div> <p>All year groups (Rec-Y6) then revisit the learning that has already taken place in the current topic by posing a question, which leads to discussion and links with the day’s focus.</p> <p>Here is an example of the introduction to Year 1 height and length:</p> <div style="background-color: #fff9c4; padding: 10px; text-align: center;"> <p>What do we use a ruler for?</p> </div>

<p>Mastering Number (Rec/KS1)</p>	<p>In Rec/KS1, there is 10-15 minutes at the start of every Maths lesson which we dedicate to Mastering Number. We have named this “Reken’roll time”.</p> <p>This focuses on developing number sense and fluency, and we use this instead of a recap. This time allows children to spot patterns and use the Rekenreks to explore numbers through composition, facts, arithmetic, counting, cardinality, ordinality and comparison.</p> 
<p>Key Vocabulary</p>	<p>We have an overview of vocabulary taught for each year group. Each topic vocabulary is included in the MNP Teacher Hub and matches with the overviews. This should be added to the working wall and displayed on the lesson slides.</p>
<p>EXPLORE Maths Journal under heading EXPLORE. 20 - 30mins</p> <p>The ‘Mastering’ resources in the textbook should also be used to inform planning at this stage.</p>	<p>The Explore section should give pupils an opportunity to work collaboratively to examine a problem. This exploration is a very important aspect of the approach, and should not be rushed.</p> <p>The Explore should be displayed on the board alongside the key questions identified at the planning stage. It may also be shown in the pupil textbook.</p> <p>Usually, children will be provided with concrete resources to help them to explore the problem, and pictorial representations used to support understanding.</p> <p>Pupils work with their partner to explore and solve the problem. If they find a solution, they may attempt to find a different way of tackling the problem.</p> <p>The teacher’s role within this session is to scaffold the learning with carefully chosen questions. The EXPLORE may need to be broken down into smaller steps, with the teacher posing a question that guides the pupils to make their own discoveries.</p> <p>Do not worry about efficiency at this stage! The scheme is structured in such a way as to eventually lead to efficient methods, but exposing the underlying mechanics of the maths is important here.</p> <p>Talking is key: talk amongst pupils is critical, allowing them to negotiate with each other and challenge their ideas. <i>This process works best with a peer; it rarely happens with a teacher as they are an authority figure.</i></p> <p>Questioning: Do not ask questions to get an answer. Ask questions to check. “Are you sure?” “Is that right?”</p> <p>When planning the EXPLORE, think critically about how to present the problem. Telling a story is often an engaging way. <i>Is a prior step required to help your class to access the learning?</i></p> <p>The teacher should rarely explain. Instead, you should add structure to pupil’s responses, or present them in a more organised or polished form, using the Flip Chart so that models and methods can remain visible during the rest of the lesson, and then be displayed on the Working Wall.</p>

	<p>Supplementary tasks or questions may be planned (guidance in the Mastering section) using variation to build upon the original Explore question(s).</p> <p>A Digging Deeper question <i>may</i> be planned for this stage of the lesson, but do not encourage children to rush on to it.</p>
Guided Practice Maths Journal 10 -20 mins	<p><i>Practice is for consolidation and fluency, <u>not</u> learning.</i></p> <p>When planning the lesson, it is essential to look ahead to Guided Practice and the Independent task. This is to ensure that you have fully prepared children for the types of question which may be presented to them in these sections of the lesson.</p> <p>During Guided Practice, pupils can work with their partner (mixed ability) to solve similar problems which are slightly different each time (variation, not repetition).</p> <p>Guided Practice should be followed by a mini-plenary – use this as an opportunity to address and critique different methods.</p> <p>A Digging Deeper Question may be planned for this stage of the lesson.</p>
Independent Practice MNP Workbook 10 mins	<p>This will probably be the shortest portion of the lesson, where children work independently to solve 3 sets of similar problems which increase in difficulty.</p> <p>It may not be necessary for a pupil to complete all of the Workbook questions in order to meet the minimum expectation of the lesson (refer to MNP Teacher Hub for clarity on the minimum expectation), but they should work quickly and quietly to put into practice the learning that has taken place.</p> <p>A Digging Deeper question linked to the learning objective <i>should</i> be planned for any children who finish the Independent Practice before the end of the lesson.</p>
Assessment	<p>Assessment for learning</p> <p>Questions on the worksheets are carefully constructed to assess:</p> <ol style="list-style-type: none"> 1. Can children correctly perform the skill? 2. Do children have the ability to take perspective / perform the skill in a certain way? <p>For this, children need to be able to comprehend.</p> <p>Note: Advanced learners should not usually be introduced to the worksheet early as they too need time to learn things meaningfully.</p> <p>Characterising Learners:</p> <p>Working Towards: making a lot of mistakes, require a lot of teacher directed questions to develop their conceptual understanding. At National: Meeting the minimum expectation for each lesson. Above: These learners should access planned opportunities to dig deeper.</p> <p>Characteristics of Greater Depth (Above) Learners:</p> <ol style="list-style-type: none"> 1. They are always able to give you a physical model – e.g. add a story to / give an example of 8×3 – it is not just about knowing number facts. 2. They are always able to give a visual model, e.g. a bar model. 3. They have the ability to explain themselves orally and can think on the spot. 4. They have the ability to record their thinking. 5. They are able to think critically / challenge themselves!

<p>How do we cater for all pupils?</p>	<p>Differentiate the learning environment For learners working towards:</p> <ul style="list-style-type: none"> • Create a safe environment where children can make mistakes; • Create choice – accept their method even if it is not the best – do not shut them down. These methods can be refined later. • Allow them time to process. <p>For learners working at greater depth:</p> <ul style="list-style-type: none"> • Make the environment less safe through questioning: “Are you sure?” “Is that always true?” “My friend disagrees, prove it.” • Challenge their thinking. <p>Support for learners ‘working towards’ These pupils will not be in a position to complete the final task on their own.</p> <ul style="list-style-type: none"> • Give adult support through the independent task, so that it becomes a further Guided Practice. • Provide additional scaffold through questioning or resources. • Break the task down for them into smaller steps. • Model how to respond when we don’t understand something. <p>Digging Deeper: Catering for all pupils, including those working at Greater Depth</p> <p>Challenge should be present throughout each aspect of the lesson, <i>not seen as something which comes at the end of the sequence.</i></p> <p>Challenge may be present through the task itself, how the teacher asks for the task to be completed, or by supplementary questioning</p> <p>Additionally, opportunities to dig deeper within the learning objective should be provided wherever relevant.</p> <p>These should be open to all, but only once a pupil has demonstrated a sound understanding of the essential teaching point.</p> <p>Be aware of time constraints and limitations.</p> <ul style="list-style-type: none"> • “Do you think you can invent a new method?” • “Pick your favourite calculation and write a story for it.” (One that resembles the ‘Explore problem.’) = Problem posing, making connections. • ‘Explain it!’ / communicate ideas (this has an inverse correlation with ability to compute!) • “Write a note in your journal to help someone else understand what we have done today.” • Carry out research eg. “Can you get 6 different digits in one equation?” <p>See Digging Deeper in Appendix iii for further resources and guidance.</p>
<p>Homework</p>	<p><u>Homework</u> Maths homework should be sent out each Friday and should be based on learning from the previous topic. The homework should give children the opportunity to answer diverse questions using different representations.</p>
<p>Appendix ii: Fluency resources</p>	<p><u>Mathematical Fluency</u> Fluency is the ability to recall the answers to basic math facts automatically and without hesitation. The key areas within fluency are:</p> <ul style="list-style-type: none"> • Number facts • Times tables

- Making connections between numbers

In order for children to become fluent in these areas, it is important that they are exposed to a range of **regular and frequent calculations** where they can practise and apply their knowledge.

"PRACTISE, DRILL, MEMORISATION."

Once children can recall number and times table facts and start to make connections with numbers, they will find it easier to reason mathematically and problem solve.

Fluency of facts, concepts, procedures and mathematical language

Mathematical Reasoning

Problem Solving

Resources and Games

It is important that fluency is practised daily in a variety of ways. At the start of each maths lesson, children should be given the opportunity to rehearse number facts or times tables. Below are a few ideas of what fluency might look like in a maths lesson.

- A times table or number bond song e.g. supermovers, Percy Parker, Rolling Numbers
- The use of a 100 square to count forwards or backwards, as well as rehearsing times tables or sequencing, identifying patterns.

Count in 2s, 5s and then 10s using the 100 square.

What do you notice?

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

- Daily arithmetic style questions that revisit prior learning. These are used as part of the recaps each day.

	<div data-bbox="523 96 986 421"> $\begin{array}{r} 3 \ 2 \ 6 + \quad = 3 \ 7 \ 6 \\ 5 \times \quad = 3 \ 5 \\ 2 \times \quad = 1 \ 2 \\ \quad + 2 \ 0 = 4 \ 8 \end{array}$ </div> <div data-bbox="391 421 973 739"> <p>DAILY ARITHMETIC</p> <p>a) $? + 100 = 1,765$ b) $792 \div 22$ c) $400 \times 40 =$ d) $0.2 \div 10 =$ e) $3^3 + 10 =$</p> </div> <p>The 'Maths No Problem' scheme plans in opportunities within the 'Explore, 'Guided Practice' and 'Independent' workbook so that children can practise fluency throughout each lesson.</p>
<p>Appendix iii: Digging Deeper resources</p>	<p>Digging Deeper prompts provide opportunities for children to extend their understanding of a concept by thinking more deeply about it. They should not seek to move the pupil on to a new area of maths, but rather encourage them to further engage with their current learning objective, or make connections with other prior learning.</p> <p>Digging Deeper questions can be strategically placed throughout lessons, and should not be restricted to particular children – they are open to all. However, a teacher may wish to direct certain pupils to attempt them, based upon ongoing assessment for learning outcomes.</p> <div data-bbox="391 1167 1252 1420"> <p><i>Digging Deeper</i></p> <p>Find another fraction or quotient that is equal to 0.215</p> </div> <p>The MNP Teacher Hub offers suggestions for activities that might be suitable 'DD' tasks, and these can be found under the Differentiation tab on the lesson guide.</p> <p>NRich (https://nrich.maths.org/) remains a valuable resource for open-ended, investigative problems, alongside Deepening Understanding (https://www.deepeningunderstanding.co.uk/), Mr Bee Teach (https://www.mrbeeteach.com/) and Vocabulary Ninja (https://vocabularyninja.co.uk/product-category/maths/)</p>
<p>Appendix iv: Vocabulary</p>	<p>For purposes of consistency, the vocabulary used in the MNP Teacher Guides should be used in those lessons. It is crucial that adults model using the correct language when explaining concepts, as this is how children learn to reason and explain things for themselves. Within the updated MNP teacher hub, the key vocabulary – including suggested sentence stems – is available to view. Please use this within the classroom environment, throughout teaching and on slides.</p>

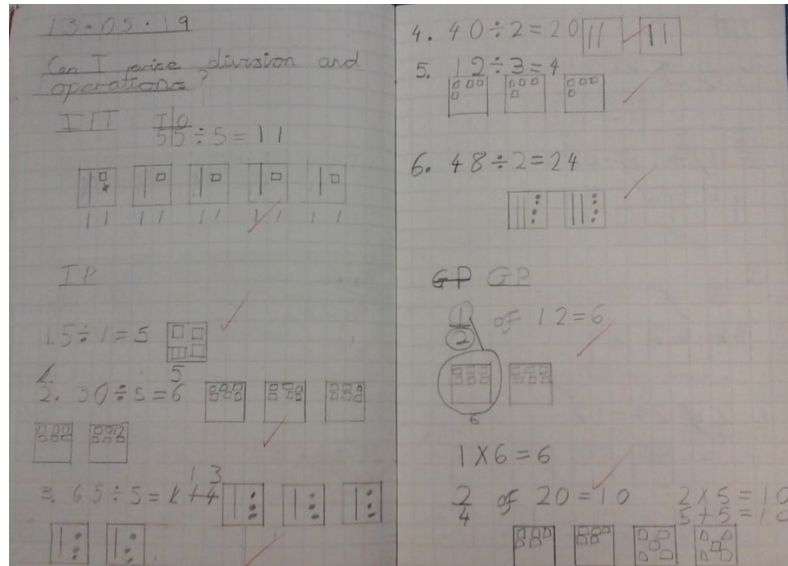
Presentation

These presentations guidelines should be followed at all times:

- Pencil should be used for all maths work including drawing, tables and charts.
- Rulers must be used to underline, ruler off or draw with. Any mistakes should be crossed out with one ruler line.
- One number to one square should be used in every lesson.
- From year 3-year 6, margins should be drawn at the start of each lesson with a ruler

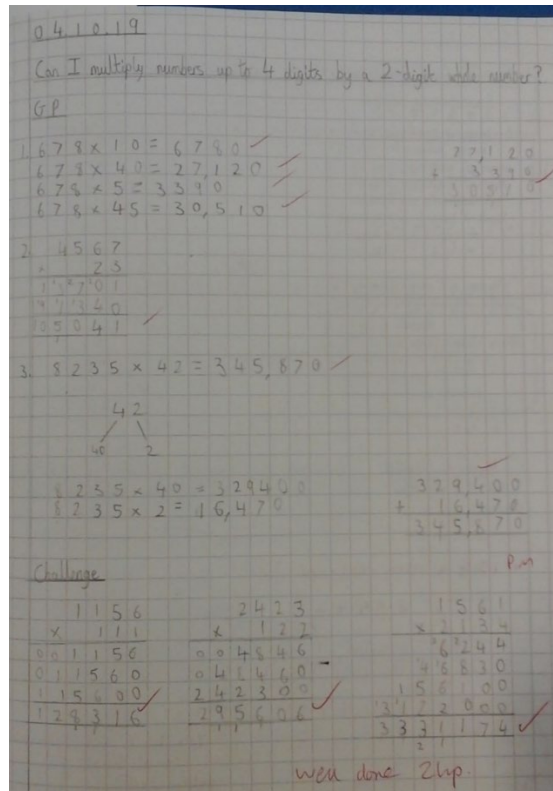
Here are two examples of how a child's work should look.

KS1



Appendix vi: Presentation

KS2



When following the maths no problem structure, children should use the following abbreviations for each part of the lesson:

RECAP – Recap

EXPLORE – Explore

GP – Guided Practice

IT – Independent Task

	DD – Digging Deeper
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