Turnditch C of E Primary School

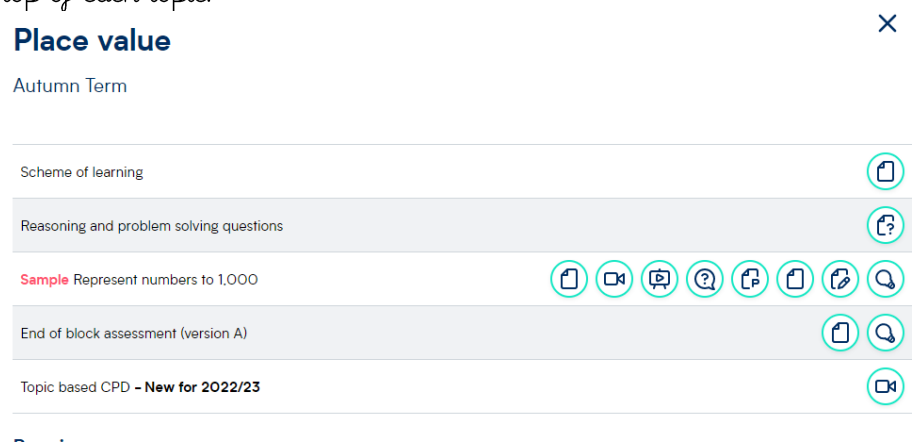
How we teach Maths at Turnditch Primary

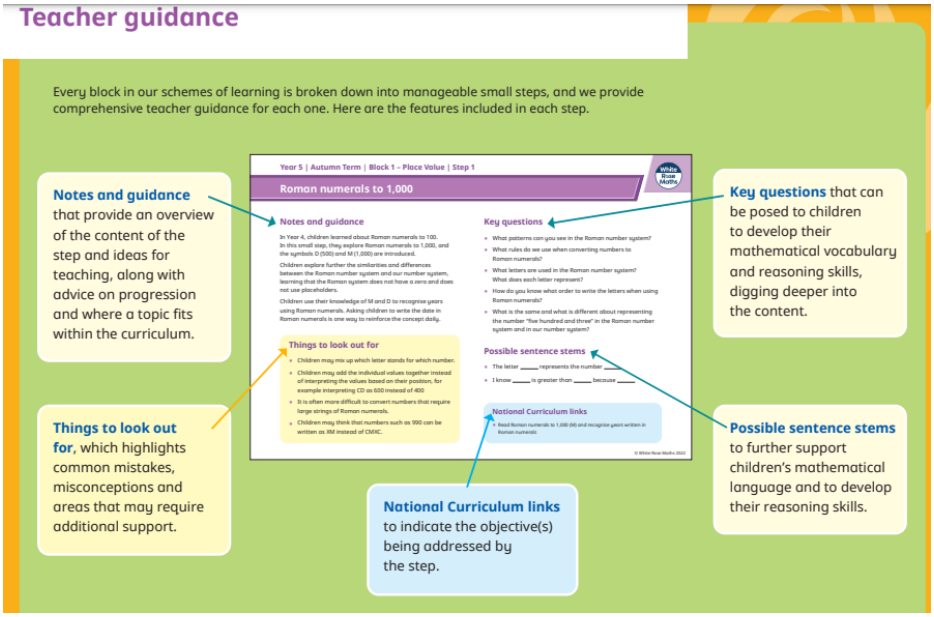
A Lesson Handbook: Guidance and Resources For Teaching Staff

Vision: Intention, Implementation and Impact	At Turnditch Primary School, our intention is to ensure that children develop an enjoyment and enthusiasm for maths that will stay with them throughout their lives and empower them in future life. We believe that developing mathematical fluency is an essential life skill for all learners and is a pre-requisite to being able to reason and solve mathematical problems. Our aim is to develop a positive culture of deep understanding, confidence, reasoning and competence in maths that produces strong, secure learning. As a school, we recognise that the key to unlocking the potential in our children is through the development of basic mathematical skills and the understanding of mathematical concepts. We therefore place great emphasis on the use of concrete resources and pictorial representations at all ages, to enable children to fully understand the concepts and principles, when presented with abstract calculations and questions. Our sequential maths curriculum is progressive and offers opportunities for children to make links with prior learning. Our ultimate aim is for children to achieve expected outcomes at the end of KS2 and to equip pupils for KS3. 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. Achieving mastery means acquiring a solid enough understanding of the concepts that have been taught to enable pupils to move on to pre advanced material. The Five Big Ideas underpin teaching for mastery in our school. Our lesson planning begins with what we want our pupils to think and notice, rather than what we want them to do. We base our lessons on the White Rose framework, linking maths for mastery guidance. As a mixed age school, we have the extra challenge of teaching two year groups simultaneously and the White Rose framework is one of the few approaches currently available where mixed age planning and teaching have been supported. The framework offers children to master maths effectively through a series of small steps, and progression is clear from EYFS to Year 6. White Rose offer a number of quality resources including teacher notes and guidance for every step, and useful assessment materials.
	Use the mixed age resources from White Rose as a basis for your planning. The order of topic blocks may be changed, providing that *Place value is taught first. *Consideration is given to how calculation aspects may be necessary for children to access other maths topics. *The suggested time is still spent on each topic.

Medium Term Planning	*The small steps in the topic are followed for progression. For example, the current WR scheme is heavily based on number and calculation in the Autumn term. Swopping a block based on shape or geometry may help keep pupils interest and focus. Teaching a mixed age class has unique challenges, especially so in maths. There are a number of strategies to consider when planning for your pupils. Even though White Rose has published mixed age planning, there are often discrepancies in both topic areas and steps when teaching two classes. Where possible, teachers should align similar learning outcomes, so for example: Y3 Represent numbers to 1000 Y4 Represent numbers to 10, 000. This may mean some re organising of the suggested WR steps. It is advisable to look at the block in entirety before starting and to consider how you may achieve this. Other strategies which could be used are: On occasions, it may be appropriate to introduce an older age concept to the younger age for planning and teaching streamlining. For example, year 3 could be introduced to rounding 2 digit numbers to 10, whilst they encounter rounding numbers to 10, 100 and 1000 in year 4. Another strategy is to ensure quality consolidation time for a lower year group whilst a new topic is introduced, so for example Y5 children could consolidate written multiplication methods whilst algebra is introduced for year 6. Such work should still stretch children. The mixed age WR framework offers a small number of weeks for consolidation at various points. These could also be used to manage the challenge of mixed age planning. Medium term plans should be uploaded and available on teams.
Lesson Approach/ Weekly Planning Differentiation	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 other race ahead. This requires carefully structured planning, thoughtful support and effective assessment for learning.

Differentiation is provided through additional support and questioning. WR provides guidance and support in each scheme of learning, available at the top of each topic.





Teachers may also find the Topic based CPD videos of use.

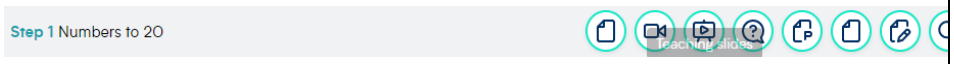
Five lessons of maths should be taught each week, with exceptions for school trips and similar. Sometimes, it may be necessary for a single lesson to last more than the allocated time session. This is ok, and the lesson can be completed the following day.

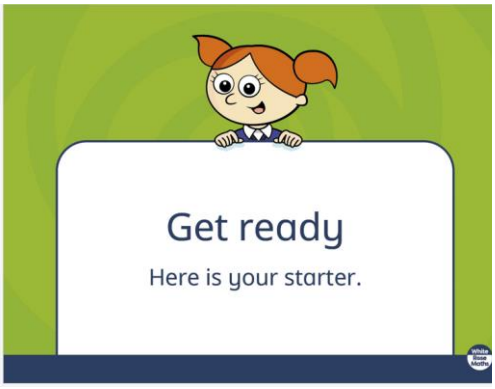
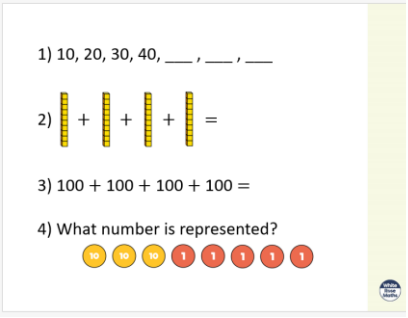
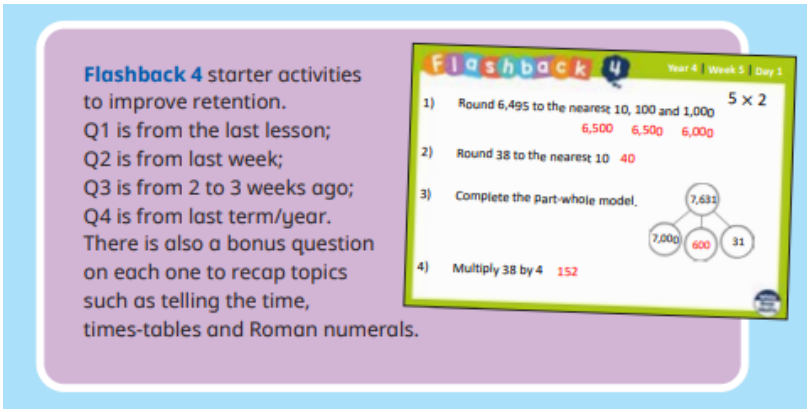
Teachers should use the following form to guide their weekly planning:

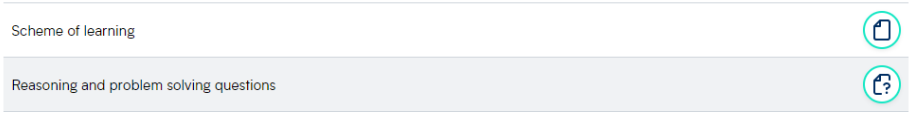
Weekly plan Maths

Term: Aut Spr Sum		Week:		Mathematical theme:			
Day	Arithmetic / fluency	Objectives	Main teaching	Lower year group	Upper year group	Differentiation	Digging deeper / misconceptions
Monday							
Tuesday							
Wednesday							
Thursday							
Friday							

See example of completed planning in appendix i.

Key Vocabulary	For each step, teachers should read the teachers notes and guidance, taking note of the key questions, vocabulary and sentence stems, key learning and reasoning and problem solving.  The vocabulary for each lesson is in the teachers' guidance. Use teaching sessions to encourage children to say things in their own words and understanding; correcting and amending vocabulary as necessary. Vocabulary should be: *Displayed on working wall and referred to when appropriate. *Used on lesson PowerPoints and slides. *Possibly written in children's books if it is a useful activity for them to do so. *Used in key questioning and sentence stems. Teaching assistants may also find these useful. Teachers should also run through the presentation slides, considering where their children may have difficulty. There is scope to adapt these slides, or add additional slides in such cases. WR provide extra IWB boards, which could be a useful tool here. Teachers should consider how best to use the slides for the mixed age session. If the learning outcome is aligned for both classes, think about the following- *Combining slides from the two age groups, perhaps starting or finishing the slides at different points if repetitive. *Using the younger year group slides as revision. *Sending an age group away to complete a number of questions, whilst concentrating on the other. The first group could return once the second group are sent away. (WR makes some good suggestions for this in their slides). If the learning outcome is less aligned, it may be appropriate to consider the following- *Sending an age group away to complete a number of questions, whilst concentrating on the other. The first group could return once the second group are sent away. (WR makes some good suggestions for this in their slides).

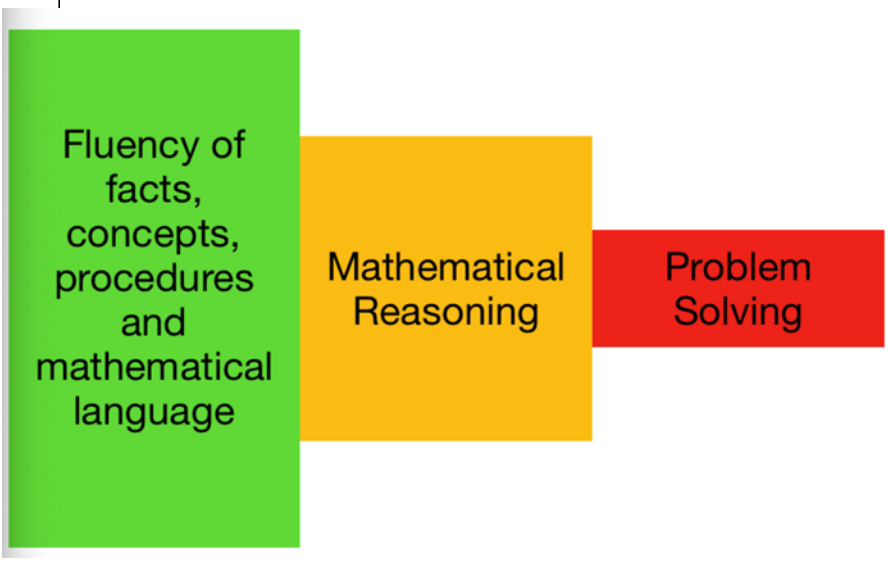
	Teachers should consider what manipulative resources might be useful, and understand how the representations may help children to make connections from concrete to abstract understanding. Teachers should also consider a suitable **digging deeper** question or task (see digging deeper section).
Arithmetic / Fluency 5 mins Choice to record (no need)	To start the lesson, there should be a recap of prior learning. This could be done in a number of ways. Both year groups should do the same task, making sure that extension questions are included if needed. *For each learning step, WR includes a get ready slide. These offer a small number of questions where the skills will be useful for the work.   WR also offer flashback slides which cover retention of topics from further back.  *You might also choose to cover a question from the previous day, where children made a common error, or children used a different way to solve a question or problem. *You might choose to rehearse a skill- a times table or number bonds work, or telling the time using an analogue or digital clock. Other visual resources could be used for this, for example songs, a counting stick.

	*You might choose to use a question from the reasoning and problem solving section of the topic.  Use a variety of strategies to ensure as many children take part as possible. For example, writing answers on whiteboards, or showing fingers/number cards, telling the person next to them their answer and so on. See Appendix ii for further suggestions.
Maths teaching and guided practice	Share the learning outcome (I can) with the children, drawing on prior knowledge and skills where appropriate. E.g. yesterday, we learnt how to add numbers under 10. Today, we're going to add numbers up to 20. We're going to find out how we can calculate the area of rectangles. You are going to need your times tables skills a lot in this lesson. Use the WR teaching slides as the guide for teaching. Be mindful of: Making children do as much maths as possible. Ask the children to show answers on their fingers, whiteboards or tell a partner the answer. Involve all children- has everyone answered a question? Allowing children to verbalise and explain their thinking as much as possible- **this is key.** Misconceptions- address these at the time where possible. Returning to vocabulary, key questions and stem sentences as needed. **Do not always** ask questions to get an answer. Encourage a number of responses to questions, e.g. Who else thinks something? Zog, do you think that Zag is right? Ask questions to check. "Are you sure?" "Is that right?" It may be useful for children to do guided practice, where they undertake a similar question or problem under the direction of a teacher or teaching assistant.
Independent practice	Children will usually progress to independent work set by the teacher. This might be: *The connected WR question sheet. WR provides 2 types, one which can be written on, and another which can be copied from. *Other work which will help children practise the learning concept. This may be from extra resources available to the teacher. *Working on a practical task related to the learning concept.

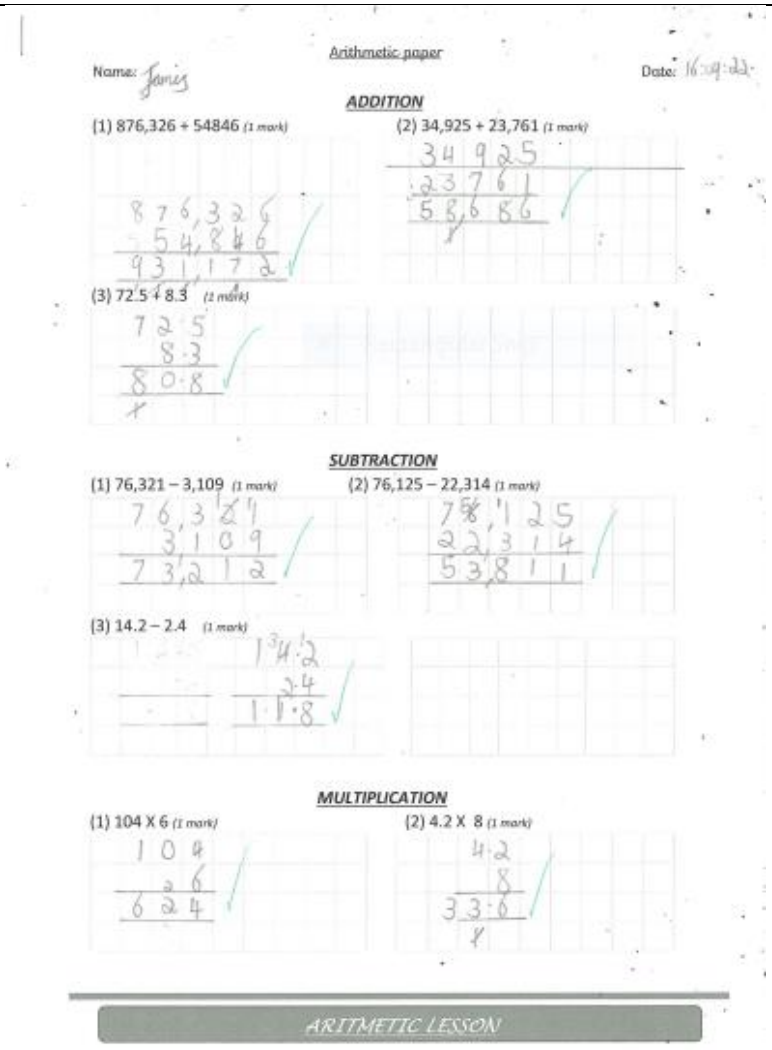
	Thought should be given here towards the non-negotiables in maths. It is good practice that children are able to complete work neatly, not always using worksheets. Using a text book correctly and presenting and recording work in their own maths book is a skill which needs to be practised and promoted where possible.
Marking and Assessment	Work should be marked as soon as possible and children assessed as to whether they have met the minimum expectation. This will then decide the next steps. If work is marked by the teacher, it should be: Marked in purple pen If verbal feedback has been given, this must be clearly shown using VF. Maths errors (no more than 3 per piece of work) are identified and addressed and responded to by the children. Number reversals are highlighted. Children and staff to use one digit per box for written calculations. Errors (no more than 3 per piece of work) in children's vocabulary and spelling are identified in yellow highlighter. VF is usually more useful as a tool to address children's misconceptions than lengthy written explanations. VF could be given individually, or to a number of children if they have made a similar mistake, perhaps as part of the next lesson. If work is marked by children, it should be Marked in green pen or pencil, as appropriate. Children should be encouraged to look again at their errors and to attempt a second go. See Appendix ii for our non-negotiables. SLT and subject leaders monitor this by completing book scrutiny twice per term. **Assessment for learning** Questions on the worksheets are carefully constructed to assess: 1. Can children correctly perform the skill? 2. Do children have the ability to take perspective / perform the skill in a certain way? For this, children need to be able to comprehend. **Characterising Learners:** 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.

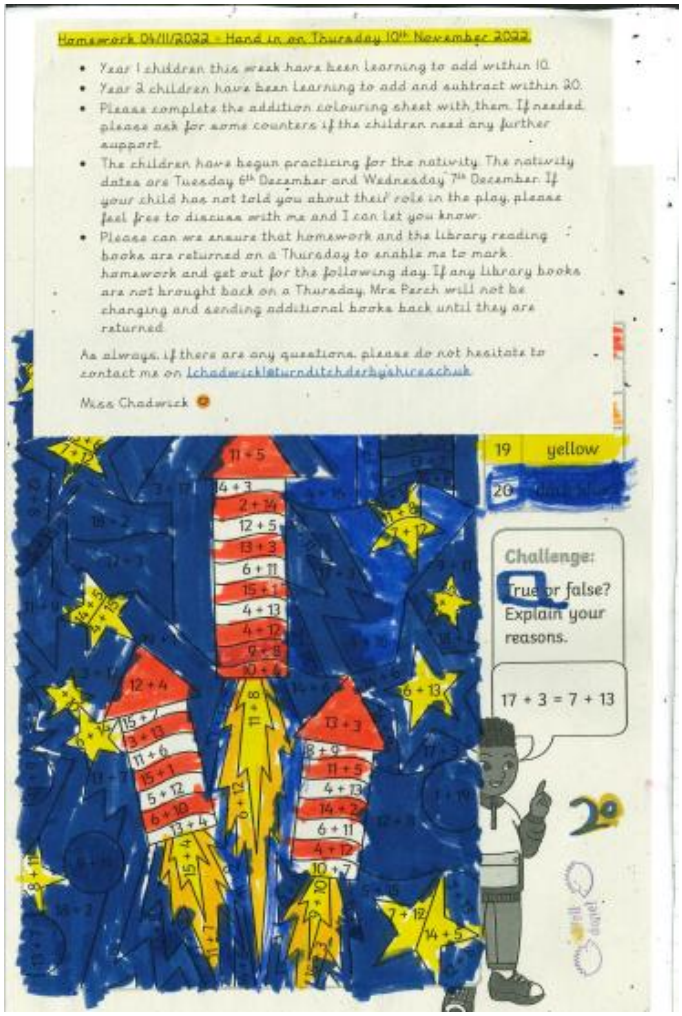
	Characteristics of Greater Depth (Above) Learners: 1. They are always able to give you a physical model – e.g. add a story to / give an example of 8 x 3 – it is not just about knowing number facts. 2. They are always able to give a visual model, e.g. a bar model. 3. They have the ability to explain themselves 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!
How do we cater for all pupils?	**Differentiate the learning environment** <u>For learners working towards:</u> *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 to explain in their own words – accept their vocabulary, model preferred vocabulary back to them. *Allow them time to process. <u>For learners working at greater depth:</u> ·Make the environment less safe through questioning: "Are you sure?" "Is that always true?" "My friend disagrees, prove it." ·Challenge their thinking. <u>Support for learners 'working towards'</u> These pupils will not be in a position to complete some tasks on their own. *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.
Digging Deeper	**Digging Deeper:** Catering for all pupils, including those working at Greater Depth. 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. 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. **How to implement digging deeper in each lesson:** Challenge should be present throughout each aspect of the lesson, not seen as something which comes at the end of the sequence.

	Challenge may be present through the task itself, how the teacher asks for the task to be completed, or by supplementary questioning. Additionally, opportunities to dig deeper within the learning objective should be provided wherever relevant. These should be open to all, but only once a pupil has demonstrated a sound understanding of the essential teaching point. Pupils can annotate any digging deeper work with initials DD. Be aware of time constraints and limitations. •"Do you think you can invent a new method?" •"Pick your favourite calculation and write a story for it." (One that resembles the 'In Focus' 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?" WR provides reasoning and problem solving questions for each unit which could be used. NRich (https://nrich.maths.org/) remains a valuable resource for open-ended, investigative problems. Maths Challenges all - available on teams. Abacus pupil books have a number of 'think' throughout the textbooks.
Mathmatical fluency	Mathematical Fluency Fluency is the ability to recall the answers to basic math facts automatically and without hesitation. The key areas within fluency are: • 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."

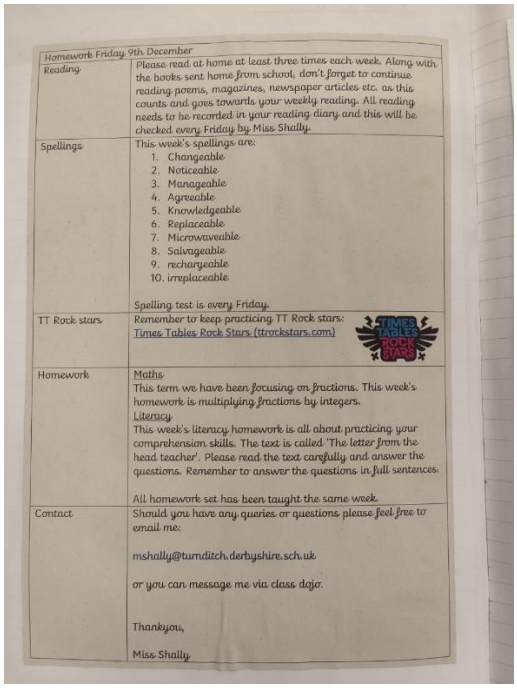
	Once children can recall number and times table facts and start to make connections with numbers, they will find it easier to reason mathematically and problem solve.  Fluency will often be rehearsed in the first five minutes of each maths lesson, but needs to remain a focus throughout. A variety of resources are available in classrooms to engage and motivate the children.
Homework	Maths homework should be sent out weekly and should include information detailing what they have been learning about in maths for that week. This may not happen every week depending on the unit of work that you are doing. The homework should give children the opportunity to answer diverse questions using different representations. EYFS - To start in January 23. Year 1 and 2 - For key stage 1 homework is sent out on Friday and returned to school the following Thursday. The homework set is relevant to the weeks learning. Year 3 and 4 - In preparation for the national times table test which children take in year four the homework in year 3 and 4 will focus of gaining knowledge and swift recall of times tables. This will be done using TT Rock stars and other activities as appropriate. Currently the school is working to address significant weaknesses in concepts of time telling. Additional activities will be encouraged for children to complete at home with the support of parents. For example: we have sent

	home a geared teaching clock home with every child and teaching games are also available. Year 5 and 6 - For upper Key Stage 2 homework is sent out on Friday and returned to school the following Thursday. The homework set is relevant to the weeks learning. See appendix iii for examples of good homework.
Presentation	These presentation 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 per one square should be used in every lesson. -From year 3- year 6 a small margin should be drawn at the start of every lesson with a ruler. See Appendix iiii for examples of good guidance.
Appendix i: Weekly planning suggestion	Weekly plan Maths Term: Aut Spr Sum Week: Mathematical theme: Day | Arithmetic / fluency | Objectives | Main teaching | Lower year group | Upper year group | Differentiation | Digging deeper / misconceptions Monday | White Rose starter slide. | Multiply up to a 4-digit number by a 1-digit number. | WR teaching slides. 2/3 extra slides for guided practice. | Year 5 WR sheet | Year 6 WR sheet | LA – 2 – digit by 1 – digit | What mistake has Tiny made? Tuesday | White Rose starter slide. | Multiply a 2 digit number by a 2 digit number. | WR teaching slides. | Year 5 WR sheet | Year 6 Target Maths page 20 | LA – 3/4 - digit by 1 – digit (T.A) | Reasoning and problem solving WR slide 4 Wednesday | White Rose starter slide. | Multiply a 2 digit number by a 2 digit number. | WR teaching slides. | = plus LA working with teacher Year 5 Target maths page 12 | Year 6 selection of reasoning and problem solving from Twinkl | See previous boxes | Four numbers make the biggest make the smallest Thursday | Jack Hartman 8 times table song | Yr 6 – Add or multiply? Yr 5 – Consolidate column multiplication. | WR teaching slides. | Yr 5 – Mixture on Monday/Tuesday work | Yr 6 WR sheet | TA to support Yr 5 Teacher to support Yr 6 Times table grid in reading diary accessible | Yr 6 - Reasoning and problem solving WR slide 9
	Year 5 and 6 arithmetic paper:

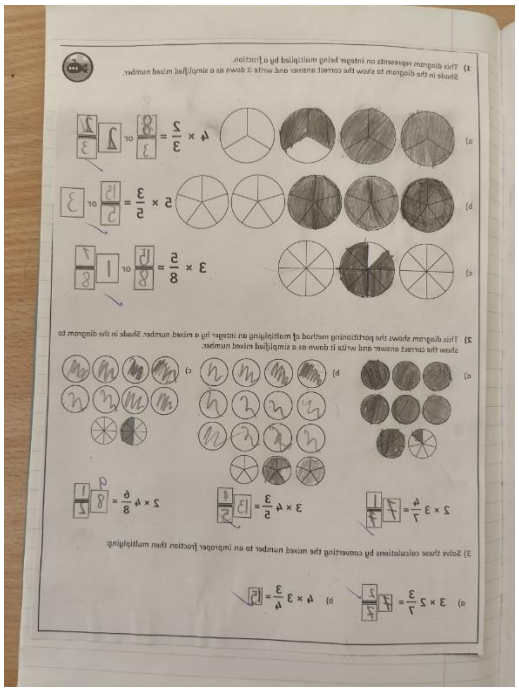
Appendix ii: Arithmetic	
Appendix iii: Non – negotiables	"I can.." statements are written and underlined in pencil. Short date written and underlined in pencil. Children and staff to use one digit per box for written calculations. All children write in pencil except when responding to marking or checking errors. Children should respond to marking in green pen or pencil as appropriate. All drawings and diagrams should be drawn neatly in pencil. All work is marked and up to date in purple pen. If verbal feedback has been given, this must be clearly shown using VF. Errors (no more than 3 per piece of work) in children's vocabulary and spelling are identified in yellow highlighter.

	Maths errors (no more that 3 per piece of work) are identified and addressed and responded to by the children. Number reversals are highlighted All work stuck in books must be cut down and stuck in neatly and straight. Neat joined handwriting to be used at all times by the teacher. This must follow the school's letter join script. Children are encouraged to present work neatly independently. Some evidence of a variety of tasks is present in books.
Appendix iii: Homework	Homework examples: KS1 - 

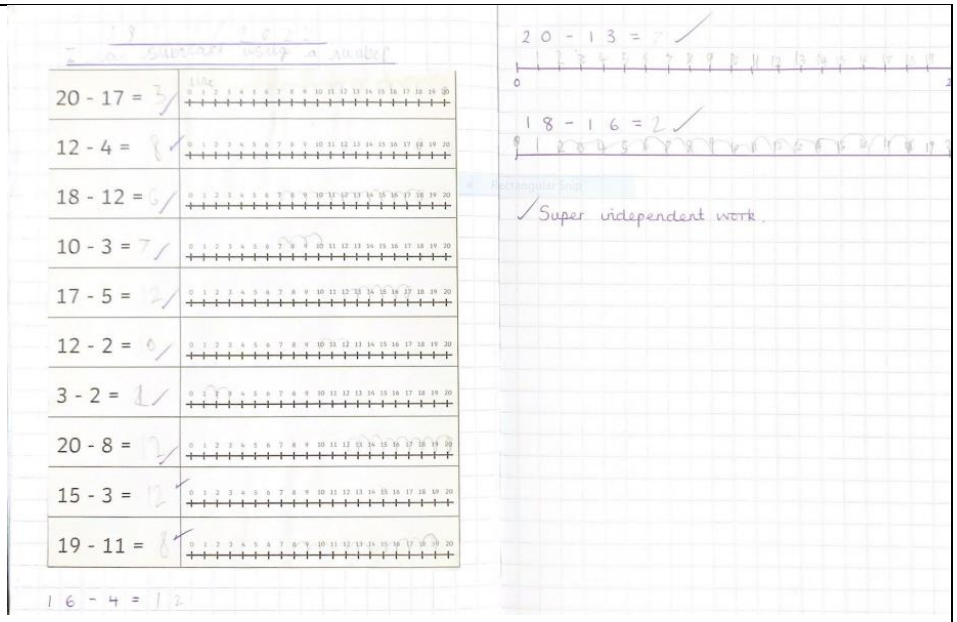
UKS2-



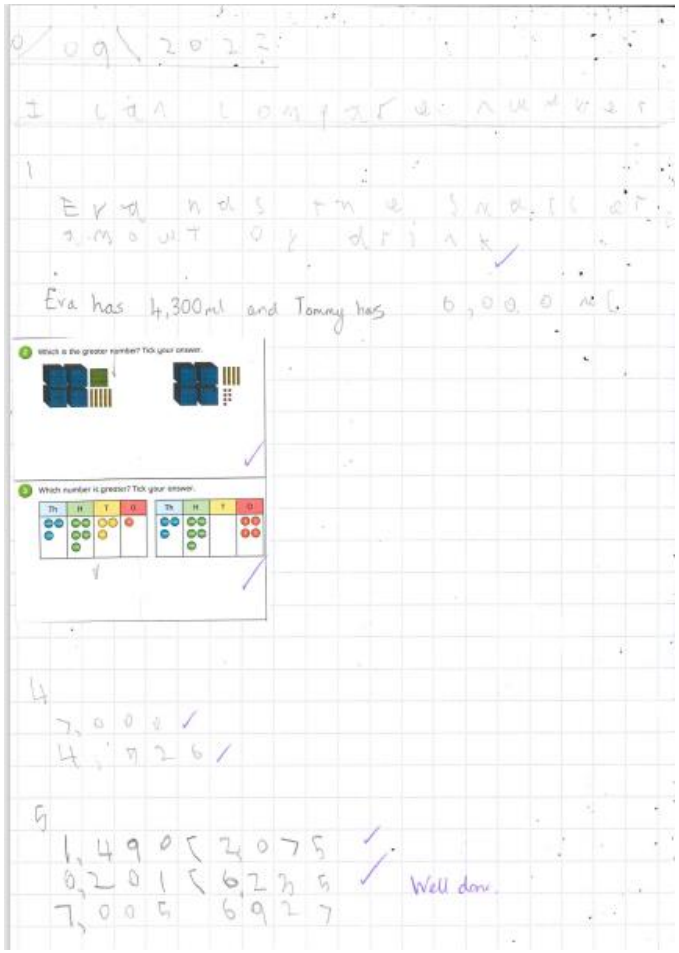
Homework Friday 9th December	
Reading	Please read at home at least three times each week. Along with the books sent home from school, don't forget to continue reading poems, magazines, newspaper articles etc. as this counts and goes towards your weekly reading. All reading needs to be recorded in your reading diary and this will be checked every Friday by Miss Shally.
Spellings	This week's spellings are: 1. Changeable 2. Noticeable 3. Manageable 4. Agreeable 5. Knowledgeable 6. Replaceable 7. Microwaveable 8. Salvageable 9. rechargeable 10. irreplaceable Spelling test is every Friday.
TT Rock stars	Remember to keep practicing TT Rock stars: Times Tables Rock Stars (ttrockstars.com)
Homework	Maths This term we have been focusing on fractions. This week's homework is multiplying fractions by integers. Literacy This week's literacy homework is all about practicing your comprehension skills. The text is called 'The letter from the head teacher'. Please read the text carefully and answer the questions. Remember to answer the questions in full sentences. All homework set has been taught the same week.
Contact	Should you have any queries or questions please feel free to email me: mshally@turnditch.derbyshire.sch.uk or you can message me via class dojo. Thankyou, Miss Shally



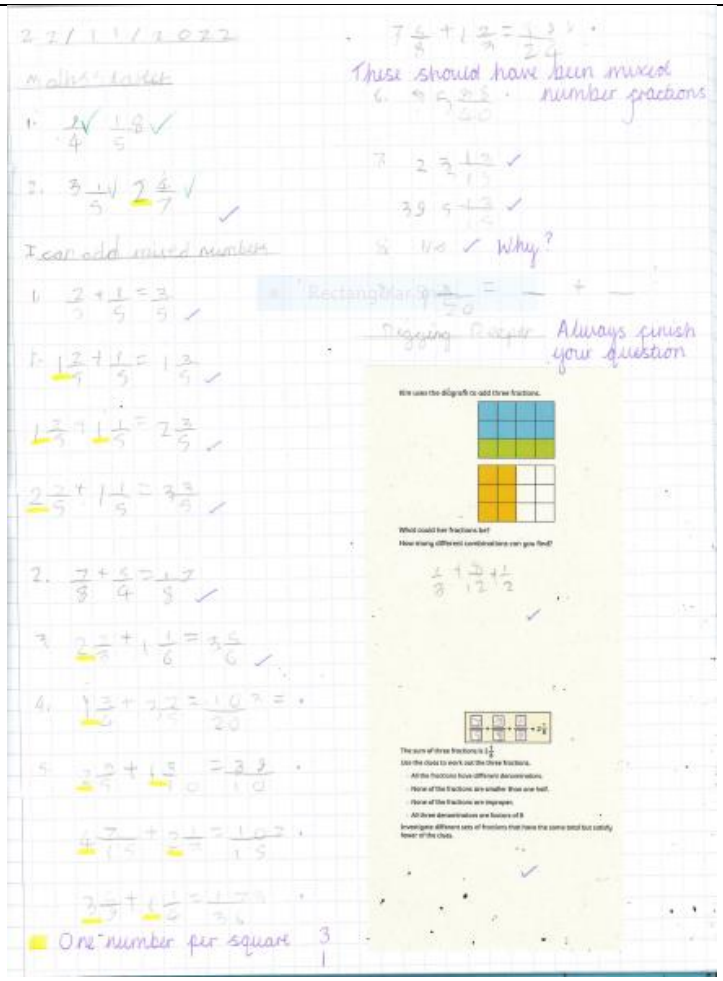
Appendix iiii Presentation:	Here are examples of how a child's work should look across the key stages: EYFS - KSI -


20 - 17 =
12 - 4 =
18 - 12 =
10 - 3 =
17 - 5 =
12 - 2 =
3 - 2 =
20 - 8 =
15 - 3 =
19 - 11 =
16 - 4 =
20 - 13 =
18 - 16 =
Super independent work.

KS2 -


Eva has 4,300ml and Tommy has
Well done.

UKS2 -



Children should use the following abbreviations for each part of the lesson:
GP - Guided Practice
IP - Independent task
DD - Digging deeper