



Pear Tree Community Junior School

Maths Expectations

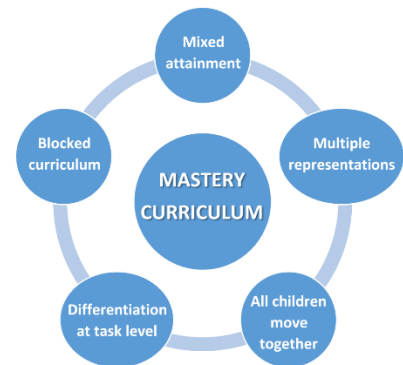
The document sets our expectations for the teaching of Maths for the following categories:

1. Curriculum and resourcing
2. Planning
3. Teaching and learning structure
4. Bookwork structure
5. Learning environment
6. Fluency
7. Assessment

All of these are underpinned by the whole-school CLIP philosophy and framework (Challenge, Leading Learning, Inspiring, Impacting Progress).

1. Curriculum and resourcing

- Mastery curriculum:
 - Expectation for *mixed-attainment groupings* (where possible and appropriate to children's needs and level of understanding)
 - Expectation for teachers to use a *variety of resources and representations* to make maths concepts accessible – e.g. CPA model; making links between representations
 - Expectation for *all children to progress through the curriculum at roughly the same pace*
 - *Differentiation is at the level of task and not child* – i.e. all children will work on the same concept, but some children will be expected to develop a deeper understanding while other children will need more directed scaffolding and support
 - Focus on *problem solving* and *reasoning*, but also on high level of *fluency*
 - 'Blocked' curriculum – i.e. topics are to be taught in consolidated blocks (see long-term plan)



- Primarily structured around MNP scheme and curriculum, but teachers are encouraged to make professional judgements about the suitability of the pitch of the MNP resources and, if need be, to supplement or replace these with other resources (e.g. from the White Rose schemes of learning).
- Teachers use the textbooks to structure their teaching; children do not have to have the textbooks on the tables.
- Teachers are expected to follow an annual scheme of learning (see long-term plan). This will be supplied by the Maths lead and revised termly to ensure as full curriculum coverage as possible.

Planning – Teaching – Bookwork – Environment Cycle

There needs to be consistency between planning contents, lesson delivery and activities, bookwork structure, and resources in the learning environment:

- the lesson delivery must reflect the stages, sequencing and activities outlines in the planning
- bookwork structure must reflect the different stages and activities of the lesson, including the starter task, anchor task, key learning message, and opportunities for children’s methods and practice
- the resources in the learning environment must directly reflect and support the key learning for a topic.

A consistent structure in planning – delivery – bookwork – environment will provide children with a structured, organised and supported learning experience.

2. Planning

The planning process will consist of three stages – long-term, medium-term and short term planning.

Long term plan

2017/18 MNP Scheme of Work

Week Beginning	wk	YEAR 3	YEAR 4	YEAR 5	YEAR 6	Notes				
19/09/2017	1	Ch 1 - Numbers to 1000	Ch 1 - Numbers to 10 000	Ch 1 - Numbers to 1000 000	Ch 1 - Numbers to 10 Million (plus SATS directed teaching / intervention)					
19/09/2017	2									
25/09/2017	3									
02/10/2017	4					Ch 2 - Addition and Subtraction	Ch 2 - Addition and Subtraction	Ch 2 - Addition and Subtraction	Ch 2 - Four Operations on Whole Numbers (plus SATS directed teaching / intervention)	Friday 6 Oct 2017 - Transform Inset Day
09/10/2017	5									
16/10/2017	6									
HALF-TERM										
30/10/2017	7	Ch 3 - Multiplication and Division	Ch 3 - Multiplication and Division	Ch 3 - Multiplication and Division	Ch 3 - Fractions (plus SATS directed teaching / intervention)					
06/11/2017	8									
13/11/2017	9					Ch 4 - Further Multiplication and Division	Ch 5 - Graphs	Ch 4 - Word Problems	Ch 4 - Decimals	
20/11/2017	10									
27/11/2017	11	ENTERPRISE WEEK - Incorporate work on graphs, time, percentages, money, etc				Mon 4th to Fri 9 Dec 2017 - Enterprise week				
04/12/2017	12	Ch 10 - Picture Graphs and Bar Graphs	Ch 7 - Time	Ch 5 - Graphs	Ch 7 - Percentages (plus SATS directed teaching / intervention)					
CHRISTMAS HOLIDAYS										
08/01/2018	14	Ch 11 - Fractions	Ch 4 - Further Multiplication and Division	Ch 6 - Fractions	Ch 5 - Measurements Ch 10 - Area and perimeter Ch 11 - Volume Ch 12 - Geometry (plus SATS directed teaching / intervention)					
15/01/2018	15									
22/01/2018	16									
29/01/2018	17					Ch 9 - Money	Ch 7 - Decimals	Ch 7 - Decimals	Ch 9 - Algebra Ch 13 - Position and Movement (plus SATS directed teaching / intervention)	
05/02/2018	18									
12/02/2018	19									
HALF-TERM										
26/02/2018	20	Ch 5 - Length	Ch 6 - Fractions	Ch 7 - Decimals	Ch 7 - Decimals (plus SATS directed teaching / intervention)					
05/03/2018	21									
12/03/2018	22	Ch 6 - Mass	Ch 8 - Decimals	Ch 8 - Percentages	Ch 8 - Ratio Ch 14 - Graphs and Averages (6 lessons)					
19/03/2018	23	Ch 7 - Volume								
EASTER HOLIDAYS										
16/04/2018	24	Ch 9 - Time	Ch 10 - Mass, Volume and Length [12 lessons] + Ch 11 - Area of Figures [6 lessons]	Ch 9 - Geometry Ch 10 - Position and Movement Ch 11 - Measurements	Ch 15 Negative Numbers [3 lessons] SATS DIRECTED TEACHING AND INTERVENTIONS (resourced from various sources) SATS					
23/04/2018	25									
30/04/2018	26									
07/05/2018	27									
14/05/2018	28									
21/05/2018	29				Bank Holiday - Monday 7 May 2018					
HALF-TERM										
04/06/2018	30	Ch 12 - Angles Ch 12 - Angles [2 lessons]	Ch 12 - Geometry	Ch 11 - Measurements	Preparing for Transition					
11/06/2018	31									
18/06/2018	32	Ch 13 - Lines and Shapes		Ch 13 - Position and Movement + Ch 14 - Roman Numerals		Ch 12 - Area and Perimeter Ch 13 - Volume	4 July - Y5 & 6 Visit to Edale (Residential)			
25/06/2018	33	Ch 13 - Lines and Shapes								
02/07/2018	34	Ch 14 - Perimeter of Figures								
09/07/2018	35	Buffer time		Buffer time		Ch 14 - Roman Numerals				
16/07/2018	36	Buffer time	Buffer time	Buffer time						
23/07/2018	37									

Medium term plan



Pear Tree – Maths Medium Term Plan (Learning sequence)

Topic: _____ Year Group: _____

Week beginning: _____

Topic learning outcome
(e.g. addition within 10 000)

Lesson	Lesson focus and key learning	Fluency focus
Lesson 1		
Lesson 2		
Lesson 3		
Lesson 4		
Lesson 5		
Lesson 6		
Lesson 7		
Lesson 8		
Lesson 9		
Lesson 10		
Assessment		

Medium term planning must consider the most effective way to sequence a topic to ensure that an appropriate level of scaffolding is provided. The medium term planning also indicates how long a topic will take to complete and any assessments which may take place during the topic.

Weekly planning



Pear Tree Community Junior School Weekly Maths Planning

Class:	Year:	Weekly Outcome (Key Learning Goals): <i>Impact on Progress</i> <i>What will pupils know or do better?</i>
Date:	Week Number:	
Topic:	Chapter:	

C		L				P
Challenge <i>How will you challenge learners to succeed?</i> <i>EAL/SEND?</i>		<i>DIRT Starter (5 mins)</i>	<i>Introduction</i> <i>Demonstration/practical</i> <i>(10 mins)</i>	<i>Anchor (in Focus) Task & Teacher</i> <i>Input (20 mins)</i>	<i>Guided Practice and</i> <i>Differentiation (20 mins)</i>	
Day	Deepening thinking Interdependence Independence Resilience	Journaling (approx. 5 mins across all sections)				Lesson Outcome – CLIP it all together
M	LO: Seeds Grow Flourish					
T	LO: Seeds Grow Flourish					
W	LO: Seeds Grow Flourish					
Th	LO: Seeds Grow Flourish					
F	LO: Seeds Grow Flourish					

Weekly planning must specify the activities and content in each lesson stage, and resources and representations to help children to learn.

This planning should show:

- the progress in learning during the lesson;
- key questions to direct children towards a specific and key learning message;
- misconceptions and mistakes that children could make and how these will be challenged.

3. Teaching and Learning / Pedagogy

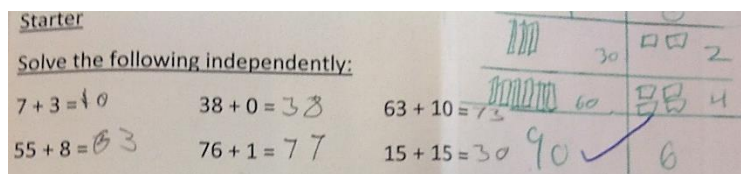
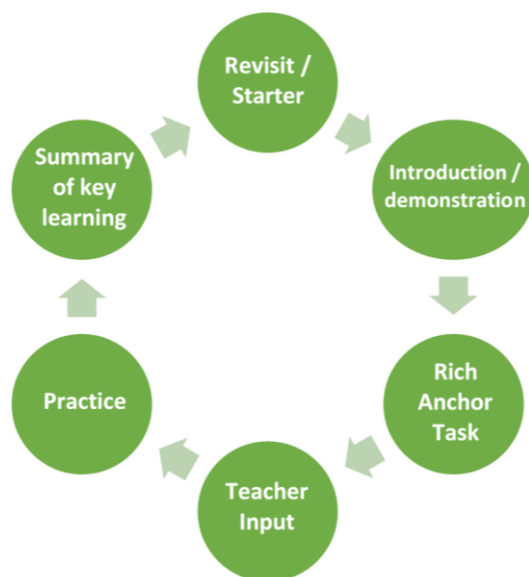
As shown in the weekly plan, the following lesson stages are expected:

Stage 1 – Starter / Revisit (≈5 min)

The purpose of this stage is to make connections between lessons so that children understand how a concept develops rather than seeing each lesson as a separate learning experience.

Possible activities for this stage:

- a brief discussion of what was covered in previous lessons that link to the topic
- revisit of an example to consolidate understanding from a previous lesson
- a task for children to complete individually to check understanding of a concept from a previous lesson
- the starter task for a lesson could be the ‘individual practice task’ from the previous lesson – this will help to build continuity between each lesson.



Stage 2 – Introduction / Demonstration (≈10 min)

The purpose of this stage is to give children a broad idea of what the lesson will be about and what they will be learning – i.e. “the big picture”.

Using a demonstration at the start of a topic is an effective way to hook children into the topic and to motivate and inspire. They provide children with a practical and physical experience of the concept to be explored. Demonstrations are not expected in every lesson.

Possible activities for this stage:

- A demonstration showing a similar activity to that in the anchor task (e.g. setting up a sales stall at the front of the class and asking children to work out which stall is cheaper for a number of items).
- A physical activity (e.g. identifying shapes around the school; exploring sorting by lining up)

Stage 3 – Rich Anchor Task and Teacher Input (≈20 min)

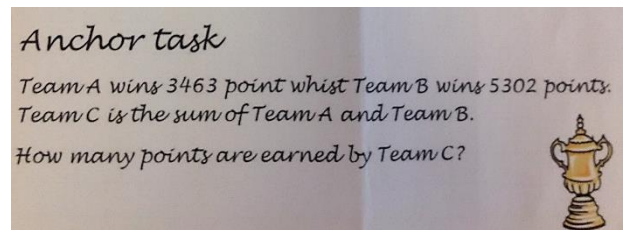
This stage involves two main activities:

- *Anchor task* - children attempting to solve an interesting problem using their existing knowledge or by discovering and trying new methods
- *Teacher input* – the teacher draws together the methods used by the children, challenges any mistakes or misconceptions, and then presents a clear learning message or chosen method.

Anchor task

Children should be able to complete this task collaboratively so that they can share and learn new ideas and ways of working. While children are working on the anchor task, the teacher's role is:

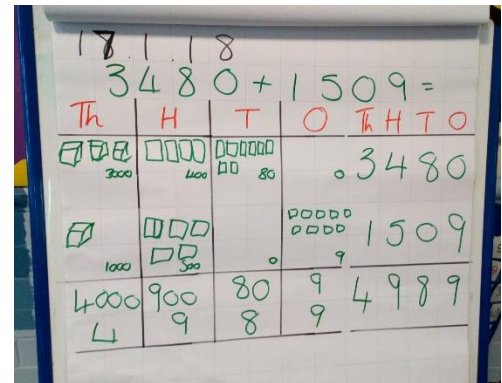
- to observe the methods that children are using
- to observe any prevalent misconceptions or mistakes that are made
- to ask probing questions to challenge or direct methods and understanding



Teacher input

Once the anchor task is complete, the teacher should model and prioritise a specific method or learning message which they want the children to understand. The teacher input should:

- celebrate, highlight and draw together different methods and representations [predicting what methods children will come up with and having these prepared (e.g. on flipchart paper) will help to ensure that the lesson pace is not compromised during this discussion]
- address any misconceptions or mistakes the teacher has observed
- explicitly state the key learning message or method that the children must focus on for the remainder of the lesson.



A further worked example

Once the teacher input is complete, children should be given a further worked example to complete to demonstrate their understanding:

- children who complete this successfully should be moved on to the practice questions.
- children who have not mastered the worked example (and, hence, the key learning message) should be given additional support (e.g. by being brought back to the front of the class for additional teacher input).

Stage 4 – Practice (≈20 min)

There are two different practice tasks:

- *Paired practice* – it is important for children to initially practice the key learning message / method in pairs or groups so that they can check and challenge their understanding
- *Individual practice* – this should take place after the paired practice and gives the teacher an opportunity to check how well each child has understood the key learning. The starter task for a lesson could be the individual practice from the previous lesson – this will help to build continuity between each lesson.

Stage 5 – Summary of key learning

The purpose of this stage is to summarise the key learning message / method for the lesson to ensure that all children understand what the main point of the lesson has been.

Possible activities for this stage:

- The teacher provides a verbal or written summary of the key learning and makes reference to specific flipchart notes or slides
- Children are invited to the front of the class to share their understanding of the key learning
- Children journal their key learning and reflections in their workbooks

4. Bookwork structure

Bookwork structure MUST reflect the structure and activities of the lesson. This will ensure that children organise their work in a way that is consistent with how the lesson was taught. The picture below shows an example of a bookwork structure that reflects all of the lesson components:

DIRT starter task with space alongside for children to record their working

Anchor task

Child's working / methods on the anchor task

Teacher's preferred method and key learning message for the lesson

A further worked example (based directly on the teacher's method / key learning message)

Child's solution for the further worked example

Paired / individual differentiated practice tasks

Where possible, try to keep each lesson on a double page spread so that it is easy for children to access previous learning and lesson.

5. Environment

The learning environment should provide another useful resource to support the children's learning. The environment should contain two types of resources:

1. resources that support general strategies (e.g. number line; place value grid)
2. resources that directly reflect current learning (e.g. notes of recent lesson contents).

Below is a description of possible resources and the importance of these for supporting learning:

NUMBERLINE

All classrooms should have a *large number-line* displayed, preferably positioned on a wall so that it is visible from everywhere in the classroom. The number-line should include the numbers that are relevant to the curriculum for your year group – for example, in Y6 classrooms the number-line should include both positive and negative numbers as this is the curriculum focus in this year.

Children must be encouraged to use this number-line regularly to help them with their calculations.

100 SQUARE

All classrooms should have a large **100-square** displayed, preferably positioned on a wall so that children can access it. If possible, counters / magnets should be attached to the 100-square so that children can use the counters to count along. As with the number-line, children should be encouraged to use the 100-square to help them with their counting and calculations.

TIMES-TABLE SQUARE

Every classroom should have a large grid / square (see below) showing the timetables relevant to the curriculum for your year group – for example, Year 2 would have only include the columns for the 2, 3, 5 and 10 times tables (up to 100).

	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

This grid should be accompanied / surrounded by notes / posters that prompt children to look for the patterns* in the times-tables. For example, in the 9 times table the digits always add up to 9; numbers in the 5 times table always ends with a 5 or a 0.

*[Helping children see the patterns in the times-tables ensures a deeper level of understanding than just getting them to learn them off by heart, and also gives them something to remember when trying to recall the times-tables]

TIMES-TABLES

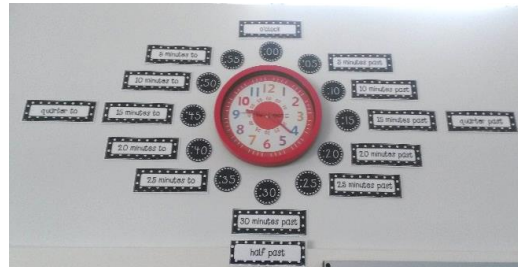
Posters of individual times-tables are also useful –children must be continually prompted to use the posters to help them in their work. These posters should also be accompanied by prompts / questions about the patterns in the times-tables.

There should be several laminated copies of the times-tables available in a folder / envelope on the working wall or stuck to the desks so that they are easily accessible.



CLOCK

There must be a clock in every classroom and the clock must be surrounded by labels / posters that highlight the specific curriculum requirements for time. For example, in Year 2 the clock should include/be surrounded by the labels '5 past', '10 past', as well as the labels 'quarter-past', 'half-past', etc. As children move from one classroom to the next it should be obvious to them what their new learning for the topic of time will be.

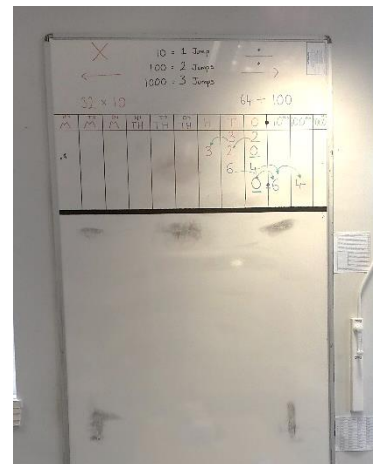


DEDICATED PLACE-VALUE RESOURCE

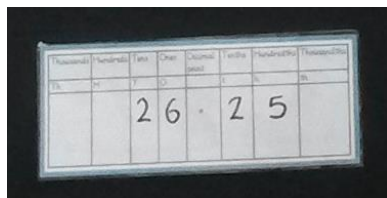
Place value is a central and crucial component of mathematical understanding and needs a dedicated resource or space in the classroom. The resource must be something that children can actively use to help them with problems involving place value.

e.g. A dedicated place-value board with magnetic counters;

e.g. A dedicated place-value arrangement on the working wall with Velcro-stick-able numbers



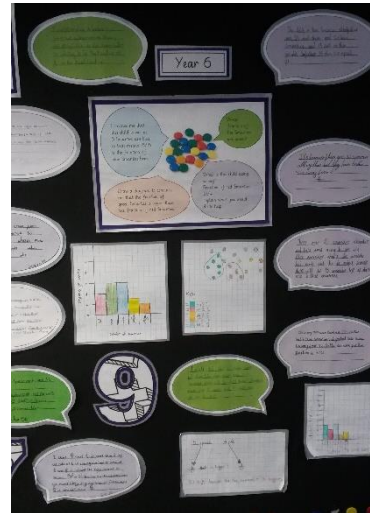
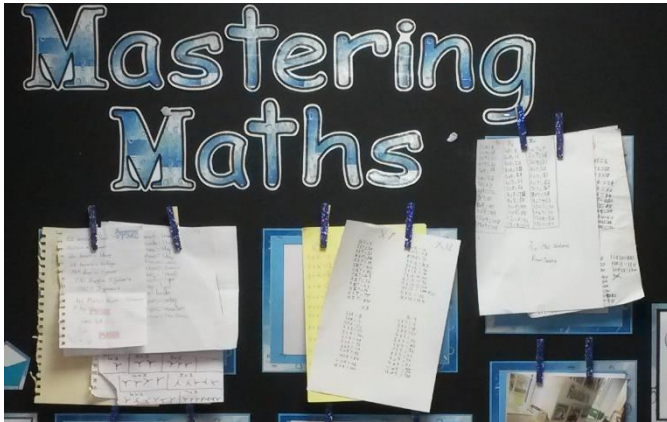
e.g. a laminated place value poster that children can write on



CHILDREN'S WORK

Displaying children's work around the classroom (or across the room on a 'washing line') serves three functions:

1. to celebrate their work
2. to give children the opportunity to engage with other children's work / methods
3. to demonstrate to any outside visitors what work the children have been doing.

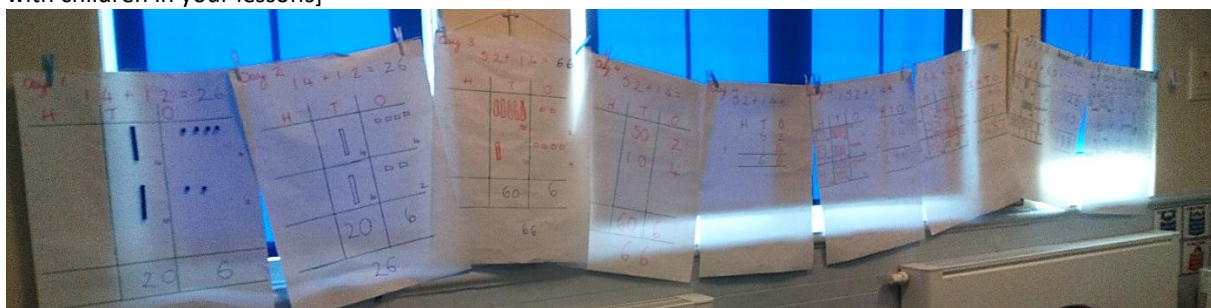
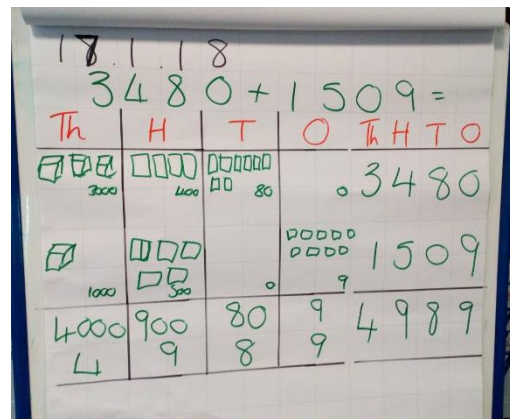


LESSON NOTES

All learning environments should have an up-to-date display of lesson notes that evidence the work that the children are currently working on. This could take the form of stuck up pieces of the flip-chart paper that you have written down notes, or examples, or methods during your teaching. It could also take the form of printed out versions of your SmartNotebook slides.

These notes will give children a vital resource to refer to during class if they get stuck on a problem. It also gives you a resource to refer your children to they need help, or if they need a reminder of a concept you have already taught.

[It also signals to an outside visitor what you have been doing with children in your lessons]



WORKED SOLUTIONS

Where possible, try to include full worked solutions of any guided or individual practice that you ask the children to do. Children can then be encouraged to self-check and self-correct their work by comparing their work to the worked solutions. This will help your children to develop independence in their learning.

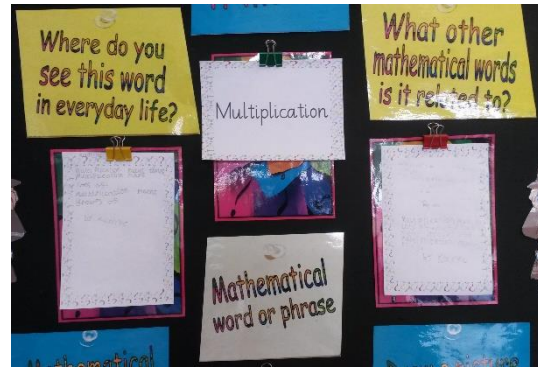
VOCABULARY RELEVANT TO THE CURRENT TOPIC

For children who come from a foreign language background, understanding of vocabulary and terminology present significant barriers to accessing and understanding mathematics. As such, it is essential that you display key terms on the working wall together with explanations of the meanings of these.

CHALLENGE / EXTENSION TASK OR THE OPPORTUNITY FOR PROBLEM-SOLVING

You may want to dedicate a section of your working wall to a challenge task or a problem-solving task. Children who finish their work quickly can be encouraged to attempt the challenge task.

However, the challenge task is not only for 'rapid graspers'. Rather, all children should be encouraged to attempt the challenge task at a suitable time (e.g. at break; or during a pause in a lesson).



6. Fluency

Fluency is a crucial skill and underpins successful problem solving and reasoning. Children who are not able to perform calculations fluently and who are not able to access their times-tables facts quickly tend to work much slower. They also tend to struggle with problem solving and reasoning questions because they stumble too much with the basic calculations and, so, cannot access the harder parts of these types of questions.

To ensure that the children at Pear Tree are confident in their fluency skills, it is essential that every teacher dedicates time every week to working on fluency problems, including:

- Times-tables
- Basic arithmetic problems (e.g. addition and subtraction)
- Memory games that help children strengthen their working memory and support memorization of number facts

Friday quiz day!

The first 10-15 minutes of each Friday lesson must be dedicated to a mini- fluency quiz. Options for this quiz include:

- Times-table quizzes
- Arithmetic quizzes – this could include focus on the four basic operations as well as other operations like converting from fractions to decimals to percentages, or simplifying fractions.

Results from weekly tests will be recorded on a central recording sheet. The Maths Lead will use this sheet to check the progress of each class. Recording sheets for each class should be displayed on the working wall so that children can see the progress that they are making.

Where possible, the contents of the quiz should reflect the fluency skills that children have been working with during the week.

www.myminimaths.co.uk provides a useful collection of fluency resources (for both times-tables and arithmetic) that teachers can use.

7. Assessment

Formal test-type assessments

All year groups are to conduct formal test-type assessments using *Puma resources* at the end of every term. The data from these tests is to be used to track children's progress and to inform targeted intervention strategies and groups.

Other sources for Maths assessment tasks:

- Test base
- NCETM Mastery Examples
- White Rose Small Steps resources

Assessment for Learning (AfL)

Teachers must conduct AfL during lessons to identify methods, mistakes and misconceptions that children encounter as they work. These observations should:

- refocus teaching in a lesson (e.g. to discuss a child's method that you had not been directly planned for)
- inform support activities for specific children or groups (e.g. for children who you have noticed have not properly grasped a concept)
- inform planning for future lessons (e.g. to directly challenge a misconception that has occurred in a previous lesson).

Marking and Feedback

Verbal feedback

Verbal feedback is the first point of marking. This does **not** need evidencing in books, but should be an active part of every teacher's practice on a daily basis and visible during lesson observations.

Feedback in books

All work done by the children in their books (e.g. attempted methods for the anchor task; guided practice answers and working) must be ticked, checked for accuracy, and checked to see if the methods used are consistent with the key learning intention for the lesson.

DIRT Starter tasks

There should be at least three DIRT Starter tasks per week. These tasks are based on observations of key challenges, mistakes or misconceptions from a lesson (gauged through AfL or via marking of books) and provide next steps for children.


The purpose of a DIRT task is three-fold:

1. to assess how well children have understood a concept or to challenge a common mistake or misunderstanding that children made in their class or bookwork;
2. or to provide children with the opportunity to remind themselves of previous learning;
3. or to practice a skill that will be useful during the lesson (e.g. specific times-tables or arithmetic skills to support fraction work);


Tasks can be differentiated relating to the Learning Challenge or can be a group/whole class task relating to a challenge or target.

The DIRT task must be acknowledged by the teacher. This can be as simple as a tick or face but shows that it has been looked at. This completes the feedback loop.


Example DIRT STARTER TASK [check understanding of a concept]

Teacher - What we discussed	Child - What I can do now ...
Finding equivalent fractions $\frac{2}{3} \quad \frac{9}{12}$ Are these fractions equivalent? Explain how you know.	

Example DIRT STARTER TASK [reminder of previous learning]

Teacher - What we discussed	Child - What I can do now ...
Yesterday we explored the following method: $\begin{array}{r} 18 \\ + 9 \\ \hline 27 \\ \hline 1 \end{array}$ Explain how to use this method.	

Example DIRT STARTER TASK [practice a skill]

Teacher - What we discussed	Child - What I can do now ...
Remind yourself of the 4 and 10 times table - we will use these in today's lesson: Calculate the following: $10 \times 2 =$ $4 \times 7 =$ $8 \times 4 =$ $10 \times 12 =$ $4 \times 10 =$ $10 \times 20 =$	

Feedback loop

Children who make basic calculation errors should be given another opportunity to correct their work, and must be prompted to do so by the teacher. Children must be given the time to respond to the teacher's prompts (e.g. at the start of the next lesson) and teachers must check and signal that a child has done the necessary corrections accurately. This will ensure that the feedback loop is closed and has been successful. Feedback loops that are not closed do not help children to move their understanding forward. Children whose bookwork shows that they have clearly not understood the key learning for a lesson should be targeted for further teaching or intervention during the next lesson.

If a comment needs to be made about an area that is not covered in the Learning Challenge, such as a target specific to that child, this can be added using a **purple pen** and a **wish bubble**. This is not a requirement.



MATHS @ PEAR TREE

'Every Child
Counts'