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 key learning message, modelling and opportunities for children's methods and practice and further challenge and/or reasoning questions
- 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

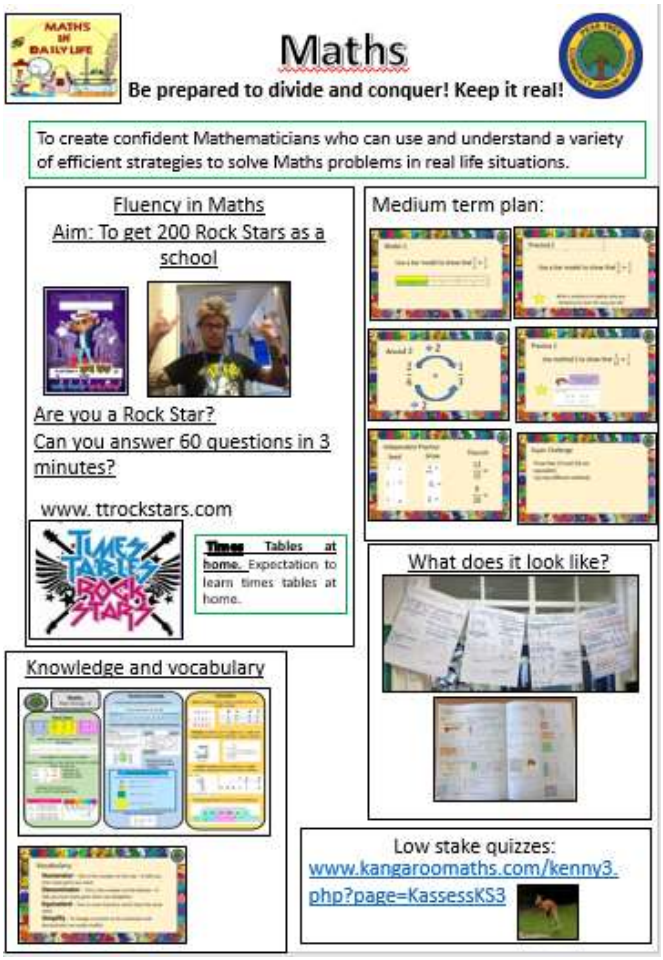
Week	Year 3	Year 4	Year 5	Year 6
1	**Chapter 1** Numbers to 1000 8 lessons	**Chapter 1** Numbers to 1000 14 Lessons	Chapter 1 Numbers to 1 million 12 Lessons	**Chapter 1** Numbers to 10 Million 7 lessons
2				
3	**Chapter 2** Addition and subtraction 23 lessons			**Chapter 2** Four Operations on Whole numbers 22 lessons
4		**Chapter 2** Addition and subtraction to 10000 17 Lessons	Chapter 2 Addition and subtraction 10 Lessons	
5			Chapter 3 Multiplication and division 19 Lessons (cont. after break)	
6				
7				**Chapter 3** Fractions 16 lessons
29.10.19 Half term				
8	**Chapter 3** Multiplication and division 15 lessons	**Chapter 3** Multiplication and Division 18 Lessons	Continued Chapter 3 Multiplication and division	Fractions continued
9			Chapter 4 Word problems 4 Lessons	
10			Chapter 6 Fractions 18 Lessons	**Chapter 4** Decimals 14 lessons
11	**Chapter 4** Further multiplication and division 11 lessons			
12		**Chapter 4** Further multiplication and division 18 lessons (cont. after break)		
13				**Chapter 7** Percentages 5 lessons
14	Enterprise week?	Enterprise week?	Enterprise week?	Enterprise week?
24.12.19 Christmas holidays				
15	**Chapter 11** Fractions 30 lessons	**Continued Chapter 4** Further multiplication and division	Chapter 7 Decimals 15 Lessons	**Chapter 5** Measurements 6 lessons

16				**Chapter 10** Area and perimeter 6 lessons
17		**Chapter 6** Fractions 13 Lessons		**Chapter 11** Volume 5 lessons
18			Chapter 8 Percentages 3 Lessons	**Chapter 12** Geometry 12 lessons
19			Chapter 9 Geometry 13 13 Lessons (cont. after break)	
20				
18.02.20 Half term				
21	**Pre teach** multiplication and division to support measures (4 days)	**Chapter 8** Decimals 17 Lessons (use two days from previous week).	Continue Chapter 9 Geometry	**Chapter 9** Algebra 1 week 10 lessons
22	**Chapter 5** Length Lessons 1-6 (use 1 day from previous week)		Chapter 10 5 Lessons	
23	**Chapter 6** Mass Lessons 1-5		**Pre teach** multiplication and division to support measures (4 days)	**Chapter 13** Position and Movement 10 lessons
24	**Chapter 7** Volume Lessons 1-7 (Merge lessons ½, ¾)	**Chapter 10** Mass, Volume and Length 12 lessons	Chapter 11 Measures 14 Lessons	
25	**Chapter 8** Money 14 lessons			**Chapter 8** Ratio 9 lessons
26				
27		**Chapter 7** Time Lessons 1-5		**Chapter 14** Graphs and Averages 12 lessons
15.04.20 Easter holidays				
28	**Chapter 9** Time 20 lessons	**Chapter 9** Money 8 Lessons	Chapter 12 Area and perimeter 11 Lessons	Graphs and Averages continued
29				

			Add multiplication pre-teach if needed	
30		**Pre teach** multiplication and division (4 lessons)	Chapter 13 Volume 10 Lessons	**Chapter 15** Negative Numbers 3 lessons
31		**Chapter 11** Area of Figures 6 Lessons (Use 1 lesson from week before)		SATS DIRECTED TEACHING THROUGH OUT
27.05.20 Half term				
32	**Chapter 12** Angles 7 Lessons (use two days of next week)	**Chapter 12** Geometry 10 Lessons	Chapter 5 Graphs 7 Lessons	
33	**Chapter 13** Lines and shapes			
34	8 Lessons	**Chapter 13** Position and Movement 5 Lessons	Chapter 14 Roman Numerals 2 Lessons	Preparing for Transition
35	**Chapter 14** Perimeter 10 Lessons	**Chapter 14** Roman Numerals 2 Lessons	*Buffer time*	
36	Add addition pre-teach if needed	**Chapter 5** Graphs 5 Lessons	*Buffer time*	
37	**Chapter 10** Picture graphs and bar graphs 5 Lessons	*Buffer time*	*Buffer time*	
38	*Buffer time*	*Buffer time*	*Buffer time*	
25.07.20 Summer holidays				

Medium term plan and weekly plan

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. The medium term plan and weekly plan work hand in hand. The topic is planned in the form of a powerpoint showing how the topic develops/progresses and notes underneath each slide give details about scaffolding needed to support groups of children. An example of WAGOLL is provided to staff. This is on the Maths on a page document below:



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

Weekly powerpoints provide the detail of each lesson including key notes by slides if required, methods to be used by groups of children and resources. Powerpoints will have the following slides: Final destination (from Knowledge Organisers at the front of books), Key Vocabulary, Recap, Model 1, Practice 1, Model 2 and Practice 2 – ie a further model (GD) if needed for a concept, Independent Practice and a Super Challenge/reasoning/word problem.

See below for example:

Learning Objective:

Calculate equivalent fractions

Vocabulary:

Numerator – This is the number on the top – it tells you how many parts you want.

Denominator – This is the number on the bottom – it tells you how many parts there are altogether.

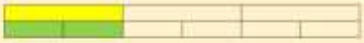
Equivalent – Two or more fractions which have the same value

Simplify – To change a fraction so its numerator and denominator are made smaller.

Recap:

Key Learning 1:

Use a bar model to show that $\frac{2}{6} = \frac{1}{3}$



Practice Question 1

Use a bar model to show that $\frac{6}{8} = \frac{3}{4}$

Write a sentence to explain why you divided your bars the way you did

Key Learning 2:

$$\frac{2}{6} \xrightarrow{+2} \frac{1}{3}$$

Practice Question 2

Use method 2 to show that $\frac{5}{15} = \frac{1}{3}$

Independent Practice

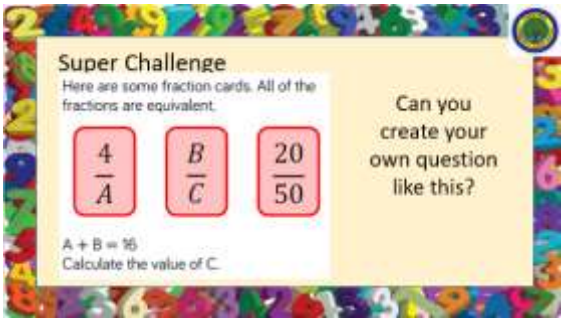
Seed

Grow

Flourish

$$\frac{12}{15} =$$

$$\frac{8}{20} =$$



These two planning documents should collectively provide:

- the progress in learning during the lesson for each group;
- 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 – Recap (≈2 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 – refer to washing line or Powerpoint slides
- revisit of an example to consolidate understanding from a previous lesson

Stage 2 – Model 1 and Practice1 (≈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/ Model 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. Modelling is expected in every lesson. Children are encouraged to take notes/ use notes provided by the teacher to support their understanding of a concept or model. This model will then be used as an aide memoir when children try a practice example following Model 1.

Stage 3 – Model 2 and practice 2 (≈10 min)

A further worked example

Once the teacher input is complete from Model 1, children should be given a further worked example to demonstrate their understanding. This will be a more challenging model and practice question linked to ARE or above.

- children who complete this successfully should be moved on to the independent practice.
- 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).
- On the spot marking is encouraged.

Stage 4 – Independent 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.

Stage 5 – Super Challenge/ reasoning/word problem

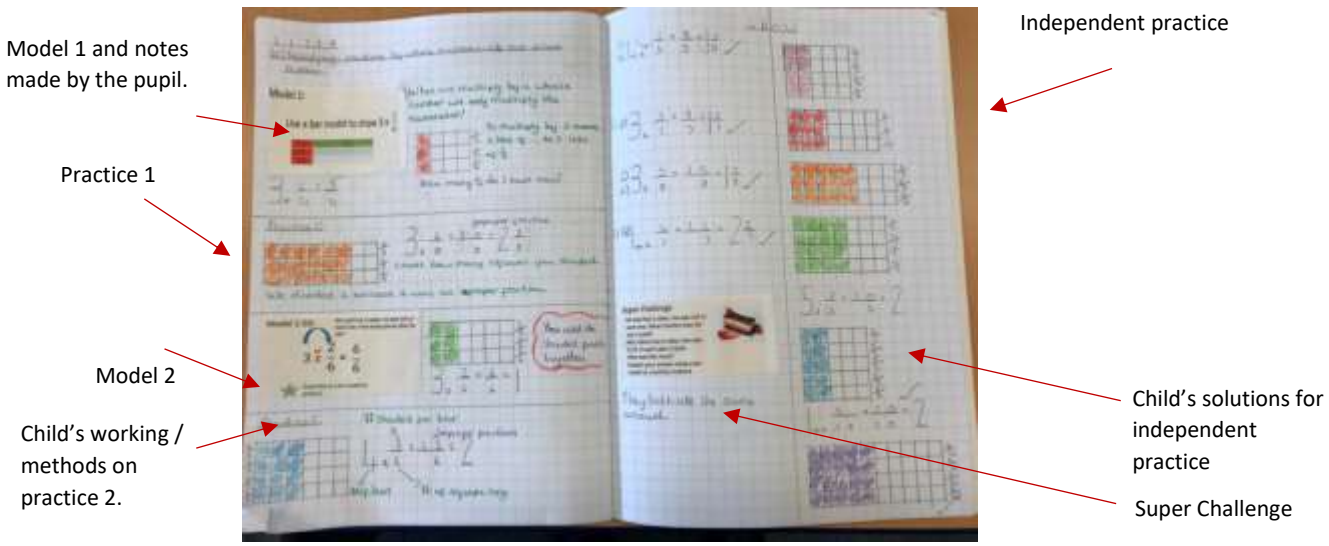
The purpose of this stage is to further challenge the children.

Possible activities for this stage:

- The children complete a challenge from Maths No Problem -In focus task
- Children complete a reasoning question from White Rose Maths
- Children complete questions from "myminimaths"

4. Bookwork structure -edit

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:



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

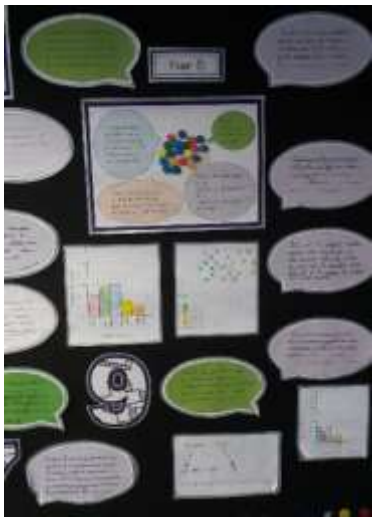
Place value is a central and crucial component of mathematical understanding and needs a dedicated resource or space in the classroom. The resource must be something that children can actively use to help them with problems involving place value.

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

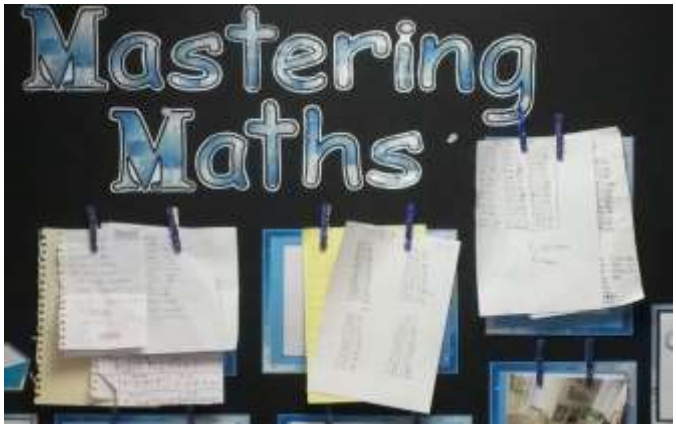
e.g. a laminated place value poster that children can write on

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.

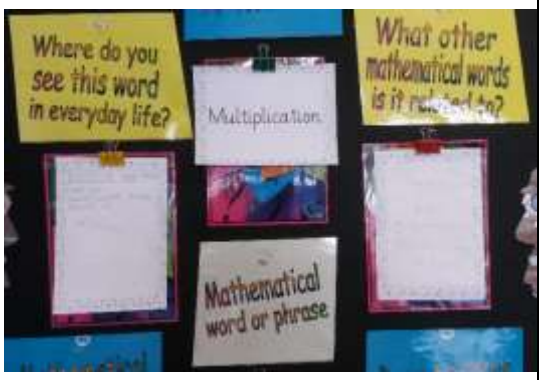
[It also signals to an outside visitor what you have been doing with children in your lessons]

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

Times Table RockStars!

During the week children will work on TTRockStars. They will take part in competitions in the arena, complete 60 questions in a 3 minutes and scores will be recorded. Pear Tree is aiming to have 200 RockStars – 200 children able to answer 60 questions in 3 minutes.

Other arithmetic quizzes will also take place – 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 must be ticked, checked for accuracy, and checked to see if the methods used are consistent with the key learning intention for the lesson.

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. ie If a child is struggling on a concept, "Pick up" is indicated on the book and support is given to the child/ an intervention as close to the point of completion as possible. This completes the feedback loop.

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. Children respond to feedback in green pen.

MATHS @ PEAR TREE

‘Every Child Counts’