

# Manor Community Primary School

## Mathematics Policy and Guidelines And Fluency Policy

### Introduction:

This policy is a statement of principles, aims and organisation for the teaching of Mathematics at Manor Community Primary School.

### Principles

Good mathematics teaching is lively, engaging and involves a carefully planned blend of approaches that direct children's learning. The pitch and pace of work is sensitive to the rate at which children learn while ensuring that expectations are kept high and progress is made by all children.

### Aims:

To develop pupils numerical skills so that they are efficient and confident in their approach to Mathematics in a wide range of contexts.

To introduce all pupils to a full range of mathematical knowledge, skills and concepts based on the New Maths Curriculum 2014 according to their stage development.

To give pupils opportunities to use and apply their knowledge, skills and understanding across all areas of their learning.

### Documents to be used by Teachers

(can be found on the network – Planning 2015 2016 – Maths)

- Programme of study for the Year document
- Stage Planning document
- Teachers medium term planning format
- Children's target sheet [simplified version of medium term plan]
- Assess and Review sheet [this has changed – children evaluation column now gone]
- End of Unit Assessment
- Weekly plan format [new format includes fluency, problem solving and reasoning]

### Programme of study for the Stage/ Year [POS]

#### Appendix 1

- This has all the Big Targets that need to be covered over the year.
- There is a separate document for each Stage/Year group.
- The relevant POS is kept at the back of each child's current ex. book
- To be used when children are working out how to solve a problem and which target achieve in order to support them in solving the problem. [e.g a maths problem linked to their creativity work]
- To design a maths learning journey for the maths targets linked to the year groups cross curricular topic
- Teachers will highlight at the end of each unit of work to indicate the children's learning and achievements on each Big Target

**Bold green** – indicates they achieved the target and are confident with it

**Slashes in green** – indicates they have some understanding but still need to work on it.

**Yellow** – teacher has delivered this but children need to work on this concept again to secure learning

## **Stage Planning**

### **Appendix 2**

- This document has the big targets from the Programme of study. Each target is broken down further into smaller steps called the Learning Challenges.
- Each stage ( eg : stage 1) aligns itself to Year 1 and so on.
- However some children may need to work on a stage below to meet their needs
- The teacher will use this document to plan a (learning journey) a medium term sheet and the children's target sheet

## **Teachers medium term planning**

### **Appendix 3**

- At the beginning of each term a new medium plan should be created and saved on the network in each teachers planning folder.
- Teachers will use this medium term plan to support their weekly planning.
- The medium plan will have a list of the Big Targets and the (small steps) Learning Challenges that will be taught that term / for that particular curriculum topic.
- The number of (smaller steps) Learning Challenges depends on the ability of the group.
- If during the assess and review sessions it is found that the children have no knowledge of the target – then irrespective of the learning challenges already on the target sheet the teacher needs to track back to a lower stage and make smaller Learning Challenges to work towards this target.
- Each set will have a different end goal towards the Big Target, depending on their needs. A more able set may achieve all the learning challenges to ensure they fully achieve the Big Target whereas a lower set may only go through a few of the learning challenges with the intention of revisiting this Big Target at a later date. Therefore teacher's must evaluate medium term plans for future records.

## **Children's target sheet**

### **Appendix 4**

- This will include the big target and the (smaller steps) learning challenges for each target
- There will a separate target sheet for each term
- The target sheet should have the Creativity/ Maths Problem on top.
- It should be highlighted green in light of Assess and Review and then highlight any targets not achieved yellow to show they are the focus and as new targets are achieved through lessons these should be highlighted in green – slashed for taught and nearly achieved or solid for small step achieved.
- This sheet will go home to parents at the start of the term to share the learning that will take place.
- At the end of the term the highlighted target sheet will go home again to show parents the progress made over the term and the areas the children still need to work on.

## **Assess and Review sheet**

### **Appendix 5**

- These sessions can take place at any time prior to the learning / teaching in order to identify the children's individual learning journey and starting point.

- The overarching target is displayed with all the learning challenges set out underneath. A range of examples linked to the LC are created on the sheet and the children complete these. They also evaluate their success against the learning challenges using faces.
- The children complete this sheet independently (or in small groups led by an adult) and show their understanding, knowledge and skills.
- The teacher will mark this sheet and use it to plan the Learning Challenges to match the needs of the children.
- There will be discussions with children about their faces and their confidence level on the Learning Challenges presented (especially if they put a smiley face but got the examples incorrect)
- The teacher will use this sheet to date and highlight the children's target sheets if they have achieved the Learning Challenge.

### **Weekly/Daily plan / Teaching Appendix 6**

- Weekly planning needs to be saved on the network at the end of the previous week.
- There will be a structure of what would be taught during the week but it may be updated daily with AFL notes and next day's lesson.
- Having assessed prior knowledge, the teacher will plan the lesson/activities for each group depending on their starting point.
- Some groups will work independently at the start of the lesson e.g. – solving a problem consolidating the learning challenge from the previous session. While the other groups are led by the Teacher or TA teaching or managing an activity.
- The daily plan will differ according to the needs of the children and the style of input needed.
- The plan will be based on the Learning Challenges linked to the target.
- Although many of the Learning Challenges are sequential they are not all found in one particular unit – at times you may need to provide a range of challenges from different areas of the POS to support understanding and/ or use and apply the targets you working on. [e.g Work on Number and the Number System may appropriately move on to decimals, which is in the fraction section of the POS]. Calculation may be linked to measure in order to use and apply basic calculation skills.
- There is no longer a need for differentiation to be planned on a daily basis as the children will move on to the next learning challenge, progressing closer to the mastery aspects over the teaching period. If children are not meeting the learning challenge then targeted support will be used in the following lesson.
- The style of the lesson can change -  
It may be a 3 part lesson (mental starter – teacher teaching - activities / tasks )

It can be group work – (groups working independently solving problems or investigations using and applying skills from learning challenges they are working on. Teachers working with groups to move them on to the next learning challenge.

- In a year group it is expected that most sets in a year group would be working on the same maths area e.g calculation/data/fractions/measure: but each set would be working at different LCs [small steps] during the week and possibly have different end points
- Each Learning Challenge requires a fluency task (no more than 8 questions) which then leads onto the children having to solve a problem solving activity/reasoning question.

### **Child Evaluation**

Children should evaluate their work daily at an appropriate level. At KS1 this may take the form of a face (smiling for confident/happy with their work, sad face for lack of understanding/unhappiness with their work).

By KS2 children should also briefly explain their self-evaluation: what did they enjoy? What did they struggle with? Do they need more help? Are they ready for a new challenge?

Children may also 'peer assess' when appropriate. This should be indicated with a 'PA' symbol and then a face/comment for their partner.

### **Marking**

The teacher will use a range of symbols to indicate how the child has worked in that particular lesson and found the work:

- I – Independent Work (lower school and some children with learning difficulties in upper school)
- GW – Group Work
- S – Supported Work
- VF – Verbal Feedback given (but write a note briefly explaining what the verbal feedback was).
- C – Corrected

The teacher will tick any work that is correct but will indicate any incorrect work with a dot. The child will be given time to correct the answer by writing the new answer next to the dot. Once corrected, the teacher will use the symbol 'c' to highlight this. If the learning challenge has been achieved at point of teaching this should be highlighted solid yellow or if they have nearly achieved the L.C this should be slashed yellow. When they go on to demonstrate that this learning is secure within a problems solving activity or reasoning question, the target sheet will be highlighted green. Also any extension challenge or reasoning question given should be called a challenge and the word challenge should be highlighted yellow.

Additionally, the teacher will leave a small comment on the child's work indicating how well they have done with that particular piece of work.

- Outstanding progress / outstanding effort
- Good progress / Good effort
- You tried hard today
- Do you feel you have achieved as much as you could have done today?

Also, this gives the teacher an opportunity to ask the child a question about their learning if applicable.

### **Reflection Time**

Every day children should be given 5-10 minutes (usually after the mental/oral starter) to reflect on their previous learning, respond to the teacher's comments and prompts and make corrections to their work. Teachers and Teaching Assistants should use this time to talk to children about their learning.

### **Presentation of work in books.**

- At KS2 work should be dated with the short date 4.9.2014 and dots to be used as shown. KS1 children will write the date – 4<sup>th</sup> September 2013.
- From Yr 3 – 6 all dates should be underlined with a single line using a ruler.
- At KS1, the LC should be printed on labels and stuck in the book under the date or at the end of the piece of work.
- At KS2 the learning Challenge is either written by the child or typed on the worksheet/task card.

- Leave a line after the LC.
- If the work has a title, this should be aligned to the left except graph work that has a central title.
- To create a margin all maths work starts 2 squares away from the left hand side of the page.
- Once work is completed and marked, the children will complete any corrections then leave a line to rule off their work. Leave a line before writing the new date.
- If a w/sheet is used these should be trimmed and stuck in neatly in the appropriate chronological order.
- All general work should be completed in pencil unless otherwise stated in a child's individual SEN provision.
- All work should be neat following the school handwriting policy.
- Each square contain one digit and decimal points go on the line between the two digits not in their own square.
- Fractions use the middle line between the squares with one number directly above the other.
- Any words written in the maths books should flow across the lines of the grid. (not one letter a square )
- Any mistakes should be crossed out neatly with a single line and the new word or number written next to it. (we suggest no rubbers unless needed for graphs and diagrams.)

### **Resources:**

- Resources are mainly stored in the Maths cupboards but necessary resources for number and calculation strands should be permanently stored in each classroom. The class teacher will need to ensure that appropriate resources for each of the other strands are available in the classroom when needed and returned to the central store at the end of each topic [ please contact subject leaders if you have any problems with resources]
- Teachers use a wide range of apparatus to model and demonstrate skills and concepts and pupils are supported in their learning by having access to practical resources.
- Each class should have an exciting and engaging maths area equipped with manipulatives / challenge cards with problems or investigations / games that children can access independently consolidate their learning.
- There will be an annual review of resources and identified needs addressed

### **Classroom displays / areas**

- Each class should have a maths working wall – display key vocabulary / examples of skills or examples linked to challenges taught as a point of reference for the children plus a chart linked to tables and other known facts which records each child's achievement.
- For each new Big Target, small steps should be displayed with the key target and the LC they need to work on to achieve the target.
- The children could attach their names or photos to show their progress over the week.
- Each class should have a maths area with a range of resources that children can access independently to support their learning.

## Homework

- Children will be given maths homework each week. This will generally link with current work taught during the week but can be used as revision for previous work covered.
- There will also be problem solving or investigation activities where children can use their mathematical skills learnt.

## Organisation in Upper and Lower school

- The children in Yr 1 will be taught in mixed ability whole classes for the first term. From term 2 they will be taught in ability sets.
- Yr 2 – 6 are taught in ability groups from term 1.

## Roles and responsibilities:

It is the role and responsibility of each class teacher:

- To plan and deliver the Mathematics / Foundation Stage curriculum according to the New National Curriculum/ Early Learning Goals.
- To plan and teach the needs of the children within their class or set
- To monitor the progress of children within their class, ensure groups are fluid to cater to the needs of the children.
- Input data every term.
- To raise issues with the Subject Leader when necessary.

## The role and responsibility of the subject leader:

To plan for and sustain development and improvement in the teaching and learning of Mathematics through:

- Leading / organising staff development
- Ensuring continuity and progression through monitoring of planning, books and lessons
- Supporting the development of record keeping, assessment and target setting systems in Mathematics
- Evaluate data – note progress and achievement across the school / KS

## Monitoring

Books	SLT – Fortnightly (Monday)	<u>Process books</u> <ul style="list-style-type: none"><li>- All book scrutiny forms to be given back to teachers and teachers to sign they received the feedback</li><li>- Documents to be added to the teachers appraisal documents.</li><li>- Email copies to respective phase leader or subject leader</li><li>- The person monitoring should leave a note could be left in the child's book and say who checked the book</li></ul> <u>Plans</u> <ul style="list-style-type: none"><li>- All planning scrutiny forms to be given back to</li></ul>
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		teachers with feedback
Plans	Phase leader - fortnightly Subject leader – regularly	- Email forms to subject leader / year group leader
Environment	Phase leader - fortnightly Subject leader – termly	<u>Environment</u> - All planning scrutiny forms to be given back to teachers with feedback - Email forms to subject leader - A checklist will be compiled to support teachers of what should be on displays
<u>Notes</u>		
<ul style="list-style-type: none"> <li>- New monitoring forms to be discussed and drawn up linked to new expectations/standards</li> <li>- Feedback to be given within 24 hours</li> <li>- Any issues / concerns to become the main focus for next scrutiny and appraisal</li> <li>- Any groups led by HLTA's or TA's need to be monitored</li> </ul>		

**Please find attached below, the fluency in maths policy**

## Manor Community Primary School

### Fluency in Maths Policy

#### What is fluency?

A good definition of fluency is “the ability to do something in a way that seems very easy.”

#### What is fluency in mathematics?

This means having good recall of key facts such as times tables and number bonds and using them confidently within both mental and written arithmetic. Pupils need a range of mental strategies, which they can select from according to the numbers involved, to avoid wasting time on written methods when mental might be quicker but they also need to be confident with formal algorithms for all 4 operations when calculations are too difficult to do mentally. All this is in order to enable the child to concentrate on reasoning and problem solving rather than on basic mathematical skills.

#### Intelligent Practice

Since the inception of the new curriculum, many schools have interpreted the need for fluency as a need for repeated practice of formal algorithms. However NCETM document June 2016 rejects this in favour of “Intelligent Practice” which both reinforces pupils’ procedural fluency and develops the conceptual understanding.

#### How do we achieve this at Manor?

When the children are introduced to new skills, for example - written subtraction, they would not have to answer more than 5 questions at the same level of difficulty successfully before moving on to demonstrate their understanding through reasoning or problem solving.

Example:

L.C.I can subtract 2 3 digit number using the column method.

$$\begin{array}{r} 1264 - 156 = 1108 \\ \text{HTU} \\ 25\cancel{4} \\ 156 \\ \hline 108 \end{array}$$

$$2665 - 264 = 401$$

$$\begin{array}{r} \text{HTU} \\ 665 \\ 264 \\ \hline 401 \end{array}$$

$$3544 - 112 = 432$$

$$\begin{array}{r} \text{HTU} \\ 544 \\ 112 \\ \hline 432 \end{array}$$

Great! Thankyou

$$4253 - 162 = 4091$$

$$\begin{array}{r} \text{HTU} \\ 38\cancel{5}3 \\ 162 \\ \hline 4091 \end{array}$$

This morning outside Manor 184 cars were parked along Keary Road. In the afternoon, 145 cars moved. How many cars were left parked on Keary Road?

ncil have placed wanscombe but, 5 of the bins are many bins are the table.

$$1104 - 145 = 959$$

$$\begin{array}{r} \text{HTU} \\ 17\cancel{4} \\ 145 \\ \hline 0959 \end{array}$$

$$2413 - 175 = 2238$$

$$\begin{array}{r} \text{HTU} \\ 34\cancel{1}3 \\ 175 \\ \hline 2238 \end{array}$$

wow! Thankyou

$$3245 - 154 = 3091$$

$$\begin{array}{r} \text{HTU} \\ 24\cancel{5} \\ 154 \\ \hline 091 \end{array}$$

Challenge:

Reasoning challenge:

Are these sums true or false:

$$126 - 113 = 13$$

$$336 - 223 = 113$$

$$547 - 331 = 215$$

Explain to me how you know.

$$1126 - 113 = 13 = \text{true}$$

$$\begin{array}{r} \text{HTU} \\ 126 \\ 113 \\ \hline 013 \end{array}$$

$$2336 - 223 = 113 = \text{true}$$

$$\begin{array}{r} \text{HTU} \\ 336 \\ 223 \\ \hline 113 \end{array}$$

Amazing! Thankyou

$$3547 - 331 = 215 = \text{false}$$

$$\begin{array}{r} 547 \\ 331 \\ \hline 216 \end{array}$$

😊 I understood my work

On occasions, the task might be scaffolded starting with easy examples and building up to harder examples.

Example:

**L.C – I can recognise and use squared numbers including the notation for squared numbers.**

Square the following numbers:

- 1) 2            5) 8  
2) 4            6) 7  
3) 3            7) 10  
4) 5            8) 9

Which numbers multiplied by themselves, give the following:

- 9) 1            13) 64  
10) 9          14) 100  
11) 25  
12) 36

**Bonus)** Which numbers multiplied by themselves, give: 121 and 144.

Use multiplication facts to 10 x 10 to multiply pairs of multiples of 10 and 100.

$3 \times 4 =$	
$3 \times 40 =$	
$300 \times 4 =$	

$5 \times 7 =$	
$500 \times 7 =$	
$50 \times 7 =$	

$4 \times 6 =$	
$4 \times 60 =$	
$40 \times 60 =$	

Miss Foster   Mrs Herbert

Maths Subject Leaders

Next Review : Jan 2018