



*'To question is to grow'*

# Wood End Park Academy

## Maths Policy

2016-2017

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*(NC: 2014)*

### **Maths Magician: the basic expectations of Mathematicians at WEPA**

In WEPA we use the maths magician model to help motivate children and teach them the skills of a good mathematician. It something we use throughout the children and the children really love to get involved in!

A Maths Magician should....

1. Use knowledge and number facts to help.
2. Know number facts (x tables, number bonds)
3. Present work neatly
4. Choose and use correct equipment
5. Use KOVEMAC to solve problems
6. Understand 4 operations and inverses
7. Use a range of strategies and choose most efficient

### **Teaching and Learning (in addition to T&L policy)**

- At the beginning of the year each class should together discuss what makes a good maths magician and create a personalised class list
- Maths Magician should then be rewarded at the end of each lesson to someone who has used the skills on the list
- AFL should be used from the beginning of a lesson to gage children's understanding of the LO
- Key questioning and whiteboards (squared if possible) should be used by the children to record responses
- Success criteria should be generated from the children's responses and displayed clearly on white squared flipchart paper
- Teachers should pitch their lesson based upon the outcomes from their assessment for learning
- Teachers should use their focus group to teach new learning
- LSAs should be used to provide support using prepared resources, having a focus group but also monitoring other groups.
- Children should be encouraged to move through the layers in maths in order to make the most progress

## Planning (in addition to T&L policy)

### Overviews

- Each year group should refer to the long term overview and New National curriculum objectives
- Each half term should be planned on a medium term overview stating the area of maths, the context, the learning outcomes to be covered, what children will find hard and ideas for big maths

### Individual lesson Structure

- A ten minute arithmetic starter should be planned for a weekly mental LO
- This is then followed by a one hour lesson based on one learning outcome which is set at age related expectations and referenced with the rising stars progression framework.

Lesson plan should be comprised of:

- 1) **Assessment for learning question** - An open question that encourages mathematical discussion and used to gauge children's current understanding of the LO and allow you to begin your success criteria on squared flipchart paper.
  - 2) **Modelled Example** - A clear example of **new learning** informed by AFL. Refer and Add to success criteria. This should be worded or presented in a **different format** to the initial AFL task
  - 3) **A second example** for children (again in a different format) to have a go independently, at this point children and the teacher will assess what layer children should be starting on. A more challenging question should be given to the more able at this point.
  - 4) A third example should be prepared but only used if necessary, children who have grasped the learning should start their work.
  - 5) **Pupil Task** - Layered worksheet. Class teacher should have a focus group that provides new learning. LSA should have a support focus group.
  - 6) **Plenary** - This should be either : 1) using the LO in a different context or 2) revision of a past skill
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- LSA role should be clear at each stage of lesson
  - CT guided group information should be annotated on to suit the needs of your class
  - **Differentiation through layered work** needs to be planned for  
And there should be **variation in types of questions within layers**
  - Language Focus for the lesson needs to be indicated on the plan in green and displayed in lesson with SC
  - Key Questions should be planned for and shown on the plan in red

## **Big Maths**

At the end of each unit (usually two weeks) children should undertake a big maths lesson which assesses children's understanding.

Big Maths assesses what children can do independently and should therefore have no teaching input, success criteria or modelled example. However a mental arithmetic warm up can be used if it is unrelated.

Big Maths should be centered around three types of activities:

### **1. Independent consolidation task**

This should give children a chance to practice, use and apply skills learned during the week. This can be in the form of a written end of unit test.

### **2. Mystery Maths Task**

Children have a task which assess their knowledge of a future unit. This assessment can then be used to inform future planning.

### **3. Adult Led group**

The teacher should take a small group at a time to question children. Questions should be based on learning done throughout the year especially gaps that children may have and not necessarily based on the unit just completed. As it is difficult for the class teacher to fit all groups in the LSA should be used take some groups to assess rather than having a supporting role.

Evidence from big maths should be recorded with dates in your maths assessment folder and can be used to update your classroom monitor markbook.

Big Maths sessions may differ to others in the year group as they should catered for your own classes needs.

Big Maths lesson plans will initially be less detailed than other lesson plans but will be annotated by each class teacher adapting the lesson to meet the needs of their particular children.

## Example of a Big Maths Plan

→ No teaching input section instead more space to add detail about your guided group

Mental Objective	Mental Starter (quick mental question as children come in)	Ct focus Teacher focus activity adapted individually by class teachers to meet the needs of their class this should be a 10 - 15 minute activity and be rotated around each group. LSA can also lead this activity with one or two groups.	Independent activities Activity 1 should be questions based on Activity 2 should be based on future learning and referred to as the mystery maths
Objective:  I can multiply and divide numbers mentally drawing upon known facts.	<b>2 minute challenge:</b>  Derive as many facts from 1 number sentence E.g. Write down as many facts as you can in two minutes derived from: $6 \times 5 = 30$  CT to assess which children have achieved this week's LO	(this section to be annotated by each class teacher to assess gaps in children's knowledge) <b>KJ - Angles activity x 3 questions</b> 1) Children to Estimate and measure an acute and obtuse angle. 2) Children to draw an acute and an obtuse angle using a protractor 3) Find missing angle on a straight line  If children complete all three: 4) Find missing angles on a whole turn (360)  CT to assess children against New National curriculum tracking sheet / pupil mark book  LSA to lead activity with 2 groups CT to lead activity with other three groups (On a rotation)	<b>Activity 1</b> <b>Number and Place Value</b> Children to complete various testbase questions based on this weeks learning outcomes:  1) <u>Ordering and comparing numbers up to 100000</u> 2) <u>Count forwards/backward in powers of ten</u> 3) <u>Count forwards and backwards through zero using negative numbers</u> 4) <u>Rounding to the nearest hundred thousand/ten thousand/thousand</u>  <b>Activity 2</b>  <b>Mystery Maths - Multiplication and division (future learning)</b> 2 misconception based questions 1 multiplication 1 division  Look at the written method. <b>Have they worked it out correctly?</b> <b>Can you correctly work out the answer? In a sentence write what you think the person did wrong?</b>

## Meeting Age Expectations

Big Maths sessions can be used to update your classroom monitor mark book.

On classroom monitor. Children cannot be deemed as At Age Expectations (green) unless they have completed that objective completely independently and able to use that skill in other.

The rising stars progression framework should also be used to further guide you in what towards at and above age expectations in mathematics looks like.

In order to ensure your children are meeting age expectations they should be exposed to questions that allow them to make connections, think critically, use mathematical language and use problem solving and reasoning skills. (See Teaching for Mastery)

## Pupil Books (in addition to T&L policy)

### Pupil Presentation

- All work in maths books should be in pencil
- 2 box margin should be drawn
- For each piece of work there should be the date and LO displayed
- Practical work should be recorded with a learning comment and/or photograph
- Pupils should divide their page into two halves: one for neat work (e.g. number sentences, final answers) and one for working out (e.g. method) see diagram below

LO: I can solve one and two step word problems

Layer 4

$1305 - 167 = 238$

Sanjay: Check and do this again.

$24560 + 6780 = 11340$

$31,345,672 \div 2 = 1,345,672$

$411,230 + 1267 = 12,497$

$53123,65 - 8345 = 2123,65$

$61,987,060 - 389,110 = 19,870,60$

02/12/15

LO: I can add and subtract fractions

$\frac{1}{25} + \frac{1}{4} = 3\frac{14}{20}$

Layer 5

$\frac{1}{5} \times 4 = \frac{4}{20}$

$\frac{3}{7} \times 5 = \frac{15}{20}$

$\frac{15}{20} + \frac{4}{20} = \frac{19}{20}$

$3\frac{1}{2} - 2\frac{2}{3} = 1\frac{1}{6}$

$\frac{1}{2} \times 8 = \frac{8}{6}$

$\frac{2}{2} \times 3 = \frac{3}{6}$

$\frac{3}{3} \times 2 = \frac{2}{6}$

$\frac{4}{6} - \frac{3}{6} = \frac{1}{6}$

3)  $3\frac{1}{2} - 3\frac{1}{2} = 0$

4)  $5\frac{3}{4} - 5\frac{1}{4} = \frac{2}{4}$

5)  $1\frac{1}{2} + 2\frac{3}{5} = 3\frac{11}{10}$

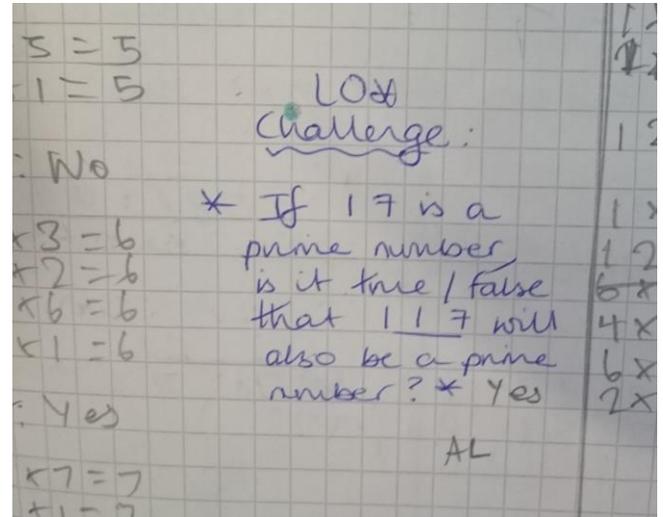
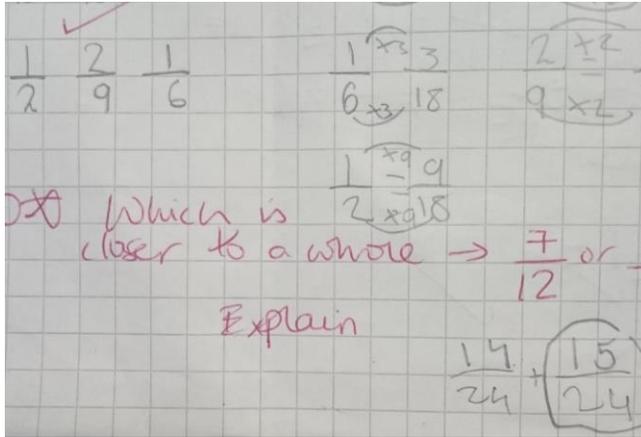
$\frac{1}{2} \times \frac{3}{5} = \frac{3}{10}$

$\frac{1}{2} \times \frac{5}{5} = \frac{5}{10}$

## Marking Class work in Mathematics

Work should be marked daily so that children can respond to next steps  
Next steps should be linked to the lesson LO and can include an additional question for children to respond to.

Some LO\* work should have challenge questions for children to respond to that deepen their understanding,



## Teaching For Mastery in Mathematics

Mastery in mathematics is a style of teaching a particular topic until children have a **deep understanding**. At Wood End Park we are taking aspects of this approach to ensure children are not moving on too quickly and have opportunities to expand their learning about a particular topic rather than accelerated learning (moving on to a new topic).

**Key concept:** A pupil really understands a mathematical concept, idea or technique if he or she can:

- describe it in his or her own words;
- represent it in a variety of ways (e.g. using concrete materials, pictures and symbols - the CPA approach)
- explain it to someone else
- make up his or her own examples (and non examples) of it;
- see connections between it and other facts or ideas;
- recognise it in new situations and contexts;
- make use of it in various ways, including in new situations

## Where will we see Aspects of Mastery at WEPA?

- In AFL
  - Discussion, explanation, creative thinking, problem solving and reasoning
- As higher layers
  - Layer 1 focus on skill with expectation to move on to layer 2 with LSA support if needed
  - Layer 2 - mastery
  - Layer 3 - Mastery with greater depth
- In guided groups and LSA focus groups
- Plenaries
- In Big Maths to assess understanding

## Displays and Classroom Environments

Maths displays need to be used to enhance children's learning, they should only have key information which children may need and not be too overcrowded, or full of *just* children's work.

Your display should include:

- Maths Magician character should be on display with a checklist for what makes a good mathematician.
- A sign of the Maths Magician of the day/week should be displayed.
- Mental Maths target and strategies on display that is updated weekly with maths lo
- Key vocabulary for operations/ shape names etc depending on topic
- KOVEMAC on display-
- Modelling on squared paper- model presentation
- Photographs of children doing maths
- Place value charts in every classroom HTh TTh Th H T O . t h th
- Number line and hundred squares, multiplication grids
- Roman numerals (years 3-6)
- Labelled analogue clock

Suggestions

- Older strategies left up to support children
- Level specific maths magician
- Children's work
- Maths challenge of the week