

Mathematics Intent statement

Intent: Introduction, Vision and Philosophy

At Weston Schools Federation we believe that children from all backgrounds can succeed in Mathematics. We aspire to ensure that our mathematics curriculum 'equips pupils with the knowledge they need to succeed in life'. *Ofsted September, 2019*. Our focus is on raising standards - working together to show what pupils are capable of and to find effective ways to enable every child to succeed.

The National Curriculum 2014 sets out the programmes of study for each year group. However, within each key stage, there is flexibility to introduce content later as appropriate. The school will ensure children's knowledge is deepened through high quality investigations for higher attaining children, rather than moving them onto the next year's curriculum.

We aim to ensure that all children:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that they have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

These are three key areas required to gain a deep mathematical understanding. Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

Implementation: What does Mathematics look like at Weston Schools Federation?

At Weston Schools Federation we follow the loopy model. There are three key sources of information which support our planning and this approach:

- Our planning is informed (but not dictated) by the White Rose Maths Hub scheme for learning and Herts for Learning. Teachers can use and adapt activities for fluency, reasoning and mastery for tasks within each learning journey. Teachers are also expected to cross reference their planning overview with the Ready to Progress resources to ensure language focus, models and tasks are pitched accurately, ensuring children are confident and ready for their next stage in maths learning.
- Our planning is also supported by the National College for the Excellence in the Teaching of Mathematics (NCETM) and NRICH Maths. The curriculum progression tool and Mastery assessment information should be adapted by teachers to ensure this approach is evident in classes.

The principles of the loopy model approach are:

- Depth before breadth; differentiation is achieved by emphasising deep knowledge through individual support and intervention at the child's own pace and based on AfL
- Varied fluency and consolidation to build understanding of underlying concepts in tandem
- Precise questioning to test knowledge and assess pupil progress
- Most pupils are progressing through the curriculum at the same pace
- Methodical curriculum design supported by carefully crafted lessons intervention
- A blend of resources to foster deep conceptual and procedural knowledge, e.g. the use of concrete and pictorial apparatus
- Developing Mathematical thinking and language through talk tasks
- High expectations that all pupils are capable of achieving high standards in Maths
- Creating an atmosphere and culture where children are unafraid to grapple with Mathematics
- Challenge comes through more complex problem solving, not a rush to new content. (The Ofsted-Proof Guide..., Third Space Learning (2016).

The planning for maths should follow the National Curriculum programmes of study for each year group and should follow the agreed format of the loopy model across the school. It should outline the 'Learning Journey' over a loop with a clear expected outcome. The learning will be progressive and ensure the children are taught the skills, knowledge and understanding needed over the unit so that by the end of the unit good progress is evident. The planning should identify the development of the mathematics.

Planning should not be over detailed or bureaucratic. The loopy model enables all teachers to plan, teach and assess the learning of mathematics. Teachers within each team should discuss the steps in each loop together. The planning process must have a sequence of inputs to teach the children the key skills they will need to access the age related mathematical problems independently. The teaching sequence should involve concrete, pictorial and abstract methods of calculations (as appropriate) or mathematical skill to aid conceptual understanding of the objective. All inputs will require an 'I do, you do' model, where the teacher models the skill and then the children would have the opportunity to practise the skill. Once a child has shown they are proficient in using this skill they would then have the opportunity to practise this skill in a range of ways which is varied fluency.

All steps in the mathematics learning journey should allow all children to become fluent, reason effectively and solve problems that are appropriate to their next steps. It is expected all children (including those with an SEND) will have opportunities to reason and problem solve at their level. Reasoning and Problem solving should feature as a regular aspect of the learning journey for each skill taught: not just as an end of unit expectation. However, the children may use a combination of the skills taught to create an end of unit “final product”, which may be a detailed investigation, application of knowledge, or this may take some other form.

Mathematics in Early Years Foundation Stage

In EYFS, there is explicit teaching which uses the CPA approach alongside the rest of the school. Children typically learn through a mix of free-choice play and more focused activities with adults both inside and outside. This is differentiated appropriately to challenge or support pupils. Adults will use mathematical language and questioning effectively to develop the children’s vocabulary and thinking.

Mathematics and early counting is used in real life situations. For example, the children embed their number skills when tidying away which enables them to practise touch counting whilst also ensuring objects are back where they should be. Progressively, resources are then organised into tens which helps children’s number sense and bonds to ten. This enables children to practise maths regularly without realising it.

The transition phase into Year 1 ensures that, towards the end of the EYFS year there are increased opportunities for more structured sessions. To support this phase further, at the start of Year 1 there is still some ‘free flow’ provision.

Resources and strategies for mathematics

There are a wide variety of practical resources stored in the school. Some of these are:

- Shapes, including 3D shapes, shape stamps, geo-boards
- Clocks
- Place value counters
- Dienes blocks (some allocated to every class, as well)
- Multi-link cubes
- Fraction walls
- Equipment for measures – scales, cylinders, weights for estimation
- Numicon

Furthermore, each class is expected to have an up-to-date learning wall which the children can interact with and use appropriately to support them in being independent. Where appropriate, further models will be displayed on the washing line. Teachers are expected to display the formal written methods for the year group they are teaching in. As well as this, they are expected to display the prior learning that the children will need to refer back to. Other aspects of the working wall include key vocabulary, stem sentences to support reasoning, success criteria or information that would help the children to solve mathematical

problems, as well as having models (I DO) up for the children to refer to. Classrooms are also expected to have a clear maths resource area (age and needs appropriate), from where the children can independently choose to use mathematical resources to support their understanding.

Arithmetic practise Year 1-6

To ensure children have the regular opportunities to consolidate and build on basic arithmetic skills all lessons will start with an arithmetic starter. It will need to include + - x / and another skill.

In KS1 this should be on small whiteboards to begin with and not timed. From the spring term however, Year 2 children should begin to complete this learning at the **back** of their workbooks. In Years 3-4 this will be called the 'FAB 5', in Year 5 this will be called the 'super six' and in Year 6 this will be called '8 in 6' to increase the range of questions given. The questions should be completed at the back of workbooks and timed.

The timings for the set of questions should follow:

FAB 5:

Y3 - 5 questions in 7 minutes

Y4 - 5 questions in 5 minutes

Super six:

Y5 - 6 questions in 4 minutes

'8 in 6'

Y6 - 8 questions in 6 minutes

During this arithmetic time the teacher (or other adults) should lap the room for on-going AFL (assessment for learning) or workshop/pre-teach with children with SEND. Children, when appropriate, should be encouraged to note down the time taken to answer the questions so that they can track their speed and aim to beat their personal best. The questions should be peer assessed and the teacher should make a note of children with misconceptions (on a post it), ready for a workshop.

Workshop groups

Within the maths lesson, there should be opportunities for the teacher or teaching assistants to work with a small group in order to support the learning or provide challenge. These groups can be planned based on the assessment information from the previous day, or they can be groups formed during a lesson where the teacher judges that a focus group would move the children's learning on. At all times, the groups for maths will be fluid and flexible depending on what the children need. Teaching Assistants should work with a variety of ability groupings over a week, unless they are timetabled for 1:1 support for an EHCP/SEND/IBP child.

Impact: Evidence and Assessment

Teachers will check pupils' understanding systematically, identify misconceptions accurately and provide clear, direct feedback at the point of teaching by lapping the room in between teaching groups and providing workshops to clarify misconceptions. This will ensure pupils make good or accelerated progress from their starting points.

Assessments to inform teacher judgements

For additional guidance, please check in accordance with the 'Assessment policy'.

Children in most year groups will complete a NTS assessment. This is to ensure children are familiar with test procedure and give teachers additional evidence to use in their assessment. The results of these will be recorded on DCPro.

At the end of each term, teachers will upload their test results and teacher assessments to DCPro. These will be based on a variety of sources but predominantly be sourced from the teacher's assessments, observations and from the children's workbooks. Children's workbooks will be moderated in year groups and cross-phase and across schools as part of the whole school assessment cycle and all teacher assessments must be based on clear evidence of independent tasks in books. The progress of each pupil, the impact of teaching and AfL will be discussed in year groups and at pupil progress meetings. Groups will be identified from these discussions to plan focus groups and additional support.

After each half-termly or termly assessment, the strengths and weaknesses of pupils in each class will be analysed by the class teacher. This analysis is then fed to the Maths leader who will identify strengths and weaknesses in the teaching of maths across the school, and arrange corresponding CPD workshops.

Moderating Maths judgements

As part of the assessment cycle there will be regular opportunities to monitor impact and moderate evidence in workbooks to validate teacher assessments in year groups, across phases and across schools in the trust. Evidence must indicate that:

- children are making progress which is appropriate for their age and ability and that students are sufficiently challenged
- children are able to independently respond to a range of blue ARE tasks and self-edit misconceptions
- children are able to independently respond to a range of yellow WAGD tasks consistently across topics for assessments at greater depth
- DCPro formative assessments must reflect learning in workbooks

The evidence must be robust, reliable and recent.