
Rationale for Maths

School: Orchard Manor

School Context

At Orchard Manor School we provide a specialist, high quality and relevant education for young people aged 3-19 with communication and interaction difficulties, Autistic Spectrum conditions and associated learning needs. Pupils attend as a mix of day and residential from Monday to Friday. We follow 3 learning pathways within our setting, known as Learning to Learn, Bridging to Learn and Ready to Learn. When Ready to Learn, our learner's access the National Curriculum at a stage appropriate to their academic level rather than their chronological age. This is delivered through formal lessons and content. We also have an Early Years Foundations Stage, which aims to take pupils from pre-formal to formal learning in preparation for their next steps, and a Post-16 Provision, aiming to extend pupils maths learning, particularly in areas of real-life maths skills that can help prepare for pupils for their next steps.

Intent

At Orchard Manor we believe that all pupils should experience every aspect of maths, including number, algebra, data, shape, and space. All these strands include developing deeper thinking skills, working towards mastery at each level and solving multi-step problems.

With pupil's individual pathways in mind, our intent is that pupils will be:

- ▶ Numerate and able to manage their finances.
- ▶ Able to apply literacy skills to communicate their mathematical thinking.
- ▶ Aware of the real-life application of maths.
- ▶ Logical thinkers who can break down problems to solve them.
- ▶ Ambitious and use their mathematical knowledge to make appropriate life choices.

Pupils receive consistent teaching approaches and assessment processes regardless of their individual needs or pathways; ensuring they enjoy learning in maths, believe in their ability to solve problems and have the opportunity to reach their full potential.

Our maths curriculum provides pupils with a platform to develop their knowledge, skills, logical and analytical thinking. Our teaching methods aim to increase curiosity, which we believe helps pupils to be more creative and develop connections to the wider world.

Pupils at Orchard Manor will be confident, resilient mathematicians who are prepared for the next step in their learning, gaining skills to support their overall development towards being independent.

Implementation

Scheme of Learning

In EYFS Evidence for Learning is used to show pupil progress, following the SEND Development Matters curriculum, with at least 5 per week overall observations and at least 1 per week maths/numeracy-based observations for each pupil.

Cherry Gardens is used for pupils working in our predominantly Learning to Learn based classes, that are generally working through the EYFS curriculum.

A daily whole class teaching input draws on the Reception Power Maths resource and is also used to begin working towards Reception and Stage 1 math's criteria, for those reaching towards Branch 8 and above.

Targeted direct teaching to individuals or groups to further develop whole class work through the continuous provision. Enhancements to the continuous provision are made based on suggestions from Power Maths linked to the weekly whole class focus.

Learning boxes used for pupils to access and practice activities linked to their individual learning focus. Pupils can access learning boxes independently, allowing for pupils at different levels to be taught new content.

Stage 1 to Stage 6 pupils work within similar topic areas at the same point in the academic year regardless of age and ability, following the Power Maths scheme, adapted to allow for mixed ability and age class groups:

Spring 1	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Year 1	Number: Addition and Subtraction (within 20) https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/664310		Measurement: Length and Height https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/664313		Number: Addition and Subtraction (within 20) Consolidation https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/664311	
Year 2	Measurement: Money https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/664456		Measurement: Length and Height https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/664461		Statistics https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/664460	
Year 3	Measurement: Money And Consolidation https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/788559		Measurement: Length and Perimeter https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/788561		Statistics https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/788560	
Year 4	Measurement: Money https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/788584		Measurement: Length and Perimeter https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/788574		Statistics https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/788586	
Year 5	Number: Decimals and Percentages https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/788602		Measurement: Perimeter and Area https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/788596		Statistics https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/788594	
Year 6	Number: Decimals https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/788619		Measurement: Perimeter, Area and Volume https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/788623		Statistics https://www.activelearnprimary.co.uk/app/plans/powermaths/unit/788628	

Pupils working within Stage 7 to Stage 9 continue to work in similar topic areas, again to allow for differentiation within mixed age and ability groups. The scheme is adapted from the White Rose maths scheme at year 7, year 8 and year 9.

Year 9, KS4 and Post 16 pupils work towards a wide range of accreditation pathways that allow them to achieve the highest possible outcomes as well as support preparation for time beyond school.

At all points in a pupil's journey through maths at OMS, we are aware of their EHCP targets, therefore supporting pupils towards the targets related to their maths curriculum and other aspects of their development through the way that lessons are planned and adapted.

Spring 1	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Year 7	Fraction, decimal and percentage equivalence 10-12			Developing number sense 7-8	Sets and probability 9-10	
Year 8	Fractions and percentages 7-9			Measures of location 11-12		Tables and probability 12
Year 9	Enlargement and Similarity 1-2		Solving Ratio and Proportion Problems 3-4		Probability 7-8	

Structure of a Lesson

Often, the starter teacher input can be pitched at the level of the lower ability pupils and then they can go off to work independently or with support staff guidance, whilst higher ability pupils receive further teacher input. Higher ability pupils may have a Challenge Task, Deepen Activity or other extension work to finish off from a previous lesson, allowing more teacher input for lower ability pupils.

The key element is that there needs to be a direct teaching input to all groups (not necessarily altogether) and that this is rooted around a context-based problem and discussion that exposes the key math's concept for the lesson i.e. the Power Maths Discover, Share and Think Together tasks.

The Power Up activities on Power Maths Active Learn or the Flashback 4 on White Rose provide great starter activities for regular retrieval to recap on previous learning, check in if previous learning has been remembered and embedded, as well as beginning to engage pupils in their learning for the lesson.

Staff working with smaller groups may also want to have the textbook pages and teaching tools open on a tablet to help model the learning for pupils. Use of the 'before you teach' unit videos can also support pupils and LSA's. The Discover and Share tasks in the Textbook can be a great starting point for lessons and displayed on boards using the Power Maths Active Learn online login.

Independent work is set based on pre unit assessments and how pupils have managed the Discover task, differentiated as appropriate. There should always be an extension opportunity available, even if this is just some verbal questions to extend thinking. An excellent resource used for extending pupil's thinking skills is the White Rose 'Editable reasoning and problem solving' tasks or the 'True/False' tasks.

The Plenary is where pupils should complete Reflect Tasks if the main task has been achieved. A reminder and discussion of the lesson objective always take place.

Unit 1: Lesson 3

Power Up

Work out which number is shown.

How else could you show this number?

Making equal groups

Discover

Share

I used counters to represent the children.

a) Put 4 \bigcirc in a group.
Put the next 4 \bigcirc in a group. Then \div by 4.

They make 3 groups. $12 \div 4 = 3$

$8 \div 4 = 2$

$4 \div 4 = 1$

I took 4 away from 12 three times.

There are 12 children.
They are put in groups of 4.
There are 3 groups.
We can write this as $12 \div 4 = 3$.

\div means divide. Here this means working out how many groups we can make.

b) 3×4

There are 4 groups now.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8

Flashback 4

Year 3 | Week 9 | Day 1

1) Use an addition to check the answer. 4×5
 $392 - 170 = 222$ $222 + 170 = 392$

2) Find the difference between 392 and 184 208

3) Calculate $523 + 94$ 617

4) Write the time in words.

Twenty-five minutes past twelve

White Rose Maths

This structure of lessons can be spread across 1, 2 or 3 lessons as best to suit the needs of the pupils. A lesson of pre learning, power up, discover tasks, share tasks and practical thinking together can lead to the next lesson where pupils are in a position where they can independently work through the practice book tasks. Developing independence in pupils is a core aim in both maths and across the school.

Assessment

Pre assessments and progress ladders are set for each new unit of learning of between two to four weeks.

Progress ladders for Power Maths and White Rose maths are made using the objectives listed at the beginning of each unit in the Textbooks, with objectives copied into the progress ladder template. These can be broken down to support pupil engagement and progress at their individual rates of learning.

In this unit we will ...

- ⚡ Divide by 2
- ⚡ Learn about odd and even numbers
- ⚡ Divide by 5 and 10
- ⚡ Divide by grouping and by sharing
- ⚡ Use related multiplication facts to solve division problems

Stage 2B Unit 6
Main Objective: To use grouping and sharing to divide by 2, 5 and 10, then solve related problems
To divide by 2
To know what odd and even numbers are
To divide by 5
To divide by 10
To divide by 2, 5 and 10 using grouping and sharing
To solve division problems involving 2, 5 and 10

Objectives clearly met in pre assessments are highlighted in GREEN. Where this is the case, an extending objective is set for the upcoming unit of learning, which can be accessed from the stages above.

Each lesson is highlighted YELLOW if the objective is met, with I – Independent, S – Supported, HS – Heavily supported also indicated. This is indicated with YELLOW highlighting, then date and page reference on the progress ladder, that this objective was achieved.

Pre Assessment 18/09/23

Stage : GCSE Grade 2-5 and Level 1-2 N and M

Main Objective: To find multiples, factors, prime numbers, prime factorisation, LCM and HCF

- To list the multiples of a positive whole number → 18/09/23 ↑ problem solve eg. is it a multiple. 19/09/23
- To find common multiples of positive whole numbers → Attempt 18/09/23 → 20/09/23 Staff prompt on pre assess
- To find common multiples of positive whole numbers for worded questions → 20/09/23
- To find at least one factor of a positive whole number → 18/09/23 Recap wording
- To find all the factors of a positive whole number → 21/09/23 ↑ How do you know/problem solve 19/09/23
- To find the Lowest Common Multiple of two whole positive numbers using lists → 22/09/23
- To find the Highest Common Factor of two whole positive numbers using lists → prompt needed on 25/09/23 ↓ method for all factors
- To know what a prime number is and identify prime numbers using multiple and factors knowledge → 26/09/23
- To write a positive whole number as a product of prime factors → 27/09/23 ↑ in indices notation 28/09/23
- To find the Lowest Common Multiple of two whole positive numbers using product of prime factors → 02/10/23 HS needed with linking steps.
- To find the Highest Common Factor of two whole positive numbers using product of prime factors → 04/10/23 05/10/23 I when revisited

The monitoring processes at OMS in maths support our teachers to continuously reflect on and develop their practise. Every term there are pupil work sampling and learning walks, where the incremental coaching approach is used for providing feedback and indicating next steps. Impact of previous monitoring is also recorded.

In addition to this, there are half termly teacher and HLTA maths CPD sessions, covering moderation, subject knowledge, sequencing and structuring lessons, adapting teaching and reviewing processes. There are also 1-1 maths conferencing meetings with teachers and fortnightly maths drop-ins, ensuring teachers are well supported in their delivery of the maths curriculum.

Impact - Assessment of outcomes

Progress

In all the academic subjects, we indicate pupil progress using the same colour coding as with EHCP targets:

Termly Progress Measures Key – Academic subjects over the Term

Working Towards	Made no sub level progress but achieved some objectives in the stage working at.
Some Progress	Made some progress within stage working at, moving up a sub-level.
Expected Progress	Made expected progress over the last term, working well towards their end of year target.
Beyond Expected	Made beyond expected progress over the last term, on track to be beyond their end of year target.

This is recorded termly to keep track of the progress individual pupils are making in maths and therefore the impact of the maths curriculum and teaching. This also allows pupils who need additional support in maths to be flagged up:

Baseline 3E

Good progress target 3S-

Assessment Score	Outcome
1-6 ticks	Emerging - (3E-)
7-12 ticks (Baseline Sept 23' - 9 ticks)	Emerging (3E)
13-18 ticks	Emerging + (3E+)
19-24 ticks (Dec 23' - 20 ticks)	Developing - (3D-)
24-30 ticks (Mar 24' - 25 ticks)	Developing (3D)
31-36 ticks	Developing + (3D+)
37-42 ticks (July 24' - 42 ticks)	Secure - (3S-)
43-48 ticks	Secure (3S)
49-54 ticks	Secure + (3S+)
55-60 ticks	Secure * (3S*)

When pupils have indicated they understand an objective, these can be ticked off the assessment criteria which span from working at Reception stage to KS4 higher GCSE outcomes:

Each Stage has 60 objectives for pupils to work towards, meeting 6 objectives allows a pupil to move up a sub level within a stage and allows showing smaller steps in progress for pupils.

Accreditation

The aim of the accreditation in maths at Orchard Manor is to prepare our pupils for the next steps beyond their time with us. The route through a wide range of accreditation opportunities allows all pupils to work towards qualifications suited to their individual abilities and form part of their preparation for adulthood.

Pupils can develop their core maths skills that will support them throughout their lives, whilst improving their ability to solve real life problems, as well as having the opportunity to build up a range of qualifications that can support access to post 16 placements and future careers.

Pupils make progress in lessons through a sequenced lesson structure when working towards accreditation:

Practice to support fluency with number skills, arithmetic proficiency, and basic/life skills.

Curiosity through practical real-life problems solving.

Use of manipulative resources to develop a range of methods to tackle problems.

Modelling of problems to develop independent skills.

Reflection to check deeper understanding and misconceptions.

Pupils make progress over time through a highly structured curriculum with well sequenced units of learning and teaching for mastery at each level.

Depending on the pathway, pupils use their mathematical skills to gain accreditation appropriate to their individual levels and ambitions beyond school:

Pathway 1 – OCR life skills awards, ASDAN, Functional Skills Entry Level 1/2/3

Pathway 2 – ASDAN, Functional Skills Entry Level 1/2/3, GCSE Foundation maths

Pathway 3 – ASDAN, EdExcel Number and Measure Award Level 1/2, Functional Skills Level 1/2, GCSE maths Foundation/Higher

The range of accreditation is always evolving, but dependant on pathway, can include:

OCR/AQA numeracy life skills units

EdExcel Functional Skills maths Entry 1, 2 and 3

EdExcel Number and Measure Level 1 and 2

EdExcel Algebra Award Level 2 and 3

EdExcel Functional Skills Level 1 and 2

OCR Entry Level Mathematics

OCR GCSE Mathematics Foundation and Higher

The percentage of pupils leaving OMS with maths accreditation rose from 85% in 2022 to 95% in 2023.

The percentage of pupils leaving OMS with a maths GCSE qualification rose from 66% in 2022 to 75% in 2023.

During the academic year of 2022 – 2023, pupils making progress in maths rose from 76% in Autumn Term to 97% in Summer Term.