



Curriculum Intent: Mathematics

At Colmers our aim is simple, we endeavour to produce happy, confident, successful mathematicians who know more, can do more and be more. Our students will embark on a journey through an ambitious & challenging curriculum, a curriculum that begins where the learner¹ is, rather than where we wish them to be.

Our curriculum will provide the knowledge & skills that are needed in everyday life & for future employment², whilst challenging every student, ensuring they can continue their journey past GCSE to A-Level & beyond.

To ensure our students know more & can do more they will:

- Develop their **fluency**³ in the **essentials** of mathematics
- Improve their ability to **recall** and **apply** knowledge, rapidly and accurately
- Develop their **conceptual understanding**⁴, as we ensure they know the *why*, as well as the *how*
- **Reason mathematically**⁵; follow a line of enquiry, explore a relationship, generalise & develop an argument or a formal proof
- **Problem solve**⁶, as they encounter routine and non-routine problems
- **Communicate**⁷ using the appropriate mathematical vocabulary
- Develop their **resilience**⁸, **confidence** & **independence**⁹, as they grow as an individual contributing to the life of the school & our local community.

Our scheme of learning is based on Complete Mathematics and has a mastery approach. The scheme is made up of stages; each stage targets a particular maths age. Different classes in each year may well be on different stages as each year group has a broad spread of attainment. We use benchmark testing to establish which stage each class should begin with. A stage may take a year, but ideally less.

Our lessons begin with a **Do Now**, the purpose is to improve **fluency** as well as **retrieval** of previously taught topics as we aim for transfer to students' long-term memory. Different year groups have differing styles of Do Nows.

Modelling from the teacher, (typically *my turn, our turn, your turn*) with the appropriate scaffolding, ensures all students have the best chance of accessing & understanding the objectives of the lesson.

Teaching to the top is our aim, scaffolding helps us to achieve this.

Regular quizzing, via MathsWatch & Complete Maths, helps us identify misconceptions as they arise, as well testing prior knowledge & utilising retrieval practice.

Strategies from formative assessment are used to check for understanding & identify misconceptions "in the now"; multiple choice questions, mini whiteboards are the usual medium for this.

We assess students before we start a unit, this enables us to see what exactly we need to teach students ensuring the level of challenge is appropriate. Unit tests are to ensure we continually monitor progress & continue to identify weaknesses in students learning, as well making use of the "testing effect"¹⁰.



Home learning is set in a number ways: MathsWatch and CompleteMaths are used as they give video support to students as well as immediate feedback, workbooks are also used for home learning. Using the My Progress function of MathsWatch means our students can be truly independent as they can choose which topics at which grades they wish to study.

1. "If [he] had to reduce all of educational psychology to just one principle, [he] would say this: The most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly" Ausubel, D.P. (1968). Educational Psychology: A Cognitive View.
2. "Good numeracy is the best protection against unemployment, low wages and poor health." Andreas Schleicher, (2015) OECD.
3. E McCrea, Making Every Maths Lesson Count, p88, 2019.
4. D Mayer, Adding It Up, p118, 2001.
5. <https://completemaths.com/blog/item/in-conversation-with-mark-mccourt> - mathematical thinking.
6. National Academies of Sciences, Engineering, and Medicine; Committee on How People Learn II.
7. Teaching Strategies for Improving Algebra Knowledge in Middle and High School Students, The Institute of Education Sciences.
8. <https://edcentral.uk/edblog/beginner-guides/a-beginners-guide-to-professor-robert-a-bjork>
9. What is independent learning and what are the benefits for students? Author(s): Bill Meyer, Naomi Haywood, Darshan Sachdev and Sally Faraday Publisher: London: Department for Children, Schools and Families Research Report 051, 2008
10. Testing effect - Psychology of Learning and Motivation, Volume 55, Henry L. Roediger III, Adam L. Putnam and Megan A. Smith