Design and Technology

Curriculum Statement

Curriculum intent

Curriculum drivers shape our curriculum breadth. They are derived from an exploration of the backgrounds of our students, our beliefs about high-quality education and our values. They are used to ensure we give our students appropriate and ambitious curriculum opportunities.

Cultural capital gives our students the vital background knowledge required to be informed and thoughtful members of our community who understand and believe in British values.

Curriculum breadth is shaped by our curriculum drivers, cultural capital, subject topics and our ambition for students to study the best of what has been thought and said by many generations of academics and scholars.

Our curriculum distinguishes between subject topics and threshold concepts. Subject topics are the specific aspects of subjects that are studied.

Threshold concepts tie together the subject topics into meaningful schema. The same concepts are explored in a wide breadth of topics. Through this 'forwards-and-backwards engineering' of the curriculum, students return to the same concepts over and over, and gradually build understanding of them.

For each of the threshold concepts, three milestones, each of which includes the procedural and semantic knowledge students need to understand the threshold concepts, provide a progression model.

Knowledge categories in each subject give students a way of expressing their understanding of the threshold concepts.

Knowledge webs help students to relate each topic to previously studied topics and to form strong, meaningful schema.

Cognitive science tells us that working memory is limited and that cognitive load is too high if students are rushed through content. This limits the acquisition of long-term memory. Cognitive science also tells us that in order for students to become creative thinkers, or have a greater depth of understanding, they must first master the basics, which takes time.

Within each milestone, students gradually progress in their procedural fluency and semantic strength through three cognitive domains: basic, advancing and deep. The goal for students is to display sustained mastery at the advancing stage of understanding by the end of each milestone and for the most able to have a greater depth of understanding at the deep stage. The timescale for sustained mastery or greater depth is, therefore, two years of study.

As part of our progression model we use a different pedagogical style in each of the cognitive domains of basic, advancing and deep. This is based on the research of Sweller, Kirschner and Rosenshine who argue for direct instruction in the early stages of learning and discovery-based approaches later. We use direct instruction in the basic domain and problem-based discovery in the deep domain. This is called the reversal effect.

Also as part of our progression model we use POP tasks (Proof of Progress) which show our curriculum expectations in each cognitive domain.

Implementation

Our curriculum design is based on evidence from cognitive science; three main principles underpin it:

• Learning is most effective with spaced repetition.

• Interleaving helps students to discriminate between topics and aids long-term retention.

• Retrieval of previously learned content is frequent and regular, which increases both storage and retrieval strength.

In addition to the three principles, we also understand that learning is invisible in the short term and that sustained mastery takes time.
Our content is subject specific. We make intra-curricular links to strengthen schema.

Continuous provision, in the form of daily routines, replaces the teaching of some aspects of the curriculum and, in other cases, provides retrieval practice for previously learned content.

Early Years

Our art and D.T journey begins in Early Years at Loxdale, through expressive arts and design. In Nursery children explore different materials freely in order to develop their ideas on how to use them and what to make. They begin to join different materials and explore different textures. Children are taught how to create closed shapes with continuous lines and how to use these shapes to represent objects. Colour and colour mixing are also explored in Nursery. As children move into Reception, they explore, use and refine a variety of artistic effects to express their ideas and feelings, they build on their previous learning, drawing with increasing complexity and detail. By the end of Reception children are expected to safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

Impact

Because learning is a change to long-term memory, it is impossible to see impact in the short term.

We do, however, use probabilistic assessment based on deliberate practice. This means that we look at the practices taking place to determine whether they are appropriate, related to our goals and likely to produce results in the long run.

We use comparative judgement in two ways: in the tasks we set (POP tasks) and in comparing a student's work over time.

We use lesson observations to see if the pedagogical style matches our depth expectations.

Assessment

Each milestone is accompanied by descriptions of end goals, these end goals will become familiar to pupils through targets. Pupils will be made aware of the learning they are working towards each lesson through their WILF, these targets can be used by pupils as a self or peer assessment tool, staff will use these targets to assess pupils' progression. These questions will be a review of the knowledge imparted previously; staff will build these assessments using the questions outlined within the POP tasks.