

Future Academies

Principles of Curriculum Design

Our Trust, and by extension our curriculum, is built on a belief in imparting knowledge to our students that will empower them, with the importance of memory in mind, by teachers who are experts in their fields. Our motto, 'Libertas per Cultum', is the clearest expression of our vision of education as an emancipatory force. The emphasis we place on curriculum development makes us distinctive as a trust. Bucking the trend, we eschew the belief that Key Stages 2 and 3 should be shaped by the pressures of external tests or future exam specifications. Rather, we hold that these phases are invaluable periods of a student's education that offer an opportunity to introduce them to a coherent, challenging and culturally rich curriculum underpinned by an evidence-informed, teacher-led approach to classroom practice.

The Curriculum Centre, established in 2012, leads the design and development of our common curriculum for the Trust. Its work is driven by our vision of education and our desire to reduce the workload of our teachers by providing schools with high-quality curriculum resources. The work of The Curriculum Centre in designing and developing the Future Academies' curriculum is based upon seven principles of curriculum design. Our curriculum materials are:

1. Knowledge-rich
2. Domain-specific
3. Coherent
4. Cumulative
5. Academically challenging
6. Written with memory in mind
7. Written for novices, not experts

1. Knowledge-rich

Our knowledge-rich curriculum is built around powerful, culturally-rich knowledge; knowledge that is, and has been, valued by society, generation after generation. Our curriculum focuses on 'the best that has been thought and said'.¹

Knowledge is undeniably important in life. Knowledge is what we think about and, crucially, what we think with. Indeed, the more you know, the better you can think.² The implication of this is that our curriculum ensures that students are supported to commit relevant knowledge to their long-term memory. The benefits of this are twofold. Firstly, the capacity to retrieve relevant prior knowledge makes it possible for students to focus on higher-level thinking in their work. Secondly, knowledge is generative. This is to say, once a student has learnt a few pieces of information, and they are supported in seeing the connections between them, they are able to build up a network of this connected information as a schema. In doing so, it becomes easier for them to add new information and recognise its place within a discipline: new knowledge can 'stick' to old knowledge.³

¹ Arnold, M. (1869), *Culture and anarchy: An essay in political and social criticism*. Smith, Elder & Co., London. Page 70.

² Willingham, D. T. (2010). *Why Don't Students Like School?: A Cognitive Scientist Answers Questions About How the Mind Works and What It Means for the Classroom*. Jossey-Bass (Wiley). USA.

³ Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How People Learn: Brain, Mind, Experience, and School*. National Academy Press. USA.

We also recognise the empowering role that cultural knowledge plays in our lives. Every student has an entitlement to access this knowledge and the opportunity to critique it. Cultural knowledge opens the door to a world beyond our own individual experiences; it gives us a larger world-view. Through knowing and understanding some of what the greatest minds have thought and said, our own minds are opened up. Cultural knowledge develops our ability to understand, to reason and to critique; it sparks our imagination and hones our judgement.

Cultural knowledge helps us make informed decisions and lead purposeful and fulfilling lives because it furnishes us with cultural literacy.⁴ Very often, we take for granted the ways in which public discourse relies upon implicit, unspoken references. Cultural literacy is the ability to decode these references in newspaper articles, public discussions, professional exchanges, and so on. It depends upon being familiar with the accumulated cultural knowledge that adults are customarily assumed to possess, such as literary references, religious metaphors, historical turning points, or scientific discoveries. In this sense, cultural literacy means being acquainted with the most enduring and ubiquitous ideas in our society, the intellectual and cultural inheritance to which all young people have an entitlement to share in. Without a broad and culturally rich education, we recognise that our students will be prevented from participating in some areas of society. As such, we are committed to the view that our curriculum should equip our students with cultural knowledge so that they know enough to be able to contribute to any discussion; to speak with anyone, in any situation, with confidence. Offering our students a curriculum built around this vision means that they will have the freedom and confidence to choose where they want to go in life, to defend and challenge viewpoints, and to decide for themselves what has value.

The purpose of our curriculum is therefore to increase the quantity and quality of what our students know; to give them a rich hinterland of knowledge and cultural capital which they will have access to and be able to build upon for the rest of their lives. A curriculum built around powerful, culturally-rich knowledge enables students to think about concepts beyond their experience of daily life; it is liberating and transformational.

2. Domain-specific

Our curriculum is domain or subject-specific as opposed to thematic or topic based. We believe strongly in the efficacy of a subject-specific curriculum in Key Stage 2 as well as in Key Stage 3 because this is a rigorous and effective way for students to build their knowledge, subject by subject. Cross-curricular links are of course important but not at the cost of muddling subjects together in a thematic fashion which makes it difficult, if not impossible, for students to know how to 'organise' what they learn.

A school curriculum obviously cannot hope to cover a whole domain, nor should it attempt to. It is not a case of cramming as much as possible into the curriculum; rather, we concentrate on picking out the most valuable knowledge and the most important foundational concepts within each domain and building a curriculum around developing a thorough understanding of that knowledge and those concepts.

The opportunity cost of what is included in a curriculum, at the expense of what has to be left out, must always be carefully considered. Beyond the foundational concepts that are essential to the disciplinary character of each subject, difficult decisions must be made about what substantive content should be chosen. Curriculum design, in this sense, is an on-going conversation about which events, books, ideas or case studies might best illuminate curricular concepts, confer the greatest cultural capital, or exemplify disciplinary thinking in the clearest way. This conversation must consider not only what is included in the curriculum but what must be left out. The critical point is not that there is a 'right' answer, rather, that the decisions we make are carefully considered and justified, providing both balance and breadth to create a coherent curriculum.

⁴ E. D. Hirsch, E. D. (1987). *Cultural Literacy: What Every American Needs to Know*. Houghton Mifflin. USA.

3. Coherent

By coherent we mean that the knowledge selected to be in the curriculum is carefully organised and sequenced, allowing students to build a schema or mental picture of a subject. The careful sequencing of the content is crucial in preventing misconceptions from building up and allowing students to organise what they know in a useful, retrievable format. For this reason, we plan our curriculum forwards from conceptual knowledge, with an interest in what is required to learn a subject for the first time, and not backwards from examination specifications.

The coherence of our curriculum involves a strong focus on vocabulary and precise definitions of subject-specific words, presented in detailed glossaries within our textbooks. We recognise that 'the literacy demands on students are unique, depending on the discipline they are studying.'⁵ Conceptual understanding and vocabulary run in tandem with each other: for example, you cannot learn about civilisation or erosion without also learning the words. We think with words; words are the building blocks of knowledge and conceptual understanding. Our focus on vocabulary therefore allows students to become increasingly nuanced in their thinking.

The coherence of our curriculum includes a strong focus on spelling, punctuation and grammar. A deep understanding of the structure of the English language and the ability to speak and write with grammatical accuracy encourage precision of thought and enable students to enunciate those thoughts with confidence and clarity. This is to say that a strong focus on the English language is crucial to enable students to grasp the concepts that lie beneath the words.

4. Cumulative

Knowledge builds on knowledge. The more you know, the easier it is to acquire more knowledge. Therefore, our curriculum is sequenced cumulatively, always building on prior knowledge. Summative assessments are, accordingly, cumulative. The curriculum can be thought of as a conceptual spiral in which knowledge is revisited again and again in increasingly complex ways.

One of the common misunderstandings of a 'knowledge-rich curriculum' is that knowledge is confused with information. Information can lack meaning in isolation because it stands alone as a thing that can be recalled at will. Knowledge, however, relies on the interrelation between known things. Here, the focus of the curriculum is on building a student's schema by making links or connections within the curriculum clear. A focus on knowledge is not simply a process of accumulating lots of facts and we do not aim to fill students' heads with disconnected information. Rather, we aim for students to know their subject as a whole by building up connections between different pieces of knowledge over time.

For this reason, we believe that learning can be defined, in part, as 'a change in long term memory.'⁶ A cumulative curriculum makes these connections explicit, making it easier for students to recall knowledge and, in doing so, recall ever-larger bodies of knowledge through these connections. This is what we mean when we say that 'the more you know, the more you can learn.' Moreover, this development of students' understanding of a subject entails that 'teaching takes place in time, but learning takes place over time.'⁷ For this reason, we recognise that effective teaching is not tied to a single lesson but, rather, what students remember and accumulate from the curriculum over the long-term.

5. Academically Challenging

⁵ Shanahan T., Shanahan, C. (2008). Teaching Disciplinary Literacy to Adolescents: Rethinking Content Area Literacy. *Harvard Educational Review*. 78 (1). Pages 40-59. Page 48.

⁶ Kirschner, P.A. Sweller, J. Clark, E. R. ((2006). Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching. *Educational Psychologist*. 41(2). Pages 75-86. Page 75.

⁷ Mason, P J. In: Griffin, P. (1989). *Mathematics Teaching* (126). Pages 12-13.

Our curriculum is intellectually demanding and embraces academic challenge, both in terms of the content chosen and what we expect our students to learn. We hold the highest aspirations for our students and believe that they are equally capable and deserving of academic success as their independently-educated peers.

Our commitment to academic challenge means that, through our curriculum materials, students encounter ideas that they are unlikely to encounter at home and which require a teacher to guide their understanding. These are ideas that students from more privileged backgrounds, or indeed teachers, may take for granted. For example, when selecting texts for our English curriculum it is vital that students study high-quality, challenging texts that they might not otherwise have the opportunity to read. We are committed to the view that all students, irrespective of their starting point, are entitled to learn some of ‘the best that has been thought and said.’ To this end, we place special importance on our teachers as subject experts, who are able to curate and explain complex ideas to students through careful instruction and scaffolding.

Our commitment to academic challenge also means that we hold the highest aspirations for what our students are able to learn. A carefully sequenced curriculum will order information from the foundational to the specialised, and not from the easiest to the hardest. This entails familiarising students with powerful concepts, for instance ‘classification’ or ‘hypothesis’ in the sciences. When done well, such concepts act as portals for students that make possible previously unknown or inaccessible ways of thinking about a subject and enrich their understanding of a subject. Many of these concepts are written unconsciously into a curriculum. It is our belief that these provide a foundation for understanding and they need to be planned for explicitly by identifying and sequencing them in the order that they need to be taught.

In fact, the earlier foundational concepts can be introduced, and therefore repeated, the better. For example, there is no reason why very young students should not be able to comprehend chronology in history or personification in English.⁸ Indeed, the disciplinary focus of our curriculum means that we teach the most essential information first. That is to say, we prioritise knowledge upon which later knowledge depends and do not start with information because it is the easiest to understand. For example, in Key Stage 2 Geography we teach latitude before climate. In order to achieve this, we sequence the conceptual and substantive knowledge across the curriculum so that it provides a clear progression model, where students revisit concepts in increasing complexity and depth. In doing so, our curriculum programmes are coherent, challenging and cumulative in nature. Alongside this, we will consider what procedural knowledge is inherent in the subject: the distinctive ways of writing about, working out, or inquiring within the subject that gives it its disciplinary focus. This enables us to create an assessment model that is closely mapped to the content, character, and elements of skill that underpin each subject but can only be arrived at through a strong foundation of knowledge. Indeed, our summative assessments are designed to measure, as best we can, what students know about the curriculum and their ability to demonstrate this knowledge.

As such, our Curriculum Centre is tasked with providing well-written and high-quality materials that are free from misconception and enable students to understand complex ideas clearly. This reflects our belief that all young people are capable of thinking about very complex information when supported to do so. The rigour and academic challenge of our curriculum means that we approach important concepts and ideas in a deep, highly-connected way that is supported by responsive teaching in the classroom, enabling our students to build up a rich understanding of the world.

6. Written with Memory in Mind

We believe that a hallmark of a successful curriculum is that it is memorable and meaningful for students. To this end, we place particular importance on ensuring that our curriculum resources and classroom practice support students to retain core knowledge. The cognitive psychologist Daniel T. Willingham tells

⁸ Willingham, D. T. (2008). What is Developmentally Appropriate Practice? *American Educator*. Pages 34-39.

us that ‘memory is the residue of thought.’⁹ By this, he means that the more you think about something the more likely you are to remember it. The implication of this is that if we want our students to remember our curriculum it is essential that they think about it persistently and deeply. Knowledge must be in the foreground of the curriculum; what students are doing in the classroom must always be in the service of what they should be thinking about, and not the other way round.

The importance of memory therefore underpins our approach to assessment. Our view is that students are making progress if they know more and remember more about the curriculum. This is not to say that we value the rote memorisation of facts. Such an approach has a limited and shallow regard for what we mean by subject knowledge. Rather, we believe that being knowledgeable about a subject involves the ability to think holistically about a domain, to be able to draw together what one knows about a subject and make informed judgements about it. As students make progress through a curriculum they ought to be able to draw on a larger body of knowledge to make more complex judgements. For this reason, our summative assessments are designed to capture the ways in which our students’ knowledge of a subject grows throughout a Key Stage, requiring students to draw upon the core knowledge they have accumulated over time. This represents an increasing level of difficulty for students and, as a result, our curriculum provides a subject-specific model of progression for the assessment of student learning.

This principle also underpins our approach to formative assessment in the classroom. The importance of memory and retention is an everyday part of our approach to curriculum. We are explicit about the knowledge that we want students to retain and what we think will be most valuable to their understanding of a subject. As such, we place an emphasis on the regular questioning and quizzing of students to support them to transfer core knowledge to their long-term memory.¹⁰

7. Written for Novices, Not Experts

Our students in Key Stages 2 and 3 are novices, not experts. In writing curriculum resources, we bear in mind that novices learn in different ways from experts and can suffer from cognitive overload very quickly. Novices need clear structure and explicit guidance. Our curriculum is built around teachers using steady, step-by-step instruction and detailed explanations of worked examples, and giving students multiple opportunities for purposeful practice.¹¹ This is the best way for students to build their own understanding of the curriculum and how we intend our curriculum to be enacted in the classroom.

The distinction between novice and expert is illustrated by the cognitive bias known as *the curse of knowledge*. In simple terms, this is the observation that it is difficult, perhaps impossible, to know what it is like not to know something. In practical terms, this means that the more expert a teacher becomes in their subject, the harder it becomes to know what it is like for students who find it difficult to understand it or learn it for the first time. For this reason, our curriculum pays special attention to the kinds of misconceptions and gaps in knowledge that students might have which prevent them from grasping a subject as they learn.

Related to this, we also know that novices learn better from experts and, resultantly, students learn best from teachers. For this reason, our curriculum is designed and developed with teachers in mind. For example, the quality and quantity of teacher exposition is particularly important in Key Stage 2, where students’ aural comprehension far outstrips their ability to comprehend new knowledge whilst reading in silence. The primary reason for this is that the decoding of words uses up most of a pupil’s working memory,

⁹ Willingham, D. T. (2010). *Why Don't Students Like School?: A Cognitive Scientist Answers Questions About How the Mind Works and What It Means for the Classroom*. Jossey-Bass (Wiley). USA. Page 41.

¹⁰ Agarwal, P. K., Bain, P. M., & Chamberlain, R. W. (2012). The value of applied research: Retrieval practice improves classroom learning and recommendations from a teacher, a principal, and a scientist. *Educational Psychology Review*, 24(3), Pages 437-448.

¹¹ Pashler, H., Bain, P. M., Bottge, B. A., Graesser, A., Koedinger, K., & McDaniel, M. (2007). *Organizing Instruction and Study to Improve Student Learning*. U.S. Department of Education. National Center for Education Research, Institute of Education Sciences. USA.

making it very difficult for them to take in the meaning of new vocabulary and new concepts simultaneously. It is much better for them to receive the new knowledge aurally, from the teacher, before moving on to reread the texts for themselves when they are searching for the precise answers to comprehension questions.

With this in mind, we have developed a clear view for a sequence of learning that we call 'the Future Way.' This sequence of learning describes the process through which new knowledge can be efficiently and effectively taught to students. Rather than an attempt to manipulate this into a generic lesson structure, our approach promotes the importance of teachers following a logical sequence to support students' learning new information:

- i. reviewing prior, relevant knowledge,
- ii. introducing new knowledge through direct instruction, providing explanation, exemplification and elaboration of the key points,
- iii. checking for understanding through frequent questioning and tasks that afford students time to condense that information into their own words, supported through responsive teaching,
- iv. providing an application task for students to use the information in more cognitively demanding ways, and
- v. recapping the salient points of that knowledge for students, being explicit about what needs to be remembered.

This sequence may take a single lesson or it may take multiple lessons; we believe teachers are the best judges for how a curriculum can be translated into individual lessons and that each subject, topic and class is distinctive in terms of how this sequence of learning will progress. In this vein, our resources are designed to reduce teacher workload by providing them with carefully written content supported by carefully crafted explanations, examples, and questions. We ensure lessons are resourced to a high-quality so that our teachers can focus on the quality of their planning and instruction. At the heart of this approach is a recognition that classroom time is finite; we cannot teach everything and what we do teach should be taught in the most efficient and effective ways possible.

References and further reading:

- Arnold, M. (1869). *Culture and anarchy: An essay in political and social criticism*. Smith, Elder & Co., London.
- Brown, P. C. Roedigger III, H. L. McDaniel, M. A. (2014). *Make It Stick: The Science of Successful Learning*. Harvard University Press, USA.
- Coe, R. Aloisi, C. Higgins, S. Major, L.E. (2014). What makes great teaching? Review of the underpinning research. Sutton Trust. Accessed January 2019, at: <https://www.suttontrust.com/wp-content/uploads/2014/10/What-Makes-Great-Teaching-REPORT.pdf>
- Hirsch, E. D. (2016). *Why Knowledge Matters: Rescuing Our Children from Failed Educational Theories*. Harvard Education Press. USA.
- Kirschner, P.A. Sweller, J. Clark, R.E. Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching. *Educational Psychologist*. 41(2). Pages 75–86
- Mandel, P., Süßmuth, B. and Sunder, M. (2019). Cumulative instructional time and student achievement. *Education Economics*. 27(1). Pages 20-34.
- Myatt, M. (2018). *The Curriculum: Gallimaufry to coherence*. John Catt Educational, Woodbridge.
- Office of Standards in Education, (2019). *Education inspection framework: overview of research*. HMI: 180045. Ofsted publications, London.
- Peal, R. (2014). *Progressively Worse*. Civitas, London.
- Rosenshine, B. (2012). Principles of Instruction: Research-Based Strategies That All Teachers Should Know. *American Educator*. 36 (1). Pages 12-19
- Soderstrom, N. C. Bjork, R. A. (2015). Learning Versus Performance: An Integrative Review. *Perspectives on Psychological Science*. 10(2). Pages 176-199.
- Sweller, J. (1988). Cognitive load during problem solving: Effects on learning, *Cognitive Science*. 12. Pages 257-285.
- Tuner, S. (2016). *Secondary Curriculum and Assessment Design*. Bloomsbury, London.
- Vlach, H.A. and Sandhofer, C.M. (2012). Distributing learning over time: the spacing effect in children's acquisition and generalisation of science concepts. *Child Dev*. 83(4): 1137-1144.
- Wiliam, D. (2013). *Re-designing Schooling – 3. Principled curriculum design*. SSAT (The Schools Network).
- Willingham, D. T. (2010). Critical Thinking: Why Is It So Hard to Teach? *Arts Education Policy Review*. 109 (4). Pages 21-31.

- Willingham, D. T. (2010). *Why Don't Students Like School?: A Cognitive Scientist Answers Questions About How the Mind Works and What It Means for the Classroom*. Jossey-Bass (Wiley). USA.
- Young, M., Lambert, D. (2014). *Knowledge and the Future School*. Bloomsbury, London.