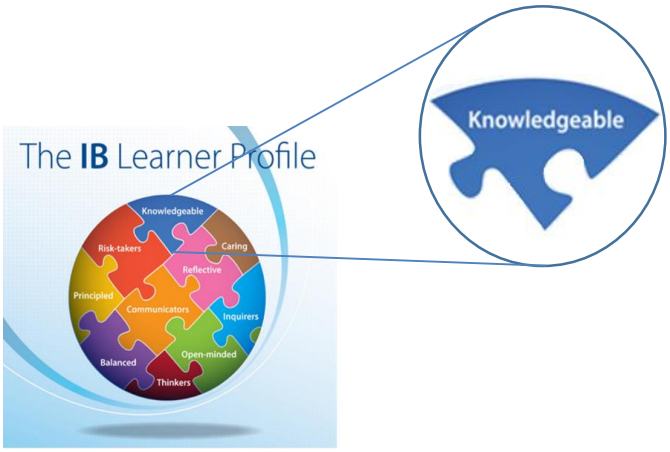
Knowledge Organisers - *the research in practice*



In order to process a text (let alone enjoy it) one must understand at least 90% of the vocabulary within it.

Hattie, *Visible Learning for Teachers*, P51

Knowledge Organisers form part of a key teaching, learning and assessment strategy at Mascalls Academy. They represent the knowledge that you need for later learning to make sense, in that essence a 'core knowledge' taken directly from the curriculum. They also represent a raising of standards in what we expect the student to be able to retain, it underpins the 10 IB learner profile characteristics. Cognitive science provides the evidence that Knowledge Organisers are capable of creating a physical change within the brain that further enhances the capacity of long term memory.

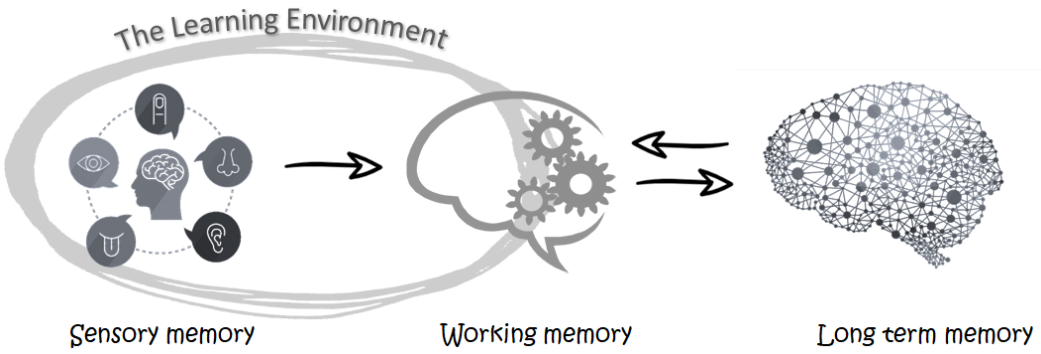
Black cab drivers who complete 'the knowledge' have shown a physical change in their brain. They have developed new neural pathways which become permanent, flexible and adaptable to new situations.

For every subject, for every topic and every Semester students will be provided with a Knowledge Organiser prior to teaching of each topic. Broken into small chunks students will work at home and in class to retain definitions, processes and other key information. In lessons, students will be asked to recall, retrieve and apply their knowledge to new situations and contexts. At the end of each Semester they will be tested on content and expected to retain at least 80% of the core knowledge. Where students fall behind, they will be supported and have the opportunity to retake the assessment and improve their score.

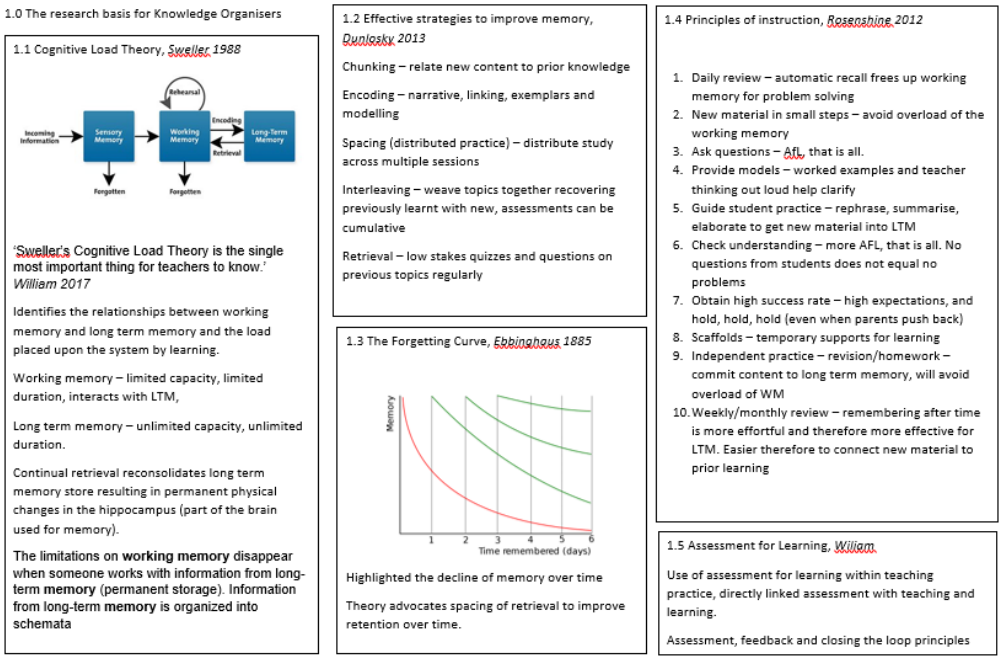
- Students are now required to memorise more information than ever before and apply it to new situations
- By developing memory, we can actually make physical changes within the brain that become permanent
- Knowledge Organisers are provided regularly and in partnership with parents are gradually committed to memory much in the same way as spellings at primary school
- Knowledge Organisers are then assessed in lessons through high frequency recall questioning, tasks and regular assessments

'If nothing has changed in long-term memory, nothing has been learned'

Kirschner, Sweller and Clark



Knowledge Organisers operate between the long term memory and the working memory, the content is to be committed to long term memory and used within the working memory. When this becomes an automatic process the working memory increases its ability to compute information. It is the job of the teacher, to create a learning environment that draws from the working memory to apply knowledge to changing scenarios and to draw the retention of information into the learning environment. This connection becomes a physical neural pathway, hard wired into the hippocampus (the area of the brain responsible for memory), flexible and adaptable to new situations.



1.0 The research basis for Knowledge Organisers

1.1 Cognitive Load Theory, *Sweller 1988*

'Sweller's Cognitive Load Theory is the single most important thing for teachers to know.' *William 2017*

Identifies the relationships between working memory and long term memory and the load placed upon the system by learning.

Working memory – limited capacity, limited duration, interacts with LTM,

Long term memory – unlimited capacity, unlimited duration.

Continual retrieval reconsolidates long term memory store resulting in permanent physical changes in the hippocampus (part of the brain used for memory).

The limitations on **working memory** disappear when someone works with information from long-term **memory** (permanent storage). Information from long-term **memory** is organized into schemata

1.2 Effective strategies to improve memory, *Dunlosky 2013*

Chunking – relate new content to prior knowledge

Encoding – narrative, linking, exemplars and modelling

Spacing (distributed practice) – distribute study across multiple sessions

Interleaving – weave topics together recovering previously learnt with new, assessments can be cumulative

Retrieval – low stakes quizzes and questions on previous topics regularly

1.3 The Forgetting Curve, *Ebbinghaus 1885*

Highlighted the decline of memory over time

Theory advocates spacing of retrieval to improve retention over time.

1.4 Principles of instruction, *Rosenshine 2012*

1. Daily review – automatic recall frees up working memory for problem solving
2. New material in small steps – avoid overload of the working memory
3. Ask questions – AfL, that is all.
4. Provide models – worked examples and teacher thinking out loud help clarify
5. Guide student practice – rephrase, summarise, elaborate to get new material into LTM
6. Check understanding – more AFL, that is all. No questions from students does not equal no problems
7. Obtain high success rate – high expectations, and hold, hold, hold (even when parents push back)
8. Scaffolds – temporary supports for learning
9. Independent practice – revision/homework – commit content to long term memory, will avoid overload of WM
10. Weekly/monthly review – remembering after time is more effortful and therefore more effective for LTM. Easier therefore to connect new material to prior learning

1.5 Assessment for Learning, *Wiliam*

Use of assessment for learning within teaching practice, directly linked assessment with teaching and learning.

Assessment, feedback and closing the loop principles

An example of a Knowledge Organiser

A typical Knowledge Organiser will be broken into chunks so that the student can learn a little at a time, gradually this will increase toward the end of each semester. Parents and students will be fully supported to develop effective strategies to enhance learning, in lessons, through assemblies and parents' evenings. Results will be shared regularly with parents and students.