Module 1: Unlearning

Module 1 begins by looking at students' existing assumptions, feelings and **misconceptions** about learning. It introduces basic **brain anatomy** and how **emotions** can interact with cognitive functions. It explains the role that **stress** can play in decreasing our cognitive capacity. Students are asked to read a letter of gratitude about a positive learning experience, and then use the letter as a model to write a letter or film a video of their own. Through the letter writing, students identify what are the most common and essential aspects of a **successful learning experience**. They then share their learning experiences with peers and reflect as a group on common themes such as clear goals, immediate feedback, and a relationship of belonging and trust.

Module 2: Relearning

Module 2 starts by asking students to think of qualities of someone they consider a good student or a successful person. Next, they engage with a mini lesson on **neuroplasticity**, the brain's ability to change in response to our actions and behaviors. Students are introduced to the role of mindset in learning through personal stories. In particular, the reasons that having a **"growth mindset"** is beneficial are outlined with the caveat that it is only one of the necessary ingredients for learning success. Students learn how to interpret their own emotions and how to respond to them. In this context, students are exposed to research on finding a "flow state" and the importance of finding work that is neither too challenging nor too easy. To apply the content of this module, students are asked to write or film an "advice column" to an imagined fellow classmate who has had a negative experience in an introductory science course and wants to abandon her goal of being a doctor.

In the second half of the module, students are introduced to the idea of **metacognition** as their own "personal coach" who can (free of charge!) provide valuable feedback to improve their performance on tasks. They create a baseline for their metacognitive function with a shortened version of the Metacognitive Awareness Inventory. Finally, we introduce **deliberate practice** as an essential element of learning success and dispel the idea that experts in a field are all naturally more gifted and do not have to work hard to achieve mastery.

Module 3: Mastering Memory (Part I - Encoding)

In this module, students are introduced to the basic processes of how memories are created beginning with the **myth of familiarity** and the fact that we are often not the best judges of our own depth of knowledge. Students then dive into the metaphor of **attention as a filter** and the ways in which we can control what information enters that filter. Mini lessons detail how our **working memory** capacity is limited in both time and space and how we can overcome these limitations when learning new information. Next, students explore why **long-term memory** is essentially unlimited in capacity and specific strategies for encoding information.

In order to actively apply these **study strategies**, students are asked to apply them to the prior content of the course. The specific techniques we use include **association**, **visualization**, **grouping and chunking**, **the method of loci**, **linking** and **mind mapping**. The final activity in this module has students create their own mind map to remember some of the key terms in the module.

Module 4: Mastering Memory (Part II - Retrieval)

The fourth module begins by introducing the "**forgetting curve**." Students develop the understanding that while counter-intuitive, it is best to allow some forgetting to occur before we try to retrieve information that we just learned. Furthermore, the act of retrieving information from memory is in fact one of the best ways to make that memory durable. To demonstrate the power of **retrieval practice**, students are asked to use four retrieval grids that ask them to recall information from earlier modules. The retrieval grids illustrate other key **study strategies** such as **spacing**, **elaboration**, interleaving and **self-testing**. We ask students to reflect on their current study routines before the module and then update their study methods with our guidance.

Module 5: Executive Function & Metacognition (Part I)

In module five, students learn about the role of **executive functions (EF)**, the "CEO" of the brain. Throughout the module, students construct an answer to the question, "How does your mind go about managing all the tasks before, during and after a goal that you have set?" They learn that there are many skills that their internal CEO must accomplish from planning and organizing to monitoring attention and reflecting on performance. Students learn about the brain regions that are responsible for EF. Next, they experience a mini lesson on writing **effective goals** that are short term, specific and moderately challenging. To apply the content, students are introduced to a fictional peer who is embarking on a major long-term senior project. They read the transcript of an interview with the peer and examine her schedule for the week. They are asked to offer constructive criticism on her **planning, organizing, time management** and goal setting for her senior project.

Module 6: Executive Function & Metacognition (Part II)
This module builds on Module 5 to discuss executive functioning behaviors needed to sustain **attention**, reduce distraction and **impulsivity** and **manage frustrations**. Students apply these skills to supporting their fictional peer to help her stay on task and submit her senior project on time. The module concludes with a discussion of why **mistakes** are essential for learning and how to benefit from **feedback** and even **failure** and use it effectively for improvement. Students examine the teacher feedback that their peer received on her senior project and recommend how she can incorporate this feedback into improving her future work in college.

Appropriate Age Groups: There are several versions of the program to target students in middle school preparing for high school as well as those preparing for success in college.

The instructional design of the program adheres to the scientific principles of human learning. We incorporated methodologies that support mastery of content and transfer of skills. As such, the majority of the course is active learning. Each module presents an engaging learning experience through which students are learning-by-doing, through storytelling, and collaboration. Students demonstrate their learning to authentic audiences of their peers and beyond.

Program Elements

Storytelling
Students learn from other people's stories and share their own experiences.

Priming Activities
Priming activities prepare the students' brains for learning and make it easier to recall the material later on.

Retrieval Practice
Students engage in frequent retrieval practice including elaboration, spacing, self- testing, and interleaving.

Creative Expression
Students engage their creative side while writing and making videos.

Collaboration
Students give and receive structured feedback to their peers

Reflection
Students make meaning of what they're learning and understand themselves as a learner through reflection.

Video Micro-Lessons
Students watch video micro- lessons to make the informationcome alive.

Application Guides

Students can print out these study guides or store them ontheir computer for easy reference.

Authentic Assessment

Students demonstrate their learning to authentic audiences of their peers andbeyond.

The ideal implementation of *Becoming a Sophisticated Learner* adheres to a blended model of instruction and ensures that students master the Science of Learning. In this model, students have the opportunity to work independently, in partnerships, in small groups, and as a whole class. The educator acts as a guide leading the students through the program. As a result, students are set up to succeed, engaged and motivated throughout, and graduate effective and efficient learners.

COGx Science of Learning School Representative Training prepares educators to lead a successful blended lesson for each of the 18 chapters. In addition, School Representatives are prepared to enroll and onboard students. School Representatives are trained by an experienced team member from the COGx Learning & Development department. This COGx team member will serve as their point of contact and provide on demand support.

Training occurs through:

- **Up to 6 Coaching Calls.** Coaching calls teach facilitators how to run a successful program from start to finish. This includes tips for getting students started, monitoring progress, and leading blended lessons.

- **The Facilitator Guide.** The guide is a manual that complements the coaching calls. It includes logistics, best practices, a lesson plan for each module, as well as a series of activities.

- **Complimentary access to the program** for school representatives.

Trained School Representatives:

- ✓ Set students up for success by establishing a manageable pace for asynchronous learning.
- ✓ Facilitate a seamless enrollment by providing COGx with relevant details.
- ✓ Ensure a smooth log on experience and acquaint students with the format of the program.
- ✓ Lead blended lessons that are both educational and enjoyable.
- ✓ Serve as a liaison between COGx and their students