

STUDENT-BASED CURRICULUM MAPPING

The Universal Code for All Knowledge and Standards

The act of making meaning, or “knowledge”—whether it be about an event in history or mathematics or grammar or how to do something (skills) or how to behave—involves structuring information to organize and better understand it. When we only teach students course content (information such as “Columbus sailed in 1492”) we are teaching *what* to think about. When we organize this information with structure, we are teaching students *how* to think. To develop students into lifelong, adaptive learners, we must teach students how they think through content to *build* their understanding. In other words, when we develop an awareness of how one thinks things through, student’s become metacognitive and can therefore navigate any course content with greater ease and deeper understanding.

Dr. Derek Cabrera’s research offers four simple, cognitive structures that underlie all types of thinking: we make distinctions, organize information into part/whole systems, draw relationships between and among things, and take many perspectives to gain new insights into ideas. These four actions are akin to a universal cognitive grammar of how we structure our thoughts and ideas. We spend our lives navigating through systems, and we teach kids about many of these systems in school. As students move across grades and subject-areas these systems seem radically different—lacking uniformity. **However, all of the subjects and topics have the same underlying cognitive structure, comprised of distinctions, systems, relationships, and perspectives.** Plectica has concretized these cognitive structures in an accessible online platform for developing visual maps of course content. Any and all subject areas, for any grade-level, can be mapped using these same structural elements to help students identify commonalities and differences across topics and grade-levels. As a result, both teachers and students see the interconnectedness of content within and across grade-levels,

and among subject areas. Geometry in kindergarten is directly related to geometry in 9th grade. In other words, by 12th grade students realize their knowledge is cumulative. Over time, as students understand the structure of what they’re learning, they can continuously evolve their learning in meaningful ways. The maps presented show:

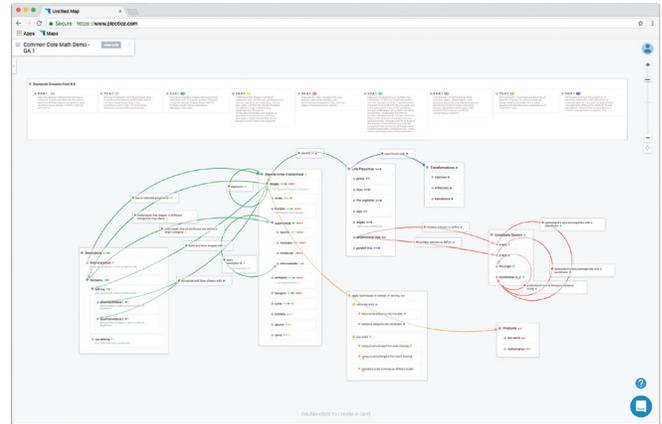
1. That these cognitive structures can be used to organize all different types of information—from math, science, english and social studies to character education;
2. The iterative evolution of standards across grades; that standards in particular genres build upon prior standards, reducing the need for review each year;
3. That students can extend the thinking of the standards by using structural rules to think more deeply about course content and see interconnections across all knowledge; and
4. That both vertical (across grades) and horizontal (across topics) rely on seeing the common cognitive structure for all students.

This structure helps students understand the standards themselves and curricula developers and educators to understand the structure and interconnectedness of standards. Once we arm children with the knowledge of how they structure content, they deeply understand what they’re learning and how it’s related to each other. Like the #2 pencil: students can use this skill in every single subject, for the rest of their lives. It will impact everything they will ever learn.

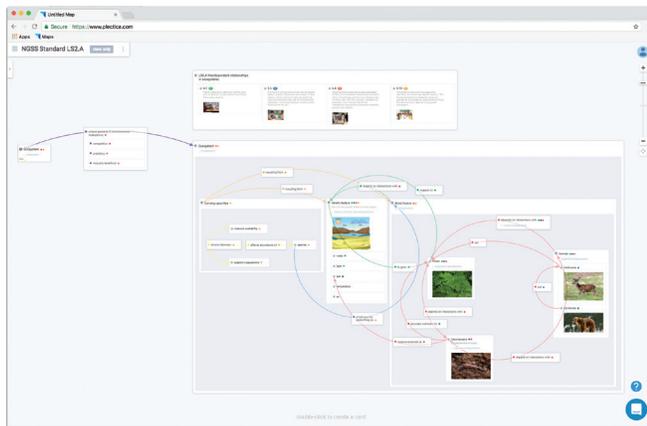
Five Standards Maps Show the Progression of Learning



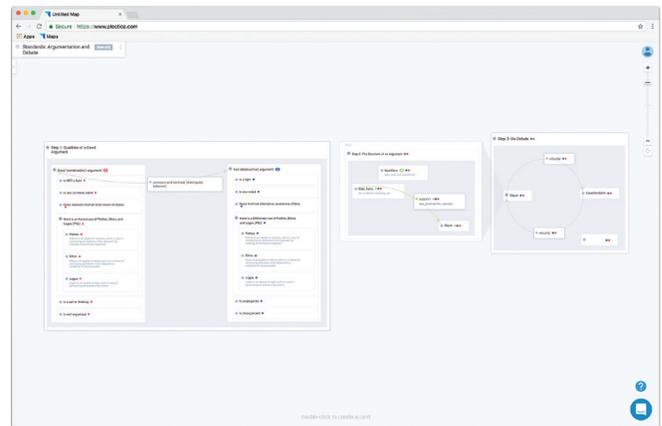
Emotional Intelligence: 2-sided vs. 3-part Relationship
Map: <https://beta.plectica.com/maps/3T9VHZ8QF>



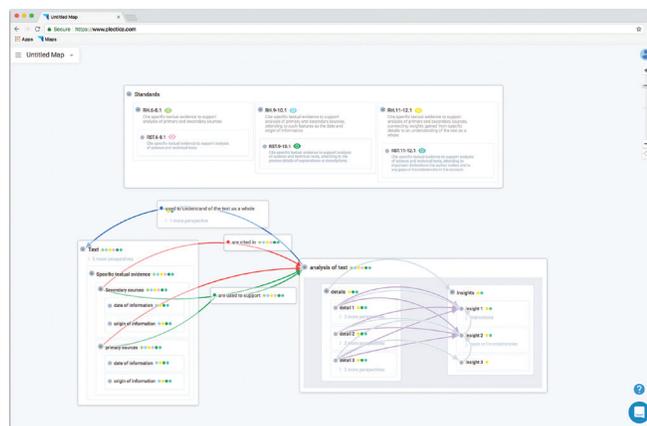
Math Standards (Geometry): G.A.1, Grades K-8
Map: <https://beta.plectica.com/maps/HK4TODZPQ>



NGSS Science Standards: LS2.A, Grades K-10
Map: <https://beta.plectica.com/maps/XHLG8INQM>



Social Studies Standards: Debate, Grades 4-7
Map: <https://beta.plectica.com/maps/6L75GCJNI>



English Literacy Standards: RH.1, Grades 6-12
Map: <https://beta.plectica.com/maps/4F152QEX2>

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