

Title: Who's afraid of Algebra?

Tom teaches 7th grade math. It is his students' first year of high school, and he knows from experience that many are *afraid* of algebra!

As Tom looked through the Learning Design Planning Template, he hypothesized that using the ***Making connections and identifying patterns*** dimension of Critical Thinking might actually help his students to become more comfortable with, and engaged in, learning algebra. He handed out copies of the dimension from the student friendly progression, talked through it with students, and they discussed what each cell might look like in math.

Student Friendly Progression:

Dimension	 Limited Evidence	 Emerging	 Developing	 Accelerating	 Proficient
Making connections and identifying patterns	I understand that when learning about something, information and ideas connect (relate) to each other. I have trouble making these connections by myself.	I am beginning to understand that I can seek, access, and explore information in many different ways. I am beginning to connect what I am learning with what I already know. With help, I am able to make connections and expand my understanding.	I can connect what I know with what I learn and expand my understanding of a topic. I am able to make some difficult connections, such as across classes, cultures, periods of time, or multiple key learning areas.	I understand that looking at a topic or task from different points of view is an important part of learning. I am able to make connections between and across subject areas.	I am skilled at making connections, identifying patterns, and seeing relationships. I can use the connections I see to understand topics or themes deeply. I understand that the world is full of conflicting information and am able to decide which information is most relevant and useful.

Teacher Progression:

Making connections and identifying patterns	Learners are able to see relatively simple patterns and connections when they are pointed out. They are unlikely to realize interdisciplinary connections, (that a concept, a learning process, or one curriculum area is connected to another).	Learners are developing their ability to seek, access, explore, and learn from multiple sources and diverse perspectives and viewpoints to expand thinking toward greater understanding, coherence, and appreciation. They are starting to see patterns and make connections, seeing the whole, not just the parts.	Learners can make connections between significant ideas, topics, questions, issues, and thinking and learning processes they are working with. They are also making some connections across artificial boundaries, such as classes, communities, and cultures; time: past, present, and future; and key learning areas or disciplines.	Learners are able to articulate the importance of identifying patterns and connection-making across artificial boundaries, especially across disciplines. They know that this reflects and strengthens their understanding of the interconnected nature of learning and of the world and how it works.	Learners are skilled in anticipating and analyzing connections, patterns, and relationships. Learners are well equipped to draw from diverse sources to construct deep understanding in an interconnected global world.
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His pedagogical practice focus, then, was to use technology (leveraging digital) to engage his students in pattern finding activities. In their first two lessons together, Tom used a number of online resources to introduce the idea of patterning. Students were asked to give an example of their own practice might look like at each of the five levels – with each example relating to how they used patterning in the online resources. This really positioned the idea that algebra was really just about finding patterns.

Tom could then move onto more algebra-specific instruction, using the text and teaching for mastery. Over the next 10 lessons, he also directed students back to conversations that used the language of the ***Making connections and identifying patterns*** dimension. He asked them to reflect with peers (incorporating Learning Partnerships) around their capacity to look at a topic or task from different points of view, how they made connections, identified patterns, and saw relationships, and how they were able to connect new learning with what they already knew. Many students mentioned that, in particular, thinking about what worked for them previously helped them navigate *the process* of learning algebra.

Tom observed that the language of the dimension allowed students to make the intangible nature of algebra much more concrete. It provided strategic touch points for students to focus on the process of learning, rather than just the learning outcomes. Compared to previous years, Tom observed that his students were more engaged, open to algebra, and able to grasp the core concepts more rapidly. His formative and summative tests also showed an overall improvement in student success, with students achieving higher average grades than in previous years.