WCUUSD Levels of Mathematical Proficiency (Version 2.0)*

Level 1 <u>Intuitive</u>

Looks like:

The student shows knowledge of the key prerequisite skills and language (and/or notation) necessary to access the concept.

Teaching strategies:

- Use relevant real-world problems that are accessible and extendable (low floor, high ceiling) with both the prior knowledge and new concept embedded.
- Address common misconceptions (that could block learning).
- Leverage prior knowledge and explicitly make connections to the new concept.
- Peer-coaching where the student is mentored by another student further along in their conceptual growth.

Level 2 <u>Concrete & Pictorial</u>

Looks like:

All of level 1 and:

The student shows they can visualize the concept (using concrete models and/or diagrams) to find and justify solutions.

Teaching strategies:

- Use relevant real-world problems that are accessible and extendable (low floor, high ceiling) with the new concept embedded.
- Ask students to develop conceptual questions and use visual models (concrete materials and diagrams) to develop and communicate their thinking.
- Highlight visual models that connect with models and materials from prior learning and make the connection explicit.
- Peer-coaching where the student is mentored by another student further along in their conceptual growth.

^{*}This is based on the work of Mahesh Sharma, David Sousa, Jo Boaler and Karin Hess.

WCUUSD Levels of Mathematical Proficiency (Version 2.0)*

Level 3 Abstraction, Application & Communication

Looks like:

The student can use multiple representations (including visual and symbolic models) flexibly to solve real-world problems and communicate theoretical understanding of the concept (addressing *why* rather than simply, *how*).

Teaching strategies:

- Use relevant real-world problems that are accessible and extendable (low floor, high ceiling) with the new concept embedded.
- Use patterning and repeated reasoning (both visually and symbolically).
- Make explicit connections between and among representations (words, concrete, visual, symbolic).
- Offer students opportunities to connect the concept to prior learning and extend to future learning.
- Offer students opportunities to explain the concept to others.

Level 4 Transfer & Connection

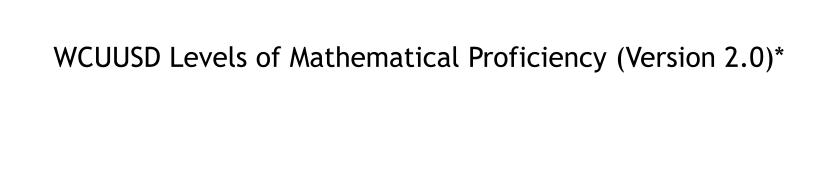
Looks like:

The student has a deep understanding of the concept that they can explain to others using multiple representations (visually, symbolically and in words) and is able to apply the concept flexibly in a myriad of mathematical and complex and/or unfamiliar real world contexts.

Teaching strategies:

- Use relevant real-world problems that are accessible and extendable (low floor, high ceiling) with the new concept embedded.
- Provide individualized and group opportunities for:
 - Peer-coaching where the student can mentor another student in their conceptual growth.
 - Generalizing or connecting ideas using supporting evidence.
 - Making and justifying conjectures.
 - Formulating a problem or model given a complex or unfamiliar situation.
 - Conducting a project that specifies a problem, identifies and analyzes solution paths, solves the problem, and reports results.

^{*}This is based on the work of Mahesh Sharma, David Sousa, Jo Boaler and Karin Hess.



^{*}This is based on the work of Mahesh Sharma, David Sousa, Jo Boaler and Karin Hess.