

# 4 GO-TO TOOLS TO BUILD GRIT

AND FUEL SENSE-MAKING

# 1

## Concrete Manipulatives

Concrete manipulatives are essential for students to construct their own cognitive models for abstract mathematical ideas. Not only are they helpful as a tool for problem solving as students build understanding from the concrete to the abstract, but they can also be used to represent student thinking.

# 2

## Multiple Representations

The use of multiple representations in the math classroom is essential for students to construct conceptual understanding as they make associations in the brain. Giving students an opportunity to inquire and make connections through the use of multiple representations while solving challenging problems provides an opportunity for productive struggle and generating grit.

# 3

## Visuals

When students are developmentally ready to move away from using concrete manipulatives but not ready for using mathematics symbols to represent and solve problems, visuals can be extremely helpful to bridge this gap. By leveraging visuals when solving problems in math class, students are given an opportunity to make connections between the tangible (concrete) and the intangible (abstract).

# 4

## Student Generated Solutions

When teaching through problem solving, educators are given an excellent opportunity to anticipate, monitor, select and sequence student generated solutions for use in the consolidation process. Not only does teaching through the problem solving process promote grit and resilience for students, but the use of student generated solutions during consolidation is an opportunity for empowering students on a daily basis.

