

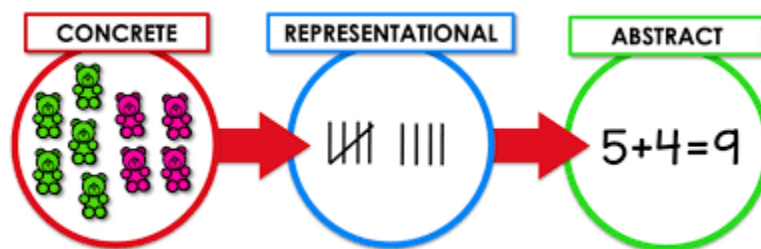
Focusing on C.R.A. (Concrete, Representational, Abstract)

Professional Development Videos:

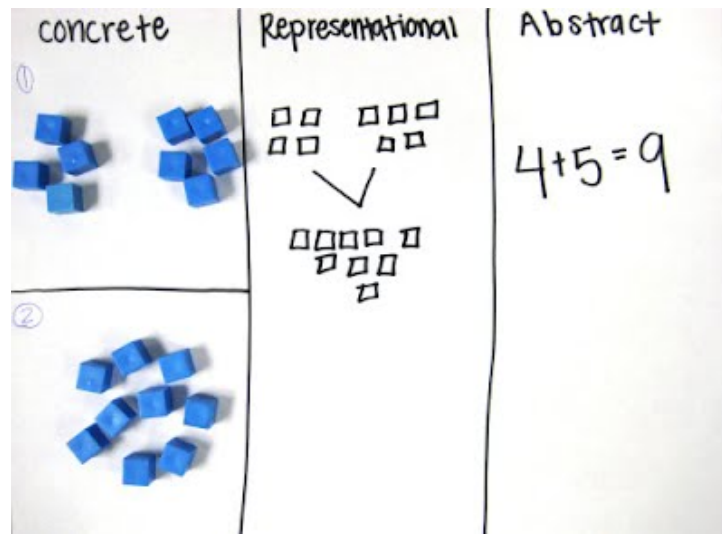
[Concrete-Representational-Abstract-Youtube by Susan Phillips](#)

[CRA Concrete Representational Abstract-Youtube by Dr. Nicki Newton](#)

We use a variety of resources to meet our student's needs. HMH (Houghton Mifflin Harcourt) Into Math is our core resource that focuses on making connections between the Concrete (manipulatives), Representational (visual), and Abstract (algorithmic) representations of math.





Concrete Representational Abstract (CRA) is a three-step instructional approach that is highly effective in teaching math concepts. The first step is called the concrete stage. The “doing” stage involves physically manipulating objects to solve a math problem. The representational (semi-concrete) stage is the next step. The “seeing” stage involves using images to represent objects to solve a math problem. The final step in this approach is called the abstract stage. It is known as the “symbolic” stage and involves using only numbers and symbols to solve a math problem. CRA is a gradual, systematic approach. Each stage builds on the previous stage and must be taught sequentially. This approach is most commonly used in elementary grades but can also be used in middle and high school classrooms.



Steps:

1. Teach the math concept using manipulatives (concrete level).
2. Allow ample opportunities for students to practice the concept using various manipulatives.
3. Ensure students understand the concept at the concrete level before moving on to the representational level.
4. Introduce pictures to represent objects (representational level). Model the concepts.
5. Provide students ample time to practice the concept using drawn or virtual images.
6. Check student understanding. Do not move to the abstract if students have not mastered the representational level.
7. Teach students the math concept using only numbers and symbols (abstract level). Model the concept.
8. Provide plenty of opportunities for students to practice using only numbers and symbols.
9. Check student understanding. If students are struggling, go back to the concrete and representational levels.
10. Once the concept is mastered at the abstract level, periodically bring back the concept for students to practice and keep their skills fresh.
11. Remember that modeling the concept and providing lots of opportunities to practice is extremely important at all three levels. Also, do not rush through the levels. Students need time to make connections and build on what they already know. Give them time to process the information before moving on to the next level.

Concrete	Representational	Abstract
<p>Student uses algebra tiles to solve the equation.</p> $2x + 1 = 3 + x$ 	<p>Student solves the equation by drawing representations of the concrete model.</p> $2x + 1 = 3 + x$ 	<p>The student connects the concrete models and the pictorial representation to the algebraic methods.</p> $2x + 1 = 3 + x$ $2x + 1 - 1 = 3 + x - 1$ $2x = 2 + x$ $2x - x = 2 + x - x$ $x = 2$

Concrete Manipulative Examples:

- Counters
- Beans
- Linking cubes
- Fraction strips
- Two-sided counters
- Pattern blocks

Representational Examples:

- Tally marks
- Dots
- Pictures of objects
- Digital tools

Benefits:

- CRA provides students with a structured way to learn mathematical concepts
- Students can build a better connection when moving through the levels of understanding from concrete to abstract
- Makes learning accessible to all learners (including those with math learning disabilities)
- Taught explicitly using a multi-sensory approach
- Follow Universal Design for Learning guidelines
- Research has proven that this method is effective
- Able to use across grade levels, from early elementary through high school
- Aligned with NCTM Standards (National Council of Teachers of Mathematics)
- Helps students learn concepts before learning rules
- C.R.A can be used in small groups or with the whole class