INSTRUCTIONAL STRATEGIES GUIDE

CRA (CONCRETE - REPRESENTATIONAL - ABSTRACT)

GRADES + SUBJECTS All

SUBJECTS Computer science, Mathematics, Science

DESCRIPTION

Concrete-Representational-Abstract (CRA) is a three-stage instructional strategy that supports conceptual understanding and procedural learning, particularly in mathematics. Students learn by manipulating concrete materials, followed by pictorial representations of the concrete materials, and then solve problems using abstract symbols. When teachers use CRA, they model each stage explicitly and provide many opportunities for students to practice during each stage. Students make connections between each stage and should not move on to the next stage until they have mastered the previous stage.CRA is a gradual, systematic process and should be implemented in order because each stage builds on the next. While CRA was specifically designed as a math strategy, it can also be used in other STEM subjects where students would benefit from developing conceptual understanding through these distinct stages.

WHEN TO USE IT

As a learning strategy, use CRA when you want students to:
- use manipulatives to develop conceptual understanding of abstract concepts
- connect concrete understanding to abstract processes
- practice solving problems using a multisensory approach

As an instructional strategy, use CRA when you want to:
- apply a structured approach to teaching conceptual and procedural information
- make learning accessible to diverse learners
- apply a multisensory approach to teaching concepts and skills

PROS

- Aligns with principles of Universal Design for Learning
- Promotes a deep understanding of concepts before rules

CONS

- Teachers must take care to choose appropriate manipulatives to represent concepts.
- Students must achieve mastery at each stage before moving on to the next, which may be time-consuming and require increased differentiation.

CULTURALLY RESPONSIVE APPLICATION

Concrete-Representational-Abstract is a multisensory approach to developing conceptual and procedural understanding. Multisensory learning is effective for meeting the needs of diverse learners and is one of many cultural learning tools that utilize the brain's memory systems. Using concrete representations not only engages students but it makes learning accessible. Because this three-stage strategy emphasizes mastery before moving on to the next stage, all students are accountable to the same high standards of learning. CRA promotes equity in the learning process and aligns with the tenets of culturally responsive pedagogy.

ESTIMATED DURATION IN CLASS

30+ minutes

BLOOM'S LEVEL(S)

Remembering, Understanding, Applying, Analyze, Show, Demonstrate, Manipulate, Solve, Calculate