

## MISCONCEPTION

Some educators believe students should not be exposed to procedural instruction until they have demonstrated adequate conceptual understanding of a topic.

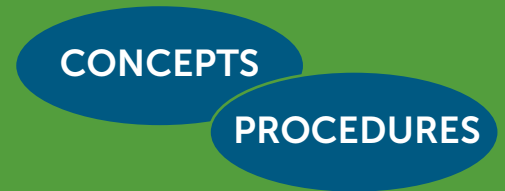
## TRUTH

Conceptual knowledge supports procedural knowledge AND procedural knowledge supports conceptual knowledge. They should be taught together!

There is a two-way relationship between conceptual and procedural knowledge -





conceptual understanding and procedural fluency develop together<sup>a</sup>



Concepts and procedures overlap - they are difficult to measure independently<sup>b</sup>

## WHEN TEACHING MATH

 Teaching and practicing conceptual understanding can help with the selection and use of problem-solving procedures.<sup>c</sup>

 Teaching and practicing procedures helps to develop and deepen understanding of concepts. Procedures include more than algorithms.<sup>d</sup>

 Teaching conceptual and procedural knowledge together can help strengthen each over time.<sup>e</sup>

<sup>a</sup>Rittle-Johnson & Schneider (2015); Schneider et al. (2011)

<sup>b</sup>Hecht & Vagi (2010); Schneider et al. (2011); Schneider & Stern (2010)

<sup>c</sup>Hiebert & LeFevre (1986)

<sup>d</sup>Star (2005)

<sup>e</sup>Rittle-Johnson (2017); Schneider et al. (2011)

