# 🚫 7 Common Misconceptions About Rigor and Depth of Knowledge

(Adapted from Hess, 2018)

## # 1 All students can't think deeply; or all students shouldn't need scaffolding to support deeper thinking.

When adults take on complex challenges, they benefit from examining models or talking and working with peers. The same is true for students. All students <u>can</u> think deeply; it is up to us to strategically scaffold learning so students can move from basic to deeper understanding.

## # 2 Depth-of-Knowledge (DOK) is a taxonomy.

Bloom's Taxonomy (1956) was conceived as a hierarchy describing lower to higher levels of thinking, where "lower-order" thinking is often devalued. If DOK had been conceived to be a taxonomy, the assumption would be that extended thinking (DOK 4), is better than strategic thinking (DOK 3), which is better than conceptual understanding (DOK 2); and that is better than recall of foundational knowledge (DOK1). In reality, tasks at lower DOK levels prepare students for solving or exploring more complex, non-routine problems requiring reasoning and proof and analyzing complex texts and issues.

## # 3 Verb wheels and verb lists can be equated with Depth-of-Knowledge levels.

In fact, verbs without content tell you very little about task complexity. "Draw a circle" requires simple recall and is not as complex as "draw a line of best fit on a scatterplot," which requires conceptual understanding, use of representations, and decision making.

## # 4 Depth of Knowledge is about greater difficulty, things just getting harder.

Dictionaries define 'rigor' with synonyms like inflexible, hard, rigid, and strict; cognitive rigor is the opposite—it's flexible thinking, seeing multiple possibilities, approaches, or possible perspectives. To uncover multiple perspectives or approaches to a problem means to understand concepts deeply and apply them broadly. Tasks we learn as a beginner (e.g., skiing, decoding

words, using mathematical formulas) may seem difficult to do at first. Practicing the routines makes them easier, and more automatic; but the DOK level doesn't change. A more complex task (DOK 3 or 4) requires students to apply those memorized skills and concepts in new – and more complex tasks. This is similar to athletic teams learning and practicing skills (dribbling, shooting, passing, etc.) before they use them in multiple ways during an actual game.

## # 5 All Depth of Knowledge levels can be assessed with a multiple-choice question.

This claim doesn't make sense when you consider the level of engagement with content that is required by DOK 3 and DOK 4 tasks, which are best assessed using constructed-response questions, performance tasks, or extended projects. To be clear, DOK 3 questions that focus on strategic thinking and reasoning can be assessed with multiple choice items; but there are better assessment strategies to uncover what students do and do not actually understand!

## # 6 Higher order thinking always leads to deeper understanding.

We generally associate higher levels of Bloom's Taxonomy - analyzing, evaluating, and creating - with "higher order" thinking; however, students might be an engaging in an activity that is not deepening their understanding. Consider these math examples using a range of analysis skills (Hess Cognitive Rigor Matrix, 2009) that increase in complexity: (DOK 1) retrieve information from a graph; (DOK 2) categorize information; (DOK 3) draw conclusions using data; and (DOK 4) analyze multiple data sets.

## # 7 Using multi-step tasks, multiple resources, or complex texts will lead to deeper thinking.

All multi-step tasks are not created equal; many are actually learned routines. Contrast long division with researching a topic. Both require multiple steps. The number of steps is NOT the determining factor of cognitive rigor. It is the non-routine nature of how one step might lead to decisions made about other steps in the process that deepens the complexity of learning and assessment tasks. Simply using multiple texts/resources or complex texts with basic recall questions does not lead to deeper understanding. These questions lay the foundation for more nuanced interpretations of texts at deeper levels.