

Cognitive Demand Analysis

	Level	Descriptors	Notes
Low	1	<p>Memorization</p> <p><i>Involves either reproducing previously learned facts, rules, formulas, or definitions or committing them to memory</i></p>	
	2	<p>Procedures Without Connections</p> <p><i>a) Are algorithmic.</i></p> <p><i>b) Call for a specific procedure or is placed after a specific procedure is introduced</i></p> <p><i>c) Has no explicit connections to the concept</i></p> <p><i>d) Are focused on producing correct answers instead of developing mathematical understanding</i></p> <p><i>e) Require no explanations or explanations that focus solely on describing the procedure that was used</i></p>	
High	3	<p>Procedures With Connections</p> <p><i>a) Focus students' attention on the use of broad general procedures for the purpose of developing deeper levels of understanding of mathematical concepts and ideas</i></p> <p><i>b) Usually involve multiple ways of representing ideas and focus on making connections among multiple representations to develop meaning.</i></p> <p><i>c) Require some degree of cognitive effort. Although general procedures may be followed, they cannot be followed mindlessly.</i></p>	
	4	<p>Doing mathematics</p> <p><i>a) Requires complex and non-algorithmic thinking – an approach is not explicitly suggested</i></p> <p><i>b) Requires students to explore and understand the nature of mathematical concepts, processes, or relationships</i></p> <p><i>c) Demands self-monitoring</i></p> <p><i>d) Requires students to access relevant knowledge and make appropriate use of it</i></p> <p><i>e) Considerable cognitive effort and may involve some level of anxiety for the student because of the unpredictable nature of the solution process required</i></p>	

Adapted from Smith, Margaret S., and Mary Kay Stein. "Selecting and Creating Mathematical Tasks: From Research to Practice." *Mathematics Teaching in the Middle School* 3, no. 5 (1998): 344–49. Used in CPM's Building on Discourse Learning Event

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