Depth of Knowledge (DOK)
Levels of Demand

Level 1 – Recall & Reproduction	Level 2 – Skills & Concepts
MEMORIZATION Involve either reproducing previously learned facts, rules, formulae or definitions OR committing facts, rules, formulae or definitions to memory. Cannot be solved using procedures because a procedure does not exist or because the time frame in which the task is being completed is too short to use a procedure. Are not ambiguous. Such tasks involve exact reproduction of previously-seen material and what is to be reproduced is clearly and directly stated. Have no connection to the concepts or meaning that underlie the facts, rules, formulae or definitions being learned or reproduced.	**PROCEDURES WITHOUT CONNECTIONS** Are algorithmic. Use of the procedure is either specifically called for or its use is evident based on prior instruction, experience, or placement of the task. Require limited cognitive demand for successful completion. There is little ambiguity about what needs to be done and how to do it. Have no connection to the concepts or meaning that underlie the procedure being used. Are focused on producing correct answers rather than developing mathematical understanding. Require no explanations or explanations that focuses solely on describing the procedure that was used.
Level 3 – Strategic Thinking	**Level 4 – Extended Thinking**
PROCEDURES WITHCONNECTIONS Focus students' attention on the use of procedures for the purpose of developing deeper levels of understanding of mathematical concepts and ideas. Suggest pathways to follow (explicitly or implicitly) that are broad general procedures that have close connections to underlying conceptual ideas as opposed to narrow algorithms that are opaque with respect to underlying concepts. Usually are represented in multiple ways (e.g., visual diagrams, manipulatives, symbols, problem situations). Making connections among multiple representations helps to develop meaning. Require some degree of cognitive effort. Although general procedures may be followed, they cannot be followed mindlessly. Students need to engage with the conceptual ideas that underlie the procedures in order to successfully complete the task and develop understanding.	**DOING MATHEMATICS** Require complex and non-algorithmic thinking (i.e., there is not a predictable, well-rehearsed approach or pathway explicitly suggested by the task, task instructions, or a worked-out example). Require students to explore and understand the nature of mathematical concepts, processes, or relationships. Demand self-monitoring or self-regulation of one's own cognitive processes. Require students to access relevant knowledge and experiences and make appropriate use of them in working through the task. Require students to analyze the task and actively examine task constraints that may limit possible solution strategies and solutions. Require considerable cognitive effort and may involve some level of anxiety for the student due to the unpredictable nature of the solution process required.

Modified from: Taking Action: Implementing Effective Mathematics Teaching Practices. (2017). Huinker & Bill. p. 41-42