Analyzing Level of Cognitive Demand

Instructions: Use the levels of cognitive demand to evaluate a task or lesson. Review the descriptors and highlight those that match the task you have selected.

### Low-Level Cognitive Demand

**Memorization Tasks**
- Involve either memorizing or producing previously learned facts, rules, formulae, or definitions
- Are routine, involving exact reproduction of previously learned procedure
- Have no connection to related concepts

**Procedures Without Connections Tasks**
- Specifically call for use of the procedure
- Are straightforward, with little ambiguity about what needs to be done and how to do it
- Have no connection to related concepts
- Focus on producing correct answers, rather than on developing mathematical understanding
- Require no explanations, but focus on the procedure only

### High-Level Cognitive Demand

**Procedures With Connections Tasks**
- Focus students’ attention on the use of procedures for the purpose of developing deeper levels of understanding of mathematical concepts and ideas
- Suggest general procedures that have close connections to underlying conceptual ideas
- Are usually represented in multiple ways (e.g., visuals, manipulatives, symbols, problem situations)
- Require that students engage with the conceptual ideas that underlie the procedures in order to successfully complete the task

**Doing Mathematics Tasks**
- Require complex and non-algorithmic thinking (i.e., nonroutine—there is not a predictable, known approach)
- Require students to explore and to understand the nature of mathematical concepts, processes, or relationships
- Demand self-monitoring or self-regulation of cognitive processes
- Require students to access relevant knowledge 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


1. Describe your overall evaluation of whether this task/lesson has the potential to engage students in higher-level thinking.

2. What adaptations can you make to the task or lesson to increase its higher-level thinking potential?