

3.5

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 |

Source: *Adapted from Smith, M. S., and Stein, M. K. (1998). “Selecting and Creating Mathematical Tasks: From Research to Practice.”* Mathematics Teaching in the Middle School, 3*(5): 344–350. Previously published by Bay-Williams, J., McGatha, M., Kobett, B. & Wray, J. (2014)* Mathematics Coaching: Resources and Tools for Coaches and Leaders, K–12*. New York, NY: Pearson Education, Inc.*

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?

*Source: Previously published by Bay-Williams, J., McGatha, M., Kobett, B., and Wray, J. (2014).* Mathematics Coaching: Resources and Tools for Coaches and Leaders, K–12*. New York, NY: Pearson Education, Inc.*

Retrieved from the companion website for *Everything You Need for Mathematics Coaching: Tools, Plans, and A Process That Works: Grades K–12* by Maggie B. McGatha and Jennifer M. Bay-Williams with Beth McCord Kobett and Jonathan A. Wray. Thousand Oaks, CA: Corwi[n, www.corwin.com.](http://www.corwin.com/) Copyright © 2018 by Corwin. All rights reserved. Reproduction authorized only for the local school site or nonprofit organization that has purchased this book.