

Strategies for Modifying Tasks to Increase the Cognitive Demand

- Ask students to create real-world stories for “naked number” problems.
- Include a prompt that asks students to represent the information another way (with a picture, table, graph, equation, and/or within a context) and to write about what insights they can gain about the math concept from the new representation.
- Eliminate components of the task that provide too much scaffolding.
- Adapt a task to provide more opportunities for students to think and reason – let students figure things out for themselves.
- Include a prompt that has students move from specific numbers to the general case (to form a generalization and to apply the generalization to other cases).
- Include a prompt that asks students to write about the meaning of the mathematics concept.
- Include a prompt that requires students to make a generalization.
- Include a prompt that asks students to note a pattern, make a mathematical conjecture and to test their conjecture.
- Include a prompt that requires students to compare solution paths or mathematical relationships and write about the relationship between strategies or concepts.
- Select numbers carefully so students are more inclined to note relationships between quantities.
- Use a task “out of sequence” before students have memorized a rule or have practiced a procedure that can be routinely applied.

Figure 1.11

Strategies for Increasing the Cognitive Demand of Tasks

1. Use comparison questions. (When is one situation greater than, equal to, or less than another?)
2. Ask a question across multiple representations in a task.
3. Validate a solution pathway or approach.
4. Require students to provide justifications for (explain) their solutions.
5. Evaluate the error or reasoning in a student solution and provide a correct solution pathway.
6. Create a context. Ask students to write a word problem that creates a context for the given information.
7. Ask students to determine an expression to represent a situation.
8. Create an open-ended debate-type task, so that multiple student responses will satisfy a solution to the mathematical task.

Beyond the Common Core, Grades 3-12; solution-tree.com

Identifying High-Quality Tasks

The task is intended to develop:

<input type="radio"/> conceptual understanding	<input type="radio"/> procedural skill and fluency	<input type="radio"/> application
--	--	-----------------------------------

Rating Scale:

2 - Fully Meets the Characteristic

1 - Partially Meets the Characteristic

0 - Does Not Meet the Characteristic

	Rating
Aligns with relevant mathematics content standards.	
Connects previous knowledge to new learning.	
Encourages the use of representations.	
Provides opportunities for students to develop and demonstrate the mathematical practices.	
Promotes reasoning and problem solving.	
Allows multiple entry points (All students can begin the task. Task can be extended.)	
Allows for multiple solution approaches and strategies.	
Engages students in explaining the meaning of the result.	
Includes a relevant and interesting context.	