

# Cognitive Rigor Matrix

This matrix from the *Smarter Balanced Content Specifications for Mathematics* draws from both Bloom's (revised) *Taxonomy of Educational Objectives* and Webb's *Depth-of-Knowledge Levels* below.

Depth of Thinking (Webb) + Type of Thinking (Revised Bloom, 2001)	DOK Level 1 Recall & Reproduction	DOK Level 2 Basic Skills & Concepts	DOK Level 3 Strategic Thinking & Reasoning	DOK Level 4 Extended Thinking
<b>Remember</b>	- Recall, locate basic facts, definitions, details, events			
<b>Understand</b>	- Select appropriate words for use when intended meaning is clearly evident	- Specify, explain relationships - summarize - identify central ideas	- Explain, generalize, or connect ideas using supporting evidence (quote, text evidence, example...)	- Explain how concepts or ideas specifically relate to other content domains or concepts
<b>Apply</b>	- Use language structure (pre/suffix) or word relationships (synonym/antonym) to determine meaning	- Use context to identify word meanings - Obtain and interpret information using text features	- Use concepts to solve non-routine problems	- Devise an approach among many alternatives to research a novel problem
<b>Analyze</b>	- Identify the kind of information contained in a graphic, table, visual, etc.	- Compare literary elements, facts, terms, events - Analyze format, organization, & text structures	- Analyze or interpret author's craft (e.g., literary devices, viewpoint, or potential bias) to critique a text	- Analyze multiple sources or texts - Analyze complex/ abstract themes
<b>Evaluate</b>			- Cite evidence and develop a logical argument for conjectures based on one text or problem	- Evaluate relevancy, accuracy, & completeness of information across texts/ sources
<b>Create</b>	- Brainstorm ideas, concepts, problems, or perspectives related to a topic or concept	-Generate conjectures or hypotheses based on observations or prior knowledge and experience	-Develop a complex model for a given situation -Develop an alternative solution	-Synthesize information across multiple sources or texts -Articulate a new voice, alternate theme, new knowledge or perspective

# Cognitive Rigor and Depth of Knowledge

- The level of complexity of the cognitive demand.
  - Level 1: Recall and Reproduction
    - Requires eliciting information such as a fact, definition, term, or a simple procedure, as well as performing a simple algorithm or applying a formula.
  - Level 2: Basic Skills and Concepts
    - Requires the engagement of some mental processing beyond a recall of information.
  - Level 3: Strategic Thinking and Reasoning
    - Requires reasoning, planning, using evidence, and explanations of thinking.
  - Level 4: Extended Thinking
    - Requires complex reasoning, planning, developing, and thinking most likely over an extended period of time.