**Table 2: Hess' Cognitive Rigor Matrix with Curricular Examples:** Applying Webb's Depth-of-Knowledge Levels to Bloom's Cognitive Process Dimensions

| Bloom's Revised Taxonomy of Cognitive Process Dimensions | Webb's Depth-of-Knowledge (DOK) Levels | | | |
|---|---|---|---|---|
| | **Level 1**<br>**Recall & Reproduction** | **Level 2**<br>**Skills & Concepts** | **Level 3**<br>**Strategic Thinking/ Reasoning** | **Level 4**<br>**Extended Thinking** |
| **Remember**<br>Retrieve knowledge from long-term memory, recognize, recall, locate, identify | o Recall, recognize, or locate basic facts, ideas, principles<br>o Recall or identify conversions: between representations, numbers, or units of measure<br>o Identify facts/details in texts | | | |
| **Understand**<br>Construct meaning, clarify, paraphrase, represent, translate, illustrate, give examples, classify, categorize, summarize, generalize, infer a logical conclusion (such as from examples given), predict, compare/contrast, match like ideas, explain, construct models | o Compose & decompose numbers<br>o Evaluate an expression<br>o Locate points (grid/, number line)<br>o Represent math relationships in words pictures, or symbols<br>o Write simple sentences<br>o Select appropriate word for intended meaning<br>o Describe/explain how or why | o Specify and explain relationships<br>o Give non-examples/examples<br>o Make and record observations<br>o Take notes; organize ideas/data<br>o Summarize results, concepts, ideas<br>o Make basic inferences or logical predictions from data or texts<br>o Identify main ideas or accurate generalizations | o Explain, generalize, or connect ideas using supporting evidence<br>o Explain thinking when more than one response is possible<br>o Explain phenomena in terms of concepts<br>o Write full composition to meet specific purpose<br>o Identify themes | o Explain how concepts or ideas specifically relate to other content domains or concepts<br>o Develop generalizations of the results obtained or strategies used and apply them to new problem situations |
| **Apply**<br>Carry out or use a procedure in a given situation; carry out (apply to a familiar task), or use (apply) to an unfamiliar task | o Follow simple/routine procedure (recipe-type directions)<br>o Solve a one-step problem<br>o Calculate, measure, apply a rule<br>o Apply an algorithm or formula (area, perimeter, etc.)<br>o Represent in words or diagrams a concept or relationship<br>o Apply rules or use resources to edit spelling, grammar, punctuation, conventions | o Select a procedure according to task needed and perform it<br>o Solve routine problem applying multiple concepts or decision points<br>o Retrieve information from a table, graph, or figure and use it solve a problem requiring multiple steps<br>o Use models to represent concepts<br>o Write paragraph using appropriate organization, text structure, and signal words | o Use concepts to solve non-routine problems<br>o Design investigation for a specific purpose or research question<br>o Conduct a designed investigation<br>o Apply concepts to solve non-routine problems<br>o Use reasoning, planning, and evidence<br>o Revise final draft for meaning or progression of ideas | o Select or devise an approach among many alternatives to solve a novel problem<br>o Conduct a project that specifies a problem, identifies solution paths, solves the problem, and reports results<br>o Illustrate how multiple themes (historical, geographic, social) may be interrelated |
| **Analyze**<br>Break into constituent parts, determine how parts relate, differentiate between relevant-irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct (e.g., for bias or point of view) | o Retrieve information from a table or graph to answer a question<br>o Identify or locate specific information contained in maps, charts, tables, graphs, or diagrams | o Categorize, classify materials<br>o Compare/ contrast figures or data<br>o Select appropriate display data<br>o Organize or interpret (simple) data<br>o Extend a pattern<br>o Identify use of literary devices<br>o Identify text structure of paragraph<br>o Distinguish: relevant-irrelevant information; fact/opinion | o Compare information within or across data sets or texts<br>o Analyze and draw conclusions from more complex data<br>o Generalize a pattern<br>o Organize/interpret data: complex graph<br>o Analyze author's craft, viewpoint, or potential bias | o Analyze multiple sources of evidence or multiple works by the same author, or across genres, or time periods<br>o Analyze complex/abstract themes<br>o Gather, analyze, and organize information<br>o Analyze discourse styles |
| **Evaluate**<br>Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique | | | o Cite evidence and develop a logical argument for concepts<br>o Describe, compare, and contrast solution methods<br>o Verify reasonableness of results<br>o Justify conclusions made | o Gather, analyze, & evaluate relevancy & accuracy<br>o Draw & justify conclusions<br>o Apply understanding in a novel way, provide argument or justification for the application |
| **Create**<br>Reorganize elements into new patterns/structures, generate, hypothesize, design, plan, construct, produce | o Brainstorm ideas, concepts, or perspectives related to a topic or concept | o Generate conjectures or hypotheses based on observations or prior knowledge | o Synthesize information within one source or text<br>o Formulate an original problem, given a situation<br>o Develop a complex model for a given situation | o Synthesize information across multiple sources or texts<br>o Design a model to inform and solve a real-world, complex, or abstract situation |

**Excerpt from:** What exactly do "fewer, clearer, and higher standards" really look like in the classroom? Using a cognitive rigor matrix for analyzing curriculum, planning lessons, and implementing assessments
By Karin K. Hess, Dennis Carlock, Ben Jones, and John R. Walkup

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