

Hess' Cognitive Rigor Matrix with Curricular Examples for SCIENCE: Applying Webb's Depth-of-Knowledge Levels to Bloom's Taxonomy

Bloom's Revised Taxonomy	Webb's Depth-of-Knowledge Levels (DOK) <i>Note: DOK is about complexity—not difficulty!</i>			
	Level 1 Recall and Reproduction	Level 2 Skills and Concepts	Level 3 Strategic Thinking/Reasoning	Level 4 Extended Thinking
Remember Retrieve knowledge from long-term memory, recognize, recall, locate, identify, explain, interpret, describe, demonstrate	<ul style="list-style-type: none"> Recall, observe and recognize facts, principles, and properties. Read a measurement. 	<ul style="list-style-type: none"> Make conversions with numbers and measurements. 		
Understand Construct meaning, clarify, represent, illustrate, classify, categorize, summarize, generalize, infer a logical conclusion (such as from examples given), predict, compare/contrast, match like ideas, explain, construct models	<ul style="list-style-type: none"> Select appropriate word for intended meaning. Represent relationships in words, pictures, or symbols Give examples. Identify a hypothesis. Make and record observations. 	<ul style="list-style-type: none"> Explain relationships (examples/non-examples; cause/effect). Make basic inferences or logical predictions from data/ observations. Summarize results, concepts, ideas Recognize concepts in varied ways (text, table, or diagram). 	<ul style="list-style-type: none"> Use concepts to explain <u>non-routine</u> problems. Explain, generalize, or connect ideas using supporting evidence. Explain thinking when more than one response is possible. Explain phenomena in terms of concepts. 	<ul style="list-style-type: none"> Relate scientific concepts to other content areas or other concepts. Develop generalizations of the results obtained and the strategies used and apply them to new problem situations.
Apply Carry out or use a procedure in a given situation; carry out (apply to a familiar task), or use (apply) to an unfamiliar task.	<ul style="list-style-type: none"> Follow simple procedures. Locate data in a table or graph. Calculate, measure, apply a rule. Solve a simple formula with one unknown. Use tools to collect data. Conduct a confirmation/ verification investigation 	<ul style="list-style-type: none"> Solve a routine problem applying more than one concept. Use models /diagrams to explain concepts. Make a table to record data. Translate between tables, graphs and words (e.g., graph data from a table). Conduct a teacher–led guided inquiry investigation. 	<ul style="list-style-type: none"> Solve a <u>non-routine</u> problem applying more than one concept. Design an investigation for a specific purpose or question. Use & show reasoning, planning, and evidence. Conduct a student-led guided inquiry investigation. 	<ul style="list-style-type: none"> Select or devise the best approach among many alternatives to solve a problem. Make changes to experimental design when new information is presented. Conduct an open inquiry investigation.
Analyze Break into constituent parts, determine how parts relate, differentiate between relevant/irrelevant, distinguish, select, organize, outline, find connections, deconstruct	<ul style="list-style-type: none"> Retrieve information from a table or graph to answer a question. Identify a pattern/trend. 	<ul style="list-style-type: none"> Use data from a table or graph to solve a problem with multiple steps. Classify materials & data based on characteristics. Organize, analyze, and interpret simple data. Compare/ contrast concepts or data. Extend a pattern 	<ul style="list-style-type: none"> Compare information within or across data sets. Analyze data, citing evidence. Interpret complex data. Analyze similarities/differences between procedures or solutions. Generalize a pattern. 	<ul style="list-style-type: none"> Analyze multiple sources of evidence. Analyze complex/abstract ideas.
Evaluate Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique		<ul style="list-style-type: none"> Evaluate a simple hypothesis. Evaluate information to make a conclusion. Draw conclusions from data. Evaluate complex/abstract explanations. Connect data to claims. 	<ul style="list-style-type: none"> Evaluate information from multiple sources to make a conclusion. Identify the best hypothesis, data or conclusion from given information. Verify reasonableness of results. 	<ul style="list-style-type: none"> Apply understanding in a novel way for argument or justification of conclusions. Apply conclusions to a new situation.
Create Reorganize elements into new patterns/structures, generate, hypothesize, design, plan, construct, produce	<ul style="list-style-type: none"> Brainstorm ideas, concepts, or perspectives related to a topic. 	<ul style="list-style-type: none"> Generate an original hypothesis based on observations or prior knowledge and experience. Create an original model. 	<ul style="list-style-type: none"> Generate a hypothesis for an original problem. Design an independent investigation. Develop a model for a complex situation. 	<ul style="list-style-type: none"> Synthesize information across multiple sources or texts. Design a model to explain or solve a real-world, complex or abstract situation.



