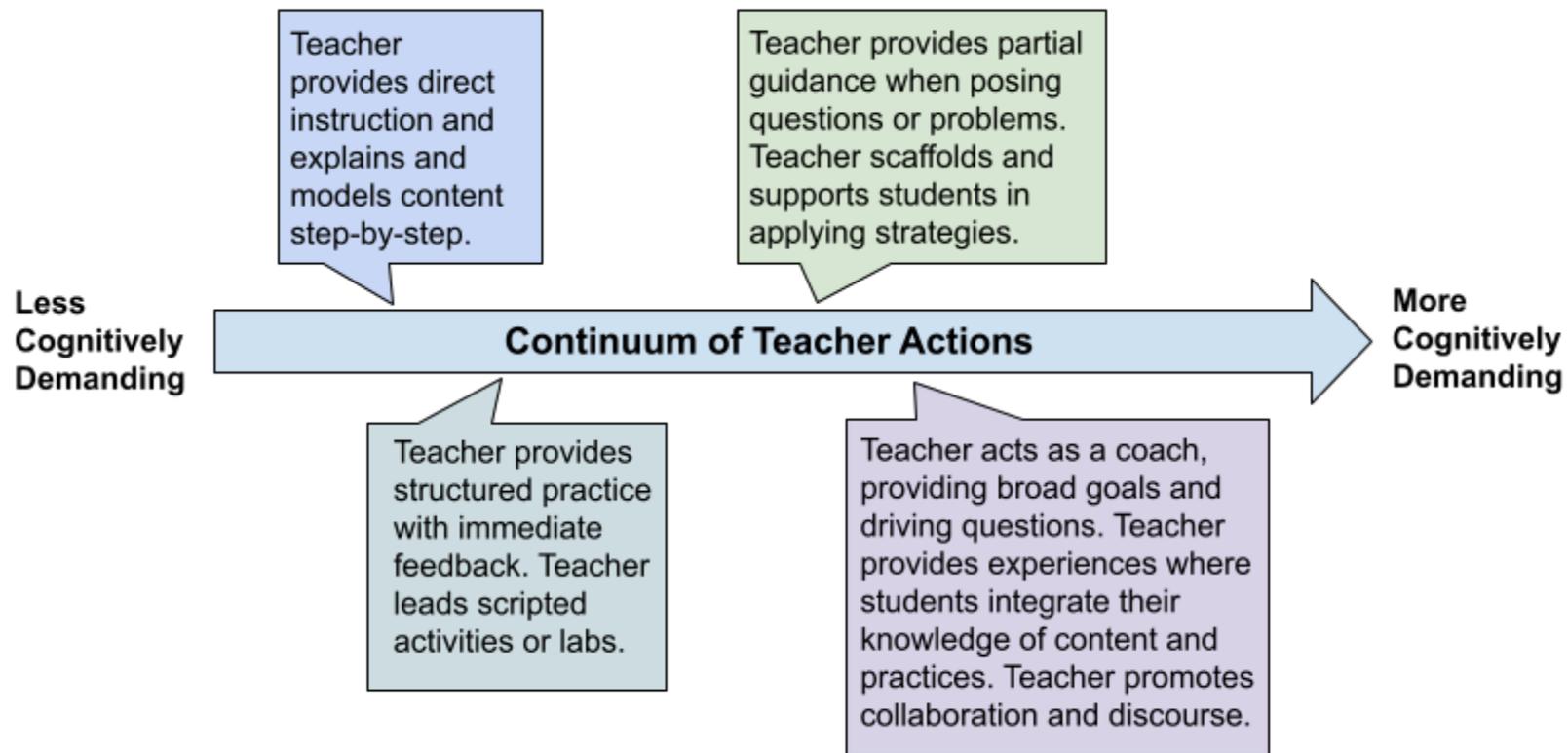


## STEM Task Analysis Guide

	<b>Low Cognitive Demand</b>	<b>Medium Cognitive Demand</b>	<b>High Cognitive Demand</b>
<b>Type of Task</b>	-Memorization tasks -Recall tasks	-Scripted tasks -Guided tasks	-Authentic, sense-making tasks (concepts, processes, and relationships) with unfamiliar contexts -Open-ended tasks
<b>Standards &amp; Learning Goals Addressed</b>	Either <b>Content</b> or <b>Practices</b> , but not both	<b>Content</b> with prescribed <b>Practices</b>	Integration of <b>Content</b> and <b>Practices</b> that simulates the way mathematicians, scientists, and engineers make sense of knowledge
<b>What Students May Be Doing</b>	<ul style="list-style-type: none"> <li>- Reproducing memorized vocabulary, facts, rules, or formulas</li> <li>- Matching or ordering</li> <li>- Computations</li> </ul>	<ul style="list-style-type: none"> <li>- Following scripted actions to achieve a predetermined outcome</li> <li>- Engaging with conceptual ideas that underlie procedures</li> <li>- Making connections between representations</li> <li>- Applying given formulas, algorithms, or prescribed steps</li> </ul>	<ul style="list-style-type: none"> <li>- Making sense of a question or problem by integrating knowledge of content and practices</li> <li>- Making decisions about which practices or skills to use</li> <li>- Accessing and applying prior knowledge and skills</li> <li>- Self-monitoring and self-regulating</li> <li>- Engaging in productive struggle</li> <li>- Interpreting, extrapolating</li> <li>- Collaborating with peers</li> <li>- Engaging in peer discourse</li> </ul>
<b>Possible Classroom Uses</b>	<ul style="list-style-type: none"> <li>- Retrieving basic information</li> <li>- Recalling previous learning to prepare for future learning</li> <li>- Preparing for local, state, and national tests</li> <li>- Mastering calculations</li> </ul>	<ul style="list-style-type: none"> <li>- Reinforcing previously taught content and skills</li> <li>- Re-creating the experience of a scientific or mathematical discovery</li> <li>- Applying given concepts to problem solving, such as identifying and correcting errors, explaining reasoning (CER), and proofs</li> <li>- Analyzing and representing data</li> </ul>	<ul style="list-style-type: none"> <li>- Designing an experiment to answer a question or solve a problem</li> <li>- Combining content knowledge and skills to construct new explanations</li> <li>- Building, explaining, and using models in new ways</li> <li>- Organizing or presenting information</li> <li>- Project-Based Learning (PBL) or Design-Based Learning (DBL)</li> </ul>

Adapted from, Smith, M. S., & Stein, M. K. (2011). 5 practices for orchestrating productive mathematics discussions. National Council of Teachers of Mathematics.



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