

Task Analysis Guide for Science (TAGS)

LOW LEVEL TASK – LEVEL 1 MEMORIZATION	
Science Practices without Science Content	Science Practices without Science Content
<ul style="list-style-type: none"> Does not require engagement in scientific practice to make conceptual links with the science concepts and ideas. Requires memorization of the definition of any scientific practice. Involves repeating previously learned steps of a “scientific method”. Requires “memorizing the doing science”. 	<ul style="list-style-type: none"> Does not require engagement in the scientific practices by which body of science knowledge is established, extended, refined, or revised. Involves reproducing previously learned “body of knowledge” or committing facts, formulas, and definitions to memory. Although it involves reproducing learned “body of knowledge”, task does not require conceptual understanding.
<p>Tasks at the “Memorization” Level:</p> <ul style="list-style-type: none"> Are not ambiguous. Such tasks involve exact reproduction of previously seen materials and what is to be produced is clearly and directly stated. Cannot be solved using procedures because a procedure does not exist or because time frame is too short to use a procedure. 	
LOW LEVEL TASK – LEVEL 2 SCRIPTED PROCEDURES WITHOUT CONNECTIONS TO MEANING	
Scripted Procedures for Practices Linked to Content	Scripted Procedures for Content
<ul style="list-style-type: none"> Students are expected to access some “scientific body of knowledge” to aid to solve the task, but this does not require conceptual understanding of the content. Requires students to follow a sequence of actions because they are told BUT not for understanding of how this scientific practice works and is connected to concepts. 	<ul style="list-style-type: none"> Does not require engagement in scientific practice to make conceptual links with the science concepts and ideas. Use of a procedure is either specifically called for or its use is evident based on prior instruction, experience. Requires application of previously learned concepts consistently but without understanding of why the concepts apply here or what they really mean.
<p>Tasks at the “Scripted Procedures Without Connections to Meaning” Level:</p> <ul style="list-style-type: none"> Require limited cognitive demand for successful completion of the task. No ambiguity about what to do and how to do it. Tasks tell students what to do. Are focused on producing correct answers to artificial questions rather than producing meaning in contexts. 	

Adapted From the Task Analysis Guide for Science by Miray Tekkumru Kisa
http://www.Irdc.pitt.edu/bov/documents/Stein_TaskAnalysis.pdf

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HIGH LEVEL TASK – LEVEL 3	
SCRIPTED PROCEDURES WITH CONNECTIONS TO MEANING	
Scripted Procedures for Practices with Meaning	Scripted Procedures for Content with Meaning
<ul style="list-style-type: none"> • Students are not required to access any science concepts to solve the task. • Involves following the steps necessary to engage in a scientific practices with an understanding of “why” they are following these procedures. 	<ul style="list-style-type: none"> • Does not require engagement in scientific practice to make conceptual links with the science concepts and ideas. Even though the task does not require engagement in scientific practices, it requires deep understanding of the science content. • Require application of previously learned concepts consistently with understanding of why the concepts apply here or what they really mean. • Use of procedure is either specifically called for or its use is evident based on prior instruction, experience but students could apply previously learned “body of knowledge” with an understanding.
<p>Tasks at the “Scripted Procedures With Connection to Meaning” Level:</p> <ul style="list-style-type: none"> • Require some degree of cognitive effort for successful completion of the task. Although the steps to be followed are explicit, they cannot be followed mindlessly. • Very little ambiguity about what to do and how to do it. Tasks tell students what to do but they understand why they are doing what they are doing. • Are focused on producing correct answers to artificial questions rather than producing meaning in contexts. 	
HIGH LEVEL TASK – LEVEL 4	
GUIDED ENGAGEMENT IN “SCIENTIFIC PRACTICES” WITH UNDERSTANDING OF THE “SCIENCE CONTENT”	
<ul style="list-style-type: none"> • Focus students’ attention to the use of practices for the purpose of developing deeper levels of understanding of “body of scientific knowledge”. • Require guided engagement in a set of scientific practices and students develop a sense of why they are engaging in these practices. • Require some degree of cognitive effort. Students need to engage with the conceptual ideas that underlie the scientific practice in order to develop understanding and make scientific reasoning. 	
HIGH LEVEL TASK – LEVEL 5	
ENGAGEMENT IN “SCIENTIFIC PRACTICES” WITH UNDERSTANDING OF THE “SCIENCE CONTENT”	
<ul style="list-style-type: none"> • Require engaging in scientific practices to understand “body of knowledge”. • Require complex thinking; there is not a predictable, well-rehearsed approach or pathway. • Require students to explore and understand a natural phenomenon. • Require considerable cognitive effort and may involve some level of anxiety for the student due to unpredictable nature of process. • Require students to access relevant knowledge and experiences and make appropriate use of them in working though the task. • There is no single solution and correctness of solution depends upon consistency with available evidence. • Involve engagement in important scientific practices such as modeling, developing explanations, and argumentation to develop deeper understanding of the science content. <p>Also</p> <ul style="list-style-type: none"> • Demand self-monitoring or self-regulation of one’s own cognitive processes. 	

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