

Practice Worksheet for Identification of Rationale for Depth Of Knowledge Levels

“Knowledge” refers to both content and process

Knowledge Level for Sample Questions	Rationale for Level Information in this column is adapted with permission from Dr. Norman Webb, Wisconsin Center for Education Research, University of Wisconsin-Madison 1025 West Johnson Street, Madison, Wisconsin 53706 http://facstaff.wcer.wisc.edu/normw/state%20alignment%20page%20one.htm
<p>Level 1: Recall, Reproduction Which correctly pairs a brain structure with its major function? A. Hippocampus - sorting and forming memories B. Cerebellum - relay station for sorting information C. Hypothalamus - where visual information ends up in the brain D. Meninges - connects right and left cerebral hemishpheres</p>	<ol style="list-style-type: none"> 1. Facts, definitions, terms, simple procedures, performing a simple science process or procedure 2. Rote response, using a well-known formula, following a set procedure (like a recipe), performing defined series of steps. 3. “Simple” procedure: well-defined, typically involves one-step 4. “Identify,” “Recall,” “Recognize,” “Use,” “Calculate,” “Measure” (cognitive work at the recall and reproduction level) 5. Simple word problems directly translated into and solved by a formula 6. “Describe” and “Explain” (classified at different DOK levels, depending on the complexity) 7. Answer does not need to be figured out or solved (knowledge necessary to answer item provides the answer to the item = Level 1.) 8. If the knowledge necessary to answer the item does not automatically provide the answer, the item = Level 2.
<p>Level 2: Skill, Concept Vicodin and Oxycodone are both combination prescription pain drugs. If someone was suffering from an overdose of these medications, they might go into respiratory depression.</p> <p>What type of drug might a doctor use to treat the person? Choose one category below and explain how it would work:</p> <p>opiate agonist opiate antagonist</p>	<ol style="list-style-type: none"> 1. Requires students to make some decisions as to how to approach the question or problem. 2. “Classify,” “Organize,” “Estimate,” “Make observations,” “Collect and display data,” and “Compare data.” More than one step. To compare data first identify characteristics then group or order the objects. 3. “Explain,” “Describe,” or “Interpret,” could be classified at different DOK levels, depending on the complexity of the action. For example, interpreting information from a simple graph, requiring reading information from the graph. Item requiring interpretation from a complex graph (making decisions regarding features of the graph that need to be considered and how information from the graph can be aggregated), is Level 3. Very simple explanation or a word or two is Level 2. 4. Examples: <ol style="list-style-type: none"> a. Specify and explain the relationship s; b. Describe and explain science concepts; c. Select a procedure according to specified criteria; perform it; d. Formulate a routine problem given data and conditions; e. Organize, represent and interpret data.

Questions: Please contact Project Director, Trez Buckland, PhD., MEd. trezbuck@u.washington.edu

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<p>Level 3: Strategic Thinking A scientist synthesizes a new drug. She wants to test its effectiveness in prevention of withdrawal symptoms when stopping use of benzodiazepines.</p> <p>She decides to conduct a series of experiments on laboratory mice to test her hypothesis.</p> <p>Explain an hypothesis she might have, the design she would use for her experiment, and justify your response.</p>	<ol style="list-style-type: none"> 1. Requires reasoning, planning, using evidence; higher level of thinking than the previous two levels; cognitive demands complex and abstract 2. There could be multiple answers (multi-step task requires more demanding reasoning.) 3. Requiring students to explain their thinking is usually Level 3 4. Activity that has more than one possible answer and requires students to justify the response 5. Experimental designs (ID research question sand design experiment); typically involve more than one dependent variable. 6. Examples: <ol style="list-style-type: none"> a. Drawing conclusions from observations; Form conclusions from experimental data b. Citing evidence and developing a logical argument for concepts; c. Explaining phenomena in terms of concepts; d. Using concepts to solve non-routine problems; e. Developing a scientific model for a complex situation.
<p>Level 4 : Extended Thinking</p> <p>Design and conduct a science investigation related to use of common over the counter drugs in your home or community that involves:</p> <ul style="list-style-type: none"> • Data collection • Data display • Interpretation of your results 	<ol style="list-style-type: none"> 1. High cognitive demands; Students required to make several connections 2. Relate ideas within the content area or among content areas 3. Select or devise a problem solving approach among many alternatives 4. Requires complex reasoning, experimental design and planning; probably will require an extended period of time either for the science investigation, or for carrying out the multiple steps of an assessment item. (Time period is not a distinguishing factor if work is only repetitive, does not require applying significant conceptual understanding and higher-order thinking: if a student has to take the water temperature from a river each day for a month and then construct a graph, this would be classified as a Level 2 activity. If the student conducts a river study that requires taking into consideration a number of variables, this would be a Level 4.) 5. Examples: <ol style="list-style-type: none"> a. Based on provided data from a complex experiment , novel to the student, deduct the fundamental relationship between several controlled variables. b. Conduct an investigation, from specifying a problem to designing and carrying out an experiment, to analyzing its data and forming conclusions.

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