**Benjamin Bloom’s Taxonomy (traditional textbook pedagogical information) 1956**

|  |  |  |
| --- | --- | --- |
| **Categories/Rating #** | **Definition** | **Math (or Science) Action Words** |
| Knowledge 1.0 | Student remembers, recalls, appropriate previously learned information. | Define; identify; name; select; state; order; one step |
| Comprehension 2.0 | Student translates, comprehends, or interprets information based on prior learning. | Convert; estimate; explain; express; factor; generalize; give examples; identify; indicate; locate; picture graphically |
| Application 3.0 | Student selects, transfers, and uses data and principles to complete a task or problem with a minimum of direction. | Apply; choose; compute; employ; interpret; graph; modify; operate; plot; practice; solve; use; three or more steps |
| Analysis 4.0 | Student distinguishes, classifies, and relates the assumptions, hypotheses, evidence, or structure of a statement or question. | Compare; contrast; correlate; differentiate; discriminate; examine; infer; maximize; minimize; prioritize; subdivide; test |
| Synthesis 5.0 | Student originates, integrates, and combines ideas into a product, plan, or proposal that is new to him or her. | Arrange; collect; construct; design; develop; formulate; organize; set up; prepare; plan; propose; create experiment and record data |
| Evaluation 6.0 | Student appraises, assesses, or critiques on a basic of specific standards and criteria. | Appraise; assess; defend estimate; evaluate; predict; rate; validate; verify |

**Norman Webb’s Depth of Knowledge (used by Horizon Corp. for PDE in PSSA development) 2005**

|  |  |  |
| --- | --- | --- |
| **Categories/Rating #** | **Definition** | **Math (or Science) Action Words** |
| Recall 1.0 | Student recalls facts, information, procedures, definitions. | Define; identify; name; select; state; order; one step |
| Basic Application of Skill/Concept 2.0 | Student uses information, conceptual knowledge, procedures. | Apply; choose; compute; employ; interpret; graph; modify; operate; plot; practice; solve; use; two or more steps |
| Strategic Thinking 3.0 | Student uses reasoning, develops a plan or sequence of steps; has some complexity. This generally takes 10 minutes or more to do. | Compare; contrast; correlate; differentiate; discriminate; examine; infer; maximize; minimize; prioritize; subdivide; test |
| Extended Thinking 4.0  (Not usually measurable on standardized tests) | Student conducts an investigation, needs time to think and process multiple conditions of problem or task. | Arrange; collect; construct; design; develop; formulate; organize; set up; prepare; plan; propose; create experiment and record data. |

\*Used with permission from Horizon Research Corporation; developer and evaluator used by the PDE for the PSSA tests. This information was made available to teacher committees evaluating pilot questions for future tests.