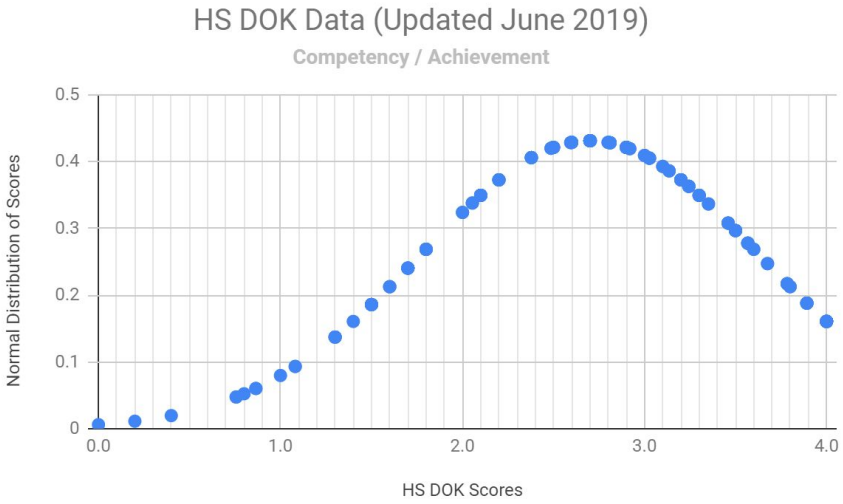
DOK PLDs for NGSS | CBE in Mr. Powner's Classes

DOK 4. Exceeds Expectations	DOK 3. Meets Expectations	DOK 2. Near Expectations	DOK 1. Below Expectations
Extended Thinking (DOK 4) Competence with DOK 3 and completing open-ended tasks, requiring creative, complex, abstract thought and sustained effort over extended time. Evaluate multiple STEM approaches to learning and problem solving. Conducting independent experiments and authoritative research. Evaluate authoritative sources for credibility, usefulness, accuracy, and possible bias; Communicate scientific ideas and technical information about phenomena and/or design and performance of proposed processes in multiple formats (i.e., orally, graphically, textually, mathematically, etc.) using precise scientific language and proper English. Apply justified conclusions to new situations.	**Strategic Thinking (DOK 3)** Competence with DOK 2 and completing tasks requiring evidence, reasoning, and multistep higher order (abstract) thinking. Design experiments and solve unfamiliar problems (STEM). Analyze data and infer meaning. Synthesizes relevant information from multiple cited sources; Prepare succinct written reports of investigations and technical information, using precise scientific language and proper English in written communication. Design and conduct investigations. Develop scientific/mathematical models. Interpret data from a complex graph. Citing evidence, develop logical arguments/conclusions.	**Skills and Concepts (DOK 2)** Competence with DOK 1 and engaging beyond recall. Compare, classify, organize, display information. Identifying relationships between concepts. Make decisions about how to approach concrete problems that often involve multi-step processes. Form hypotheses. Use relevant reference sources to find information and then use it to answer simple questions; Compare, contrast, classify, organize, display, and explain information. State and justify opinions. Interpret a simple graph.	**Recall and Reproduction (DOK 1)** Recall, look up, observe, question, or reproduce facts, definitions - mostly verbatim, little paraphrasing. Following explicit procedures with concrete understanding. Identifies reference sources; Find and use information verbatim; Recognizes universality and consistency of natural laws; Distinguishes science from non-science. Calculate, measure, and record data. Identify patterns or trends. State opinions (without justification).
Abstract, Creative Thinking	**Abstract, Flexible Thinking**	**Concrete, Exploratory Thinking**	**Concrete, Rigid Thinking**
A | Excellent	**B | Above Average**	**C | Average**	**D | Below Average**
100 - 90%	89 - 80%	79 - 70%	69 - 60%
GPA 4.0 - 3.7	GPA 3.6 - 2.7	GPA 2.6 - 1.7	GPA 1.6 - 0.7
ΔDOK > +2.8 (can be scaled)	ΔDOK +2.8 to +2.3 (can be scaled)	ΔDOK +2.2 to +1.1 (can be scaled)	ΔDOK +1.0 to +0.5 (can be scaled)

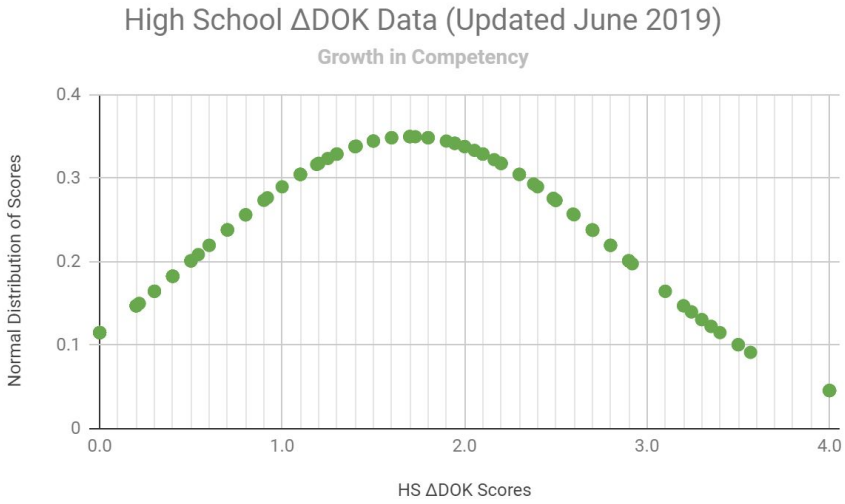
Abbreviations

DOK = depth of knowledge, PLD = proficiency level descriptor, CBE = competency based education, ABE = achievement based education, OBE = outcome based education

LEA Research Data Distribution Analysis



DOK HS Proficiency Scores
Mean = 2.7, SD = 0.9, 163 students



DOK HS Growth Scores
Mean = +1.7, SD = 1.1, 157 students

Hybridization of DOK/PLD Descriptors

- This version of the SAHS LEA-specific DOK descriptors is a hybrid of the language used in NGSS SEP Progressions, ACT PLDs, USBE Core Science ILOs (circa 2019), and Depth of Knowledge (DOK) as described by Webb and Hess. Not included are breadth of knowledge (BOK) descriptions as defined by NGSS Disciplinary Core Ideas (DCIs) Progressions.

Sources:

- "ACT Aspire Performance Level Descriptors (All Levels)." *ACT*, success.act.org/servlet/fileField?entityId=kaZ1B00000000ClUAI&field=File__Body__s.
- "ACT College & Career Readiness Standards." *ACT*, www.act.org/content/dam/act/unsecured/documents/CCRS-ScienceStandards.pdf.
- "Appendix F - Science and Engineering Practices in NGSS." *Next Generation Science Standards (NGSS)*, www.nextgenscience.org/sites/default/files/resource/files/Appendix F Science and Engineering Practices in the NGSS - FINAL 060513.pdf.
- Hess, Karen K. "Linking Research with Practice: A Local Assessment Toolkit to Guide School Leaders." *UEN.org*, www.uen.org/literacyresources/downloads/linking_research_with_practice.pdf.
- Webb, Norman. (2017). Summary Definitions of Depth of Knowledge (Webb's DOK) [Infographic published by WCEPS]. Madison, WI.
- University of Utah. (2019). GPA Calculator. Retrieved from https://advising.utah.edu/academic-standards/gpa-calculator-new.php

- “Utah Science with Engineering Education (SEEd) Standards.” *Utah State Board of Education (USBE)*, www.schools.utah.gov/file/3eea5b86-efbb-4a8e-9aa8-e63cc3078588.