

*Project Archaeology: Investigating Shelter*  
Next Generation Science Standards – Science and Engineering Practices  
Alignment for Grades 3-5  
*January 25, 2013*

**Summary of Relevant NGSS Science and Engineering Practices** (January 2013 draft)

**Asking Questions and Defining Problems.** A practice of science is to ask and refine questions that lead to descriptions and explanations of how the natural and designed world works and which can be empirically tested.

**Planning and Carrying Out Investigations.** Scientists and engineers plan and carry out investigations in the field or laboratory, working collaboratively as well as individually. Their investigations are systematic and require clarifying what counts as data and identifying variables and parameters.

**Analyzing and Interpreting Data.** Scientific investigations produce data that must be analyzed in order to derive meaning. Because data patterns and trends are not always obvious, scientists use a range of tools—including tabulation, graphical interpretation, visualization, and statistical analysis—to identify the significant features and patterns in the data.

**Using Mathematics and Computational Thinking.** In both science and engineering, mathematics and computation are fundamental tools for representing physical variables and their relationships. They are used for a range of tasks such as constructing simulations; solving equations exactly or approximately; and recognizing, expressing, and applying quantitative relationships.

**Constructing Explanations and Designing Solutions.** The goal of science is construction of theories that provide explanatory accounts of the world. A theory becomes accepted when it has multiple lines of empirical evidence and greater explanatory power or phenomena than previous theories.

**Learning science practices through archaeological inquiry.** Archaeological inquiry provides young students with an engaging way to learn science practices and their underlying concepts. As in scientific endeavor, archaeologists ask questions, plan and conduct investigations based on those questions, collect and analyze data both quantitatively and qualitatively, and construct interpretations and explanations based on evidence. *Project Archaeology: Investigating Shelter* models a complete archaeological investigation of a real archaeological site. The investigation is structured to provide scaffolding for the process of inquiry, but allows students to generate testable questions and answer them with the data provided. Following instruction in *Investigating Shelter*, students can conduct their own investigations of another archaeological site using the Project Archaeology database of regional and historic shelter investigations. *Investigating Shelter* supports the Common Core State Standards for English

Language Arts by providing non-fiction texts and authentic archaeological data to help teachers seamlessly integrate science with history and the humanities.

<b>NGSS Standard for Grades 3-5 (from Condensed version)</b>	<b>WU</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>AS</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>FPU</b>
ADQP: Identify scientific (testable) and non-scientific (non-testable) questions.					●	●		●	●	●		
ADQP: Ask questions based on careful observations of phenomena and information.					●	●		●	●	●		
ADQP: Ask questions to clarify ideas or request evidence.	●				●	●		●		●		
ADQP: Formulate questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect.					●	●		●		●		
PCOI: Design and conduct investigations collaboratively, using fair tests in which variables are controlled and the number of trials considered.								●		●		
PCOI: Make observations and/or measurements, collect appropriate data, and identify patterns that provide evidence for an explanation of a phenomenon.			●					●		●		
AID: Display tables and graphs, using digital tools when feasible, to reveal patterns that indicate relationships.			●							●		
AID: Compare data collected by different groups in order to discuss similarities and differences in their findings.			●		●			●	●	●		
AID: Interpret data to make sense of and explain phenomena, using logical reasoning, mathematics and/or computation.			●		●	●		●		●		
UMCT: Organize simple data sets to reveal patterns that suggest relationships.			●					●		●		
UMCT: Describe, measure, estimate, and graph quantities such as area, volume, weight, and time to address scientific and engineering questions and problems.										●		
CEDS: Construct explanations of observed quantitative relationships.			●			●		●		●		
CEDS: Use evidence (e.g., measurements, observations, patterns) to construct a scientific explanation.			●		●	●		●		●		
CEDS: Identify the evidence that supports particular points in an explanation.								●		●	●	●
CEDS: Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the problem.							●					●

Abbreviations (NGSS): ADQP = Asking Questions and Defining Problems; PCOI = Planning and Carrying Out Investigations; AID = Analyzing and Interpreting Data; UMCT = Using Mathematics and Computational Thinking; CEDS = Constructing Explanations and Designing Solutions.

Abbreviations (*Investigating Shelter*): WU = Warm-Up Lesson; 1-9 = Lessons One through Nine; AS = Assessment; FPU = Final Performance of Understanding