NECAP Science GE and DOK Alignment Chart **INQUIRY** **Grades 9-12** **GE 1-2**

DOK & NECAP Release Item Codes	GE Statement with Ceiling DOK Level	Examples/Practice Items
Enduring Knowledge (Scientific Questioning): Students raise scientifically oriented questions that can be answered through observations, experimentation and/or research. At early stages, students learn how to develop investigable questions that guide their work. At later stages, students connect their questions to scientific ideas, concepts, and quantitative relationships that inform investigations.		
All Inquiry GEs are assessed at the state level (NECAP Science). **DOK 3** **DOK 2**	**S9-12:1** **(DOK 3)** **Students demonstrate their understanding of SCIENTIFIC QUESTIONING by…** • Framing **testable questions** showing evidence of observations and prior knowledge to illustrate cause and effect. **AND** • Developing a **testable question** appropriate to the scientific domain being investigated.	
Enduring Knowledge: (Predicting and Hypothesizing): Scientists' explanations about what happens in the world come partly from what they observe and partly from what they think. Preliminary explanations are constructed with conceptual knowledge and propose a new level of understanding. At early stages, students think about what may happen during an investigation and justify their thinking. At later stages, students identify cause and effect relationships within an hypothesis and base predictions on factual evidence more than opinions.		
All Inquiry GEs are assessed at the state level (NECAP Science). **DOK 3** **DOK 2** **DOK 2**	**S9-12: 2** **(DOK 3)** **Students demonstrate their understanding of PREDICTING AND HYPOTHESIZING by…** • Developing a testable/guiding hypothesis and predictions based upon evidence of scientific principles. **AND** • Predicting results (evidence) that support the hypothesis. **AND** • Clearly distinguishing cause and effect within a testable/guiding hypothesis.	

NECAP Science GE and DOK Alignment Chart **INQUIRY** **Grades 9-12** **GE 3-4**

DOK & NECAP elease Item Codes	GE Statement with Ceiling DOK Level	Examples/Practice Items
nduring Knowledge (Designing Experiments): Students design investigations that control variables, generate adequate data/observations to provide easonable explanations, and can be reproduced by other scientists. At early stages, experimental design reflects what the experimenter will do to answer a uestion and ensure that a test is fair. At later stages, students design investigations that will produce the appropriate kinds of evidence to support or refute an ypothesis. Multiple trials or the collection of multiple data points are incorporated into the design and variables are controlled to ensure that the investigation is alid and reproducible.		
All Inquiry GEs are assessed at the state level (NECAP Science). **DOK 3**	**S9-12:3** **(DOK 3)** **Students demonstrate their understanding of EXPERIMENTAL DESIGN by…** • Writing a plan related to the question and prediction that includes: a. Procedures that incorporate appropriate protection (e.g., no food in lab area). b. Appropriate tools, units of measurement and degree of accuracy. c. Components that reflect current scientific knowledge and available technology . d. Use of scientific terminology that supports the identified procedures	
nduring Knowledge (Conducting Experiments): Students follow an experimental design and use scientific tools (including measurement tools) ppropriately and accurately. At early stages, students are encouraged to pay close attention to their experimental plan and record data throughout an nvestigation. At later stages, students engage in extended investigations and use more sophisticated science tools including computers.		
All Inquiry GEs are assessed at the state level (NECAP Science). **DOK 2** **DOK 3**	**S9-12:4** **(DOK 3)** **Students demonstrate their ability to CONDUCT EXPERIMENTS by…** • Collecting **significant data** by completing multiple trials; • Evaluating and revising procedures as investigation progresses.	

NECAP Science GE and DOK Alignment Chart **INQUIRY** **Grades 9-12** **GE 5-6**

DOK & NECAP Release Item Codes	GE Statement with Ceiling DOK Level	Examples/Practice Items
Enduring Knowledge (Representing Data and Analysis): Students represent data using text, charts, tables, graphs.		
All Inquiry GEs are assessed at the state level (NECAP Science).	**S 9-12:5** **(DOK 2)** **Students demonstrate their ability to REPRESENT DATA by…**	
DOK 2	• Representing data quantitatively to the appropriate level of precision through the use of mathematical calculations.	
	AND	
DOK 2	• Developing the skill of drawing a **"best fit" curve** from data.	
	AND	
DOK 2	• Recording accurate data, free of bias.	
	AND	
DOK 2	• Explaining importance of avoiding plagiarism/fabrication of other recorded research data.	
	S 9-12: 6 **(DOK 3)** **Students demonstrate their ability to ANALYZE DATA by…**	
DOK 2	• Accounting for identified **experimental errors.**	
	AND	
DOK 3	• Analyzing significance of experimental data.	
	AND	
DOK 3	• Critically examining and explaining the relationship of evidence to the findings of others (e.g., classmates or scientists in the field).	

NECAP Science GE and DOK Alignment Chart **INQUIRY** **Grades 9-12** **GE 7**

DOK & NECAP Release Item Codes	GE Statement with Ceiling DOK Level	Examples/Practice Items
Representing Data and Analysis (continued)		
All Inquiry GEs are assessed at the state level (NECAP Science).	**S9-12:7** **(DOK 3)** **Students demonstrate their ability to EXPLAIN DATA by…**	
DOK 3	• Proposing, synthesizing, and evaluating alternative explanations for experimental results.	
	AND	
DOK 3	• Citing experimental evidence within an explanation.	
	AND	
DOK 3	• Including logically consistent position to explain observed phenomena.	
	AND	
DOK 2	• Comparing an experimental conclusion to other proposed explanations by peer review (e.g., students, scientists or local interest groups).	
	AND	
DOK 3	• Conducting objective scientific analysis and evaluating **potential bias** in the interpretation of evidence.	
	AND	
DOK 3	• Identifying and evaluating uncontrolled variables inherent in experimental model.	
DOK 3	**EXTENSION:** • Considering multiple variables when interpreting mathematical analysis.	

NECAP Science GE and DOK Alignment Chart **INQUIRY** **Grades 9-12** **GE 8**

DOK & NECAP Release Item Codes	GE Statement with Ceiling DOK Level	Examples/Practice Items	
Enduring Knowledge (Applying Results): Students synthesize the results of an investigation by generating new questions related to the results of the investigation, stating a general rule regarding the understandings learned from the investigation, or applying the understandings learned to similar situations. At early stages, students make connections between classroom investigations and similar situations or experiences. At later stages, students recognize that different explanations can sometimes arise from the same evidence. Students demonstrate an ability to resist overgeneralization based on insufficient evidence and suggest the types of evidence that need to be gathered in order to better understand the focus of the investigation			
All Inquiry GEs are assessed at the state level (NECAP Science). **DOK 2** **DOK 3-4** **DOK 3**	**S9-12:8** **(DOK 3)** **Students demonstrate their ability to APPLY RESULTS by…** • Using technology to communicate results effectively and appropriately to others (e.g., power point, web site, posters, etc.). **AND** • Predicting/recommending how scientific conclusions can be applied to civic, economic or social issues. **AND** • Proposing and evaluating new questions, predictions, procedures and technology for further investigations.		