DOING SCIENCE: THE PROCESS OF SCIENTIFIC INQUIRY

Pennsylvania Academic Standards for Science and Technology – Grade 7

Lesson	Standard	Description
1, 2, 3, 4	3.1.7.B.2	Apply models to predict specific results and observations.
4	3.1.7.E.3	Describe the effect of making a change in one part of a system on the system as a whole.
All lessons	3.2.7.A.2	Answer "What if" questions based on observation, inference, or prior knowledge or experience.
All lessons	3.2.7.B	Apply process knowledge to make and interpret observations: measure materials using a variety of scales; describe relationships by making inferences and predictions; communicate, use space / time relationships, define operationally, raise questions, formulate hypotheses, test and experiment; design controlled experiments, recognize variables, and manipulate variables; interpret data, formulate models, design models, and produce solutions.
2, 3, 4	3.2.7.D.2	Define all aspects of the problem, necessary information and questions that must be answered.
2, 3, 4	3.2.7.D.3	Propose the best solution.
3, 4	3.2.7.D.6	Explain the results, present improvements, identify and infer the impacts of the solution.

Pennsylvania Academic Standards for Reading, Writing, Speaking, and Listening – Grade 8

Lesson	Standard	Description
2, 3, 4	1.1.8.C	Use knowledge of root words as well as context clues and glossaries to understand specialized vocabulary in the content areas during reading. Use these words accurately in speaking and writing.
2, 3, 4	1.1.8.D	Identify basic facts and ideas in text using specific strategies (e.g., recall genre characteristics, set a purpose for reading, generate essential questions as aids to comprehension and clarify understanding through rereading and discussion).
3	1.1.8.F	Understand the meaning of and apply key vocabulary across the various subject areas.
2, 3, 4	1.1.8.G.1	Make, and support with evidence, assertions about texts.
All lessons	1.1.8.G.3	Make extensions to related ideas, topics or information.
2, 3, 4	1.1.8.G.5	Analyze the positions, arguments and evidence in public documents.
All lessons	1.1.8.H.5	Demonstrate comprehension
3, 4	1.2.8.A.1	Differentiate fact from opinion utilizing resources that go beyond traditional text (e.g., newspapers, magazines and periodicals) to electronic media.

2, 3, 4	1.2.8.A.2	Distinguish between essential and nonessential information across texts and going beyond texts to a variety of media; identify bias and propaganda where present.
All lessons	1.2.8.A.3	Draw inferences based on a variety of information sources.
2, 3, 4	1.5.8.A	Write with a sharp, distinct focus.
2, 3, 4	1.5.8.B	Write using well-developed content appropriate for the topic.
All lessons	1.6.8.A	Listen to others: ask probing questions; analyze information, ideas, and opinions to determine relevancy; take notes when needed.
All lessons	1.6.8.D	Contribute to discussions: ask relevant, probing questions; respond with relevant information, ideas, or reasons in support of opinions expressed; listen to and acknowledge the contributions of others; adjust tone and involvement to encourage equitable participation; clarify, illustrate, or expand on a response when asked; present support for opinions; paraphrase an summarize, when prompted.
3	1.6.8.F	Use media for learning purposes.

Pennsylvania Academic Standards for Mathematics – Grade 8		
Lesson	**Standard**	**Description**
3	2.1.8.A	Represent and use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, exponents, scientific notation, square roots).
3	2.2.8.B	Add, subtract, multiply and divide different kinds and forms of rational numbers including integers, decimal fractions, percents and proper and improper fractions.
3, 4	2.4.8.B	Combine numeric relationships to arrive at a conclusion.
3, 4	2.5.8.B	Verify and interpret results using precise mathematical language, notation and representations, including numerical tables and equations, simple algebraic equations and formulas, charts, graphs and diagrams.
3, 4	2.7.8.B	Present the results of an experiment using visual representations (e.g., tables, charts, graphs).
3	2.7.8.D	Compare and contrast results from observations and mathematical models.
3, 4	2.7.8.E	Make valid inferences, predictions and arguments based on probability.
3, 4	2.8.8.G	Represent relationships with tables or graphs in the coordinate plane and verbal or symbolic rules.