Curriculum Grid

Objective Number	NGSS Grade 6-8 ● = Fully covered ◐ = Partially covered	Activities				Problem-Solving Activities					
		Beam Balance	Tower Crane	Ramp	Gear Racer	Catapult	Handcart	Winch	Merry-Go-Round	Watch Tower	Bridge
Disciplinary Core Ideas: Physical Science											
1	MS-PS2 Motion and Stability: Forces and Interactions	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
2	MS-PS3 Energy	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
Crosscutting Concepts											
1	Patterns	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
2	Cause and effect: Mechanism and explanation	●	●	●	●	●	●	●	●	●	●
3	Scale, proportion, and quantity	●	●	●	●	◐	◐	●	◐	◐	◐
4	Systems and system models	●	●	●	●	●	●	●	●	●	●
5	Energy and matter: Flows, cycles, and conservation	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
6	Structure and Function	●	●	●	●	●	●	●	●	●	●
7	Stability and change	●	●	●	●	●	●	●	●	●	●
Science and Engineering Practices											
1	Asking questions and Defining Problems	◐	●	●	●	●	●	●	●	●	●
2	Developing and using models	●	●	●	●	●	●	●	●	●	●
3	Planning and carrying out investigations	●	●	●	●	●	●	●	●	●	●
4	Analyzing and interpreting data	●	●	●	●	●	●	●	●	●	●
5	Using mathematics, Informational and Computer Technology, and computational thinking	●	●	●	●	●	●	●	●	●	●
6	Constructing explanations and designing solutions	●	●	●	●	●	●	●	●	●	●
7	Engaging in argument from evidence	◐	◐	◐	◐	●	●	●	●	●	●
8	Obtaining, evaluating, and communicating information	◐	●	●	●	●	●	●	●	●	●

Objective Number	Common Core Mathematics Standards Grade 6-8 ● = Fully covered ◐ = Partially covered	Activities				Problem-Solving Activities					
		Beam Balance	Tower Crane	Ramp	Gear Racer	Catapult	Handcart	Winch	Merry-Go-Round	Watch Tower	Bridge
Mathematical Practice											
MP1	Make sense of problems and persevere in solving them	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
MP2	Reason abstractly and quantitatively	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
MP3	Construct viable arguments and critique the reasoning of others	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
MP4	Model with mathematics	●	●	●	●	●	●	●	●	●	●
MP5	Use appropriate tools strategically	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
MP6	Attend to precision	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
MP7	Look for and make use of structure	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
MP8	Look for and express regularity in repeated reasoning	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
Ratios & Proportional Relationships											
6.RP.A	Understand ratio concepts and use ratio reasoning to solve problems	◐		◐	●		◐		◐		◐
7.RP.A	Analyze proportional relationships and use them to solve real-world and mathematical problems	◐		◐	◐	◐					
The Number System											
6.NS.B	Compute fluently with multi-digit numbers and find common factors and multiples	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
7.NS.A	Apply and extend previous understandings of operations with fractions	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
Expressions & Equations											
6.EE.A	Apply and extend previous understandings of arithmetic to algebraic expressions	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
6.EE.B	Reason about and solve one-variable equations and inequalities	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
6.EE.C	Represent and analyze quantitative relationships between dependent and independent variables	◐	◐	●	●	●	◐	◐	◐	◐	◐
7.EE.B	Solve real-life and mathematical problems using numerical and algebraic expressions and equations	●	●	●	●	●	●	●	●	●	●
8.EE.A	Work with radicals and integer exponents	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
8.EE.B	Understand the connections between proportional relationships, lines, and linear equations			●	●						
8.EE.C	Analyze and solve linear equations and pairs of simultaneous linear equations	◐	◐	◐	◐						
Function											
8.F.A	Define, evaluate, and compare functions	◐	◐	◐	◐						
8.F.B	Use functions to model relationships between quantities			●	●	●		●	●		
Geometry											
6.G.A	Solve real-world and mathematical problems involving area, surface area, and volume	◐								◐	◐
7.G.A	Draw construct, and describe geometrical figures and describe the relationships between them										◐
7.G.B	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume						◐	◐	◐	◐	◐
8.G.A	Understand congruence and similarity using physical models, transparencies, or geometry software	◐									●
Statistics & Probability											
6.SP.A	Develop understanding of statistical variability	◐	◐	◐	◐	◐	◐				
8.SP.A	Investigate patterns of association in bivariate data				◐						

Objective Number	**Common Core English Language Arts Grade 6-8** ● = Fully covered ◐ = Partially covered	**Activities**				**Problem-Solving Activities**					
		Beam Balance	Tower Crane	Ramp	Gear Racer	Catapult	Handcart	Winch	Merry-Go-Round	Watch Tower	Bridge
Speaking and Listening											
SL 6.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly	●	●	●	●	●	●	●	●	●	●
SL 6.2	Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
SL 6.3	Delineate a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
SL 6.4	Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation	●	●	●	●	●	●	●	●	●	●
SL 6.5	Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
SL 6.6	Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 6 Language standards 1 and 3 for specific expectations.)	●	●	●	●	●	●	●	●	●	●
SL 7.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly	●	●	●	●	●	●	●	●	●	●
SL 7.2	Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
SL 7.4	Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation	●	●	●	●	●	●	●	●	●	●
SL 7.5	Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
SL 7.6	Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 7 Language standards 1 and 3 here for specific expectations.)	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
SL 8.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly	●	●	●	●	●	●	●	●	●	●
SL 8.2	Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
SL 8.4	Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation	●	●	●	●	●	●	●	●	●	●
SL 8.5	Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
SL 8.6	Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 8 Language standards 1 and 3 here for specific expectations.)	●	●	●	●	●		●	●	●	●

Objective Number	**Common Core English Language Arts Grade 6-8** ● = Fully covered ◐ = Partially covered	**Activities**				**Problem-Solving Activities**					
		Beam Balance	Tower Crane	Ramp	Gear Racer	Catapult	Handcart	Winch	Merry-Go-Round	Watch Tower	Bridge
Reading Standards for Literacy in Science and Technical											
RST 6-8.1	Cite specific textual evidence to support analysis of science and technical texts.	●	●	●	●	●	●	●	●	●	●
RST 6-8.2	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.	●	●	●	●	●	●	●	●	●	●
RST 6-8.3	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.	●	●	●	●	●	●	●	●	●	●
RST 6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.	●	●	●	●	●	●	●	●	●	●
RST 6-8.5	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.	●	●	●	●	●	●	●	●	●	●
RST 6-8.6	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
RST 6-8.7	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
RST 6-8.10	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.	●	●	●	●	●	●	●	●	●	●
Writing Standards for Literacy in History/Social Studies, Science, & Technical Subjects											
WHST 6-8.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.	●	●	●	●	●	●	●	●	●	●
WHST 6-8.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	●	●	●	●	●	●	●	●	●	●
WHST 6-8.5	With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
WHST 6-8.7	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
WHST 6-8.10	Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐

Observation Checklist Part 1 **Science and Engineering Practices** **Grade 6-8** Use the Bronze (1), Silver (2), Gold (3), and Platinum (4) proficiency level descriptions, or another assessment scale that is relevant to your school context.		Name(s)										
Practice 1: I observed students asking questions												
a	to seek more information.											
b	to seek evidence for a claim.											
c	to challenge a claim or interpretation of data.											
d	to identify and understand independent and dependent variables.											
e	that can be investigated in this class.											
Practice 2: I observed students developing and/or using a model												
a	to explore its limitations.											
b	to explore what happens when parts of the model are changed.											
c	to show the relationship between variables.											
d	to make predictions.											
e	to generate data about what they are designing or investigating.											
Practice 3: I observed students planning and carrying out investigations												
a	that included independent and dependent variables and controls.											
b	that included appropriate measurement and recording tools.											
c	that tested the accuracy of various methods for collecting data.											
d	to collect data to answer a scientific question or test a design solution.											
e	to test the performance of a design under a range of conditions.											
Practice 4: I observed students analyzing and interpreting data												
a	by constructing graphs.											
b	to identify linear and non-linear relationships.											
c	to distinguish between cause and effect vs. correlational relationships.											
d	by using statistics and probability such as mean and percentage.											
e	to determine similarities and differences in findings.											
f	to determine a way to optimize their solution to a design problem.											

Notes:

Observation Checklist Part 2

Science and Engineering Practices
Grade 6-8

Use the Bronze (1), Silver (2), Gold (3), and Platinum (4) proficiency level descriptions, or another assessment scale that is relevant to your school context.

		Name(s)										
Practice 5: I observed students using mathematics and computational thinking												
a	by including mathematical representations in their explanations and design solutions.											
b	by using an algorithm to solve a problem.											
c	by using concepts such as ratio, rate, percent, basic operations, or simple algebra.											
Practice 6: I observed students constructing explanations and design solutions												
a	that included quantitative and qualitative relationships.											
b	that are based on scientific ideas, laws and theories.											
c	that connect scientific ideas, laws, and theories to their own observations.											
d	that apply scientific ideas, laws, and theories.											
e	to help optimize design ideas while making tradeoffs and revisions.											
Practice 7: I observed students engaging in arguments from evidence												
a	that compare and critique two arguments on the same topic.											
b	while respectfully providing and receiving critiques using appropriate evidence.											
c	while presenting oral or written statements supported by evidence.											
d	while evaluating different design solutions based on agreed-upon criteria and constraints.											
Practice 8: I observed students evaluating and communicating information												
a	when they read scientific text adapted for the classroom.											
b	when they read or wrote information in combinations of text, graphs, diagrams, and other media.											
c	when they created presentations about their investigations and/or design solutions.											

Notes: