Nottingham School District
Grade Level Competencies

State/CCSS Standards Addressed	Competency Statement	Related "I Can" Statements		Taught (Units / Topic)	Assessed (Activity / Test /Project)
MS-PS1-2 MS-PS4-1	Students will work collaboratively and individually to generate testable questions or define problems in terms of given constraints and criteria; plan and conduct investigations or apply engineering design practices to analyze and interpret data, and construct and communicate evidence-based explanations or possible optimal solutions.	DOK 4 4 3	•I can develop testable questions, make logical predictions, collect and analyze data, and use specific evidence to interpret and draw conclusions, communicate findings, and develop scientific explanations. • I can apply the engineering design process to optimally improve or solve problems using evidence. • I can utilize scientific hypotheses, theories and laws to objectively explore and describe the natural and engineered world, investigate changes over time and revise or reinterpret knowledge bases on new evidence.		
MS-PS1-2 MS-PS4-1	Students will observe, predict, and analyze patterns in order to support evidence based claims about relationships (e.g., cause and effect, structure and function, macroscopic and microscopic)	DOK 3 3 4	• I can use identified patterns in rates of change and other numerical relationships that provide information about natural and human-designed systems. • I can analyze and interpret data for past patterns to predict future patterns. • I can create models to predict trends and explain patterns in data that support my claims.		

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MS-PS1-4 MS-PS2-3 MS-PS2-5	Students will investigate, explain, and evaluate potential causal relationships, using evidence to support claims and predictions about the mechanisms that drive those relationships	DOK 3 3 4 4	• I can classify relationships as causal or correlational using evidence to support my claim. • I can investigate cause and effect relationships in order to explain the mechanisms driving change. • I can predict phenomena in natural or designed systems, by applying cause and effect relationships.. • I can describe cause and effect relationships using probability concepts.		
MS-PS1-1 MS-PS3-1 MS-PS3-4	Students will apply reasoning and modeling to determine the proportional relationships in observable and non-observable phenomena in terms of relative scale and quantity.	DOK 3 3 2 2	•I can determine an appropriate scale to observe time, space, and energy phenomena using models to study systems that are quite large or small. • I can use a variety of methods, tools and mathematical representations (algebraic expressions and equations) to make measurements, observations, and predictions of phenomena. • I can observe that the function of natural and designed systems may change with scale. • I can find and describe proportional relationships (e.g., speed as the ratio of distance traveled to time taken) among different types of quantities and use the relationship to predict the magnitude of properties and processes.		

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MS-PS1-4 MS-PS2-3 MS-PS2-5	Students will investigate and analyze a natural or human designed system in order to develop and justify a model that accurately represents the system or aspects of the system (e.g., boundaries, inputs, outputs, interactions, and behaviors).	DOK 3 3 4 3	• I can describe the structure and interactions of systems that may exist independently, be composed of subsystems, or be a part of larger complex systems. • I can model systems and their interactions, including inputs, processes, and outputs. • I can design and utilize a model to explain and justify the possible effects of change within a system (e.g., cycling of matter and the flow of energy). • I can determine the limitations of a model when it represents only certain aspects of the system under study		\
MS-PS1-5 MS-PS1-6 MS-PS3-3 MS-PS3-5	Students will analyze evidence (e.g., investigations, models, theories, scenarios) to predict and track changes in the cycling of matter and flow of energy within and between systems in order to identify their possibilities and limitations.	DOK 3 4 4 2	• I can develop a model and from it draw evidence that matter is conserved in physical and chemical processes. • I can demonstrate how the transfer of energy drives the motion and/or cycling of matter within a natural and a designed system,. • I can interpret and defend my interpretation of the effects of different forms of energy within and between systems (e.g. energy in fields, thermal energy, energy of motion). • I can predict possible changes within the system by tracking the transfer of energy flow through a designed or natural system		

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MS-PS1-5 MS-PS1-6 MS-PS4-1 MS-PS4-2 MS-PS4-3	Students will analyze the relationship among structure and function of natural or human designed objects, using evidence to redesign or support claims about survival and/or improved performance	DOK 3 3 3 4	• I can model complex and microscopic structures and systems. • I can visualize and model how function depends on the shapes, composition, and relationships among its parts. • I can analyze complex natural and designed structures/systems to determine how they function. • I can use functional and structural evidence to develop or improve natural or human-designed structures by taking into account properties of different materials and how materials can be shaped and used.		
MS-PS2-2	Students will analyze and evaluate the stability of natural and human designed systems in order to develop evidence-based explanations and predictions of changes over time.	DOK 4 3 3 4 4	•I can use evidence to analyze and evaluate the stability and change of natural or designed systems. • I can examine changes over time and forces at different scales, including the atomic scale, to explain and predict the stability of a system. • I can use evidence to predict how small changes in one part of a system may influence large changes in another part. • I can use empirical evidence to construct an argument of how stability might be disturbed either by sudden events or gradual changes that accumulate over time. • I can demonstrate, using evidence, that a system in dynamic equilibrium is stable due to a balance of feedback mechanism		

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