Windsor Locks High School
Believe and You Will Achieve

1. Connect the relationship between cause and effect to how it impacts the balance across physical, biological, and/or environmental changes.				
Student can...	**4**	**3**	**2**	**1**
1.1: Evaluate evidence to make claims about specific causes and effects.	I can predict cause and effect relationships by examining evidence.	I can make evidence-based claims about specific causes and effects.	I can distinguish evidence as a cause or effect.	I can identify a cause and effect relationship.
1.2: Analyze the existing balance/equilibrium found within and among physical, biological, and environmental systems.	I can predict the effect of changes to the balance/equilibrium among physical, biological, and environmental systems.	I can analyze the balance/equilibrium found within and among physical, biological, and environmental systems.	I can identify factors that maintain balance/equilibrium within and among physical, biological, and environmental systems.	I can describe an example of balance/equilibrium within a system.
1.3: Evaluate the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.	I can refine a chemical system by justifying tradeoffs that would optimize the system to increase the amount of product at equilibrium.	I can evaluate criteria and constraints of reactants and products, and availability of resources to maximize the concentration of products at equilibrium.	I can analyze the relative quantities of reactants and products before and after equilibrium in a chemical reaction system.	I can describe how changing a component of a chemical system affects the amount of reactants and products in that system at equilibrium.

2. Analyze and apply how energy and matter transfers and transforms within and across physical, biological, and/or environmental processes.

Student can...	4	3	2	1
2.1: Create models to track how changes of energy or matter flows into, out of, and within a system.	I can relate the changes of energy or matter in a system to the laws of conservation of energy/matter.	I can create models to track how changes of energy or matter flow into, out of, and within a system.	I can describe how energy or matter flows into, out of, and within a system.	I can identify different forms of energy or matter within a system.
2.2: Develop an evidence-based argument to show that all systems require energy.	I can predict what would happen to a system without energy.	I can develop an evidence-based argument to show that all systems require energy.	I can determine where energy is used within a system.	I can describe the law of conservation of energy.

3. Analyze relationships between structure and function of matter as it applies to physical, biological, and/or environmental systems.

Student can...	4	3	2	1
3.1: Connect the relationship between structures, properties, and/or functions of different materials.	I can refine designs or solve problems by examining the structures, properties, and/or functions at differing scales.	I can connect the relationship between structures, properties, and/or functions of different materials.	I can compare and contrast the properties, functions, and/or structures of different materials.	I can list the properties, structures (shape, composition), and/or functions of a material.
3.2: Differentiate how changes at each level of organization can affect a system's structure and/or function.	I can predict the effect of changes on the system.	I can analyze how changes can affect a system's structure and/or function.	I can identify changes that affect a system.	I can categorize levels of organization within a system.
3.3: Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms	I can evaluate electron configurations and ionization energies for atoms and formation of ions.	Apply the periodic table ato predict the relative properties and trends of elements based on the patterns of electrons in the outermost energy level of atoms	I can develop a logical argument that relates the properties and reactivity of elements to patterns of outermost electrons.	I can predict the properties of main group elements.
3.4: Construct an explanation for the outcome of a chemical reaction based on patterns of valence electrons and periodic trends	I can predict products of chemical reactions based on patterns of attraction between atoms and ions.	I can construct an explanation for the outcome of a chemical reaction based on observable evidence and unobservable rearrangements of atoms.	I can predict how the types of bonds formed between atoms in chemical reactions relate to atomic properties.	I can illustrate the outcome of chemical reactions in relation to patterns of valence electrons.

4. Critique patterns to predict behavior and relationships within physical, biological, and/or environmental systems.				
Student can...	**4**	**3**	**2**	**1**
4.1: Analyze patterns in evidence to organize, classify, or ask questions about relationships in the natural world.	I can predict the result of changes or disruptions in a pattern based on evidence.	I can analyze patterns in evidence to organize, classify, or ask questions about relationships in the natural world.	I can make an evidence-based claim for a pattern within physical, biological, and/or environmental systems.	I can organize data into a graph/chart to represent patterns.
4.2: Create models to relate how patterns at different scales (observable and unobservable) can provide evidence for explanations of phenomena.	I can revise explanations of phenomena based on new information at small and large scales.	I can create models to relate how patterns at different scales (observable and unobservable) can provide evidence for explanations of phenomena.	I can relate observable patterns to the microscopic and atomic-level structures.	I can illustrate patterns at different scales (macroscale and microscale).
4.3: Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	I can critique chemical processes using mathematical representations to compare limiting and excess reactants in practical applications.	I can apply mathematical representations to quantify reactants and/or products	I can explain how the Law of Conservation of Mass applies to chemical reactions.	I can identify quantities of reactants and products of a chemical reaction
4.4: Construct an explanation based on evidence about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.	I can evaluate reaction rates under varying conditions.	I can construct an explanation based on evidence about the effects of changing conditions of the reacting particles on the rate at which a reaction occurs.	I can analyze patterns to relate how changing concentration and temperature influence the rate of a reaction.	I can describe reaction rates in terms of the kinetic energy and collisions of particles in a reaction.

5. Design and conduct controlled physical and environmental science investigations.

Student can...	4	3	2	1
5.1: I can ask and refine questions to explain natural phenomena.	I can revise my questions based on new information.	I can ask questions to explain phenomena.	I can determine variables involved with phenomena.	I can make observations based off a phenomena.
5.2: I can explain phenomena utilizing relevant information.	I can support my claims with background research.	I can explain phenomena utilizing relevant information.	I can communicate information from various resources.	I can summarize the central idea of a source.
5.3: I can conduct an investigation using a clear, concise procedure.	I can create and conduct an investigation to answer a scientific question.	I can conduct an investigation using a clear, concise procedure.	I can determine the type of data that should be collected during an investigation.	I can identify independent variable, dependent variable, and constants in an investigation.
5.4: I can create an appropriate visual representation of data.	I can manipulate data or make inferences about the data.	I can create an appropriate visual representation of data.	I can make a visual representation of data.	I can collect data.
5.5: I can construct an explanation based on evidence	I can connect my explanation to the real-world.	I can construct an explanation based on evidence.	I can summarize supporting evidence	I can state a claim to answer a scientific question
5.6: I can evaluate the reliability and validity of data sets.	I can identify the causes of error in the investigation..	I can evaluate the reliability and validity of data sets.	I can assess the validity of data sets/	I can identify sources of error within the investigation.
5.7: I can develop models to support explanations, predict phenomena, analyze systems, and/or solve problems.	I can evaluate the merits and limitations of different models in order to select or revise a model that best fits the evidence.	I can develop models that support explanations, predict phenomena, analyze systems, and/or solve problems.	I can use a model to explain phenomena.	I can select an appropriate model to represent a phenomenon
5.8: I can design a solution to a real-world problem.	I can evaluate a solution to a real-world problem based on prioritized criteria and trade-offs.	I can design a solution to a real-world problem.	I can explain why the real-world problem needs to be solved.	I can identify a problem that can be solved.