Student Growth Objective Form

Name	School	Grade	Course/Subject	Number of Students	Interval of Instruction
	Orange High School	9-12	Chemistry		September 2015 to March 2016

Standards, Rationale, and Assessment Method

Name the content standards covered, state the rationale for how these standards are critical for the next level of the subject, other academic disciplines, and/or life/college/career. Name and briefly describe the format of the assessment method.

STANDARDS:

Unit I: Structure and Properties of Matter

HS-PS1-1: 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.
HS-PS1.A: Each atom has a charged substructure consisting of a nucleus, which is made of protons and neutrons, surrounded by electrons.
The periodic table orders elements horizontally by the number of protons in the atom's nucleus and places those with similar chemical properties in columns. The repeating patterns of this table reflect patterns of outer electron states.
HS-PS1.C- Nuclear Process involve the absorption or release of energy.
HS-PS2.B - All forces between objects arise from a few types of interactions: gravity, electromagnetism, and strong and weak nuclear interactions
HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.

Unit II: Conservation of Matter

HS-PS1.A- Each atom has a charged substructure consisting of a nucleus, which is made of protons and neutrons, surrounded by electrons.
The periodic table orders elements horizontally by the number of protons in the atom's nucleus and places those with similar chemical properties in columns. The repeating patterns of this table reflect patterns of outer electron states.
HS-PS1.B Many substances react chemically with other substances to form new substances with different properties. However, the total number of each type of atom is conserved in any chemical process, and thus mass does not change either.
HS-PS1-2 Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.
HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.

Unit III: Reaction rates and Chemical Equilibrium

HS-PS1.A Explain that the amount of energy per bond depends on the strength of the bond, and how the energy release or absorbed affects the internal motion of atoms and molecules in the system.
HS-PS1-4 Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.
HS-PS1.B Connect the rate law to the frequency and success of molecular collisions, considering the sufficient energy needed to overcome the activation energy barrier.
HS-PS1-5 Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.
HS-PS1.B Cite ways to disturb equilibrium and the corrective shifts that occur.
HS-PS1-6 Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.

Unit IV: Nuclear Chemistry

HS-PS1.C Explain, using evidence, the very strong force holding the protons and neutrons of an atomic nucleus together.
HS-PS1.B; PS1.C Compare and contrast chemical and nuclear reactions
HS-PS1.C Construct a graphic organizer, such as a chart, table, or concept map, to compare and contrast fission and fusion reactions with respect to reactants, products, and energy.
HS-PS1-8 Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.
HS-PS1.C Construct representations, at the particle level and graphically, of the changes that occur in a given radioactive sample (e.g., 64 particles decaying over four half-lives).
HS-PS1.C Explain the energy transformations and transfers occurring in a nuclear power plant.
HS-ESS1-1 Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy in the form of radiation.

Rationale

Chemistry investigates matter and energy and ways in which these two quantities interact. Over a course of study in chemistry, students should be able to recognize how both matter and energy are both quantified (measured) and qualified (observed) in a variety of contexts.

The units are presented so that students have multiple opportunities to explore matter and energy. In each unit, students will develop and explain models and theoretical frameworks that have evolved over time. They will also have opportunities to explain emergent theories and/or use modern and original data to investigate novel explanations for historical positions. The units are designed so that there are conceptual "bridges" that tie ideas from one unit to the next.

A lab-based/inquiry chemistry course is structured so that students actively engage in scientific and engineering practices and apply crosscutting concepts to deepen their understanding of the core ideas. The learning experiences provided for students should engage them with fundamental questions about the world and with how scientists have investigated and found answers to those questions. Students should have the opportunity to carry out scientific investigations and engineering design projects related to the disciplinary core ideas in physical sciences (pp. 8-9, NRC, 2012).

Assessment Method
Authentic Assessments throughout the year will be used to measure students' growth. The assessments will consist of selected content understanding task, and performance task that reflect higher levels of cognitive complexity.

Starting Points and Preparedness Groupings
Students will be tiered as determined by a data point systems the uses 3 points of data. Each tier group will be assigned a target level.

Data Measures used to Establish Baselines
2014-2015 Final Grade; weight (. 35)
Science Pre-Assessment: weight (.35)
Labs: weight (.30)

Preparedness Group	Baseline Score
Tier 1	< 0.45
Tier 2	0.45 – 0.65
Tier 3	0.65 – 0.75
Tier 4	0.75 -.85
Tier 5	>.85 ***increase within tier group**

Student Growth Objective

By March 2016, 70% of students in each preparedness group will meet their assigned target command level for full attainment of the objective as shown in the scoring plan.

Preparedness Group (e.g. 1,2,3)	Number of Students in Each Group	Target Level of SGO Combined Assessments
Tier 1		2
Tier 2		3
Tier 3		4
Tier 4		5
Tier 5		Growth with 5

Scoring Plan
State the projected scores for each group and what percentage/number of students will meet this target at each attainment level. Modify the table as needed.

Preparedness Group	Student Target Command Level	Teacher SGO Score Based on Percent of Students Achieving Target Score			
		Exceptional (4)	Full (3)	Partial (2)	Insufficient (1)
Tier 1	2				

Tier 2	3				
Tier 3	4				
Tier 4	5				

Approval of Student Growth Objective
Administrator approves scoring plan and assessment used to measure student learning.

Teacher _____ Signature_____ Date Submitted_____

Evaluator _____ Signature _____ Date Approved _____

Results of Student Growth Objective
Summarize results using weighted average as appropriate. Delete and add columns and rows as needed.

Preparedness Group	Students at Target Score	Teacher SGO Score	Weight (based on students per group)	Weighted Score	**Total Teacher SGO Score**

Notes
Describe any changes made to SGO after initial approval, e.g. because of changes in student population, other unforeseen circumstances, etc.

Review SGO at Annual Conference
Describe successes and challenges, lessons learned from SGO about teaching and student learning, and steps to improve SGOs for next year.

Teacher _____ Signature _____ Date _____

Evaluator _____ Signature _____ Date _____