Chemistry

School Year 2014-2015	Instructor: Mrs. Sieber
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Course Overview:

Chemistry plays an important part in all of the other natural sciences, basic and applied. Plant growth and metabolism, the degradation of environmental pollutants, development of new food products, and establishment of forensic evidence: none of these can be understood without the knowledge and perspective provided by chemistry.

This year-long course is structured around six main themes (big ideas) articulated in the curriculum framework outlined in the Next Generation Science Standards, as well as an introductory unit on laboratory safety. Each big idea has accompanying learning targets. The degree to which a student shows mastery of these learning targets will be the **ONLY** criteria used to determine his/her grade. The grading policy and learning targets are explained in detail below.

Standards-Based Grading (SBG):

The purpose of **SBG** is to ensure that a student's grade is reflective of his or her learning based on our course's expectations. Since SBG models do not use the traditional point scale, but instead collect accurate evidence of student performance and academic growth to determine mastery, students will reflect on and build their knowledge and skills throughout the semester. At the end of the semester, the teacher reviews the evidence presented by each student, for each standard, and convert said evidence into a traditional letter grade. In this model student learning is based on, neither points nor weights, but a professional interpretation of evidence of student mastery of the standards/learning targets.

There are two ways that we measure student progress: formative and summative assessments.

Formative assessments – provide an opportunity to check in on your student's progress. Students are given feedback and often a numerical score, but these do not count towards the student's final grade. These assessments allow a student to know whether or not they are on track with learning for that specific objective.

Summative assessments – act as the conclusive measure of the student's work and are the only scores that count towards the student's final grade. There may be more than one summative assessment for a specific learning target. It is up to the teacher's discretion as to whether the most recent summative assessment or all points of the summative assessments will be used for each unit.

(Most **lab activities** will be formative however if a formal write up is requested it will be count as a summative. The **Final Exam** each semester will be considered a summative. If a student fails the final it is possible that he/she may fail the class for the semester.)

The following marks will be used to grade the summative assessments:

Assessment Grade	What does it mean?
4-Mastery	Student exceeds expectations of mastery of the standard/ learning target. This indicates not only evidence of application and analysis, but also includes synthesis and evaluation.
3-Proficiency	Student can demonstrate complex knowledge, skills, application, and analysis of the standard/ learning target.
2-Basic	Student can demonstrate basic knowledge and comprehension of the standard/ learning target.
1-Below Basic	Student can demonstrate some evidence of simple skills, but lack continuity of knowledge and comprehension.
0-No evidence	Student cannot provide evidence of learning (missing and/or incomplete work)

Determination of Final Grades:

Step 1:

Grades for each learning standard are calculated by reviewing your student's scores, per learning standard, as shown on summative assessments that have been graded by the teacher. By looking at the assessments associated with each standard, a student, a parent, and the teacher can determine the overall grade by utilizing the double majority (mode) matrix below.

4	3	2	1
4-3	2-4	2-3	1-4
4-2	3-2	2-1	1-3
3-4	4-1	3-1	1-2

For example, if a student's most frequent score were a 3, and the second most frequent score were a 4, that student would have a "3-4," or an overall score of 4 for that standard.

Step 2:

After determining a score for each standard (using the above matrix), the teacher will use the matrix a second time to determine a final grade. However, the scores entered into the second matrix are the scores for individual standards, not individual assessments. In other words, the teacher will use the results of Step 1 to determine the final grade in Step 2.

For the Semester Final Grade in Chemistry–
The student's individual summative assessment grades will not be averaged together, but students will still receive letter grades for report cards. . We will use the following rubric to assign the grades:

A: Majority score of "4" in learning targets, no more than one "3", **NO** "2", or "1" in any learning target
B: Majority score of "3" in learning targets, no more than two "2", **NO** "1"
C: Majority score of "2" in learning targets, no more than one "1"
D: More than two "1" in any learning target
E: A score of "1" in 3 or more of the learning targets and/or a "0" in any learning target

Core Learning Standards/Skills:

SF1-Recognize the potential hazards of working in a Chemistry lab and understand that procedures for preventing common accidents, is an important practice throughout the year.

HSN-Q.A.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas

RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

SL.11-12.2 Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.

WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

L.11-12.6 Acquire and use accurately general academic domain-specific words and phrases, sufficient for reading, writing, speaking and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Course Standard/Learning Targets:

Big Idea 1: Structure of matter.

1a. I can draw, explain and interpret the structure of an atom.

Targets:

4- I can illustrate four given elements in the periodic table and correctly provide the *atomic features using only the periodic table.

3- I can illustrate four given elements in the periodic table and, with 80% accuracy, provide the atomic features using only the periodic table.

2- I can illustrate four given elements in the periodic table and, with 70% accuracy, provide the atomic features using only the periodic table.

1- I can illustrate four given elements in the periodic table and, with 60% accuracy, provide the atomic features using only the periodic table.

Atomic features are: chemical symbol, mass number, atomic number, number of sub atomic particles, classification (ion, neutral and isotope), ion type (cation or anion), Bohr model, long electron configuration and valence electron.

1b. I can explain trends of the periodic table.

Targets:

4- I can correctly compare and contrast *periodic trends between two different given families without any external references.

3- I can correctly compare and contrast periodic trends between two different given families by using the periodic table.

2- I can correctly compare and contrast periodic trends between two different given families by using notes and the periodic table.

1- I can correctly compare and contrast 50% of the periodic trends between two different given families by using notes, the periodic table and external references

Periodic trends are: valence electrons, electronegativity, ionization energy, atomic radii, atomic mass, and charge of ions, classification (metals, non-metals and metalloids), family name, group and period number and subatomic particles.

Big Idea 2: Bonding and Intermolecular Forces

2a. I can distinguish between the two types of bond (ionic and covalent) and understand the relationship that bond type and the resulting chemical and physical properties.

Targets:

4-Given a list of the first 20 elements, I can create two unique ionic and covalent compounds and compare and contrast bonding features as they relate to the list below without any external references.

3-Given a list of six compounds, I can choose one ionic and one covalent compound and compare and contrast bonding features as they relate without using any external references.

2-Given a list of six compounds, I can choose one ionic and one covalent compound and compare and contrast bonding features as they relate using the periodic table.
1- Given two compounds, I can choose one ionic and one covalent compound and compare and contrast bonding features as they relate using all references available.
Bonding features: Nomenclature (Name and Formula), Lewis structure, boiling point, electronegativity, melting point, conductivity, polarity and molecular shapes.

Big Idea 3: Chemical Reactions

3a. I can distinguish between the different types of reactions, predict products and balance a chemical equation.

Targets:

4-Given a list of reactants (compounds, polyatomics, and elements), I can create an example of each of the five types of reactions, predicting their products, balancing and naming their equations without any external references.
3-Given a list of reactants (compounds, polyatomics, and elements), I can create an example of each of the five types of reactions, predicting their products, balancing and naming their equations using a periodic table.
2-Given the reactants for the five equations (compounds, polyatomics, and elements), I can predicted their products, balance and name their equations using the periodic table.
1- Given the reactants for the five equations (compounds, polyatomics, and elements), I can predicted their products, balance and name their equations using the periodic table and notes.

3b. I can explain the mole concept and perform calculations as it applies to stoichiometry.

Targets:

4- I can use my own examples to demonstrate my understanding of the mole concept as it applies to stoichiometry (limiting reactant, theoretical yield, actual yield and percentage yield) using the periodic table.
3-I can use teacher provided examples to demonstrate my understanding of the mole concept as it applies to stoichiometry (limiting reactant, theoretical yield, actual yield and percentage yield) using the periodic table.
2-I can use teacher provided examples to demonstrate my understanding of the mole concept as it applies to stoichiometry (limiting reactant, theoretical yield, actual yield and percentage yield) using the periodic table as well as the mole reference sheet.
1-I can use teacher provided examples to demonstrate my understanding of the mole concept as it applies to stoichiometry (limiting reactant, theoretical yield, actual yield and percentage yield) using the periodic table, the mole reference sheet, and student notes.

Big Idea 4: Kinetics

4a. I can differentiate between the three classes of matter as they related to the kinetic molecular theory.

Targets:

4- Draw a heating or cooling curve, I can label axis, phase changes, and states of matter and apply the kinetic molecular theory, using a real-world example, to the curve without any references.

3-Given a teacher-generated heating or cooling curve, I can label axis, phase changes, and states of matter, and apply the kinetic molecular theory to the curve without any references.

2-Given a teacher-generated heating or cooling curve, I can correctly label, with 90% accuracy, axis, phase changes, and states of matter, and apply the kinetic molecular theory to the curve without any references.

1- Given a teacher-generated heating or cooling curve, I can correctly label, with 50% accuracy, axis, phase changes, and states of matter, and apply the kinetic molecular theory to the curve without any references.

4b. I can describe the general properties of gases according to the kinetic molecular theory.

Targets:

4-I can correctly describe and explain (mathematically and conceptually) and provided examples of the gas laws*.

3-Given the gas law formulas, I can correctly describe and explain (mathematically and conceptually) the gas laws.

2-Given teacher generated exercises and the gas law formulas, I can correctly solve and explain (mathematically and conceptually) the gas laws.

1-Given teacher generated exercises and the gas law formulas and using notes, I can correctly solve and explain (mathematically and conceptually) the gas laws

*The gas laws: Boyle's Law, Dalton's Law, Charles' Law, Avogadro's Law, and the Ideal Gas Law.

Big Idea 5: Thermochemistry

Targets:

5a. I can describe the quantity of heat released or absorbed in a chemical reaction using mathematical calculations.

4- Given laboratory data and the specific heat capacity of several materials, I can identify an unknown material by calculating its specific heat capacity and apply the kinetic theory without using any formulas or external references.

3- Given laboratory data and the specific heat capacity of several materials, I can identify an unknown material by calculating its specific heat capacity using the formula, but without using external references.

2- Given laboratory data and the specific heat capacity of several materials, I can identify an unknown material by calculating its specific heat capacity using the formula and using external references.
1- Given laboratory data and the specific heat capacity of several materials and a flow chart, I can identify an unknown material by calculating its specific heat capacity using the formula and using external references.

5b. I can compare and contrast, graph, and calculate energy changes in endothermic and exothermic reactions.
Targets:
4-Draw and correctly label both enthalpy diagrams for each type of reaction, including explanations and mathematical calculations, providing examples for each reaction.
3- Given both enthalpy diagrams, I can correctly label axis, products and reactants, activation energy and activated complex each type of reaction, including explanations and mathematical calculations, providing examples for each reaction.
2-Given both enthalpy diagrams, I can correctly label (90% accuracy) axis, products and reactants, activation energy and activated complex each type of reaction, including explanations and mathematical calculations, providing examples for each reaction.
1-Given both enthalpy diagram, I can correctly label (70% accuracy) axis, products and reactants, activation energy and activated complex each type of reaction, including explanations and mathematical calculations, providing examples for each reaction.

Big Idea 6: Chemical Equilibrium
6a. Identify and explain chemical equilibrium and factors that affect chemical reactions.
Targets:
4- I can explain the conditions of a system at equilibrium and give an example. Give and explain examples of the 5 factors that can influence the rate of a reaction (temperature, pressure and concentration, particle size and presence of a catalyst);
3- I can correctly explain the conditions of a system at equilibrium using examples from the textbook; correctly explain using textbook examples, 5 factors that can influence the rate of a reaction (temperature, pressure and concentration, particle size and presence of a catalyst);
2- Using a teacher provided chemical equation, I can correctly explain the conditions of a system at equilibrium; using teacher provided material, I can correctly explain the 5 factors that can influence the rate of a reaction (temperature, pressure and concentration, particle size and presence of a catalyst)
1- Using a teacher provided chemical equation, I can correctly explain the conditions of a system at equilibrium; Using teacher provided material, I can correctly explain the 3 factors that can influence the rate of a reaction (temperature, pressure and concentration, particle size and presence of a catalyst);

6b: I can apply Le Chatelier's Principle to explain the reversibility of chemical reactions.

4- I can infer the shift in equilibrium when 3 different stresses are applied to a chemical system (LeChatelier's Principle) and give examples of each. I can write and calculate an equilibrium constant expression for a reaction.

3- I can infer the shift in equilibrium when 3 different stresses are applied to a chemical system (LeChatelier's Principle) by using textbook examples of each. Using textbook examples, I can write and calculate an equilibrium constant expression for a reaction.

2-Using teacher provided material, I can infer the shift in equilibrium when a 3 different stresses are applied to a chemical system (LeChatelier's Principle). Using teacher provided materials; I can correctly calculate an equilibrium constant expression for a reaction.

1- Using teacher provided material, I can infer the shift in equilibrium when a 2 different stresses are applied to a chemical system (LeChatelier's Principle). Using teacher provided materials; I can correctly calculate an equilibrium constant expression for a reaction.

Frequently Asked Questions:

What does this mean for Infinite Campus?

It means that there will not be an in-progress grade posted on the main screen in Infinite Campus. Your student's teacher will weekly post a pass/fail grade for eligibility and grades will be posted for the quarter. However, if you look at your student's grades on each of the summative assessments, you can use the above rubric to determine your child's current grade. (Remember, only the summative assessments count towards the final grade)

What happens if I receive a 0,1 or an Incomplete on a summative assessment?

You can retake any summative assessment within the allotted time given by the instructor. Before being allowed to retake a summative assessment you need to show evidence of continued learning and improved mastery. This work will be assigned by the instructor and must be shown to the instructor prior to retaking any summative assessment. Actual retakes can be completed during office hours, but must be scheduled with me in advance.

So what role does homework/classwork (formative assessments) play in our class?

Formative assessments are assigned on an as needed basis. Remember, formative assignments are check-ins on your progress during the year. They aid you and your teacher in determining your mastery of a subject before you complete a summative assessment. Although formative assessments may not count toward your final grade, they are vital stepping stones to ensure success on summative assessments and completion of the class.

How can my student get extra help when they are struggling?
I am usually available after school at least one day per week. These days will be posted on the board every Monday. You can also get help by attending Maroons Achieve during your lunch or study hall, or Club Elgin after school.

Behavioral Expectations of Students

Earn and Give Respect, **H**old Yourself Responsible **S**afety First

Students are expected to always follow the simple directive listed above. In addition, in my classroom, students need to abide by the following:

- Bring Chemistry binder, notebook, and a pen/pencil to class EVERYDAY
- Keep cell phones in backpack/purse unless specifically instructed by me to do otherwise
- Come to class ON TIME. Be in your seat and ready to be an active participant in your learning!
- Follow all lab safety rules. Any immature or risky behavior will result in expulsion from that lab activity and possibly disciplinary action determined by me
- Be in charge of your own learning.

While class attendance/tardiness and participation is not graded, these factors will ultimately play a role in the student's ability to perform on assessments. I will provide feedback about mastery of the nonacademic standards when necessary.

Please keep this syllabus, for the duration of the year, in your Chemistry binder. It will serve as a road map for both course expectations and standards-based grading.

Please complete and return this form.

We have received, read, and understood our copy of Mrs. Sieber's Chemistry course expectations and grading policies.

Student Name: _____ Period_____

Student Signature: _____

Parent/Guardian printed name: _____

Parent/Guardian signature: _____ Date: _____

Relationship to student (mom, dad, etc.) _____

Student Cell number: _____

Student Email: _____

Parent Home Phone number: _____

Parent Cell number: _____

Parent Email: _____

Best time to call between 7am - 4pm? _____

Interpreter needed? Yes or No