Class Purpose
This course uses a project-based, standards aligned curriculum framework to encompass the essential concepts of chemical and physical science. Students will analyze and explain the nature of science in the search for understanding the natural world, as well as practice the application of technology, scientific tools and critical thought skills in solving problems. This first semester, students will formulate an answer to the questions: “How do substances combine or change (react) to make new substances? How does one characterize and explain these reactions and make predictions about them?” Chemical reactions, including rates of reactions and energy changes, can be understood by students at this level in terms of the collisions of molecules and the rearrangements of atoms. Using this expanded knowledge of chemical reactions, students are able to explain important biological and geophysical phenomena. As scientific learners, students will make and interpret models, collect and analyze data, analyze results, draw conclusions and communicate their findings. The crosscutting concepts of patterns, energy and matter, and stability and change are called out as organizing concepts for these disciplinary core ideas. In these performance expectations, students are expected to demonstrate proficiency in developing and using models, using mathematical thinking, constructing explanations, and designing solutions and to use these practices to demonstrate understanding of the core ideas. Throughout the course, students will work both independently and collaboratively, with an active learner approach. The goal for the course is for students to gain a more meaningful understanding of the world around them as well as a deeper appreciation of how science can help shed light on contemporary issues of social justice and environmental sustainability, particularly in the areas of energy production.

Class Overview
This semester will focus on the major theories and concepts in Chemistry: The composition of matter, how matter is categorized, how matter interacts, the signs and causes of chemical reactions, and the properties and structure of matter.

Cross Cutting Concepts
- Recognize PATTERNS in physical forms and events and evaluate their significance
- Identify SYSTEMS by their boundaries and components, and utilize MODELS OF SYSTEMS
- Recognize the occurrence of CAUSE AND EFFECT, and distinguish between correlation and cause.
- Recognize the relationship of STRUCTURE AND FUNCTION in objects and living things

Science and Engineering Practices
- Ask questions and define problems.
- Analyze and interpret data.
- Obtain, evaluate, and communicate information
- Plan and carry out investigations
- Engage in argument from evidence
- Develop and use models

Chemistry
Plan and carry out investigations to test predictions of the outcomes of various reactions, based on patterns of physical and chemical properties.

Develop and use models to explain the relationship of the structure of atoms to patterns and properties observed within the Periodic Table and describe how these models are revised with new evidence.

Develop and use models for the transfer or sharing of electrons to predict the formation of ions, molecules, and compounds in both natural and synthetic processes.

Obtain, evaluate and communicate information about how the use of chemistry related technologies have had positive and negative ethical, social, economic, and/or political implications.

**Habits of Heart and Mind**
- **Inquiry:** Formulates questions that are appropriate to context and contribute to the learning process.
- **Evidence:** Develops opinions that are based on careful examination of evidence and are consistent with one's own values
- **Action:** Sets realistic goals within a realistic timeframe and manages time to meet deadlines.

**Major Assignments**

**The Inquiry Process** (3 weeks) Student will walk through the Inquiry Process, journal requirements and explore What is Science.

**Major Project:** *Who am I, a Scientist* project presentation

**Physical Properties** (5 weeks) Students learn how to “describe stuff,” while exploring physical and chemical properties of matter (density, boiling point, melting point, solubility) through hands-on research.

**Gold Standard Project:** Design and conduct controlled investigation.

**Midterm exam**

**Chemistry** (4 weeks) Explain the systematic development and organization of the periodic table.

Major project: Element presentation

**Buy, Use, Toss** (5 weeks) Investigate how the transfer of energy can affect the physical and chemical properties of matter and the practical implications on our planet Earth.

**Gold Standard Project:** research and policy debate renewable resources.

**Final Exam**

**Competency Based Learning**

Students will keep a journal for exploring ideas on science topics in and out of class. The journal will be checked periodically by peers and by the teacher for participation and content. Students will also keep a Lab Notebook (provided by teacher). Labs and experiments will be assessed on an individual basis. Other work may be assigned on Google Classroom and should be turned in via Google Classroom unless otherwise requested. Not all assignments will be graded - some will be entered in PowerSchool as Complete/Incomplete/NHI. It is important to complete (and revise if needed) all assignments, even those that do not receive a grade. **About Google Classroom:** City High School uses Google Apps for Education; this means you have an email account and access to Google products like Drive, Gmail, etc, with your @cityhighschool.org username. One of these apps is called Classroom (classroom.google.com). Classroom is your one-stop shop for announcements & assignments. You will be given assignments through Classroom and you will turn them in through Classroom. **It is your responsibility to check Classroom on a DAILY BASIS to stay up-to-date on the work for the class.**
Scoring Assignments and Assessments

You should revise any assignment that you get a score below proficient on, or if you receive feedback requesting revision. You can revise any part of the assignment. However, you MUST follow these guidelines:

1. Actually **redo the work**. Apply the feedback I gave you. Rewrite. Revise.
2. If it’s a hard copy, attach your new version to the old version. Include the original grading rubric. **If the original work was submitted via Google Classroom, then you MUST resubmit your work by clicking on the RESUBMIT button.**
3. Email me to let me know you have resubmitted your work. Include a brief description of what you want me to look at again.

**Late Work**
Everyone’s life is easier if you turn in your work on time. Deadlines and due dates exist for a reason. However, I understand that life happens. If you are unable to turn in a graded assignment on time, you **must** talk to me before the due date to make arrangements. **Work that is late still must be completed if you want to earn an A or a B in the class.** All assignments are important for learning and growth, especially when it comes to writing & reading skills.

**Being Absent**
If you miss school, it is your responsibility to find out what you missed. Check Google Classroom, check in with a classmate, email me, and see me during my office hours.

**Grades**
Grades in this class are based on standards. A “standard” is defined as “a level of quality or attainment” or “an idea or thing used as a measure.” Standards in education are the things you’re supposed to learn and be able to do after taking a certain class. Teachers use standards to let you know what level you need to achieve, and we use them to measure how well you’re reaching that level. Every graded assignment you’ll get will be graded using a rubric. A rubric is a detailed breakdown of what is required and provides specific feedback to you about your work. I use what’s called a 4-point rubric system, which means there are 4 levels to the rubric:

- The highest level is **HIGHLY PROFICIENT (H)**. At this level, you are working above and beyond the standard. You can do things above grade level or beyond what was taught.
- Next is **PROFICIENT (P)**. You can demonstrate the skill or knowledge easily, without help.
- Below that is **NEARLY PROFICIENT (N)**. You are close to meeting the standard, but you might still need help or there are parts of the skill or concept you are still working on.
- The last level is **UNDERPERFORMING (U)**. You’re still stretching to learn the skill or concept; it’s really new to you; you need a lot of help; there’s a lot of work and effort you still need to put in.

For each graded assignment, you’ll be given a set of standards that that assignment is asking you to show, and your grade will be made up of these kinds of feedback. You can see what you did well and what you need to revise and work on. Progress scores on assignments will be updated weekly on Wednesday by 5pm.

Scoring Rubrics
Grades in this class are based on standards. A “standard” is defined as “a level of quality or attainment” or “an idea or thing used as a measure.” Standards in education are the things you’re supposed to learn and be able to do after taking a certain class. Teachers use standards to let you know what level you need to achieve, and we use them to measure how well you’re reaching that level. Every graded assignment you’ll get will be graded using a rubric. A rubric is a detailed breakdown of what you’re graded on. Rubrics provide specific feedback to you about your work. I use what’s called a 4-point rubric system, which means there are 4 levels to the rubric:

- The highest level is **HIGHLY PROFICIENT (H)**. At this level, you are working above and beyond the standard. You can do things above grade level or beyond what was taught.
- Next is **PROFICIENT (P)**. You can demonstrate the skill or knowledge easily, without help.
- Below that is **NEARLY PROFICIENT (N)**. You are close to meeting the standard, but you might still need help or there are parts of the skill or concept you are still working on.
- The last level is **UNDERPERFORMING (U)**. You’re still stretching to learn the skill or concept; it’s really new to you; you need a lot of help; there’s a lot of work and effort you still need to put in.

For example, our final Gold Standard Project this semester will be a parliamentary debate concerning renewable or nonrenewable resources. This is a sample of the rubric we will be using:

<table>
<thead>
<tr>
<th></th>
<th>HP</th>
<th>P</th>
<th>NP</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organization &amp; Clarity</strong></td>
<td>Completely clear and orderly presentation</td>
<td>Mostly clear and orderly in all parts</td>
<td>Clear in some parts but not overall</td>
<td>Unclear and disorganized throughout</td>
</tr>
<tr>
<td><strong>Use of Argument</strong></td>
<td>Very strong and persuasive arguments given throughout</td>
<td>Many good arguments given, with only minor problems</td>
<td>Some decent arguments, but some significant problems</td>
<td>Few or no real arguments given, or all arguments given had significant problems</td>
</tr>
<tr>
<td><strong>Use of cross-examination and rebuttal</strong></td>
<td>Excellent cross-exam and defense against Negative team’s objections</td>
<td>Good cross-exam and rebuttals, with only minor slip-ups</td>
<td>Decent cross-exam and/or rebuttals, but with some significant problems</td>
<td>Poor cross-exam or rebuttals, failure to point problems in other team’s position or failure to defend against attack.</td>
</tr>
</tbody>
</table>

For each graded assignment, you’ll be given a set of standards that that assignment is asking you to show, and your grade will be made up of these kinds of feedback. **No traditional letter grades. No numbers. Just H, P, N, or U.** One graded assignment might have 4-5 standards that are being assessed. You might get two “Ps” one “U” and one “H” You can see what you did well and what you need to revise and work on.
Course Grade
In order to better support competency-based efforts, teachers at City High School will generate course grades (A, B, C, or F) only at the end of each Semester. Here is the course grade rubric teachers will use to assign letter grades at the end of each semester.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
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| A     | - Assessments indicate a high level of understanding of concepts/mastery of skills (many H’s)  
- Almost all assignments are completed/revised as needed  
- Journal exhibits unusual, insightful, and/or creative ways to show learning  
- Learning targets are fully and consistently met and often extended  
- Reflections show frequent evidence of revision and growth |
| B     | - Assessments indicate a good grasp of concepts and skills (mostly PROs)  
- Most assignments are completed/revised as needed  
- Journal exhibits a combination of standard and novel/insightful/creative ways to show learning  
- Most of the learning targets are fully or consistently met  
- Reflections show some evidence of growth, with a few challenges remaining unaddressed |
| C     | - Assessments indicate inconsistent acquisition of skills and concepts with some gaps (mostly N’s)  
- Some assignments are incomplete/not revised/missing  
- Journal exhibits standard ways to show learning, may be missing some evidence of learning  
- More than half of the learning targets are fully or consistently met  
- Reflections show a few instances of growth, with several challenges remaining unaddressed |
| I     | - Journal does not show satisfactory acquisition of skills and concepts (mostly E’s)  
- Many assignments are incomplete/missing  
- Portfolio provides too little evidence of learning to make a determination  
- Less than half of the learning targets are fully or consistently met  
- Reflections show little or no growth |

Required Materials
Lab journal (we will be using electronic journal until materials are distributed), pencils, pens, colored pencils, metric ruler.

Academic Integrity
Students must be responsible and accountable for their own learning. Students are responsible for completing their own work. There is no room for cheating or plagiarism. If students are guilty of cheating or plagiarism, they will have to redo the assignment to demonstrate proficiency. Everyone involved will receive communication with parents/guardians and administrative referral to the Dean of Students for follow up.

Welcome. It is a joy to be here at City High School with its powerful focus on the inquiry process, place-based learning and collaboration. Know that I am available for conversations, suggestions and clarifications. We do not know what lies ahead, but I am honored to step into the grand adventure with you.

- Christy Coverdale Voelkel, MEd