Course Overview:
If we look at the world around us, many of our observations will be directly linked to chemistry. DNA, plants, plastic, and even the earth are made up of tiny particles known as atoms, ions, and molecules. The structure of these particles give rise to the properties that we observe and enable chemical reactions. In AP Chemistry we will take time to characterize material at the microscopic and macroscopic scale - identifying laws, theories and patterns. We will consider qualitative and quantitative relationships and in doing gain a deeper appreciation for the chemistry of materials and chemical reactions.

Units and Activities: What will we be learning about and doing in this course?
We will be following the AP Curriculum and exploring the following ideas.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Main Ideas of the unit</th>
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<tbody>
<tr>
<td>Unit 1 - Atomic Structure and Properties</td>
<td>In this unit we explore the periodic table and take a closer look at the atom. We will identify relationships between an atom’s structure and properties. We will also learn how to quantify atoms in terms of moles.</td>
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<tr>
<td>Unit 2 - Molecular and Ionic Compound Structure and Properties</td>
<td>Here we will learn about the bonds that hold atoms/ions together to form molecular and ionic compounds. We will consider the structural features of these compounds and discover how these features relate to a compound’s properties.</td>
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<tr>
<td>Unit 3 - Intermolecular Forces and Properties</td>
<td>Forces exist between molecules in the solid, liquid, and gaseous state. We will characterize these forces and their influence on the macroscopic scale.</td>
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<tr>
<td>Unit 4 - Chemical Reactions</td>
<td>Here we will study chemical reactions. We will discover different types of reactions noting the starting and ending material. We will build upon our understanding of the law of conservation of mass, by looking at its application in reactions.</td>
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<td>Unit 5 - Kinetics</td>
<td>Reactions proceed at different rates. In this unit we will look at factors that influence whether a reaction will occur and we will look at factors that speed up or slow down a reaction. We will use our new found knowledge to make predictions about the speed of a reaction.</td>
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<tr>
<td>Unit 6 - Thermodynamics</td>
<td>In this unit we will look at heat that is released and absorbed in a reaction. We will make quantitative observations that enable us to better understand heat changes during reactions and changes in phase.</td>
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<tr>
<td>Unit 7 - Equilibrium</td>
<td>Sometimes reactions are reversible. In this unit we will look at these reactions and the factors that influence whether a reaction proceeds in the forward or reverse direction. Following our investigations we will make quantitative descriptions of the reaction at equilibrium and identify the amount of product that forms.</td>
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Unit 8 - Acids and Bases

Acids and Bases are observed in many aspects of our daily life. In this unit, we will learn about these solutions at a microscale. We will learn about the quantitative component of these solutions as we consider pH, titrations, buffers, and pKa.

Unit 9 - Applications of Thermodynamics

Here we will take a deeper dive into thermodynamics and consider the role of disorder (entropy). We will also take a look at Gibbs Free Energy as well as Electrolytic and Galvanic Cells.

Standards: What knowledge and skills will I gain by the end of this course?

Anchor Standards: This course will assess the knowledge and skills students build in key Anchor Standards. Each Anchor Standard for this course is described below.

**Computational Thinking** - An essential skill in chemistry is to understand the quantitative relationships that exist between matter and energy. Therefore we will develop our ability to apply computational thinking in this manner.

**Modeling** - As we look at chemistry phenomena at the macroscopic scale, it is important to recognize that these properties are directly related to the microscopic scale (i.e. atoms, molecules). As we learn about various phenomena we will also develop the ability to model the relationships that exist between the macroscopic and microscopic scale.

**Explaining** - We will also take time to engage in the art of explaining. We will not only describe our understanding of a field, but also provide relevant information that supports our thinking. We will work to develop explanations collaboratively and independently in writing and in speaking to others.

*Please note: Investigations are also an important component to a chemistry education. While we are not assessing this standard per se, we will be doing a fair number of investigations in class and using the skills listed above to demonstrate understanding.*

Course Standards: This course follows the AP Curriculum provided by the College Board. A list of standards can be found here.

Assessment of Learning:

For information about assessment types, scoring, and overall grade calculation: click here.

Communication:

How Do I Access Work from Home, and What Should I Expect?

- All work will be posted in Google Classroom.
- The work will be explained during our in-person meetings and/or by video posted to Google Classroom.
- The work will also be explained in our Class Planner posted to Google Classroom.
- If you have any questions, email your teacher.
**How Do I Know What My Grades Are?**
- On Summative Assessments, teachers will provide both a 4-point grade and a letter grade.
- You can monitor your progress in the following ways:
  - By reading feedback and scoring returned to students on summative assessments.
  - By monitoring the scores and Overall Course Mastery Grade in the Parent/Student portal on JumpRope. Reminders to check grades will be sent from the school.
  - Communicating with your teacher if you are unclear.

**Where Can I Find This Syllabus during the School Year?**
- This syllabus will be available on the school website in each subject’s department tab once the school year is up and running. It will also be available in our Google Classroom.

**How Do I See What’s Due?**
- Assignment and summative assessment due dates with handouts are posted in Google Classroom, with connection to Google Calendar, for student access.

**How Do I See What’s Past Due?**
- If a student is missing a grade on an assessment, it will be listed in the red “Missing Assessment” section of the JumpRope Parent/Student Portal along with any attachments. Please contact your teacher if you have any questions.

**Schoolwide Procedures:**
*Please see the Student Handbook for Procedures and Policies related to: Due dates and deadlines, extra credit, retaking assessments, and turnaround time for grade entry.*

**Personal Mobile Devices:** This class will follow the procedures outlined in the student handbook.

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**Classroom Expectations:**

**Lab Safety** - Labs are an important component to a chemistry education. They make learning both fun and meaningful. However, there can be serious safety concerns when proper lab safety procedures are not followed. Therefore students will be required to complete a safety sheet at the beginning of the year before beginning labs and we will review safety concerns throughout the year. For the safety of all students, unsafe or dangerous activities during labs will not be tolerated.

**We will build upon the following ideas in class to create our classroom norms:**

- **Respect** - We all come to the classroom with different ideas and perspectives. Everyone has the right to be heard and supported within the classroom. We may think differently, but we can still find ways to respect each other as individuals.
**Responsibility** - Students have an important role in their own education and students will learn more when they ask questions, engage in learning activities, and complete assignments. We also have a responsibility to care for our classroom materials to ensure that we can use them for future activities.

**Teamwork** - Learning is a team effort that requires the engagement of all learners to create a positive learning culture. In class we participate, look out for one another, help each other out, and try to bring out the best in each other.

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**Materials:**

- Please ensure that you bring your laptop/tablet to class for full participation. We will frequently need to access digital materials on Google Classroom and elsewhere.

- We will reference the AP Edition Chemistry Textbook by Zumdahl, Zumdahl, and Decoste. However, we will also reference free virtual textbooks [Openstax](https://openstax.org) and [UCDavis Online Textbook](https://www.ucdavis.edu/). 

- It is very important for you to have a good organizational system. This will help you as we go through the year as you will need to easily access older worksheets/notes. For some students a binder is a very helpful organizational tool. However, it is also possible to keep track of your old assignments online. (We will briefly discuss some organizational strategies in class).

- Pencil or Pen, Calculator (The classroom has access to several calculators, but some students may want their own. However, please note that cellphone and computer calculators are not permissible for formatives/summatives).