

AP Chemistry Scope & Sequence

Days	Unit	Standard(s)/Outcome(s)	Essential/Guiding Questions
7	<p>Unit 1: Atomic Structure and Properties <i>You'll learn about the composition of atoms and ways scientists measure and categorize these molecular building blocks.</i></p>	<p><u>BIG IDEAS:</u></p> <ul style="list-style-type: none"> ● Scale, Proportion, and Quantity ● Structure and Properties <p><u>SCIENCE PRACTICES:</u></p> <ul style="list-style-type: none"> ● Models and Representations ● Question and Method ● Model Analysis ● Mathematical Routines 	<p>Why are eggs sold as a dozen?</p> <p>How can the same element be used in nuclear fuel rods and fake diamonds?</p>
9	<p>Unit 2: Molecular and Ionic Compound Structures and Properties <i>You'll discover the range of chemical bonds and how their structure can affect the properties of the molecules created.</i></p>	<p><u>BIG IDEAS:</u></p> <ul style="list-style-type: none"> ● Structure and Properties <p><u>SCIENCE PRACTICES:</u></p> <ul style="list-style-type: none"> ● Representing Data and Phenomena ● Model Analysis ● Argumentation 	<p>How has the discovery of DNA changed the world?</p> <p>How are molecular compounds arranged?</p>
11	<p>Unit 3: Intermolecular Forces and Properties <i>You'll explore how atoms come together to create solids, liquids, and gases, and how</i></p>	<p><u>BIG IDEAS:</u></p> <ul style="list-style-type: none"> ● Scale, Proportion, and Quantity ● Structure and Properties <p><u>SCIENCE PRACTICES:</u></p>	<p>How do interactions between particles influence mixtures?</p> <p>Why does the smell of</p>

	<i>subatomic forces govern the properties of everything around you.</i>	<ul style="list-style-type: none"> ● Question and Method ● Representing Data and Phenomena ● Model Analysis ● Mathematical Routines ● Argumentation 	<p>perfume only last a short time?</p> <p>Why can you swim in water but you cannot walk through a wall?</p> <p>How are the properties of gases described?</p> <p>How can you determine the structure and concentration of a chemical species in a mixture?</p>
11	<p>Unit 4: Chemical Reactions</p> <p><i>You'll learn how to differentiate physical and chemical processes, and how to measure and express chemical reactions via chemical equations.</i></p>	<p><u>BIG IDEAS:</u></p> <ul style="list-style-type: none"> ● Scale, Proportion, and Quantity ● Transformations <p><u>SCIENCE PRACTICES:</u></p> <ul style="list-style-type: none"> ● Models and Representations ● Question and Method ● Representing Data and Phenomena ● Mathematical Routines ● Argumentation 	<p>What makes fireworks explode?</p> <p>Why is the mass of a raw egg different than a boiled egg?</p> <p>What are the processes related to changes in a substance?</p>
10	<p>Unit 5: Kinetics</p> <p><i>You'll explore various methods to observe the changes that occur during a chemical</i></p>	<p><u>BIG IDEAS:</u></p> <ul style="list-style-type: none"> ● Transformations ● Energy <p><u>SCIENCE PRACTICES:</u></p>	<p>Why are some reactions faster than other reactions?</p> <p>How long will a marble</p>

	<i>reaction and the effects of a series of reactions.</i>	<ul style="list-style-type: none"> ● Models and Representations ● Representing Data and Phenomena ● Mathematical Routines ● Argumentation 	<p>statue last?</p> <p>How can a sports drink cure a headache?</p> <p>Why does bread rise?</p>
7	<p>Unit 6: Thermodynamics <i>You'll learn about energy changes in chemical reactions and how a transfer of energy can change a substance's physical qualities.</i></p>	<p><u>BIG IDEAS:</u></p> <ul style="list-style-type: none"> ● Energy <p><u>SCIENCE PRACTICES:</u></p> <ul style="list-style-type: none"> ● Models and Representations ● Question and Method ● Representing Data and Phenomena ● Model Analysis ● Mathematical Routines ● Argumentation 	<p>Why is energy released when water becomes an ice cube?</p> <p>How are chemical transformations that require bonds to break and form influenced by energy?</p>
11	<p>Unit 7: Equilibrium <i>You'll chart how chemical reactions change over time, what causes substances to reach equilibrium, and how systems react when that equilibrium is disturbed.</i></p>	<p><u>BIG IDEAS:</u></p> <ul style="list-style-type: none"> ● Transformations <p><u>SCIENCE PRACTICES:</u></p> <ul style="list-style-type: none"> ● Question and Method ● Representing Data and Phenomena ● Model Analysis ● Mathematical Routines ● Argumentation 	<p>Why is a waterfall considered a spontaneous reaction?</p> <p>How can reactions occur in more than one direction?</p> <p>How is caffeine removed from coffee?</p> <p>Why is food stored in a refrigerator?</p>

11	<p>Unit 8: Acids and Bases <i>You'll learn more about pH, the qualities and properties of acids and bases, and how they interact in chemical reactions.</i></p>	<p><u>BIG IDEAS:</u></p> <ul style="list-style-type: none"> ● Structure and Properties <p><u>SCIENCE PRACTICES:</u></p> <ul style="list-style-type: none"> ● Question and Method ● Mathematical Routines ● Argumentation 	<p>How are reactions involving acids and bases related to pH?</p> <p>How does your body maintain pH balance?</p>
7	<p>Unit 9: Applications of Thermodynamics <i>You'll be introduced to the concept of "thermodynamic favorability" for reactions, meaning how likely they are to occur given energy changes and environmental factors.</i></p>	<p><u>BIG IDEAS:</u></p> <ul style="list-style-type: none"> ● Scale, Proportion, and Quantity ● Structure and Properties ● Energy <p><u>SCIENCE PRACTICES:</u></p> <ul style="list-style-type: none"> ● Question and Method ● Model Analysis ● Mathematical Routines ● Argumentation 	<p>How does water flow uphill?</p> <p>How is the favorability of a chemical or physical transformation determined?</p> <p>How is electrical energy generated using chemical reactions?</p>