



Course: Chemistry 12

Teacher: Alistair Eggo

Unit: Acids and Bases

Date: 04/11/2020

Duration: 7 weeks

Description:

This unit builds off the previous three units, but will be a step up in terms of complexity. Both calculations and abstract concepts will be challenging here, and students are encouraged to seek help early on if they have any difficulty. In this unit we will learn about different definitions of acids, what pH is, and numerous other ways to quantify acids. As we will not be able to do the appropriate laboratory experiments in our homes, I will likely complete some videos of experiments at the school building for students to appreciate the experimental aspect of this unit, and to engage in some limited inquiry into how acids and bases function.

	Big Ideas	Essential Questions
Understand	<p><i>Which Big Ideas will be the focus of this unit?</i></p> <p>Acid or base strength depends on the degree of ion dissociation.</p>	<p><i>What questions will be guiding your students' inquiry?</i></p> <p>How can we apply mathematics to understand acid/base strength? How do mathematical principles further our understanding of acids and bases? How do acids/bases compete? How can we further quantize equilibria? What happens when acids and bases mix? What are the most harmful acids? Why? How can these be used safely?</p>

	Core Competencies	
Do	<p><i>Choose one or more Core Competencies that will be focused on and developed in this unit: (1) Communication; (2) Creative Thinking; (3) Critical Thinking; (4) Positive Personal and Cultural Identity; (5) Personal Awareness and Responsibility; and (6) Social Responsibility.</i></p> <ul style="list-style-type: none"> - Communication - Critical Thinking 	<p><i>Which activities, projects, exercises or discussions will teach this Core Competency? How will they implement the First Peoples Principles of Learning? How will they be inquiry-based?</i></p> <p>Students will improve their communication through mathematics, by appropriately expressing their conceptual understanding through numbers and equations. Similarly, dealing with this level of abstraction will improve their critical thinking as conceptual understanding is expressed</p>

	<p>through numbers, numbers are applied to experimental contexts, and experiment findings are explained using those previous concepts. Transitioning between words, numbers and experiments will grow students' critical thinking.</p>
<p>Curricular Competencies</p>	
<p><i>Which Curricular Competencies (specific to your course) will students learn and be assessed on in this unit?</i></p> <p>Questioning and predicting</p> <ul style="list-style-type: none"> - Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal, local, or global interest <p>Planning and conducting</p> <ul style="list-style-type: none"> - Use appropriate SI units and appropriate equipment, including digital technologies, to systematically and accurately collect and record data - Apply the concepts of accuracy and precision to experimental procedures and data: <ul style="list-style-type: none"> - significant figures - uncertainty - scientific notation <p>Processing and analyzing data and information</p> <ul style="list-style-type: none"> - Seek and analyze patterns, trends, and connections in data, including describing relationships between variables, performing calculations, and identifying inconsistencies <p>Evaluating</p> <ul style="list-style-type: none"> - Describe specific ways to improve their investigation methods and the quality of their data - Evaluate the validity and limitations of a model or analogy in relation to the phenomenon modelled <p>Communicating</p> <ul style="list-style-type: none"> - Formulate physical or mental theoretical models to describe a phenomenon 	<p><i>Which activities, projects, exercises or discussions will teach these Curricular Competencies? How will they implement the First Peoples Principles of Learning? How will they be inquiry-based? How will the Curricular Competencies be assessed?</i></p> <p>All of these curricular competencies will be built on through calculations and experimental work. Calculations will first be displayed and explained, before students are asked to complete them and apply them to new contexts. This relates to the FNMI principle of: Learning takes practice and time. As students apply models to understand abstract concepts, and complete their own calculations, they will build the skills listed here, amongst others. We will reflect on these calculations and what they mean after completion.</p>

Curricular Content	
Know	<p><i>Which Curricular Content (specific to your course) will students learn and be assessed on this unit?</i></p> <ul style="list-style-type: none"> - relative strength of acids and bases in solution: <ul style="list-style-type: none"> - electrical conductivity - table of relative acid strength - equations of strong and weak acids and bases in water - water as an equilibrium system - weak acids and weak bases: equilibrium systems - titration: <ul style="list-style-type: none"> - the method to find an equivalence point: - strong acid–strong base titration - weak acid–strong base titration - strong acid–weak base titration - hydrolysis of ions in salt solutions: <ul style="list-style-type: none"> - acidic, basic, or neutral salt solutions - amphiprotic ions - applications of acid-base reactions: non-metal and metal oxides in water and associated environmental impacts - buffers
	<p><i>Which activities, projects, exercises or discussions will teach this Curricular Content? How will they implement the First Peoples Principles of Learning? How will they be inquiry-based? How will the Curricular Content be assessed?</i></p> <p>Students will be assessed through worksheets, quizzes and a final exam. Where possible, students will have the opportunity to see laboratory work being done, and may be asked to ‘write up’ the experiment. A final exam for this unit will be administered. Formative assessment will be completed from the Hebden textbook.</p>

Required Resources
<p><i>What resources (textbooks, computer programmes, website subscriptions) will students need to complete this unit?</i></p> <p>Hebden textbook Notebook/Google Docs note-taking Functional computer with internet access</p>