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| **Lesson Plan:**  |

**Prior learning and thinking:** Students have completed the unit on chemical equilibrium, which are the basics for the acid/base section. They also know how to Keq to find the concentrations of reactants/products at equilibrium and work backwards to solve for Keq. They may or may not have learned how to use logs, which is needed for calculating pH and pOH. Students have experience with neutralization reactions and know the strong acid to strong base reaction only.

**Learning objectives**

- Identify acids and bases through experimentation

- Test and classify various laboratory solutions and household chemicals as acids or bases.

- List general properties of acids and bases

- Write names and formulae of some common household acids and bases

- Outline some of the uses and commercial names of common household acids and bases.

**Big Ideas**

4) Safety and application of acid/base reactions in real life situations.

**PLOs**

**D1** identify acids and bases through experimentation

**Material and equipment needed**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| NaOH | Ca(OH)2 | Oven cleaner | Ammonia | White vinegar | Blue and Red litmus |
| HCl | H2SO4 | Lemon Juice | Easy off | Phenolphthalein | Magnesium metal strips |
| KOH | HNO3 | 7-up | Milk of Magnesia | Methyl Orange | Beakers (100mL or 400mL) |
| Test tubes | Test tube racks | Spot plates | Droppers | Safety goggles | Copies of articles |
| Worksheet 4-1 | Lab handout | Laptop | Projector | Unit overview | Hovercam |

**Assessment Plan:**

**Formative -** Inquiry questions discussed in class and worksheet handed in this class or next class

**Hook and Introduction**

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| --- | --- | --- | --- |
| **Time** | **Activity** | **Teaching notes** | **Assessment** |
| 15 min | * Introduction to class and the structure of the classes
* Social expectations
 | * Introduce teacher candidate, learning outcomes, lesson structures, and assessment
* Video to start the day every lesson
* Unit Overview
* Can ask what they know about Acids/Bases
 | * Can ask what they know about acids/bases
 |

**Development**

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| --- | --- | --- | --- |
| **Time** | **Activity** | **Teaching notes** | **Assessment** |
| 50 min | * Experiment 13A in Essential Experiments for Chemistry
 | * Teacher: Prep - 1 bench for equipment and chemical distributionIntroduce lab that leads into unit and why acids and bases are importantGive instructions for the lab: handout, read, write purpose of lab (1 sentence), read procedures, create data tables (leave space for observations), do the lab, record rest of data from other groups, answer marked questions on handout below data tables, hand in beginning of next class (1 copy per group with names of all group members)Go over safety and clean up procedureNumber students off into 7 groups
* Students:7 groups - each group assigns a team leader, a recorder, an experimenter (1-2), and a researcherTeam leader - manages group, meets with other team leaders to share dataRecorder - works with experimenter in collecting data and observations. Also works with researcher to collect useful information to write down on lab write-up Researcher - looks up chemical formulas, definitions. Works with team leader to analyze data.Each group receives: 2 samples - 1 unknown and 1 household product in a beaker, 2 droppers, 1 test tube rack, 2 test tubes, 2X1cm magnesium strips, 1 phenolphthalein, 1 methyl orange, 2 blue litmus, 2 red litmus, 2 glass spot plates, safety gogglesTeam leader shares data with other team leaders from other groupsClean up
 | * Short lab-write up
 |
|  10 min | * Work on analysis and follow up questions
 | * Students work on assigned questions and may hand in the report before class ends
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**Closure**

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| --- | --- | --- | --- |
| **Time** | **Activity** | **Teaching notes** | **Assessment** |
| 5 min | * Check in with the class
 | Check with class how the lab went, what did they learn, have they gotten the formulas they need. Distribute articles + worksheet 4-1 and post up the homework | **HWK** 1) Lab report (next class)2) Article summary - formulae of chemicals and what kind of chemical reaction happened that caused the man's death (next class)3) Worksheet 4-1 (Friday the 27th) |