### Hawaiian Values:
- **LAULIMA** - helps others do well
- **KULEANA** - takes assigned & implied classroom responsibilities seriously

### Science Content Standards:
- Domain I, Strand 1 - Science as Inquiry
- Domain I, Strand 3 - Doing Safety

### Learning Styles:
- Left Brain
- Auditory
- Visual
- Kinesthetic

### Unit: Kai/Ocean
### Term: 1
### Week: 5

### Lesson Topic:
**INTRO TO THE SCIENTIFIC METHOD & pH SCALE (Acids & Bases)**

### Global Learning Objectives:
- #2 Community Contributor
- #3 Complex Thinker

### Date:
M Tu W Th F

### Time:
______________ to ____________ (90 minutes)

### Objectives:
1. Students will read to learn how scientists describe properties of acids & bases, what indicators & neutralizers are
2. Students will share their responses to the readings
3. Students will be introduced to the Scientific Method of Inquiry
4. Students will apply the Scientific Method to a team experiment
5. Students will report the results of their lab (in writing &/or verbal presentation to the class)

### Assessment/Performance Indicators:
- Informal assessment: reading effort and participation/listening to discussion of same
- Formal assessment: Lab report includes all 6 steps of Scientific Method, accurate analysis of team's experience (even if results were incorrect or inconclusive), and 2 or more concluding notes to show learning; Optional: presentation of lab results given audibly and accurately

### Exceeds Expectations:
- Full SSR participation (2); Lab report 90% accurate or better (9-10); presentation 90% clear & accurate or better (3)

### Meets Expectations:
- 75% SSR participation or better (1.5-2); Lab report 75% accurate or better (7.5-8.5); presentation 75% clear & accurate or better (2-2.5)

### Needs Improvement:
- 60% SSR participation or less (0-1); Lab report 60% accurate or less (0-7); presentation 60% clear & accurate or less (0-1.5)

### Procedures to Teach Strategies, Skills, Content:
1. SSR: Acids, bases, indicators & neutralizers - class shares views on reading
2. Intro to Scientific Method: 1) Purpose (students copy: to find if mystery solutions are acids, bases, & what pH); 2) Research (students answer: what I already know about pH scale, acids & bases) … Optional: can use hand-out
3. Pairs (or 3s) get mystery liquid (see list on pH scale in notes) and write a Hypothesis (what do I think will happen to the pH paper in my liquid); 4) copy Experimental Procedure from chalkboard & then select recorder & observer, then get test strips and test solution(s)… Optional: test more than 1 solution
4. Analysis (students compare result to pH scale to determine if their solution is an acid or base & how strong); 5) Conclusion (teams write up lab report); Optional: groups present findings to class &/or share notes on all mystery solutions. Note: some may be given the choice of writing or speaking

### Materials:
- (Safety) no long hair, loose sleeves, slippers/open-toed shoes, work on flat surfaces
- For teacher: pH paper &/or litmus papers; cup each of lemon, vinegar, milk, baking soda & water, milk of magnesia, ammonia (note: safety precautions, allergies, no tasting or touching, care when smelling, etc)
- For students: each pair or trio needs one mystery solution (measure into 10 mL container) & litmus or pH paper strips