

## NGSS.CH07.SET: Acids, Bases and Salts (ages 9+) - includes Control Chart, Research Cards and Task Cards

### Research Cards Standards

#### Grade 5

##### NGSS 5-PS1-3 – Structure and Properties of Matter

**Summary:** Materials can be identified by measurable properties.

**Focus Area:** Classify acids, bases, and neutral substances.

**Students will:**

- Use indicators like litmus to test solutions.
- Differentiate substances by pH values.

##### NGSS 5-PS1-4 – Chemical Reactions

**Summary:** Mixing substances may result in new substances.

**Focus Area:** Explore neutralization as a chemical change.

**Students will:**

- Use examples of neutralization ( $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$ ).
- Explain evidence that salts are new substances.

#### Grade 6

##### NGSS MS-PS1-2 – Structure and Properties of Matter

**Summary:** Analyze properties before and after interactions to determine chemical change.

**Focus Area:** Use acids and bases as examples of reactive substances.

**Students will:**

- Compare strong vs weak acids/bases by degree of ionization.
- Explain how acid-base interactions change chemical properties.

##### NGSS MS-PS1-5 – Chemical Reactions

**Summary:** Atoms are conserved during chemical reactions.

**Focus Area:** Represent neutralization with balanced equations.

**Students will:**

- Write and interpret equations showing conservation of matter.
- Model ions combining to form water and salts.

### Task Cards Standards

#### Grade 5

##### NGSS 5-PS1-3 – Structure and Properties of Matter

**Summary:** Identify materials by their observable and measurable properties.

**Focus Area:** Classify acids, bases, and neutral solutions with indicators.

**Students will:**

- Identify household acids and bases.
- Use pH values to categorize strong and weak solutions.

#### **NGSS 5-PS1-4 – Chemical Reactions**

**Summary:** Evidence of new substances from interactions.

**Focus Area:** Explore neutralization and salt formation.

**Students will:**

- Conduct tests with acids and bases.
- Record evidence of salts forming during reactions.

### **Grade 6**

#### **NGSS MS-PS1-2 – Structure and Properties of Matter**

**Summary:** Data reveal when chemical changes occur.

**Focus Area:** Compare properties of acids, bases, and salts before and after reactions.

**Students will:**

- Test litmus and pH before and after mixing.
- Conclude that neutralization is a chemical change.

#### **NGSS MS-PS1-5 – Chemical Reactions**

**Summary:** Atoms rearrange but are conserved.

**Focus Area:** Balanced equations for acid-base reactions.

**Students will:**

- Model conservation in acid + base  $\rightarrow$  salt + water.
- Apply particle-level reasoning to explain new substances.

## **Control Chart Puzzle Standards**

### **Grade 5**

#### **NGSS 5-PS1-3 – Structure and Properties of Matter**

**Summary:** Substances can be identified by measurable properties.

**Focus Area:** Reinforce classification of acids, bases, and salts.

**Students will:**

- Match puzzle pieces to categories.
- Self-correct using control chart labels.

#### **NGSS 5-PS1-4 – Chemical Reactions**

**Summary:** Mixing can result in new substances.

**Focus Area:** Show neutralization as a reaction.

**Students will:**

- Use puzzle to demonstrate acid + base  $\rightarrow$  salt + water.

### **Grade 6**

#### **NGSS MS-PS1-2 – Structure and Properties of Matter**

**Summary:** Changes in properties signal chemical reactions.

**Focus Area:** Show how salts differ from reactants.

**Students will:**

- Classify strong/weak acids and bases.
- Explain how salt formation changes substance properties.

**NGSS MS-PS1-5 – Chemical Reactions**

**Summary:** Atoms are conserved in reactions.

**Focus Area:** Apply conservation of matter to neutralization.

**Students will:**

- Balance equations shown on puzzle.
- Explain conservation using particle-level models.