

**Unit 7: Chemical Reactions** Physical Science

**Topic 1**

**Topic:** How can you tell a chemical reaction occurred?

**Objectives:** Investigate and provide evidence of a chemical change by recording systematic observations, such as color change, odor, and temperature for various chemical reactions. Classify reactions as energy absorbing or energy releasing on the basis of temperature measurements.

**Discussion:** Characteristics of chemical reactions

**Lab:** Chemistry in a Ziploc

**Related Text:** Read pg 56-57

**Homework:** Finish Lab  
Signs of a chemical reaction concept map  
Endo and Exothermic reaction Venn diagram

**Topic 2**

**Topic:** Why do we use recipes to cook?

**Objectives:** Conclude from experimental evidence, based on mass measurement, that mass is neither created nor destroyed during chemical reactions.

**Discussion:** Conservation of mass. Balancing equations

**Activity:** Counting atoms WS, Balancing equations overhead, Snowman Challenge.

**Related Text:** Read Section 7.1 (192-194)  
Answer questions: Pg 198 (1-2, 4, 6, 9)  
Pg 223 (1-2, 7-8, 12, 19-20, 28)  
Pg 225 (1)

**Homework:** Balancing equations WS

**Topic 3**

**Topic:** What happens when you mix hydrochloric acid and sodium hydroxide?

**Objectives:** Discuss and identify the types of chemical reactions including synthesis, decomposition, single and double replacement reactions.

**Discussion:** Types of reactions

**Activity:** Types of reaction WS, Writing Reactions WS

**Related Text:** Read Section 7.2 (199-203)  
Answer questions pg 205 (1, 4, 8)  
Pg 223 (4, 6)  
Pg 225 (2, 4)

**Homework:** Prep Reaction Rate Lab  
Types of a reaction concept map

**Topic 4**

**Topic:** Why does our stomach have enzymes?

**Objective:** Demonstrate an understanding of how reaction rates are a function of collisions among particles (i.e. effects of temperature, particle size, stirring, concentration of reaction rates, and effects of catalysts on reaction rates)

**Discussion:** Rates of reactions

**Lab:** Rates of reaction lab

**Activity:** Writing reactions WS

**Related Text:** Read Section 7.4 (212-215)  
Answer questions Pg 215 (1-3, 5, 7)  
Pg 223 (9)  
Pg 224 (25-27)

**Homework:** Finish Lab  
Factors that affect the rate of reaction concept map  
Study for Test

**Topic 5**

**Topic:** Chemical Reactions Test

Name \_\_\_\_\_ Block \_\_\_\_\_ Test Date \_\_\_\_\_

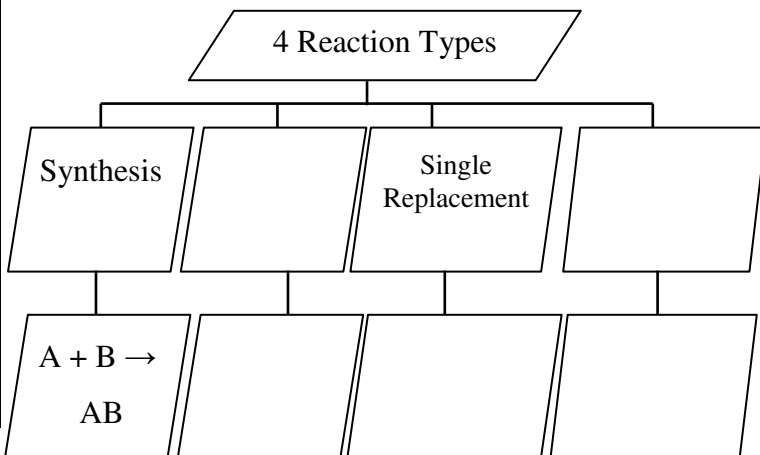
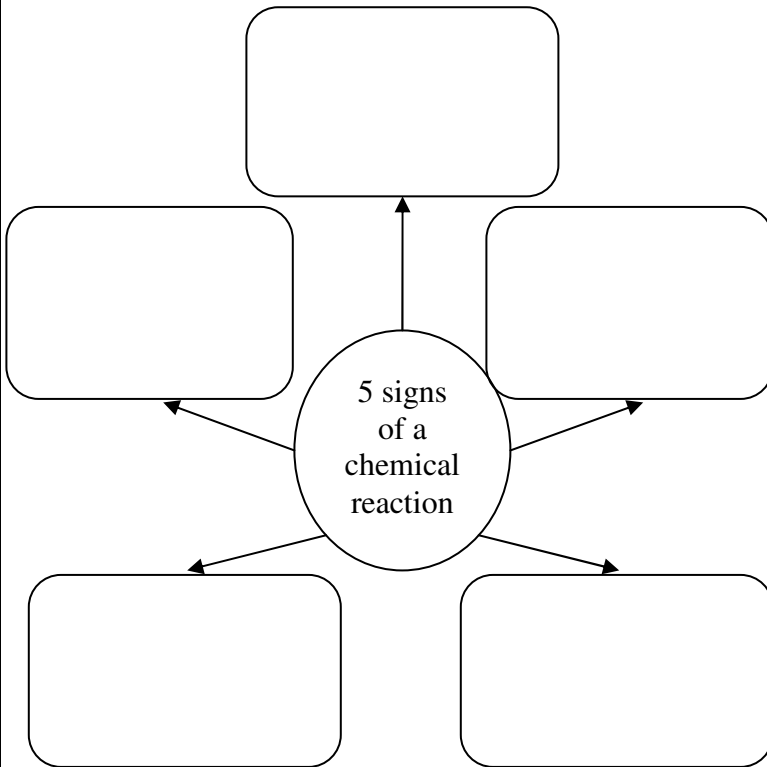
**Unit 7 Vocabulary**

Define two words from each category, A-C. Draw a picture to remind yourself of the definition of each word.

- A. Exothermic Reaction  
Endothermic Reaction
- B. Reactants  
Products  
Chemical Equation
- C. Coefficients  
Yield Sign  
Subscript

Write an example equation for each of the following reaction types (see pg 200-203)

- D. Decomposition Reaction
- E. Synthesis Reaction
- F. Double Replacement Reaction
- G. Single Replacement Reaction



Unit 7: Chemical Reactions

**Title:** Chemistry in a Ziploc

**Purpose:** Observe chemical reactions between calcium chloride, baking soda, and bromothymol blue.

**Materials:** Baking Soda                      Calcium chloride  
 Bromothymol Blue                      Ziploc bag  
 Weigh boats                                  Balance

**Procedure:** *Read the procedure carefully! Follow all directions!*

**PUT ON GOGGLES.**

1. Read the procedure and draw a data table.
2. Put one teaspoon of baking soda into one corner of the plastic bag. Record your observations.
3. Put one teaspoon of calcium chloride into the opposite corner of the plastic bag. Record your observations.
4. Measure 15ml of Bromothymol Blue solution. Carefully pour the solution into a weigh boat. Make sure that you do not spill. Record your observations.
5. Carefully place the weigh boat into the bag so as not to spill any solution.
6. Carefully squeeze as much air out of the plastic bag as much as you can and seal it tightly.
7. Carefully place the plastic bag on the balance and record this mass.
8. Spill the Bromothymol Blue out of the weigh boat by tilting the weight boat. Mix the content of the bag.
9. Record recording observations (at least ten minutes).
10. When finished making observations, take the mass of the bag. Record observations in your data table.
11. Clean up by taking the weigh boat out of the bag. Rinse the weigh boat with plenty of water. Place the plastic bag in the trash container. Clean the rest of the equipment.

	Observations (color, temp, action, etc)
Teaspoon of baking soda in ziploc corner	
Teaspoon of CaCl <sub>2</sub> in other corner	
With Bromothymol Blue boat in ziploc	
Mass before reaction (grams)	
Calcium chloride and bromothymol blue	
Baking soda and bromothymol blue (1 min)	
(2 min)	
All mixed, hanginh (3 min)	
(4 min)	
(5 min)	
(6 min)	
(7 min)	
(8 min)	
(9 min)	
(10 min)	

**Follow up:**

Review all your observations. List all the observations that would indicate that this is indeed a chemical reaction.

**Title:** Speed of Chemical Reactions

**Purpose:** Observe chemical reaction speed of Alka-Seltzer tablets with water at three different temperatures.

**Materials:** 3 Alka-Seltzer tablets                      Beakers  
 Graduated Cylinder                                      Timer  
 Water at different temperatures

**Pre-lab:**

1. What factors change the speed of reaction?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. What can you do to speed up a reaction?

\_\_\_\_\_

3. What can you do to slow down a reaction?

\_\_\_\_\_

4. Write a hypothesis for the reaction

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Procedure:** *Read the procedure carefully! Follow all directions!*

**PUT ON GOGGLES.**

1. Read the procedure and draw a data table.
2. Put 200 mL of tap water in a beaker.
3. Add one Alka-Seltzer to the water. Record the time it takes for the solid to disappear.
4. Pour out and rinse out the beaker.
5. Repeat steps 2-4 using hot water. Record data.
6. Repeat steps 2-4 using icy water. Record data.
7. Clean your lab station and get checked out of lab.

	Time to dissolve (min)	
	Prediction	Actual
Regular tap water		
Hot tap water		
Cold tap water		

**Single and Double Replacement Reactions Story: Rindercella:**

Once upon a time, in a coreign fountry, there lived a very geautiful birl; her name was Rindercella. Now, Rindercella lived with her mugly other and her two sad bisters. In this same coreign fountry, there was a very prandsom hince.

This prandsom hince was going to have a bancy fall. He'd invited people from riles amound, especially the pich people. Rindercella's mugly other and her two sad blisters went out to buy some drancy fesses to wear to this bancy fall, but Rindercella couldn't go because all she had to wear were some old rirty dags. Finally, the night of the bancy fall arrived and Rindercella couldn't go. So she just cat down and scried. She was a kitten there a scrien, when all at once there appeard before her, her gairy modfother. He touched her with his wagic mand, and there appeared before her, a cig boach and hix white sorces to take her to the bancy fall. But now, he said to Rindercella, "You must be home before nidnight, or I'll purn you into a tumpkin!"

When Rindercella arrived at the bancy fall, the prandsom hince met her at the door because he had been watchin' behind a woden hindow. Rindercella and the prandsom hince nanced all dight until nidnight... and they lell in fove. Finally, the mid clock strucknight. Rindercella staced down the rairs. Just as she beached the rottom, she slopped her dripper!

The next day, the prandsom hince went all over the coreign fountry looking for the geautiful birl who had slopped her dripper. Finally he came to Rindercella's house. He tried it on Rindercella's mugly other, and it fidn't dit. Then he tried it on her two sigly usters, and it fidn't dit. Then he tried it on Rindercella, and it fid dit! It was exactly the sight rize!

So they were married and lived heverly after hapwards. The storall of the mory is this: If you ever go to a bancy fall and want to have a prandsom hince loll in fove with you, don't forget to slop your dripper!

Practice Part A: Identify the equations below as: Synthesis, Decomposition, Single Replacement, or Double Replacement.

Reaction	Classification:
1 $\text{HgO} \rightarrow \text{Hg} + \text{O}_2$	
2 $\text{NaCl} + \text{AgNO}_3 \rightarrow \text{NaNO}_3 + \text{AgCl}$	
3 $\text{Ng} + \text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$	
4 $\text{Zn} + \text{H}_2\text{SO}_4 \rightarrow \text{ZnSO}_4 + \text{H}_2$	
5 $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$	
6 $\text{Al}_2(\text{SO}_4)_3 + \text{Ca}(\text{OH})_2 \rightarrow \text{Al}(\text{OH})_3 + \text{CaSO}_4$	
7 $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$	
8 $\text{Cl}_2 + \text{NaBr} \rightarrow \text{NaCl} + \text{Br}_2$	
9 $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$	
10 $\text{KClO}_3 \rightarrow \text{KCl} + \text{O}_2$	
11 $\text{H}_2\text{O} + \text{Fe} \rightarrow \text{Fe}_2\text{O}_3 + \text{H}_2$	
12 $\text{Ca}(\text{OH})_2 + \text{HNO}_3 \rightarrow \text{Ca}(\text{NO}_3)_2 + \text{H}_2\text{O}$	
13 $\text{Na}_2\text{O} + \text{CO}_2 \rightarrow \text{Na}_2\text{CO}_3$	
14 $\text{H}_2 + \text{N}_2 \rightarrow \text{NH}_3$	

Practice Part B: Balance the following chemical equations. Show all work.

1	$\text{HgO} + \text{Cl}_2 \rightarrow \text{HgCl} + \text{O}_2$
2	$\text{Na} + \text{Br}_2 \rightarrow \text{NaBr}$
3	$\text{KClO}_3 \rightarrow \text{KCl} + \text{O}_2$
4	$\text{Ca}(\text{OH})_2 + \text{HNO}_3 \rightarrow \text{Ca}(\text{NO}_3)_2 + \text{H}_2\text{O}$
5	$\text{Al}_2\text{O}_3 \rightarrow \text{Al} + \text{O}_2$
6	$\text{CuCl}_2 + \text{H}_2\text{S} \rightarrow \text{CuS} + \text{HCl}$
7	$\text{Cl}_2 + \text{NaBr} \rightarrow \text{NaCl} + \text{Br}_2$
8	$\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
9	$\text{NaOH} + \text{HBr} \rightarrow \text{NaBr} + \text{H}_2\text{O}$
10	$\text{Na}_2\text{O} + \text{CO}_2 \rightarrow \text{Na}_2\text{CO}_3$
11	$\text{H}_2\text{O} + \text{Fe} \rightarrow \text{Fe}_2\text{O}_3 + \text{H}_2$
12	$\text{Mg} + \text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$