



Grade 9 Lab Notebook

## Science in Action 9

Index of Investigations, Challenges and Activities

### Matter and Chemical Change

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**QuickLAB** Organizing The Properties of Matter (p. 97)

copper wire <hr/> <hr/> <hr/> <hr/>	vinegar <hr/> <hr/> <hr/> <hr/>
salad oil <hr/> <hr/> <hr/> <hr/>	aluminum foil <hr/> <hr/> <hr/> <hr/>
granite <hr/> <hr/> <hr/> <hr/>	graphite <hr/> <hr/> <hr/> <hr/>
rock salt <hr/> <hr/> <hr/> <hr/>	pepper <hr/> <hr/> <hr/> <hr/>
baking soda <hr/> <hr/> <hr/> <hr/>	rock salt <hr/> <hr/> <hr/> <hr/>

Group properties:


**5. Similar properties used by other students to group the substances:**

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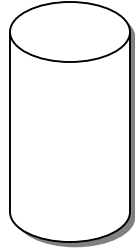
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**Different properties used by other students to group the substances**

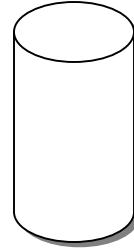
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QuickLAB Observing A Physical Change (p. 98)



**Before**



**After**

**Procedure:**

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**Questions:**

7. \_\_\_\_\_

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8. \_\_\_\_\_

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9. \_\_\_\_\_

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***Inquiry B-1***  
**IDENTIFYING MYSTERY SUBSTANCES (p. 100-101)**

**Question:** How can the properties of a substance be used to identify it?

**Hypothesis:** \_\_\_\_\_

**Materials and Procedure:** (p. 100-101)

**Data Collection:** Substance studied \_\_\_\_\_

Test	Type of Test	Description (Observations)
1	Appearance	_____
2	Crystal Shape	_____
3	Behavior in Water	_____
4	Behavior in Acid	_____
5	Behavior in Iodine	_____

**Summary Chart:**

Substance	State	Appearance	Crystal Shape	Behavior in Water	Behavior in Acid	Behavior in Iodine
salt						
baking soda						
corn starch						
sodium nitrate						
sodium thiosulfate						
Unknown 1						
Unknown 2						

*Analyzing and Interpreting:*

20. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

21. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

22. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

23. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

*Forming Conclusions:*

24. \_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

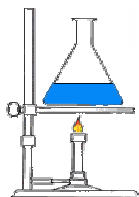
*Applying and Connecting (p. 101)*

Learn about **casein** and present an informative talk to your group, by sharing your research.

SKILL **PRACTICE**

**Identifying Physical and Chemical Changes** (p.105)

**A**



Boiling a solution

**Physical Chemical**

Evidence \_\_\_\_\_

**B**



Vinegar and Baking Soda

**Physical Chemical**

Evidence \_\_\_\_\_

**C**



Salt Dissolving in Water

**Physical Chemical**

Evidence \_\_\_\_\_

**D**



Fireworks

**Physical Chemical**

Evidence \_\_\_\_\_

**E**



Alka-Seltzer in water

**Physical Chemical**

Evidence \_\_\_\_\_

**F**



Leaves changing color

**Physical Chemical**

Evidence \_\_\_\_\_



***Inquiry B-2***

**INVESTIGATING PHYSICAL AND CHEMICAL CHANGES (p. 106-107)**

**Question:** What are some characteristics of physical and chemical changes?

**Hypothesis:**

<b>Physical</b>	<b>Chemical</b>

**Materials and Procedure:** (p. 106-107)

**Data Collection:**

<b>Change</b>	<b>Observations before change</b>	<b>Predictions</b>	<b>Observations during change</b>	<b>Observations after change</b>	<b>Type of Change (phys. / chem.)</b>
<b>Sodium Carbonate and dilute Hydrochloric Acid</b>					
<b>Sugar and heat</b>					
<b>Copper (II) Sulfate and Sodium Carbonate</b>					
<b>Copper (II) Sulfate and Water</b>					

*Analyzing and Interpreting:*


19. \_\_\_\_\_  
\_\_\_\_\_

20. \_\_\_\_\_  
\_\_\_\_\_

21. \_\_\_\_\_  
\_\_\_\_\_

22. \_\_\_\_\_  
\_\_\_\_\_

*Forming Conclusions:*

23. 

**Give It A TRY**  
**CREATING A TIME LINE STORY OF MATTER** (p. 112)

8000 BC



TODAY

MODEL THAT RESULTED FROM THE 'KEY IDEA' ABOUT THE STRUCTURE OF MATTER ...

A large empty rectangular box with a black border, intended for drawing a model that resulted from the 'key idea' about the structure of matter.



**SKILL PRACTICE**  
**USING THE PERIODIC TABLE** (p. 129)

Element	Atomic Number	Atomic Mass	# of protons	# of neutrons	# of electrons
vanadium					
nickel					
phosphorus					
bromine					
beryllium					
argon					
magnesium					
uranium					
silicon					
chromium					
titanium					

***Inquiry B-3***  
**BUILDING A PERIODIC TABLE (p. 130-131)**

**Question:** How can you use a model to represent the patterns in the periodic table?

**Hypothesis:** \_\_\_\_\_

\_\_\_\_\_

**Materials and Procedure:** (p. 130-131)

**Part 1**

Share your ideas \_\_\_\_\_

\_\_\_\_\_

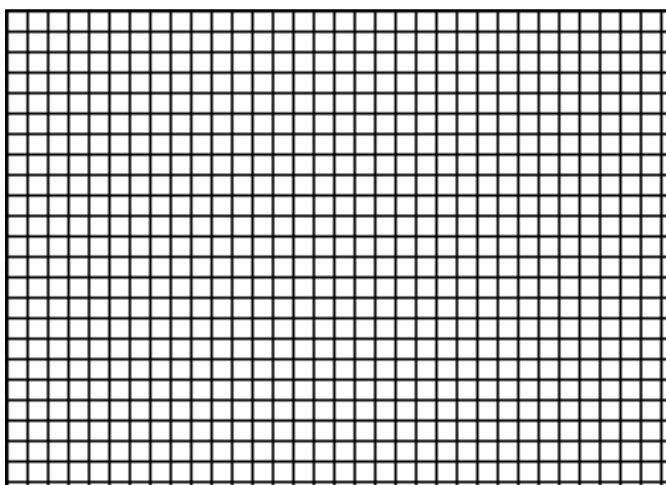
\_\_\_\_\_

Mass of Samples	1	2	3	4	5
1					
2					
3					
4					
5					

**Data Collection:** Class involvement will depend on whether this lab is done as a demo or as a station.

**Analyzing and Interpreting:**

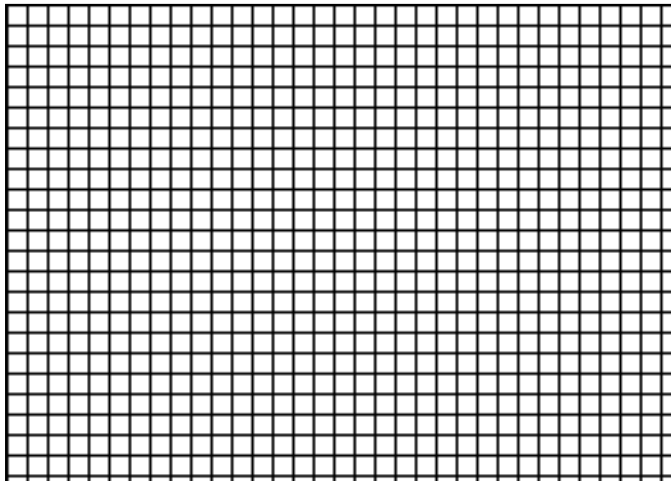
**13. Graph of Nut/Bolt Mass Vs Nut/Bolt Number**



**14.** \_\_\_\_\_

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**15. Graph of Atomic Mass  
Vs Atomic Number**



16. \_\_\_\_\_

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***Forming Conclusions:***

17. \_\_\_\_\_

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***Applying and Connecting:***

Illustrate 2 examples of other Periodic Tables you have been able to find.

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**SKILL PRACTICE**  
**EXPLORING PATTERNS IN THE PERIODIC TABLE** (p. 129)

1. a) \_\_\_\_\_

b) \_\_\_\_\_

2. \_\_\_\_\_

3. a) \_\_\_\_\_

b) \_\_\_\_\_

4. a) \_\_\_\_\_

b) \_\_\_\_\_

5. a) \_\_\_\_\_

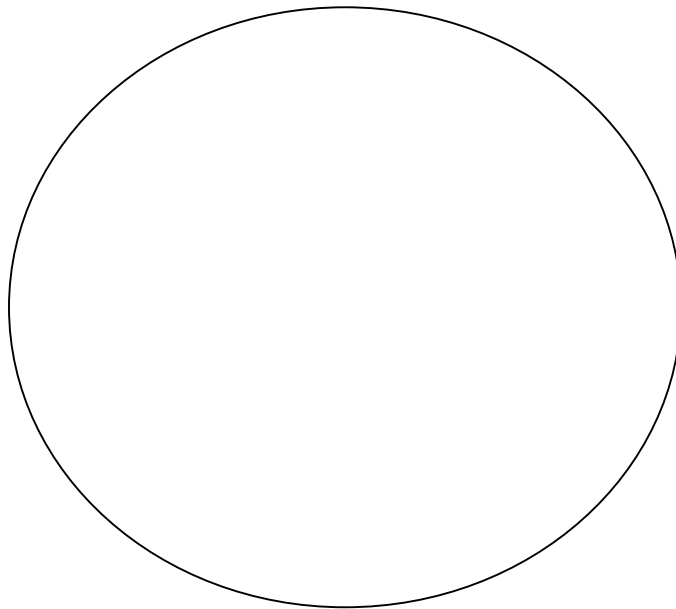
b) \_\_\_\_\_

c) \_\_\_\_\_

d) \_\_\_\_\_

6. \_\_\_\_\_

**SKILL PRACTICE**  
**MAKE A MODEL OF AN ATOM** (p. 130)





**QUICKLAB**  
**COMMON CHEMICALS IN YOUR HOME** (p. 140)


7.


8. \_\_\_\_\_  
\_\_\_\_\_

9. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SKILL PRACTICE**  
**WORKING WITH COMPOUNDS** (p. 142)

Compound	Elements in the Compound	Number of Atoms in each element	Drawing of Compound
$\text{CaO}_{(s)}$			
$\text{CaCl}_{2(s)}$			
$\text{Al}_2\text{O}_{(s)}$			
$\text{Na}_2\text{O}_{(s)}$			
$\text{AlCl}_{(s)}$			
$\text{KCl}_{3(s)}$			
$\text{NaOH}_{(s)}$			

**QUICKLAB**  
**USING BATTERIES TO INVESTIGATE A CHEMICAL REACTION** (p. 145)

Illustrate what happened

7. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

8. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

9. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

***Inquiry B-4***  
**MODELLING IONIC COMPOUNDS** (p. 148)

**Question:** How can you use create models to illustrate ionic compounds?


***Analyzing and Interpreting:***

7. \_\_\_\_\_

8. \_\_\_\_\_

***Forming Conclusions:***

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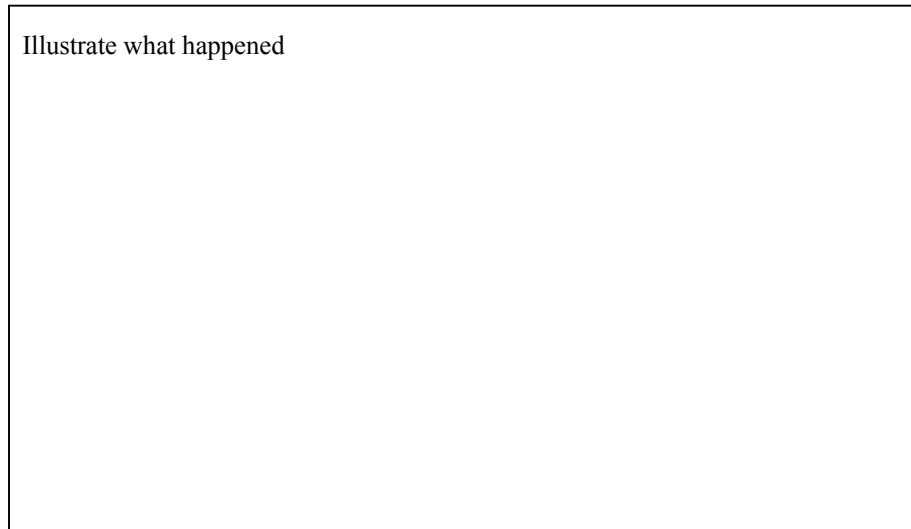
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**QUICKLAB**  
**IONIC OR MOLECULAR COMPOUND?** (p. 150)

Illustrate what happened



**Observations**

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**Questions:**

7. \_\_\_\_\_

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8. \_\_\_\_\_

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**Question:** How can you use create models to illustrate molecular compounds?


**Analyzing and Interpreting:**

7. \_\_\_\_\_

8. \_\_\_\_\_

**Forming Conclusions:**

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**ROCKET SCIENCE** (p. 157)

*Illustrate each test firing of your rocket and identify the variable you changed*

Test 1 Manipulated Variable	Test 2 Manipulated Variable	Test 3 Manipulated Variable

**Questions:**

6. \_\_\_\_\_

\_\_\_\_\_

7. \_\_\_\_\_

\_\_\_\_\_

8. \_\_\_\_\_

\_\_\_\_\_

**GIVE IT A TRY**

**IDENTIFY THE REACTION** (p. 158)

**Reaction 1**

<b>Reactants</b>		<b>Products</b>	
<b>Chemical word equation</b>			

**Reaction 2**

<b>Reactants</b>		<b>Products</b>	
<b>Chemical word equation</b>			

**Reaction 3**

<b>Reactants</b>		<b>Products</b>	
<b>Chemical word equation</b>			

***Inquiry B-6***

OBSERVING CHEMICAL REACTIONS (p. 159)

**Question:** How will different materials react with each other?

**Hypothesis:** \_\_\_\_\_

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**Materials and Procedure:** (p. 159)

**Data Collection:**

Reaction 1 – Sulfuric Acid and Magnesium Ribbon

Reactants		Products	
<b>Chemical Change or Physical Change</b>			
<b>Evidence:</b>			
<b>Observations:</b>			

Reaction 2 – Copper (II) Sulfate and Steel Wool

Reactants		Products	
<b>Chemical Change or Physical Change</b>			
<b>Evidence:</b>			
<b>Observations:</b>			

Reaction 3 – Iron (III) Chloride and Sodium Hydroxide

Reactants		Products	
<b>Chemical Change or Physical Change</b>			
<b>Evidence:</b>			
<b>Observations:</b>			





***Inquiry B-7***  
**REACTIONS FOR UPSET STOMACHS (p. 161)**

***Question 1*** : Which Antacid medication works best?

***Hypothesis:*** \_\_\_\_\_

\_\_\_\_\_

***Question 2*** : What is the most effective way to take it?

***Hypothesis:*** \_\_\_\_\_

\_\_\_\_\_

***Materials needed:*** \_\_\_\_\_

\_\_\_\_\_

***Your Procedural Design:***

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***Inquiry B-8***  
**CONSERVING MASS (p. 164)**

**Question:** Does the mass of reactants and products change during a reaction?

**Hypothesis:** \_\_\_\_\_

**Materials and Procedure:** (p. 164)

**Data Collection:**

<b>Before</b>	<b>After</b>

**Prediction** \_\_\_\_\_

**Observations:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

*Analyzing and Interpreting:*

8. Evidence \_\_\_\_\_  
\_\_\_\_\_

9.

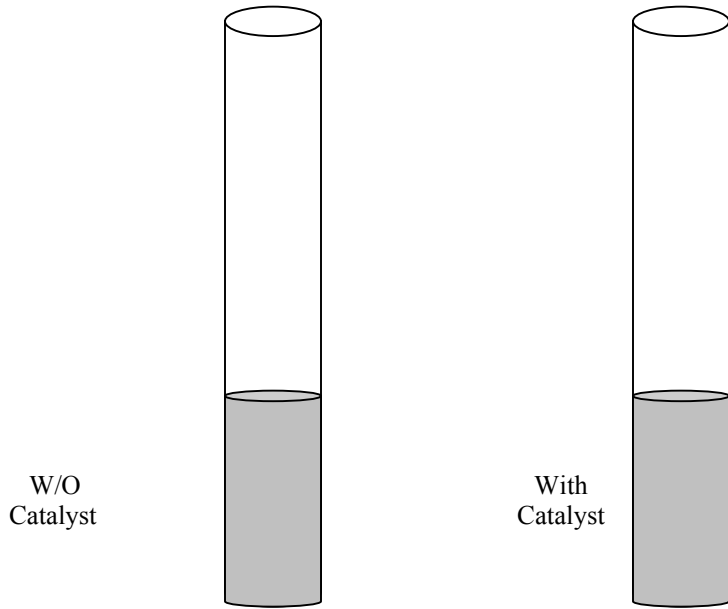
<b>Mass Before</b>	
<b>Mass After</b>	

10. \_\_\_\_\_  
\_\_\_\_\_

*Forming Conclusions:*

11. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**QUICKLAB**  
**HYDROGEN PEROXIDE AND THE CATALYST MANGANESE (IV) DIOXIDE** (p. 187)



**Questions:**

6. \_\_\_\_\_  
\_\_\_\_\_

7. \_\_\_\_\_  
\_\_\_\_\_

8. \_\_\_\_\_  
\_\_\_\_\_

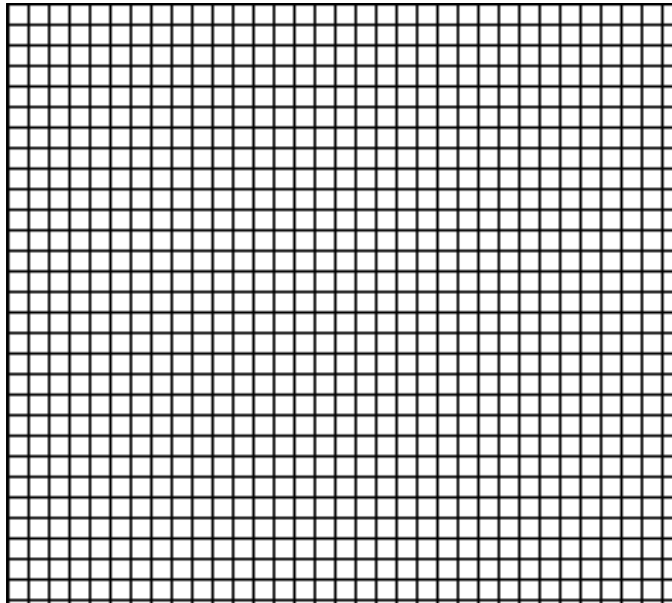
9. \_\_\_\_\_  
\_\_\_\_\_



*Analyzing and Interpreting:*

11. \_\_\_\_\_  
\_\_\_\_\_

12.



13. \_\_\_\_\_

14. \_\_\_\_\_

15. \_\_\_\_\_

16. \_\_\_\_\_  
\_\_\_\_\_

*Forming Conclusions:*

17. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_