



## Grade 9 Lab Notebook

# Science in Action 9

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## Environmental Chemistry

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## QuickLAB Testing Health Products (p. 181)

Follow the procedure on p. 181

Observations (illustrate)

Suspension	Reactions		
	Red Litmus	Blue Litmus	Universal Indicator
Aspirin			
Vitamin C			
Echinacea			

5. \_\_\_\_\_

\_\_\_\_\_

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

\_\_\_\_\_

## Give It A TRY Chemicals in the Environment (p.183)

Element Chosen \_\_\_\_\_

***Inquiry C-1***  
**VIEWPOINTS ON ELECTRIC POWER** (p. 189)

**Question:** How can scientific questions be used to help people decide how electric power in Alberta should be generated?

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

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**Background:** (p. 189) Read the information about this Issue

**Analyze and Evaluate:**

3.

Speaker	Viewpoint
---------	-----------

a)

b)

c)

d)

4.


5.


6.

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*Inquiry C-2*  
**MEASURING ACIDS AND BASES** (p. 192)

**Question:** What are the **pH**'s of some common substances?

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

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**Data Collection:**

2. 3. 4.

Substance Tested	Acid (1-6)	Neutral (7)	Base (8-14)
tap water			
bottled water			
rain water			
ammonia			
vinegar			
lemon juice			
antacid			
baking soda			
cola			
fruit juice			

**Analyzing and Interpreting:**

5. **Manipulated variable** was \_\_\_\_\_

**Responding variable** was \_\_\_\_\_

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

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**Forming Conclusions:**

7. a) \_\_\_\_\_

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

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

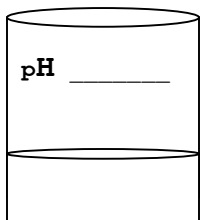
**Inquiry C-3 Neutralizing Acid** (p. 194)

**Question:** What effect does adding a base to an acid have on the **pH** of a solution?

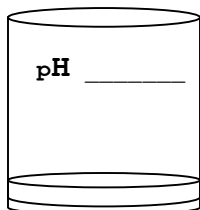
**Hypothesis:** \_\_\_\_\_

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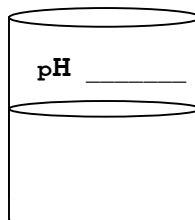
**Data Collection:**



Baking Soda Solution



Vinegar



Vinegar & Baking Soda Solution

**Analyzing and Interpreting:**

4. \_\_\_\_\_

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5. \_\_\_\_\_

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

**Forming Conclusions:**

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

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**Extending** (optional)

**Give It A TRY ORGANIC OR INORGANIC** (p. 196)

SUBSTANCE	ORGANIC	INORGANIC
OXIGEN		
DISTILLED WATER		
SUGAR		
MOTOR OIL		
HYDROCHLORIC ACID		
RUST		
VITAMIN C		
GLASS		
FAT		
RUBBER		

***Inquiry C-4***

**TESTING FOR ORGANIC MOLECULES** (p. 200-201)

**Question:** What effect does adding a base to an acid have on the **pH** of a solution?

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

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***Data Collection:***

Substance Tested	Final Colors Using Indicators			Light Transmittal Through Brown Paper
	Benedict's Solution	Iodine Solution	Biuret Solution	
<b>Glucose</b>				
<b>Corn Starch</b>				
<b>Vegetable Oil</b>				
<b>Gelatin</b>				
<b>Unknown</b>				

***Analyzing and Interpreting:***

15. a) \_\_\_\_\_  
b) \_\_\_\_\_  
c) \_\_\_\_\_  
d) \_\_\_\_\_

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

***Forming Conclusions:***

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

*Inquiry C-5*  
**BREAKDOWN OF STARCH BY HYDROLYSIS** (p. 207)

**Question:** Which of the following processes breaks down starch more quickly: heating or using enzymes?

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

---

**Data Collection:**

	4 drops of test solution on spot plate	Starch Test		
		1 drop of Iodine	Repeat # 1	Repeat # 2
Spot Plate	starch suspension			
Beaker 1	boiled starch suspension			
Beaker 2	digestive enzyme suspension			

**Analyzing and Interpreting:**

9.

Manipulated Variable	
Responding Variable	

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

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

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**Forming Conclusions:**

12. \_\_\_\_\_

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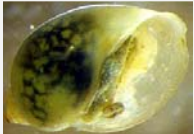



**Applying and Connecting** (p. 207)

CORN STARCH IS HYDROLYZED TO PRODUCE VARIOUS KINDS OF CORN SYRUP, WHICH ARE USED FOR MAKING CANDY AND CHEWING GUM.

IDENTIFYING AQUATIC INVERTEBRATES (p. 215)

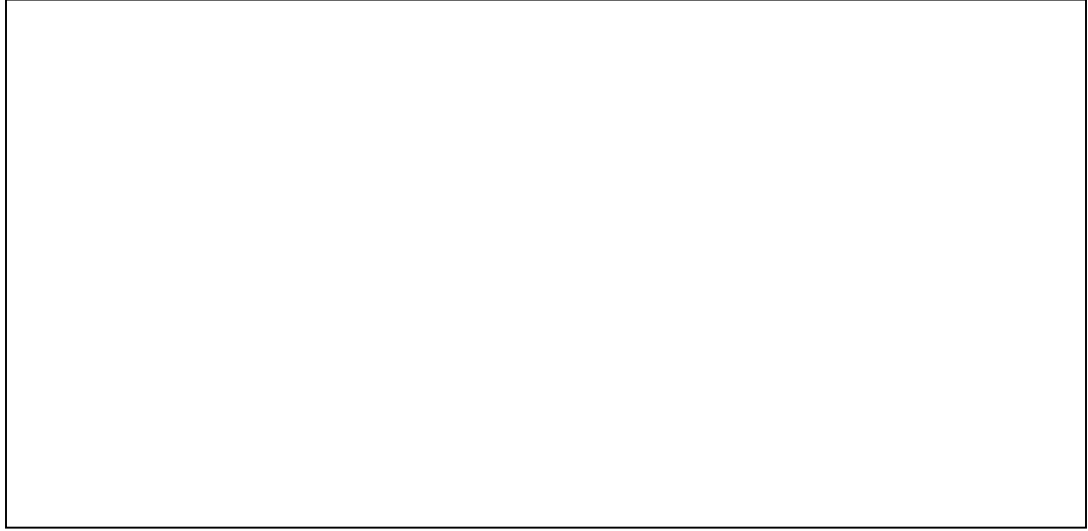
CAN YOU IDENTIFY THE FOLLOWING AQUATIC INVERTEBRATES?

Mayfly Nymph	Snail	Stonefly Nymph	Water Boatman	Beetle
Worm	Leech	Midge Larva	Fly Nymph	Water Strider

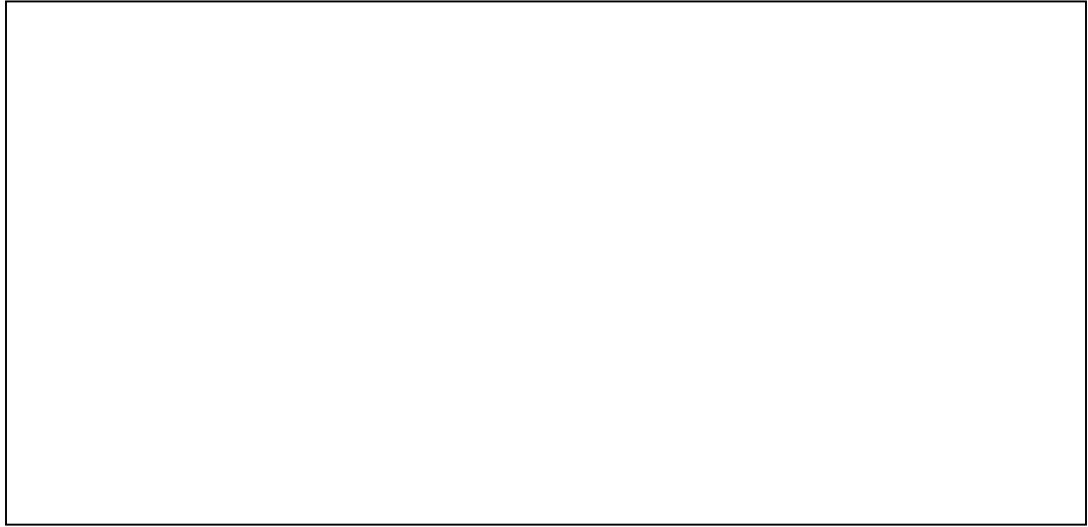
				
				

**SKILL PRACTICE**  
**PARTS PER MILLION** (p. 217)

- 



- 



- 



***Inquiry C-6***

**HOW DOES OXYGEN GET INTO THE WATER?** (p. 218)

**Question:** What is the effect of turbulence on the amount of dissolved oxygen in water?

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

---

**Materials and Procedure:** (p. 218)

**Data Collection:**

Test Sample	Level of Dissolved Oxygen in milligrams per Litre
1	
2	
4	

**Analyzing and Interpreting:**

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

---

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

---

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

---

**Forming Conclusions:**

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

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**Applying and Connecting:**

The bubbles in an aquarium are generated by an **aerator** (a device which replaces the dissolved oxygen in the water)

**Extending:**

(Optional)

**QUICKLAB**  
**PHOSPHORUS AND 'FOGGY' WATER** (p. 220)

			
Sample A	Sample B	Sample C	Sample D

**Questions**

4. \_\_\_\_\_  
 \_\_\_\_\_

5. \_\_\_\_\_  
 \_\_\_\_\_

**Experiment On Your OWN C-7**

**WHAT KILLED THE FISH?** (p. 222)

**Question:** Which *Test Site* has the poorest water quality?

Invertebrate (refer to Table p. 217)	Number of organisms in a Sample			
	Site 1	Site 2	Site 3	Site 4
Mayfly nymphs	187	0	35	233
Stonefly nymphs	255	0	23	162
Caddisfly larvae	34	0	6	27
Midge larvae	110	159	133	97
Worms	15	142	58	23

**Analyzing and Interpreting:**

\_\_\_\_\_  
 \_\_\_\_\_

**SKILL PRACTICE** (ANALYZING GRAPHIC DATA)  
**MEASURING NITROGEN OXIDES** (p. 226)

- a) \_\_\_\_\_
- b) \_\_\_\_\_
- c) \_\_\_\_\_
- d) \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

***Inquiry C-8*** (review info-bit on p. 183)  
**ANALYZING CARBON DIOXIDE MEASUREMENTS** (p. 231)

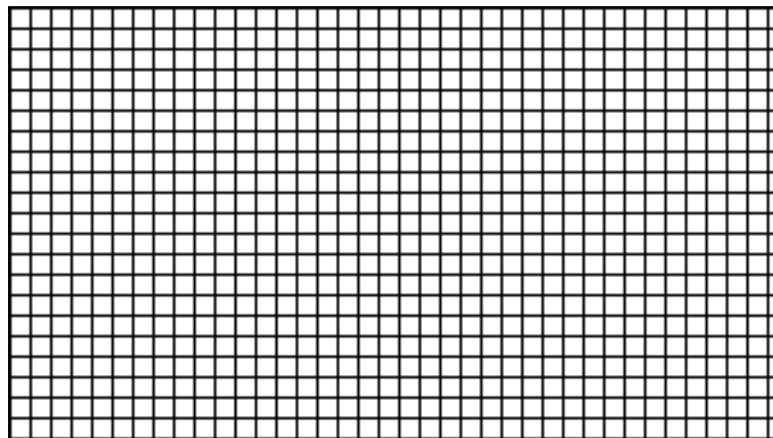
**Question:** What does monitoring information indicate about trends in amounts of atmospheric carbon dioxide?

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

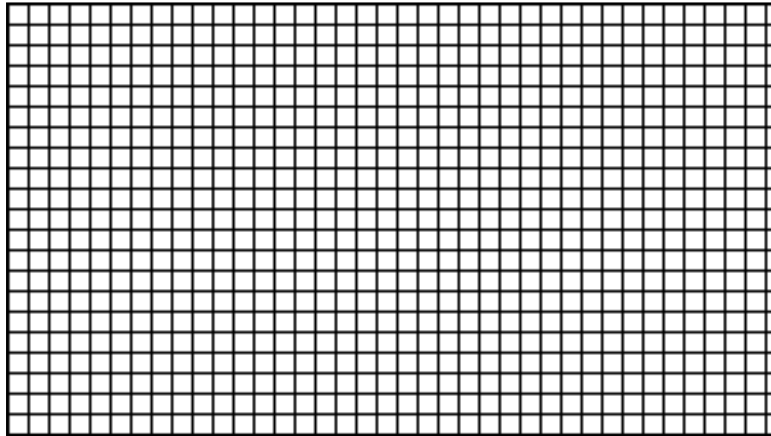
\_\_\_\_\_

**Data Sheets:** (To be provided by Teacher)

**Monthly CO<sub>2(g)</sub>**



**Yearly CO<sub>2(g)</sub>**



***Analyzing and Interpreting:***

5. \_\_\_\_\_

\_\_\_\_\_

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

\_\_\_\_\_

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

\_\_\_\_\_

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

\_\_\_\_\_

***Forming Conclusions:***

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

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**QUICKLAB**  
**ENVIRONMENTAL TRANSPORT** (p. 230)

**Questions**

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

\_\_\_\_\_

3. \_\_\_\_\_

\_\_\_\_\_

4. \_\_\_\_\_

\_\_\_\_\_

***Inquiry C-9***  
**ACID RAIN AND SOIL** (p. 240)

**Question:** What effect does the type of soil have on an acidic solution that passes through it?

Sample Soil	pH
clay	
loam	
sandy	

***Analyzing and Interpreting:***

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

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

***Forming Conclusions:***

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

\_\_\_\_\_

***Applying and Connecting:***

Soil pH is important because certain nutrients are only available to plants within a certain pH range. Adding peat or sulphur to basic soil will make it less basic.

***Extending*** (p. 240) :  
(Optional)

**Inquiry C-10 Bury Your Garbage** (p. 245)

**Question:** What effects do the following factors have on the rate of biodegradation of substances: **moisture, temperature, surface area of pieces, type of waste?**

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

**Materials and Procedure:** (p. 245)

**Data Collection:**

Manipulated Variable		Responding Variable	
<b>Controlled variables:</b>			
Size		Number	
Amount of soil		Amount of water	
Temperature		Location	
Time allowed		Recording method	

**Analyzing and Interpreting:**

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

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

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

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

**Forming Conclusions:**

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

Test Sample	Effect of ( <b>Manipulated Variable</b> ) on rate of biodegradation		
food	increased	remained the same	decreased
plastic	increased	remained the same	decreased
paper	increased	remained the same	decreased
metal	increased	remained the same	decreased
packing	increased	remained the same	decreased



GIVE IT A TRY USING A HAZARDOUS PRODUCT (p. 254)

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

***Inquiry C-12*** HOUSEHOLD CHEMICALS AND THE ENVIRONMENT (p. 256)

***Question:*** What effect do household chemicals have on the germination of radish seeds?

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

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

***Data Collection:***

Water	
Ammonia	
Bleach	
Rubbing Alcohol	

***Analyzing and Interpreting:***

10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_

***Forming Conclusions:***

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