

Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher

Correlation to Next Generation Science Standards* (NGSS)

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<ul style="list-style-type: none"> • Developing and using models • Planning and carrying out investigations • Analyzing and interpreting data • Constructing explanations 	<p>PS 1: Matter and its interactions</p> <p>PS 3: Energy</p>	<ul style="list-style-type: none"> • Cause and effect: Mechanism and explanation • Scale, proportion, and quantity • Systems and system models • Energy and matter: Flows, cycles, and conservation

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Workshop Safety



Demo: Frozen Beaker

An extreme endothermic reaction

Solid barium hydroxide octahydrate and solid ammonium chloride react in a spontaneous endothermic reaction.



This reaction may reach a temperature as low as -30°C .

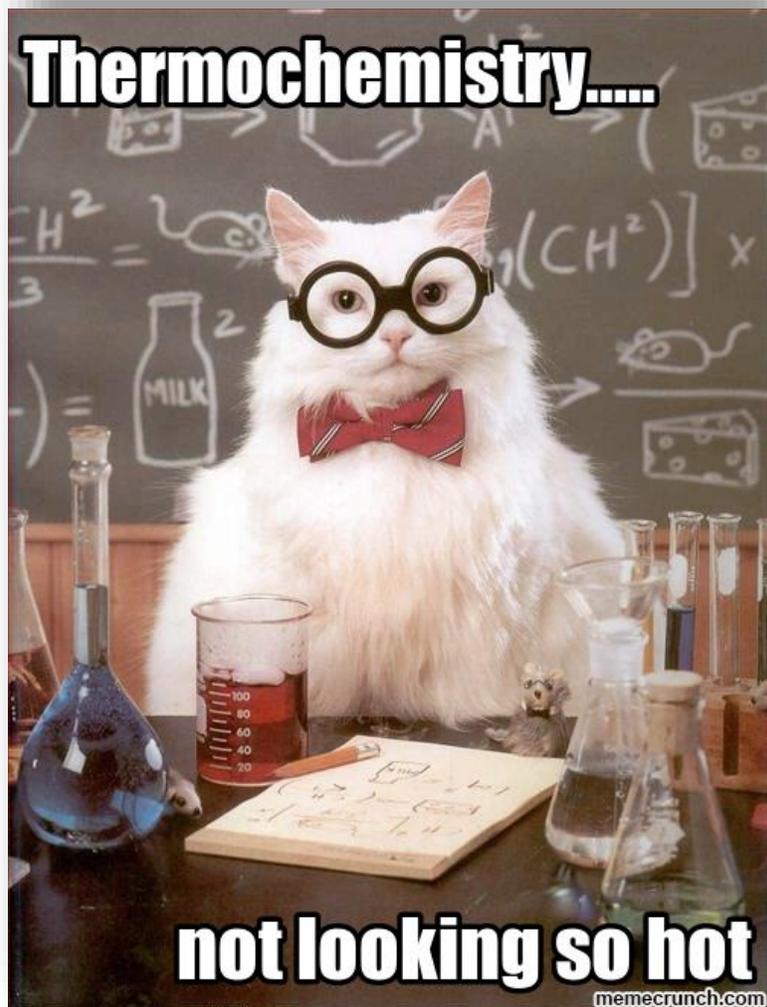
Predict

Observe

Explain

Demo: Frozen Beaker

An extreme endothermic reaction



- **Curriculum connections:**
 - **Laws of thermodynamics**
 - **Energy changes**
 - **Endothermic vs. exothermic reactions**

- **Possible discussion questions:**
 - **What would be some practical real-world applications of an endothermic reaction?**
 - **Could you measure the heat of reaction in this demo? If not, why?**
 - **Are heat and temperature the same thing?**

Lab: Mystery Chemical Reactions

Explore scientific phenomena

Identify visible signs of reaction
(precipitate, gas, and/or color change)

Microscale chemistry benefits
(save time and money; reduce waste)

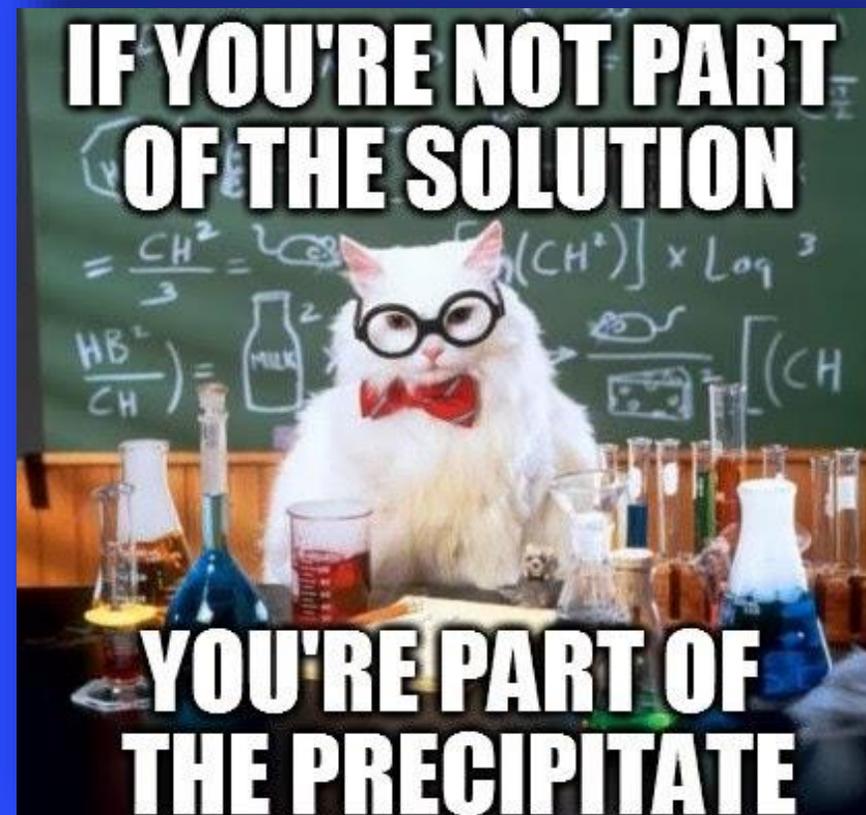
Featured Digital Content

- Interactive lessons

	sodium phosphate	iron(III) chloride	copper(II) sulfate	potassium iodide	lead(II) nitrate	sodium carbonate	silver nitrate	calcium chloride
chloric		yellow precipitate	blue precipitate				white precipitate	
oxide		yellow precipitate	blue precipitate		white precipitate		brown precipitate	
sulfide		yellow precipitate	blue precipitate			white precipitate	white precipitate	
nitrate		yellow precipitate	blue precipitate	yellow precipitate		orange precipitate		
carbonate		orange precipitate	blue precipitate		white precipitate			
iodide		orange precipitate	blue precipitate	yellow precipitate				
phosphate		orange precipitate	blue precipitate					
sulfite		orange precipitate	blue precipitate					

Lab: Mystery Chemical Reactions

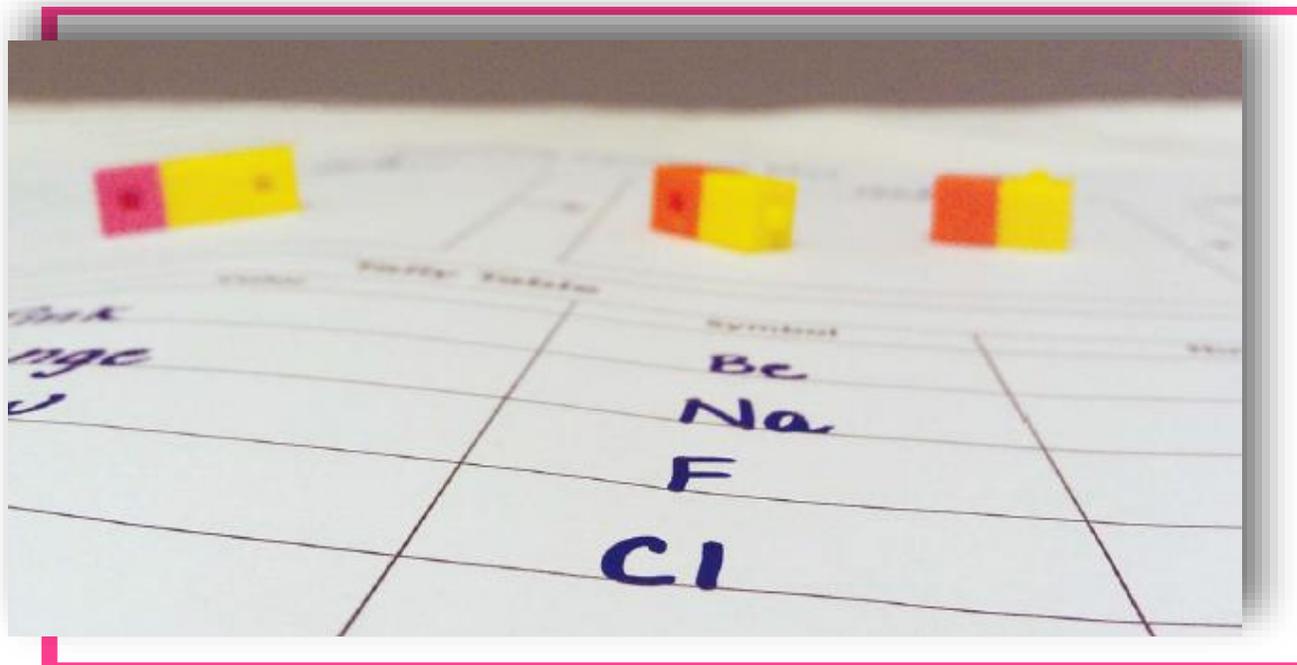
	sodium phosphate	iron(III) chloride	copper(II) sulfate	potassium iodide	lead(II) nitrate	sodium carbonate	silver nitrate	calcium chloride	sodium hydroxide
hydrochloric acid		yellow precipitate	white precipitate		white precipitate		white precipitate		
sodium hydroxide		yellow precipitate	blue precipitate		white precipitate		brown precipitate		
calcium chloride		yellow precipitate	blue precipitate			white precipitate	white precipitate		
silver nitrate	white precipitate	yellow precipitate	blue precipitate	yellow precipitate			white precipitate		
sodium carbonate		white precipitate	blue precipitate		white precipitate				
lead(II) nitrate		white precipitate	blue precipitate	yellow precipitate					
potassium iodide		red precipitate							
copper(II) sulfate		red precipitate							
iron(III) chloride		yellow precipitate							



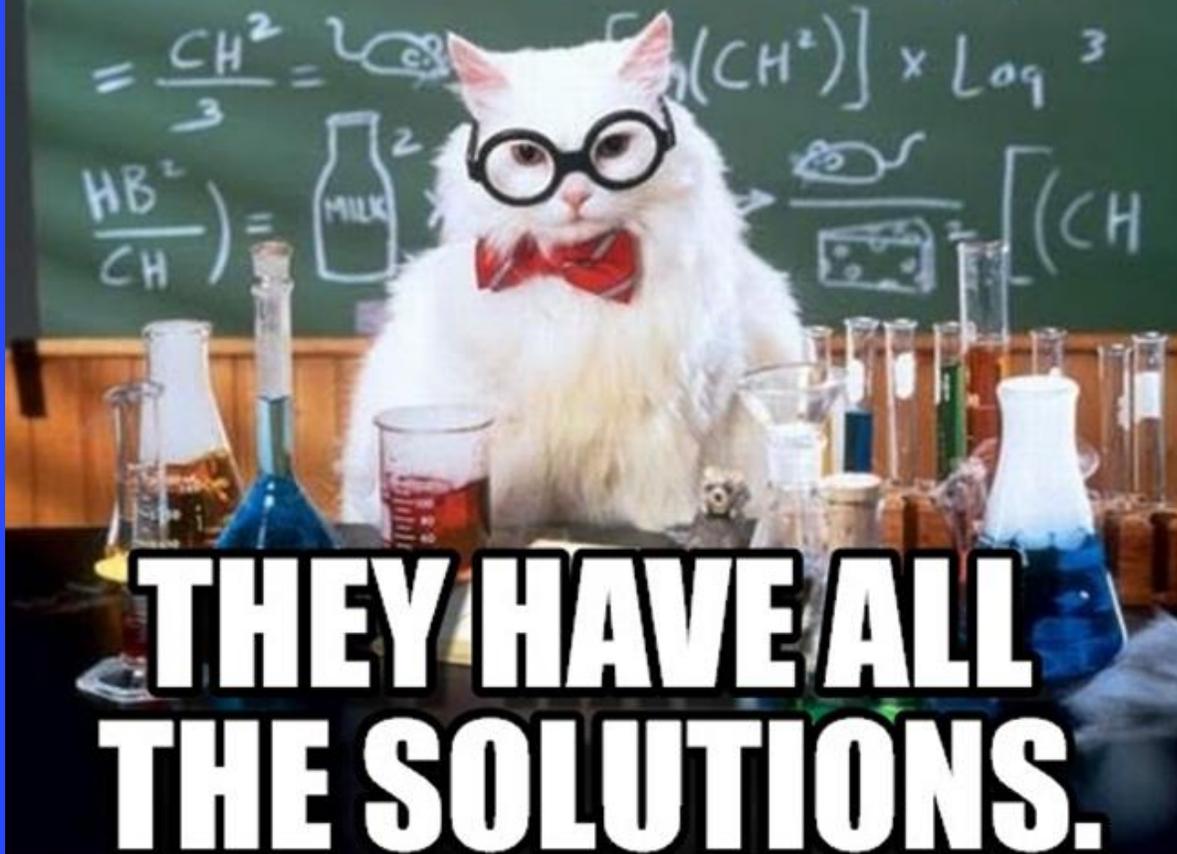
Lab: Balancing Chemical Equations

A tactile introduction to stoichiometry

- Understand the Law of Conservation of Mass
- Understand the difference between coefficients and subscripts in chemical equations



**WHY ARE CHEMISTS GREAT
FOR SOLVING PROBLEMS?**



**THEY HAVE ALL
THE SOLUTIONS.**

Workshop Kit Review



**Carolina
Chemonstrations®:
Beaker Freezer
Item # 840378**



**Carolina
ChemKits®:
Mystery Chemical
Reactions
Item #840660**

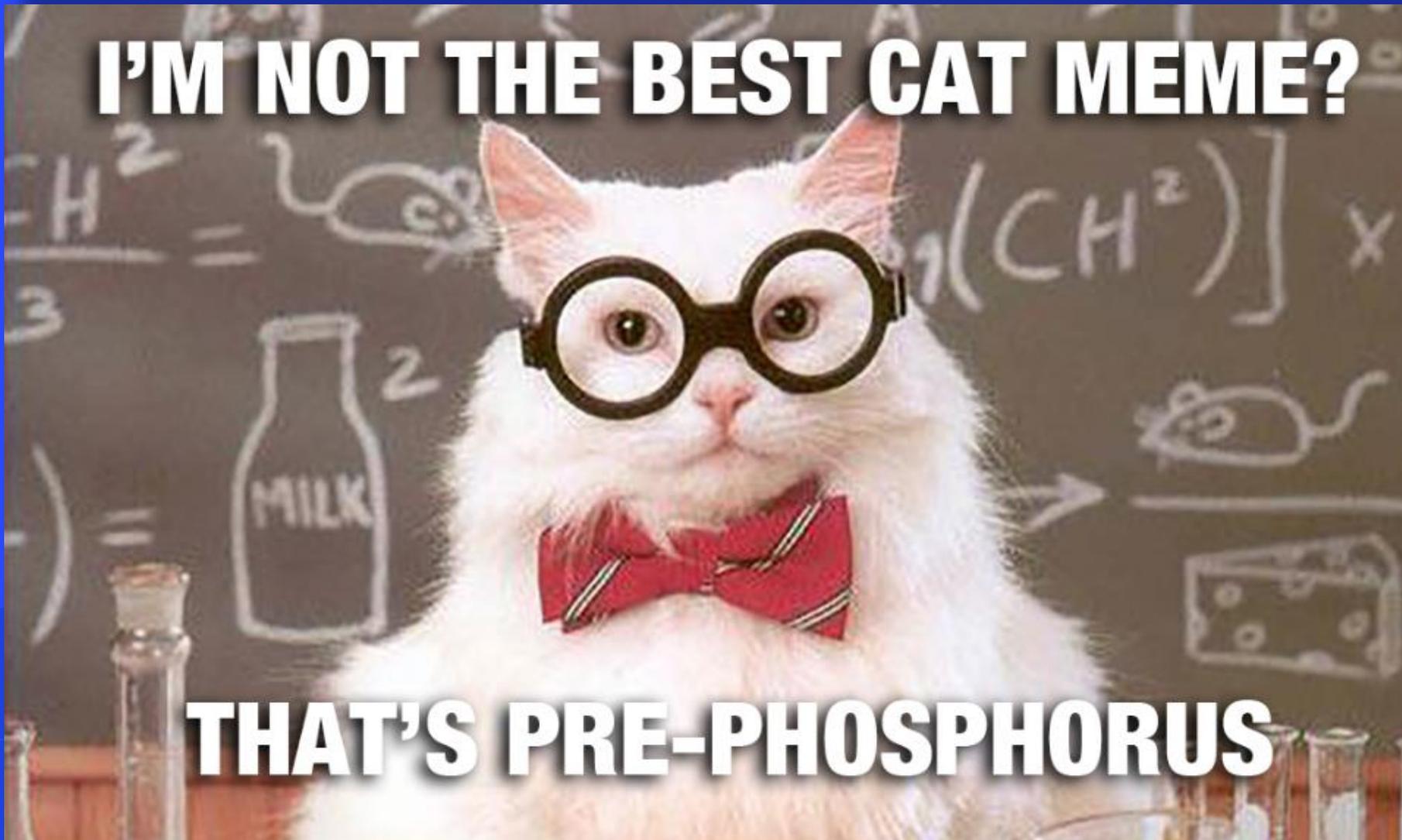


**Carolina
ChemKits®:
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Electrolysis
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**Carolina
ChemKits®:
Balancing Chemical
Equations
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I'M NOT THE BEST CAT MEME?



THAT'S PRE-PHOSPHORUS