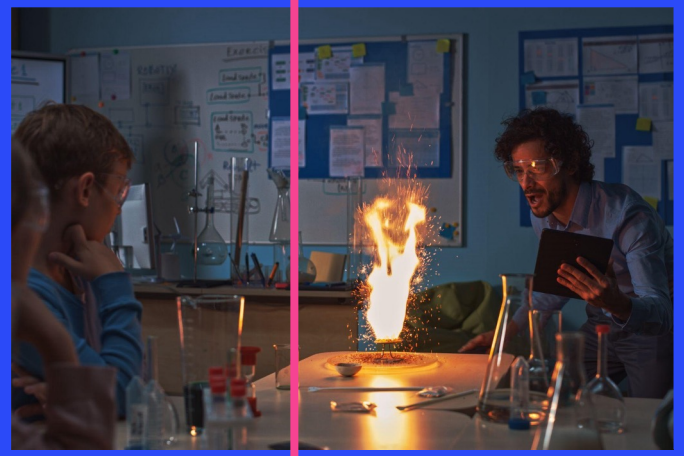
CAROLINA
UNLEASH LEARNING™



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

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Building Toward 3-Dimensional Learning

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
▪ Developing and using models ▪ Planning and carrying out investigations ▪ Analyzing and interpreting data ▪ Constructing explanations	**PS 1:** Matter and its interactions **PS 3:** Energy	▪ Cause and effect: Mechanism and explanation ▪ Scale, proportion, and quantity ▪ Systems and system models ▪ Energy and matter: Flows, cycles, and conservation[1]

1. NGSS Lead States, Next Generation Science Standards: For States, By States *(Washington, DC: The National Academies Press, 2013), retrieved from www.nextgenscience.org or ngss.nsta.org*

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Workshop Safety





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Workshop Reminders

- A PowerPoint® presentation for this workshop is available at knowledge.carolina.com. Type “workshop” in the search bar.
- More demos? Chemistry webinar available at knowledge.carolina.com. Type “webinar” in the search bar.
- Handout includes all demos and activities from the workshop.



Highly Visual Chemistry Phenomena for 3D Instruction - Web

44:30

Presenters: Matt Bostic and Chris Petersen, Carolina Product Developers
Grades: 6–12

What are the aspects of good phenomena? How can you redesign classic, tried-and-true chemistry demos to support 3-dimensional learning? Find out in this webinar.

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Demo: Frozen Beaker

An extreme endothermic reaction

Goggles on! Carolina Chemonstration® in progress



Solid barium hydroxide octahydrate and solid ammonium chloride

$$\text{Heat} + Ba(OH)_2 \cdot 8H_2O(s) + 2NH_4Cl(s) \rightarrow BaCl_2(aq) + 2NH_3(g) + 10H_2O(l)$$

Predict → **Observe** → **Explain**

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

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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?



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Lab: Mystery Chemical Reactions

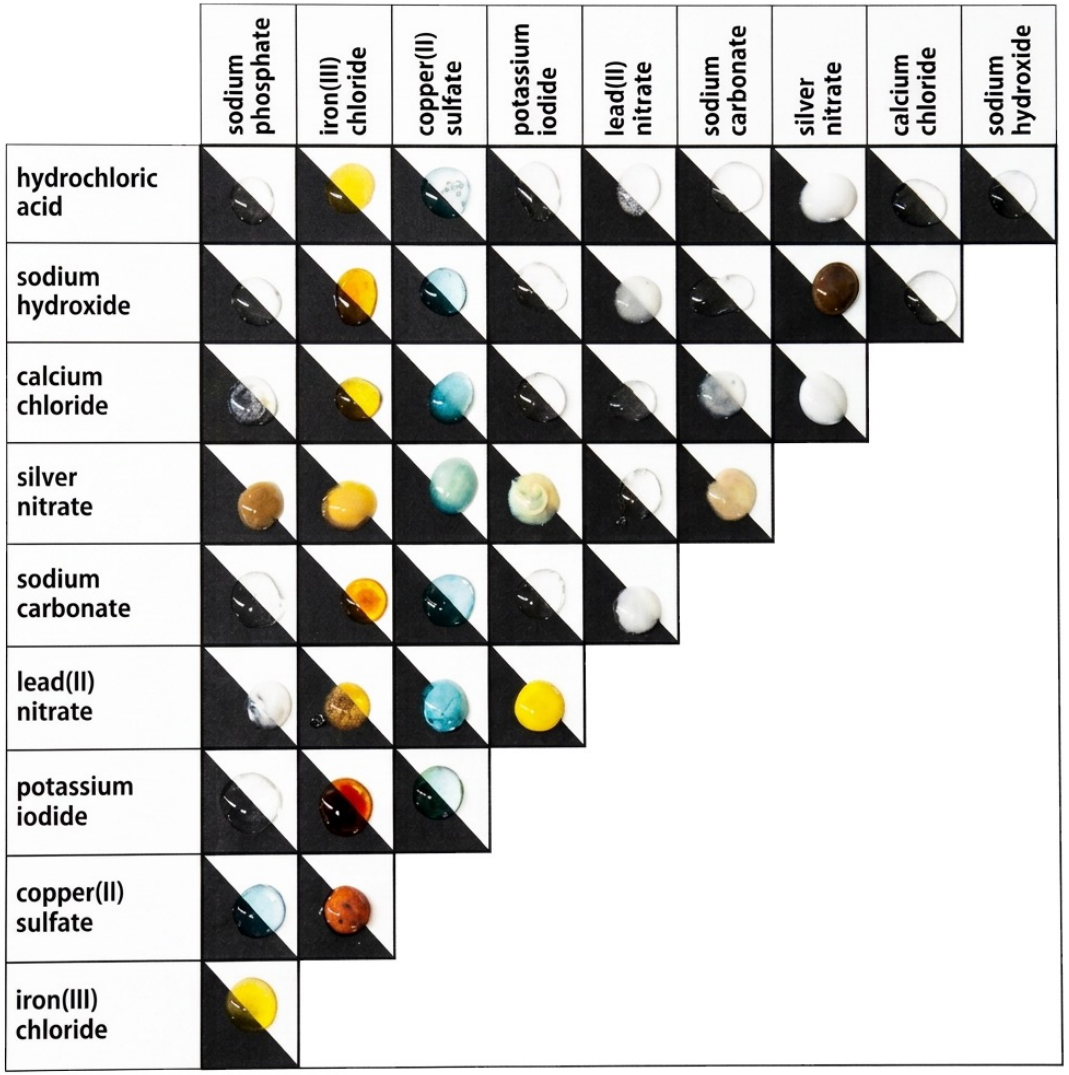
- **Explore scientific phenomena**
- **Identify visible signs of reaction** (precipitate, gas, and/or color change)
- **Microscale chemistry benefits** (save time and money; reduce waste)

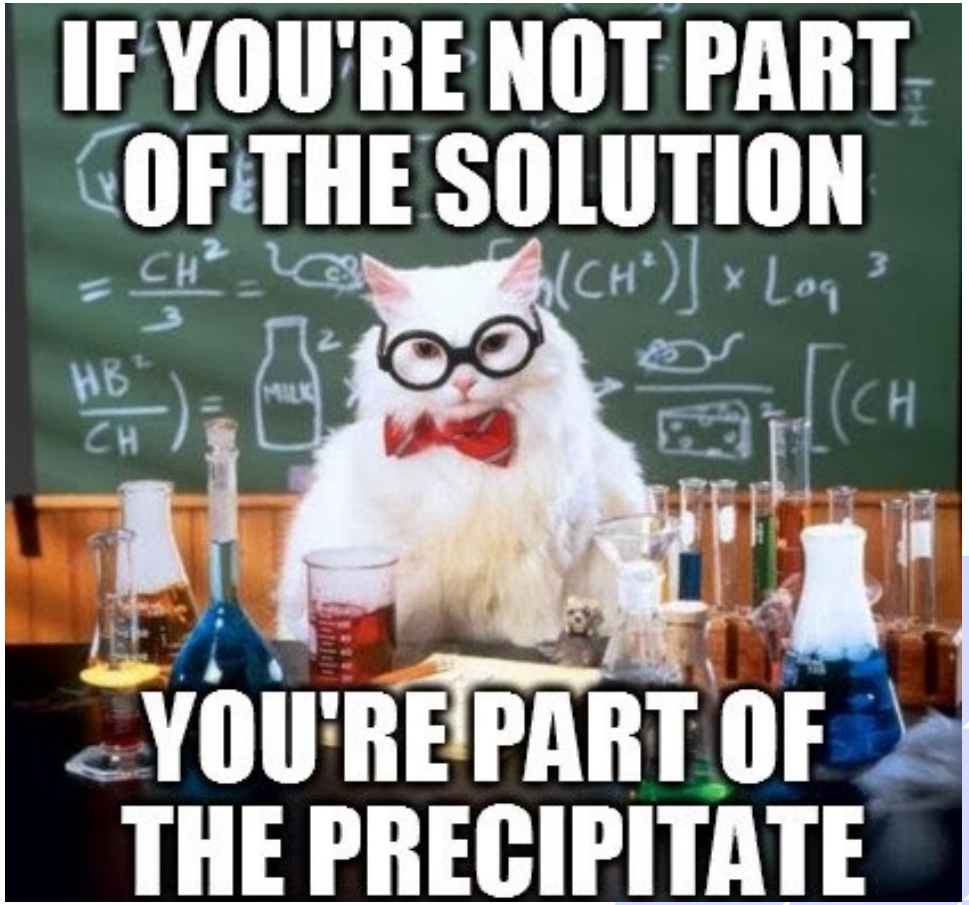
Featured Digital Content
- Interactive lessons



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Lab: Mystery Chemical Reactions





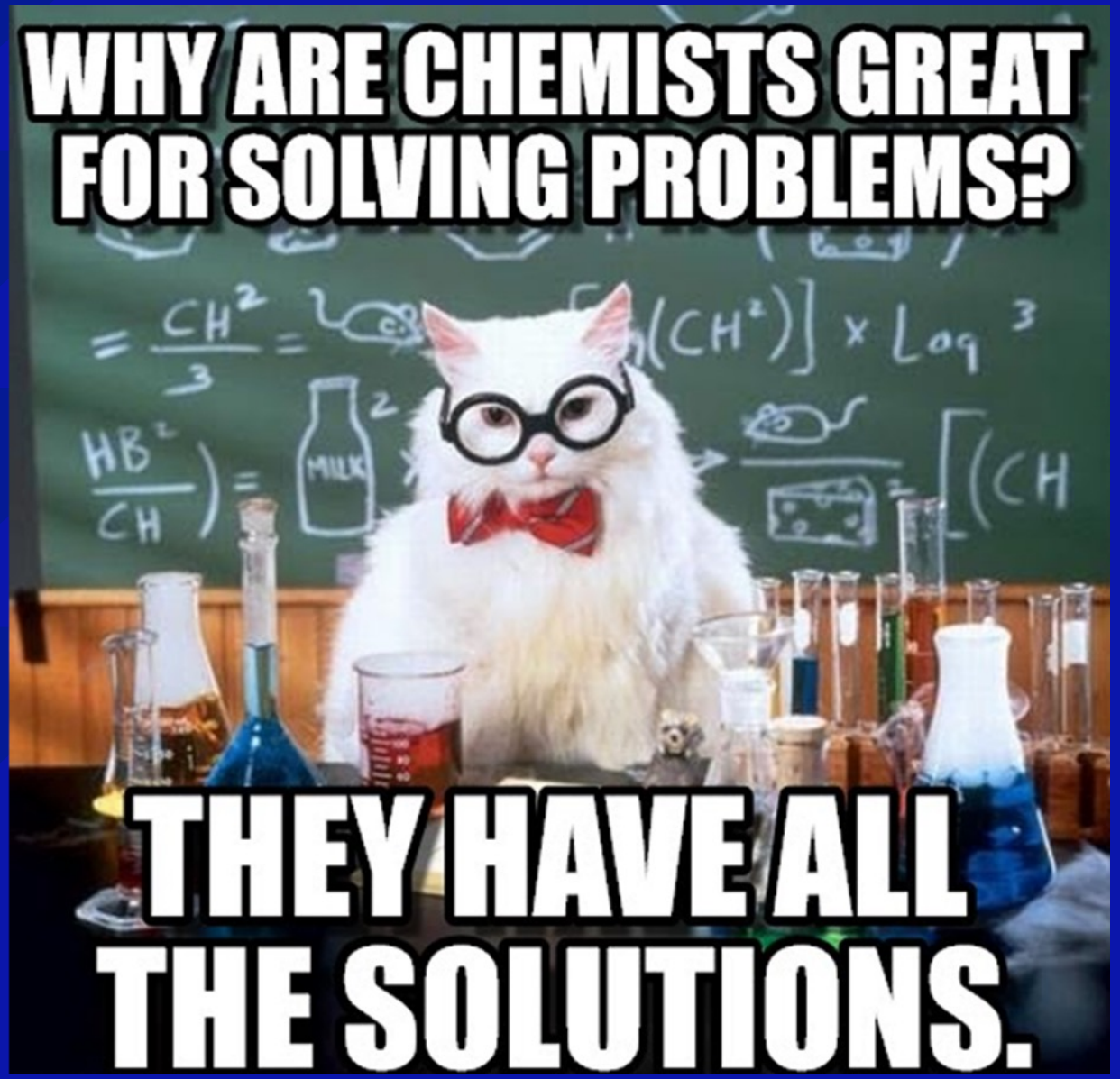
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Lab: Balancing Chemical Equations
A tactile introduction to stoichiometry

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



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Workshop Kit Review



Endothermic Reactions: Beaker Freezer

Item #840378



Mystery Chemical Reactions

Item #840660



Petri Dish Electrolysis

Item #840830

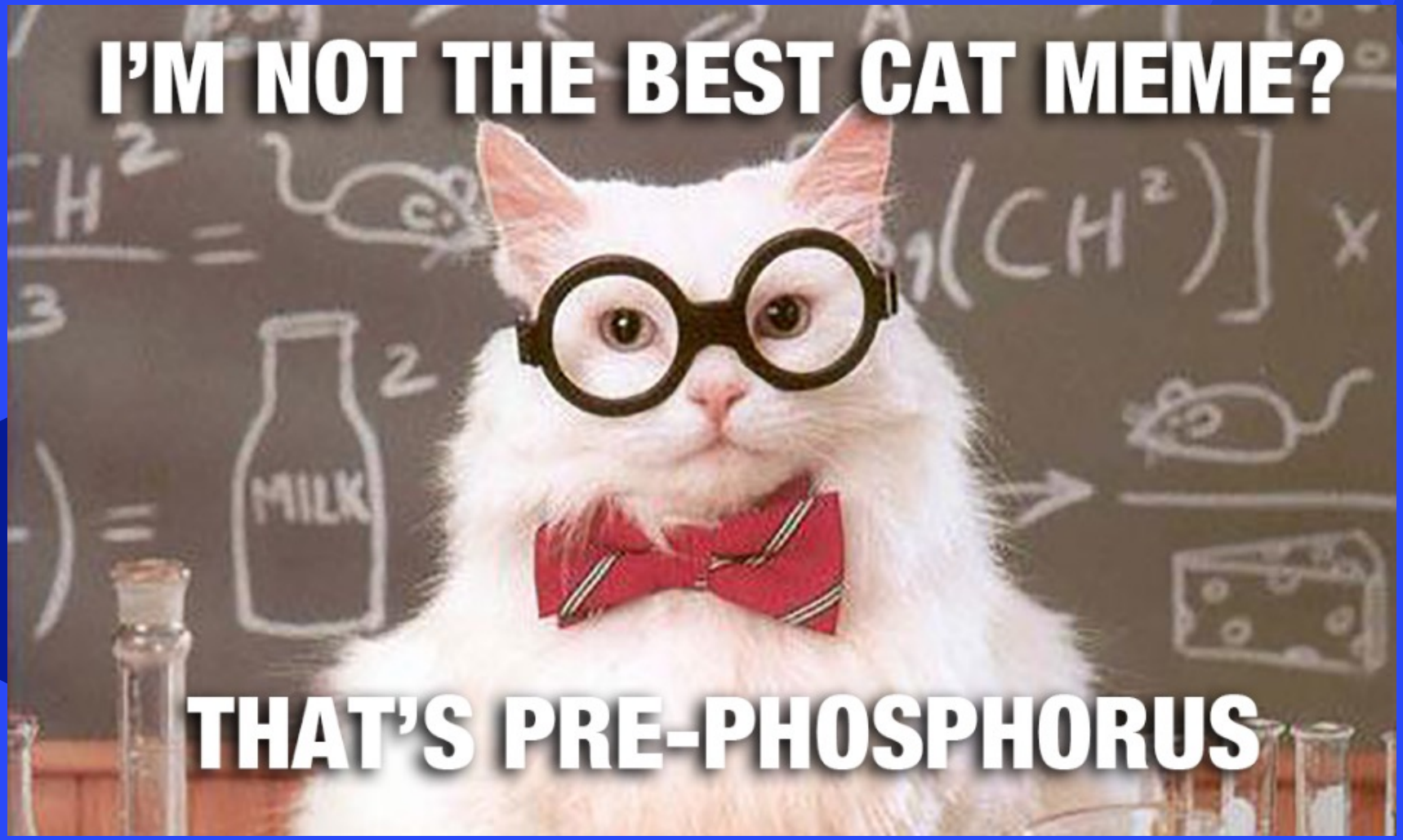


Balancing Chemical Equations

Item #840656

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