

Volume 2 Activities Indexed by National Science Education Standards: Grades 5–8

| | Fired Up!, pg. 11 | Observing Candles, pg. 19 | Burp Bottle, pg. 29 | Crushing Bottles Reversibly, pg. 35 | Elevator Tube, pg. 41 | Mystery Thermometer, pg. 47 | Egg in the Bottle, pg. 53 | Chemistry Under Glass, pg. 65 | Balloon in a Flask, pg. 73 | Crushing Can, pg. 79 | Scent of a Mystery, pg. 87 | Invisible Crystals, pg. 95 | Can You Drop Around?, pg. 101 | Antigravity Jars, pg. 109 | Capillary Action, pg. 119 | Polarity Painting, pg. 127 | Sumi Nagashi, pg. 135 | Are Volumes Additive?, pg. 141 | How Much Sugar in Your Soft Drink?, pg. 149 | Osmosis in Action, pg. 161 | Mixture Separation, pg. 169 | A Bag Full of Chemistry, pg. 175 | Investigating Common Acid-Base Indicators, pg. 183 | Micro-Rocket Challenge, pg. 193 | Darda Car, pg. 201 | Pop-Bead Equilibrium, pg. 205 | Designer Challenges, pg. 211 | |
|---|-------------------|---------------------------|---------------------|-------------------------------------|-----------------------|-----------------------------|---------------------------|-------------------------------|----------------------------|----------------------|----------------------------|----------------------------|-------------------------------|---------------------------|---------------------------|----------------------------|-----------------------|--------------------------------|---|----------------------------|-----------------------------|----------------------------------|--|---------------------------------|--------------------|-------------------------------|------------------------------|---|
| Science as Inquiry—Abilities Necessary to Do Scientific Inquiry | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Identify questions that can be answered through scientific investigations. | | | • | | • | • | | • | • | | • | • | • | | • | | • | • | • | • | | | • | • | | | | • |
| Design and conduct a scientific investigation. | | | • | • | • | • | • | • | • | | • | • | • | | • | | • | • | • | • | | • | | • | | | | • |
| Use appropriate tools and techniques to gather, analyze, and interpret data. | • | • | | | | | | • | | | | | | | • | | | • | • | • | • | • | • | • | | | • | |
| Develop descriptions, explanations, predictions, and models using evidence. | • | • | • | • | • | | • | • | • | • | | | • | • | • | • | • | • | | • | | • | • | | • | • | | |
| Think critically and logically to make the relationships between evidence and explanations. | • | • | | • | • | | • | • | | • | • | | • | • | • | • | • | • | | • | | • | | | | | | • |
| Communicate scientific procedures and explanations. | | | | | • | | | • | • | • | • | | • | | | | | • | | • | • | • | • | | | | • | |
| Use mathematics in all aspects of scientific inquiry. | • | | | | | | | | | | | | • | | | | | • | • | • | • | | | | • | | • | |
| Physical Science | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Properties and changes of properties in matter | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| Motions and forces | | | | • | • | | | • | | | | | | • | | | | | | | | | | | | | | |
| Transfer of energy | • | • | | | | • | • | | | | | • | | | | | | | | | | • | | | | • | | • |
| Science in Personal and Social Perspectives | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Personal and community health | • | | | | | | | | | | | | | | • | | | | | | | | | | | | | |
| Life Science | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Structure and function in living systems | | | | | | | | | | | | | | | • | | | | | | | | | | | | | |

Volume 2 Activities Indexed by National Science Education Standards: Grades 9–12

| | Fired Up!, pg. 11 | Observing Candles, pg. 19 | Burp Bottle, pg. 29 | Crushing Bottles Reversibly, pg. 35 | Elevator Tube, pg. 41 | Mystery Thermometer, pg. 47 | Egg in the Bottle, pg. 53 | Chemistry Under Glass, pg. 65 | Balloon in a Flask, pg. 73 | Crushing Can, pg. 79 | Scent of a Mystery, pg. 87 | Invisible Crystals, pg. 95 | Can You Drop Around?, pg. 101 | Antigravity Jars, pg. 109 | Capillary Action, pg. 119 | Polarity Painting, pg. 127 | Sumi Nagashi, pg. 135 | Are Volumes Additive?, pg. 141 | How Much Sugar in Your Soft Drink?, pg. 149 | Osmosis in Action, pg. 161 | Mixture Separation, pg. 169 | A Bag Full of Chemistry, pg. 175 | Investigating Common Acid-Base Indicators, pg. 183 | Micro-Rocket Challenge, pg. 193 | Darda Car, pg. 201 | Pop-Bead Equilibrium, pg. 205 | Designer Challenges, pg. 211 |
|---|-------------------|---------------------------|---------------------|-------------------------------------|-----------------------|-----------------------------|---------------------------|-------------------------------|----------------------------|----------------------|----------------------------|----------------------------|-------------------------------|---------------------------|---------------------------|----------------------------|-----------------------|--------------------------------|---|----------------------------|-----------------------------|----------------------------------|--|---------------------------------|--------------------|-------------------------------|------------------------------|
| Science as Inquiry—Abilities Necessary to Do Scientific Inquiry | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Identify questions that can be answered through scientific investigations. | | | • | | • | • | | • | • | | • | • | • | | • | | • | • | • | • | | | • | • | | | • |
| Design and conduct a scientific investigation. | | | • | • | • | • | • | • | • | | • | • | • | | • | | • | • | • | • | | • | | • | | | • |
| Use technology and mathematics to improve investigations and communications. | • | | | | | | | | | | | | • | | | | | • | • | • | • | | | • | | • | |
| Formulate and revise scientific explanations and models using logic and evidence. | • | • | • | • | • | | • | • | • | • | | | • | • | • | • | • | • | | • | | • | • | • | • | • | • |
| Recognize and analyze alternative explanations and models. | • | | | | • | | | | | | | | • | • | | | | • | | | | | • | | | | |
| Communicate and defend a scientific argument. | | | | | • | | • | • | • | • | • | | • | | | • | | • | | • | | | • | | | | • |
| Understandings about scientific inquiry | • | • | | | • | | | • | • | | | | • | | | | | | • | | | • | | | | | • |
| Physical Science | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Structure and properties of matter | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | • | • | • | • | • | • | • | • |
| Chemical reactions | • | • | | | | | • | • | | | | | | | | | | | | | • | • | • | • | • | • | • |
| Motions and forces | | | | • | • | | | • | | | | | • | | | | | | | | | | | | | | |
| Conservation of energy and the increase in disorder | • | • | | | | • | • | | | | | | | | | | | | | | | | | | | | • |
| Interactions of energy and matter | | | | | | | | | | | | | | | | | | | | | | | | | | | • |
| Science in Personal and Social Perspectives | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Personal and community health | • | | | | | | | | | | | | | | | • | | | | | | | | | | | |
| Life Science | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Matter, energy, and organization in living systems | | | | | | | | | | | | | | • | | | | | | | | | | | | | |
| The cell | | | | | | | | | | | | | | | | | | | | • | | | | | | | |