



**Switched-On**  
SCHOOLHOUSE® 2011 EDITION

# Curriculum Catalog

Chemistry

## Welcome to Switched-On Schoolhouse!

We are excited that you are including Switched-On Schoolhouse as part of your program of instruction, and we look forward to serving you and your students.

Switched-On Schoolhouse comes complete with a full, multimedia-rich curriculum for grades 3-12 in five core subjects and electives.

Thanks for choosing us!

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**UNIT 1: MEASUREMENT AND ANALYSIS**

**Assignment Titles**

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|--|---|
| 1. An Introduction to Chemistry and Metric Measurement | 13. Using Graphs to Analyze Data                              |
| 2. Report: Metric System                               | 14. Quiz 3: Measurement to Graphs                             |
| 3. Measuring Volume in the Chemistry Laboratory        | 15. Using Significant Figures to Show the Reliability of Data |
| 4. Practice in Measuring Metric Volumes                | 16. Using Scientific Notation with Significant Figures        |
| 5. Measuring Mass in the Chemistry Laboratory          | 17. Quiz 4: Measurement to Significant Figures                |
| 6. Quiz 1: Metric Conversions                          | 18. Doing Chemistry Your Way: Find Your Future                |
| 7. Showing Precision in Measurements                   | 19. Quiz 5: Chapter Review                                    |
| 8. Project: Measuring Length with Precision            | 20. Special Project   |
| 9. Experiment: Masses                                  | 21. Test  |
| 10. Quiz 2: Measurement and Precision                  | 22. Alternate Test  |
| 11. Observation and Hypothesizing                      |   |
| 12. Learning to Make Useful and Detailed Observations  |   |

**UNIT 2: STARTING THE INVESTIGATION: HOW TO IDENTIFY ELEMENTS, COMPOUNDS, AND MIXTURES**

**Assignment Titles**

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|--|---|
| 1. The Basic Ingredient: Chemical Elements                       | 7. Quiz 2: Elements to Compounds and Chemical Changes         |
| 2. Quiz 1: Elements, Chemical and Physical Properties            | 8. Report: Density  |
| 3. Using Chemical and Physical Properties to Identify Substances | 10. Experiment: Using the Tyndall Effect to Identify Colloids |
| 4. Experiment: Observations of a Phase Change                    | 11. Quiz 3: Chapter Review                                    |
| 5. Experiment: Salt and Sand                                     | 12. Special Project   |
| 6. Creating Compounds: Investigating Chemical Changes            | 13. Test  |
|  | 14. Alternate Test  |

**UNIT 3: EXPLORING LAWS FOR GASES AND CONSERVATION OF MASS**

**Assignment Titles**

- |   |  |
|---|--|
| 1. Nothing Stays Put - The Basis for Diffusion and Pressure | 12. Combined Gas Law   |
| 2. Gases and Kinetic Molecular Theory                       | 13. Quiz 4: Diffusion to Combined Gas Law                      |
| 3. Project: Graphing Kinetic Energy                         | 14. Counting Gas Particles: The Measure of the Mole            |
| 4. Quiz 1: Diffusion and Kinetic Molecular Theory           | 15. How Big is a Mole? Avogadro's Number                       |
| 5. Pressure-Volume Relationships in Gases (Boyle's Law)     | 16. Demonstrating Conservation of Mass with Balanced Equations |
| 6. Quiz 2: Diffusion to P-V Relationships in Gases          | 17. Essay: Biography   |
| 7. Temperature-Volume Relationships in Gases (Charles' Law) | 18. Project: Examining the Use of Certain Gases as Propellants |
| 8. Experiment: Finding Absolute Zero Experimentally         | 19. Quiz 5: Chapter Review                                     |
| 9. Experiment: Charles' Law and a Metal Can                 | 20. Special Project  |
| 10. Project: Absolute Zero: Real or Theoretical?            | 21. Test   |
| 11. Quiz 3: Diffusion to V-T Relationships in Gases         | 22. Alternate Test   |

**UNIT 4: THE DISCOVERY OF ATOMS: NATURE'S BUILDING BLOCKS**

**Assignment Titles**

- |  |   |
|--|---|
| 1. The Golden Years of Chemistry                       | 10. Charging Up: Ionization of Atoms        |
| 2. Experiment: Physical Properties of Elements         | 11. Quiz 4: Golden Years to Ionization      |
| 3. Experiment: Chemical Properties of Some Metals      | 12. A Closer Look Inside: Nuclear Reactions |
| 4. Masters of Classic Atomic Theory                    | 13. Report: Fission Reactors                |
| 5. Quiz 1: Golden Years to Masters                     | 14. Quiz 5: Chapter Review                  |
| 6. Designing an Organizational Map: The Periodic Table | 15. Special Project                         |
| 7. Quiz 2: Golden Years to Periodic Table              | 16. Test                                    |
| 8. The Bohr Model Revisited                            | 17. Alternate Test                          |
| 9. Quiz 3: Golden Years to Bohr Model                  |   |

## Chemistry (cont.)

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### UNIT 5: MOLECULAR STRUCTURE

#### Assignment Titles

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|--|--|
| 1. Chemical Accounting: Stoichiometry          | 8. Polar Covalent Molecules and Dot Structures |
| 2. Valence Structure                           | 9. Experiment: Demonstrating Polar Properties  |
| 3. Quiz 1: Stoichiometry to Valence            | 10. Quiz 3: Chapter Review                     |
| 4. Determining Chemical Formulas               | 11. Special Project                            |
| 5. Electron Availability: Prelude to Bonding   | 12. Test                                       |
| 6. Quiz 2: Stoichiometry to Prelude to Bonding | 13. Alternate Test                             |
| 7. Types of Chemical Bonds                     |  |

### UNIT 6: CHEMICAL REACTIONS, RATES AND EQUILIBRIUM

#### Assignment Title

- |  |   |
|--|---|
| 1. Evidence for Chemical Change                                  | 10. Factors that Affect Reaction Rate: Temperature, Catalysts, Concentration of Reactants |
| 2. Experiment: Observing Chemical Changes                        | 11. Quiz 2: Chemical Change to Reaction Rate  |
| 3. Experiment: Chemical Reactions                                | 12. Reaction Equilibriums and Equilibrium Constants                                       |
| 4. Experiment: Ammonium Nitrate                                  | 13. Activity: Exploring Factors that Affect Equilibrium                                   |
| 5. Enthalpy of Reaction  | 14. Conditions Affecting Equilibriums   |
| 6. Using Gibbs Free Energy to Predict Spontaneous Reactions      | 15. Quiz 3: Chapter Review  |
| 7. Quiz 1: Chemical Change to Entropy and Gibbs Free Energy      | 16. Special Project   |
| 8. Factors that Affect Reaction Rates: Solution Concentration    | 17. Test  |
| 9. Experiment: Affect of Solution Concentration on Reaction Rate | 18. Alternate Test  |

### UNIT 7: EQUILIBRIUM SYSTEMS

#### Assignment Title

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|--|---|
| 1. Chemist's Toolbox                       | 13. pH Scale  |
| 2. Solutions                               | 14. Titration of Acids and Bases                      |
| 3. Solution Concentration: Molarity        | 15. Quiz 3: Toolbox to Titration                      |
| 4. Electrical Nature of Solutions          | 16. Redox Equilibrium                                 |
| 5. Solubility                              | 17. Redox and Oxidation Potentials                    |
| 6. Quiz 1: Toolbox to Solubility           | 18. Activity: Solution Concentration vs. Conductivity |
| 7. The Dissolving Process                  | 19. pH Calculations                                   |
| 8. Experiment: Solubility Trends           | 20. Quiz 4: Chapter Review                            |
| 9. The Solubility Constant                 | 21. Special Project                                   |
| 10. Quiz 2: Toolbox to Solubility Constant | 22. Test  |
| 11. Acid-Base Equilibria                   | 23. Alternate Test                                    |
| 12. Experiment: Acid Strength              |   |

### UNIT 8: CARBON CHEMISTRY: HYDROCARBONS

#### Assignment Title

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|--|------------------------------------|
| 1. Organic Compounds                           | 8. Alkanes: Saturated Hydrocarbons |
| 2. Sources of Organic Compounds                | 9. Unsaturated Hydrocarbons        |
| 3. Experiment: Volatility                      | 10. Quiz 3: Chapter Review         |
| 4. Quiz 1: Organic Compounds and Their Sources | 11. Special Project                |
| 5. A Closer Look at the Carbon Atom            | 12. Test                           |
| 6. Bonding in Organic Compounds                | 13. Alternate Test                 |
| 7. Quiz 2: Organic Compounds to Bonding        |                                    |

## Chemistry (cont.)

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### UNIT 9: CARBON CHEMISTRY: FUNCTIONAL GROUPS

#### Assignment Title

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|--|--|
| 1. Common Reactions of Saturated Hydrocarbons                            | 8. Nitrogen Functional Groups            |
| 2. Reactions of Unsaturated Hydrocarbons                                 | 9. Proteins and Amino Acids              |
| 3. Quiz 1: Reactions of Saturated and Unsaturated Hydrocarbons           | 10. Experiment: Preparation of a Polymer |
| 4. Alcohols  | 11. Quiz 3: Chapter Review               |
| 5. Aldehydes, Acids, and Ketones   | 12. Special Project                      |
| 6. Esters  | 13. Test                                 |
| 7. Quiz 2: Reactions of Saturated and Unsaturated Hydrocarbons to Esters | 14. Alternate Test                       |

### UNIT 10: CHEMISTRY REVIEW

#### Assignment Title

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|--|----------------------------|
| 1. Measurement and Analysis                    | 12. Solutions              |
| 2. Scientific Analysis and Significant Figures | 13. Solubility Equilibrium |
| 3. Elements, Compounds, and Mixtures           | 14. Neutralization         |
| 4. Gases and Moles                             | 15. Organic Compounds      |
| 5. Quiz 1: Measurement to Gases and Moles      | 16. Hydrocarbon Chemistry  |
| 6. Atomic Structure and Nuclear Reactions      | 17. Quiz 3: Chapter Review |
| 7. The Periodic Law                            | 18. Special Project        |
| 8. Molecular Structure                         | 19. Test                   |
| 9. Chemical Reactions, Rates, and Equilibrium  | 20. Alternate Test         |
| 10. Reaction Dynamics                          |                            |
| 11. Quiz 2: Measurement to Reaction Dynamics   |                            |