

## Unit 2: Chemical Reactions

adapted from [http://www.phschool.com/advanced/lesson\\_plans/chem\\_brown\\_2003/index.html](http://www.phschool.com/advanced/lesson_plans/chem_brown_2003/index.html)

### Objectives:

- Balance chemical equations.
- Write balanced chemical equations from word descriptions.
- Predict the products of reactions based on the types of reactions
- Predict to some extent whether a substance will be a strong electrolyte, weak electrolyte, or nonelectrolyte.
- Predict the ions that an electrolyte dissociates into.
- Identify substances as acids, bases, and salts.
- Predict the products and write a balanced chemical equation for neutralization and metathesis reactions.
- After constructing molecular reactions for metathesis reactions, be able to identify spectator ions and write the net ionic equations.
- Assign oxidation numbers to atoms.
- Determine whether a reaction is Redox or not.
- Use the activity series to predict whether a Redox (single replacement) reaction will occur, and be able to write the molecular and net ionic equations if it does.

### Lab Objectives:

- Observe some typical chemical reactions studied in the text, identify products, and write chemical reactions.
- Become familiar with the relative chemical reactivity of metals.
- Gain experience with reactions in solution.
- Be able to write molecular, ionic, and net ionic equations for these metathesis reactions.

### Suggested Labs:

- Chemical Reactions
- Activity Series
- Reactions in Aqueous Solutions

### Key Words:

stoichiometry	aqueous solutions	equilibrium precipitate	metathesis reactions	salts
conservation of mass	solute	acids	molecular equation	neutralization
reactants	solvent	bases	(complete) ionic equation	oxidation
products	electrolyte, nonelectrolyte	strong acids and bases	net ionic equation	reduction
combustion	strong electrolyte	weak acids and bases	solubility	redox reaction
combination	weak electrolyte		spectator ions	oxidation number
decomposition	chemical			displacement reactions
				activity series

### Tips:

- It is very important that each species in chemical equations be expressed correctly with their physical state and, if they are ions, with their specific charge.
- Oxidation numbers are not always real charges.
- In writing ionic equations, only dissolved strong electrolytes are written as ions.
- There is no reaction if all ions are spectators.

