

# Chemistry Content Integration Guide

Each Collisions HE content area is designed to introduce students to key chemistry concepts and objectives through interactive gameplay and scaffolded leveling. To best align a specific Collisions HE content area with a topic that you are teaching, please refer to the list below.

## RADII TRENDS

- Atomic neutrality
- Pauli Exclusion Principle
- Aufbau Principle
- Hund's Rule
- Atomic radii trends
- d-orbitals
- Electronegativity
- Valence electrons

## ACID STRENGTH

- Brønsted-Lowry acids and bases
- Electronegativity
- Strong versus weak acids
- Percent dissociation Neutralization
- Polyprotic acids
- Amphoteric substances
- Conjugate acids and bases
- Charge of resulting ions

## IONIC BONDING

- Attraction and repulsion
- Net compound neutrality
- Cation to anion ratios
- Single cation to anion type
- Polyatomic ions
- Lattice structure

## LECHÂTELIER

- Reversible reactions
- Relative reaction rates: forward/reverse
- Relative Kc
- LeChâtelier's Principle: effects of changes in
  - Concentration
  - Temperature
  - Pressure

## IONIZATION ENERGY

- Cation formation
- Anion formation
- Octet rule
- Valence electrons/ion charge
- Ionization energy trends
- Electron affinity trends
- Ionic radii trends

## LEWIS STRUCTURES

- Octet/duet rule
- Single bonds
- Double and triple bonds
- Non-bonded domains
- Electronegativity
- Bond polarity
- Electron domains
- Molecular shape/VSEPR

## LATENT HEAT

- Melting/freezing
- Boiling/condensation
- Sublimation/deposition
- Relative kinetic energy of phases
- Intermolecular forces
- Endothermic vs exothermic processes
- Potential vs kinetic energy
- IMF strengths and boiling points
- IMF vs ionic bonding

## INTERMOLECULAR FORCES (IMFS)

- London Dispersion Forces
- Dipole-dipole interactions
- Hydrogen bonding
- Relative IMF strengths
- Polar and nonpolar bonds
- Polar and nonpolar molecules
- Molecular geometry and polarity