

- Lab Experiments are categorized by Topic/Objective.
- **Lab Prices are shown with the lab.** (\$0.50/lab processing fee up to 10).
- Common household materials and a few inexpensive equipment items are required.
- **Answer keys** are provided for all labs.

Introduction

Simple Graphing \$1.99

Hands on. Explain the components of a typical graph (data collection, axis intervals and units, plotting points, slope lines, dependent and independent variables).

Matter

Ice to Water \$0.99

Hands on & virtual. Show the conservation of mass when states of matter change.

Separating Mixtures \$0.99

Hands on & virtual. To separate a mixture using paper chromatography.

Classifying Matter & Physical Versus Chemical Changes \$3.99

- Virtual. Determining types of matter (homogeneous, heterogeneous)
- Virtual. To investigate the difference between physical and chemical changes.

Sublimation \$0.99

Hands on & virtual. To observe sublimation using air freshener.

Pressure Activities \$0.99

Hands on. Collapsing Can; Balloon & Eggs sucked into container.

Density: An Intensive Property \$3.99

Hands On. Determining the density of six items.

Density Virtual Lab \$3.99

Virtual Experiment. Determining the density of liquids and metals.

Measurement

Metric Progression Lab \$2.99

Hands on. Metric progression and metric measurements (milli to kilo).

Accuracy Versus Precision \$1.99

Hands on. To measure the dimensions of an object as accurately and precisely as possible and to apply rules of significant figures to measurements and calculations with measurements.

Accuracy Versus Precision Supplementary Lab \$0.99

Hands on. To investigate accuracy and precision of measuring tools using volume. (Graduated cylinder, plastic cube, beaker).

Atomic Structure

Electrostatic Force Activities \$2.99

Hands on and virtual. To investigate electric force using various activities. Attraction, repulsion using acrylic tape, balloons, and a Van der Graaf machine (video link provided).

Nuclear Symbols Simulation \$2.99

Virtual. Determine the number of protons, neutrons, and electrons in various atoms of different elements and show atomic number and atomic mass. Isotopes.

PHET Atomic Models Simulation \$1.99

Virtual. Outstanding activity illustrating contributions of Dalton, Thomson, Rutherford, Bohr, Debroglie, and Shroedinger.

Flame Test Lab \$2.99

Virtual. Explain the movement of electrons between orbitals in an atom. Use the flame tests to identify substances.

Probability of Finding an Electron \$0.49

Hands on. Use statistics to simulate the probability of finding an electron.

Emission Spectra Lab \$1.99

**This lab requires special equipment (gases [Hydrogen, Helium, Argon, mercury], an emission spectrum device, diffraction grating (3 D glasses)). To understand the quantum nature of atomic structure by determining the wavelengths and identity associated with specific spectral lines of several elements.*

Periodic Table

Periodic Table of Foods \$0.49

Hands on. Arrange food items into columns and rows based on a recognizable pattern, which is analogous to the Periodic Table arrangement.

Top Secret Agent Periodic Table \$0.99

Hands on. To discover patterns from various kinds of information in order to arrange elements or items into a meaningful sequence. Arrange the sketches in a pattern so that you can determine the missing secret agent.

Ionic Bonding

Solutions Containing Ions \$0.99

Hands on or virtual. To show that ions in solution conduct an electric current.

Movement of Charge \$0.99

Hands on. To make a simple model of the atom, showing transfer of charge during an electrostatic reaction. This is the BEST activities ever to show how atoms become ions by the movement of electrons.

Covalent Bonding

Polar vs Non-Polar Covalent Compounds & Solubility of Ionic Compounds in Polar vs Non-Polar Covalent Compounds \$0.99

Hands on or virtual. Compare water to vegetable oil. Determine if an ionic compound can dissolve in polar and non-polar compounds.

Formulas

Bonding & Formulas Lab \$1.99

Hands on. To understand the concepts of ionic versus covalent bonding using electro-negativity differences. Draw electron configurations and recognize molecular geometry of covalent molecules.

Formulas & Naming Ionic Compounds Lab \$0.99

Hands on. Practice building and naming ionic compounds and writing their formulas.

Law of Definite Proportions Lab \$2.99

Virtual. The purpose of this experiment is to investigate the validity of the Law of Definite proportions using a decomposition reaction.

Molar Quantities

Counting by Weighing Lab \$0.99

Hands on. To determine the mass of several samples of household chemical compounds and the data to count atoms. Includes moles and Avogadro's number.

Empirical Formula of a Copper Oxide Lab \$2.99

Virtual. Compare the empirical and molecular formula of a substance. Use experimental data to find the empirical formula of a substance.

Reactions

Double Displacement Reactions: Precipitates & Solubility \$3.99

Virtual. To investigate a series of chemical reactions related to the solubility of various compounds. This will render practice in writing and balancing chemical reactions, naming chemical formulas, and discovering if and when precipitates form, all based on real reagents combining to form real products.

Chemical Reactions Types and Their Equations \$3.99

Virtual. Describe the five classes of chemical reactions. Observe chemical reactions for qualitative results. Write balanced chemical equations for chemical reactions.

Stoichiometry

Butane exploding in a tennis ball canister \$1.99

Hands on or virtual. To investigate some principles of stoichiometry (limiting reagent), writing and balancing equations, and the ideal gas law to create a controlled explosion inside of a tennis ball canister.

Quantitative Analysis: Percent Yield \$0.99

Virtual. Determine the percent yield for a double displacement reaction.

Limiting & Excess Reactants Lab \$2.99

Virtual. Use stoichiometry to determine the ratios of substances in a chemical reaction. Explain how the quantity of reactants limits the amount of product. Determine the substances that are limiting or excess in a reaction.

Percent Yield \$3.99

Hands on. This lab deals with determining stoichiometry and percent yield. To predict the amount of sodium acetate that should be produced in a chemical reaction and to calculate the percent yield.

Gas Laws

Pressure Activities \$0.99

Collapsing Can; Balloon & Eggs sucked into container.

Gas Laws: Boyle's & Charles' Law \$3.99

Virtual. This experiment investigates two different Gas Laws, Boyle's Law and Charles' Law, confirming the relationship between variables of pressure and volume when temperature and moles are held constant (Boyle's Law), and between temperature and volume when pressure and moles are held constant (Charles' Law).

Boyle's & Charles' Law Simulations \$0.99

Virtual. To learn how about Boyle's Law and Charles' Law using the internet.

Water & Solutions

Solubility of Solids (Temperature) \$0.49

Hands on. To investigate solubility of solids based on the temperature of the solvent.

Solubility & Temperature Using Gases \$0.99

Hands on & virtual. To investigate solubility of gases based on temperature.

Colligative Properties; Freezing Point Depression \$2.99

Hands on. To investigate the Colligative property of Freezing Point depression in a most yummy and delightful way: making ice cream!

Colligative Properties Simulation \$1.99

Virtual. Learn about the Colligative Properties of Freezing Pt depression and Boiling Pt elevation by adding solutes to solvents.

Thermochemistry

Specific Heat Of A Metal – Calorimetry \$2.99

Hands on or Virtual. To investigate the specific heat of a metal by using a calorimeter.

Heating & Cooling Curves of Water \$3.99

Hands on or Virtual. To investigate the energy changes which occur during phase changes resulting from heating or cooling substances. For the virtual lab contact learningctronline@gmail.com and request video links.

Equilibrium / Reaction Rate

Reaction Rate versus Temperature \$1.49

Hands on. To investigate reaction rate and factors that affect it.

Stressing Equilibrium (LeChatelier's Principle) Simulation \$1.99

Virtual. Stressing a system by temperature, pressure, or concentration.

LeChatelier's Principle \$1.99

Virtual. Stressing a system by temperature, pressure, or concentration.

Acid / Base

Acids & Bases Simulation \$1.99

Virtual. To learn about neutralization, hydronium and hydroxide ion concentrations, and pH.

Indicators from Natural Sources \$0.99

Hands on. To measure the pH of common household materials by using a natural indicator, and to make an indicator chart.

Titration Lab \$3.99

Virtual. Learn about strong and weak acids and bases and titrating them. Reading titration graphs and using dilutions.

REDOX / Electrochemistry

REDOX Simulation \$1.99

Virtual. Observe molecular reduction-oxidation reactions and how electrons are transferred. Learn about the metallic activity series.

Electrochemistry Lemon Battery \$2.99

Hands on. A battery operates because reduction and oxidation are occurring simultaneously inside.

Voltaic Cell & Electrochemical Cell \$2.99

Virtual. Compare reduction-oxidation in a voltaic cell versus an electrochemical cell (electrolysis and electroplating).