

- Engaging laboratory learning experiences based on modern pedagogies.
- Educational background information that fully prepares students for completing the labs.
- Clearly defined procedures, mirroring on-campus laboratory coursework.
- Comprehensive assessments bring meaning to experiment results and build critical thinking skills.

Choose our Signature Physical Science LabPaq below or configure your own!

EXPERIMENT	PS-1 LP-2253-PS-02
Acceleration	•
Anions, Cations, and Ionic Reactions	•
Caloric Content of Food	•
Determining the Speed of Sound	•
Friction	•
Laboratory Techniques and Measurements	•
Observations of Physical and Chemical Changes	•
Separation of a Mixture of Solids	•
Simple Machine – Lever	•
Specific Heat Capacity of Metals	•
Stoichiometry of a Precipitation Reaction	•
Titration for Acetic Acid in Vinegar	•
Using Buffers	•
Using the Scientific Method to Identify Unknowns	•
NUMBER OF EXPERIMENTS	14

Experiment	Student Hands-On Activities
Acceleration	<ul style="list-style-type: none"> Examine the horizontal and vertical forces acting on a ball rolling down an incline. Measure a marble's velocity as it rolls down an incline. Calculate rate of acceleration from experimental data.
Anions, Cations, and Ionic Reactions	<ul style="list-style-type: none"> Perform chemical reactions with silver nitrate and hydrochloric acid to describe 6 anions. Perform flame tests to describe 5 cations. Conduct confirmation tests to identify the anion and/or cation of 5 unknown chemicals.
Caloric Content of Food	<ul style="list-style-type: none"> Build a rudimentary calorimeter and measure the caloric content of 3 foods. Compare experimental data to nutrition labels found on the packaging of food items. Calculate the estimated caloric content of foods based on the nutrition label and Atwater factors.
Determining the Speed of Sound	<ul style="list-style-type: none"> Construct a resonance tube. Calculate the velocity of sound in air using a tuning fork of known frequency. Measure the wavelength of a sound using the resonance of an air column inside a PVC pipe submerged at various depths in water. Calculate the speed of sound from experimental data.
Friction	<ul style="list-style-type: none"> Measure friction using a spring scale. Calculate the coefficient of friction from experimental data. Compute forces for static and kinetic friction required to move a wooden block.
Laboratory Techniques and Measurements	<ul style="list-style-type: none"> Perform measurements using a graduated cylinder, volumetric flask, graduated pipet, ruler, digital scale, beaker, and thermometer. Apply Archimedes' principle and the water displacement method to measure the volume of an irregularly shaped object. Create solutions of varying concentrations and densities by diluting a stock solution.
Observations of Chemical Changes	<ul style="list-style-type: none"> Perform 8 reactions and conduct scientific observations to describe chemical changes. Investigate the results of heating an object and burning an object using magnesium, mossy zinc, copper(II) carbonate, and copper(II) nitrate. Compare the heating and burning of chemicals.
Separation of a Mixture of Solids	<ul style="list-style-type: none"> Separate a mixture into 4 components using the properties of solubility and magnetism. Calculate the percent composition of each substance present in a mixture of solids.
Simple Machine – Lever	<ul style="list-style-type: none"> Construct first, second, and third class levers. Measure force with a spring scale. Calculate the mechanical advantage of lever types from experimental data.
Specific Heat Capacity of Metals	<ul style="list-style-type: none"> Construct a calorimeter. Measure heat changes of two metals. Calculate specific heat of metals from experimental data.

Experiment	Student Hands-On Activities
Stoichiometry of a Precipitation Reaction	<ul style="list-style-type: none">• Use stoichiometry to determine the amount of reactant needed to create the maximum amount of product in a precipitation reaction.• Perform a precipitation reaction and measure the precipitate.• Calculate the percent yield of a precipitation reaction and compare the value to the theoretical yield.
Titration for Acetic Acid in Vinegar	<ul style="list-style-type: none">• Apply titration techniques on a sample of commercial vinegar using sodium hydroxide.• Calculate the molar concentration and percent concentration of acetic acid in commercial vinegar.
Using Buffers	<ul style="list-style-type: none">• Create an acetic acid/sodium acetate buffer solution.• Evaluate buffering capacity in response to additions of concentrated and dilute acids and bases.
Using the Scientific Method to Identify Unknowns	<ul style="list-style-type: none">• Apply the scientific method to address 2 real-world problems.• Construct hypotheses and collect qualitative and quantitative data from systematic observations of 5 white, solid substances.• Design a controlled experiment, conduct observations, and draw conclusions about the identities of 3 unknown substances.