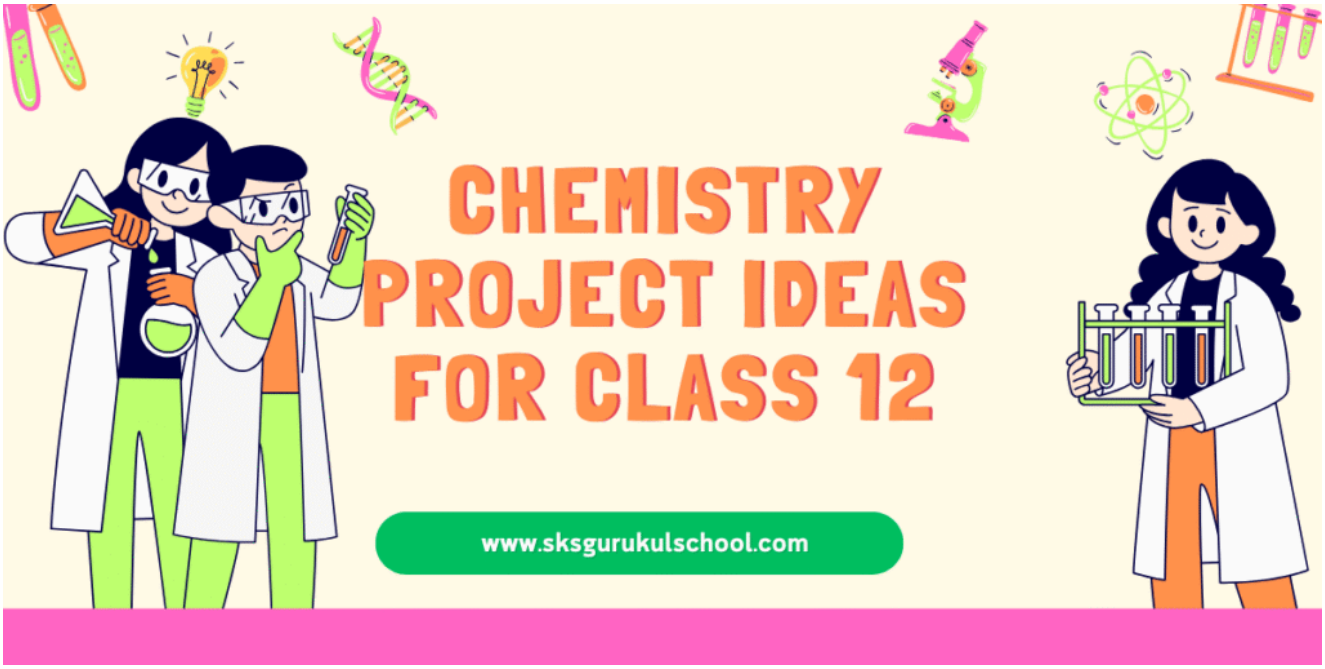
148+ Chemistry Project Ideas for Class 12



Chemistry is a subject full of experiments, colors, reactions and useful ideas. For class 12 students, project work helps to understand theory in a simple and practical way.

A good project shows your teacher that you can plan, perform experiments, observe carefully, and explain results in clear language.

This article gives 150 chemistry project ideas for class 12. Each idea includes a short description, the basic materials you might need, and what concept you will learn.

The language is simple so you can read, copy, and use these ideas directly for your project report.

Before you choose a project, read the safety and tips section below. Some experiments need adult help or lab supervision. Choose a project that matches the time, materials, and help you have.

Safety and tips

- Always wear safety goggles, gloves, and a lab coat when doing experiments.
- Work in a well-ventilated area or under a fume hood if you are using volatile chemicals.
- Never taste or directly smell chemicals. Use the wafting method if needed.
- Dispose of chemical waste according to your teacher's instructions. Do not pour unknown chemicals down the drain.
- Keep a fire extinguisher, first-aid kit, and emergency contact numbers nearby.
- If you are unsure, ask your teacher or an experienced adult to help.

How to pick a good project

- Choose a topic you find interesting. You will enjoy working on it.
- Prefer projects that are safe and use easy-to-find materials.
- Keep the experiment simple so you can repeat it and get reliable results.
- Make a clear hypothesis — what you expect to happen.
- Note down all observations and take photos if possible.
- Explain your results with simple chemistry ideas.

Presentation tips

- Start with a clear title and aim of the project.
- Give a short introduction and write the hypothesis.
- List materials and step-by-step procedure.
- Present data in tables or simple graphs.
- Write a conclusion that matches your observations. State sources of error and future scope.

Must Read: 5th Grade Science Fair Project Ideas — 150 Fun & Easy Projects for Kids!

150 Chemistry Project Ideas for Class 12

A. Physical Chemistry

1. **Rate of reaction: effect of concentration**
   - *Description:* Study how reactant concentration affects reaction speed.
   - *Materials:* Hydrochloric acid, sodium thiosulfate, stopwatch, water.

- *Concept:* Reaction kinetics and collision theory.

2. **Rate of reaction: effect of temperature**
   - *Description:* Measure how increasing temperature changes reaction rate.
   - *Materials:* Reactants like HCl and sodium thiosulfate, water bath, thermometer.
   - *Concept:* Activation energy and Arrhenius equation idea.
3. **Conductometric titration of strong acid vs strong base**
   - *Description:* Use electrical conductivity to find equivalence point.
   - *Materials:* Conductivity meter, HCl, NaOH, burette.
   - *Concept:* Ionic conduction and neutralization.
4. **Study of adsorption using activated charcoal**
   - *Description:* Measure how dye is removed from water by charcoal.
   - *Materials:* Activated charcoal, dye solution, spectrophotometer or color comparison.
   - *Concept:* Adsorption isotherms and surface area.
5. **Determination of molecular mass by vapor density**
   - *Description:* Calculate vapor density of a volatile liquid to find molar mass.
   - *Materials:* Lightweight flask, volatile liquid, balance, heating setup.
   - *Concept:* Gas laws and molar mass determination.
6. **Study of diffusion using gel medium**
   - *Description:* Observe how ions move through agar gel over time.
   - *Materials:* Agar, indicator salts, petri dish.
   - *Concept:* Diffusion and rate dependent on size and temperature.
7. **pH change during a chemical reaction**
   - *Description:* Monitor pH with time for an acid–base reaction.
   - *Materials:* pH meter or indicators, acids and bases.
   - *Concept:* Acid-base equilibrium and buffering.
8. **Calorimetry: heat of neutralization**
   - *Description:* Measure heat released when acid reacts with base.
   - *Materials:* Calorimeter (simple), thermometer, HCl, NaOH.
   - *Concept:* Enthalpy change and energy conservation.
9. **Study of surface tension with different liquids**
   - *Description:* Compare surface tension of water, alcohol, oils.
   - *Materials:* Capillary tubes, liquids, ruler.
   - *Concept:* Intermolecular forces and surface energy.
10. **Viscosity measurement of liquids**
    - *Description:* Determine viscosity using flow through a capillary or siphon.
    - *Materials:* Stopwatch, tubes, liquids.
    - *Concept:* Resistance to flow and molecular size.
11. **Effect of catalyst on decomposition of hydrogen peroxide**
    - *Description:* Compare decomposition rate with and without catalyst like MnO_2.
    - *Materials:* H_2O_2, catalyst, gas collection setup.
    - *Concept:* Catalysis and activation energy lowering.
12. **Determination of dissociation constant of weak acid**

- *Description:* Use pH and concentration to estimate Ka.
- *Materials:* Weak acid (acetic), pH meter, volumetric glassware.
- *Concept:* Acid dissociation and equilibrium.

13. **Electrolytic conductance vs concentration**
    - *Description:* Plot conductance of salt solutions at different concentrations.
    - *Materials:* Conductivity meter, KCl solutions of varying molarity.
    - *Concept:* Ionic mobility and limiting molar conductance.
14. **Study of colligative properties: boiling point elevation**
    - *Description:* Measure boiling point of solvent with and without solute.
    - *Materials:* Distilled water, sugar or salt, thermometer.
    - *Concept:* Colligative properties and molal boiling point elevation.
15. **Determination of activation energy using rate data**
    - *Description:* Use rate constants at different temperatures to estimate Ea.
    - *Materials:* A simple reaction setup, thermometer, stopwatch.
    - *Concept:* Arrhenius plot and activation energy.

B. Organic Chemistry

16. **Synthesis of aspirin (acetylsalicylic acid)**
    - *Description:* Prepare aspirin from salicylic acid and acetic anhydride.
    - *Materials:* Salicylic acid, acetic anhydride, catalyst (H_2SO_4), recrystallization setup.
    - *Concept:* Esterification and purification.
17. **Preparation of soap and its cleaning power**
    - *Description:* Make soap from vegetable oil and NaOH; test cleaning on stains.
    - *Materials:* Oils, NaOH, molds, dirty cloth samples.
    - *Concept:* Saponification and emulsification.
18. **Extraction and analysis of essential oil from citrus peel**
    - *Description:* Steam-distil peels to collect aromatic oil and test properties.
    - *Materials:* Citrus peels, distillation setup, separating funnel.
    - *Concept:* Volatile oils and distillation.
19. **Study of polymerization: making nylon rope trick (nylon 66)**
    - *Description:* Interfacial polymerization to demonstrate nylon formation.
    - *Materials:* Hexamethylenediamine, adipoyl chloride, solvents.
    - *Concept:* Condensation polymerization and amide bonds.
20. **Synthesis and testing of an aspirin alternative (paracetamol)**
    - *Description:* Prepare paracetamol from p-aminophenol and acetic anhydride.
    - *Materials:* p-Aminophenol, acetic anhydride, acid catalyst.
    - *Concept:* Acetylation and drug synthesis basics.
21. **Identification of functional groups by simple tests**
    - *Description:* Use small tests to identify alcohol, aldehyde, ketone, carboxylic acid.
    - *Materials:* Ferric chloride, Tollen's reagent, 2,4-DNP, $NaHCO_3$.
    - *Concept:* Characteristic reactions and qualitative analysis.

22. **Study of dye extraction from plants and thin-layer chromatography (TLC)**
    - *Description:* Extract pigments from leaves and separate by TLC.
    - *Materials:* Plant material, solvents, TLC plates.
    - *Concept:* Chromatography and polarity.
23. **Preparation of esters and smell comparison**
    - *Description:* Make small esters and compare smells to identify them.
    - *Materials:* Alcohols, carboxylic acids, acid catalyst.
    - *Concept:* Esterification and functional group properties.
24. **Hydrogenation of vegetable oil: trans fats study**
    - *Description:* Partial hydrogenation of oils to study changes in melting point.
    - *Materials:* Vegetable oil, hydrogen source, catalyst (Pd), safety gear.
    - *Concept:* Hydrogenation and structural change in fats.
25. **Oxidation of ethanol to acetic acid**
    - *Description:* Oxidize ethanol and test product with indicators.
    - *Materials:* Ethanol, oxidizing agent (acidified $KMnO_4$), distillation.
    - *Concept:* Oxidation states and organic oxidation reactions.
26. **Study of polymer biodegradation**
    - *Description:* Test how different plastics break down in soil over time.
    - *Materials:* Samples of different plastics, soil containers, scale.
    - *Concept:* Polymer stability and biodegradation.
27. **Synthesis of biodiesel from vegetable oil**
    - *Description:* Transesterification of oil with methanol and catalyst to make biodiesel.
    - *Materials:* Vegetable oil, methanol, NaOH, separating funnel.
    - *Concept:* Ester exchange reaction and renewable fuels.
28. **Study of pH effect on indicator color and structure**
    - *Description:* Note color changes of natural and synthetic indicators at different pH.
    - *Materials:* Litmus, phenolphthalein, red cabbage extract.
    - *Concept:* Acid-base indicators and molecular structure.
29. **Preparation and testing of aspirin purity**
    - *Description:* After aspirin synthesis, test purity by melting point and simple tests.
    - *Materials:* Aspirin sample, melting point determination, TLC.
    - *Concept:* Purification and analytic checks.
30. **Extraction and identification of caffeine from tea**
    - *Description:* Isolate caffeine and test its properties.
    - *Materials:* Tea leaves, solvents, filtration setup.
    - *Concept:* Alkaloid extraction and solubility.

C. Inorganic and Coordination Chemistry

31. **Synthesis of coordination compounds and color study**

- *Description:* Prepare simple complexes like copper(II) sulfate complexes and study color change.
- *Materials:* Metal salts, ligands (NH_3, H_2O, Cl^-), glassware.
- *Concept:* Coordination chemistry and ligand effects.

32. **Preparation and study of ferrofluid (colloidal magnetic fluid)**
    - *Description:* Make a safe ferrofluid and see it respond to magnets.
    - *Materials:* Iron oxide nanoparticles (or prepared in lab), surfactant, magnetic source.
    - *Concept:* Colloids and magnetism.
33. **Synthesis of starch-iodine complexes and color analysis**
    - *Description:* Study how iodine reacts with starch and what modifies color intensity.
    - *Materials:* Starch solution, iodine, varying conditions.
    - *Concept:* Inclusion complexes and detection reactions.
34. **Preparation of coordination polymers with visible properties**
    - *Description:* Create simple polymeric salts and observe properties like solubility and color.
    - *Materials:* Metal salts and ligands that form chains.
    - *Concept:* Extended coordination structures.
35. **Study of hardness of water: effect on soap**
    - *Description:* Test samples of water with soap and compare lathering.
    - *Materials:* Soap solution, water samples, titration chemicals for hardness.
    - *Concept:* Hardness ions (Ca^{2+}/Mg^{2+}) and soap action.
36. **Preparation and testing of oxygen from hydrogen peroxide**
    - *Description:* Decompose H_2O_2 and test for oxygen with glowing splint.
    - *Materials:* H_2O_2, catalyst, test tube, glowing splint.
    - *Concept:* Gas tests and decomposition reactions.
37. **Chromium oxidation states and color changes**
    - *Description:* Show how chromium changes color with oxidation state using simple reagents.
    - *Materials:* Chromium salts, oxidizing and reducing agents.
    - *Concept:* Transition metal oxidation and color.
38. **Synthesis of colored precipitates and their solubility**
    - *Description:* Form precipitates of metal ions and study solubility in acids/bases.
    - *Materials:* Metal salts, NaOH, acids.
    - *Concept:* Precipitation reactions and solubility rules.
39. **Preparation of pigments from transition metal compounds**
    - *Description:* Make and compare simple inorganic pigments.
    - *Materials:* Iron oxide, copper compounds, lead-free pigments.
    - *Concept:* Coordination environment and color.
40. **Study of flame tests for metal ions**
    - *Description:* Observe colors produced by different metal ions on flame.
    - *Materials:* Metal salts, nichrome wire, Bunsen burner.

- *Concept:* Electron excitation and emission spectra.

41. **Synthesis of zeolite-like adsorbent from clay**
    - *Description:* Convert local clay to porous adsorbent and test dye removal.
    - *Materials:* Clay, alkali, heat treatment, dye solutions.
    - *Concept:* Porous materials and adsorption.
42. **Preparation and uses of oxygen scavengers in food packaging**
    - *Description:* Make a simple oxygen absorber and measure oxygen reduction.
    - *Materials:* Iron powder, salt, desiccant packet.
    - *Concept:* Redox chemistry and food preservation.
43. **Test for anions and cations in unknown salt**
    - *Description:* Perform qualitative analysis to identify ions in a sample.
    - *Materials:* Test reagents, unknown salt, flame test setup.
    - *Concept:* Systematic qualitative inorganic analysis.
44. **Synthesis of coordination complex as an indicator switch**
    - *Description:* Use complex formation to show color change with pH or ligand.
    - *Materials:* Metal salts, ligands, pH buffers.
    - *Concept:* Ligand exchange and colorimetry.
45. **Study of corrosion rates under different coatings**
    - *Description:* Compare corrosion of metal samples with and without protective coatings.
    - *Materials:* Metal strips, paints or oils, salt solution.
    - *Concept:* Electrochemical corrosion and protection.

D. Analytical Chemistry

46. **Titration: determination of NaOH concentration by standard acid**
    - *Description:* Standard acid-base titration to find unknown concentration.
    - *Materials:* HCl or H_2SO_4 standard, NaOH solution, phenolphthalein.
    - *Concept:* Titration principle and molarity.
47. **Colorimetric determination of iron in water**
    - *Description:* Use color reagent to quantify iron concentration.
    - *Materials:* Water samples, color reagent (orthophenanthroline), spectrophotometer or color chart.
    - *Concept:* Complex formation and Beer-Lambert law idea.
48. **Estimation of vitamin C in fruit juices**
    - *Description:* Titrate juice with standardized DCPIP or iodine to find vitamin C.
    - *Materials:* DCPIP or iodometric reagents, fruit juice.
    - *Concept:* Redox titration and nutrient estimation.
49. **Determination of chloride by argentometric titration**
    - *Description:* Use silver nitrate titration to find chloride content.
    - *Materials:* $AgNO_3$, K_2CrO_4 indicator, unknown chloride solution.
    - *Concept:* Precipitation titration and titration endpoints.
50. **Gravimetric estimation of calcium as $CaCO_3$**

- *Description:* Precipitate Ca^{2+}, dry and weigh to estimate amount.
- *Materials:* Reagents to precipitate carbonate, filtration setup.
- *Concept:* Gravimetric analysis and accuracy.

51. **pH meter calibration and accuracy testing**
    - *Description:* Calibrate pH meter and test accuracy on buffer solutions.
    - *Materials:* pH meter, standard buffer solutions.
    - *Concept:* Instrument calibration and error sources.
52. **Thin-layer chromatography for drug detection**
    - *Description:* Separate components of an aspirin or analgesic tablet.
    - *Materials:* TLC plates, solvent system, sample extract.
    - *Concept:* Separation by polarity and Rf values.
53. **Determination of copper concentration by titration**
    - *Description:* Use EDTA titration to measure Cu^{2+} in sample.
    - *Materials:* EDTA solution, metal indicators.
    - *Concept:* Complexometric titration and chelation.
54. **Estimation of dissolved oxygen in water**
    - *Description:* Use Winkler method to measure DO in pond water.
    - *Materials:* Winkler reagents, titration setup.
    - *Concept:* Water quality and oxygen chemistry.
55. **Determination of purity of sample using melting point**
    - *Description:* Measure melting point and compare with literature to judge purity.
    - *Materials:* Melting point apparatus, sample.
    - *Concept:* Purity and mixed melting behavior.
56. **Quantification of sulfate in water by precipitation**
    - *Description:* Precipitate sulfate as $BaSO_4$ and weigh.
    - *Materials:* $BaCl_2$ solution, filter paper, water sample.
    - *Concept:* Gravimetric precipitation and stoichiometry.
57. **Use of potentiometry to estimate concentration**
    - *Description:* Measure potential change during titration to find endpoint.
    - *Materials:* pH/ion-selective electrode, titrants.
    - *Concept:* Electrode potentials and Nernst equation idea.
58. **Determination of sugar content using refractometer**
    - *Description:* Measure Brix of fruit juices and compare with sugar estimation.
    - *Materials:* Refractometer, juice samples.
    - *Concept:* Optical properties and concentration.
59. **Qualitative analysis of unknown organic compound**
    - *Description:* Carry out simple tests to find functional groups in an organic sample.
    - *Materials:* Common reagents (Tollen's, $NaHCO_3$, 2,4-DNP).
    - *Concept:* Systematic qualitative organic analysis.
60. **Estimation of nitrate in soil by colorimetry**
    - *Description:* Extract nitrate and use color reagent to quantify.
    - *Materials:* Soil samples, extracting water, color reagent.

- *Concept:* Agricultural chemistry and nutrient analysis.

E. Environmental Chemistry

61. **Effect of water pH on aquatic life indicators**
    - *Description:* Measure pH of various water sources and relate to aquatic health.
    - *Materials:* pH meter, water samples from ponds, taps.
    - *Concept:* Environmental pH and ecosystem impact.
62. **Removal of heavy metals using biosorbents**
    - *Description:* Test how agricultural waste (peels, husk) removes metals from water.
    - *Materials:* Metal solutions, biosorbent powders, filtration.
    - *Concept:* Adsorption and pollution control.
63. **Study of photocatalytic degradation of dye using TiO_2**
    - *Description:* Use TiO_2 and sunlight to degrade colored dye in water.
    - *Materials:* TiO_2 powder, dye, UV/sunlight source.
    - *Concept:* Photocatalysis and environmental cleanup.
64. **Comparative study of biodegradable vs non-biodegradable plastics**
    - *Description:* Test breakdown of different plastics in soil/compost.
    - *Materials:* Plastic samples, soil containers, scale.
    - *Concept:* Environmental impact and decomposition rates.
65. **Measurement of air quality: particulate matter study**
    - *Description:* Collect dust with filter paper and weigh to estimate PM level.
    - *Materials:* Filter paper, pump or passive collection, balance.
    - *Concept:* Air pollution monitoring basics.
66. **Study of acidity (pH) of rainwater in different areas**
    - *Description:* Collect rainwater and measure pH to detect acid rain.
    - *Materials:* Clean collection bottles, pH meter.
    - *Concept:* Atmospheric chemistry and pollutants.
67. **Testing pesticide residue in vegetable samples**
    - *Description:* Extract possible residues and test with simple kits or chromatography.
    - *Materials:* Vegetable samples, extraction solvents, test strips or TLC.
    - *Concept:* Food safety and analytical detection.
68. **Biodegradation of oil using microbes**
    - *Description:* Test how certain microbes reduce oil in water samples.
    - *Materials:* Oil sample, soil microbes, small reactors.
    - *Concept:* Bioremediation and microbial metabolism.
69. **Study of chlorine levels in drinking water**
    - *Description:* Measure free chlorine in tap water using DPD test.
    - *Materials:* Chlorine test kit, water samples.
    - *Concept:* Disinfection chemistry and safety.
70. **Effect of fertilizers on nitrate leaching**

- *Description:* Simulate soil columns and measure nitrate movement with different fertilizers.
- *Materials:* Soil columns, fertilizers, water, nitrate test.
- *Concept:* Agricultural runoff and nutrient leaching.

71. **Removal of fluoride using low-cost adsorbents**
    - *Description:* Test how bone char or activated alumina removes fluoride from water.
    - *Materials:* Fluoride solution, adsorbents, fluoride test kits.
    - *Concept:* Ion exchange and adsorption.
72. **Measurement of biochemical oxygen demand (BOD) in wastewater**
    - *Description:* Estimate BOD of domestic wastewater samples.
    - *Materials:* Incubation bottles, DO measurement setup.
    - *Concept:* Organic pollution and oxygen consumption.
73. **Study of algal bloom effect on water chemistry**
    - *Description:* Observe changes in pH, DO, and nutrients during algal growth.
    - *Materials:* Water sample, algae culture, measuring equipment.
    - *Concept:* Eutrophication and nutrient cycles.
74. **Testing natural coagulants for water purification**
    - *Description:* Compare alum and plant-based coagulants (moringa) for clarifying water.
    - *Materials:* Turbid water, coagulants, settling jars.
    - *Concept:* Water treatment and coagulation chemistry.
75. **Study of heavy metal accumulation in plants near roads**
    - *Description:* Test plant leaves for Pb, Cd after exposure to vehicle emissions.
    - *Materials:* Plant samples, extraction reagents, test methods.
    - *Concept:* Environmental contamination and bioaccumulation.

F. Biochemistry

76. **Enzyme activity: effect of pH on catalase**
    - *Description:* Measure rate of H_2O_2 breakdown by catalase at different pH.
    - *Materials:* Potato or liver extract (catalase source), H_2O_2, buffers.
    - *Concept:* Enzyme activity and optimal pH.
77. **Effect of temperature on amylase activity**
    - *Description:* Test starch breakdown by saliva or amylase at various temperatures.
    - *Materials:* Starch solution, iodine, enzyme source.
    - *Concept:* Enzyme kinetics and denaturation.
78. **Qualitative test of proteins in food samples**
    - *Description:* Perform Biuret test and others to detect protein.
    - *Materials:* Biuret reagent, food extracts.
    - *Concept:* Protein detection and nutrition.
79. **Study of fermentation: alcohol production from fruits**

- *Description:* Ferment fruit sugars and measure ethanol production.
- *Materials:* Fruit mash, yeast, fermentation vessel, hydrometer.
- *Concept:* Anaerobic metabolism and biochemical pathways.

80. **Effect of preservatives on microbial growth in food**
    - *Description:* Compare spoiled rate of food with and without preservatives.
    - *Materials:* Food samples, preservative solutions, controlled storage.
    - *Concept:* Food chemistry and antimicrobial action.
81. **Extraction and estimation of chlorophyll from leaves**
    - *Description:* Extract pigments and measure absorbance to estimate chlorophyll content.
    - *Materials:* Leaves, acetone or ethanol, spectrophotometer.
    - *Concept:* Photosynthetic pigments and light absorption.
82. **Study of antioxidant levels in fruits**
    - *Description:* Use DPPH or similar methods to estimate antioxidant activity.
    - *Materials:* Fruit extracts, DPPH reagent, spectrophotometer.
    - *Concept:* Free radical scavenging and health chemistry.
83. **Investigation of lactose content in milk**
    - *Description:* Test for reducing sugars after enzymatic hydrolysis.
    - *Materials:* Milk samples, lactase, Benedict's reagent.
    - *Concept:* Carbohydrate chemistry and enzyme hydrolysis.
84. **Protein coagulation in milk: effect of acid and heat**
    - *Description:* Observe curd formation by changing pH and temperature.
    - *Materials:* Milk, acid (vinegar), heat source.
    - *Concept:* Denaturation and coagulation of proteins.
85. **Study of DNA extraction from fruits**
    - *Description:* Extract visible DNA using household materials.
    - *Materials:* Strawberries or bananas, detergent, salt, ethanol.
    - *Concept:* DNA basics and cell structure.
86. **Effect of metal ions on enzyme activity**
    - *Description:* Test how ions like Cu^{2+} or Mg^{2+} change enzyme rates.
    - *Materials:* Enzyme source, metal salt solutions.
    - *Concept:* Cofactors and inhibitors.
87. **Study of blood glucose estimation methods**
    - *Description:* Compare enzymatic and colorimetric methods for sugar detection.
    - *Materials:* Glucose test strips or reagents, sample solutions.
    - *Concept:* Clinical biochemistry basics.
88. **Extraction and analysis of pectin from fruit peels**
    - *Description:* Isolate pectin and test gelling ability with sugar and acid.
    - *Materials:* Fruit peels, acid, alcohol.
    - *Concept:* Polysaccharide structure and food chemistry.
89. **Study of microbial enzyme production from food waste**
    - *Description:* Use waste to grow microbes that produce enzymes like amylase.
    - *Materials:* Food waste, simple culture setup.

- *Concept:* Biotechnology and waste valorization.

90. **Testing probiotic bacteria in curd: beneficial count**
    - *Description:* Estimate colony-forming units in homemade curd with simple plating.
    - *Materials:* Agar plates, curd samples, sterile tools.
    - *Concept:* Microbiology and beneficial microbes.

G. Electrochemistry

91. **Construction of a simple electrochemical cell and EMF measurement**
    - *Description:* Make Daniell or similar cell and measure voltage.
    - *Materials:* Zn and Cu electrodes, salt bridge, voltmeter.
    - *Concept:* Galvanic cells and electrode potentials.
92. **Electroplating of metal on an object**
    - *Description:* Plate a metal layer using electrolysis and study factors affecting thickness.
    - *Materials:* Power source, metal salt solution, electrodes.
    - *Concept:* Faraday's laws and deposition.
93. **Study of corrosion and protection by cathodic protection**
    - *Description:* Show how sacrificial anode protects metal.
    - *Materials:* Metal samples, sacrificial anode (zinc), salt water.
    - *Concept:* Electrochemical corrosion and protection methods.
94. **Effect of concentration on cell potential**
    - *Description:* Measure EMF of cell with changing ion concentrations.
    - *Materials:* Electrodes, solutions of known molarity, voltmeter.
    - *Concept:* Nernst equation and concentration cells.
95. **Power generation with lemon battery and scale-up study**
    - *Description:* Make batteries from lemons and test electrical output.
    - *Materials:* Lemons, copper and zinc plates, wires, multimeter.
    - *Concept:* Redox reactions and electrochemical energy.
96. **Electrolysis of water: hydrogen and oxygen collection**
    - *Description:* Split water into gases and measure volumes.
    - *Materials:* Electrolysis cell, DC power, electrodes.
    - *Concept:* Faraday's laws and gas production.
97. **Study of conductivity of electrolytes vs non-electrolytes**
    - *Description:* Compare conductance of salt water and sugar solution.
    - *Materials:* Conductivity meter, solutions.
    - *Concept:* Ionic conduction.
98. **Determination of Faraday constant experimentally**
    - *Description:* Use electrolysis of copper sulfate and mass change to estimate Faraday's constant.
    - *Materials:* Electroplating setup, balance.
    - *Concept:* Charge, moles, and Faraday's laws.

99. **Construction of pH-sensitive electrode and measurement**
    - *Description:* Build a simple glass electrode model and test pH response.
    - *Materials:* Glass electrode or pH probe, buffer solutions.
    - *Concept:* Electrochemical sensors.
100. **Study of fuel cell model using hydrogen and oxygen**

    - *Description:* Create a small fuel cell and measure power output.
    - *Materials:* Fuel cell kit or proton-exchange membrane model, gas supplies.
    - *Concept:* Electrochemical energy conversion.

101. **Electrochemical detection of metal ions using simple electrodes**

    - *Description:* Use cyclic or linear sweep ideas to detect metals qualitatively.
    - *Materials:* Working electrode, reference electrode, solutions.
    - *Concept:* Electroanalysis basics.

102. **Study of electrolyte concentration effect on battery life**

    - *Description:* Test cells with varying electrolyte concentration and measure discharge time.
    - *Materials:* Simple battery cells, electrolyte solutions.
    - *Concept:* Ionic strength and battery performance.

103. **Investigate electromotive series using different metals**

    - *Description:* Pair metals to build cells and compare EMFs to predict reactivity.
    - *Materials:* Different metal strips, salt bridges, voltmeter.
    - *Concept:* Reactivity series and cell potentials.

104. **Effect of temperature on internal resistance of a cell**

    - *Description:* Measure voltage under load at different temperatures.
    - *Materials:* Cell, heater, multimeter, resistor.
    - *Concept:* Internal resistance and temperature dependence.

105. **Study of electrochemical sensors for glucose detection**

    - *Description:* Demonstrate working principle of enzyme-based glucose sensors.
    - *Materials:* Enzyme strips or model sensors, glucose solutions.
    - *Concept:* Biosensors and amperometric detection.

H. Polymer and Material Chemistry

106. **Synthesis of superabsorbent polymer from sodium polyacrylate**

- *Description:* Make and test water absorption capacity of SAP.
- *Materials:* Monomers or commercial powders, water, measuring cups.
- *Concept:* Polymer cross-linking and absorbency.

107. **Preparation of biodegradable plastic from starch**

- *Description:* Make film from starch and glycerol and test strength.
- *Materials:* Starch, glycerol, heating plate.
- *Concept:* Bioplastics and mechanical properties.

108. **Study of polymer swelling and crosslink density**

- *Description:* Compare swelling of different polymer beads in solvents.
- *Materials:* Polymer beads, solvents, balance.
- *Concept:* Cross-linking and solvent interaction.

109. **Making conductive polymer composites**

- *Description:* Add graphite or metal powder to polymer to make conductive samples.
- *Materials:* Polymer resin, filler particles.
- *Concept:* Percolation threshold and conductivity.

110. **Study of glass transition using simple softening tests**

- *Description:* Observe temperature at which polymer becomes soft.
- *Materials:* Polymer strips, hot plate, thermometer.
- *Concept:* Glass transition temperature (Tg) idea.

111. **Synthesis and testing of hydrogels for water retention**

- *Description:* Prepare hydrogel and measure water retention over time.
- *Materials:* Monomers or commercial hydrogel powder, water.
- *Concept:* Network polymers and swelling.

112. **Study of UV protection properties of fabrics with chemical treatments**

- *Description:* Treat fabric and test UV transmittance.
- *Materials:* Fabrics, UV-blocking chemicals, UV lamp or meter.
- *Concept:* UV absorbers and material treatments.

113. **Making aerogel-like lightweight material from silica**

- *Description:* Lab-scale method to prepare low-density porous material.
- *Materials:* Silica precursors, solvents, drying setup.
- *Concept:* Porous materials and insulation.

114. **Effect of plasticizers on polymer flexibility**

- *Description:* Add plasticizers to PVC film and test flexibility.
- *Materials:* Polymer film, plasticizers (glycerol for starch films).
- *Concept:* Plasticization and mechanical behavior.

115. **Study of corrosion resistant coatings on metal**

- *Description:* Apply different coatings and test exposure to salt spray.
- *Materials:* Metal strips, paints, oil coatings, salt solution.
- *Concept:* Surface chemistry and protection.

116. **Preparation of photovoltaic dye-sensitized solar cell (simple model)**

- *Description:* Build a dye-sensitized cell using TiO_2 and natural dyes.
- *Materials:* TiO_2 paste, natural dyes (anthocyanin), conductive glass (if available).
- *Concept:* Solar energy conversion and semiconductor basics.

117. **Study of thermal insulation properties of common materials**

- *Description:* Compare heat loss through different insulators.
- *Materials:* Foam, cloth, metal, thermometer, heat source.
- *Concept:* Thermal conductivity and insulation.

118. **Synthesis of clay-based nanocomposite and study mechanical strength**

- *Description:* Mix clay with polymer and test tensile or bending strength.
- *Materials:* Clay, polymer resin, simple testing rig.
- *Concept:* Composite materials and reinforcement.

119. **Preparation of flame retardant coatings for fabrics**

- *Description:* Treat cloth with flame retardant and test burning rate (controlled and safe).
- *Materials:* Fabrics, flame retardant chemicals, controlled flame source.
- *Concept:* Flame chemistry and safety treatments.

120. **Synthesis of color-changing thermochromic material**

- *Description:* Make material that changes color with temperature using leuco dyes.
- *Materials:* Leuco dyes or thermochromic pigments, binder.
- *Concept:* Molecular switches and temperature-sensitive dyes.

I. Food and Industrial Chemistry

121. **Testing adulteration in milk samples**

- *Description:* Detect water, detergent, starch, and urea in milk.
- *Materials:* Milk samples, reagents for tests (boiling, clot test, Benedict's).
- *Concept:* Food safety and common adulterants.

122. **Study of fermentation in bread making: yeast activity**

- *Description:* Measure CO_2 production and dough rise under different conditions.
- *Materials:* Flour, yeast, sugar, measuring scale.
- *Concept:* Fermentation and food chemistry.

123. **Effect of preservatives on fruit spoilage**

- *Description:* Test how salt, sugar, or citric acid preserves fruit slices.
- *Materials:* Fruit, preservatives, storage jars.
- *Concept:* Preservation mechanisms and microbial growth control.

124. **Testing oil rancidity by peroxide value**

- *Description:* Measure peroxide value to assess oil spoilage.
- *Materials:* Oil samples, titration reagents.
- *Concept:* Lipid oxidation and food quality.

125. **Study of anticaking agents in powdered foods**

- *Description:* Compare flow properties with different anticaking additives.
- *Materials:* Powdered samples, anticaking agents.
- *Concept:* Bulk powder behavior and additives.

126. **Extraction of starch and its application as thickener**

- *Description:* Isolate starch from potatoes and test thickening in sauces.
- *Materials:* Potatoes, filtration, water.
- *Concept:* Polysaccharide properties in food.

127. **Study of milk pasteurization effect on bacterial count**

- *Description:* Compare raw and pasteurized milk for bacterial load.
- *Materials:* Milk samples, agar plates, incubator.
- *Concept:* Heat treatment and microbiological safety.

128. **Testing corrosion inhibitors used in industry**

- *Description:* Compare rates of metal loss with different inhibitors in salt spray.
- *Materials:* Metal coupons, inhibitors, salt solution.
- *Concept:* Industrial corrosion control.

129. **Study of detergents: biodegradable vs non-biodegradable**

- *Description:* Compare cleansing efficiency and biodegradability tests.
- *Materials:* Detergent samples, dirt-stained cloth, biodegradability setup.
- *Concept:* Surfactant chemistry and environmental impact.

130. **Preparation of natural food colors and stability test**

- *Description:* Extract colors from beetroot, spinach and test color stability on heating.
- *Materials:* Vegetables, solvents, heat source.
- *Concept:* Pigment stability and food additives.

131. **Study of polymeric packaging effect on food shelf life**

- *Description:* Store food in different packaging materials and monitor spoilage.
- *Materials:* Foods, packaging types, storage.
- *Concept:* Packaging chemistry and barrier properties.

132. **Analysis of sugar alternatives and sweetness index**

- *Description:* Compare sucrose, stevia, and artificial sweeteners for sweetness and caloric effect.
- *Materials:* Sweeteners, sensory tests, refractometer.
- *Concept:* Sweeteners chemistry and intensity.

133. **Testing hardness and mineral content in bottled water**

- *Description:* Measure Ca^{2+}/Mg^{2+} and total dissolved solids in bottled water brands.
- *Materials:* Test kits, TDS meter.
- *Concept:* Water chemistry and mineral content.

134. **Study of paper sizing effect on ink absorption**

- *Description:* Test different paper treatments and how ink spreads.
- *Materials:* Papers, sizing agents, ink.
- *Concept:* Surface chemistry and paper technology.

135. **Investigation of preservatives used in pickling**

- *Description:* Test salt, vinegar concentration and effect on preservation time.
- *Materials:* Vegetables, salt, vinegar.
- *Concept:* Osmosis, acidity, and preservation.

J. Demonstrations, Household & Miscellaneous

136. **Homemade pH indicator from red cabbage and its chart**

- *Description:* Make indicator and create a pH color chart.
- *Materials:* Red cabbage, water, test solutions.
- *Concept:* Natural indicators and pH scale.

137. **Making invisible ink and revealing methods**

- *Description:* Write with lemon juice and reveal by heat or reagents.
- *Materials:* Lemon juice, paper, heat source.
- *Concept:* Oxidation and organic compounds.

138. **Study of polymer slime: crosslinking with borax**

- *Description:* Make slime and explain crosslinking reaction.
- *Materials:* Glue, borax solution, water.
- *Concept:* Polymer networks and viscoelasticity.

139. **Cloud formation in a bottle: condensation demonstration**

- *Description:* Create a visible cloud in a plastic bottle using smoke and pressure change.
- *Materials:* Bottle, hot water, ice, source of smoke.
- *Concept:* Condensation and phase changes.

140. **Making a natural sunscreen and testing SPF qualitatively**

- *Description:* Prepare a lotion using zinc oxide or natural oils and test on UV-sensitive paper.
- *Materials:* Zinc oxide (if allowed), oils, UV paper.
- *Concept:* UV absorption and sun protection.

141. **Study of crystal growth: effect of impurities**

- *Description:* Grow salt or alum crystals with and without impurities and compare.
- *Materials:* Alum or salt, water, containers.
- *Concept:* Crystal habit and impurity effects.

142. **Homemade battery using coins and saltwater**

- *Description:* Stack coins and paper soaked in saltwater to light a small LED.
- *Materials:* Coins of different metals, saltwater, LED.
- *Concept:* Simple voltaic cell and redox.

143. **Creating colored flames using household salts (safe demo)**

- *Description:* Use safe small-scale demos to show flame colors from salts (supervised).
- *Materials:* Salt solutions (table salt, borax), controlled flame.
- *Concept:* Electron excitation and emission colors.

144. **Testing hardness of water using soap vs synthetic detergents**

- *Description:* Compare lather formation and explain reasons.
- *Materials:* Soap bars, detergent, water samples.
- *Concept:* Hardness ions and surfactant behavior.

145. **Preparation and testing of antacid tablets**

- *Description:* Compare neutralizing power of different antacids by titration or pH measurement.
- *Materials:* Antacid tablets, HCl, pH meter.
- *Concept:* Acid neutralization and active ingredients.

146. **Study of effervescence rate in antacid tablets at different temperatures**

- *Description:* Time CO_2 evolution when antacid reacts with acid at varied temps.
- *Materials:* Antacid tablets, HCl, temperature control.
- *Concept:* Reaction rate and temperature dependence.

147. **Homemade gel electrophoresis model using food colors**

- *Description:* Demonstrate separation by size using agar gel and dye molecules.
- *Materials:* Agar, dyes, simple power source (low voltage) — supervised.
- *Concept:* Electrophoresis basics and charge separation.

148. **Observation of osmotic effect using potatoes and sugar/salt solutions**

- *Description:* Change in potato mass due to osmosis in different solutions.
- *Materials:* Potato slices, sugar/salt solutions, balance.
- *Concept:* Osmosis and water potential.

149. **Making a rainwater harvesting filter and testing water quality**

- *Description:* Build a simple filter with sand, charcoal and see improvement in clarity and pH.
- *Materials:* Sand, charcoal, gravel, funnel.
- *Concept:* Filtration and basic water treatment.

150. **Study of foam formation in different detergents and factors affecting it**

- *Description:* Compare foam volume with different water hardness and detergent type.
- *Materials:* Detergents, shaker, water samples.
- *Concept:* Surfactant action and foam stability.

Must Read: 149+ Fun Honesty Activities for Kids — Simple, & Effective Ideas

Conclusion

These 150 project ideas cover many areas of chemistry suitable for class 12 students. Each idea is written in simple language with the aim to make it easy for you to choose, plan, and execute.

Remember to follow safety rules, get teacher approval, and keep clear notes of your procedure, data, and observations.

When you write your report, explain the chemistry behind your observations and mention sources of error and how you might improve the experiment next time.

If you want, I can help you pick one project from this list and prepare a full project report: introduction, aim, hypothesis, detailed procedure, observations table, graph templates, conclusion, and references.

Tell me which project number or title you like and I'll build the complete report in a ready-to-copy format.

Education, Project Ideas

136+ Front Page Decoration Ideas for Kids – Fun & Easy Ways

SKS TEAM

With years of experience, I work alongside a passionate group of educators and professionals to create a welcoming and supportive environment. At SKS International Gurukul, we focus on helping students grow both academically and personally, ensuring they have everything they need to succeed.

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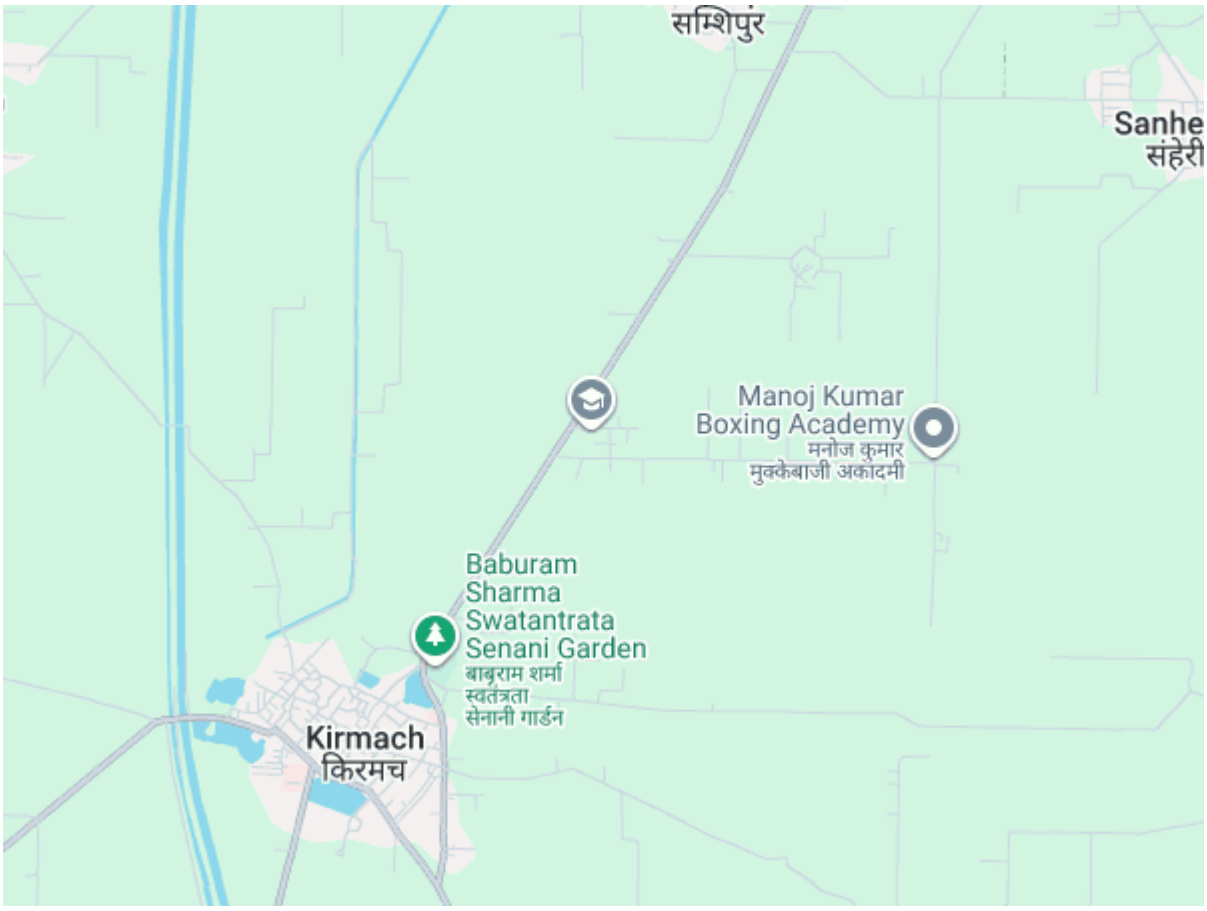

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SKS International Gurukul, the best school in Kurukshetra, provides modern facilities, dedicated teachers, and engaging activities for Pre-nursery to 12th grade students.

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