

## Environmental Science

- **Plastic Waste Management**
  - Study methods to reduce plastic waste in local communities.
  - **Difficulty:** Medium.
  - **Skills Required:** Research, Experimentation.
  - **Duration:** 2-3 weeks.
  - **Resources Needed:** Plastic samples, lab equipment.
- **Air Quality Monitoring**
  - Develop a system to measure and analyze air quality.
  - **Difficulty:** High.
  - **Skills Required:** Electronics, Programming.
  - **Duration:** 4-6 weeks.
  - **Resources Needed:** Sensors, microcontroller.
- **Water Purification Techniques**
  - Compare various water purification methods.
  - **Difficulty:** Medium.
  - **Skills Required:** Experimentation.
  - **Duration:** 2-3 weeks.
  - **Resources Needed:** Water samples, purification kits.
- **Composting and Soil Health**
  - Investigate the effects of composting on soil health and plant growth.
  - **Difficulty:** Medium.
  - **Skills Required:** Research, Experimentation.
  - **Duration:** 3-4 weeks.
  - **Resources Needed:** Compost materials, soil samples.
- **Energy-Efficient Homes**
  - Design and test energy-saving techniques for homes.
  - **Difficulty:** High.
  - **Skills Required:** Research, Engineering.
  - **Duration:** 4-6 weeks.
  - **Resources Needed:** Insulation materials, energy meters.
- **Effects of Pollution on Local Wildlife**
  - Study how local pollution impacts wildlife behavior and health.
  - **Difficulty:** Medium.
  - **Skills Required:** Research, Observation.
  - **Duration:** 3-4 weeks.
  - **Resources Needed:** Wildlife observation tools, pollution data.
- **Green Roofs and Urban Heat Islands**
  - Explore the impact of green roofs on reducing urban heat.
  - **Difficulty:** Medium.
  - **Skills Required:** Research, Experimentation.
  - **Duration:** 3-4 weeks.

- **Resources Needed:** Plant materials, temperature sensors.
- **Rainwater Harvesting Systems**
  - Design a system for collecting and using rainwater.
  - **Difficulty:** Medium.
  - **Skills Required:** Engineering, Research.
  - **Duration:** 3-4 weeks.
  - **Resources Needed:** Collection barrels, filtration system.
- **Sustainable Agriculture Practices**
  - Study and implement sustainable farming techniques.
  - **Difficulty:** High.
  - **Skills Required:** Research, Experimentation.
  - **Duration:** 4-6 weeks.
  - **Resources Needed:** Seeds, soil, compost.
- **Impact of Deforestation on Local Climate**
  - Investigate how deforestation affects local weather patterns.
  - **Difficulty:** High.
  - **Skills Required:** Research, Data Analysis.
  - **Duration:** 4-6 weeks.
  - **Resources Needed:** Climate data, deforestation maps.

## Physics

- **Solar Energy Efficiency**
  - Investigate the efficiency of different solar panel designs.
  - **Difficulty:** Medium.
  - **Skills Required:** Research, Experimentation.
  - **Duration:** 3-4 weeks.
  - **Resources Needed:** Solar panels, measuring tools.
- **Magnetic Levitation**
  - Create a model demonstrating magnetic levitation principles.
  - **Difficulty:** High.
  - **Skills Required:** Electronics, Magnetism.
  - **Duration:** 4-6 weeks.
  - **Resources Needed:** Magnets, coils, power source.
- **Building a Simple Electric Motor**
  - Construct and test a basic electric motor using everyday materials.
  - **Difficulty:** Low.
  - **Skills Required:** Electronics, Assembly.
  - **Duration:** 1-2 weeks.
  - **Resources Needed:** Wire, battery, magnet.
- **Balloon Rocket Physics**
  - Explore the principles of rocket propulsion using a balloon.
  - **Difficulty:** Low.
  - **Skills Required:** Experimentation, Physics Knowledge.

- **Duration:** 1-2 weeks.
- **Resources Needed:** Balloons, string, tape.
- **Projectile Motion Analysis**
  - Study the trajectory of a projectile and its factors.
  - **Difficulty:** Medium.
  - **Skills Required:** Physics, Experimentation.
  - **Duration:** 2-3 weeks.
  - **Resources Needed:** Projectiles, measuring tools.
- **Sound Wave Propagation**
  - Investigate how sound waves travel through different materials.
  - **Difficulty:** Medium.
  - **Skills Required:** Experimentation, Physics Knowledge.
  - **Duration:** 2-3 weeks.
  - **Resources Needed:** Sound sources, measuring devices.
- **Newton's Laws of Motion**
  - Demonstrate and analyze Newton's laws using simple experiments.
  - **Difficulty:** Low.
  - **Skills Required:** Experimentation, Physics Knowledge.
  - **Duration:** 1-2 weeks.
  - **Resources Needed:** Various objects for experiments.
- **Electromagnetic Induction**
  - Explore the principles of electromagnetic induction using simple circuits.
  - **Difficulty:** High.
  - **Skills Required:** Electronics, Experimentation.
  - **Duration:** 3-4 weeks.
  - **Resources Needed:** Coils, magnets, multimeter.
- **Thermal Conductivity**
  - Test and compare the thermal conductivity of different materials.
  - **Difficulty:** Medium.
  - **Skills Required:** Experimentation, Data Analysis.
  - **Duration:** 2-3 weeks.
  - **Resources Needed:** Materials, thermometers.
- **Pendulum Motion**
  - Study the factors affecting the motion of a pendulum.
  - **Difficulty:** Medium.
  - **Skills Required:** Experimentation, Physics Knowledge.
  - **Duration:** 2-3 weeks.
  - **Resources Needed:** Pendulum, timing devices.

## Chemistry

- **Chemical Reaction Rates**
  - Study how different factors affect the rate of chemical reactions.
  - **Difficulty:** Medium.

- **Skills Required:** Experimentation.
- **Duration:** 2-3 weeks.
- **Resources Needed:** Chemicals, lab equipment.
- **Natural pH Indicators**
  - Create pH indicators from natural substances and test their effectiveness.
  - **Difficulty:** Low.
  - **Skills Required:** Chemistry, Experimentation.
  - **Duration:** 1-2 weeks.
  - **Resources Needed:** Fruits/vegetables, pH test strips.
- **Effect of Temperature on Solubility**
  - Investigate how temperature affects the solubility of various substances.
  - **Difficulty:** Medium.
  - **Skills Required:** Experimentation.
  - **Duration:** 2-3 weeks.
  - **Resources Needed:** Solvents, solutes, thermometer.
- **Electrolysis of Water**
  - Demonstrate the process of splitting water into hydrogen and oxygen using electrolysis.
  - **Difficulty:** Medium.
  - **Skills Required:** Chemistry, Experimentation.
  - **Duration:** 2-3 weeks.
  - **Resources Needed:** Electrolysis apparatus, water.
- **Crystal Growth**
  - Investigate the conditions that affect the growth of crystals.
  - **Difficulty:** Low.
  - **Skills Required:** Experimentation, Observation.
  - **Duration:** 1-2 weeks.
  - **Resources Needed:** Solvents, crystallization containers.
- **Acid-Base Titration**
  - Perform titrations to determine the concentration of acidic or basic solutions.
  - **Difficulty:** Medium.
  - **Skills Required:** Chemistry, Experimentation.
  - **Duration:** 2-3 weeks.
  - **Resources Needed:** Titration apparatus, solutions.
- **Effectiveness of Natural Cleaners**
  - Test the cleaning efficiency of natural versus commercial cleaning agents.
  - **Difficulty:** Medium.
  - **Skills Required:** Experimentation, Data Analysis.
  - **Duration:** 2-3 weeks.
  - **Resources Needed:** Cleaning agents, test surfaces.
- **Chemical Reactions in Cooking**
  - Explore the chemical changes occurring during cooking.
  - **Difficulty:** Medium.
  - **Skills Required:** Chemistry, Observation.

- **Duration:** 2-3 weeks.
- **Resources Needed:** Cooking ingredients, laboratory tools.
- **Effects of pH on Enzyme Activity**
  - Study how different pH levels affect enzyme activity.
  - **Difficulty:** High.
  - **Skills Required:** Chemistry, Biology.
  - **Duration:** 3-4 weeks.
  - **Resources Needed:** Enzymes, pH buffers.
- **Stainless Steel Corrosion**
  - Investigate the factors influencing the corrosion of stainless steel.
  - **Difficulty:** Medium.
  - **Skills Required:** Experimentation, Data Analysis.
  - **Duration:** 2-3 weeks.
  - **Resources Needed:** Stainless steel samples, corrosive solutions.

## Biology

- **Plant Growth Under Different Light Conditions**
  - Explore how different light conditions affect plant growth.
  - **Difficulty:** Medium.
  - **Skills Required:** Research, Experimentation.
  - **Duration:** 3-4 weeks.
  - **Resources Needed:** Plants, light source, measuring equipment.
- **Bacterial Growth and Antibiotics**
  - Study the effect of different antibiotics on bacterial growth.
  - **Difficulty:** High.
  - **Skills Required:** Biology, Experimentation.
  - **Duration:** 3-4 weeks.
  - **Resources Needed:** Bacterial cultures, antibiotics.
- **Genetic Traits in Families**
  - Explore and analyze the inheritance of genetic traits in families.
  - **Difficulty:** Medium.
  - **Skills Required:** Research, Genetics Knowledge.
  - **Duration:** 2-3 weeks.
  - **Resources Needed:** Family pedigree data.
- **Effect of Soil pH on Plant Health**
  - Study how soil pH affects plant health and growth.
  - **Difficulty:** Medium.
  - **Skills Required:** Experimentation, Biology Knowledge.
  - **Duration:** 2-3 weeks.
  - **Resources Needed:** Soil samples, pH meter.
- **Behavioral Study of Animals**
  - Observe and analyze specific behaviors in animals under controlled conditions.
  - **Difficulty:** High.

- **Skills Required:** Observation, Data Analysis.
- **Duration:** 3-4 weeks.
- **Resources Needed:** Observation tools, animals.
- **Human Body Systems**
  - Create a model demonstrating the interaction of different human body systems.
  - **Difficulty:** Medium.
  - **Skills Required:** Research, Model Building.
  - **Duration:** 3-4 weeks.
  - **Resources Needed:** Craft materials, diagrams.
- **Plant Response to Environmental Stimuli**
  - Investigate how plants respond to different environmental stimuli.
  - **Difficulty:** Medium.
  - **Skills Required:** Experimentation, Observation.
  - **Duration:** 3-4 weeks.
  - **Resources Needed:** Plants, environmental controls.
- **Effect of Fertilizers on Plant Growth**
  - Study the impact of different types of fertilizers on plant growth.
  - **Difficulty:** Medium.
  - **Skills Required:** Experimentation, Biology Knowledge.
  - **Duration:** 3-4 weeks.
  - **Resources Needed:** Fertilizers, plants, growth measuring tools.
- **Yeast Fermentation**
  - Explore the process of yeast fermentation and its applications.
  - **Difficulty:** Medium.
  - **Skills Required:** Biology, Experimentation.
  - **Duration:** 2-3 weeks.
  - **Resources Needed:** Yeast, sugar, fermentation vessels.
- **Effect of Temperature on Enzyme Activity**
  - Study how temperature affects enzyme activity.
  - **Difficulty:** High.
  - **Skills Required:** Biology, Experimentation.
  - **Duration:** 3-4 weeks.
  - **Resources Needed:** Enzymes, temperature control equipment.

## Computer Science

- **Simple Weather App**
  - Develop a basic weather application using available APIs.
  - **Difficulty:** High.
  - **Skills Required:** Programming, Design.
  - **Duration:** 4-6 weeks.
  - **Resources Needed:** Computer, coding software.
- **AI Chatbot Creation**
  - Build a simple AI chatbot to answer common questions.

- **Difficulty:** High.
- **Skills Required:** Programming, AI.
- **Duration:** 4-6 weeks.
- **Resources Needed:** Computer, coding platforms.
- **Cybersecurity Basics**
  - Create a project demonstrating basic cybersecurity measures and practices.
  - **Difficulty:** Medium.
  - **Skills Required:** Research, Programming.
  - **Duration:** 2-3 weeks.
  - **Resources Needed:** Computer, cybersecurity tools.
- **Interactive Quiz Game**
  - Design and code an interactive quiz game using a programming language.
  - **Difficulty:** Medium.
  - **Skills Required:** Programming, Design.
  - **Duration:** 3-4 weeks.
  - **Resources Needed:** Computer, programming tools.
- **Data Visualization Project**
  - Create visualizations to represent complex data sets effectively.
  - **Difficulty:** Medium.
  - **Skills Required:** Data Analysis, Programming.
  - **Duration:** 3-4 weeks.
  - **Resources Needed:** Data sets, visualization software.
- **Virtual Reality Experience**
  - Develop a simple VR experience using available tools.
  - **Difficulty:** High.
  - **Skills Required:** Programming, VR Design.
  - **Duration:** 4-6 weeks.
  - **Resources Needed:** VR headset, development software.
- **Basic Website Design**
  - Build a basic, functional website using HTML, CSS, and JavaScript.
  - **Difficulty:** Medium.
  - **Skills Required:** Web Design, Programming.
  - **Duration:** 2-3 weeks.
  - **Resources Needed:** Computer, web development tools.
- **Game Development**
  - Create a simple 2D game using game development software or programming languages.
  - **Difficulty:** High.
  - **Skills Required:** Programming, Game Design.
  - **Duration:** 4-6 weeks.
  - **Resources Needed:** Game development tools, computer.
- **Voice Recognition System**
  - Build a basic voice recognition system using available APIs.
  - **Difficulty:** High.

- **Skills Required:** Programming, AI.
- **Duration:** 4-6 weeks.
- **Resources Needed:** Microphone, coding software.
- **Smart Home Automation**
  - Develop a simple smart home automation system using IoT devices.
  - **Difficulty:** High.
  - **Skills Required:** Programming, Electronics.
  - **Duration:** 4-6 weeks.
  - **Resources Needed:** IoT devices, microcontroller.