# 1. Environmental Science

1. **Plastic Waste and Soil Health**
   - **Description:** Test how plastic waste affects plant growth in soil.
   - **Tools Needed:** Soil, plastic waste, plant seeds, pots.
   - **Duration:** 4 weeks
2. **Natural Water Filters**
   - **Description:** Try different natural materials (sand, charcoal) to filter dirty water.
   - **Tools Needed:** Water, natural materials, containers.
   - **Duration:** 3 weeks
3. **Air Pollution and Plants**
   - **Description:** See how air pollution affects plant growth.
   - **Tools Needed:** Plants, pollution sources, measuring tools.
   - **Duration:** 4 weeks
4. **Decomposition of Waste**
   - **Description:** Compare how quickly biodegradable and non-biodegradable waste breaks down.
   - **Tools Needed:** Waste samples, compost bins.
   - **Duration:** 5 weeks
5. **Mulch and Soil Moisture**
   - **Description:** Check how different mulches affect soil moisture.
   - **Tools Needed:** Mulch, soil moisture sensors.
   - **Duration:** 3 weeks
6. **Urbanization and Wildlife**
   - **Description:** Study how city development affects local animals.
   - **Tools Needed:** Wildlife observation tools.
   - **Duration:** 6 weeks
7. **Wetlands and Floods**
   - **Description:** Find out how wetlands help prevent floods.
   - **Tools Needed:** Wetland models, flood data.
   - **Duration:** 4 weeks
8. **Pesticides and Insects**
   - **Description:** Compare the effects of organic vs. chemical pesticides on helpful insects.
   - **Tools Needed:** Pesticides, insects.
   - **Duration:** 3 weeks
9. **Green Roofs in Cities**
   - **Description:** See how green roofs reduce city heat.
   - **Tools Needed:** Green roof models, temperature sensors.
   - **Duration:** 4 weeks
10. **Noise Pollution and Birds**
    - **Description:** Investigate how noise pollution affects birds.
    - **Tools Needed:** Noise meters, bird observation tools.

○ **Duration:** 5 weeks

## 2. Physics

1. **Solar Panel Efficiency**
   ○ **Description:** Test how solar panels work in different weather.
   ○ **Tools Needed:** Solar panels, multimeter, weather data.
   ○ **Duration:** 2-3 weeks
2. **Heat Insulation**
   ○ **Description:** Check how different materials keep heat in a container.
   ○ **Tools Needed:** Insulation materials, thermometer.
   ○ **Duration:** 2 weeks
3. **Electromagnetic Motor**
   ○ **Description:** Build a simple motor using magnets and wire.
   ○ **Tools Needed:** Wire, battery, magnets.
   ○ **Duration:** 2 weeks
4. **Friction and Rolling Objects**
   ○ **Description:** Test how different surfaces affect how things roll.
   ○ **Tools Needed:** Rolling objects, various surfaces.
   ○ **Duration:** 2 weeks
5. **Hydraulic Systems**
   ○ **Description:** Build a basic hydraulic system to show how pressure works.
   ○ **Tools Needed:** Hydraulic fluid, cylinders, pump.
   ○ **Duration:** 3 weeks
6. **Light and Photosynthesis**
   ○ **Description:** See how different lights affect plant photosynthesis.
   ○ **Tools Needed:** Light sources, plants.
   ○ **Duration:** 3 weeks
7. **Seismograph Model**
   ○ **Description:** Make a simple device to detect ground vibrations.
   ○ **Tools Needed:** Seismograph materials.
   ○ **Duration:** 4 weeks
8. **Voltage and Current**
   ○ **Description:** Test how changing voltage affects current in a circuit.
   ○ **Tools Needed:** Battery, resistors, multimeter.
   ○ **Duration:** 2 weeks
9. **Levers and Mechanical Advantage**
   ○ **Description:** Study how different levers make lifting easier.
   ○ **Tools Needed:** Levers, weights.
   ○ **Duration:** 2 weeks
10. **Air Resistance and Falling Objects**
    ○ **Description:** See how air resistance affects falling objects.
    ○ **Tools Needed:** Objects, fan.
    ○ **Duration:** 3 weeks

## 3. Chemistry

1. **Natural Dyes**
   - **Description:** Extract dyes from plants and test them on fabric.
   - **Tools Needed:** Plants, water, fabric.
   - **Duration:** 3 weeks
2. **Homemade vs. Commercial Cleaners**
   - **Description:** Compare how well homemade cleaners work vs. store-bought ones.
   - **Tools Needed:** Cleaners, cleaning surfaces.
   - **Duration:** 2 weeks
3. **Reaction Rates and Temperature**
   - **Description:** See how temperature affects how fast a chemical reaction happens.
   - **Tools Needed:** Chemicals, temperature control.
   - **Duration:** 2 weeks
4. **Food pH Levels**
   - **Description:** Measure the acidity or alkalinity of various foods.
   - **Tools Needed:** pH meter, food samples.
   - **Duration:** 1-2 weeks
5. **Non-Newtonian Fluids**
   - **Description:** Test how fluids like cornstarch and water change under pressure.
   - **Tools Needed:** Cornstarch, water.
   - **Duration:** 1 week
6. **Electrochemical Cell**
   - **Description:** Build a simple battery using everyday items.
   - **Tools Needed:** Electrolytes, electrodes.
   - **Duration:** 2 weeks
7. **Catalysts and Reactions**
   - **Description:** See how different substances speed up chemical reactions.
   - **Tools Needed:** Catalysts, reactants.
   - **Duration:** 2 weeks
8. **Crystal Formation**
   - **Description:** Grow and observe crystals from different substances.
   - **Tools Needed:** Substances for crystals, containers.
   - **Duration:** 3 weeks
9. **Concentration and Reaction Rate**
   - **Description:** Study how changing concentration affects how quickly a reaction happens.
   - **Tools Needed:** Chemicals, measuring tools.
   - **Duration:** 2 weeks
10. **Food Preservation**
    - **Description:** Compare how different preservation methods affect food.
    - **Tools Needed:** Food samples, preservation methods.

- **Duration:** 3 weeks

## 4. Biology

1. **Organic vs. Chemical Fertilizers**
   - **Description:** Compare how plants grow with organic vs. chemical fertilizers.
   - **Tools Needed:** Fertilizers, plant seeds, pots.
   - **Duration:** 4-6 weeks
2. **Music and Plant Growth**
   - **Description:** Test if music affects how plants grow.
   - **Tools Needed:** Plants, music sources.
   - **Duration:** 3 weeks
3. **Light Intensity and Photosynthesis**
   - **Description:** See how different light levels affect photosynthesis in plants.
   - **Tools Needed:** Light sources, plants.
   - **Duration:** 3 weeks
4. **Soil Types and Plant Growth**
   - **Description:** Compare how plants grow in different soil types.
   - **Tools Needed:** Soil samples, plant seeds, pots.
   - **Duration:** 4 weeks
5. **Microorganisms in Composting**
   - **Description:** Study how microorganisms help decompose compost.
   - **Tools Needed:** Compost materials, microscope.
   - **Duration:** 4 weeks
6. **Water Sources and Aquatic Plants**
   - **Description:** Compare how aquatic plants grow in different types of water.
   - **Tools Needed:** Water samples, aquatic plants.
   - **Duration:** 4 weeks
7. **Pollution and Water Quality**
   - **Description:** Study how pollution affects water quality.
   - **Tools Needed:** Water samples, pollution sources.
   - **Duration:** 5 weeks
8. **Temperature and Enzyme Activity**
   - **Description:** Test how temperature changes affect enzyme function.
   - **Tools Needed:** Enzyme solutions, temperature controls.
   - **Duration:** 2 weeks
9. **Fertilizers and Soil pH**
   - **Description:** Measure how different fertilizers affect soil pH.
   - **Tools Needed:** Fertilizers, soil samples, pH meter.
   - **Duration:** 3 weeks
10. **Plant Adaptations**
    - **Description:** Study how plants adapt to extreme environments.
    - **Tools Needed:** Plant samples, environmental data.
    - **Duration:** 4 weeks

## 5. Engineering

1. **Simple Water Purifier**
   - **Description:** Build a basic device to filter dirty water.
   - **Tools Needed:** Bottles, sand, charcoal.
   - **Duration:** 2 weeks
2. **Wind-Powered Vehicle**
   - **Description:** Make a small vehicle powered by wind.
   - **Tools Needed:** Model materials, wind source.
   - **Duration:** 3 weeks
3. **Sustainable Energy House Model**
   - **Description:** Create a model house using solar and wind energy.
   - **Tools Needed:** Model materials, solar panels, wind turbine.
   - **Duration:** 4 weeks
4. **Water-Flow Monitoring System**
   - **Description:** Build a system to measure water flow.
   - **Tools Needed:** Flow sensors, water channels.
   - **Duration:** 3 weeks
5. **Mechanical Arm**
   - **Description:** Construct a simple arm that can move objects.
   - **Tools Needed:** Mechanical parts, servos.
   - **Duration:** 4 weeks
6. **Automated Plant Irrigation**
   - **Description:** Make a system to water plants automatically based on soil moisture.
   - **Tools Needed:** Sensors, microcontroller.
   - **Duration:** 4 weeks
7. **Seismograph for Earthquakes**
   - **Description:** Build a basic device to detect earthquakes.
   - **Tools Needed:** Seismograph materials.
   - **Duration:** 4 weeks
8. **Solar Charging Station**
   - **Description:** Create a small solar-powered station to charge devices.
   - **Tools Needed:** Solar panels, batteries.
   - **Duration:** 4 weeks
9. **Robotic Arm with Gripper**
   - **Description:** Build a robotic arm with a gripper to pick up objects.
   - **Tools Needed:** Robotic kit, servos.
   - **Duration:** 4 weeks
10. **Water Wheel Generator**
    - **Description:** Design a water wheel to generate small amounts of electricity.
    - **Tools Needed:** Water wheel components, generator.
    - **Duration:** 3 weeks

## 6. Mathematics

1. **Population Growth Model**
   - **Description:** Create a model to predict how a population will grow.
   - **Tools Needed:** Graphing tools, data.
   - **Duration:** 2-3 weeks
2. **Geometric Patterns in Nature**
   - **Description:** Find and analyze geometric shapes in nature.
   - **Tools Needed:** Camera, nature samples.
   - **Duration:** 3 weeks
3. **Geometry in Art**
   - **Description:** Explore how geometry is used in different artworks.
   - **Tools Needed:** Art samples, geometric tools.
   - **Duration:** 3 weeks
4. **Fibonacci Sequence in Nature**
   - **Description:** Study where the Fibonacci sequence appears in nature.
   - **Tools Needed:** Nature samples, measurement tools.
   - **Duration:** 3 weeks
5. **School Performance Statistics**
   - **Description:** Analyze student performance data from school.
   - **Tools Needed:** Data sets, statistical tools.
   - **Duration:** 2 weeks
6. **Geometry of Crystals**
   - **Description:** Study the geometric shapes of different crystals.
   - **Tools Needed:** Crystal samples, geometric tools.
   - **Duration:** 3 weeks
7. **Fractals in Nature**
   - **Description:** Examine fractal patterns in nature.
   - **Tools Needed:** Nature samples, fractal tools.
   - **Duration:** 3 weeks
8. **Disease Spread Modeling**
   - **Description:** Create a model to simulate how diseases spread.
   - **Tools Needed:** Data sets, simulation software.
   - **Duration:** 3 weeks
9. **Genetic Traits Probability**
   - **Description:** Analyze how traits are passed down in families using probability.
   - **Tools Needed:** Family tree data, probability tools.
   - **Duration:** 2 weeks
10. **Traffic Flow Analysis**
    - **Description:** Use math to study and improve traffic flow.
    - **Tools Needed:** Traffic data, modeling tools.
    - **Duration:** 3 weeks

## 7. Computer Science

1. **Weather Prediction App**
   - **Description:** Develop a basic app to predict the weather.
   - **Tools Needed:** Programming tools, weather data.
   - **Duration:** 4-6 weeks
2. **Basic Robotics Model**
   - **Description:** Build a simple robot to perform tasks.
   - **Tools Needed:** Robotics kit, programming software.
   - **Duration:** 4 weeks
3. **Personal Finance App**
   - **Description:** Create an app to track personal expenses.
   - **Tools Needed:** Programming tools, financial data.
   - **Duration:** 4-6 weeks
4. **Quiz Game in Python**
   - **Description:** Make an interactive quiz game using Python.
   - **Tools Needed:** Python software, quiz content.
   - **Duration:** 3 weeks
5. **Local Community Website**
   - **Description:** Design a website for a community group.
   - **Tools Needed:** Web development tools, content.
   - **Duration:** 4 weeks
6. **AI Chatbot**
   - **Description:** Create a simple chatbot to answer questions.
   - **Tools Needed:** AI tools, chatbot framework.
   - **Duration:** 4-6 weeks
7. **Educational Programming App**
   - **Description:** Build an app to teach basic programming.
   - **Tools Needed:** Programming tools, educational content.
   - **Duration:** 4-6 weeks
8. **Data Visualization Tool**
   - **Description:** Develop a tool to visualize data sets.
   - **Tools Needed:** Data visualization tools, data.
   - **Duration:** 4 weeks
9. **Personal Blog**
   - **Description:** Create a personal blog using HTML/CSS.
   - **Tools Needed:** HTML/CSS skills, blog content.
   - **Duration:** 2-3 weeks
10. **Task Management App**
    - **Description:** Build an app to manage and prioritize tasks.
    - **Tools Needed:** Programming tools, task management features.
    - **Duration:** 4-6 weeks