1. Mechanics

1. Build a pendulum to study motion.
2. Create a mini catapult to test projectile paths.
3. Design a simple pulley system.
4. Make a friction ramp with different surfaces.
5. Construct a spring-mass system to observe oscillations.
6. Build a simple lever to explore mechanical advantage.
7. Create a marble run to study acceleration.
8. Test air resistance with paper airplanes.
9. Build a DIY hydraulic lift with syringes.
10. Design a basic gear system to understand mechanical ratios.

2. Thermodynamics

11. Make a solar oven from a pizza box.
12. Build a DIY thermometer with alcohol and food coloring.
13. Create a simple heat engine with a balloon.
14. Test insulation with different materials and ice.
15. Build a model steam engine from a soda can.
16. Design a hot air balloon using a hairdryer.
17. Create a DIY calorimeter with a coffee cup.
18. Make a solar-powered water heater with plastic bottles.
19. Test heat absorption with different colored surfaces.
20. Design a basic thermal expansion model.

3. Optics

21. Build a pinhole camera.
22. Create a simple magnifying glass with lenses.
23. Make a rainbow with a glass of water.
24. Design a basic periscope with mirrors.
25. Test lens magnification with a simple setup.
26. Build a DIY spectroscope with a CD.
27. Create a light diffraction setup with slits.
28. Make a basic optical fiber with a plastic bottle.
29. Design a simple camera obscura.
30. Build a model of a concave and convex lens.

4. Electricity and Magnetism

31. Build a simple electromagnet with a nail and wire.
32. Create a basic electric motor with a battery and wire.

33. Design a circuit with switches and light bulbs.
34. Make a battery from lemons or potatoes.
35. Build a simple compass with a needle and magnet.
36. Create a basic generator with a coil and magnet.
37. Test conductivity with a homemade battery.
38. Design a simple circuit to light up an LED.
39. Build a DIY galvanometer with a compass.
40. Create an electric buzzer with a battery and wire.

5. Waves and Sound

41. Make a string phone to study sound transmission.
42. Create a simple wave tank with water.
43. Design a homemade musical instrument with rubber bands.
44. Test sound insulation with different materials.
45. Build a simple resonator tube.
46. Create a sound wave visualizer with sand.
47. Make a DIY seismograph with a pen and a moving base.
48. Design a wind chime to study sound resonance.
49. Build a basic echo chamber.
50. Create a simple sound amplifier with a paper cup.

6. Modern Physics

51. Build a cloud chamber with dry ice and rubbing alcohol.
52. Design an experiment to show the photoelectric effect with light and metal.
53. Create a simple model to simulate radioactive decay with dice.
54. Test quantum superposition with simple particles and light.
55. Build a basic spectrometer with a CD and a box.
56. Make a model of the double-slit experiment with light.
57. Create a simple setup to observe electron behavior with a CRT.
58. Build a basic setup to study wave-particle duality.
59. Design a simple experiment to show Brownian motion.
60. Create a model to demonstrate wave interference.

7. Astrophysics

61. Build a simple telescope with lenses.
62. Create a model solar system with orbiting planets.
63. Design a star tracker using a star map.
64. Make a sundial to measure time.
65. Create a model of the lunar phases with a ball and lamp.
66. Build a basic planetarium projector.
67. Design a comet model with ice and dirt.

68. Create a simple star chart.
69. Build a model of a black hole with fabric and marbles.
70. Design a solar eclipse simulator.

8. Fluid Dynamics

71. Build a water rocket to study propulsion.
72. Create a simple hydrometer with a floating object.
73. Design a basic wind tunnel with a fan and tube.
74. Test viscosity with different liquids and a dropper.
75. Make a DIY cyclone model.
76. Build a water wheel to explore hydropower.
77. Create a setup to measure water pressure with a bottle.
78. Design a fluid flow model with different pipe shapes.
79. Build a simple model to demonstrate Bernoulli's principle.
80. Make a rain gauge to measure precipitation.

9. Acoustics

81. Build a simple musical instrument with pipes.
82. Create a soundproof box with foam.
83. Design a basic oscilloscope with a speaker and vibration plate.
84. Test sound frequency with a homemade tuning fork.
85. Make a simple echo locator with sound waves.
86. Build a resonating tube to study sound waves.
87. Create a model to visualize sound waves with rice on a speaker.
88. Design a basic sound amplifier with a funnel.
89. Build a DIY vibration sensor with a piezoelectric element.
90. Make a simple sound recorder with a cup and string.

10. Experimental Physics

91. Measure gravity with a simple pendulum.
92. Test friction with different surface textures and a sliding block.
93. Create a simple momentum conservation model with marbles.
94. Build a DIY centrifuge with a spinning jar.
95. Design a lever to explore mechanical advantage.
96. Measure density with a homemade hydrometer.
97. Build a pendulum clock to measure time.
98. Test surface friction with different materials and a ramp.
99. Create a simple harmonic oscillator with a spring and weight.
100. Design a gyroscope to study rotation.

11. Environmental Physics

101. Build a solar water heater with plastic bottles.
102. Create a small wind turbine to generate electricity.
103. Design an insulation model with different materials.
104. Make a rain gauge with a plastic bottle.
105. Test air quality with a homemade filter.
106. Build a simple composting setup to study decomposition.
107. Create a model to measure the effects of urban heat.
108. Design a basic water filtration system.
109. Test energy efficiency with a DIY light bulb holder.
110. Build a simple green roof model for temperature regulation.

12. Biophysics

111. Make a basic microscope with a lens and a slide.
112. Build a model of human joints to study movement.
113. Test plant growth under different light conditions.
114. Create a setup to measure enzyme activity with temperature changes.
115. Design a simple model of muscle contraction with rubber bands.
116. Build a basic heart model to study blood flow.
117. Test the effect of radiation on seeds.
118. Create a model to study human grip strength.
119. Design a basic respiration monitor with a balloon.
120. Make a spectrometer to analyze plant pigments.

13. Chemical Physics

121. Measure gas volume changes with a balloon and a bottle.
122. Build a simple chemical reaction setup with baking soda and vinegar.
123. Create a DIY pH meter with cabbage juice.
124. Test reaction rates with different catalysts.
125. Design a simple distillation apparatus with a glass jar.
126. Measure conductivity with different liquids and electrodes.
127. Build a basic calorimeter with a metal cup and water.
128. Create a setup to study chemical equilibrium with color changes.
129. Test specific heat capacity with different materials and water.
130. Make a simple model to explore exothermic and endothermic reactions.

14. Nanophysics

131. Create a simple model of nanoparticle size with beads.
132. Build a setup to study light scattering with nanoparticles.
133. Design a basic experiment to test nanoparticle strength with weights.
134. Make a simple spectrometer to measure nanoparticle absorption.
135. Test the thermal conductivity of different nanomaterials with a heat source.

136. Build a model to explore magnetic properties of nanoparticles.
137. Design a basic experiment to study nanoparticle effects in solutions.
138. Create a setup to test the environmental impact of nanomaterials.
139. Measure particle size distribution with a DIY setup.
140. Test the effects of nanoparticles on light transmission.

15. Space Physics

141. Build a simple model of the ISS with paper and straws.
142. Create a setup to study microgravity effects with falling objects.
143. Design a model to simulate black hole effects with a fabric and ball.
144. Make a comet model with ice and dirt.
145. Build a simple space habitat model.
146. Create a basic radio telescope with a satellite dish.
147. Design an experiment to test solar radiation effects on materials.
148. Make a model rocket to explore propulsion.
149. Build a basic cosmic ray detector with a cloud chamber.
150. Create a setup to measure cosmic background radiation with a detector.

16. Quantum Physics

151. Design a simple experiment to demonstrate quantum entanglement.
152. Build a model to show quantum superposition with spinning tops.
153. Create a setup to test wave-particle duality with light and barriers.
154. Make a DIY interferometer with mirrors and a laser.
155. Test photon behavior with different light sources.
156. Build a basic setup to show quantum tunneling with balls and barriers.
157. Design a project to explore quantum decoherence with spinning objects.
158. Create a simple model to study quantum cryptography principles.
159. Build a spectrometer to analyze atomic spectra.
160. Make a model of quantum energy levels with different colored lights.

17. Atomic Physics

161. Build a simple atomic model with balls and sticks.
162. Design a project to study atomic emission spectra with a prism.
163. Create a setup to explore atomic orbital shapes with clay models.
164. Make a basic atomic clock model with a pendulum.
165. Test atomic interactions with different gases in a sealed container.
166. Build a basic ion trap with electrodes and a power source.
167. Design a setup to study magnetic fields on atomic transitions with magnets.
168. Create a model to explore atomic bonding with magnets and balls.
169. Build a simple atomic radius measurement setup with a micrometer.
170. Make a model to show applications of atomic physics in technology.

18. Biomechanics

171. Build a model of a human joint with straws and rubber bands.
172. Design a project to study prosthetic biomechanics with different materials.
173. Create a setup to measure impact on human gait with a pressure mat.
174. Make a DIY model of muscle and tendon interactions with springs.
175. Test biomechanical performance with different materials in a grip strength test.
176. Build a simple model to explore balance and stability with a balancing board.
177. Design a project to study footwear effects on athletic performance with a force plate.
178. Create a setup to measure forces in human movements with a force sensor.
179. Make a model to show principles of balance with a seesaw.
180. Design a project to study sports equipment biomechanics with simple tools.

19. Energy Physics

181. Build a solar-powered car with a small solar panel.
182. Create a setup to measure energy efficiency with different light bulbs.
183. Design a project to explore energy conservation with a pendulum.
184. Make a DIY wind turbine with plastic bottles and a motor.
185. Test energy storage with homemade batteries.
186. Build a basic thermoelectric generator with a hot plate.
187. Design a setup to measure energy output of different batteries.
188. Create a model to test insulation effectiveness with different materials.
189. Build a simple piezoelectric generator with crystals.
190. Design a project to study renewable energy applications with a solar panel.

20. Environmental Impact

191. Build a model to study air pollution with filters and a fan.
192. Create a setup to measure water pollution with different substances.
193. Design a project to explore soil erosion with different ground covers.
194. Make a DIY air purifier with activated charcoal and a fan.
195. Test energy consumption with different household appliances.
196. Build a model to study deforestation effects on local climate with a temperature sensor.
197. Design a project to measure waste management techniques with different bins.
198. Create a model to study plastic waste impact on marine environments with water and plastic.
199. Build a setup to explore climate change effects with temperature sensors.
200. Design a project to measure effectiveness of renewable energy sources with different setups.