

Science Fair Project Ideas For High School

List of fantastic science fair project ideas for high school students across various categories:

Biology:

1. How plants grow in space
2. Bacteria in different water sources
3. Effects of music on plant growth
4. Animal behavior in different light conditions
5. Mold growth on various foods
6. Impact of pollution on local ecosystems
7. Fruit fly genetics and inheritance patterns
8. Heart rate changes during exercise
9. Effects of caffeine on memory
10. Plant growth with different fertilizers
11. Comparing human and animal DNA
12. Microplastics in marine life samples
13. Effects of sleep on test performance
14. Bird migration patterns in your area
15. Impact of temperature on enzyme activity
16. Antibiotic resistance in common bacteria
17. Effects of video games on reflexes
18. Plant growth in different colored light
19. Soil composition and plant health
20. Effects of stress on the immune system

Chemistry:

21. Making biodegradable plastic from plants
22. Comparing the effectiveness of cleaning products
23. Acid rain effects on plant growth
24. Creating natural dyes from plants
25. Electrolysis of different salt solutions
26. Density of various liquids experiment
27. Making a battery from fruit
28. Crystal growth under different conditions
29. Comparing antacids for stomach acid relief
30. Extracting DNA from various fruits
31. Making soap from natural ingredients
32. Comparing water quality from different sources
33. Rust formation on different metals
34. Making invisible ink with household items
35. Comparing different types of sunscreen
36. Creating a homemade lava lamp
37. Testing pH levels of standard drinks
38. Making a simple water filter

39. Comparing different types of fire extinguishers
40. Creating your chemical garden

Physics:

41. Building a simple electric motor
42. Measuring sound insulation of materials
43. Creating a homemade wind turbine
44. Testing aerodynamics of different shapes
45. Building a solar-powered oven
46. Comparing the efficiency of light bulbs
47. Making a working hydraulic arm
48. Testing the strength of different bridges
49. Creating a homemade seismograph
50. Measuring friction on different surfaces
51. Building a simple spectroscope
52. Testing water pressure at different depths
53. Creating a pinhole camera
54. Comparing different types of insulation
55. Making a working hovercraft model
56. Testing magnetism of various materials
57. Building a simple electric generator
58. Comparing bounce heights of different balls
59. Creating a homemade thermometer
60. Testing sound travel through materials

Earth Science:

61. Measuring erosion in local streams
62. Creating a model of plate tectonics
63. Testing soil pH in different areas
64. Building a working weather station
65. Comparing different types of rocks
66. Creating a model of the water cycle
67. Testing air quality in your area
68. Building a working volcano model
69. Comparing different types of clouds
70. Creating a model of ocean currents
71. Testing the porosity of different soils
72. Building a working earthquake-resistant structure
73. Comparing different types of fossils
74. Creating a model of the greenhouse effect
75. Testing the effects of acid rain
76. Building a working solar still
77. Comparing different kinds of minerals
78. Creating a model of a watershed
79. Testing the impact of deforestation
80. Building a working wind vane

Environmental Science:

81. Testing the biodegradability of different materials
82. Comparing the energy efficiency of appliances
83. Creating a composting system
84. Testing air pollution levels in your area
85. Comparing the effectiveness of recycling methods
86. Creating a rainwater collection system
87. Testing effects of oil spills
88. Comparing different types of renewable energy
89. Creating a vertical garden system
90. Testing the effectiveness of natural pesticides
91. Comparing carbon footprints of activities
92. Creating a greywater recycling system
93. Testing effects of invasive species
94. Comparing different types of eco-friendly packaging
95. Creating a model of a sustainable city
96. Testing the effectiveness of water conservation methods
97. Comparing different types of biofuels
98. Creating a small-scale aquaponics system
99. Testing effects of light pollution
100. Comparing different types of solar panels

Astronomy:

101. Building a working telescope
102. Tracking sunspots over time
103. Creating a scale model solar system
104. Measuring light pollution in your area
105. Building a working sundial
106. Tracking moon phases and tides
107. Creating a star map of constellations
108. Measuring asteroid impacts on the moon's surface
109. Building a working planetarium projector
110. Tracking planetary movements over time

Computer Science:

111. Creating a simple chatbot program
112. Building a basic website
113. Developing a mobile app
114. Creating a simple computer game
115. Building a basic encryption program
116. Developing an image recognition program
117. Creating a simple weather prediction algorithm
118. Building a basic network security system
119. Developing a voice recognition program
120. Creating a simple artificial intelligence program

Mathematics:

121. Exploring fractals in nature
122. Analyzing traffic patterns using statistics
123. Creating a mathematical model of population growth
124. Exploring the golden ratio in art
125. Analyzing probability in card games
126. Creating a mathematical model of disease spread
127. Exploring patterns in prime numbers
128. Analyzing the efficiency of different sorting algorithms
129. Creating a mathematical model of climate change
130. Exploring geometry in architecture

Psychology:

131. Testing effects of color on mood
132. Analyzing decision-making in different scenarios
133. Testing memory recall techniques
134. Analyzing the impact of social media usage
135. Testing perception of time in activities
136. Analyzing the effects of multitasking on performance
137. Testing the effectiveness of study techniques
138. Analyzing the effects of music on concentration
139. Testing perception of optical illusions
140. Analyzing the effects of praise on motivation

Robotics:

141. Building a line-following robot
142. Creating a robotic arm
143. Developing an obstacle-avoiding robot
144. Building a solar-powered robot
145. Creating a robot that sorts objects
146. Developing a robot that draws
147. Building a robot that climbs stairs
148. Creating a robot that plays music
149. Developing a robot that solves puzzles
150. Building a robot that plants seeds

Microbiology:

151. Testing the effectiveness of hand sanitizers
152. Analyzing bacteria growth on money
153. Testing antibiotic resistance in soil bacteria
154. Analyzing microbes in different ecosystems
155. Testing effects of probiotics on digestion
156. Analyzing bacteria in different types of milk
157. Testing effects of natural antibiotics

158. Analyzing microbes in fermented foods
159. Testing effects of UV light on bacteria
160. Analyzing bacteria in different water sources

Genetics:

161. Analyzing genetic traits in families
162. Testing for GMOs in food products
163. Analyzing DNA extraction methods
164. Testing for genetic markers in plants
165. Analyzing inheritance patterns in pets
166. Testing effects of mutations on bacteria
167. Analyzing genetic diversity in populations
168. Testing for genetic modifications in crops
169. Analyzing epigenetic changes in plants
170. Testing for genetic resistance in insects

Neuroscience:

171. Testing effects of meditation on brainwaves
172. Analyzing reaction times to different stimuli
173. Testing effects of sleep deprivation
174. Analyzing brain lateralization in tasks
175. Testing effects of music on brain activity
176. Analyzing decision-making in moral dilemmas
177. Testing effects of exercise on cognition
178. Analyzing learning styles and memory
179. Testing effects of scents on mood
180. Analyzing brain plasticity in learning

Biochemistry:

181. Testing enzyme activity in different conditions
182. Analyzing protein denaturation in cooking
183. Testing effects of pH on digestion
184. Analyzing vitamin C content in foods
185. Testing effects of temperature on fermentation
186. Analyzing lipid content in different diets
187. Testing effects of antioxidants on oxidation
188. Analyzing glucose levels after meals
189. Testing effects of preservatives on food
190. Analyzing hormone levels in plants

Zoology:

191. Analyzing animal behavior in crowds
192. Testing effects of artificial light on insects
193. Analyzing camouflage effectiveness in animals

194. Testing Effects of diet on Pet Health
195. Analyzing communication patterns in ants
196. Testing effects of noise on wildlife
197. Analyzing migration patterns of local birds
198. Testing effects of habitat loss simulation
199. Analyzing social structures in fish schools
200. Testing effects of pheromones on insects

Botany:

201. Analyzing the effects of music on plant growth
202. Testing germination rates of different seeds
203. Analyzing phototropism in different plants
204. Testing effects of colored water on flowers
205. Analyzing allelopathy between plant species
206. Testing effects of different soils on growth
207. Analyzing transpiration rates in plants
208. Testing effects of pruning on plant growth
209. Analyzing seed dispersal mechanisms
210. Testing effects of gravity on root growth

Oceanography:

211. Analyzing the effects of temperature on water density
212. Testing effects of oil on marine life
213. Analyzing ocean acidification with shells
214. Testing effects of salinity on buoyancy
215. Analyzing marine debris in local waters
216. Testing effects of pollution on coral
217. Analyzing bioluminescence in marine organisms
218. Testing effects of currents on dispersal
219. Analyzing wave patterns and beach erosion
220. Testing effects of depth on water pressure

Meteorology:

221. Analyzing cloud formation in a bottle
222. Testing effects of pressure on boiling point
223. Analyzing the formation of tornadoes in jars
224. Testing effects of altitude on temperature
225. Analyzing dew point and relative humidity
226. Testing effects of wind on evaporation
227. Analyzing air pressure with crushing cans
228. Testing effects of land and water heating
229. Analyzing the formation of fog in jars
230. Testing effects of pollution on rainfall
231. Analyzing lightning formation with static electricity

Winning science fair projects for high school

1. Developing a machine learning algorithm to detect early signs of plant diseases.
2. Investigating the effects of microplastics on aquatic ecosystems.
3. Creating a low-cost water purification system using locally available materials.
4. Studying the impact of different light wavelengths on plant growth and nutrition.
5. Designing and testing a new method for capturing atmospheric carbon dioxide.
6. Analyzing the effectiveness of natural vs. synthetic antibiotics on resistant bacteria.
7. Developing a smartphone app for early detection of skin cancer.
8. Investigating CRISPR gene editing to fight crop diseases.
9. Creating and testing biodegradable alternatives to common plastics.
10. Studying social media effects on teenage mental health and sleep patterns.

National winning science fair projects

11. Developing an AI-powered prosthetic hand with improved sensory feedback.
12. Creating a method to detect Alzheimer's early using eye tracking.
13. Designing a low-cost, portable device for quick diagnosis of infectious diseases.
14. Using genetically modified bacteria to clean up oil spills.
15. Developing a new technique for eco-friendly removal of space debris.
16. Creating an algorithm to predict and prevent power grid failures.
17. Studying gut bacteria for its potential to combat obesity.
18. Designing a solar-powered system to collect water from the air in dry regions.
19. Investigating nanoparticles for targeted cancer treatment.
20. Developing a method to convert plastic waste into fuel.

Last-minute science fair projects for high school

21. Comparing homemade and commercial cleaning products for effectiveness.
22. Testing how music genres affect plant growth.
23. Investigating temperature's effect on battery life.
24. Analyzing the link between social media usage and academic performance.
25. Testing natural methods for water purification.
26. Comparing insulation properties of household materials.
27. Investigating how light colors affect reaction times.
28. Testing different methods for removing stains from fabric.
29. Analyzing caffeine's effect on memory and focus.
30. Investigating the effect of cooking methods on vitamin content in vegetables.

These project ideas range from complex, long-term topics to simple, quick experiments. A thriving science fair project isn't just about the concept—it's about your experimental design, data collection, analysis, and presentation.

For last-minute projects, focus on topics that are easy to complete using available materials but add a unique spin to make them stand out.

Science Fair Ideas for 8th Grade

Biology and Life Science

1. **Plant Growth Experiment:** Test how different factors like light, water, or nutrients affect plant growth.
2. **Microorganism Culture:** Grow bacteria or fungi in various environments to observe their behavior.
3. **Genetic Inheritance:** Study traits in plants or animals to learn how genetics are passed down.
4. **Enzyme Activity:** Test how temperature, pH, or substrate concentration affect how enzymes work.
5. **Photosynthesis:** Measure photosynthesis rates in plants under different conditions.

Chemistry

6. **Crystal Formation:** Grow crystals using different substances and observe their shapes and sizes.
 7. **Acid-Base Titration:** Use titration to find the concentration of an unknown acid or base.
 8. **Electrolysis of Water:** Split water into hydrogen and oxygen gases using an electric current.
 9. **Polymer Synthesis:** Create polymers from different materials and study their properties.
 10. **Chromatography:** Use chromatography to separate components of a mixture.
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Science Fair Ideas for 7th Grade

Physics

1. **Simple Machines:** Investigate how different simple machines like levers and pulleys work.
2. **Electricity and Circuits:** Build circuits to study how voltage, current, and resistance relate.
3. **Sound Waves:** Experiment with sound waves to understand their properties.
4. **Motion and Forces:** Study motion laws and see how forces affect objects.
5. **Light and Optics:** Explore how light works, including reflection and refraction.

Earth and Environmental Science

6. **Water Filtration:** Test materials to see how well they filter water.
7. **Soil Erosion:** Study what causes soil erosion and find ways to prevent it.
8. **Weather Patterns:** Study the weather in your area and figure out what causes changes.
9. **Mineral Identification:** Identify minerals based on their physical traits.
10. **Renewable Energy:** Explore renewable energy sources and how they can be used.