



If you want to do a project but aren't sure where to start, this guide can help you get an idea. It is best to choose a topic that interests you, then you will enjoy your project more. Your project can be based in either **Science** or **Engineering**. Any topic can be a fit for any student, grades 5-12. The scoring rubrics instruct the judges to look for age-appropriateness, so they would expect a more in-depth project and knowledge on the same topic from an older student. You can do a project individually or as a team of 2-3 students.

Science Projects investigate a question - Engineering Projects solve a problem

Science Project

ASK A QUESTION - A Science Project should use scientific method to propose and test a hypothesis. The first step is to ask a question about something that interests you, then your project can answer your question – Do you enjoy gardening? Ask a question about what affects seed germination or plant growth. Want to help around the house? Ask a question about what cleaning products work best at specific jobs. Do you enjoy sports? Ask a question about how an athlete's height affects their performance at a specific task. **NOTE** – If you choose a topic that involves testing on humans or animals, extra planning is involved to get the required approvals.*

Don't have any ideas? Check out the list of science project ideas below or go to www.ScienceBuddies.org → Menu → Topic Selection Wizard. In addition to these resources, there are LOTS of project ideas available with a simple Google search.

TURN YOUR QUESTION INTO A HYPOTHESIS - A hypothesis is a tentative, testable answer to a scientific question. Do some research on your topic to find out what is already known, then use that information to form a tentative answer to your scientific question. Sometimes people refer to the tentative answer as an "educated guess." Keep in mind that the hypothesis also must be testable since the next step is to do an experiment to determine whether the hypothesis is right! Don't worry too much about whether your educated guess will turn out to be right or wrong – your experiment can either prove or disprove your hypothesis, and either is equally acceptable.

A GOOD HYPOTHESIS - A hypothesis leads to one or more predictions that can be tested by experimenting. Predictions can take the shape of "If _____ then _____" statements, but they do not have to. Predictions should include both an independent variable (the factor you change in an experiment) and a dependent variable (the factor you observe or measure in an experiment). A single hypothesis can lead to multiple predictions, but generally, one or two predictions is enough to tackle for a science fair project.

EXAMPLE: Question – Does fertilizer make a plant grow bigger?
 Hypothesis – Adding nutrients to the soil with fertilizer will help plants grow taller than non-fertilized ones.
 Variables – Your independent variable is the amount of fertilizer you use. The dependent variable is the growth. Other variables, like the amount of light and water the plants get, would stay the same for all plants.



WHAT NOT TO DO – Avoid just researching a topic and presenting your findings. All projects involve some research, but there should be a hands-on experimental element to your project to get the best score from the judges.



ORIGINALITY – The judges score the projects on originality. They will investigate how you came up with your project idea, whether you modified it from readily available information, how well you understand your research and findings. They are looking for originality in concept relative to grade level (i.e., not “cookbook”, not classroom lab, not a simple extension of “found” idea) – New idea, concept, principle, insight, or non-obvious approach.

***Human and animal research** – If you are thinking about doing a project that involves researching using human or animal subjects, please read our relevant “Human Research” or “Animal Research” documents to understand what types of research we allow for projects entering in our fair. These documents are posted on our website at LakotaLEADS.org → Science Fair, or you can email us at LakotaScienceFair@gmail.com to

request them. After reading the relevant document, if you believe your type of research will be acceptable, please email us with your name, grade, and a detailed description of the type of human or animal research you plan to do. Wait for our approval before you begin.

Engineering Project

If you like to build more than you like to experiment, you can opt to do an engineering project! Where a science experiment answers a question, and engineering project solves a problem or need. Think about things you encounter in your daily life and what you could design and build to improve them. Do you enjoy camping? Maybe you can figure out how to cook a hotdog using only solar energy. Or design and build a car that moves by wind power. Or build the strongest bridge you can using only index cards. Science projects have variables, whereas engineering projects may take several prototypes before you find the best design to solve your problem.

EXAMPLE: Problem – School drinking fountains are closed due to Covid-19.

Idea – Convert existing drinking fountains into touchless water bottle fillers.

(This is an actual problem that a few Lakota West students took on, and they solved the problem with their design.)

Here are some websites with Engineering project ideas for students, but a Google search will give you lots of options:

<https://www.instructables.com/Project-Based-Engineering-for-Kids/>

<https://www.sciencebuddies.org/science-fair-projects/project-ideas/energy-power>

<https://sciencing.com/store-energy-using-dynamo-10073929.html>

WHAT NOT TO DO – avoid just summarizing your knowledge. The project should start with a problem or need, then include a design and build to get the best score from the judges.

ORIGINALITY – The judges score the projects on originality. They will investigate how you came up with your project and prototype ideas, and whether you modified any existing designs that you found. They are looking for originality in concept relative to grade level – New idea, concept, principle, design, or non-obvious approach and/or a novel association or relationship of previous designs or knowledge. The design should effectively and creatively address your problem or need and be design-based.



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E-mail your question to LakotaScienceFair@gmail.com!

NEXT STEP: 2 - How to Plan Your Project

Science Project Ideas

Here are some Science Project ideas to get you thinking. You do not have to choose one of these, but reading the list may help to give you ideas:

1. How does the temperature of a tennis ball affect the height of its bounce?
2. How does the air pressure of a soccer ball affect how far it travels when kicked?
3. Does a metal baseball bat vibrate more than a wooden one?
4. How does the weight of a bowling ball affect how many pins the ball knocks down?
5. Which increases your heart rate more: walking up and down real stairs or using a stair-master?
6. How does yoga affect your flexibility?
7. How does fast dancing affect your heart rate?
8. How does humidity affect the curliness of hair?
9. How does a shampoo's brand affect the strength of hair?
10. How does the type of material affect how long a shirt takes to dry?
11. Which nail polish best resists chipping?
12. How does the fat content of cheese affect its stretchiness?
13. How does the length of time that a soda bottle is open affect its fizziness?
14. How does the temperature of water affect the time it takes to freeze into ice cubes?
15. How will the time spent chewing bubble gum affect its bubbles' maximum size?
16. How will adding different flavors of Kool-Aid® to water affect the water's boiling point?
17. Which brand of popcorn leaves the fewest unpopped kernels?
18. Does the flavor of gelatin affect the amount of time it takes to set?
19. How does playing video games affect hand-eye coordination?
20. What is the effect of toothpaste brand on teeth-cleaning power?
21. What brand of paper towel is most absorbent?
22. What brand of trash bag can withstand the most weight before ripping?
23. How does a light bulb's wattage affect the amount of heat detected above a light?
24. Under what color light do plants grow best?
25. Which brand of mouthwash kills the most bacteria?
26. Which brand of breath mint lasts longest?
27. How does the amount of sugar in homemade ice cream affect how fast it freezes?
28. In a blind taste test, can you tell the difference between nonfat, low-fat, and whole milk?
29. When you pour soda out of a newly opened soda bottle, which produces more fizz: regular or diet soda?
30. How does brand affect ketchup's flow?
31. Given the same amount of water, how does pot size affect the amount of time it takes to boil water?
32. Where is the best place to store home-baked cookies to keep them fresh longest?
33. How does the amount of yeast affect how high bread rises?
34. Which cereal brand stays crunchy in milk the longest?
35. Which brand of chocolate bar melts fastest in the sun?
36. Which type of bread turns moldy first: store-bought or bakery bread?

37. How does the type of container affect ice cream's melting time?
38. Which can support more weight: paper or plastic grocery bags?
39. Does the type of animal in a pet-store window affect the number of people who are attracted to the window?
40. Does the color of a terrarium affect a lizard's skin color?
41. Does the brand of kitty litter affect clumping?
42. Does listening to one type of music lower heart rate more than another type?
43. How old does chewed gum have to be before it stops sticking to shoes?
44. Which frozen dessert melts slowest: ice cream, frozen yogurt, or sorbet?
45. How does the tension in a violin's strings affect its pitch?
46. How does the size of a drum affect its pitch?
47. How does a person's age affect his or her flexibility?
48. How does a person's age affect his or her ability to see at night?
49. How does the amount of air in a bicycle's tires affect how long it takes the bike to brake?
50. How does the size of a bicycle's tires affect how far it travels given a specific amount of pedaling?
51. How does hair's curliness affect its strength?
52. How does color affect a person's mood?
53. How does the time of day affect your body's temperature?
54. How does the type of music that a person listens to while exercising affect how hard he or she works out?
55. Does one type of food fill you up faster than another?
56. Which grows faster: fingernails or toenails?
57. Does gender affect lung capacity?
58. If you are right-handed or left-handed, do you also prefer a certain foot?
59. Does the surface of a tennis court affect the height that a tennis ball bounces?
60. Does the time of day affect your flexibility?
61. How does air temperature affect your flexibility?
62. Does a no-name stain remover work just as well as a brand name?
63. Which is a better insulator: wool, cotton, or down feathers?
64. How do various ski waxes affect the amount of friction between the ski and the snow?
65. Does playing Sudoku puzzles improve your performance on other types of puzzles?
66. How does shutter speed affect the color of a photograph?
67. How can you speed up the ripening of tomatoes?
68. What effect does watering have on how fast a plant grows from a seed?
69. How does gravity affect the direction of a plant's growth?
70. Do all plants seek out light?
71. How does the weight of a paper airplane affect its ability to fly?
72. How does a parachute's material affect the speed at which it falls?
73. How does the anticipation of a tickle affect you?
74. How does the weather affect your mood?
75. Which type of soap removes more grease: dish soap, hand soap, or shampoo?
76. Which type of fruit is more acidic: lemons, oranges, or watermelon?
77. What type of ground layers limit erosion most: sand, gravel, or soil?
78. How does the speed of a river's current affect the size of the grains on the riverbed?
79. How does the type of music played in a store affect the number of purchases made by customers?
80. In what type of lighting does a plant grow best?
81. What difference do low-phosphorous fertilizers have on a lake's pollution levels compared with standard fertilizers?

82. How does the type of seed in a birdfeeder affect the types of birds that the feeder attracts?
83. What types of flowers attract the highest number of butterflies?
84. Which brand of potato chips has the least grease?
85. How does the material of a bandage affect its ability to stick after getting wet?
86. How does the time of day affect levels of algae in a lake?
87. How does tire pressure affect a car's fuel efficiency?
88. How does the amount of air in a balloon rocket affect how far it flies?
89. How does the type of string used in a "can and string" phone affect the phone's ability to transmit sound?
90. Does one cell-phone carrier get better reception than other carriers?
91. Do "triple roll" toilet paper rolls really last three times as long as regular rolls?
92. Are rooms with carpeted floors noisier or quieter than rooms with wooden floors?
93. How does humidity affect how often a plant needs to be watered?
94. Can people tell the difference between music played on an MP3 player, CD player, tape player, and turntable?
95. How does temperature affect the growth of mold?
96. How does meditation affect your heart rate?
97. Which has a longer life: an LED or an incandescent light bulb?
98. Is the incidence of asthma in a region related to the area's level of air pollution?
99. How does the color of a shirt affect the amount of heat it absorbs?
100. How does the amount of daylight that enters your room affect how late you sleep?
101. How does the type of stuffing in a pillow affect its fluffiness?
102. How does the time of year affect the number of hours of daylight in a 24-hour period?
103. How does the magnification of binoculars affect how far you can see?
104. Do all chocolate candies have the same melting point?
105. Do different types of onions make your eyes tear up more than others?
106. Which is better at cleaning mold and mildew: vinegar or commercial cleaning agents?
107. Does maple syrup's "grade" affect its flow?
108. Do different brands of batteries last longer than others?
109. Which uses more water: a shower or a bath?
110. Which type of cup will keep a hot drink warm longer: paper, plastic, Styrofoam, or glass?
111. Do natural mosquito repellants keep more mosquitoes away than artificial repellants?
112. How do gas stations affect the soil around them?
113. Which cleans teeth more effectively: baking soda or toothpaste?
114. Does the length of a clock's pendulum affect its period?
115. Which holds hair in place for a longer period of time: gel or hairspray?
116. Does listening to music while studying affect your performance on a memory test?
117. Does a person's height affect his or her ability to successfully make a jump shot in basketball?
118. How much trash do you keep out of a landfill by recycling paper and plastics?
119. Which type of photos do people hold on to longer before making prints: digital or film?
120. Do mood rings accurately predict a person's emotions?
121. Is a person's favorite subject in school influenced by gender?

122. Does the weight of a baseball bat affect how far the ball goes when it is hit?
123. Does the temperature of a hockey puck affect how far it will travel when struck by the stick?
124. Do girls spend more time talking on the phone with friends than boys?
125. How does the type of food dispensed in school vending machines affect the eating choices that kids make throughout the day?
126. Which type of fertilizer helps plants grow taller?
127. Which has a better chance of survival: grass that was planted as seed or sod?
128. Is there a correlation between gender and the number of push-ups that a person can do?
129. Do best friends have the same favorite color?
130. Who buys from the "sale" rack more often: kids or adults?
131. Are kids more likely to be influenced by ads that feature other kids or by ads that feature adults?
132. Does the amount of time a student spends watching TV affect his or her grades?
133. Does the length of a surfboard affect its stability?
134. Which stays fresher longer: organic or nonorganic fruit?
135. Does a person's age affect whether he or she goes to the Internet, radio, TV, or newspaper for news?
136. Which stains dentures more: coffee, soda, or grape juice?
137. How does the temperature of a pool's water affect the speed at which a swimmer swims?
138. Does the use of flippers help a person swim faster?
139. Do you wake up feeling more alert when you awaken to an alarm clock that buzzes, plays music, or plays nature sounds?
140. Does the size of a dog determine how high or low-pitched its bark is?
141. Does your cat prefer one brand of food over another?
142. Can blindfolded people tell the difference between bottled water and tap water?
143. Is there a relationship between people's age and the amount of time they can hula hoop?
144. Do objects float better in freshwater or in salt water?
145. How does a person's age affect reaction time?
146. How does caffeine affect people's heart rate?
147. Do some materials conduct heat more than others?
148. How does the roughness of sandpaper affect its ability to smooth various surfaces?
149. How does increasing the height of a ramp affect how far a ball rolls down the ramp?
150. How does the strength of a magnetic field vary with the magnet?
151. Can people identify their pet dog by the sound of its bark alone?
152. Do people who exercise regularly have a greater lung capacity?
153. Can people use their sense of hearing alone to tell apart a penny, nickel, dime, and quarter?
154. Do left-handed people prefer the same school subjects as right-handed people?
155. Does the type of liquid in a glass affect the pitch of the note that results when a person rubs the rim of the glass?
156. Does the length of a wind chime affect its pitch?
157. Do people who live in rural areas name constellations correctly more often than people who live in cities?
158. Does weather affect satellite-TV reception?
159. Do girls and boys talk about the same topics as each other when they hang out with their friends?
160. Does the length of a bat affect how far a baseball will travel?

161. Does your dog prefer water directly from the faucet or tap water that's been refrigerated?
162. How often can people accurately tell if someone is happy, sad, or mad just by looking at the person's eyes?
163. How often can people correctly determine if a person is left-handed or right-handed just by looking at the person's handwriting?
164. What melts ice the fastest: sand, cat litter, or mineral rock salt?
165. Does temperature affect the growth rate of shoots on a potato?
166. Which type of container traps the most heat: a shoebox covered in aluminum foil, plastic wrap, or wax paper?
167. How does the shape of a boat's hull affect its speed?
168. How does water pressure vary with depth?
169. Which best helps prevent soil erosion on a slope: plants, rocks, or mulch?
170. Does one brand of antacid neutralize acids faster than another?
171. Do gym shoes have more bacteria than sandals?
172. Does sunlight fade the paper more in books or in magazines?
173. In which room of the house do plants grow the highest?
174. Which toothbrushes last longest: ones with natural or nylon bristles?
175. Which air freshener lasts longest?
176. Do mildew-resistant shower curtains really keep mildew away longer than regular shower curtains?
177. Does a person's weight vary throughout the day?
178. Do certain bicycle helmets hold up better after an impact than others?
179. Can you skate faster with in-line skates or roller skates?
180. Do thunderstorms happen more often in the afternoon than in the morning?
181. Does bread stay fresher longer when it is kept in the refrigerator or on the counter?
182. Which kind of gum keeps its flavor longer: sugar-free or regular?
183. Which lightens stains better: vinegar or lemon juice?
184. Which type of bread toasts fastest?
185. Do bigger lemons have more seeds than smaller ones?
186. Does squinting improve your vision?
187. Do fans really make you cooler or do they just make you feel like you're cooler?
188. Do taller people take longer strides than shorter people?
189. Can you judge depth as well using just one eye than using two?
190. Does your "handedness" have any relation to which eye is stronger?
191. Does exercise increase or decrease your energy level?
192. How does your sight affect your balance?
193. Which do people prefer: a booth or a table toward the middle of a restaurant?
194. Do plants inside a mall grow faster under artificial light or under a skylight?
195. Does listening to rock music make you eat faster than listening to classical music?
196. Does eye color affect how well a person sees?
197. Does toothpaste with whitener whiten teeth more than regular toothpaste?
198. Does washing your hands reduce the amount of bacteria on them more than not washing?
199. Does using conditioner leave your hair with fewer knots than not using conditioner?
200. Does hair take longer to dry when using a hair drier or when it dries naturally?