



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY**

Name(s) James V. Bittleston	Project Number 38108
Project Title Horse Power	
Objectives/Goals The goal of my project is to determine if horse manure is a viable source of energy compared to traditional sources of energy such as wood and coal.	
Abstract The goal of my project is to determine if horse manure is a viable source of energy compared to traditional sources of energy such as wood and coal.	
Methods/Materials I built a calorie meter from 2 tin cans and used that device to measure the energy output from each sample which there is 9 total (3 samples per fuel source). I measured each fuel source sample for weight and took high and low temperature readings of the water heated by each burning sample to find the temperature difference between the two. Then converted that data into calories burned and multiplied it by the specific heat of water (4.18). That gave me the correct number for Joules generated for each sample. I then averaged each sample and was able to create specific graphs that was related to the conclusion of my project.	
Results All 9 samples data was recorded and each of the three fuel source samples were averaged. This allowed me to compare each sample in terms of joules to find out which fuel source was better. Coal (1239 Joules) was by far the best with wood (696 Joules) coming in second and horse manure (404 Joules) a close third.	
Conclusions/Discussion Horse manure came in last on the Joules chart but if one compared the time burned to the mass of each sample then one can conclude that Horse manure is a viable source of energy.	
Summary Statement The purpose of my project is to show that horse manure is a viable source of energy compared to wood and coal.	
Help Received My Dad, Brad Bittleston, helped me build my calorie meter by drilling holes into the tin cans.	