



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY**

Name(s) Aryah Hubbard	Project Number J0204
Project Title From Trash to Gas	
<p style="text-align: center;">Abstract</p> <p>Objectives The objective of this project is to see which types of biomass produce the most biogas.</p> <p>Methods The materials used for this project include cow manure mixed with banana peels, cow manure with vegetable peels, and just plain cow manure. Balloons attached to the bottles that these items were in were measured to see how much biogas was produced from each of the items.</p> <p>Results The results of this experiment indicated that cow manure and banana peels produced the most biogas. With this combination, the balloon attached to the bottle filled with a circumference of 14 centimeters. The cow manure and vegetables bottles had a circumference of 10 centimeters. The bottles with cow manure only had a circumference of 3.5 centimeters and had no change.</p> <p>Conclusions In conclusion, the bottles with cow manure and mashed banana produced the most biogas. The balloon at the top of the bottle with cow manure and mashed banana ended with a circumference of 14 centimeters and two of the three balloons stood upright. The cow manure and vegetables bottles had a circumference of 10 centimeters and the balloons stayed leaning to the side except for one of the bottles. The bottles with cow manure only had a circumference of 3.5 centimeters and had no change. This shows that bananas could potentially be a source of renewable energy. Biogas can be produced from food waste and manure. I could go further into this project by testing different kinds of fruits, vegetables, and manure from different animals and also different ways of producing the gas and turning it into energy.</p>	
Summary Statement I showed that biogas could be produced from biomass.	
Help Received I performed my experiment myself but my science teacher, Mrs. Antonio, emphasized validity and the scientific method.	