



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

Name(s) Sam T. Freeman	Project Number 38551
Project Title Can Trees Beat E. coli?	
Objectives/Goals The purpose of this experiment was to test pine sawdusts ability to filter E.coli out of fresh water. Abstract Methods/Materials The methods used in this experiment involved syringes filled with pine and redwood sawdust plugs of standard volume. Solutions with known amounts of E.coli and a color indicator were filtered through the sawdust plugs and the resulting solutions pipetted into cuvettes. These cuvettes were placed in an incubator overnight at 37 °C. The results were measured visually and quantitatively using a colorimeter. Five control samples of sterile water and five control samples of the bacteria solution with indicator were also prepared in cuvettes. They were placed in the incubator overnight at 37°C and the absorbance measured. The controls were used to set a baseline to show how much absorbance is due to the bacteria solution and sterile water so that the filtered samples could be compared and the filtration effectiveness determined. Results The results of this experiment showed that pine sawdust has the ability to remove E.coli from fresh water. In addition, it shows that the wood from other parts of a tree, in this case the heartwood, may not have the ability to remove E.coli. Conclusions/Discussion One unusual observation was that the first data point in both the pine and redwood samples was larger than the rest of the data points. In the case of the pine, it was an outlier. Based on these findings, the experiment would be more robust if there were more samples tested to off-set possible human error. Also, understanding what happens to xylem when sapwood is turned into sawdust would be another area to explore. This experiment could be expanded into actual methods for filtering E.coli out of drinking water in third world countries by developing a system to run water through tubes filled with sapwood.	
Summary Statement This experiment tests the use of sawdust to remove E.coli from fresh water supplies.	
Help Received Mrs Hofmann and Ms Hofmann from Baymonte Christian. Samantha Freeman (Mom)	