



**CALIFORNIA STATE SCIENCE FAIR  
2015 PROJECT SUMMARY**

<b>Name(s)</b> <b>Katrina G. Ordway</b>	<b>Project Number</b> <b>J2024</b>
<b>Project Title</b> <b>Do Marmoleum or Vinyl Flooring Effectively Inhibit Microbial Growth?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> I wanted to help my grandmother find the best kind of anti-microbial flooring to fit her needs. When I researched types of flooring, I came across Marmoleum and vinyl flooring both of which were anti-microbial. I decided to investigate which one of these two types of flooring had more effective anti-microbial properties. I hypothesized that Marmoleum would inhibit the growth of all microbes, while vinyl flooring would only repel certain kinds of microbes, but not all.</p> <p><b>Results</b> After researching, I found that vinyl flooring and Marmoleum have many differences. Marmoleum is environmentally friendly, and vinyl flooring is not. Vinyl flooring is made out of a material called PVC, or polyvinylchloride. This substance is known to emit harmful toxins into the air. Marmoleum is made out of natural materials such as minerals for the topsheet, and woven jute for the backing. Vinyl can imitate hardwood, stone, or tile. Marmoleum does not have all of the decorative options. Many different microbes have some kind of effect on almost all flooring materials. It is for this reason that anti-microbial flooring may be a necessity.</p> <p>My results showed that Marmoleum was more effective than vinyl at inhibiting growth of microbes. Very few of the Marmoleum test plates showed any signs of bacterial or mold growth, in fact, most appeared sterile. No plates inoculated by Marmoleum samples grew coliforms, only a few grew noncoliform bacteria and none of the Marmoleum plates contained E.coli. The vinyl flooring inoculated plates showed more microbial growth, which included coliforms, noncoliforms, and molds. Many of the plates of vinyl flooring were contaminated, although none of the plates contained E.coli. E.coli was only seen in the positive control plates.</p> <p><b>Conclusions/Discussion</b> I hypothesized that both types of flooring would inhibit E.coli, which was supported. I also believed that Marmoleum would show little to no microbial growth in general, while vinyl flooring would not be as effective in inhibiting microbial growth. Most of the plates of Marmoleum appeared sterile, if any contamination existed it was due to noncoliform bacteria. The vinyl flooring samples showed significantly more microbial growth. Neither flooring showed any growth of E.coli.</p>	
<b>Summary Statement</b> The purpose of my project was to investigate whether Marmoleum flooring or Vinyl flooring possessed effective anti-microbial properties.	
<b>Help Received</b> My father bought the tile samples for me.	