# CALIFORNIA STATE SCIENCE FAIR
# 2015 PROJECT SUMMARY

**Name(s)**

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**Project Number**

35321

**Project Title**

## Pseudomonas fluorescens Exposed to Plastics: Decomposition Proposition

**Abstract**

**Objectives/Goals**

The objective of this experiment was to determine which of three different types of plastic would decompose at the fastest rate when exposed to the bacteria Pseudomonas fluorescens for a five week period.

**Methods/Materials**

Three different types of plastic, polyethylene terephthalate (PET), high-density polyethylene (HDPE), and polyvinyl chloride (PVC), were selected for the experiment based on their widespread use in products. In the experiment, 40 small disks of each type of plastic were put in petri dishes: six experimental petri dishes and one control petri dish for each type of plastic. Pseudomonas fluorescens that had been incubated in a nutrient broth was then added to each experimental petri dish, and nutrient broth without Pseudomonas fluorescens was added to the control petri dishes. All of the petri dishes were then placed on a rack in an incubator set to 25º C for 5 weeks. In the end, the petri dishes were taken out of the incubator, the plastic pieces were removed from the dishes, dried, then weighed. The percent change was found by comparing the original weight of the disks to their weight after 5 weeks.

**Results**

For PET, the average percent change in weight was -6.6%. For HDPE, the average percent change in weight was -4.6%. For PVC, the average percent change in weight was -3.5%.

**Conclusions/Discussion**

According to my data, PET decomposed at the fastest rate and is therefore more environmentally friendly than the other two types of plastic. PET decomposed 2.0% more in weight than HDPE and 3.1% more in weight than PVC. The fact that PET decomposed faster than the other two plastics that I tested suggests that if it were used more often, the global build up of plastic waste would be less severe.

**Summary Statement**

The goal of this project was to find which of three types of plastic would decompose at the fastest rate when exposed to the bacteria Pseudomonas fluorescens.

**Help Received**

I received assistance from Mark Stefanski, a 9th grade biology teacher at Marin Academy, and Rachel Quirk, a Dominican University Laboratory Technician, in regard to my methods.

Preliminary