



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

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| Name(s) Eleanor O. Frost | Project Number J1111 |
| Project Title Back to Nature: Which Spoon Does It the Fastest? | |
| Objectives/Goals My project is the study of the biodegradability of disposable spoons. I selected 5 different types of disposable spoons and placed them in 4 environments. I observed the spoons as they started to decompose. | |
| Abstract I placed 5 of each type of spoon in each environment, so that conclusions would not be based on the results of only one spoon. The five different types of spoons are made of: traditional plastic, vegetable starch, potato starch (2), and corn starch. The environments included in ground, in pond water, in sea water, and in the open air. The test period for each environment was 119 days. during the test period, I observed changes in the spoons and environments. Periodically, I cleaned the spoons, observed and noted changes in the surfaces, weighed the spoons and recorded the results. In this experiment the biodegradation of the spoons would appear as a loss in weight of the spoon. | |
| Methods/Materials I placed 5 of each type of spoon in each environment, so that conclusions would not be based on the results of only one spoon. The five different types of spoons are made of: traditional plastic, vegetable starch, potato starch (2), and corn starch. The environments included in ground, in pond water, in sea water, and in the open air. The test period for each environment was 119 days. during the test period, I observed changes in the spoons and environments. Periodically, I cleaned the spoons, observed and noted changes in the surfaces, weighed the spoons and recorded the results. In this experiment the biodegradation of the spoons would appear as a loss in weight of the spoon. | |
| Results The traditional plastic spoons did not show any signs of degradation no matter what the environment, except that the in ground traditional plastic spoons did have many surface scratches. The in ground environment produced the most biodegradation. The vegetable starch spoon lost 10.3% of its initial weight during the in ground test. One of the spoons made of potato starch lost 6.8% of its initial weight. In the pond water and sea water environments these same two spoons gained over 15% of their original weight. The corn starch spoons and other potato starch spoons absorbed very little water and gained only 2% in weight. | |
| Conclusions/Discussion Two of the spoons showed signs of activity in all of the environments: the spoons made of vegetable starch and one of the spoons made of potato starch. Interestingly, the other spoon made of potato starch did not degrade in the in ground test. In the water environments, it gained only 2% in weight and these spoons felt and behaved more like plastic than like the other spoon made of potato starch. This suspect spoon, made in China, is called "Taterware" and is currently used for take out food at Whole Foods Markets. It appeared that the most active spoons gained weight in each environment (even the open air) as they absorbed water. then later in the experimental period, the spoons in the ground started to loose weight. | |
| Summary Statement My Project is the study of the biodegradability of five different disposable spoons | |
| Help Received father bought the spoons and supported me in digging up the planter in the front yard. My teacher helped with the design on the tests and my family gave me moral support | |