ISEF Abstract Template

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| **Title**  **Name**  **School** |
| **Purpose of Project / Experiment**   * An introductory statement of the reason for investigating the topic of the project. * A statement of the problem or hypothesis being studied. |
| **Summarize procedures, emphasizing the key points or steps**   * A summarization of the key points and an overview of how the investigation was conducted. * Omit details about the materials used unless it greatly influenced the procedure or had to be developed to do the investigation. * An abstract should only include procedures done by the student. Work done by a mentor (such as surgical procedures) or work done prior to student involvement must not be included. |
| **Detail succinctly observations/data/results:**   * This section should provide key results that lead directly to the conclusions you have drawn. * It should not give too many details about the results nor include charts or graphs. |
| **State conclusions / applications** |

*Example:*

**Effects of Marine Engine Exhaust Water on Algae**

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This project in its present form is the result of bioassay experimentation on the effects of two-cycle marine engine exhaust water on certain green algae. The initial idea was to determine the toxicity of outboard engine lubricant. Some success with lubricants eventually led to the formulation of “synthetic” exhaust water which, in turn, led to the use of actual two-cycle engine exhaust water as the test substance.

Toxicity was determined by means of the standard bottle or “batch” bioassay technique. Scenedesmus quadricauda and Ankistrodesmus sp. Were used as the test organisms. Toxicity was measured in terms of a decrease in the maximum standing crop. The effective concentration -50% (EC50) for Scenedesmus quadricauda was found to be 3.75% exhaust water; for Ankistrodesmus sp. 3.1% exhaust water using the bottle technique.

Anomalies in growth curves raised the suspicion that evaporation was affecting the results; therefore, a flow-through system was improvised utilizing the characteristics of a device called a Biomonitor. Use of the Biomonitor lessened the influence of evaporation, and the EC50 was found to be 1.4% exhaust water using Ankistrodesmus sp. As the test organism. Mixed populations of various algae gave an EC50 of 1.28% exhaust water.

The contributions of this project are twofold. First, the toxicity of two-cycle marine engine exhaust was found to be considerably greater than reported in the literature (1.4% vs. 4.2%). Secondly, the benefits of a flow-through bioassay technique utilizing the Biomonitor was demonstrated.