

Olfactory Conditioning Apparatus for Fruit Flies

Week 12 – April 24 to April 30, 2009

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Problem Statement:

The aim of this project is to improve or completely re-design a device that is currently used to test fruit flies' olfactory sense, memory, and ability to learn. The current device is producing some inaccurate results because the fruit flies experience changes in air pressure and airflow. Airflow and pressure change need to be kept at a minimum while odors are introduced and cleared from the device.

Restatement of Last Week's Goals:

The team's goals from last week were to fine-tune the airflow, record smoke tests on video, to test the current device to compare it to our improved device, and to prepare for the poster presentation.

Summary of Accomplishments:

- Incorporated needle valves to fine tune airflow
- Incorporated "U-tubes" as pressure gauges
- Conducted further airflow tests with smoke. Recorded on video
- Completed poster, prepared for presentation

Team Goals:

- Present device
- Write final paper

Activities:

Rob	4.25.2009	Smoke testing, finish assembly	2.5 hrs	7.5 hrs
	4.26.2009	Make poster	4 hrs	
	4.30.2009	Prepare for presentation	1 hr	
Graham	4.25.2009	Smoke testing, finish assembly	2.5 hrs	7.5 hrs
	4.26.2009	Make poster	4 hrs	
	4.30.2009	Prepare for presentation	1 hr	
Chuck	4.24.2009	Purchased needle valves and components necessary to construct pressure gauges	3 hrs	10.5 hrs
	4.25.2009	Smoke testing, finish assembly	2.5 hrs	
	4.26.2009	Make poster	4 hrs	
	4.30.2009	Prepare for presentation	1 hr	
Scott	4.24.2009	Purchased needle valves and components necessary to construct pressure gauges	3 hrs	7.5 hrs
	4.25.2009	Smoke testing, finish assembly	2.5 hrs	
	4.26.2009	Make poster	1 hr	
	4.30.2009	Prepare for presentation	1 hr	

Difficulties:

Smoke testing went well, but eventually the diffusion holes became clogged with smoke deposits. This caused a pressure buildup and a backup in the mineral oil bubblers. In actual operation, one would not need to worry about this issue, because the odors won't cause any deposits to form. Also, the smoke capturing devices leaked a little, which caused uneven pressures. Again, during actual operation, this won't be an issue because the smoke capturing devices are not used during the procedure.

Project Timeline:

	February				March				April				
Tasks	4	11	18	25	4	11	18	25	1	8	15	22	29
Project research	█	█	█	█	█	█	█	█					
Brainstorming	█	█	█	█	█	█	█	█					
PDS		█	█	█	█	█	█	█					
Prototype design				█	█	█	█	█					
Prototype building						█	█	█	█	█			
Actual device design						█	█	█	█	█			
Ordering							█	█	█	█	█		
Expected shipping							█	█	█	█	█		
Device manufacturing							█	█		█	█	█	█
Testing							█	█			█	█	█
Re-designing							█	█			█	█	█
Re-testing							█	█				█	█
Presentation					█		█	█					█
Progress report	█	█	█	█	█	█	█	█	█	█	█	█	█
Website	█	█	█	█	█	█	█	█	█	█	█	█	█

Expenses:

Tubing and connections cost \$320.33, the new center piece costs \$335, and the two pumps (including shipping) cost \$219.96, for a grand total of \$875.29