

The Mystery of Lyle and Louise  
A lab on Forensic Entomology  
Fisher Scientific  
**Alicia Harkins-Pritchett**

Student procedure:

- Examine six life stages from two species of fly.
- Develop a dichotomous key that will separate maggots into life stages and species
- Use key to identify maggots collected from bodies of two victims
- Finally students will use known insect life-cycle information and National Weather Service data to estimate a time of death for each victim
- Once lab results have been analyzed, students may conduct a mock trial to synthesize information from the investigation

Materials needed

- Species A Life Stages (3 sets of 6)
- Species B Life Stages (3 sets of 6)
- Evidence Collections (6 vials)
- Weather Service Data (6 Sheets)
- Forceps
- Dissection microscopes or hand lenses
- Pre and post lab questions

Lab Procedure- 3 parts

Part 1

- Students familiarize themselves with the morphology of each life stage of two species of fly.
- Identify key characteristics and develop a system to separate the two species and six life stages
- Use ABSOLUTE characters so that identifying can be made without needing comparison

Part 2

- Students use the system (or taxonomic key) they developed to identify samples of flies collected from the two bodies
- Aggregate data so everyone has a complete set

## Part 3

- Analyze data collected and determine and approximate time of death

### History of Forensic Entomology

- Have discussion before lab
- “There is considerable need for forensic entomologists to engage in such growth a development studies, both in the laboratory and field. As this research is performed and results are published, forensic entomology is becoming an increasingly useful tool in a crime scene investigation
- Achieve an advanced degree (either M.S or Ph.D.) in entomology, ecology biology or zoology
- Become certified by the American Board of Forensic Entomology by completing a minimum of 3 years of professional experience in casework, publishing at least one scholarly paper and giving on professional presentation in the field of forensic entomology.
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### **EDUCATOR COMMENTARY:**

***This lab is set up to take 4 or 5 class days. In a normal biology classroom this would not be possible as we are required to follow state standards and most of this lab would be an adjunct and not mandatory material. I found that parts of this lab would be useful but to complete it in its entirety would be useless. The following were some of the comments my fellow educators had to say about this lab:***

Louann says: This activity has a "gross-out" factor that kids will love! It would be very helpful to develop skill in identifying the species and stages of flies before doing the mystery.

Emily- Not sure I would use this lab. I think it would be a good way to incorporate the use of dichotomous keys but not sure that I like it for use in genetics.

Carrie - This lab would be helpful to have students practice making a dichotomous key. The setup of the lab should be modified to reflect each teacher's organizational styles.

Kasi-I would suggest that each stage of the flies be place on the petri dish, as to compare the two group side by side. The larvae was hard to see, must have a dissecting microscope. I'm not sure when I would use this lab.

Bryan - This was an interesting kit that I see using more with a science club than in a classroom. I do not think the average science student would have the patience to carefully study the details of the different larval stages to distinguish between different species. For students with an interest in science, it serves the purpose of developing keen observation skill, gathering data, and analyzing results to solve a problem.

Joseph: I would suggest that you set up stations for comparison. I fear too much damage will become of the bugs if they are freely disbursed. Place elements side by side with labels. Allow them time at each station to sketch what they see. You might be surprised with some of the results.

Rich: This is a lab that I would really like to do. There needs to be some adjustments for students to be capable of identifying organisms and their stages. An option would be to place your specimens within a harden resin