

Entomology

Vocabulary

Accumulated degree hour (ADH): a given amount of thermal energy needed to develop from one stage of an insect life cycle to the next

Ambient temperature: temperature of surrounding air

Climatological: weather related

Entomology: a scientific study of insects

Forensic entomology: a scientific study of insects as it applies to criminal cases to help determine the postmortem interval (time since death), possible movement of the body and other clues to the circumstances before and after death

Medical Examiner: a medical doctor who ascertains cause of death, especially for those deaths not occurring under natural circumstances

Oviposition: egg deposition, especially for insects

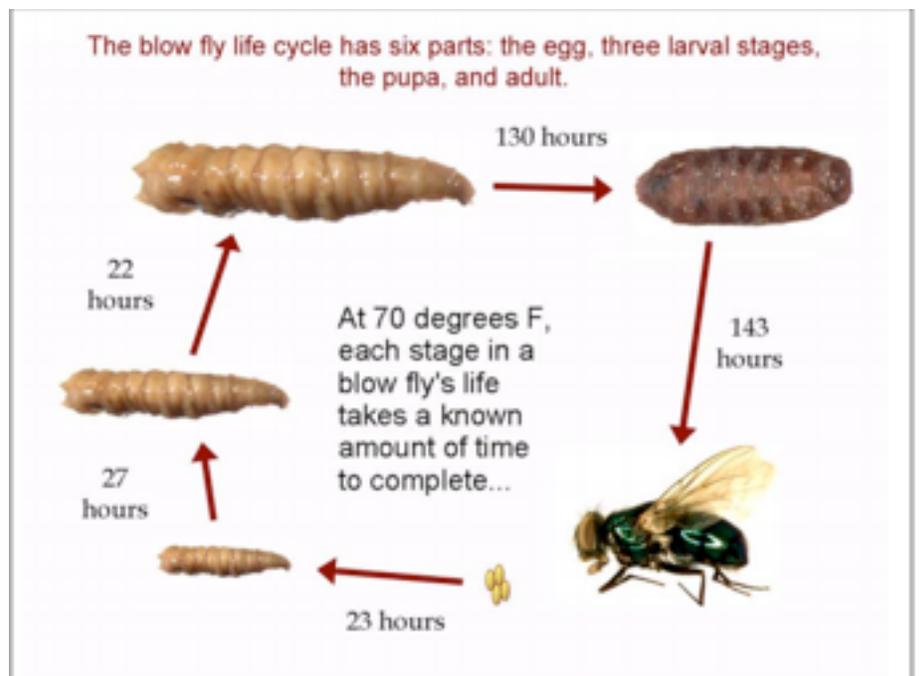
Phaenicia sericata: green bottle fly

Phormia regina: black blow fly

Postmortem interval: PMI, time since death

Blowfly Introduction

The blowfly lays its eggs on dead animals to provide food for its carnivorous larvae as they hatch. This means that in nature, the life cycle of the blow fly is part of the decomposition process of dead bodies. The study of this phenomenon by *entomologists* has led to our ability to estimate the time since death by examining which stage of growth blow fly is in when found on the cadaver. The *forensic entomologist* conducts examinations at crime scenes and examines the insect evidence found there to bring evidence to court cases involving human cadavers. To make a determination, the scientist makes visual observations, collects insect evidence, determines the stages of development, and calculates the time of initial deposit of the blow fly eggs on the cadaver. In the laboratory, the scientist rears (raises) collected specimens to confirm the species and more accurately establish the stage of growth. They then compile their findings and make a "best guess estimate" as to how long the cadaver has been dead.



Name: _____ Date: _____

Entomology Worksheet

1. What kind of information is provided on the Blow Fly Life Cycle paragraph and picture?

2. Calculate the heat/thermal energy (accumulated degree hour) required for each stage of the Green Bottle Fly's life cycle.

Table 1: ADH of the Green Bottle Fly

From	To	Temperature	Hours	ADH (accumulated degree hour) Formula: temp (°F) x hours to change = ___ ADH
Egg	1 st Instar*	70°F	23	70 x 23 = 1610 ADH
1 st Instar	2 nd instar	70°F		
2 nd Instar	3 rd Instar	70°F		
3 rd Instar	Pupa	70°F		
Pupa	Adult	70°F		

***Instar is another word for larval stage**

3. Using the above Table 1 as the reference, calculate and fill in the blank areas.

a. How many hours does it take for a green bottle fly egg to become an adult fly?

_____ hours

Convert these hours to: _____ days and _____ hours

b. For a maggot at the beginning of the second instar stage, how many hours does it take to reach the third instar if the ambient temperature is at 77° F? **hint, plug in the known ADH from the chart and the new temperature into the formula**

_____ hours

c. If you are rearing a Green Bottle Fly pupa, at what temperature do you need to keep the pupa to have the adult fly merge in about 7 days?

_____ F

4. Describe in your own words how insect life cycles can be used in estimating the time of death