



Forensic entomology

Activity 6.5 Crime investigation

- **Open a copy of the activity sheet and work your way through the tasks.**
- **You need to do the following:**
 - **Calculate the estimated date of death.**
 - **You need to account for the difference in the apparent age of the maggots from the nostril and those from the body and shirt.**
 - **If you were the SIO (Senior Investigating Officer),**
 - **What do you think happened?**
 - **What would you do next?**

Note: Slides towards the end of this presentation will explain the answers.



Forensic pathologist

- A body was discovered at a house in Redhill, Surrey on May 11 2009.
- The body was found outside, near the house, and the immediate cause of death was thought to be a stab wound to the abdomen.
- From the state of decomposition of the body it would appear the victim had been **dead for at least a week** when discovered.



Autopsy report

Cause of death

- Ruptured spleen and blood loss from abdominal stab wound.
- **EXTERNAL EXAMINATION**
 - Body bloated and discoloured green/black over most of the surface. It is estimated 1 week to 10 days must have elapsed since death.
 - Stab wound to upper left abdomen had bled profusely internally and externally.
 - Bleeding shows that death took place up to 30 minutes after the stabbing.
 - Victim could have been stabbed at a nearby address occupied by Mr Anthony Gifford where a blood-stained shirt was found and then staggered home before dying outside.



Toxicology Report

- Cocaine (0.6 mg l^{-1}) and its metabolites were present in the blood and urine at double the amount normally found in a recreational dose (0.3 mg l^{-1}).
- This was less than the 1 mg l^{-1} which would cause serious toxicity.
- Heavy drug user but not enough for a fatal overdose.



Forensic entomologist

- Calculate the average temperature for the period 4–10 May

- $7.85 + 5.3 + 9.85 + 12.2 + 9.95 + 10.8 + 13.5 = 69.45$

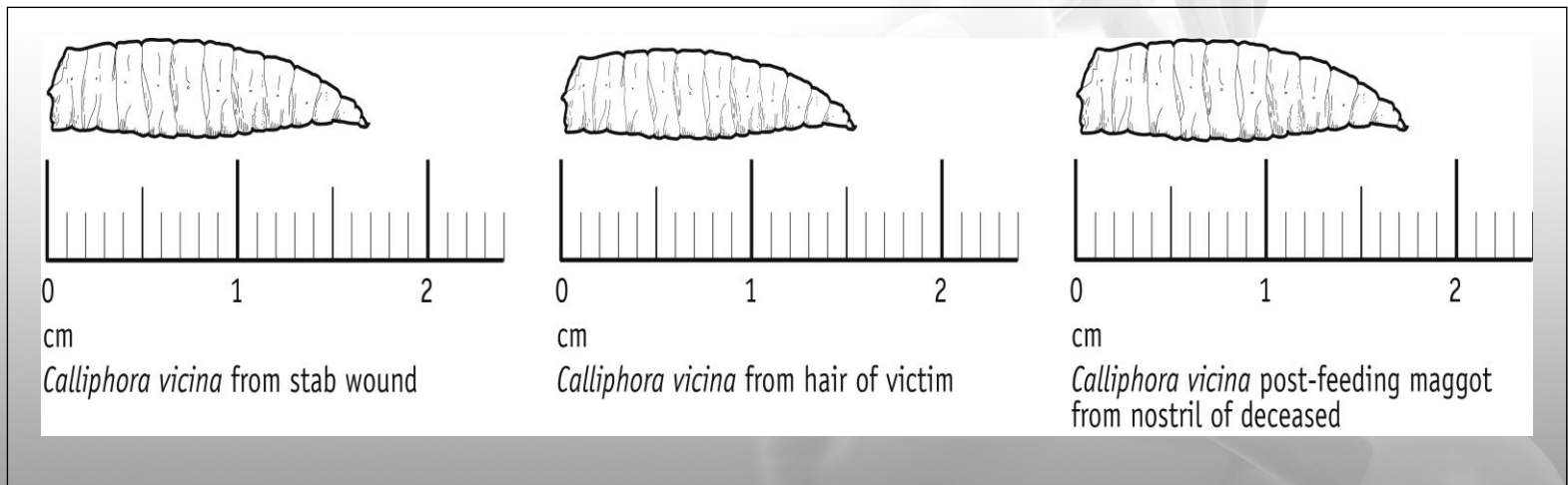
- $69.45 \div 7 = 9.92$

- To the nearest whole $^{\circ}\text{C} = 10^{\circ}\text{C}$

Date in May		Average daily temperature/ $^{\circ}\text{C}$
Mon	1st	7.25
Tues	2nd	7.30
Wed	3rd	8.25
Thurs	4th	7.85
Fri	5th	5.30
Sat	6th	9.85
Sun	7th	12.2
Mon	8th	9.95
Tues	9th	10.80
Wed	10th	13.50
Thurs	11th	13.25
Fri	12th	13.00
Sat	13th	10.85

Measure the maggots

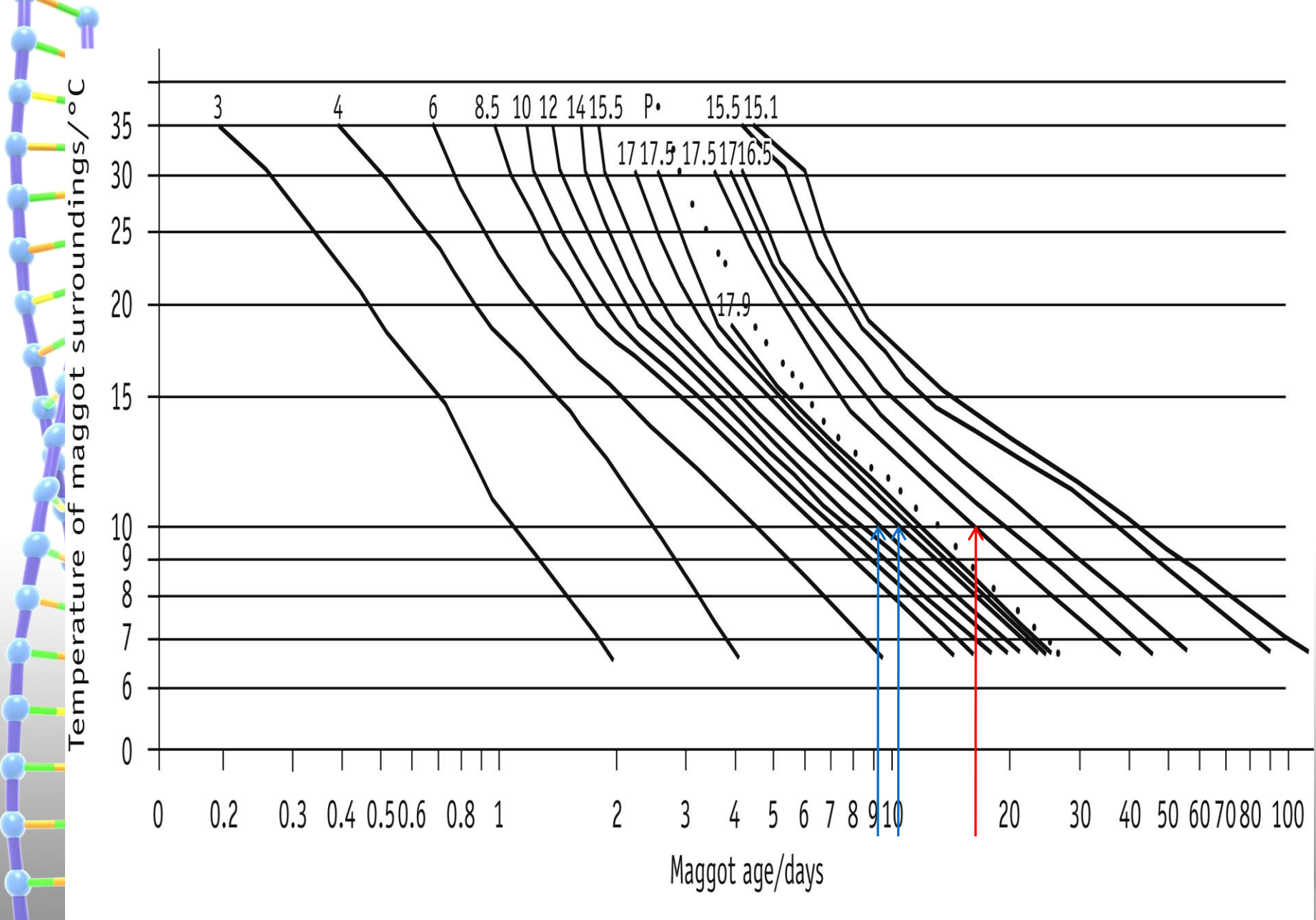
- Measure the length of the maggots, and use the graph of length variation over time with temperature to estimate the age of the maggots.



1. 17 mm

2. 15.5 mm

3. 17.5 mm



Hair – 15.5mm = 9 days

Wound – 17mm = ~10.5 days

Nostril – 17.5 mm (post-feeding) = ~ 17 days



Maggot sizes and ages

- The average temperature for 4–10 May was 9.9 (10) °C.
- Maggot measurements suggest
 - those in the stab wound are about 10.5 days old;
 - those from the hair are 9 days old;
 - the post-feeding maggot is about 17 days old.
- The earliest emergence of adult flies from the stab wound area, along with measurement of the maggots, suggests that the body had been dead for 10 days when it was found on 11th May 2009.
- Consequently Mr Patrick Barrett-Hughes probably died on 1st May 2009.



More information

Different dates?

- It would be expected that flies would oviposit first in a wound before the rest of the body, attracted by the blood.
- This accounts for the delayed development of the maggot from the hair of around 1 day.



Drugs and maggots

- The accelerated development of the maggot from the nostril could either indicate
 - that the body had been covered apart from the head at first, or
 - that there is a substance, for example a drug, present that has stimulated the accelerated development.
- A toxicology test can be carried out on the maggot itself or on blood from the body.
 - Cocaine was found in the victims blood which would have accelerated maggot development.



Fingerprint analysis

- The briefcase containing cocaine has a print that can be matched with the right middle finger of the victim, Patrick Barrett-Hughes.
- The money package can be matched with the victim's right index finger and with the thumb and index finger from Gifford's left hand.
- The victim may have been involved in a transaction at Gifford's house related to the cocaine.



Senior Investigating Officer

Recommendation

- Mr Anthony Gifford is the main suspect.
- He should be picked up and questioned regarding Mr Barrett-Hughes's death.
- There is insufficient evidence to charge Mr Gifford with murder at this stage.
- More evidence will be required (or a confession).
- The charge could be reduced to accessory to murder, or to manslaughter depending on the results of further enquiries.