SBI3U Name: _____

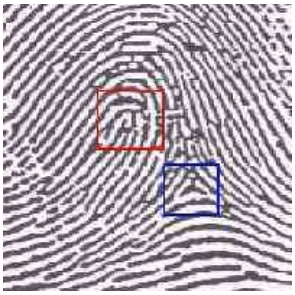
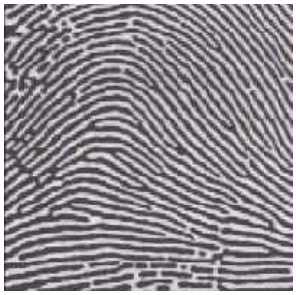
Date: _____

Forensic Microscopy Lab

Complete all tables on this sheet and answer questions on a separate page and staple together. For all microscope calculations, show full solutions. (1 mm = 1000 um)

Fingerprints

No two human beings (including identical twins) are exactly alike and every single person has unique fingerprints. Fingerprints are formed in the fetal stage and remain the same throughout life. Although every fingerprint differs, there are 3 main patterns: loop, whorl, and arch. Each finger can have a different pattern.

		
Loop	Whorl	Arch

1. Rub a soft pencil across a piece of paper making a very dark area. Press your finger firmly into the dark area rolling it a bit to either side and covering your finger with graphite from the pencil.

2. Carefully press a piece of clear transparent tape onto your finger over the graphite. Gently remove the tape and stick it in the table below. Record the finger you used.

3. Examine the fingerprint using a hand lens and identify the pattern.

4. Repeat step 1-3 for a different finger (or thumb) but this time put the tape onto a glass microscope slide and examine it under different objective magnifications. Look in detail at the pattern and try to identify it. Throw out the tape.

Tape:	Class Data		
Finger:	L	W	A
Pattern:			

dFOV's

5. Use an acetate ruler to measure the **$dFOV_{LP}$** for your microscope. Then use the equations to calculate **$dFOV_{MP}$** and **$dFOV_{HP}$**.

Cheek Cell

6. Place a small drop of methylene blue stain on a clean glass microscope slide. Using the blunt end of a toothpick, scrape the inside of your cheek and then swirl the toothpick in the stain. Add a cover slip and examine under low, medium, and high power.

7. Calculate the actual size (width) of one cheek cell using the high power objective lens.

Hair

8. Remove a hair from your head and prepare a wet mount using water. Examine the hair under low, medium, and high power.

9. Calculate the actual size (width) of the hair under EITHER the medium or high power objective lens.

Discussion Questions

10. Describe what happens to the light intensity as you switch from low, to medium, to high power objective lens.

11. Describe what happens to the field of view visible as you switch from low, to medium, to high power objective lens.

12. Which objective lens provides the greatest "resolution": the ability to see very close objects as actually separate?

13. What is the purpose of using a stain such as methylene blue?

14. If you calculated the actual size of a cell as 65 micrometres on medium power, what will be the actual size of the cell on high power?

15. How many cat hairs placed side by side would it take to fit across a $dFOV_{MP}$ of 1200 micrometres if an average cat hair is 0.50 millimetres wide?