

# SWIFT OPTICAL INSTRUMENTS, INC.

Microscopes • Digital Imaging Products

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## The Swift M3-F Comparison/ Forensics Microscope

We know the M3-F uses revolutionary technology to compare images in both micro and macro environments. We know that with the dedicated macro lens and with its large working distance we can view not only bullets but larger, bulkier "evidence items" such as forensic entomology specimens. We also know we can use the micro position and overlay option to view other evidence clues, such as hair, fibers and blood. But did you know that the M3-F has many other uses? Read on to discover how the M3-F may be used in your STEM classroom!

### **STEM Specific Applications:**

#### **Science Related Applications:**

##### Dental Studies

- Data Collection
- Pre and post treatment results (gingivitis or other dental disorders)
- Aging: the mature mouth vs. the younger mouth

##### Cell Biology

- Cell structure comparisons

##### Plants as Models of Metabolic Tests

- Temperature
- Osmolarity
- CO<sub>2</sub> (carbon dioxide)

##### Toxicology

- Enzyme Inhibitors
- Allosteric effects

##### Macroscopic Pathology

- Bone sculpturing
- Identifying stress fractures
- Owl pellets: great for demonstration

##### Physiology

- Brine shrimp: great to demonstrate heart rate
- PH indicators: protozoa
- Epigenetics

##### Histology

- Form and Function (absorption, secretion)

##### Inquiry

- Use samples such as hair to determine environmental conditions, evolutionary origins, and human vs. other species. Cheap samples: Dryer lint, air conditioner filter lint, dust balls. All can be used to identify types of fibers, presence of squamous cells, dust mites, etc.

### **Technology Applications:**

- With the optional C-mount adapter, any C-mount ready imaging device can be attached. This allows for image capture which can be used for further data manipulation, assessment and evaluation.

### **Math Related Applications:**

- Have you discovered that you can compare specimens and use in math calculations? For example, compare glass fragments and determine cosine and sine.
- Colony counts or

### **Engineering/ Industry Application:**

- Quality control
- Examination of components for consistency
- Check for corrosion, damage, erosion

### **Motic Software Advantages:**

- Testing: reverse images to see if students really understand what the cell is! Can the students identify the cell?
- Perspective: Use as a digital notebook for data collection
- Pseudo phase contrast: Data mining, striations, demonstrating underlying organelles and cell layers, use on live cells without destroying.
- Real time side by side analysis (using the comparison tool)
- Faculty and Student projects: Database development and analysis, group work, inquiry and just plain fun!
- Digital side by side microscopy analysis
- Side by side comparisons: For example lung tissue. Can compare two samples and determine where someone lived by what is seen in the sample tissue. May also use this to demonstrate principles of absorption, secretion, diffusion, surface to volume applications.

### **How does the Swift M3-F use fit into National High School Standards/Frameworks (more than just forensics?)**

- Critical Inquiry
- Data Mining
- Pedagogy (of using the scope)
- Go beyond what you do with the “regular” compound or stereo microscope

### **FOR ADDITIONAL INFORMATION**

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