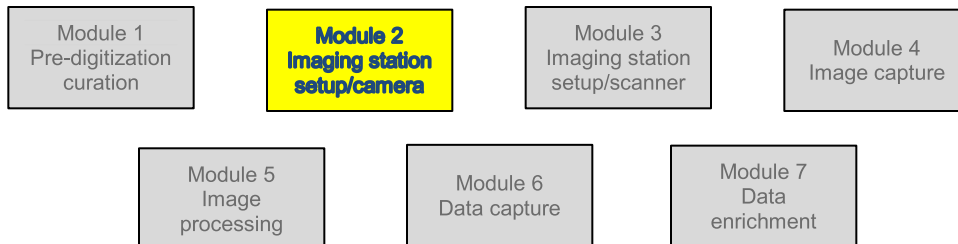


Workflow Detail: Imaging Station Setup/Camera (for flatsheets and packets)



Module 2: Imaging Station Setup/Camera Task List

Task ID	Task Description	Explanations and Comments	Resources
T1	Review imaging protocol.	Ensures that initial camera setup matches imaging policies and protocols. It should be noted that the remainder of the tasks included in this module may be re-ordered based on equipment selection and requirements, local conditions, and institutional preference.	Imaging protocol or handbook.
T2	Change or attach lens to camera.	Lens choice may depend upon subject to be recorded, i.e. herbarium sheet, bryophyte packet, label, or macro morphological feature.	Selected lenses.
T3	Mount camera on copy stand; connect or ensure connection of computer to camera and power source via surge protection.	USB, firewire, or other connection to computer. Lens may be mounted to camera prior to mounting camera on copy stand.	Camera. Appropriate cables and surge protection.
T4	Connect remote shutter release to camera.	Allows remote release of the shutter without jarring the camera.	Camera. Wireless or tethered camera release.
T5	Set up and start studio lighting, lightbox, light tent, or equivalent and allow time to warm up.	Lighting arrangements vary from enclosed light boxes and light tents to free-standing studio lights or daylight fluorescent tubes on stand-mounted light arms. Some lighting systems require up to 10 minutes to reach full output. Some institutions use varying lighting systems for varying specimen types (e.g., sheets versus packets), which may	Lighting arrangement.



		determine the precise setup activities accomplished during this task.	
T6	Check, adjust, test flash units, power supplies.	For flash-based systems, ensure that batteries are fully charged and/or power supplies are fully functional.	Flash unit(s). Power supply. Replacement batteries.
T7	Place and/or affix scale and color standard; ensure both are clean, visible in the field of view, and that the colors on the color standard have not faded from their original hue and brightness.	It may be best to have these attached to the copy stand, specimen frame, or base surface of a light box.	Color standard, scale bar.
T8	Start camera.		Camera.
T9	Start compatible image acquisition or camera control software.	Most digital cameras used for imaging scientific specimens can be completely controlled by a computer using compatible camera control software. This is currently the common practice. An alternative implemented by some institutions is to record images onto the internal memory card, then download the images to the computer en masse.	Computer and software.
T10	Start ancillary image management/processing software.	Image processing software might include Adobe Lightroom, Adobe Photoshop, Nikon Capture Nx2, Gimp, etc.	Appropriate software.
T11	Set aperture, shutter speed, ISO, white balance, color temperature, and focus point to desired settings, or load these settings from a previously configured settings file.	For flat sheets and packets, adjusting most of these settings occurs once for each imaging session. Some camera control software is capable of saving these settings to a file that can be reloaded for future, similarly situated shooting sessions. The ordering of this task may be dependent upon whether camera settings are adjusted from a computer via camera control software, as assumed here, or	Camera. Computer and associated camera control software. Settings file. Adobe Lightroom or equivalent. Digital gray card.



		<p>manually. If manually, adjustments might be made prior to attaching the camera to the copy stand.</p> <p>Use Adobe Lightroom or equivalent to adjust or set white balance to meet the color temperature of the lighting source.</p> <p>A neutral gray card designed specifically for digital cameras (e.g., the Robin Myers Imaging Digital Gray Card or WhiBal G7 White Balance Reference Gray Card) is inexpensive and helpful in this process.</p> <p>An option used by some institutions is to open a test image in Adobe Lightroom and rest the cursor over the white square in the color standard (affixed in T7) while reading the RGB values, then adjusting the camera, reshooting, and re-testing until all values are in the range 240 ± 3 (237–243).</p>	
T12	Adjust or ensure appropriate camera height, lens zoom (if variable focal length lens is used), and specimen framing.	A pre-measured camera height is helpful for this step, as is a visually delimited region or framing mechanism (e.g. black, metal carpenter square) for ensuring appropriate placement of the specimen and associated scale and color standard for imaging.	Camera. Copy stand. Camera lens. Framing mechanism.
T13	Ensure correct aspect ratio for highest resolution.	This may require recording one or more test exposures and examining the resulting images.	Camera.
T14	Set aperture, shutter speed, ISO, white balance, color temperature, and focus point to desired settings, or load these settings from a previously configured settings file.	<p>For flat sheets and packets, adjusting most of these settings occurs once for each imaging session. Camera control software is capable of saving these settings to a file that can be reloaded for future, similarly situated shooting sessions.</p> <p>The ordering of this task may be dependent upon whether camera settings are adjusted from a computer via camera control software, as assumed here, or manually. If manually, adjustments might be made prior to attaching the camera to the copy stand.</p>	Adobe Lightroom or equivalent. Digital Gray Card.



		<p>Using Adobe Lightroom or equivalent, adjust or set white balance to meet the color temperature of the lighting source.</p> <p>A neutral gray card designed specifically for digital cameras (such as the Robin Myers Imaging Digital Gray Card or WhiBal G7 White Balance Reference Gray Card) is inexpensive and helpful in this process.</p>	
T15	Perform initial quality control for image color prior to imaging session.	Options include software examination of color standard in image or human examination of sheet and image with a color calibrated monitor.	

