

DIGITAL PHOTOGRAPHY FOR OBJECT DOCUMENTATION

This document introduces techniques and procedures for the in-house photographic documentation of cultural objects. While working with a professional photographer may yield the best results, the costs may not be sustainable on a smaller institution's budget. This document provides an outline of basic camera skills and key concepts regarding the photographic documentation of cultural materials, and offers beginner, intermediate, and advanced options regarding equipment, light setting, and documentation for your collection.

BASIC CONCEPTS ON DIGITAL PHOTOGRAPHY

Image File Formats

A file format is the structure of how images are stored in your camera and eventually in your computer as information files. Essentially, the various image file formats that are available differ in how much actual photographic information (this includes metadata) you wish to “store” within each image file, and how much is thrown away. The three main image file formats are JPEG, TIFF, and RAW. You should always document your collection using the highest quality that your camera will allow. JPEG and/or RAW will likely be the most common digital capture file types. While RAW is the best file type to use, it requires special software and post-production experience to utilize effectively. JPEG is the most user-friendly and it should always be set at the highest quality and size available on your camera (typically JPEG / Fine / Large depending on the camera manufacturer) in order to document the cultural objects in your collections according to museums, archives, and library preservation standards.

Image Quality
"RAW"
"JPEG Fine Large"



White Balance

White Balance refers to the color temperature of the light in which a photograph is taken. All situations, whether indoors or outdoors, have a particular color temperature that affects the color cast of a photograph. It is possible to counteract these color shifts by adjusting the white balance on your camera.

White Balance
"AUTO"
"Incandesant"
"Daylight"
"Shade"
"Flash"



For instance, if you are taking your images in open shade, then the "shade" setting will properly balance your photograph to offset changes in color introduced by shade. If your lighting is tungsten (standard indoor light-bulb), then set the white balance on your camera to the 'tungsten' setting. If your camera has white-balance controls they will be found in the camera controls menu.

ISO

ISO measures the sensitivity of the image sensor. The same principles apply as in film photography – the lower the number, the less sensitive your camera is to light and the finer the grain. Higher ISO settings are generally used in darker situations to get faster shutter speeds. For example, an indoor sports event when you want to freeze the action in lower light. However the higher the ISO you choose the ‘noisier’ shots you will get. 100 ISO is generally accepted as ‘normal’ and will give you nice crisp shots (little noise/grain). Most people tend to keep their digital cameras in “Auto Mode” where the camera selects the appropriate ISO setting depending upon the conditions you are shooting in (it will try to keep it as low as possible) but most cameras also give you the opportunity to select your own ISO also. When you do override your camera and choose a specific ISO you’ll notice that it impacts the aperture and shutter speed needed for a well exposed shot. For example, if you bumped your ISO up from 100 to 400 you’ll notice that you can shoot at higher shutter speeds and/or smaller apertures.

Camera Settings

There are several camera settings or modes you can use to document your work. Most cameras offer options ranging from fully manual to fully automatic. Ideally, you should photograph in manual mode since this offers the most control; however, this mode can be complicated for beginners. Consider using the semi-automatic mode called *Program* mode.



P = Program automatic-assist

P = gives photographers a bit more control than a full *Automatic Mode*. **P** allows you to manually override some settings, such as focus, while the camera adjusts for exposure automatically. **P** mode is recommended for users who want good shots without thinking too hard about it; however, it does require just a bit more control than is offered by the full *Automatic Mode*.

In **P**, the ISO and white balance can be adjusted or left on automatic. To successfully use **P** mode, consider the following suggestions:

- Make sure you turn off your camera's flash feature and utilize a tripod.
- Set a low ISO setting (no greater than 400 ISO) on your camera to ensure image quality and avoid unwanted digital noise.
- Ensure there is plenty of light available and that your tripod is steady to avoid camera shake.
- Set a white balance appropriate to the given lighting conditions (i.e. cloudy, open shade, automatic, etc.).

BEGINNER DIGITAL PHOTOGRAPHY

OUTDOOR / NATURAL LIGHTING

Required Gear

- Digital camera (DSLR recommended)
- Tripod

Optional Gear

- Remote trigger (to shoot without touching camera)
- Multiple lenses and/or camera filters
- Camera bag

Lighting

Mid-morning to mid-afternoon is typically the best time to photograph. During these times, lighting doesn't change frequently and there is plenty of light available allowing colors to be rendered most accurately.

- Use diffused daylight:
 - Bright, overcast skies are best for photographing objects outdoors.
 - Cloudy, windy days are not recommended since it renders inconsistent lighting.
- During bright and sunny days:
 - Photograph in open shade (avoid photographing in direct sunlight).
 - You may utilize a circular polarizing filter to help cut down on glare or try adjusting the angle of the object toward the sky.
 - Adjust your camera's *White Balance* setting for proper sunlight under changing circumstances (i.e. cloudy, open shade, automatic, etc.).

Documenting Objects Outside

- Use a tripod to steady the camera.
- Set your white balance and ISO appropriately.
- Use the shady side of a building on a sunny day in a neutral color area where there is smooth even light and no shadows.
- If your object is two dimensional (for example, flat painting), then photograph somewhere where there are no shadows.
- If your object is three dimensional (like a sculpture), then it is OK to move out into sunlight as it will give you shadows that can better show the depth and form of the work.
- Keep the work free of distracting backgrounds and fill the frame.

Lighting Setup Outside



To photograph artworks outside, place works in a fully shaded area, such as the shadow side of a building, do not use dappled light.

INTERMEDIATE DIGITAL PHOTOGRAPHY

INDOOR LIGHTING

Required Gear

- Digital camera (DSLR recommended)
- Tripod
- Hot lights (tungsten, quartz, or halogen bulbs) and stands (2 lights for 2D objects, 3 for 3D objects); cheap tree style floor lamps or lamp lights from the hardware store fitted with as bright of natural spectrum bulbs.
- A space free of light pollution from other sources.

Optional Gear

- Remote trigger (to shoot without touching camera)
- Circular polarizer filter (to reduce glare on reflective surfaces)
- Multiple lenses and/or camera filters
- Camera bag

Lighting

- Almost any room can serve as a studio, although the clearer floor space the better. All-white walls may be a temptation, but if the wall or central part of that wall facing a 2D object is black, or non-reflective black (like velvet or felt), you'll get fewer reflections or less glare.
- Opaque curtained windows make it easier to only have one light source illuminating the object.
- When using lights on a stand to light a work, place them at a 45-degree angle on either side of the work to eliminate shadows.
- Make sure your light is evenly distributed in all four corners, as well as the center of the object (you can use a single light source if you wish to produce shadows).
- If you use lights, you will have to set your balance to reflect the appropriate light source (typically tungsten for basic hot lights).
- Keep the work free of distracting backgrounds and fill the frame with the object.
- Use the camera's timer mode to minimize camera shake (if no remote sensor or cable release is available).

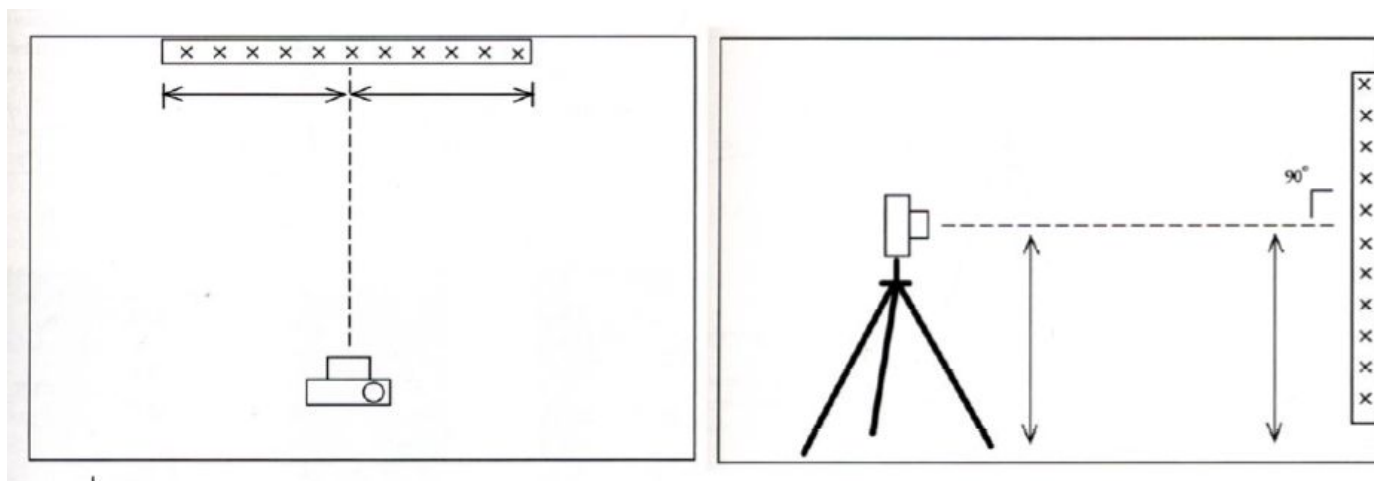
Camera Settings for Intermediate Shooters

- Set the camera to shoot in JPEG (or RAW if familiar).
- Set the *ISO* to 400 or lower.
- Set the camera to *P mode* as recommended above.

- Set the *white balance* (Tungsten, Fluorescent, Daylight, Custom, etc.). If you have mixed lighting, you can create a custom white balance.

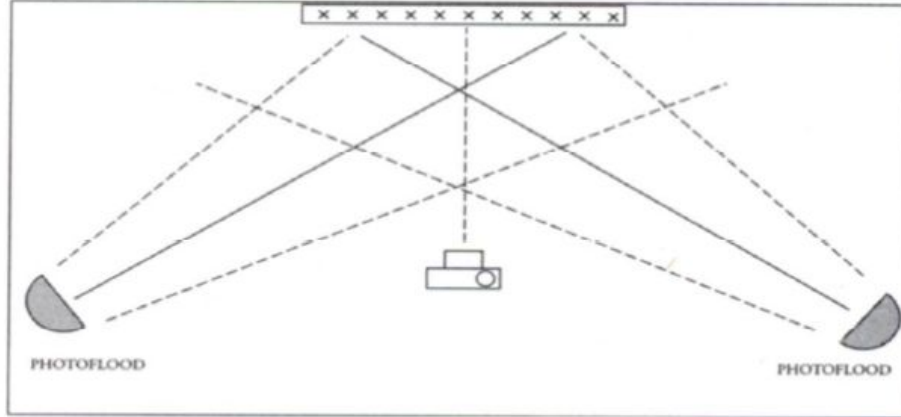
Setting up the Camera

1. Set up the camera on a tripod; make sure the tripod and camera are leveled.
2. After attaching the camera, bring the lens to the exact height of the middle of the object.
3. Place the tripod at a distance where the object fills almost the entire view but is not so close it gets distorted (see the attached diagram).



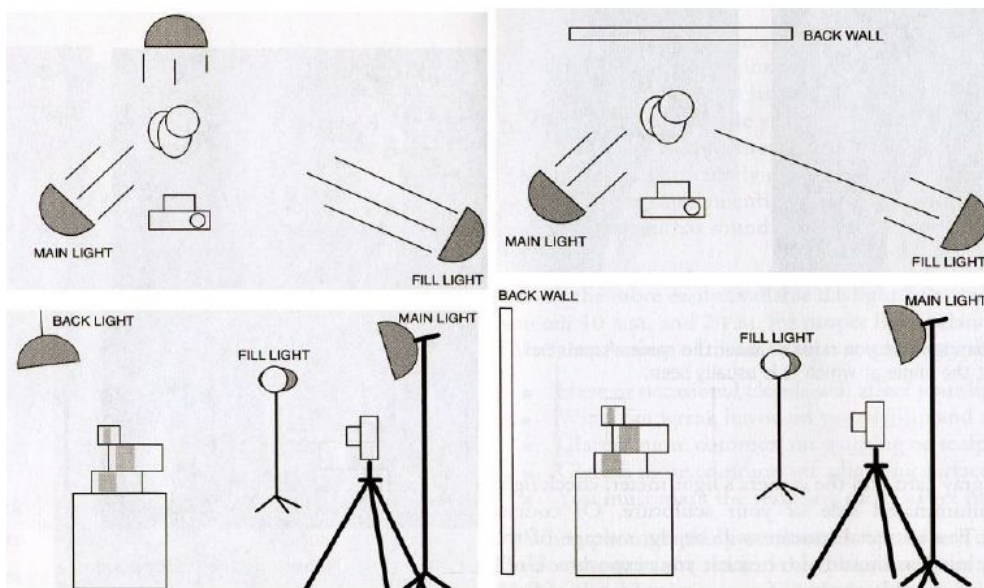
Documenting 2D Objects

1. Place or hang your piece on a flat surface (like a wall) with a grey, black or white background.
2. Place lights at a 45 degree angle from the art, halfway between the art and the camera. This will give even, diffused light.
3. Get the entire image in the frame with a bit of background and focus your image.
4. Press the button and let go of the camera. The timer function will open the shutter and take the shot.
5. Review on LCD prior to changing settings or moving object. Leave the tripod in place in case you need to come back and shoot more images.
6. Make sure to capture your piece from multiple angles if needed.



Documenting 3D Objects

- Set-up using the above guidelines.
- For smaller objects, place on a flat surface with a neutral colored background. Don't place it too close to the background, give it some space. Note: If your object is small enough and you want even, diffused light, use a tabletop softbox.
- At first, place the lights at 45 degree angles from the object, halfway between the object and the camera. This will give even, diffused light.
- Move one of the lights around to start creating shadows. Once you have reached a desired shadow, leave the light and begin shooting.
- Some 3D objects need three lights to create dimensionality. If needed, add a third light as a fill, but be conscious of the additional shadows.



ADVANCED/PROFESSIONAL DIGITAL PHOTOGRAPHY

STUDIO LIGHTING

The most advanced option for object documentation is to have the object photographed in a studio by a professional. The difference is that the professional will have access to equipment that will provide the best possible quality and your photograph will be produced by an individual who knows how to use the equipment properly. Therefore, Option #3 highlights camera and lighting tips for those “in-the-know.” Lighting position will be exactly the same as Option #2 (Better) and is therefore covered in that section.

Required Gear

- Digital camera (DSLR recommended)
- Tripod
- A space free of light pollution from other sources

Optional Gear

- Table covered with backdrop paper
- Remote trigger (to fire without touching camera)
- Circular polarizer filter (to reduce glare on reflective surfaces)
- Multiple lenses and/or camera filters
- Strobe or floodlight kit and accessories
- Backdrop and stands
- Camera bag
- Studio lighting

Lighting Tips

- The minimum you need is two lights with stands and accessories like umbrellas or softboxes.
- On-camera or built-in electronic flash is a problematic light source, especially when used too close to the object because it tends to overexpose highlight areas, and create underexposed shadows under protrusions on objects.
- Lighting is set-up in the same positions as in Option #2 (Better). Only this time, greater attention is given to camera controls.
- For 3D works, incorporate a third light as a fill light in which the light sources are bounced (i.e. using umbrellas) or diffused (i.e. using a softbox).
- For reflective surfaces, consider utilizing a circular polarizer filter to remove glare. You can also attempt moving to remove the glare off the object, or consider positioning the camera so the glare appears in an area that is non-distracting.

Camera Settings for Advanced Shooters

1. Set the camera to shoot in RAW (this will give you the most digital information).
2. Set the *ISO* to 100 (this will reduce 'noise' in the digital image).
3. Set the camera to 'aperture priority' (this will keep the aperture locked). Or even better, photograph using 'manual mode' and bracket your exposures.
4. Set the *aperture* to f/8 or higher (this will put more of the image in focus).
5. Set the *white balance* if shooting in JPEG or TIFF (Tungsten, Fluorescent, Daylight, Custom, etc.) If you have mixed lighting, you can create a custom white balance.
6. Set the camera to timer mode (this is to minimize camera shake) or utilize a cable release or remote trigger.

Additional Tips

- Fill the frame.
- Check focus after every shot.
- Use your camera's histogram for exposure accuracy.
- Use depth of field and your camera's aperture to your advantage, particularly if you have multiple objects in the same photograph.
- Make sure you are "stopped down" to a point where your main objects fall in the same field of focus, but not far enough that it reveals unnecessary details on your backdrop or in your surroundings.
- Choose a high quality professional lens. It is good practice to avoid wide angle lenses as these provide more distortion.

Post Processing

- The photographer should capture all images in RAW format.
- In post-production, the photographer crops and edits the images and creates JPEG files that would later be used for display in an online repository or collection database.
- These images, along with the original RAW and DNG files, are renamed, embedded with usage rights metadata, and placed into storage.
- Conversion to other preservation formats such as TIFF may be considered at a later date.
- It is important to consider file size of whatever format you choose, as this will affect the amount of server space that you dedicate to storage.
- This process requires knowledge of image editing software such as Photoshop, Lightroom, and/or Adobe's Creative Suite.

DIGITAL CAMERA PURCHASING SUGGESTIONS

Good photography is not about your camera – it is about the photographer’s vision. If you are in the market for a new digital camera, definitely consider Canon or Nikon (long-time industry leaders). Regardless of what you choose, your camera should have manual controls over shutter speed and aperture. For digital point-and-shoot cameras, look for something with strong optical zoom capabilities and the ability to shoot in RAW format.

Lens-wise, kit lenses are not the best lenses but they’re good to learn on. If it is your first lens, a kit lens is not bad option as they typically cover a large focal range (wide to telephoto) which offers you the opportunity to discover what sort of photographer you are. You can then buy additional lenses accordingly. For shooting collection objects, you can get away with a cheaper lens and a polarizer filter (helps remove glare from glass and/or shiny objects). Even though a cheaper lens contains more distortion, this can be corrected in post-production given the proper software and skill set. A higher quality lens is typically sharper and contains less distortion.

Camera buying articles:

<http://www.adorama.com/alc/0008102/article/Buying-Guide-The-best-starter-DSLRs-right-now>

<http://www.cnet.com/topics/cameras/best-digital-cameras/dslr-for-beginners/>

Vendors and Reviews:

Also, places like Adorama, B&H, and Calumet offer educational programs discounts on gear. KEH is also fantastic if you are shopping used. Digital Photography Review (<http://www.dpreview.com/>) is a great resource as well as it allows you to compare camera specifications side by side and read unbiased reviews for each model.

Additional Resources:

http://www.tomsguide.com/us/best-dslrs_review-2218.html

<http://www.techradar.com/us/news/photography-video-capture/cameras/best-dslr-top-cameras-by-price-and-brand-944543>

<http://www.cnet.com/topics/cameras/best-digital-cameras/midrange-dslr/>

<http://entry-level-dslr-camera-review.toptenreviews.com/>