CTE Study Guide for Digital Photo

Standard 1:

Students will have knowledge of the history of photography.

Objective 1. History of photography.

The first camera was the CAMERA OBSCURA
JOSEPH NIEPCE took the world's first permanent camera image (French)
Louis Daguerre invented the first process for developing a print (French. again.)
George EASTMAN invented film and the prototype of the film cameras we use today. He made the first mass produced FILM camera that was affordable/accessible to the public.

Objective 2. History of Digital Photography.

Willard BOYLE and George E. SMITH invented the CCD in 1969 (same year walked on the moon).
The first real digital camera, the SONY MAVICA, was invented by Steve Sasson in 1975.

Objective 3. Brief history of Adobe Photoshop.

?? did Photoshop invent Photoshop? "KNOLL!" Thomas Knoll did in 1988. It was released in 1990.

Objective 4. Introduction to Digital Photography.

The difference between film and digital photography is HOW images are recorded. Film cameras record images on FILM while digital cameras record images on a DIGITAL SENSOR. Initial problems: low res/ high cost
CCD: Charged Coupled Device *takes the place of film in old film analogue cameras. It is where the digital image is recorded.
Invented in 1969 by By Willard Boyle & George E. Smith

Additive color deals with LIGHT

- RGB red green blue
- mixed together makes WHITE
- used for SCREENS, projectors, etc

Subtractive color deals with PIGMENT

- CMYK cyan magenta yellow and key (black)
- used for PRINT

Digital photographs are made up of little squares of color called PIXELS.
Pixels comes from two words, PICTURE and ELEMENT.
A megapixel is ONE MILLION (1,000,000) pixels

Standard 2:

Students will be able to understand and apply the multi-step process of "workflow."

a. TAKING THE PHOTO Basic steps: capture/edit/output
1. Check settings, compose picture, take picture, check your results. Hold the camera (Steady, shoot, and format)

B. Memory cards

CF: compact Flash	SD: Secure Digital	XD: Extreme Digital	Micro SD
			
Big memory card, used mainly in digital SLR cameras.	Most common memory card, used in digital point and shoot cameras and newer DSLR	Half the size of SD cards. Used in Olympus cameras and Fujifilm Cameras.	Used in mobile devices and some cameras.

C. Use a **TRIPOD** if your shutter speed is slower than **60.** Tripods have **3** legs. Monopods have one leg and can also help keep your camera steady.

D. Composition. RULE OF THIRDS / SYMMETRY / WORM'S EYE / BIRD'S EYE / FRAMING / LEADING LINES

E. Focus (auto or manual)- AF on lens in Auto focus. The "MF" on lens is manual focus.

F. Exposure (auto or manual-aperture and shutter priority)- Auto-camera chooses the exposure. Manual-you choose by setting aperture, shutter, and ISO. Aperture priority-You set aperture, camera sets shutter. Shutter priority-You set shutter, camera sets aperture.

G. Light metering: To meter using your camera, press your shutter release button down half-way.

H. Flash (On or off) If your shutter speed is too fast, you will have problems with flash synchronization. Half your picture will be black, the other half will be fine. If you turn your shutter off, you may have problems with blurry pictures. Flashes make your subjects look flat. They take away shadows and dimension. They make the background look darker. RED EYE can be a result of on camera flash.

I. Capturing the image. *KNOW SHOOTING MODES
- Timer
- Remote
- Continuous *takes photo after photo. Hold down shutter release. good for sports photography

J. Verify correct exposure or adjust and reshoot (histogram, overexpose, underexpose)

You can access the histogram by pressing the info button on your camera.

***Overexposed digital images are very bright and white. Too much light got into your camera.
***Underexposed digital images are dark. Too little light got into your camera.

IMAGE EDITING

Objective 2. Identify the multi-step process of workflow as it relates to Image editing.

A. Image Transfer (downloading files to a computer)—You can use a card reader or a cord that hooks directly from the camera to the computer. You can also use a scanner. In Photoshop you go to File-Import-Twain Acquire. Scan in at least 300 ppi. Scanning takes a hard copy photo and turns it digital.

B. Image Management (organizing files, photo selection, and managing folders)

C. Create a contact sheet (using any of the following programs: Photoshop, Lightroom, Bridge). Under file, automate, contact sheet 2.

D. Basic Image Editing (Straighten, rotate, limited crop, adjust tonal range, contrast, color correction) The cropping tool can be used to not only crop a photo but also straighten a photo. To rotate a picture you go to Image, Image Rotation. Adjust tonal range can be done under image, adjustments.

Objective 3. Identify the multi-step process of workflow as it relates to Image Output.
Output is putting a picture somewhere where people can see it, either printing it or putting it on the internet.

A. Size/Resolution for intended purpose (web, presentation, or print)

WEB	72 ppi (pixels per inch) RGB color code pixels	PRINT	300 dpi (dots per inch) CMYK color code inches/feet etc.

You can set size and resolution under image, image size. You can also use the cropping tool to set size and resolution.

B. Cloud storage (Dropbox, Google Drive, Web Services). Storing photos places where you or others can access them.

Standard 3: Students will be able to identify different types of digital cameras, the location of their basic components, and the benefits and drawbacks of each type.

Mobile Devices/Action Cameras. (Camera Phones, Tablets, GoPro).
Benefits—You usually have mobile devices with you. Small and easy to use.
Drawbacks—Quality is usually not great. Not a lot of megapixels. Not a lot of options on settings.

Digital Point and Shoot Cameras.
Benefits—Not as expensive as DSLRs. Pretty easy to use.
Drawbacks--You usually can not change apertures and shutters the way you can with a DSLR. Usually not as many megapixels as a DSLR.

Digital Single-Lens Reflex (DSLR) Cameras.
Benefits—You can change lenses. You can set aperture sizes and shutter speeds. There are usually more megapixels than a digital point and shoot camera.
Drawbacks—No real drawbacks.

Mirrorless Interchangeable Lens Cameras (MILC)
They are smaller and more portable.
They have no mirror in the body that flips up and flips back down.

Standard 4: Students will demonstrate the appropriate use of the camera controls on a digital camera.
***KNOW WHAT THE ICON LOOKS LIKE!**

Exposure (MANUAL) Modes
Shutter Priority—You set the shutter, your camera sets the aperture.
Aperture Priority—You set the aperture, your camera sets the shutter.
Program: Camera sets aperture and shutter, you set white balance and ISO.
Manual—You set the aperture and the shutter. You can also set ISO and white balance. The most flexible setting. *MRS WHITE'S FAVORITE!

Pre-programmed (AUTO) modes AUTO

a. Auto—Camera sets everything.
b. Landscape—The mountain. Puts everything in focus. *deep depth of field
c. Action—The running man. **Uses a faster shutter speed** and the continuous setting where you press the shutter release button and your camera takes one picture right after the other.
d. Portrait—Person. Blurs out the background and focuses more on the person. Uses shallow depth of field.
e. Macro—The flower. The close-up setting. Blurs out the background more.
f. Night—Person with the star and moon. Good for low light photos.

Standard 5: Students will be able to use and identify memory devices and file types associated with digital cameras and scanners.

Objective 1. Demonstrate an understanding of file formats as they pertain to image capture. (i.e. RAW, TIFF, JPEG)
RAW—Highest quality you can take a picture at. Raw data. It allows the greatest flexibility in Photoshop. TIFF—Tagged Image File Format. Big file format. Not compressed at all. Lossless file format.
JPEG—Joint Photographers Expert Group. Most common file format. **It is lossy**. It losses data the more you open at close the image. It compresses images when you save them.
PSD—Photoshop Document. Works only in Photoshop. has/ SAVES LAYERS. It's like an onion ;)

Objective 2. Demonstrate an understanding of compression in digital file sizes as they pertain to image capture. (i.e. Extra Fine, Fine, Basic, and Normal) Compression—How images are taken and saved. Colors and info are chunked. Extra Fine shows the most details. It saves all data.

Objective 3. Demonstrate an understanding of the difference between high and low resolution and how they are linked to pixelization. (Intended use of photograph i.e. print, email, photo sharing). A picture that has low resolution has fewer pixels. When a picture has less pixels you can see the pixels when you print or enlarge the picture. Pictures with lower resolution are good to email and share on social media but not good for printing.

Objective 4. Identify common memory cards and camera compatibilities. (i.e. Compact Flash, SD, Micro SD, XD, and internal storage) See above under second section. Internal Storage—hard drive.

Objective 5. Identify necessary equipment used for downloading images (i.e. cables, card readers).

Objective 6. Properly download files from the camera to a computer.

Objective 7. Demonstrate an understanding of how to scan an image for use with a computer (flat bed scanner, film scanner, negative scanner).

Standard 6: Students will be able to understand and operate a point and shoot camera or DSLR. *know what the parts look like and where they are located!

Objective 1. Identify basic digital camera parts and their functions (i.e. viewfinder or LCD monitor, lens, mode dial, shutter release, etc.) LCD—Liquid Crystal Display. Screen that you view pictures on. Mode dial or Mode Selector—Allows you to change settings on your camera. Hot Shoe—Where you can attach accessories like a big flash. Shutter Release—The picture-taking button.

Objective 2. Understand focal length and optical zoom vs digital zoom.
A. Focal length: The distance between the lens and the image sensor when the subject is in focus.
e. Optical Zoom—Optics of the lens makes the subject appear closer. It keeps the same quality and the same number of pixels.
f. Digital Zoom—Picture is cropped. Digital zoom lowers the quality of your picture. It cuts out pixels. It is found on mobile devices and point and shoot cameras.

Objective 3. Use of a tripod or other steady shoot method when it is appropriate. **A TRIPOD IS A STABILIZER!** Use a tripod for low light pictures. **Use a tripod when your shutter speed is slower than 60.**

Objective 4. Identify the need and appropriate use of an on camera flash. Low light situations. You usually need to use a flash inside. Flashes make the background darker and make your subject look FLAT.

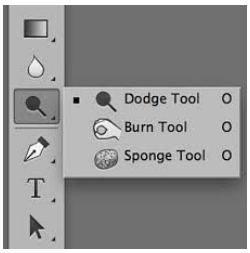
Objective 5. Identify the difference between Shutter Priority and Aperture Priority. See above.

Objective 6. Identify some of the basic differences between digital Point and Shoot and Digital SLR (Single Lens Reflex) cameras (i.e. size, width, and lens options). Digital SLR cameras are bigger than point and shoot cameras. You can change lenses on a digital SLR camera. You can not change them on a digital point and shoot camera. The buffer on a DSLR camera is bigger which allows you to take several photos before the buffer downloads onto your memory card.

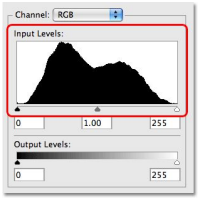
Objective 7. Identify differences in types of photographic lenses for a DSLR.
(Wide 10-35mm, Standard or Normal 50-70mm, Telephoto or Long 80mm and above)
Wide Angle: Spreads out space, makes the background smaller. Distorts people.
Standard or Normal: Recreates what your eye sees.
Telephoto or Long: Compresses space (makes things look like they are closer together). Makes the background bigger.
Prime Lens have one focal length. They do not zoom.
Zoom lenses allow you to change the focal length.

ISO: The camera sensor's sensitivity to light # gets bigger in lower lighting situations
APERTURE/F-STOP: increases or decreases in size to allow more/less light through, like the iris of the eye. Controls depth of field. Bigger opening = smaller number (4) = shallow Depth of field. Smaller opening = bigger number (22) = deep depth of field
SHUTTER SPEED: the length of time when digital sensor inside the camera is exposed to light/when a camera's shutter is open when taking a photograph. Slower shutter = blur. Faster shutter = frozen image.

Standard 7: Students will be able to demonstrate basic proficiency in the use of Adobe Photoshop.
Objective 1. Demonstrate how to use Photoshop to set size and resolution for images based on the intended use of the image (web, print). Use Image, Image size or the Crop tool.



Objective 2. Demonstrate tonal adjustments (i.e. histogram, Brightness and Contrast, Shadow/Highlight correction, Levels, Dodge and Burn Tool).
DODGE & BURN Dodge—Lightens a part of the print. Burn—Darkens a part of the print.



Histogram—Graph of the value/tonal range in a picture

Objective 3. Demonstrate color correction (i.e. color balance, hue/saturation, and levels). Hue—Formal name for color. Saturation—The intensity of the color.

Objective 4. Demonstrate cropping (i.e. cropping, straightening, and perspective)

Objective 5. Demonstrate techniques for photo retouching (i.e. Healing Brushes, Red Eye, Clone Stamp). Healing brush blends in with the pixels around it. Clone Stamp stamps the same color, the same pixels. Healing Brush or Clone Stamp can be used to fix skin issues. The Red Eye tool is under the healing brush.

Objective 6. Demonstrate and use the Layers pallet (i.e. active layer, layer order, creating and deleting layers, and Opacity). The active layer is blue. You can change layer order by clicking on a layer and dragging it to the top or bottom of your layer's pallet. If you create a new layer, it appears above the active layer. If something is 100% opacity, you can not see through it. If you lower the opacity, a layer becomes transparent.

Objective 7. Demonstrate the black and white conversion process in Photoshop. You can use Image, Mode, Grayscale or Image, Adjustments, Black and White, or Image, Adjustments, Desaturate.

Objective 8. Demonstrate effective use of the Undo and Redo (i.e. history pallet, step forward or backward). Control Z is the key command for undoing one step in Photoshop. The History Pallet lets you step back multiple times in Photoshop.

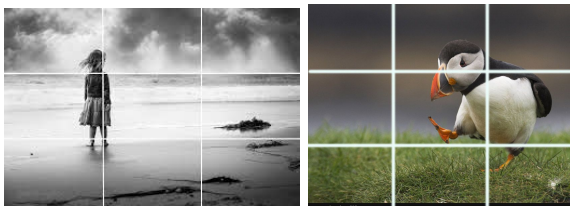
Objective 9. Demonstrate the use of the Transform tool (i.e. scale, rotate, skew, flip, and distort).

Objective 10. Demonstrate the use of selection tools (i.e. Marquee, Lasso, Magic Wand, Quick Select Tool). The shift key adds to a selection. The alt key removes from a selection. The marquee tool makes a square or circular selection. The lasso tool lets you draw around something. The polygonal lasso tool lets you make a multi-sided straight edge selection. The magic wand tool selects pixels of a similar color.

Objective 11. Demonstrate different imaging file types and know their intended use (.psd .jpeg .png) PSD-Photoshop document, opens only in Photoshop. JPEG-Most common file format, small and lossy. PNG-Portable network graphic. Found a lot on the internet. Used for some photos and a lot of graphics.

*** keyboard shortcuts! Which ones do we use the most? How do you zoom, deselect, undo etc. Include images!
***What do the brackets do? (hint, they change the size of something!)
Know how the eyedropper tool works: The Eyedropper tool picks up a color and puts that color on the tool bar so you can paint with it.

Standard 8: Students will be able to understand and demonstrate the elements of composition.

Rule of Thirds 	Simplicity/Emphasis 
Perspective (Worm's Eye, Bird's Eye) 	Leading lines lead the eye to the point of interest. 

Standard 9: Students will be able to understand and practice copyright laws, ethics and legal issues dealing with photography as identified in United States Code Title 17 Chapter 1 Section 101.

COPYRIGHT: the exclusive legal right, given to an originator or an assignee to print, publish, perform, film, or record literary, artistic, or musical material, and to authorize others to do the same.
copyright protected: Only you can make copies
PUBLIC DOMAIN: the state of belonging or being available to the public as a whole, and therefore not subject to copyright.
FAIR USE:(in US copyright law) the doctrine that brief excerpts of copyright material may, under certain circumstances, be quoted verbatim for purposes such as criticism, news reporting, teaching, and research, without the need for permission from or payment to the copyright holder.
You can use another's photos once you get permission

Standard 10: Students will gain an understanding of the careers available in the field of photography. (CAREERS) SkillUSA is the CTSO or club for this class. "Preparing for Leadership in the World of Work."