SONY NXCAM –NX5

Tutorial 2 – Worksheet

What is Zebra *(button)?*

Zebra stripes, or *zebras*, are a feature of professional cameras which give an indication of exposure levels. When activated, diagonal lines appear across any part of the picture which is approaching over-exposure. These lines appear only in the viewfinder — they are not output from the camera or recorded.

Normal Setting

Zebra Stripes

AE Shift

AE (Automatic Exposure) is an automated digital camera system that sets the aperture and/or shutter speed, based on the external lighting conditions for the photo. With beginner-level digital cameras, photographers usually can select one of three different AE modes.

What is Exposure?

The term derives from the days of film (remember them?) when you created a photograph by exposing a piece of film to light. These days, CCD and CMOS image sensors have replaced film but the basic concept is the same – to create moving video, you expose a CCD or CMOS image sensor to light.

Why Does Exposure Matter?

The amount of light that hits your image sensor is one of the most important factors impacting video quality. Too much light, and the bright portions of your video will appear washed out (or blown out) - overly white with no visible details. If not enough light enters your camcorder, you'll be looking at dark blobs.

What is Exposure Control?

There are four controls on the camera that affect exposure:

S SHUTTER **I** IRIS **N** NEUTRAL DENSITY (ND) **G** GAIN

Shutter

The term *shutter* comes from still photography, where it describes a mechanical "door" between the camera lens and the film. When a photo is taken, the door opens for an instant and the film is exposed to the incoming light. The speed at which the shutter opens and closes can be varied — the faster the speed, the shorter the period of time the shutter is open, and the less light falls on the film.

The main effect of higher shutter speeds is that individual frames appear sharper, due to the minimization of *motion blur*. Motion blur occurs when the subject moves within the frame while the shutter is open. The less time the shutter is open (i.e. the faster the shutter speed), the less movement will take place.

One side-effect of higher shutter speeds is that movement appears jerkier. This is because motion blur tends to smooth consecutive frames together.

The three shots below were each taken as the car travelled past a stationary camera at 100 km/hr. With the shutter off, motion blur is most pronounced. As the shutter speed is increased, the image becomes sharper.



Iris/Aperture

We can control the amount of light coming through the lens by the use of an IRIS or APERTURE. This works in the same way as the iris (or pupil) of your eye: when you are in bright light the iris is made as small as possible (it 'stops down') to prevent too much light entering your eye, when you are in a darkened room your iris dilates and becomes as wide as possible ('opens up') to let in as much light as possible.

With the cameras iris in manual you will have total control over exposure, which will enable you to choose the look you want. Plus, with manual iris you can also select the depth of field you want to work with (see below).

There are a selection of apertures to choose from when the camera is in manual exposure mode. Apertures are referred to as f-stops - the smallest aperture is f11, which lets the least amount of light into the camera. The largest aperture is f1.6, which allows the maximum amount of light into the camera.

Neutral Density

There are four ND (neutral density) filters on our camera 0, 1, 2, & 3 ND. The purpose of a neutral density (ND) filter is to reduce the amount of light that reaches the camera's sensor. Using an ND filter does not affect the white balance – because they are neutral.

- ND1 reduces the amount of light entering the camera to about 1/6.
- ND2 reduces the light entering the camera to around 1/32.

You may need the ND Filters if, it is sunny, you are by the sea, you are on a sandy beach or working in snow.

Gain

Gain is an electronic way to boost the brightness of your video images.

When shooting in low light conditions (e.g. at night) the iris is will be fully **OPEN** at f1.6 but, the camera may still needs more light to produce a picture. If you cannot light the scene then the only way to brighten the image is to electronically boost it with **GAIN.** The great thing about gain is that you will be able to see in the dark.

Follow-up Questions

Please answer the following questions about the video tutorial you have viewed and what you have read. This will count as a quiz grade. **Please used lined paper to answer the questions.**

1. What does the zebra button do?
    a. Adjust the zoom
    b. Show exposure levels
    c. Change the chrominance channel
    d. Adjust the beam splitter

2. How many ND settings does our camera have?
    a. 1
    b. 2
    c. 3
    d. 4

3. What does the ND filter do?
    a. Changes the f stop
    b. Changes the pixels of the camera
    c. Controls the zoom
    d. Acts as a light filter

4. What feature/setting of this camera would you use if a scene you were trying to shoot was too dark even at your lowest aperture setting?
    a. Iris
    b. Gain
    c. Zoom
    d. White Balance

5. What does a Shutter do?
    a. It handles audio signals.
    b. It engages the automatic focus.
    c. It opens and closes allowing light to enter during frames.
    d. Controls zoom.

6. What does the Iris button do on our camera?
    a. It determines how opened or closed the iris should be for a shoot and adjusts the camera.
    b. It resets the camera to the factory settings.
    c. It allows you to view the footage you have already taken.
    d. It opens the shutter.

7. How are apertures measured?
    a. In foot candles
    b. In f stops
    c. In n stops
    d. In letters

8. The faster the speed of the shutter the less light that is let in to expose the image.
    a. True
    b. False

9. The lower the f stop the more light that is let into the lens.
    a. True
    b. False

10. What are the four controls that effect exposure?

    _____
    _____
    _____
    _____