

London Art College

Photography Diploma Contents

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SECTION 1

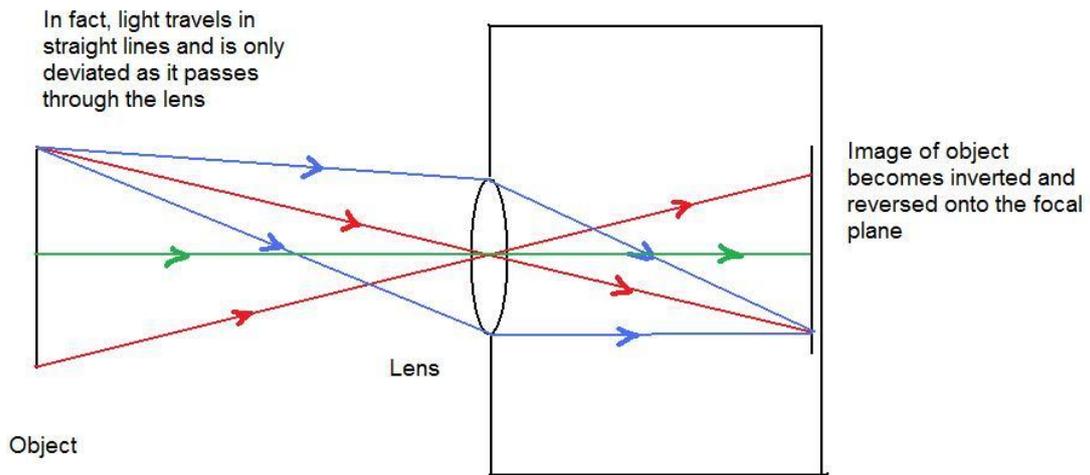
CAMERA STRUCTURE AND HOW IT RELATES TO PHOTOGRAPHIC TECHNIQUES

LESSON 1

In its very basic form, the camera is a lightproof room with a sensitive area on the back wall and a focussing window (with a curtain) at the front. Indeed, the meaning of the word 'camera' is 'a room' or 'closed room'. The size of the window restricts the light entering the room and the speed that the curtain is opened and closed also has an effect. The sensitivity of the receptive material at the back has the final effect on the result. The sensitive material at the back may be film, transparency film, Polaroid film, cine film or a digital sensor. We can therefore split cameras into those using film and those that retain images by electronic means. Although most folk starting out in photography these days buy the digital variety, there are those stalwarts that consider film the pinnacle of quality, and there are quite a few that use both digital and film. This guide, however, will concentrate on the digital camera with its overly complicated emphasis on gadgets, but the rudiments of photography are the same for both film and digital cameras alike.

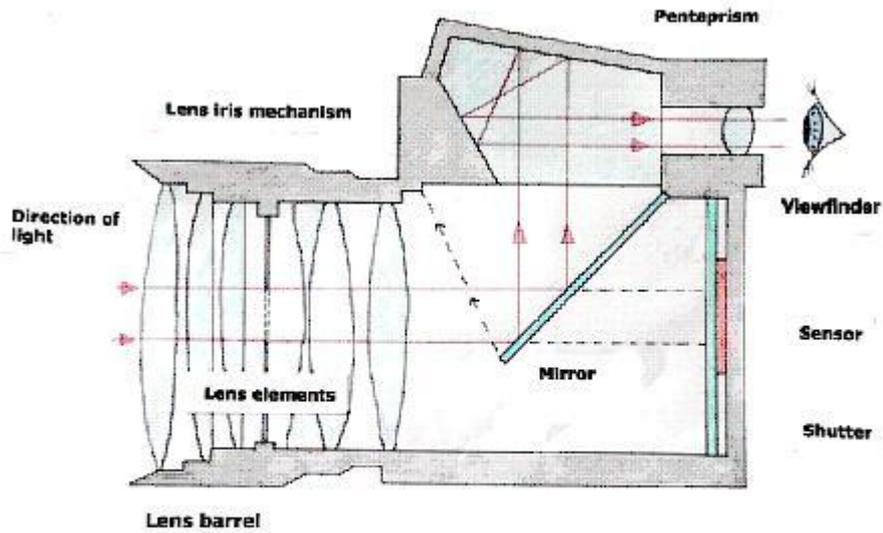
The story of every photograph starts with the light energy that is reflected from a subject, the frequency of that energy giving the object its colour. This energy then enters the camera and changes the light sensitive material. This change is then made usable by either chemicals, in the case of film, or electronically, in the case of digital. Film has **grain** or **layers** of three **colour dyes**. Grain works in a similar way to digital sensors in that the clumps are dot-like (invisible to the naked eye) and the intensity of the clump gives a cumulative effect: the image. Grain, however, is random and variable in size, but digital sensitive materials (called **pixels**), en masse, are regularly placed.

The light enters the camera via the lens and, due to the glass structure of the lens, the image is reversed and inverted. The next diagram shows the way light travels through a lens and ends up upside down and reversed at the back of the camera.



Through the very centre of the lens there is no deviation and light passes straight through.

Diagram showing the direction of light entering a camera.



Section through a DSLR camera (camera at rest)



Michaelmas daisy © Rona Cox

As you are so close, the amount of light able to enter the lens is reduced, and it is usually necessary to increase the ISO quite a lot or use a flash. On board flash may work, but will not be dedicated and just give out the power that it can, in the case of reversed lenses. The lens must be capable of shutting down manually and a large f number will be required due to the reduced depth of field. You can attach a flash off camera on a bracket, but this will be discussed further in the next sections when dealing with table top flash.

Alternatively, you can purchase close up lenses that screw onto the front of your lens. These are like giant magnifying glasses, and when the lens is focused down to its nearest point, the subject is magnified by the close up lens(es). They come in different magnifications and are measured in dioptres like spectacles. Consequently, the higher the magnification, the greater the price, but they are a value-for-money way of achieving a decent result. They can be added together to increase their overall magnification. Make sure they are good quality; like any lens, they have their own problems and this will be very evident in your photographs – if you get that far!

You can also purchase a contraption that harks back to the beginning of photography: a bellows system. This is attached between the camera and the lens. The whole thing is on a focusing track that is via a screw thread adjustable

heads'. They are expensive to run, but relatively cheap to buy, although the bulbs have a tendency to blow at the wrong times and, as they are effectively 'over-run' light bulbs, have a much shorter life than ordinary bulbs. They run very hot so you can't put things in front of them to modify the light and can be uncomfortable to work under due to the amount of heat generated.

Flash heads, monoblocs or studio flash are superior and much more versatile. They can be relatively expensive if you go overboard with big names, but there are some good 'value for money' models out there, just right for the enthusiast. If you progress to wanting to take things seriously then you can add to them or upgrade if you later consider them underpowered for your needs.



The rear of a typical strobe or studio flash head. © Rona Cox

Lights are sold by their wattage; this equates to their power output. Some web sites quote lights in pairs, as a total output, which can be a bit confusing, so read all literature carefully. For example, the lights are quoted as being 300 watts, but, actually, they are 150 watts each. There are some well-known companies that sell 'studios in a box' in various guises and these are great for starters, but a little expensive. If you want advice on this subject, either contact your tutor or talk to your local photography supplier. Lights range from the plastic basic models with little control, to metal casings with computerised digital control and fan cooling. The number of people you are expecting to photograph will dictate the power and the number of lights you will need. In reality, you can use three or four lights with a single