

The Complete
DICTIONARY
of **PHOTOGRAPHY**



The ultimate pocket guide
to photographic jargon
and acronyms

WELCOME TO...

The Complete **DICTIONARY** of **PHOTOGRAPHY**



The Complete Dictionary of Photography explains the meanings of dozens of photographic terms, from aberration to zoom ratio. Like any hobby or specialist field, photography has built up its own rich language of distinctive words, like chimping, photobomb and snoot. Our A-Z addresses them all, providing easy-to-understand definitions and helpful cross-referencing.

You'll find this dictionary useful in all sorts of situations. Buying a new lens and want to know what all the letters in its name actually mean? Maybe you're aware that moiré patterns are something you want to avoid in your photos, but don't actually know what they are? It's all here.

Whether you're well-versed in photographic jargon and history or are just starting to explore the language that helps to shape this brilliant artform, we hope you'll find browsing through *The Complete Dictionary of Photography* informative, enlightening and entertaining.

Ben

Ben Brain, Editor
ben.brain@futurenet.com

A

Aberration

An optical fault in a lens that creates a less-than-perfect image.

Abstract

In photography, this term refers to images that concentrate on aspects of a subject such as shape, form, colour and texture, instead of a straightforward representation of a subject.

Adams, Ansel

Adams (1902-1984) was an influential American photographer, acclaimed for his black-and-white landscapes of the American West, and particularly Yosemite National Park. Together with Fred Archer, he formulated the Zone System as a way to determine the optimum exposure for a negative.

Adjustment layer

This is a layer containing an image adjustment or effect instead of image content. Like a red Cellophane overlay on a print, an adjustment layer will alter the appearance of layers below it, but not actually alter their content, making adjustment layers a cornerstone of reversible, 'non-destructive' editing. The adjustment can be altered, hidden or removed at any point. When you add an adjustment layer, a mask is

also automatically created, so that the effect can be applied to a lesser extent (or not at all) in particular areas of the image.

Adobe Camera Raw

A free plugin used by Photoshop and Elements to process and edit raw files. Adobe Camera Raw is frequently updated to support the newest camera models.

AE

An abbreviation for automatic exposure. This camera feature enables the user to determine the shutter speed and aperture for an image, usually via a TTL (through-the-lens) exposure meter.

AEL

Automatic exposure lock. This is a push-button control that enables you to select the part of the scene from which the camera takes its meter reading, and then lock this setting while the image is re-framed for better composition.

AF

Stands for autofocus, a function first introduced on cameras in the late 1970s, in which the lens is adjusted automatically to bring the designated part of the image into sharp focus. Almost all modern lenses for digital SLRs have AF, which is achieved via one or more sensors and a motor either

integrated in the lens itself or the camera body.

AF illuminator

This is a system used by some cameras and flashguns to assist autofocus in low light. A pattern of red light is projected on to the subject, which aids the contrast-detection autofocus to adjust the lens correctly.

AF-S

This stands for 'autofocus-silent', and refers to Nikon lenses that use a silent motor to control the autofocus system.

AL

See *aspherical lens*.

Albumen print

A type of photographic print, invented in 1850 by Frenchman Louis Désiré Blanquart-Evrard (1802-1872). It consists of a sheet of paper coated in egg white (albumen) and salt, then dipped in a light-sensitive silver nitrate solution. The paper, when dried, is overlaid with a glass negative and exposed to the sun. The albumen print was widely used until the late 19th century.

Alternative processes

This term refers to a range of photographic processes, mostly dating from the late 19th and early

20th century, which devotees continue to use for their unique qualities. They include the daguerreotype, gum bichromate, cyanotype, salt print, bromoil, platinum and palladian processes.

Ambient light

The existing light in a particular scene, which may be sunlight, moonlight or an artificial light already providing illumination. It excludes any light source added by the photographer, such as flash or studio lighting.

Angle of view

A measurement of how much a lens can see of a scene from a particular position, usually measured in degrees. The longer the focal length of the lens, the narrower the angle of view. Zoom lenses have adjustable angles of view.

Antialiasing

A method of smoothing diagonal or curved lines in digital images to avoid a 'staircase' or 'stepped' appearance (also called 'jaggies'), caused by the fact that the pixels making up an image are discrete blocks of colour.

Aperture

The opening in the lens that restricts how much light reaches the image sensor. In all but the

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most basic cameras, the size of the aperture is adjustable. The aperture setting used has an important role to play in both exposure and depth of field.

Aperture priority

Semi-automatic exposure system, where the aperture is set by the photographer. The shutter speed is then set by the camera to suit the light level reading taken by the camera's own meter.

APO

Abbreviation of apochromatic. This is used to describe Sigma lenses that use super-low dispersion (SLD) lens elements to reduce chromatic aberration.

APS

The initials of the Advanced Photo System, a short-lived film photography format introduced by Kodak and other manufacturers in 1996. The 24mm film was housed in a drop-in cartridge, and could be shot in three different formats. It was mainly used in compact cameras, but also a small number of SLRs.

APS-C

This refers to the size of sensor used in some digital cameras, measuring around 22.5x15mm, and with a 3:2 aspect ratio. It gets its name and dimensions from the

APS (Advanced Photo System) film format, used in its Classic (C) aspect ratio.

Artefacts

Flaws in an image caused by limitations in the recording or manipulation process. Examples include colour and tonal banding, random blotches or a mottled, grainy appearance.

ASA

A method of measuring and specifying film speed, or a film's sensitivity to light, as devised by the American Standards Association in 1943. It was replaced by the ISO (International Organisation for Standardisation) film speed system in the 1980s. Also, see *ISO*.

AS and Asp

Abbreviations for aspherical. See *aspherical lens*.

Aspect ratio

The relationship between the width and height of a picture, which describe the proportions of an image format or a photograph. The aspect ratio of most D-SLRs is 3:2, while on most other digital cameras, it's 4:3.

Aspherical lens

A lens element that has a surface that isn't perfectly spherical.

All camera lenses are made up of a number of individual lenses or elements. Many of these elements are spherical, as if cut from a sphere. Aspherical elements are less rounded and are used in wide-angle and wide-apertured lenses to help provide distortion-free images.

Astrophotography

Photography achieved by attaching a camera to a telescope, and concerned with recording images of astronomical objects in the night sky such as stars, planets and the moon. Astrophotography can also be used to record astronomical objects invisible to the human eye by using long exposures.

AT-X

Stands for Advanced Technology Extra – the branding used on all current Tokina lenses.

Autobracketing

A feature on some cameras that enables you to automatically shoot a sequence of shots of the same scene at slightly different shutter speeds (or aperture settings) from the 'correct exposure'. This feature can be used if there's some doubt that the meter reading is accurate for a particular subject. It can also be used to shoot a sequence that's combined into one high dynamic range image. See HDR. Other

autobracketing features available on some cameras include automatic flash, ISO or white balance bracketing.

Autochrome

The name of the first colour photography process, invented by French brothers Auguste and Louis Lumière, and patented in 1903. A glass plate was coated in microscopic grains of potato starch, coloured red, green and blue, overlaid with a black-and-white silver halide emulsion. The process was widely used until Kodachrome and Agfacolor films were introduced in the 1930s.

Autofocus

See *AF*.

Available light

See *ambient light*.

Avedon, Richard

Avedon (1923-2004) was one of America's most famous fashion and portrait photographers. He was the chief photographer for *Harper's Bazaar* magazine in the 1940s and *Vogue* from the 1960s. His portraits are famous for their intimacy as well as their stark and minimalist quality.

AWB

Automatic white balance. This is a system that automatically adjusts

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the colour balance of an image, according to the colour temperature of the light source, to make it look as natural as possible to the human eye.

B

B (Bulb)

A shutter speed setting that enables you to keep the shutter open for as long as the shutter release is held down, usually with a remote release. It's used for long exposures of up to several minutes.

Backlighting

An image is backlit when the light source is on the far side of the subject in relation to the camera. It means that there's more light coming from behind the subject than is directly on the subject itself. It's often used to separate the subject from the background to make a subject more dramatic, or to make a silhouette.

Backup

A copy of a digital file that's kept in case of damage to, or loss of, the original digital image.

Ballhead

A type of tripod head in which the head mount, which holds the camera, is attached to a ball-and-socket joint. When the socket is

tightened using the ball lock knob, it locks the head in place.

Barn doors

Four hinged doors fixed on the front of studio lights. The doors are used to modify the shape and direction of the light.

Barnack, Oskar

Barnack (1879-1936), an optical engineer and industrial designer, is known as 'the father of 35mm photography' for his work as the head of development at the Leitz camera company. He designed the first Leica camera, which went on sale in 1925, and introduced the 24 x36mm format (now known as 35mm) for still photography.

Barrel distortion

Barrel distortion is a lens fault or aberration that causes straight, parallel lines in an image to bow outward, and is seen when shooting with wide-angle lenses. The wider the lens, the greater the distortion. The appearance is similar to the effect you'd see if an image was wrapped around a barrel. It can be corrected using post-capture software.

Beauty dish

A studio lighting device used to give a flattering effect in portrait and fashion photography. It consists of a large circular

dish-shaped reflector, usually around 40-50cm in diameter, with a light source in the centre. The light usually has an opaque cover so that only the diffused light reflected from the dish reaches the subject.

Bellows

A concertinaed tube made of flexible, light-proof material that separates a lens from the camera body. Bellows were first used on very early cameras in the mid-19th century, and are still used on large-format equipment (such as the Ebony view cameras) today. They allow the plane of focus to be adjusted via a swing and tilt mechanism. Bellows are also used instead of extension rings on SLR cameras for making more finely adjustable macro images.

Bit

The basic unit from which any digital piece of data is made. Each bit has a value of either 0 or 1. The sizes of digital files are usually counted in bytes, which are each made up of eight bits.

Bit depth

The number of bits used to record the colour of a single pixel. Digital cameras usually use at least eight bits for each of the red, green, and blue channels, providing a 24-bit depth, and a possible 16,700,000

colours. Many D-SLRs offer higher bit depths when set to record in raw mode.

Black trinity

A derogatory name given by fashion and portrait photographer Norman Parkinson (1913-1990) to three photographers who emerged in the late 1950s and early 1960s: David Bailey (born 1938), Brian Duffy (1933-2010), and Terence Donovan (1936-1996). This trio worked in a more relaxed and spontaneous style, and became the leading fashion and portrait photographers of the period.

Blending mode

Blending modes determine how the pixels in a layer interact with the underlying pixels on other layers instead of simply covering them. Some blending modes are much more useful for photo editing than others. Multiply is used to darken an image, and Screen to lighten it; Overlay and Soft Light boost contrast.

Blown out

Bright areas in a photo that are over-exposed are said to be blown out. They won't hold any detail and will be bleached white.

Bokeh

Derived from the Japanese word for 'blur', this term is used to describe

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the aesthetic quality of the blur in out-of-focus areas of a picture, or the lens creating them. Smooth, circular out-of-focus highlights are a feature of 'good bokeh.'

Bounce flash

Indirect flash-lighting technique, where the flashgun is angled to bounce off a wall, ceiling, or other reflector. This scatters the illumination, creating a softer lighting effect.

Bounding box

In Photoshop, a rectangular border around a selected part of an image that can be dragged to transform, rotate, scale or move.

Bracketing

A system for increasing the chances of getting the correct exposure by taking a sequence of pictures with a slightly different exposure setting for each. See *autobracketing*.

Brady, Mathew

Mathew Brady (1822-1896) was a pioneering American photographer, famous for his photographs of the American Civil War and his portraits of prominent Americans, including Abraham Lincoln.

Brandt, Bill

Bill Brandt (1904-1983) was an important British photographer

who began his career documenting the British class system in the 1930s. He went on to photograph London in the war years before bringing his unique style to landscapes, portraiture and finally abstract nudes.

Bridge camera

A camera that bridges the gap between compacts and D-SLRs. They are similar in appearance and handling to small D-SLRs, but they have a fixed, usually 'superzoom' lens, with some models offering up to a 50x optical zoom. Instead of a D-SLR's optical viewfinder, they have an electronic viewfinder.

Brightness range

This is the difference between the brightness of the brightest part of the subject and the brightness of the darkest part of the subject. Also known as Subject Brightness Range (SBR).

Bromoil

A photographic process in which prints made on silver bromide paper are chemically bleached and hardened before an oil pigment is applied. It was popular among Pictorialist photographers from its invention in 1907 until the 1930s.

Brownie

The name of a series of simple box cameras made by the Eastman

Kodak company. The first Brownie went on sale in 1900, and was intended to make photography simpler and more affordable for everyone. The cameras were named after the cartoon characters created by illustrator Palmer Cox.

Buffer

Temporary memory used by a digital SLR. The size of the buffer in a camera helps dictate the maximum burst rate, and the number of shots per burst.

Burn tool

A tool that can be used to darken parts of an image selectively during digital image manipulation. The tool gets its name (and its hand-shaped icon) from 'burning-in', a traditional darkroom process in which parts of a print could be made darker by giving some areas of a print more exposure than others. Also, see *Dodge tool*.

Burst rate

The continuous shooting speed of a digital camera, which enables a sequence of images to be taken in rapid succession, measured in frames per second (fps). The rate can only be sustained for a certain number of shots.

Butterfly lighting

A technique for lighting portraits achieved by pointing the flash

down towards the front of the face and creating a distinctive butterfly-shaped shadow under the nose. A reflector is used to soften the shadow. This technique is also known as 'Paramount lighting' after the movie studio's glamorous portraits from the 1930s.

Byte

The standard unit for measuring the memory capacity of digital storage devices. Each byte can have one of 256 different values, and is equal to eight bits.

C

Cable release

A mechanical or electronic device for firing a camera from a short distance away, without physically pressing the shutter release. It's often used as a way to minimise vibration when using a slow shutter speed and a camera support, such as a tripod.

Calibrator

A device used to standardise the colour and brightness of a computer monitor so that images can be accurately adjusted.

Calotype

One of the earliest photographic processes, announced by William Henry Fox Talbot (1800-1877) in

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1841, in which a negative image was recorded on a sheet of translucent paper coated with light-sensitive chemicals. The earliest surviving example is an image of a window at Lacock Abbey, made in 1835. Using the process, multiple positive images could subsequently be produced by contact-printing the negative.

Camera shake

Blurring of the image caused by movement of the camera during the exposure. Handheld cameras are prone to camera shake, and the fastest available shutter speed needs to be used to reduce or eliminate the problem.

Camera trap

A remotely activated camera used for documenting the behaviour of animals in the wild without the photographer being present. The camera's shutter is usually triggered when an animal's movement is detected by an infrared or motion sensor.

Cameron, Julia Margaret

Julia Margaret Cameron (1815-1879) was a British photographer who made portraits of some of the major figures of the Victorian period as well as her relatives and friends. She was one of the first people to see photography as an artistic medium open to

interpretation, rather than simply a mechanical process for recording reality. Her portraits often make a creative use of soft focus.

Canvas

A Photoshop term for the overall dimensions of the image file you are using. Like the canvas used for a painting, the Canvas may be the same size as the actual size of the picture, or it may be larger.

Canvas Size

The Canvas Size control enables you to increase the size of the canvas without affecting the pixels that make up the image itself. It can be used to add a border to a photo, for example, or to add a blank area into which more sky can be cloned.

Cartier-Bresson, Henri

Henri Cartier-Bresson (1908-2004) is regarded as one of the most influential reportage and street photographers. He was one of the co-founders of the Magnum Photos agency in 1947. He was one of the first to exploit the advantages of the Leica 35mm camera, and used it to capture brilliantly timed and composed images throughout his long career.

Cartridge film

A type of photographic film housed in a plastic cassette. Because it's

light-tight, film can be loaded into a camera in daylight. 126 cartridge film was introduced by Kodak in 1963, followed by 110 film in 1972. Two later formats, Disc film and APS film, used their own specially designed cartridges.

Catch light

A white highlight in the eye of the subject, which is a reflection of the light source. The shape, size and intensity of the highlight, as well as the number of highlights, will vary depending on the lighting setup.

CCD

(Charge Coupled Device)

A type of imaging sensor commonly used in digital cameras, and an alternative to the CMOS sensor. See *CMOS*.

Centre-weighted

A type of built-in metering system, provided as an option on some cameras. Centre-weighted meters measure light intensity across the entire image area, but bias the average in favour of light taken toward the centre of the frame. The system isn't foolproof; it's easier to predict when it will make an inappropriate reading than more sophisticated metering systems.

Channel mixer

A feature in Photoshop that enables you to adjust the red, green

and blue channels to increase or decrease colour saturation, or convert an image to monochrome.

Chiaroscuro

A term that originated in Renaissance art. It refers to a style of image that features a strong contrast between the light and dark areas of the picture.

Chimping

This is a short form of 'checking image preview'. It refers to the act of looking too frequently at the image on your camera's LCD screen, rather than concentrating on the subject.

Chromatic aberration

A lens fault common in telephoto lenses in which different colours of white light are focused at slightly different distances, creating ugly coloured haloes around the edges of a photographic subject. Software can remove or reduce the effect.

Chromogenic film

A fine-grain photographic film that produces black-and-white images, but is processed using C41 colour chemistry.

Circular polariser

A type of polarising filter. Circular polarisers can be used with modern cameras without interfering with the operation of exposure metering

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and autofocus systems, unlike older and cheaper linear polarisers.

Clipping

Clipping occurs when the dark parts of an image become pure black or the light parts become pure white, so that image detail is lost in these areas. On a histogram, a clipped shadow or highlight is indicated by the graph being 'cut off' on the left-hand (shadows) or right-hand (highlights) side.

Clone Stamp

An image-editing tool that enables you to replace an area of the image with pixels taken from elsewhere in the image (or even another image). It's commonly used for removing blemishes and other unwanted objects from a picture.

Close-up lens

A filter-like accessory that fits on the front of the camera lens to magnify the image. This low-cost macro accessory can be used on most types of cameras and lenses. Close-up lenses come in a variety of different strengths, usually measured in dioptres.

CMOS (Complementary Metal Oxide Semiconductor)

This is a type of imaging sensor used in digital cameras. Located at the focal plane, it converts the focused image into an electrical

signal. It's similar in function to the CCD sensor.

CMYK

Cyan, magenta, yellow and black (or 'key'), the four primary inks used in commercial colour printing. CMYK also refers to the printing process itself.

Collodion process

This is an early technique for making photographic prints, invented by Frederick Scott Archer (1813-1857) in 1851, which used collodion (cellulose nitrate) to stick light-sensitive chemicals on the surface of a glass plate. The plate was exposed, developed and fixed while still wet. The process produced good results and was used widely until around 1880.

Colour cast

A colour tint in an image, caused by shooting in a particular kind of light. Tungsten light causes a yellow cast, while fluorescent light causes a green cast. Casts can be corrected using the camera's white balance feature, or at the post-capture stage.

Colour channels

Every colour you see on a screen is created by a specific mix of red, green and blue light, and every printed colour by a specific formula of ink colours. In

Photoshop, the component colours can be represented and seen as separate colour channels – RGB for most digital photos. See Channel mixer for more on this.

Colour filter array (CFA)

The pattern for red, green, and blue filters used over the photo sites in an imaging sensor. Usually, half the photo sites in a digital camera (which define pixels) have green filters, a quarter have red filters, and quarter have blue filters.

Colour management

An overall system that tries to ensure that the colours of an image are displayed and output in exactly the same way, whatever the device being used.

Colour profile

Description of how a camera, printer, monitor or other device displays or records colour. It provides a universal way in which different devices can produce similar-looking results. This is sometimes known as an ICC profile, because the standards are set down by the ICC (International Colour Consortium).

Colour negative film

Film on which all original colours are recorded as their complementary colours. When the image is printed on photographic

paper, the colours are again reversed to their original hue. Colour negatives have an orange tint or mask, which helps to control contrast and improves the reproduction quality.

Colour reversal film

Film processed to produce a colour positive image on its transparent base. Traditionally, images are mounted in card or plastic mounts. Also commonly known as slide or transparency film.

Colour space

The theoretical definition of the range of colours that can be displayed by a device.

Colour temperature

All light sources have a characteristic colour temperature: artificial (tungsten-filament) lights are warmer (more orange) than daylight, which is warm near dawn, turns cooler (more blue) during the day, then warms again at nightfall. Our eyes adjust for colour temperature much of the time without our realising it, so that colours look pretty consistent. Digital cameras can make electronic adjustments using a white balance system to neutralise colours. When they get it wrong (or you use the wrong white balance setting on your camera), a colour cast results.

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Combination printing

The use of two or more negatives to make one print. The technique was first used in the mid-19th century to overcome exposure limitations in early photographic processes, although photographers such as Oscar Gustave Rejlander (1813-1875) could use dozens of images to make one epic scene.

Compact

A type of camera with a shutter mechanism built into the lens. Compacts are generally point-and-shoot designs that are easy to carry around. Most digital compacts have built-in zoom lenses.

CompactFlash

This is a type of removable memory card commonly used in digital SLRs.

Compact System Camera (CSC)

These are cameras with no mirror mechanism, and are therefore smaller and lighter than D-SLRs, but still offer similar controls, high-quality images and interchangeable lenses. Depending on the model, there's either an electronic viewfinder or no viewfinder and only the LCD screen. CSCs are also referred to as MILCs (mirrorless interchangeable lens camera) or EVILs (electronic viewfinder, interchangeable lens).

Complementary colours

Also known as 'opposite colours', these are pairs of colours that create a strong contrast. On the traditional colour wheel they are red/green, yellow/violet and blue/orange, while the CMYK and RGB models use red/cyan, green/magenta and blue/yellow.

Compression

The process of reducing the sizes of files such as digital images, so that they use less storage capacity and are faster to upload and download. See *lossless compression* and *lossy compression*.

Contact print/sheet

Contact prints are photographic images made by laying one or more film negatives on a sheet of photographic paper, usually under a sheet of glass, and exposing it to light. In the traditional wet darkroom, a contact sheet is usually the first stage of printing an image.

Continuous autofocus

This is an autofocus setting in which the focus is constantly adjusted until the shutter is actually fired. It's especially useful for moving subjects such as in wildlife or sports photography, where it would be unhelpful for the focus distance to be locked as soon as it's initially found.

Continuous lighting

Lighting that remains on throughout a shoot, as opposed to the brief burst of illumination given by flash or strobe lighting.

Contrast-detection autofocus

See *passive autofocus*.

Contrast range

A measurement of the difference in brightness between the very darkest and lightest parts of an image. See *brightness range*.

Contre-jour

In French, literally 'against the light'. See *backlighting*.

Converging verticals

A term used to describe the effect of parallel lines getting closer together, particularly the two sides of a building, or a section of a building, when shooting from a low angle of view.

Crop

To remove unwanted parts of an image.

Crop factor

Sensors of several different sizes are used in D-SLRs, and this size affects the angle of view offered by a particular lens. The smaller the sensor, the narrower the angle of view. The 'crop factor' is to convert

the actual focal length of a lens to the effective focal length (EFL – see below). The crop factor for Four Thirds and Micro Four Thirds models is 2x; the crop factor for most popular D-SLRs is 1.5x or 1.6x. Full-frame D-SLRs need no focal length conversion, so they have a crop factor of 1x.

Cross-processing

Sometimes called 'X-Pro', in film photography this refers to processing colour negative film in reversal film (E6) chemicals, or colour reversal film in negative film (C41) chemicals. The resulting colour shifts gave images a distinctive look. The technique was once especially popular in fashion photography. A similar appearance can be created in Photoshop by boosting contrast and tweaking colour channels.

Curves

This powerful Photoshop tool enables you to adjust the exposure and contrast of an image. By altering the shape of the curve, different areas of tone can be lightened or darkened by varying amounts. By altering the curves for each of the different colour channels, the colour balance of the image can also be altered to create special effects, or simply to correct for unwanted colour casts. Elements' version of Curves, called

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Adjust Colour Curves, is more limited than Photoshop's Curves.

Cyanotype

A printing process that creates a distinctive cyan-blue print, discovered in 1842 by scientist Sir John Herschel (1792-1871). It was first used in photography by Anna Atkins (1799-1871), who produced a book of cyanotype photograms made using seaweed in 1843.

D

D

A type of Tokina lens that's compatible with full-frame SLRs.

DA

Stands for Digital Auto, which features on a range of Pentax lenses that (unlike some earlier ranges) don't have a manual aperture ring. They have a 'Quick Shift' mechanism that enables you to override focus manually, even when the lens is set to autofocus.

DA*

The premium lens range from Pentax, which combines weatherproofing with the advantages of the DA range.

Dark cloth

A sheet of black material, mainly used in large-format photography.

It covers the photographer's head and the camera, and allows the relatively dim image on the ground-glass screen to be seen more clearly when composing and focusing an image.

Darkroom

A light-tight room for processing and printing traditional photographs. Negatives are loaded into the processing tank in complete darkness, while a red/orange safe light can be used at the printing stage.

Daguerre, Louis

Louis Daguerre (1787-1851) was an artist and inventor who devised one of the earliest photographic processes, the daguerreotype, announced in 1839. It was made by coating a silver-plated copper sheet with light-sensitive silver iodide, and exposing it in a camera to create a positive image.

DC

This features on the range of Sigma lenses that are designed specifically for use with crop-factor SLRs, and which can't be used with full-frame models.

Decisive moment

The split-second when all the elements of a photograph simultaneously come together. The decisive moment is associated with

Cartier-Bresson, who described photography as “the simultaneous recognition, in a fraction of a second, of the significance of an event as well as of a precise organization of forms which give that event its proper expression.”

Dedicated flashgun

A type of flashgun that’s designed to provide direct one-way or two-way communication with the camera. The amount of dedication varies enormously depending on the flashgun and camera. Increased dedication tends to provide a more accurate flash metering, as well as making the flash system easier to use successfully.

Depth of field

A measure of how much of a picture is in focus, from the nearest point in the scene to the camera that looks sharp, to the furthestmost point that looks sharp. Depth of field is dependent on the aperture used, the distance that the lens is focused at, and the focal length of the lens.

Depth of field preview

Device found on some digital SLRs that enables you to see the viewfinder image at the actual aperture you’ll be using for the exposure. This gives a visual indication as to how much depth of field there is, and which parts of

the resulting picture will be sharp or blurred. This is necessary because the viewfinder normally only shows the image as it would appear if the widest aperture available were used.

Depth of field scale

A scale found on some lens barrels that can be used to work out the depth of field for particular apertures, and that can be used for manual focus adjustments to maximise or minimise the depth of field.

Depth program

A program exposure mode in which the aperture and shutter speed are set automatically in order to provide the maximum depth of field, while maintaining a shutter speed that’s fast enough for hand-held photography. With some cameras, the different subject distances measured by the multipoint autofocus system are also taken into account, and the focus is adjusted to suit.

Developer

A mixture of chemicals used to convert or amplify a latent image on a photographic film or print to make it visible.

DFA

This features on the range of Pentax lenses that will work with

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full-frame 35mm film cameras as well as crop-factor digital SLRs.

DG

This refers to the Sigma lens range suitable for full-frame SLRs (but that can also be used on crop-factor models).

Di

Tamron's 'Digitally Integrated' lenses have a full-size image circle, so they are suitable for full-frame and crop-factor SLRs.

Di II

Tamron's second-generation Digitally Integrated lenses are designed for use on popular crop-factor SLRs, and are not suitable for full-frame models.

Diaphragm

Another term for the aperture. These are the adjustable blades that regulate how much light enters the lens and reaches the sensor.

Dialog

A window that pops open when you select certain commands, usually to give you the opportunity to configure settings or enter further preferences. In Photoshop and Elements, menu commands that will open a dialog for further instructions before applying their effect are usually indicated by an ellipsis (...) after the name, such as

File>Save As... Those without this, such as File>Save, will work immediately, with no dialog.

Differential focusing

Controlling depth of field to ensure that one element in the picture is sharp, while others are as out of focus as possible.

Diffraction

Scattering of light caused by deflection at the edges of an opaque object. Diffraction causes slight fuzziness in the image when the narrowest apertures are used.

Diffuser

Any material that scatters the light as it passes through it, softening the illumination and making shadows less distinct. Diffusers are commonly used with artificial light sources. On sunny days, clouds act as natural diffusers.

Diopre

Optical measurement used to describe the light-bending power of a lens. The diopre value of a lens is equal to the number of times that its focal length will divide into 1000mm. Diopres are used to measure the magnification of close-up lenses, and of viewfinder lenses.

Dioptric correction

The facility provided on some

cameras for adjusting the viewfinder to suit the user's eyesight. Limited adjustment is built-in, and some cameras permit further modification with the use of additional dioptre lenses.

Disc film

A short-lived format introduced by Kodak in 1982. The disc-shaped film, housed in a plastic cartridge, contained 15 negatives measuring 11x8 mm. After each exposure, the disc rotated to the next frame. Poor image quality made it unpopular, and it was discontinued in 1999.

DNG (Digital Negative)

DNG is a raw file format invented by Adobe and used by some camera manufacturers. An advantage of DNG is that, unlike other raw formats, it isn't specific to just one camera manufacturer or model, and it isn't just a read-only format – you can save your files in DNG format too. A free DNG converter application available from Adobe at www.adobe.com/products/dng enables you to convert any raw file into a DNG.

DO

Diffraction Optics is used on a handful of Canon telephoto lenses. The technology enables these long lenses to be made smaller and lighter than equivalents using conventional optical designs.

Dodge tool

A way of lightening selected areas of the image during digital manipulation. The tool gets its name (and its spoon-shaped icon) from the traditional darkroom technique of 'dodging', where parts of a print are shielded from exposure and therefore given less light than other parts. See also *Burn tool*.

Doughnuts

The name given to the ring-shaped bokeh created by the unique construction of a mirror lens.

DPI

Dots per inch. Strictly speaking, a measure of the density of dots of ink that a printer lays down on paper. Compare image resolution (density of pixels) of a print or on-screen image at a certain size, measured in pixels per inch.

DPOF

(Digital Print Order Format)

A facility available on some digital cameras that enables users to mark the images from which they wish to have prints made.

D-SLR

(digital single lens reflex)

See *single-lens reflex*.

DT

A Sony lens with a smaller image

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circle, designed for use on crop-factor cameras.

Duotone

A duotone image is one made from two inks (usually black and another colour), and is often used in printed books to increase the tonal range of an image. It's also used by some fine-art photographers to add subtle colour to black-and-white photographs. A similar appearance can be achieved in Photoshop by converting a colour image to greyscale, then choosing Image > Mode > Duotone.

DX

Tokina's and Nikon's way of marking lenses that are only suitable for crop-factor (or APS-C) digital SLRs.

Dynamic range

A term used to describe the range between the lightest and darkest points in a photograph. The range that can be recorded by a digital camera is relatively small compared with the range that the human eye can perceive.

E

Eastman, George

George Eastman (1854-1932) was an American entrepreneur and philanthropist. He patented the

first paper negative roll film in 1884 before establishing Eastman Kodak in 1892, which went on to become one of the world's largest photographic companies. The popular Kodak 'Brownie' series was launched in 1900, with the famous slogan, 'You push the button, we do the rest'.

ED

A lens featuring Extra-low Dispersion glass in one or more of its elements, to help correct chromatic aberration. This abbreviation is used by Nikon, Panasonic, Olympus and others.

Edgerton, Harold Eugene

Harold Eugene Edgerton (1903-1990) was a professor of electrical engineering at Massachusetts Institute of Technology, who conducted innovative experiments with high-speed flash photography. He developed a flash tube that fired for one-millionth of a second, recording for the first time subjects such as a bullet piercing an apple.

EF

Stands for Electro Focus. This is the name of the lens mount Canon introduced on its first autofocus SLR cameras in 1987. EF lenses can be used on all Canon SLRs.

Effects filter

See *filter*.

EFL (effective focal length)

A measure for comparing the angle of view and magnification of different lenses and lens settings, whatever the size of imaging chip being used. The actual focal length is converted to the equivalent focal length that would give the same angle of view on a camera using 35mm. See focal length.

EF-S

Stands for Electro Focus Short back focus, a lens mount introduced by Canon in 2003. EF-S lenses have a small image circle so they are only suitable for use on crop-factor SLRs. A modified mount means that they can't physically be fitted onto incompatible (i.e. full-frame) Canon models.

EX

Sigma's designation for its premium lens range.

Element

An individual optical lens. Most photographic lenses are constructed using a number of lens elements, placed parallel to each other along a single axis. Some are placed together in groups.

Enlarger

A projector used in a traditional wet darkroom. Negatives are placed in the carrier, and a light inside the

enlarger head projects the magnified image onto a sheet of photographic paper on the baseboard. When the exposure is complete, the photograph is developed and fixed.

Environmental portrait

A portrait shot in a subject's home or work environment in such a way that it gives an insight into the subject's character. The American photographer Arnold Newman (1918-2006) is considered the father of environmental portraiture.

EV (exposure value)

The scale used to denote the exposure required without the need to specify either shutter speed or aperture. A particular EV setting has its own set pairs of possible shutter speed and aperture. Exposure values are often quoted in combination with an ISO speed to denote a specific light level.

Evaluative metering

A metering system used on many cameras, in which light readings are taken from a number of different areas, or zones, across the image. These readings are then compared to data programmed into the camera, so it can work out an appropriate exposure setting. Information from the multipoint

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autofocus system is also used, to ascertain the likely position of the subject. This 'intelligent' metering system can avoid many of the failings of simpler systems. However, it's impossible to second-guess, so it can be difficult to predict the occasions where it will get the exposure wrong. It's also known as matrix metering.

EVF (electronic viewfinder)

An eye-level LCD screen, as found on hybrid cameras, bridge cameras and camcorders. The image seen by the lens is electronically projected onto the screen.

EVIL (electronic viewfinder, interchangeable lens)

A type of hybrid camera that combines features of a traditional SLR with those of a compact camera. Unlike a digital SLR, this type of camera has an electronic rather than optical viewfinder. See *compact system camera*.

EXIF (exchangeable image file)

Camera settings recorded by many digital cameras as part of the image file. This data automatically notes a wide range of information about the picture, including the date and time it was recorded, aperture, shutter speed, model of camera, whether flash was used, number of pixels used, metering mode,

exposure mode, exposure compensation used and zoom setting. The information can then subsequently be read by suitable software. To access this information in Photoshop and Elements, go to File > File Info.

Exposure

The total amount of light used to create an image. The term is also used to describe a single shutter cycle, that is, the process of the camera's shutter opening, closing and resetting.

Exposure compensation

A control for manually overriding the built-in exposure meter of a camera to provide more or less light to the sensor.

Extension tube

An accessory used in macro and close-up photography that fits between the D-SLR body and the lens. The extra extension between the lens and sensor enables the lens to focus closer and to provide a higher image magnification than would otherwise be possible. Extension tubes are usually sold in sets of three, and are used singly or in combination to provide a total of seven different magnifications.

Eyedropper

A Photoshop tool used to sample the colour of an area, typically

changing the foreground colour to the same shade. It can also be used in some adjustment tools for setting exposure or colour balance, by clicking a particular area of tone as a reference point.

Eye relief

A measurement of the optimum viewing distance between the photographer's eye and the camera's viewfinder.

Eyepiece correction

See *dioptric correction*.

F

F-stop

The aperture setting on a lens. The number is the focal length of the lens divided by the diameter of the aperture. As a result, larger f-stop numbers represent narrower aperture sizes. F-stop numbers are used so that exposure settings for a particular scene can be expressed without having to know the focal length of the lens used. The term, F-stop, comes from the Waterhouse stop (a series of circular holes in strips of metal that 'stopped' some of the light passing through the lens). The system was invented by John Waterhouse (1806-1879) in 1858, but the hole sizes don't correspond with modern f-stop numbers.

f/x.x

The f-stop number is the size of the lens's maximum aperture, measured as a fraction of the focal length of the lens. On some zoom lenses there may be two apertures quoted f/4-5.6, for example. This means that the maximum aperture gets narrower as the lens is zoomed in. The maximum aperture on the lens barrel may also be expressed as a ratio, such as 1:4-5.6.

FA

A Pentax lens that's full-frame compatible, and that features an old-fashioned aperture ring.

False colour

A colour shown in a digital image that's different from the actual subject colour, and that often appears together with a moiré pattern. See *moiré pattern*.

Fast ISO setting

An ISO setting that makes the sensor more sensitive to light than usual, and thus requires less exposure than usual. Fast settings are useful in low-light situations where long shutter speeds are not suitable. A drawback is that grain-like noise within the image becomes more pronounced as the ISO speed is increased. See *ISO*.

Fast lens

A lens that has a wider maximum

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aperture than is usual for that particular focal length or zoom range, allowing a shorter shutter speed. Fast lenses are not only useful in low light; they can be invaluable for throwing backgrounds out of focus to a greater extent than usual.

Fast shutter speed

Relative term for an exposure that is shorter than average, usually set to avoid the blur that would otherwise be created by movement of the subject.

Feathering

A way of softening the edges of an area that you've selected to work on in Photoshop. It adds a transition zone of transparent pixels, which enables any background to partially show through (like with the edges of a feather). It's used so that the join between manipulated and non-manipulated areas is rendered less obvious.

Fenton, Roger

Roger Fenton (1819-1869) was a British photographic pioneer who took some of the earliest war photographs on the battlefields of the Crimean War in 1854. He was also the founder and first secretary of The Photographic Society, later renamed to The Royal Photographic Society.

File format

The way in which a digital image is stored. When you've finished editing your images, you usually get a choice of formats to use while saving. Common file types include JPEG, TIFF, and PSD.

Fill-in flash

Flash used as a secondary light source. A fill-flash feature is an option on many cameras with a built-in flash unit. With it you can soften shadows on foreground subjects, helping to avoid problems with backlighting. Fill-in flash can also be used to enhance the colours and contrast of foreground subjects in dull lighting conditions.

Fill light

In studio lighting, a fill light is used to give more detail to dark or shadow areas, and reduce contrast.

Film

In photography, film is a transparent plastic perforated strip or sheet that acts as a base for microscopic, light-sensitive silver halide crystals coated on one side with a gelatin emulsion. Black-and-white film has a single layer of silver salts, while colour film has a minimum of three layers of dye (blue, green and red), which sensitise the salts to different colours, as the scene being photographed dictates.

Filter

A general term used within Photoshop for a wide range of artistic effects and other utilities. Many are special effects, such as those that add grain and texture to an image. Others, such as the sharpening filters, are more utilitarian. Also, see *optical filter*.

Fisheye lens

An ultra-wide-angle lens that distorts the image in order to maximise the field of view. On 35mm cameras, the term refers to lenses with focal lengths of around 8-15mm.

FireWire

A method of transferring data such as digital images or video between devices. FireWire 400 was first introduced by Apple in the 1990s. The most recent version is FireWire 800. A FireWire 400 cable can be connected to a FireWire 800 socket using an additional adaptor.

Fixed focal length lens

A lens that doesn't have a variable focal length, and which has a single angle of view.

Fixer

A chemical mixture used in the wet darkroom to stabilise negatives and prints after development and make them insensitive to light.

Flare

Stray, non-image-forming light that reaches the sensor, creating unwanted highlights or softening the image. Lens coatings and hoods are designed to minimise flare. However, flare can still prove a problem when shooting towards a bright light source.

Flash

A burst of artificial light used to provide all or some of the illumination for an image. Most cameras have built-in flash units, while some allow a separate flash unit to be attached via the hotshoe, or used off-camera. In studio work, large standalone flash units or strobes use mains power, and are triggered by a flash sync cable or radio signal. Flash durations are usually between 1/200 sec -1/1000 sec and have a colour temperature of around 5,500-6,000k.

Flash synchronisation

Process that ensures that the peak output from the flash tube coincides with the shutter being fully open. On digital SLRs with focal plane shutters, full synchronisation is only possible at certain shutter speeds.

Flattening

A Photoshop term for merging all the visible layers to the background layer, reducing the file size.

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Fluorescent light

The lighting produced by strip light tubes. The colour balance can vary enormously, depending on the type of tube, and manual white balance settings therefore often offer several fluorescent settings. Daylight-balanced fluorescent tubes are used in some studio lighting systems.

FO

Stands for Focus-One-touch mechanism, on Tokina lenses. It enables you to switch between autofocus and manual focus by snapping the focus ring backwards and forwards.

Focal length

Optical term describing the distance between the optical centre of a lens and its focal point. In practice, the focal length is a measure of the magnification and angle of view of a given lens or zoom setting. It's usually measured in millimetres. However, its usefulness as a way of comparing different lenses is diminished by the fact that the exact focal length required to give a particular angle of view will depend on the size of the imaging chip used by the camera in question. See *EFL*.

Focal plane

The flat surface upon which the image is focused in a camera.

This is the plane where the photo sites of the CCD or CMOS image sensor are positioned.

Focal plane shutter

A shutter mechanism that sits just in front of the image sensor, in the lens's focal plane. It consists of two light-tight curtains that, when using fast shutter speeds, travel across the focal plane with a thin slit between them. Light passes through this slit to expose the image sensor or film. Using shutter speeds lower than the flash sync speed, one curtain crosses the focal plane to expose the whole sensor or frame of film, followed separately by the second curtain. This type of shutter is commonly used on D-SLR cameras.

Focus peaking

An electronic visual aid in which the parts of an image in sharp focus are highlighted on a Live View screen. This function was included on Sony's NEX mirrorless cameras in 2011. It has since been introduced on other companies' new camera models, including the Leica M (typ 240) and the Olympus OM-D E-M1.

Focusing screen

The surface upon which the viewfinder image of a digital SLR is projected. Its textured surface is designed to accentuate the degree

by which the image is sharp or not, thereby providing assistance when you're focusing.

4K

An ultra-high-resolution video format that delivers four times the amount of detail as 1080p full HD. It means that individual video frames, which have eight million pixels, are of a high enough quality to be printed as still images. Panasonic and Sony have both announced 4K-capable models, and more manufacturers are due to follow suit.

Four Thirds system

A standard image sensor format introduced by Olympus and Kodak in 2002. It has a 4:3 aspect ratio (the sensor size is usually 18 x 13.5mm), while other D-SLR systems use a larger sensor with a 3:2 aspect ratio.

Format

In film photography, 'format' refers to a photographic film size and its associated camera systems. Miniature Format is 35mm or smaller, Medium Format is any film size higher than 35mm, but lower than 4x5, while Large Format is anything larger than 4x5. For file formats, see *image file format*.

Fox Talbot, William Henry

An inventor and pioneer of

photography, Fox Talbot (1800-1877) introduced the calotype or talbotype process in 1841. His book, *The Pencil of Nature* (published in instalments from 1844-1846) was the first commercially published book to be illustrated with photographs. One of his most famous photographs, made in 1844, showed Nelson's Column in Trafalgar Square, London, under construction.

Fps (frames per second)

Measurement of the continuous shooting rate of a camera.

Framing

A technique for highlighting a subject and giving depth to an image by using another feature within the image to form a frame around it. Examples include shooting a church tower through an archway, or a portrait of someone looking through a window frame.

Frontal lighting

Lighting directed towards the subject, and therefore positioned behind, or level, with the camera.

Full-frame

Used to describe a digital SLR sensor that has a light-sensitive area the same size as a frame of 35mm film – around 24x36mm. See *sensor size*.

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FX

A Nikon (or Nikkor) lens that's compatible with its full-frame SLRs, as well as crop-factor ones.

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Stands for Gold – a designation found on top-class Sony lenses. It's also used for current Panasonic Lumix compact system cameras and lenses.

Gain

Amplification of an electronic circuit. It's used in digital cameras and camcorders as a way of electronically boosting the sensitivity of the imaging chip in low light. See *ISO*.

Gamut

The range of colours that can be printed or displayed by a particular device.

Gelatin emulsion

A thin coating on one side of a roll of photographic film, which contains microscopic light-sensitive silver halide particles.

Giclée

A name for digital prints made on high-resolution large format inkjet printers, coined by the printmaker Jack Duganne in 1991. It comes

from 'gicler', the French word meaning 'to spray or squirt'. The name originally referred to prints made on a prepress Iris printer, but now also includes those made on other large-format printers that use pigment-based inks and archival paper.

GIF

(graphic interchange format)

A digital file format that uses lossless compression. GIFs are sometimes used for graphics and images for use on the web. Its image palette is limited to 256 colours – much fewer than a TIFF, JPEG or raw file can contain – so its use to show photographs isn't recommended.

Gigabyte (GB)

Unit for measuring computer memory, roughly equivalent to 1,000 megabytes.

Guide Number (GN)

A number on a flash unit that measures its capacity to light a subject at a particular distance and ISO setting. Usually, based on a setting of ISO100, the guide number is determined by multiplying the flash-to-subject distance by the f-stop setting needed to correctly expose the subject at that distance. A flash with a lower guide number

produces a much weaker flash than one with a higher guide number.

Gradient tool

Fills the image or selection with a colour that fades into another colour (or into transparency).

It's particularly useful for creating masks with seamless edges, but can also be used to add colour to a drab sky.

Grad

See *graduated*.

Graduated

A type of optical filter that has a dark section and a clear section. These filters – commonly known as ND grads – are used to balance the brightness in high-contrast scenes, usually landscapes, with the dark area placed over the bright sky and the clear section over the dark foreground.

Grain

Metallic silver particles, random in shape and distribution, particularly visible in images made with black-and-white photographic film. It's present to a lesser degree in colour film. Grain is more noticeable in higher ISO film, but it's also visible in lower ISO film when making big enlargements.

Grey card

A neutral grey card, usually with

18% reflectance, is used as a standard reference when determining consistent photographic exposure. It's used by placing it in a scene to be photographed and taking a reading from it with a reflected light meter. This avoids problems of over-exposure and under-exposure.

Greyscale

A digital image in which all the colour information has been removed, leaving only black, white and shades of grey.

Grip and rip

A slang phrase for setting the camera to its highest continuous drive mode and keeping the shutter button held down to shoot as many frames as possible in a short space of time. 'Spray and pray' has the same meaning.

Ground glass screen

A sheet of glass, ground to a matte finish, which is used to look at images on large-format cameras. The image from the lens is projected upside-down on the screen. The image is examined and focused more easily by blocking out all other light with a dark cloth.

Group f/64

A group of like-minded San Francisco-based photographers, formed in 1932, which was

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dedicated to making clear, sharply focused images of landscapes and other natural forms. The group included Ansel Adams, Edward Weston and Imogen Cunningham. The group's name is a reference to its members' preference for using a very narrow aperture for increased depth of field.

Golden hour

Although not necessarily an hour long, this is the period of time after sunrise or before sunset in which landscape photographers particularly enjoy working because of the favourable effect of the light on their images. The main reason for the term is the warm colour of the sunlight, which, together with its reduced contrast, gives outdoor scenes an especially attractive appearance. The low angle of sunlight also creates longer shadows and reveals more texture in a landscape.

GPS

Stands for global positioning system. This geotagging feature is built into many more recently introduced camera models. Using satellite-based navigation, it records the camera's position when an image is made. This information can then be embedded in the image's metadata, allowing some software to show maps of where you took each photo.

H

Haloos

A term used to describe the glow that's created around the edges of objects when they've been over-sharpened in Photoshop or other similar photo-editing software. They are even more prevalent in HDR images.

Hand tool

A tool for moving your image around when you're zoomed in and can't see all the image at once, by dragging on the image. Press the H key, or hold down the space bar, to switch to this tool quickly.

HDR (high dynamic range)

A digital imaging technique where a series of identical pictures of a scene are taken at different exposures and then combined into one image. This brings out detail in shadow and highlight areas that usually can't be captured in a single exposure, and is particularly useful for high-contrast subjects, such as brightly-lit landscapes, interiors and night scenes.

Healing Brush tool

A retouching tool that lays down copied pixels like the Clone Stamp tool, but in addition it analyses nearby colour and tone and attempts to blend the cloned pixels in with the surrounding area.

Sometimes it produces better results than the Clone Stamp, but not always, because its blending effect will tend to blur detail. For seamless cloning, it's often a good option to use both tools.

HID

Stands for High Index Dispersion, a type of glass used in Tamron lenses that helps to minimise chromatic aberration.

High key

An image in which the bright, white tones dominate.

Highlights

The brightest (whitest) areas of an image.

High speed sync (HSS)

Flash feature that allows the use of shutter speeds with flash, faster than the usual sync speed. The flash pulses at high frequency to ensure an even exposure, even though the shutter blinds are never fully open during the exposure. The facility is useful for freezing close-up action in daylight, and for allowing the widest apertures even in bright light.

Histogram

A graph that provides an instant guide to the contrast and exposure of a picture. It maps the distribution of tones, from the

darkest on the left to the brightest on the right. The scale runs from 0 (solid black) to 255 (pure white), and the height of the graph at any point represents the relative number of pixels in the image with that brightness level. The overall shape of the histogram gives you an at-a-glance indication of the tonal range of the image and the presence of any clipping. You can use tools such as Levels to adjust the shape of the histogram and thereby improve the contrast and exposure of the image.

Hotshoe

An accessory shoe with an electrical contact, for mounting and connecting a flashgun.

HSM

Sigma's Hyper Sonic Motor is used in some of its lenses to provide faster and quieter AF operation.

Hue

Another term for colour. It tells you where a colour lies on the colour wheel without telling you how bright or dark it is.

Hyperfocal distance

The shortest distance at which a lens can be focused so that depth of field stretches to infinity for a given aperture and focal length. When focused at the hyperfocal length, depth of field will stretch

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from exactly half the hyperfocal distance to infinity.

I

Incident light meter

A hand-held light meter that measures the amount of light falling on a subject.

IF

Stands for internal focusing, and is found on many lenses from many manufacturers. The lens is constructed so that it doesn't change in length as the lens is focused. It also means that the front element doesn't rotate – which can help with the use of some lens attachments, such as petal-shaped lens hoods and polarising filters.

Image file format

A standard way of encoding information for storage in a computer file. File formats used in photography include JPEG, TIFF, PSD and GIF, all of which are suitable for particular uses. See the separate entries for those formats for details of how they differ.

Image sensor

An integrated circuit chip that converts an optical image into an electronic signal. In current digital cameras, most are either CCD

(charged coupled device) or CMOS (complementary metal-oxide-semiconductor) sensors.

Infinity

Optical term to describe objects that are so far away from the lens that light from them reaches the lens as parallel rays. In practice, it's usually used to mean objects that are on or near the horizon. Represented on lenses by the mathematical symbol, ∞ .

Infrared photographs

Images recorded on an image sensor or photographic film that's only sensitive to infrared (IR) light, beyond the spectrum visible to us. Black-and-white IR landscapes have a 'dreamlike' quality; grass and foliage is recorded as almost white, while blue skies become black. Digital cameras can be converted to only shoot IR images by removing the IR blocker in front of the sensor in the camera body and replacing it with a filter that instead blocks visible light.

Instamatic

The name of a hugely popular series of low-cost, easy-to-use cameras made by Kodak. First sold in 1963, Instamatics used Kodak's cartridge-based 126 film. In 1972, the company introduced the Pocket Instamatic, which used the smaller 110 film.

Inverse square law

This law particularly relates to the use of studio lights or flash, and says that if an object is twice a particular distance from a point source of light, it will receive a quarter of the illumination. For example, if your subject is two metres away, and you increase it to four metres, the resulting fall-off means you'll need four times the amount of light to keep the same exposure settings. Alternatively, you'll have to increase the exposure by two stops.

Iris

Another name for the diaphragm, or aperture, of a lens.

IS

The abbreviation used for Image Stabilization – the optical camera shake-reduction system found in a wide range of Canon lenses.

ISO

Stands for International Organisation for Standardisation. In photography, it refers to a system for measuring and specifying the sensitivity of digital imaging systems and photographic films. The higher the ISO number, the greater the sensitivity to light. Cameras have an ISO range, enabling you to choose an ISO setting that suits the situation in which you're shooting.

J

Jack

A socket into which a plug is inserted to make a connection, also known as a 'female' connector.

A jack on a camera is used for connecting an accessory such as headphones or a remote shutter release. A 3.5mm mini-jack is used for connecting an external stereo mic or to connect to old TVs.

Jaggies

See *antialiasing*.

Joiner

A term coined by the artist David Hockney (born 1937) to describe his photo-collage work in the 1980s. Hockney's joiners combined overlapping prints, made at slightly different times and from multiple viewpoints, to make landscapes and portraits. His most elaborate joiners used hundreds of individual prints to make one collage. Other photographers creating joiners (also called 'panographs') have followed Hockney's method of assembling prints, or have combined digital images on screen using photo-stitching software.

JPEG (Joint Photographic Experts Group)

A file format used for digital images. A variable amount of compression can be used to vary

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amount of detail stored and the resulting file size. It's the standard format used by digital cameras (although raw or TIFF formats may also be options).

K

Kelvin (K)

Unit used for measuring the colour temperature of light sources, named after the 19th century physicist and engineer William Thomson, first Lord Kelvin (1824-1907). Average noon daylight usually has a colour temperature of around 5500K.

Key light

The main light on a subject used in studio photography.

L

L Stands for Luxury, and is used to designate Canon's best pro lenses, which have superior build quality and weatherproofing.

Lange, Dorothea

Dorothea Lange (1895-1965) was an American photojournalist and documentary photographer. Her most famous image was taken in the 1930s, when she recorded the plight of sharecroppers and

migrant labourers during the Depression era for the American government's Farm Security Administration. Her best-known picture, *Migrant Mother* (1936) has come to symbolise the era.

Large format

See *format*.

Lasso tool

A pencil-like Photoshop tool that you can use to select an area you want to work on simply by drawing around it.

Layer

The digital counterpart of the cut-out pieces of paper in a collage or decoupage. Layers containing cut-out objects can be stacked on top of an original image or Background layer in order to create a composite image. Adjustments and effects can also be applied in the form of adjustment layers, enabling you to alter the exposure, colour, and so on, without actually altering the original. Layers can be opaque, translucent, or merged with layers in the stack below in a number of ways.

Layers panel

Formerly known as the Layers palette, this Photoshop feature enables you to manage and organise the layers in a multi-layered image, add new layers or

adjustment layers, and change the way in which layers interact with each other (such as their opacity and blending mode).

LCD (liquid crystal display)

Type of display panel used widely on cameras to provide information to the user. High-resolution colour LCDs are capable of showing detailed images, and are used as viewing screens on digital cameras.

LD

This features on Tamron lenses that use one or more Low Dispersion lens elements to help reduce chromatic aberration.

Leaf shutter

Also known as a diaphragm shutter, it uses overlapping 'leaves' of metal, which open and close to allow light to reach the image sensor or film. It's usually located between lens elements, and is commonly found on medium- and large-format cameras.

LED (light emitting diode)

Coloured indicator lamp used on many cameras.

Lensbaby

A selective focus lens with a flexible bellows tube section used for creating special effects. It allows the photographer to keep part of the image in focus while the

rest becomes increasingly blurred. The point of focus can be moved by pushing or pulling the lens.

Lens hood

Attaches to the front of the lens to prevent stray light from outside the image area entering the lens. The lens hood is important for preventing flare, and needs to be designed for a specific lens so as not to cause image falloff.

Levels

A tool used in digital image manipulation to adjust exposure, contrast and colour balance. Histograms are used as a guide to the corrections that need to be made to the image.

Light-field camera

Also known as a plenoptic camera, this device uses microlens-array technology to record images in a completely different way to a conventional camera. Uniquely, this allows images to be re-focused after they have been shot. The first light-field camera was introduced by Lytro in 2011.

Light meter

A device used to measure the amount of light and determine the correct exposure. Most cameras have built-in light meters that measure the reflected light from a subject, as do hand-held reflected

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light meters. Incident light meters measure the light falling on the subject, and readings are taken from the subject's position with the light meter pointing back towards the camera.

Light modifier

Any one of a number of devices that alters the direction and intensity of light. See reflector, softbox, snoot, barn doors and beauty dish.

Light trails

Lines of light recorded in an image by a moving light source during the exposure. Examples are vehicle lights on a motorway at night, lights on a fairground Ferris wheel or someone moving a hand-held torch. They can also result from shooting images of still lights and moving the camera during the exposure.

Lomography

A photographic style originally inspired by the images produced using the low-cost Russian-made 35mm Lomo LC-A camera, introduced in the 1980s. Lomography enthusiasts include lens blur, light leaks and other camera quirks as an important part of their images.

Long exposure

An exposure in which the camera's

shutter is open for an extended time period. It may be used at night to capture movement, such as car lights on a motorway or star trails, or during daylight to blur water movement in a river running through a scene. Long exposures in daylight are usually made using a neutral density (ND) filter to prevent over-exposure.

Long-focus lens

A lens used to magnify distant subjects that has a focal length longer than the diagonal measurement of the image sensor or film being used. In 35mm terms, this is any lens with a focal length longer than the 'normal' 50mm.

Lossless compression

A process whereby the size of a digital image file is made smaller without losing information. Lossless formats include TIFF and PNG.

Lossy compression

A process in which information is lost from a digital image file to make the file size smaller. This reduces the image quality, although the result may not be noticeable. JPEG is the most common file format to use lossy compression.

Low key

An image that is dominated by dark tones.

Lytro

See *light-field camera*.

M

Macro

Term generally used to describe equipment for taking pictures at a closer shooting distance than usual, to provide a bigger image of the subject. Historically speaking, the term 'macro' refers to when the recorded image is life-size or larger than life-size, with a magnification ratio that is 1:1 or greater.

Maddox, Dr Richard Leach

Maddox (1816-1902) was an English photographer and doctor who invented the first successful gelatin dry plate for photography in 1871. Until then, photographers used wet plates, which had to be coated, exposed and developed in hazardous chemicals while still wet. Leach's invention made photography much less dangerous and complicated, and laid the basis for early film emulsions.

Magic Wand tool

A tool that selects pixels on the basis of their colour. Click a pixel, and more pixels of a similar colour or tone will be selected. The Tolerance setting will dictate how close in colour other pixels must be in order to be included.

Magnification ratio

The relationship between the size of the focused image and the size of the subject. If the image is life-size, the magnification ratio is 1:1.

Manual exposure

An exposure made after the photographer has selected a shutter speed and aperture of their choice, usually after taking a reading from a built-in or hand-held light meter.

Manual focus

Adjusting the camera's focus by turning the focusing ring on the lens barrel by hand. It's often used to choose a particular focus point in macro photography. It can also be essential in certain lighting situations, for example low light or mist, when autofocus can struggle to lock on to a subject.

Marching ants

The dotted lines that flicker around areas that have been selected with a Marquee tool in Photoshop.

Marquee

The Marquee tools enable you to make regular-shaped selections such as ellipses or rectangles. The term 'marquee' is also used to refer to the animated dotted outline that indicates the border of a selection, which is also often referred to as 'marching ants'.

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Matrix metering

See evaluative metering.

Maxwell, James Clerk

James Clerk Maxwell (1831-1879) was a theoretical physicist who collaborated with photographer Thomas Sutton (1819-1875) to create the first colour photographic image in 1861. They photographed a tartan ribbon through red, green and blue filters. Then, at a lecture at The Royal Institution of Great Britain in London, the three negatives were projected together on a screen, using the same coloured filters, and combined to make one colour image.

Medium-format camera

Any camera that uses film larger than 35mm, but smaller than 4x5 (large format) film. In digital photography, the term refers to cameras that use sensors larger than a 36 x 24mm image sensor. Current examples include the Pentax 645Z and Hasselblad H5D-200c (both with a sensor size of 43.8 x 32.8mm)

Megabyte (MB)

A unit for measuring the size of computer memory and storage capacity in hard disks. Largely outmoded by the larger gigabyte unit (roughly 1,000 megabytes) as technology has improved to offer larger sizes.

Megapixel

A measurement of the resolution of a digital camera, equal to 1,000,000 pixels.

MemoryStick

Family of removable memory cards used by some digital cameras. Pioneered by Sony.

Metadata

Text information that describes an image file, such as EXIF camera settings and user-added captions.

Metered manual

An exposure mode in which shutter speed and aperture are set manually by the user, although information as to their suitability is provided by the camera's own metering system.

Micro Four Thirds system

A standard for compact system cameras (CSCs) created by Olympus and Panasonic in 2008. It uses the same sensor as Four Thirds system D-SLR cameras, but doesn't use the mirror box or pentaprism. This allows a smaller, lighter and more compact body and lens design.

Midtones

All the areas of an image that aren't shadows or highlights. These are areas of brightness that, if the image were converted to black and

white, would be a shade of grey rather than black or white. In a histogram, they correspond with the main central parts of the histogram graph.

Minimalist

As with minimalism in art, music and literature, this is a style of photography that uses a small number of elements to create its effect, and is often calm and contemplative. One contemporary photographer who consistently uses a minimalist style in his landscape work is Michael Kenna.

Moiré pattern

In photography, moiré occurs when a detailed or repetitive pattern in the subject is overlaid with the pattern of pixels on a digital sensor. The interaction of the two patterns produces a separate, often wavy, moiré pattern. The effect is reduced by the camera's optical low pass filter.

Monochrome

Although the term applies to images made using only one colour, or shades of one colour, in photography it usually refers to black-and-white images. The 'monochrome mode' on digital cameras enables you to record directly in black and white, instead of converting colour images at the post-capture stage.

Monopod

A one-legged camera support. This doesn't provide complete stability to the camera, but enables slower shutter speeds to be used than would otherwise be possible with a handheld camera. Used widely by sports photographers due to its manoeuvrability.

Motion blur

Out-of-focus streaking effect caused by the movement of the subject or camera during the exposure. Examples include a long exposure of a moving object passing through a static street scene at night, or panning the camera with a moving subject to create a background with blur.

Motor drive (or motorwind)

A camera facility for taking a number of pictures in rapid succession. The camera continues to take pictures as long as your finger keeps the release down, or until it runs out of memory.

Move tool

A tool used for aligning a layer by moving it around the canvas.

Mugshot

Taken from 'mug', the established slang word for 'face', the term originally applied to the stark police photographs of criminals, taken after arrest. It now refers to

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any simple head-and-shoulders portrait such as those found on a driving licence or passport.

Multiple exposure

An image created by two or more superimposed images.

Multizone metering

See *evaluative metering*.

N

Naturalistic photography

An approach put forward in the 1880s by the English photographer Peter Henry Emerson (1856-1936). He said that photographs should be direct and simple and reflect nature. He also said they should be produced from a single negative (as opposed to the use of multiple negatives in combination printing), without being staged or retouched.

Negative

An image made on a strip or sheet of film made of transparent plastic. Tones are reversed on black-and-white negative film, while on colour negative film, colours are recorded as their complementary colours. Negatives are converted to positive images when printed on photographic paper. The first negative was recorded on paper by William Henry Fox Talbot in 1835, using his calotype process.

Neutral-density (ND) filter

An optical or electronic filter that reduces the amount of light reaching the image sensor equally across the entire field of view. It permits longer shutter speeds or wider apertures than would otherwise be possible in the lighting conditions.

NFC

Stands for near-field communication, a short range wireless technology that has been introduced on many new camera models. It enables devices to communicate by using interacting electromagnetic radio fields. Images can be transferred wirelessly between a camera and a smartphone with NFC, simply by placing the devices close together.

Niépce, Joseph Nicéphore

Niépce (1765-1833) was a French inventor who made the earliest surviving permanent image from nature in 1826. He used a camera obscura to project an image onto a pewter plate coated with light-sensitive Bitumen of Judea. His groundbreaking 'heliograph', View from a Window at Le Gras, showed a courtyard and buildings at his house.

Noise

Unwanted interference in an electrical signal, which is seen as a

grain-like pattern in dark areas of a digital image. Noise increases in digital photos when a higher ISO setting is used.

North light

The diffuse, reflected light that comes through a north-facing window, which is therefore not directly lit by sunlight. Its soft, flattering quality makes it popular in portrait photography.

O

OIS

Optical image stabilisation, the system used on Panasonic lenses to reduce camera shake.

OLED

Stands for organic light-emitting diode. OLED screens use a thin film of organic compound between two conductors that emits a bright light when an electric current is applied. These screens make flexible, high-quality displays that are lighter, thinner and faster to respond than LCDs. They are becoming increasingly common on high-end cameras.

1080p

A format for recording full HD video with a resolution of 1920 x 1080 pixels, offered on many current digital cameras.

Optical filter

A glass or plastic accessory placed in a holder or attached to the front of the camera lens. They are used to alter the image being recorded by allowing light of particular wavelengths to pass through while blocking others. Most of the traditional optical filters are only used in film photography, because their effects can be replicated by in-camera digital filters or by using post-processing techniques on a computer. The types of optical filters still used widely in digital camera capture include the polariser, UV filter, ND filter, ND grad and infrared filter.

Optical low-pass filter

A filter built into many digital cameras and located in front of the image sensor. It reduces the combined effect of moiré and false colour in digital images.

Orientation sensor

A sensor used in some cameras that detects when you turn the camera to take a vertical shot. It stores this information so that it displays the image correctly when played back on the camera LCD or computer screen.

OS

Stands for optical stabilisation, the system used on some Sigma lenses to reduce camera shake.

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Over-exposure

Exposing an image for too long to suit the subject in given lighting conditions. As a result, details in highlight areas are lost or 'blown out'. Some photographers choose to over-expose when creating a particular effect. They may also use over-exposure to compensate when the camera's light meter gives an incorrect reading – when shooting snow scenes, for example.

P

Pack shot

A short form for 'packaging shot', this is a photograph of a product with labelling clearly displayed, and is usually taken for advertising or other commercial reasons. Studio setups for pack shots can vary from the simple to the elaborate.

Paint Bucket tool

A Photoshop tool that fills a complete area with a particular colour. As with the Magic Wand tool, you can adjust the Tolerance to change the effect. It can be useful for creating masks.

Painting with light

Creating images with a mobile light source. One way of painting with light is to shoot a scene in the dark, whether indoors or outdoors, with the camera on the B (bulb) setting.

While the shutter is open, objects in the scene can be 'painted' with light from a hand-held flash or other light source. The other technique also involves shooting in the dark with the shutter open, but in this case the light source is moved while being pointed towards the camera, often to create a 'light trail' shape in the final image.

Palette Bin / Panel Bin

Area on the right of the interface for keeping various dialogs and information displays in Photoshop/Elements. Later versions tend to use the term 'panel' instead of 'palette'. The feature can be minimised to buttons or hidden completely.

Pan-and-tilt head

A tripod attachment that provides independent movement of the camera in both horizontal and vertical planes, giving the photographer greater flexibility.

Panning

Moving the camera along a horizontal plane during the exposure to follow a moving subject.

Panograph

See *joiner*.

Panoramic

An elongated image in which the width is at least twice the height.

Panoramas are made by cropping one image, made using a specially designed panoramic camera, or by combining several images together using 'stitching software'. Aspect ratios for panoramic images can be 4:1 or higher.

Partial metering

A type of metering system where the exposure reading is taken from a small area in the centre of the field of view. It's similar to spot metering, but the reading is taken from a larger area of the image.

Passive autofocus

An autofocus system that adjusts the focus of the lens by analysing the image itself, rather than actively measuring the subject distance. Passive autofocus is used by most digital cameras, and is also known as phase-detection or contrast-detection autofocus.

Parallax

An effect in which the image seen through a camera's lens is not the same as that seen through the viewfinder, resulting in parts of the scene missing in the photograph. It's found in any camera in which the viewfinder and lens are separate, such as rangefinder and twin-lens reflex cameras.

PC-E

Stands for perspective control-

electronic. It's used to designate Nikon's range of tilt-shift lenses, which enable you to move the front elements on the lens to avoid or exaggerate lens distortion. These lenses are commonly used in architectural photography to ensure vertical lines remain parallel in the picture.

PC lens

Stands for perspective-control lens, another name for a shift lens.

PC socket

A simple electrical connection socket found on some D-SLRs for connecting a flash to a camera to enable synchronisation. It's widely used for connecting studio flash.

Pellicle mirror

A lightweight, thin, translucent mirror used in Sony's Single Lens Translucent (SLT) cameras. In this design, part of the light coming through the lens is diverted to an autofocus unit, and part goes to the digital sensor. This allows the photographer to see a continuous image through the viewfinder during exposure. It also avoids vibration and noise from the movement of a mirror.

Pentamirror

A low-cost alternative to the pentaprism (see next entry) used in the construction of some D-SLRs.

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They offer the same functionality, but use mirrors for the viewfinder construction rather than a prism.

Pentaprism

The five-sided prism used in the eye-level viewfinder of SLR and D-SLR cameras. It ensures that the image appears the right way up and the right way around in the viewfinder, correcting the effects of the mirror and the lens.

Perspective

Perspective is used to translate a three-dimensional scene into a two-dimensional image. It gives the viewer a sense of depth in the image, for example, through the use of converging lines in a landscape. Perspective allows us to interpret the size and distance between objects, relative to the camera's viewpoint.

Phase-detection autofocus

See *passive autofocus*.

Photobomb

To appear in the background of an informal portrait and upstage the person being photographed, without them being aware.

Photo book

A book largely consisting of photographs. It's a means by which photographers have displayed their work since the earliest days of the

medium. Landmark photo books of the past have included Robert Frank's *The Americans* and Cartier-Bresson's *The Decisive Moment*. More recently, the ability to create a personalised photo book has come within everyone's reach via online companies such as Blurb, Snafish and Photobox.

Photogram

A photographic image created by placing an object on a sheet of light-sensitive paper and exposing it to light. When the paper is developed, parts of the object that light rays cannot pass through are recorded as pure white, while translucent parts might be recorded as shades of grey. The technique goes back to photography's earliest days. The artist and photographer Man Ray (1890-1976) later produced many such images, which he called 'Rayographs' or 'Rayograms'.

Photojournalism

News journalism using a camera to record events. The 'golden age' of photojournalism's lasted from the 1930s to the 1950s, before television took over as the main source of news, but it still plays an important role in the media.

Photomerge

A group of 'automated' features designed for combining a number

of similar or related shots together, including Photomerge Panorama for combining an overlapping sequence to create a panoramic view. Elements includes additional Photomerge tools not included in Photoshop, such as Photomerge Group Shot (for combining the best features from a series of near-identical group portraits).

Photomicrography

Photographic images of things invisible to the naked eye, created using a microscope. D-SLR cameras are connected to a microscope using an adaptor, and the degree of magnification is determined by the power of the microscope.

Photoshop

Industry-standard software program produced by Adobe that enables photographers to edit digital images on screen and save them as a JPEG, TIFF, PNG or GIF. It was initially named Display, and was created by Thomas and John Knoll in 1988.

PictBridge

A system for printing direct from a camera to a compatible printer without the need for first uploading images to a computer.

Pictorialism

An artistic approach to

photography, dominant during the late 19th and early 20th century. Instead of being straightforward documents of reality, photographs were given a more painterly, soft-focus appearance. Processes such as bromoil, gum bichromate and platinum printing, which involved manipulating a photograph's tones and texture using brushes, pigments and inks, were popular among Pictorialists.

Pincushion distortion

A lens fault or aberration that causes parallel lines in an image to bow inwards towards the centre, and is seen when shooting with telephoto lenses. The effect is similar to one you'd see if an image was printed on a pincushion. It can be corrected using post-capture software such as Photoshop.

Pinhole camera

A camera that uses a small hole instead of a lens to project an inverted image on to photographic film or a digital sensor. Exposures are usually manually operated and can range from several seconds to hours in duration. D-SLRs can be converted to pinhole cameras by replacing the lens with a piece of plastic drilled with a hole of around 0.3mm in diameter. Alternative pinhole cameras have been made with anything from wheelie-bins to shoe boxes.

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Pixels

Every digital photograph is made up of millions of square-shaped dots called pixels (the term derives from “picture elements”). Like the tiles in a mosaic, they blend together to create a photorealistic image. Zooming into your images using the Zoom tool in Photoshop/Elements enables you to see, and then edit, each of these building blocks if you choose.

Pixelated

A digital image in which individual pixels can be clearly seen, either due to very low resolution or high magnification of a small part of an image. Pictures are sometimes deliberately pixelated, for example when someone’s face is obscured in a newspaper for legal reasons.

Plugin

A piece of software that adds functionality to an existing computer program. Plugins are available for many digital image manipulation programs, including Photoshop/Elements, providing an increased range of effects and transformations.

Polariser

A filter that only transmits light vibrating in one plane. It can be used to deepen the colour of part of a picture, such as the sky. It can also be used to eliminate or reduce

reflections on non-metallic surfaces, such as water or glass. It must be rotated in front of the lens until you achieve the desired effect. See circular polariser.

Positive

An image that gives an accurate representation of the composition, tones and colours of the original subject being photographed, as opposed to a negative in which the subject’s composition, tones and colours are reversed.

PPI

Pixels per inch. A measure of the resolution (density of pixels) in a print or on-screen image.

Predictive autofocus

A sophisticated autofocus setting where the focus is not only adjusted until the shutter is actually fired, but continues to be adjusted during the delay between pressing the shutter and the picture actually being taken. This enables the camera to focus more accurately on moving subjects.

Prefocusing

A manual focusing technique used for photographing moving subjects. The lens is focused on a point or at a distance, which you anticipate the subject is going to move through. The shutter is released when this point is reached.

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Previsualisation

A term first introduced by Ansel Adams, which he defined in his book *The Camera* (1980) as “the ability to anticipate a finished image before making the exposure”.

Prime lens

A non-zoom lens, that is, a lens with a single and fixed focal length.

Program exposure

Any exposure mode where the camera defines both the aperture and the shutter speed.

Program shift

A program exposure mode in which the camera sets the shutter speed and aperture automatically, but the photographer has the option of altering the bias between the two readings to set a preferred shutter speed or aperture without changing the overall exposure.

PSD

Photoshop’s (and Elements’) own file format, which preserves components such as layers and transparency that aren’t supported by some formats (including JPEG). It’s worth saving an edited photo as a PSD if you might want the option to revisit layers or adjustment layers at a later time.

Puppet Warp tool

First introduced in Photoshop CS5,

this tool allows you to adjust or radically change the shape of parts of an image. Subjects can be selected and altered without affecting the background.

Push/pull processing

In film photography, push processing means increasing the film’s speed by shooting with shorter exposures than recommended and increasing the development time proportionately. This allows photographers to work in lower light conditions, but increases the grain size. Pull processing means using longer exposures than recommended and reducing development times, to give a negative with reduced contrast and grain.

PZ

Stands for power zoom, a servo-assisted zoom facility found on some Panasonic compact system camera lenses.

PZD

Stands for piezo drive, a type of ultrasonic motor used in Tamron lenses to provide fast, quiet AF.

Q

Le Querrec, Guy

Guy Le Querrec (born 1941) is a French photographer best known

for his documentary work with jazz musicians. He joined Magnum Photos in 1976 and began experimenting with film shortly after. He won the Grand Prix de la Ville de Paris in 1998.

Quick-release plate

A facility for attaching and removing a camera from a tripod. A plate attaches to the camera using the traditional screw-in arrangement, then the plate slots into a recess on the tripod.

R

Rangefinder

A camera with a separate lens and viewfinder, linked by a rangefinder mechanism. When looking through the viewfinder, two separate images are shown, one of which moves when the focus ring is turned. When the two superimposed images are perfectly aligned, the image is in focus.

Raw

A file format option provided by D-SLRs and some other top-end digital cameras. Image data is stored in a semi-processed state and needs to be fully processed on a computer. Raw files enable exposure compensation, image contrast, colour balance and other settings to be altered after the

initial exposure, while still retaining maximum image quality. Raw images also offer a greater tonal range than the alternative JPEG recording quality options. Raw isn't an abbreviation, or even a single file type like JPEG; the format varies from manufacturer to manufacturer, and sometimes from camera to camera. Most current Canon models use CR2, and Nikon models use NEF.

Rear-curtain sync

Flash feature found on some D-SLRs and flashguns that synchronises the flash output when the second shutter curtain is about to close. Usually, the flash fires at the point where the first shutter is fully open. The facility gives more natural-looking images when using flash in conjunction with slow shutter speeds.

Reciprocity

The reciprocity law states that the density of a photographic image is in direct proportion to the intensity of light (aperture setting) and the duration (shutter speed). For example, if the correct exposure for a subject is 1/125 sec at f/4 and the aperture is increased by one stop to f/2.8, the shutter speed must be correspondingly reduced by one stop to 1/250 sec to maintain the same image quality, and vice versa.

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Reciprocity failure

In film photography, when shooting with very long or very short exposures, the reciprocity law (see above) can break down, leading to reciprocity failure. In these cases, extra exposure might be needed to compensate, as specified by the film manufacturer. Reciprocity failure doesn't occur with digitally captured images.

Red-eye

An effect often caused by a camera's built-in flash. The flash light reflects from the retina of a subjects' eyes and gives them a bright red colour. It can be reduced or corrected in-camera, or at the post-processing stage.

Reflected light reading

The most frequently used type of exposure meter reading, which measures the amount of light reflecting from a subject. An alternative approach is to use an incident light meter, which measures the amount of light falling on a subject.

Reflector

A piece of card or other flat material that reflects and increases the amount of illumination from a light source. Reflectors can be white, silver or gold, and are often used to 'bounce' light into shadow areas and make them brighter. An

umbrella-shaped reflector on a studio light is used to create softer and more diffuse illumination.

Rembrandt lighting

A studio portrait lighting technique named after the Dutch painter Rembrandt van Rijn (1606-1669), who often used it. It refers to lighting one side of the face so that it creates a triangle of light on the opposite cheek. A reflector is sometimes used to bounce light on to the side of the face in shadow.

Reportage

The act or technique of news reporting. In photography, the term refers to the art of telling a news story through pictures. Many wedding photographers offer 'reportage style' pictures. This simply means that the day's events are approached as if it were a news event, and recorded in an informal and unobtrusive way. See *photojournalism*.

Resize

To create a new copy of an image with a different file size or resolution (pixel count).

Resolution

A measure of the density of pixels in a printed or on-screen image, usually expressed in terms of pixels per inch (ppi). A resolution

of 300ppi is widely regarded as the optimum for professional-quality printing. Monitors typically display images at between 72 and 96ppi, although this can vary with monitor size and other factors. Changing a photo's resolution in the Image Size dialog in Photoshop won't change how big it looks on-screen, only in print.

RF

The rear focus feature is found on super telephoto lenses. With rear focus, the group of elements nearest the camera are used to determine the point of focus, providing faster autofocus.

RGB

Stands for red, green and blue. These are the three primary colours used by a digital camera to record a picture. Some tools can access and edit each of the three colour channels separately.

Rim lighting

Light from behind or to the side of a subject that gives a thin line of light around some or all of the subject's edge, which sets it clearly apart from the background.

Ring flash

A flash lighting system that uses a circular flash tube attached to the front of the lens to provide even, shadowless lighting. Ring flash is

often used in macro photography, but is sometimes used in other kinds of photography including portraiture. Oversized ring flashes are available for studio use, providing doughnut-shaped catch lights when used for portraits.

Rule of thirds

One of the best-known compositional 'rules', in which an image is divided, horizontally and vertically, into three parts, using two equally spaced lines. Important elements of the picture are then placed on one or more of these lines, which creates a stronger and more visually appealing composition than simply centering the subject. The term has its origins in painting, and was first written down by the artist John Thomas Smith in 1797.

Roll film

A photographic film wound on a spool and protected from light with paper backing. The most commonly used type is 120 roll film. It's used in cameras shooting 6x4.5, 6x6, 6x7 and 6x9 negative sizes, plus panoramic cameras.

S

Sabattier effect

A wet darkroom effect in which an image is processed so that it's

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partly a normal positive image and partly a negative. It was first described in the 1860s, but became well-known in the work of Man Ray (1890-1976). His assistant, Lee Miller (1907-1977) accidentally turned on a light while developing a print, but Ray liked the effect and consciously used it in his work. He called it 'solarisation'. The Sabattier effect is easily recreated using Photoshop, and looks best applied to a black-and-white image.

Safelight

A red/orange lamp used to light a traditional wet darkroom when printing black-and-white photographs. It's safe to use at the printing stage because photographic paper isn't sensitive to red/orange light.

SAM

Stands for smooth autofocus motor, which has been used in recent Sony Alpha lenses.

Saturation

The strength of a colour or hue. An increase in saturation gives a more intense colour. Too much saturation, and the image will look unreal. An image with no saturation whatsoever will be black and white.

Scale

Scale gives us a sense of the size of

an object or environment in an image, by using another object in the scene as a frame of reference. For example, by including a person in a landscape, the viewer is given a strong idea of the relative size of that landscape.

Scheimpflug principle

Theodor Scheimpflug (1865-1911) stated: "If the lens plane is tilted down, when the extended lines from the lens plane, the object plane and the film plane intersect at the same point, the entire subject plane is in focus."

This principle comes into play when using tilt-shift lenses or tilt-and-swing movements on view cameras. In practice, it means that if you're photographing a landscape, the lens can be tilted forwards until the plane of focus runs parallel to the ground. As a result, depth of field is vastly increased, even when shooting with the lens wide open.

Scratch disk

Hard disk space used by Photoshop while processing an image to temporarily store information and make the process faster. It's used, for example, to store the history states that are essential for using the History panel.

Screen grab

Also called a screen shot or screen

capture, this is an image of all or part of a computer monitor display that can be saved as a graphics file.

SD

Super-low dispersion, the glass used in Tokina lenses to reduce chromatic aberration.

SD (Secure Digital) card

A type of removable memory card used in some digital cameras.

SDHC

(Secure Digital High Capacity)

A type of SD card that has a higher maximum capacity than standard SD cards (up to 32GB).

SDM

Supersonic drive motor, Pentax's fast, quiet focus motor.

SDXC (Secure Digital Extended Capacity)

A type of SD card that has an even higher maximum capacity than SDHC cards (up to 2TB).

Second curtain sync

An alternative term for rear-curtain sync.

Secondary mirror

A mirror used in digital SLRs to project some of the light passing through the lens to exposure and autofocus sensors.

Selenium tone

A chemical treatment applied to a silver-based black-and-white print in a wet darkroom that changes some of the metallic silver to silver selenide. Depending on dilution and the type of printing paper, tones may range from red-brown to purple-brown. The appearance of the effect can now be simulated in post-capture software on a computer. Photoshop CS6 and CC includes selenium toning among its range of toning presets.

Selfie

A modern term for self-portrait, a genre becoming increasingly popular in the age of the smartphone camera.

Self-timer

A camera facility that incorporates a delay between the pressing of the trigger and the beginning of the exposure. It has traditionally been used to enable the photographer to appear in the shot. It can also be used as a way of minimising the vibration caused by pressing the camera shutter, when shooting a long exposure with the camera mounted on a monopod or tripod.

Sensor size

The dimensions of the CCD or CMOS sensor in a digital camera vary greatly according to the type of camera. This has a major impact

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on image quality. Larger sensors collect more light and produce images with greater dynamic range and less noise than smaller sensors. Smartphone camera sensors measure around 4.5 x 3.4mm; compact camera sensors are around 6.1 x 4.5mm; D-SLR sensors are around 23.5 x 15.6mm, while a 'full frame' 35mm sensor measures around 36 x 24mm. A medium-format sensor (such as in the Pentax 645Z) measures around 44 x 33mm.

Sepia tone

A chemical treatment used in traditional photography that converts metallic silver in a black-and-white photograph to silver sulphide. It has the effect of changing shades of grey into shades of reddish-brown.

The appearance can easily be created in digital images, either in-camera or using Photoshop.

720p

A high-definition video recording format with a resolution of 1,280 x 720 pixels, offered on many of the more recent digital cameras.

Sharpening

Sharpening boosts the contrast around the edges of objects to increase definition, which helps counter the inherent softening effect of digital capture. Inkjet

printing has a further softening effect, so if you're going to print your image, it will need more sharpening than it would need for on-screen viewing.

Sheet film

Film used in large-format cameras, including 5x4 and 10x8 equipment, which is supplied in boxes of individual sheets.

Shift lens

An interchangeable lens available for a small number of D-SLRs and medium-format cameras. The lens provides a limited range of camera movements, including a facility for the lens to be shifted upwards to avoid converging verticals when photographing tall subjects, especially buildings. Also known as a PC lens.

Shutter

A device for allowing light to pass through a camera lens to the digital sensor or film, usually for a precise period of time. See also *leaf shutter* and *focal plane shutter*.

Shutter lag

The delay between the photographer physically pressing the shutter and the exposure actually being made.

Shutter priority

A semi-automatic exposure mode

in which the shutter speed is set by the photographer. The aperture is then set by the camera to suit the metered light readings taken by the camera.

Shutter speed

Also called exposure time, this is the length of time the camera's shutter is open to allow light coming through the lens to reach the image sensor or film.

Side lighting

This is illuminating a subject from one side across the camera axis, either using natural or artificial light, while the other side remains in shadow. It's often used in portraiture to give texture and depth to a subject. It can give a dramatic look, especially against a dark background. If desired, shadow areas can be lightened by using a reflector.

Silver halide

The light-sensitive chemical compound that, when coated on photographic film or paper, enables images to be recorded.

Single lens reflex (SLR)

A camera that uses a pentaprism and mirror to show the exact image being seen through the lens. When the shutter is released, the mirror flips up to allow the image to pass through to the sensor or film.

Slave

Device that triggers a flash unit automatically when another flash is fired. The slave uses a light-sensitive photoelectric cell, and cuts down on the number of cables needed in a studio.

SLD

Stands for super-low dispersion – lens elements in Sigma lenses that reduce chromatic aberration.

Slow lens

A lens with a narrower than average maximum aperture for the focal length. As a result, shutter speeds at the maximum aperture are longer than with 'faster' lenses.

Slow sync flash

Technique in which a slow shutter speed is used in conjunction with flash. The flash usually provides the main source of illumination, but the ambient light creates a secondary exposure that can be useful in suggesting movement, or for providing detail in a background that would otherwise have looked unnaturally dark.

SLT

Stands for Single Lens Translucent. This is a proprietary name for Sony Alpha cameras that use a pellicle (fixed, translucent) mirror, electronic viewfinder and phase-detection autofocus system.

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Smc

Stands for super multi coating, a seven-layer coating used on Pentax lenses to reduce light reflected by the lens itself.

Snapshot aesthetic

A style of fine-art photography that uses a seemingly casual, snapshot appearance, and focuses on everyday subject matter. Photographers using this approach have included William Eggleston (born 1939), Nan Goldin (born 1953) and Wolfgang Tillmans (born 1968). It was particularly popular in 1990s fashion photography.

Snoot

A tube-like attachment in the shape of a cone or cylinder, which fits on the front of a flash unit or studio light. It enables the photographer to control the direction and width of the light so that it concentrates on, or isolates, a subject.

Social documentary

Photographic genre that concentrates on recording the everyday lives of people from different nationalities, cultures and social classes. Social documentary projects often have a particular purpose, such as the photographs of Lewis Hine (1874-1940) highlighting child labour in the early part of the 20th century,

or Sebastião Salgado's 1993 project on the conditions endured by workers in different countries around the world.

Softbox

An enclosure around a flash or continuous light. The insides are lined with reflective material while the square or round front screen is made of a white opaque material that diffuses and softens the light. Softboxes can measure anything from 40cm to 2m across the front.

Soft focus

Slightly blurred and lacking in sharp definition. Images can be 'soft' due to a lens flaw, or made deliberately so to give a romantic 'glow' to an image. It can be achieved in-camera by attaching a soft-focus or diffuser filter to the lens, or by shooting through a piece of translucent material (for example, a section cut out from a pair of tights). It can also easily be added using post-capture software on a computer.

Solarisation

See *Sabbattier effect*.

Sontag, Susan

Susan Sontag (1933-2004) was an American writer, filmmaker and prominent activist, whose series of essays collected in the book, *On Photography* (1977), was a

groundbreaking critique of the photographic medium.

Soup

Slang term for developer.

SP

Stands for super performance, a long-standing tag found on top-of-the-range Tamron lenses.

Spot meter

Exposure metering system in which a meter reading is taken from a very small area in the centre of the frame.

sRGB

RGB colour space frequently used by digital cameras, but providing a narrower range of colours than the Adobe RGB space.

SSM

Stands for supersonic motor, used for high-speed autofocus in top-of-the-range Sony lenses.

Standard lens

A focal length of lens roughly equal to the diagonal of the image sensor area. Typically, standard lenses have an effective focal length of around 50mm.

Steichen, Edward

Edward Steichen (1879-1973) was an American fashion and portrait photographer. As Chief

Photographer at Condé Nast publications in the 1920s and 1930s, he was the most famous (and reputedly the highest paid) photographer in the world. He was Director of Photography at the Museum of Modern Art in New York from 1947-1962 and in 1955 organised the Family of Man exhibition, seen by over nine million people.

Still-life photography

Following in the centuries-old tradition of still-life painting, still-life photographs focus on single or small groups of objects. They can be shot indoors or outdoors, using daylight or artificial light, and are usually carefully arranged by the photographer. Notable still-life photographers include Edward Weston (1886-1958) and Irving Penn (1917-2009).

Street photography

Photographs taken in public places that record human behaviour or interaction in a way that comments on society or life in general. Street photographers aim to capture life as it happens and usually take pictures when people are unaware. Those who have worked in this broad genre include Henri Cartier-Bresson (1908-2004), Robert Frank (born 1924) and Garry Winogrand (1928-1984).

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Stieglitz, Alfred

An important advocate for photography as an artistic medium, Stieglitz (1864-1946) formed the Camera Club of New York in 1896 and edited the magazine *Camera Notes*. He formed the Photo-Secession in 1902, a group of leading photographers that argued that artistic expression was the most important thing about photography. His ideas influenced a generation of photographers.

Stitching

Combining two or more overlapping images of a subject to create one seamless panoramic or high-resolution image. It can be achieved via dedicated software programs such as Autostitch or Canon's Photostitch, or using the Photomerge feature in Photoshop.

Stop

A unit of exposure. Changing exposure by a single stop is equivalent to doubling or halving the amount of light reaching the image sensor. The distance between each of the standard aperture settings (f/2.8, f/4, f/5.6, f/8, f/16 etc.) is a full stop. Digital SLRs usually provide a number of intermediate half-stop or third-stop settings.

Stop down

Close down the camera's aperture.

Strobe light

Also called a stroboscopic lamp, this light source produces flashes of light (usually around 200 microseconds in length) at regular intervals. In photography, it's been used to make high-speed images of subjects that move too fast for the eye to see, such as a bullet zipping through the air. Strobe lights have also been used to capture multiple images of a moving subject in one image, for example in the photographs of dancers by Gjon Mili (1904-1984).

Superzoom

A lens with an unusually large focal length range. Current superzoom examples available for D-SLR cameras include the Tamron 80-270mm f/3.5-6.3 and the Sigma 18-200mm f/3.5-6.3. Some of the largest superzooms are found on bridge cameras; the Panasonic Lumix DMC-FZ70 has a 60x optical zoom, for example, which is equivalent to 20-1,200mm. Bridge cameras themselves are sometimes called 'superzooms' or 'ultrazooms'. See *bridge camera*.

Swinger, Polaroid

A name used on some of the affordable and easy-to-use range of instant cameras produced by the Polaroid Corporation in the 1960s and 1970s.

SWM

Silent wave motor, the high-speed quiet autofocus motor used on Nikon's AF-S lenses.

Sync speed

The fastest shutter speed that can be set on a camera that enables synchronisation with the flash. See flash synchronisation.

T

Table-top photography

Images of small objects or a miniature scene, arranged on a table top.

Talbotype

See *calotype*.

Teleconverter

A supplementary lens used between a primary lens and the camera body to increase the focal length range of the primary lens. For example, a 1.4 teleconverter on a 200mm lens will increase the focal length to 280mm, but causes a corresponding reduction in the maximum aperture size.

Telephoto

A term generally used to describe any long-focus lens (in 35mm photography, a lens with a focal length of 85mm upwards). However, telephoto technically

refers to a long-focus lens in which the physical length of the lens is shorter than its focal length, a design feat achieved by its internal lens assembly.

Terabyte (TB)

Unit for measuring computer memory or disk storage capacity, which is roughly equivalent to 1,000 gigabytes.

TFT (thin film transistor)

High-quality colour LCD technology, widely used for rear displays on digital cameras.

Thumbnail

A small, low-resolution version of a larger image. It's often used in image management applications such as Adobe Bridge and Organizer to make it easier and faster to search through and preview your photo collection. The small representations of each layer in the Layers panel in Photoshop and similar software are also referred to as thumbnails.

Three-quarters lighting

Used in portraiture, this style of lighting is created by placing a light at approximately 45 degrees from each side of the centre line of the face. It lights three quarters of the face, leaving a shadow area along the side opposite to the light that gives the face depth and volume.

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TIFF (Tagged Image File Format)

Digital image format used to record files with maximum available detail. Files can be large, although this can be reduced using lossless compression.

Time exposure

See *long exposure*.

Time-lapse

Technique where pictures are taken of the same subject at regular intervals. Some time-lapse photographers record an event that takes place over a long period of time, such as a butterfly emerging from a chrysalis.

TLR

Stands for twin-lens reflex. A TLR camera has two lenses of the same focal length; one is used for taking the picture while the other provides the image for the waist-level viewfinder, seen via a 45-degree mirror. The two lenses are connected so that focusing is the same on both lenses.

Tog

Short form for 'photographer'.

Tone mapping

A technique used in image processing to reduce the range of tonal values in a high dynamic range image, so it looks more

natural when shown on a computer monitor or in print.

Toning

Changing the colour of a black-and-white print or digital image. In traditional photography, black-and-white prints are usually toned using chemicals to change the metallic silver in the print emulsion to a silver compound. This happens in sepia and selenium toning. Other processes, such as platinum and gold toning, are known as metal-replacement toners. Similar effects can be produced in digital images using post-processing techniques.

Toy camera

An inexpensive and easy-to-use film camera, such as the Holga, Lubitel, Lomo LC-A and Diana. Their lens quality and general build leads to vignetting, image blur, distortion and light leaks, but many photographers enjoy incorporating these flaws into their images for artistic effect.

Transform

A Photoshop tool used to scale, rotate, reduce, enlarge, distort or change the perspective of a layer, selection or shape.

Travel photography

A genre of photography that concentrates on documenting the

landscape, people, culture and customs of a country.

Tripod

A three-legged camera support.

Tripod bush

Threaded socket found on the base of cameras, used for attaching tripods and other accessories.

TS-E

Tilt-shift electronic – Canon's range of perspective control lenses. (See *PC-E*.)

TTL

(through the lens) metering

An exposure metering system in which the intensity of light is measured through the camera lens.

Tungsten lighting

A type of bulb lighting that has a warm colour temperature of between 2,600 and 3,500K.

Tv (time value)

Abbreviation used for shutter priority on some cameras.

U

UD

Stands for ultra-low dispersion, a type of glass used in Canon lenses to reduce chromatic aberration in the image.

Umbrella

An umbrella is used in a studio to reflect and diffuse light from a flash unit, creating a softer and more even light. The most common types are the white shoot-through umbrella, which is used between the flash and the subject, or the black umbrella with a reflective silver or white underside that bounces flash light back on to the subject.

Under-exposure

An insufficient exposure for the subject to retain all the shadow details, so that darker areas become black or almost black. The greater the under-exposure, the darker the image. This may be a conscious choice for artistic reasons.

Underwater housing

A sealed container specifically made to protect particular cameras from damage in underwater photography, and that allow controls to be accessed and operated as normal.

Unsharp Mask

One of the most popular Photoshop tools for increasing sharpness in a digital image. It gets its curious name from a traditional print process, where a soft focus negative is sandwiched with the sharp original in order to increase edge contrast.

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USB 3.0

The third version of the Universal Serial Bus standard for connection and communication between computer peripherals (including digital cameras and printers) and personal computers. It was released in 2008 and was further updated to USB 3.1 in 2013.

USD

Stands for ultrasonic silent drive, Tamron's fast, quiet AF motor.

USM

Stands for ultrasonic motor, a fast, low-noise autofocus motor used by some Canon lenses.

UV filter

An optical filter that absorbs ultraviolet (UV) radiation. It can be used to improve visibility and quality in mountain and maritime landscapes. Many use them to protect the front of the lens.

V

Variable contrast

A type of photographic printing paper that, in the wet darkroom, allows a range of contrast grades to be produced by changing the colour of the filter in the enlarger head.

VC

Stands for vibration compensation,

the name of the optical camera shake-reduction system on some Tamron lenses.

Vibrance

A slider available in Adobe Camera Raw and Photoshop that enables you to increase the saturation of colours. It doesn't increase saturation universally – it concentrates on colours that are not saturated already, with a more limited effect on colours that are already intense. This often leads to a more visually pleasing result.

View camera

A large-format film camera that uses sheet film. Depending on the camera design, film sizes can range from 5x4 inches to 20x24 inches. All view cameras have a front standard with a lens mount and a rear standard with a film holder and ground glass screen for focusing. Both standards can be moved backwards and forwards and at different angles to alter perspective, focus and depth of field. They are connected by a flexible and extendable bellows. View cameras can be used with digital backs instead of film.

Vignetting

Darkening of the corners of an image. This appearance is often deliberately created to highlight a subject in the centre of the image,

and can be applied by digitally burning in corners. It's also commonly seen in images taken with toy cameras such as the Holga. If vignetting is unintended, it's usually due to lens fall-off, and can be corrected using post-processing software.

VR

Stands for vibration reduction, Nikon's name for its image-stabilisation system.

W

WB

An abbreviation for white balance. See *white balance*.

Watermark

An element embedded in a digital image, such as a name or symbol, to show ownership and prevent images being used without the copyright owner's permission.

Weston, Edward

Edward Weston (1886-1958) was one of the major American fine-art photographers of the 20th century. His aim was, he said, to "make the commonplace unusual." His photographs were clear and detailed representations of landscapes, portraits, nudes, and, most famously, still-life subjects such as seashells and peppers.

White balance

Digital camera system that sets the colour temperature for the scene being photographed. This can be set automatically, with the system attempting to set the colour so that it looks normal to the human eye. Most D-SLRs also offer a wide selection of manual white balance settings – where the WB can be set from a reference source (such as a piece of white card), or to a particular Kelvin value, or to a lighting type (such as sunny daylight or tungsten bulb lighting).

Wide-angle lens

A lens with a focal length shorter than the 'normal' lens (that is, the lens that gives the most true-to-life field of view) for a given format. In the 35mm format, focal lengths from 35mm to 24mm are considered wide-angle, while lenses from 21mm to 14mm are generally described as ultra wide-angle.

WR

Weather resistant – a term found on certain Pentax lenses.

Wratten number

A code for labelling optical filters, named after the inventor Frederick Wratten (1840-1926). Each separate colour has a number (orange filters, for example, have the number 81) and some have

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letters to indicate the strength of the filter (an 81EF is much stronger than an 81A, for example).

X

XLD

Stands for extra low dispersion, the glass used in some Tamron lenses to reduce chromatic aberration.

XMP

Stands for extensible metadata platform. A labelling technology used by a number of image-editing programs, including the Photoshop family. It records information about a file, and is usually embedded within the file itself. With raw files, the XMP information is recorded separately.

XR

Stands for extra refractive, a type of glass used in Tamron lenses. It can bend light at wider angles than normal glass, helping to make the overall size of the lens smaller.

Y

Yellow filter

In film photography, yellow filters were often used by black-and-white landscape photographers to darken a blue sky and brighten the landscape.

Yevonde, Madame

Madame Yevonde (1893-1975) popularised the use of colour in portrait photography in the early 1930s. She's most famous for her studio portraits of the mid-1930s that made creative use of costumes and props.

Z

ZA

Stands for Zeiss Alpha – a range of Sony lenses designed by Carl Zeiss.

Zone system

The Zone system is a systematic technique for calculating the best possible film exposure and development. It was formulated in around 1940 by photographers Ansel Adams (1902-84) and Fred Archer (1889-1963).

Zoom

A lens with a variable angle of view. On a zoom lens, the focal length can be changed while the focus remains the same.

Zoom ratio

The relationship between the shortest and longest focal length setting of a zoom lens. For example, a 14-42mm lens has a zoom ratio of 3:1, or 3x; a 50-500mm lens has a zoom ratio of 10:1, or 10x.

