



Pamaris Alfaro Gronz and her children live in an 8-by-8-foot structure in Nueva Vida. She says sometimes her baby daughter gets milk and sometimes only water to keep her alive. Photo by NOPPADOL PAOTHONG, *The Chart* (Missouri Southern State College, Joplin, Mo.; Chad Stebbins, adviser)

Technique

Text by BRADLEY WILSON

Learning how to use a camera is the beginning, but not the end, to producing good photos.

"An unusual or highly refined technique, like the subject of a picture, is not as important as the idea expressed in the photograph."

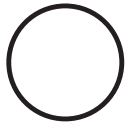
Jerry Burchfield, Mark Jacobs, Ken Kokrda, *Photography in Focus*

"A camera is not some mysterious device that will turn you into an artist overnight. It is a tool, a mechanical device, a machine. In many ways, a photographer is similar to a musician. Both use machines — that's exactly what a saxophone or a violin really is — but the quality of their art depends on how they use those machines."

Michael F. O'Brien & Norman Sibley, *The Photographic Eye: Learning to See with a Camera*



APERTURE



f/2



f/2.8



f/4



f/5.6



f/8



f/11



f/16



f/22

most light
least depth of field

least light
most depth of field

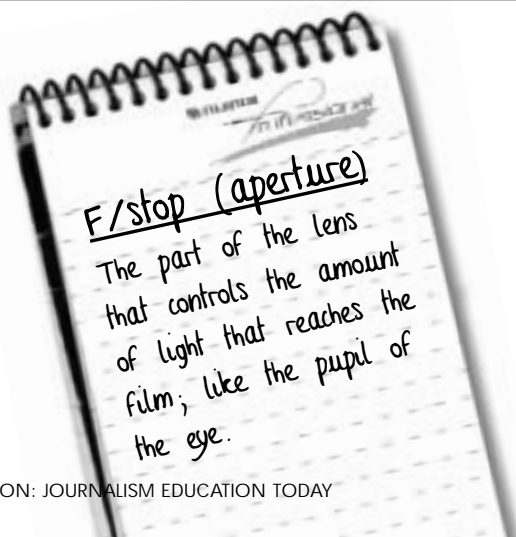
For this photo, JENNI GREEN of Chantilly High School (Va.; Mary Kay Downes, adviser) used an f/stop such as f/5.6 for this picture under stage lights.



With a wide-angle lens and plenty of light, MATT SLOCUM used a high f/stop such as f/8 or f/11 for the photo below.



In extreme low-light situations, wide-open apertures maximize the amount of light reaching the film. Each f/stop lets in half as much light as the next higher f/stop or twice as much light as each lower f/stop. For example, f/8 lets in twice as much light as f/11 and half as much light as f/5.6. So, the less light available, the wider the aperture. For this photo, photographer MATT SLOCUM used a wide-open aperture such as f/2.

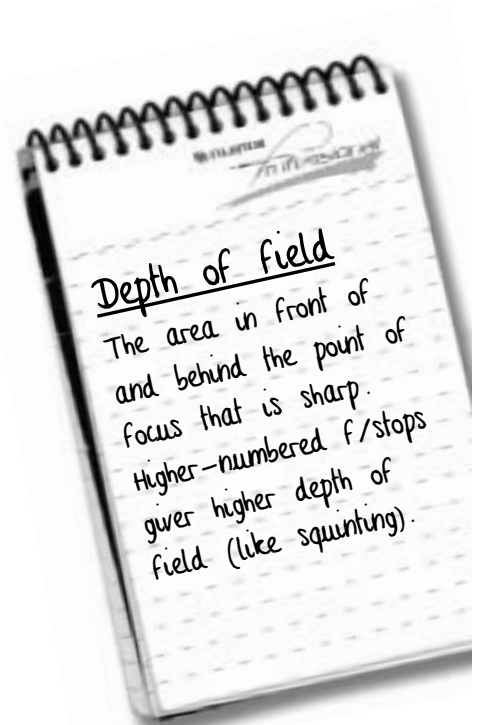


F/stop (aperture)
The part of the lens that controls the amount of light that reaches the film; like the pupil of the eye.

DEPTH OF FIELD

High-numbered f/stops, such as f/16 or f/22 used for this photo below JUSTIN HAYWORTH, render nearly everything in the foreground and background in focus – high depth of field. Using high depth of field is useful when the background contributes to the content of the photo. The lens a photographer uses and the distance from the subject also influence the depth of field. Wider-angle lenses inherently have more depth of field. The closer the photographer is to the subject, the less the depth of field.

Low-numbered f/stops, such as the f/2 or f/2.8 MATT SLOCUM used for the photo below, help isolate the subject from the background. In technical terms, the f/stop number represents how many times the diameter of the lens can be divided by the focal length. For example, if f/2 is the widest opening on a lens, then the widest diameter of that lens is one-half the focal length.



SHUTTER SPEED

1	1/2	1/4	1/8	1/15	1/30	1/60	1/125	1/250	1/500	1/1000	1/2000
more light			FRACTIONS OF A SECOND						less light		
stops less action									stops more action		

Photographer BRYAN KLECKA (Cy Falls High School, Houston, Texas; Lisa Van Etta, adviser) used a relatively slow shutter speed, about 1/60 of a second, to stop some of the action while blurring the faster-moving objects.



For this photo, photographer JOSH MERWIN stopped the action with his flash, but used a slow shutter speed, around 1/15 of a second, to allow the arena's lights to register a blurry image on the film. The technique gives the photo a sense of action. Each shutter speed lets in half as much light as the next slower shutter speed and twice as much light as the next faster speed. For example, 1/125 lets in twice as much light as 1/250 but half as much light as 1/60.



When there's plenty of light, fast shutter speeds, such as 1/500 or 1/1000, are good for stopping all the action as JOSH MERWIN did in this picture.

FILM

ISO (International Standards Organization)

25	100	125	200	400	800	1000	3200
low sensitivity to light less grain						high sensitivity to light more grain	

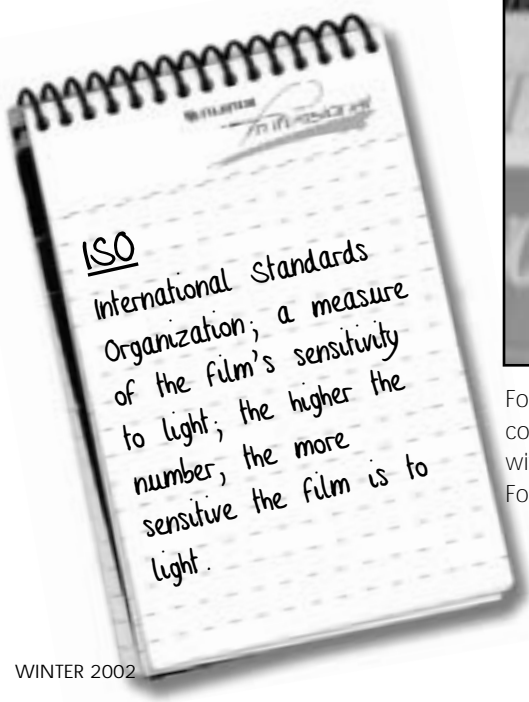


For photographs under low light when a fast shutter speed is desirable, photographers like JOSH MERWIN typically use Fuji 800 film.

Under bright light, such as in this photo by BRADLEY WILSON, 200 ISO film gives higher resolution and lower grain than faster films.



For the average academic shot, 400 ISO film, either in black-and-white or color, works. It has tolerable grain and can be used inside and outside and with flash. As the ISO number doubles, so does the film's sensitivity to light. For example, 400 ISO film is twice as sensitive to light as 200 ISO film.



EXPOSURES

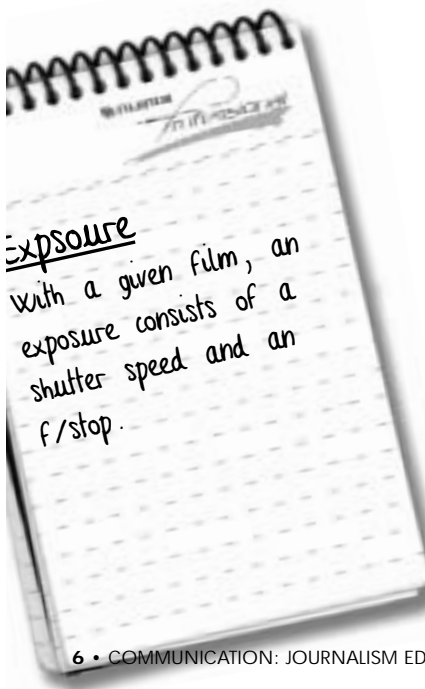
In bright sunlight, the appropriate exposure can be determined using the f/16 rule: "In bright sunlight, the exposure is f/16 at the shutter speed closest to 1/ISO of the film." For example, for this daytime football shot, the photographer, BRENT BUNGER (Cy Falls High School, Lisa Van Etta, adviser) could have used 400 ISO film. So, applying the f/16 rule, the exposure would have been f/16 @ 1/500 since the closest regular shutter speed to 1/400 is 1/500.



A camera's light meter can be tricked into underexposing the subject, the firefighter, when there is bright light source in the background – backlighting. To properly expose the subject, move in close and take a meter reading of just the subject. Then back up and keep the same exposure setting. Alternatively, open the recommended exposure by two stops. For example, if the meter indicates f/5.6 @ 1/250, use f/2.8 @ 1/250. The final alternative is to use a flash to illuminate the foreground. In some cases, however, such as in this photo by MICHAEL DALBOM (Shawnee Mission Northwest High School, Kan., Susan Massey, adviser), the silhouette can be powerful.

CAMERA EXPOSURE MODES

- P Program:** camera sets shutter speed and aperture.
- S Shutter Priority:** you set shutter speed; camera sets aperture.
- A Aperture Priority:** you set aperture; camera sets shutter speed.
- M Manual:** you set both aperture and shutter speed.



EQUIVALENT EXPOSURE



f/2 @ 1/4000



f/4 @ 1/1000



f/8 @ 1/250

ALL OF THESE EXPOSURES ARE EQUIVALENT.

All of these pictures were taken from the same position on the same day with the same amount of light. It was a partly cloudy day so the base exposure with 200 ISO film was f8 @ 1/250, the closest exposure to f/16 @ 1/200 plus two stops because it was partly cloudy. This exposure was used for the picture on the right side. To bring the viewer's focus in to one of the girls, the photographer needed less depth of field so he opened up two f/stops. Because that let in four times as much light, he had to compensate by using a faster shutter speed to give an equivalent exposure of f/4 @ 1/1000, the middle picture. That still did not provide low enough depth of field so he opened up two more f/stops and compensated by closing down two "stops" on the shutter speed, giving an equivalent exposure of f/2 @ 1/4000, resulting in the image on the left.



f/8 @ 1/250



f/2.8 @ 1/2000

BOTH OF THESE EXPOSURES ARE EQUIVALENT.

The exposure for this picture started out, on a sunny day, as f/16 @ 1/250 using 200 ISO film. The subject was backlit so the initial exposure was modified to be f/8 @ 1/250, adding two stops. Because the photographer was concerned more about depth of field to isolate the subject from the background, he changed the aperture and not the shutter speed. Had he been able to use a slow shutter speed, he could have compensated by using an exposure of f/16 @ 1/60. To blur the background more, the photographer's camera set on aperture priority calculated the following equivalent exposures:

- f/5.6 @ 1/500
- f/4 @ 1/1000
- f/2.8 @ 1/2000

To minimize depth of field, he used the last exposure. Notice that this exposure, compensated for backlighting, minimized depth of field and stopped all the action.

F/16 RULE

In bright sunlight, the exposure is f/16 at the shutter speed closest to 1/ISO of the film.

PARTLY CLOUDY

Starting with the f/16 rule, add two "stops." For example, open up the aperture by two stops or use a shutter speed two speeds slower. Or open up one f/stop and one shutter speed.

CLOUDY

Add four "stops."

Equivalent exposure
Two or more exposures that allow the same amount of light to reach the film but use a different shutter speed, aperture combination.

LENSES



A **TELEPHOTO LENS** has a narrow angle of view. A 200mm lens, for example, has an angle of view of 12". Telephoto lenses

compress the objects in the frame, making them appear closer together. All other things being equal, telephoto lenses have a lower depth of field than other lenses. Long telephoto lenses are ideal for taking pictures of distant subjects such as at sporting events. Photo by CRAIG MOORE.



A **WIDE-ANGLE LENS** encompasses more in the picture than other lenses. A typical 28mm wide-angle lens

has an angle of view of 76". Items close to the edge of the frame are distorted. Wide-angle lenses, all other things being equal, have a higher depth of field than other lenses. Any lens wider than 50mm (for a 35mm camera) is considered a wide-angle lens. Extreme wide angle lenses, around 15mm, are called fisheye lenses. Photo by JOSH MERWIN.



A **NORMAL LENS** (50mm for a 35mm camera) has an angle of view roughly equivalent to the human eye 46". Normal lenses are generally inexpensive and have a large maximum aperture of f/1.4 or f/1.8. The maximum aperture or "speed" of a lens is one criteria that determines cost. The wider the maximum aperture, the greater its light-gathering capability. Photo by MIKE SHEPHERD.



A **MACRO LENS** is designed for extreme close-up photography.

Typically, they come in 50mm and 100mm varieties and have the other characteristics of normal lenses of the same size. The closer you are to the subject, inherently, the lower the depth of field, making focus critical. Photo by THOMAS HARDY.

FOR 35MM CAMERAS

15mm FISHEYE
extreme wide-angle lens

20mm 28mm 35mm WIDE-ANGLE LENSES

good for moving close to a subject but still getting a lot in the frame; distortion along the edges

50mm NORMAL
good for routine shooting

85mm 105mm 135mm SHORT TELEPHOTO
good for portraits, candid and some sporting events

200mm 300mm 400mm LONG TELEPHOTO LENSES
used when the subject is distant; good for sporting events and wildlife photography

EXERCISE

Using your own paper, answer the following questions. Be sure to show how you arrived at your answer.

1. To avoid having to carry a bag full of lenses, many photographers carry a zoom lens such as one that goes from 28mm-70mm – wide-angle to short telephoto. For the photo at right, assuming the photographer used such a zoom lens, what focal length did she use?
2. The picture was taken under bright sunlight using 400 ISO film. Using the f/16 rule, what was the initial exposure?
3. To blur the background more, if you wanted to decrease the depth of field, what's an equivalent exposure you could use?
4. Evaluate the composition and the content of this photograph. How could it be improved?



For this photo by JEANEL DRAKE, Shawnee Mission Northwest High School (Kan., Becky Lucas, adviser), the photographer got down low, a creative way to eliminate clutter from the background. However, with the bright sky, the subjects were backlit.

1. How did Jeanel compensate for backlighting in this photo?
2. What other ways could she have compensated?

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