Exposure value

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In photography, exposure value (EV) denotes all combinations of a camera's shutter speed and relative aperture that give the same exposure for a selected sensor speed (ISO.) In an attempt to simplify choosing among combinations of equivalent camera settings, the concept was developed by the German shutter manufacturer Friedrich Deckel (de) in the 1950s (Ray 2000, 318). Exposure value also is used to indicate an interval on the photographic exposure scale, with 1 EV step corresponding to a standard power-of-2 exposure step, commonly referred to as a stop.

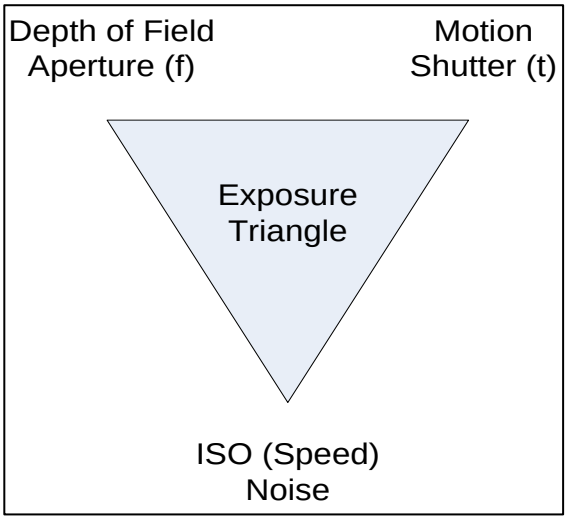
See the full article for additional information.

Download this file and print the next two pages. Follow the instructions to assemble a sliderule exposure calculator. To make the slid move easily, fold the first page just outside the lines and trim the slider on the second page just inside the lines.

To use the calculator, find a sceen description that matches the sceen you are wanting to photograph then move the slider to put that EV value in the right hand window next to the ISO setting you are using. The left hand window displays the shutter speed value for each apature.

Most modern cameras can set exposures down to EV 1, or lower. However, many night sceens will give an incorrect exposure value depending on how the sceen iluminates the sensors. The calculator can be used in these situations to estimate a correct exposure.

Use the calculator exporsure as a starting point and adjust as needed to get the effect you desire for your photograph.



Exposure Triangle

Exposure is the combination of 3 values, Apature (f stop), Shutter (time) and ISO (sensor speed.) For any exposure you can select only 2 of the 3 values.

To increase Depth of Field, use a small aperture (high f number f:16.)

To stop motion, use a fast shutter speed (1/500.)

To decrease noise, use a low ISO value (200.)

Exposure Calculator

Sunny f/16 Rule

For EV 15, Subjects in bright or hazy sun, set apature to f/16, set shutter to 1/ISO.

Shutter	f/Stop
	1
	1.4
Cut out	2
window	2.8
	4
	5.6
	8
	11
	16
	22
	32
	45
	64

ISO	EV
25	
50	
100	Cut
200	out
400	win.
800	
1600	
3200	
6400	
12800	
25600	
51200	
102400	

EV	Sceen
-6	Night, away from city lights, subject under starlight only.
-5	Night, away from city lights, subject under crescent moon.
-4	Night, away from city lights, subject under crescent moon. Meteors (during showers, with time exposure).
-3	Night, away from city lights, subject under full moon.
-2	Night, away from city lights, snowscape under full moon.
-1	Subjects lit by dim ambient artificial light.
0	Subjects lit by dim ambient artificial light.
1	Distant view of lighted skyline.
2	Lightning (with time exposure). Total eclipse of moon.
3	Fireworks (with time exposure).
4	Candle lit close-ups. Christmas lights, floodlit buildings, fountains, and monuments. Subjects under bright street lamps.
5	Night home interiors, average light. School or church auditoriums. Subjects lit by campfires or bonfires.
6	Brightly lit home interiors at night. Fairs, amusement parks.
7	Bottom of rainforest canopy. Brightly lighted nighttime streets. Indoor sports. Stage shows, circuses.
8	Las Vegas or Times Square at night. Store windows. Campfires, bonfires, burning buildings. Ice shows, football, baseball etc. at night. Interiors with bright florescent lights.
9	Landscapes, city skylines 10 minutes after sunset. Neon lights, spotlighted subjects.
10	Landscapes and skylines immediately after sunset. Crescent moon (long lens).
11	Sunsets. Subjects in deep shade.
12	Half moon (long lens). Subject in open shade or heavy overcast.
13	Gibbous moon (long lens). Subjects in cloudy-bright light (no shadows).
14	Full moon (long lens). Subjects in weak, hazy sun.
15	Subjects in bright or hazy sun (Sunny f/16 rule).
16	Subjects in bright daylight on sand or snow.
17 to 21	Rarely encountered in nature. Some man made lighting.
22 23	Extremely bright. Rarely encountered in nature.

<--- fold line

Shutter	f/Stop	ISO	EV
	Slider		23
			22
			21
			20
			19
			18
			17
			16
8000			15
4000			14
2000			13
1000			12
500			11
250			10
125			9
60			8
30			7
15			6
8			5
4			4
2			3
1s			2
2s			1
4s			0
8s			-1
15s			-2
30s			-3
1m			-4
2m			-5
4m			-6
8m			

Instructions
Print these 2 pages.

Cut out windows labeled Shutter and EV on the first page.

Fold the page on the verticle lines to form a flat tube.

Trim the edges of the page and tape the edges to hold the tube together.

Cut out the slider on this page on the verticle lines.

Slide the slider into the flat tube so that you can see the shutter and EV values in the windows.

TO UES EXPOSURE CALCULATOR:
Locate the EV for yor sceen in the list on the front and back of the flat tube.

Move slider to align sceen EV with your ISO setting printed on the front of the tube.

Read shutter and f/Stop pairs for that EV and ISO in the Shutter window. Select an exposure setting for the sceen as a starting point and experiment for the best exposure.

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