Sunny 16 rule

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In photography, the **Sunny 16 rule** (also known as the **Sunny f/16 rule**) is a method of estimating correct daylight exposures without a light meter. (For lunar photography there is a similar rule known as the Looney 11 rule.) Apart from the obvious advantage of independence from a light meter, the Sunny 16 rule can also aid in achieving correct exposure of difficult subjects. As the rule is based on incident light, rather than reflected light as with most camera light meters, very bright or very dark subjects are compensated for. The rule serves as a mnemonic for the camera settings obtained on a sunny day using the exposure value (EV) system.

The basic rule is, "**On a sunny day set aperture to *f*/16 and shutter speed to the [reciprocal of the] ISO film speed [or ISO setting] for a subject in direct sunlight.**"[1] For example:

- On a sunny day and with ISO 100 film / setting in the camera, one sets the aperture to f/16 and the shutter speed to 1/100 or 1/125 second (on some cameras 1/125 second is the available setting nearest to 1/100 second).
- On a sunny day with ISO 200 film / setting and aperture at f/16, set shutter speed to 1/200 or 1/250.
- On a sunny day with ISO 400 film / setting and aperture at f/16, set shutter speed to 1/400 or 1/500.

As with other light readings, shutter speed can be changed as long as the f-number is altered to compensate, e.g. 1/250 second at f/11 gives equivalent exposure to 1/125 second at f/16. More in general, the adjustment is done such that for each step in aperture increase (i.e., decreasing the f-number), the exposure time has to be halved (or equivalently, the shutter speed doubled), and vice versa. This follows the more general rule derived from the mathematical relationship between aperture and exposure time — within reasonable ranges, exposure is proportional to the square of the aperture ratio and proportional to exposure time; thus, to maintain a constant level of exposure, a change in aperture by a factor c requires a change in exposure time by a factor $1/c^2$ and vice-versa. Steps in the aperture always correspond to a factor close to the square root of 2, thus the above rule.

An elaborated form of the Sunny 16 rule is to set shutter speed nearest to the reciprocal of the ISO film speed / setting and f-number according to this table:[2][3]

Aperture	Lighting Conditions	Shadow Detail
f/22	Snow/Sand	Dark with sharp edges
f/16	Sunny	Distinct
f/11	Slight Overcast	Soft around edges
f/8	Overcast	Barely visible
f/5.6	Heavy Overcast	No shadows
f/4	Open Shade/Sunset	No shadows
Add One Stop	Backlighting	n/a

References

1. ^ Bernhard J. Suess (2003). *Mastering Black-and-White Photography* (http://books.google.com/books?id=7LaRPNINH_YC&pg=PT112&dq=%22sunny+16+rule%22). Allworth Communications. ISBN 1-58115-306-6.
2. ^ James Martin (2004). *Digital Photography Outdoors: A Field Guide for Travel and Adventure Photographers* (http://books.google.com/books?id=XMd7CsUws6sC&pg=PA70&dq=Slight+Overcast+16+Soft+around+edges). The Mountaineers Books. ISBN 978-0-89886-974-3.
3. ^ Chris Bucher (2007). *Lighting Photo Workshop* (http://books.google.com/books?id=o6QUAI_WYZsC&pg=PA58&dq=Slight+Overcast++f/11+%22Soft+around+edges%22#PPA59,M1). John Wiley and Sons. p. 58. ISBN 978-0-470-11433-9.

External links

- Guide to Photography (http://guidetofilmphotography.com/sunny-16-exposure.html) Sunny 16 and film exposure guide.
- Ultimate Exposure Computer (http://www.fredparker.com/ultexp1.htm) Fred Parker's guide to using the Sunny 16 Rule and an EV scale to calculate exposure by hand.
- Rules of thumb for moonlit exposures (http://home.earthlink.net/~kitathome/LunarLight/moonlight_gallery/technique/moonbright.htm)