

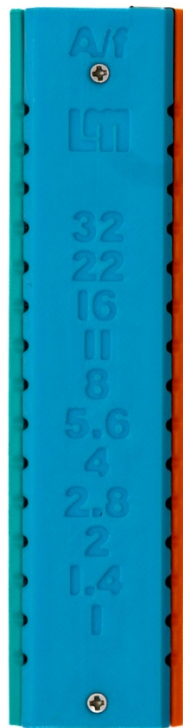
# Manual Exposure Calculator

A compact, fully mechanical slide rule designed to calculate and balance the exposure triangle (Aperture, Shutter Speed, ISO) instantly—no batteries or apps required.

## 1. Overview & Specifications

Each face of the triangular body features an independently sliding scale calibrated in full 1-stop increments:

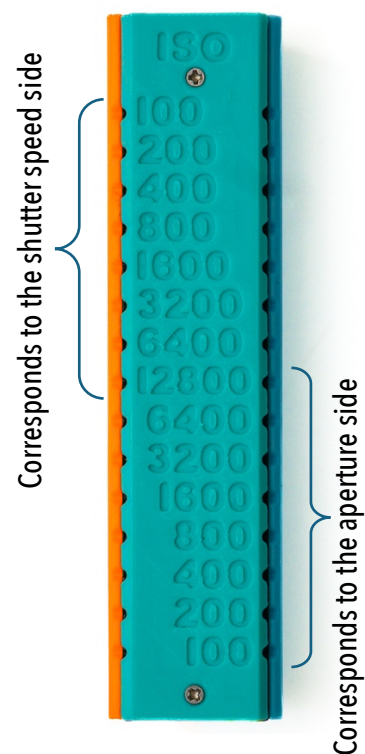
| Face  | Setting       | Scale Range (1-Stop Increments)                                           |
|-------|---------------|---------------------------------------------------------------------------|
| A / f | Aperture      | f/1 · f/1.4 · f/2 · f/2.8 · f/4 · f/5.6 · f/8 · f/11 · f/16 · f/22 · f/32 |
| S / t | Shutter Speed | 2" (2 sec) to 1/8000s                                                     |
| ISO   | Sensitivity   | ISO 100 · 200 · 400 · 800 · 1600 · 3200 · 6400 · 12800                    |



Aperture



Shutter Speed



ISO

## 2. Operating Principle (Reciprocity Law)

The calculator relies on maintaining equivalent exposure while trading off one camera setting for another:

### Gather More Light (+1 Stop)

- Open aperture ( $f/4 \rightarrow f/2.8$ )
- Slower shutter speed ( $1/250s \rightarrow 1/125s$ )
- Higher ISO ( $100 \rightarrow 200$ )

### Reduce Light (-1 Stop)

- Close aperture ( $f/4 \rightarrow f/5.6$ )
- Faster shutter speed ( $1/250s \rightarrow 1/500s$ )
- Lower ISO ( $200 \rightarrow 100$ )

## 3. How to Use

### Basic Setup (Align Baseline)

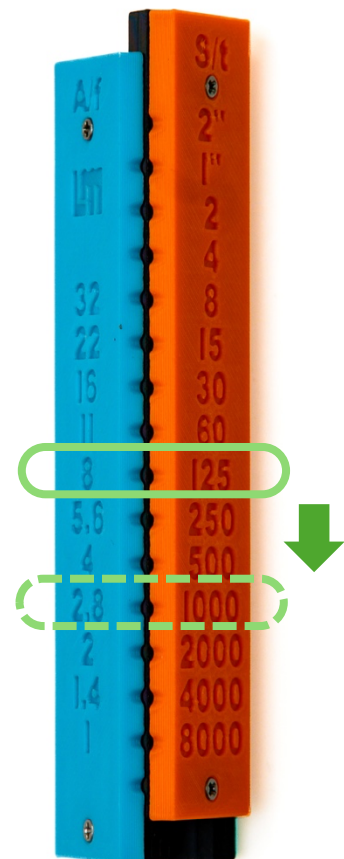
1. Determine baseline exposure values (Aperture, Shutter Speed, ISO) using an external meter, camera meter, or Sunny 16 rule.
2. Slide the strips on adjacent faces to align your current baseline values side by side.

### Practical Examples

#### Case 1.

#### Aperture (A/f) ↔ Shutter Speed (S/t)

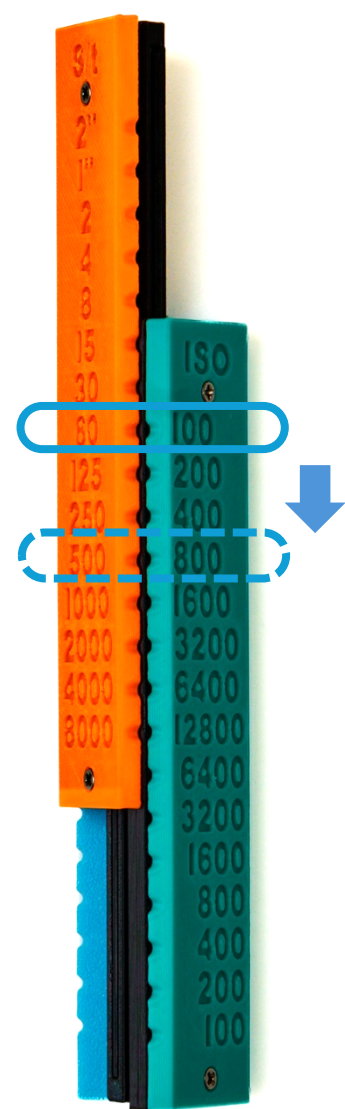
- **Scenario:** Baseline is set to  $f/8$  and  $1/125s$ . You want to open to  $f/2.8$  for shallow depth of field (background blur).
- **Steps:**
  1. Look at the viewing edge where the Aperture and Shutter Speed strips meet.
  2. On the Aperture strip, locate  **$f/2.8$**  (+3 stops wider from  $f/8$ ).
  3. On the adjacent Shutter Speed strip, check the value directly aligned with  $f/2.8$ . You will see  **$1/1000s$**  (+3 stops faster) aligned to balance exposure.



### Case 2.

#### Shutter Speed (S/t) ↔ ISO (Top-Left Aligned Numbers)

- **Scenario:** Baseline is set to 1/60s and ISO 100. You need a faster shutter speed of 1/500s to prevent motion blur.
- **Steps:**
  1. Look at the viewing edge where the Shutter Speed and ISO strips meet.
  2. On the Shutter Speed strip, locate **1/500s** (-3 stops faster from 1/60s).
  3. On the adjacent ISO strip, check the value directly aligned with 1/500s (top-left numbers). You will see **ISO 800** (+3 stops higher) lined up.



## 4. Care & Maintenance

- **3D Print Care:** Avoid prolonged exposure to extreme heat (over 60°C / 140°F), such as inside a vehicle in direct sunlight, to prevent warping.
- **Smooth Operation:** If sliding feels stiff, do not force the strip. Inspect the guide rails for debris and clean gently.
- **All-Weather & Battery-Free:** 100% mechanical and moisture-resistant. No charging or batteries required.

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