MIT Student Art Association Spring 2011

Digital Photography

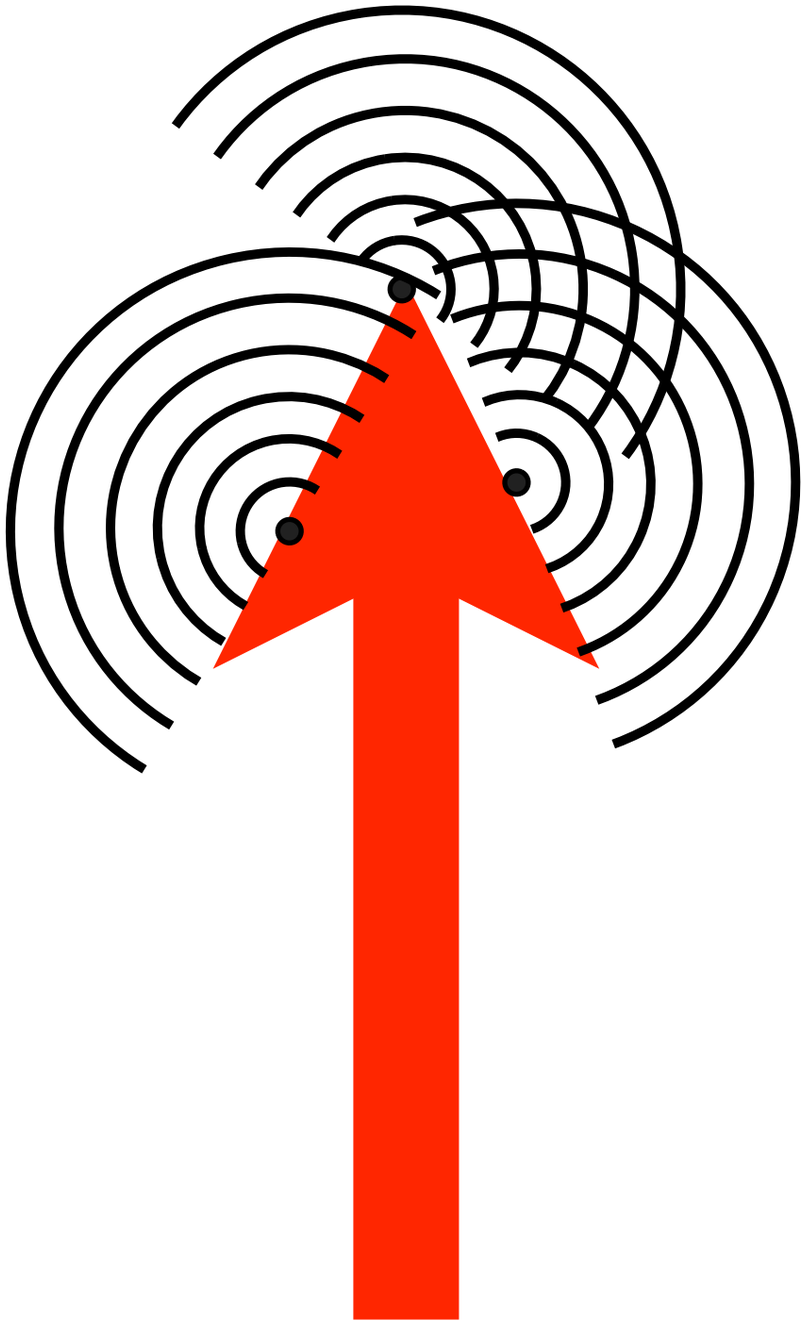
Nikon
D700
MODE
FX

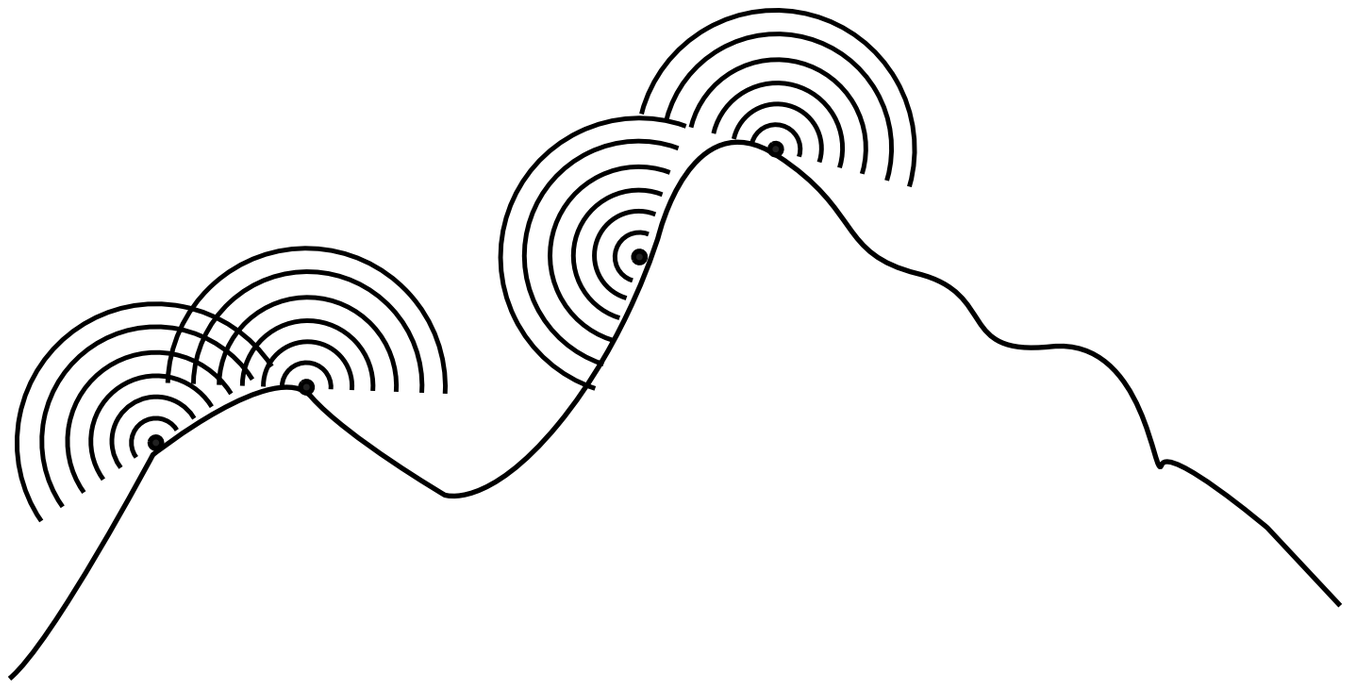
3G
9:41 AM
Monday
7
Messages
Calendar
YouTube
Stocks
Notes
Utilities
Settings
Phone
Mail
5.0 MEGA PIXELS
LG
MOTOROLA
5:30 PM
See all your apps.
Touch the Launcher icon.
Text Mess
Browser
Market
Voicemail
verizon

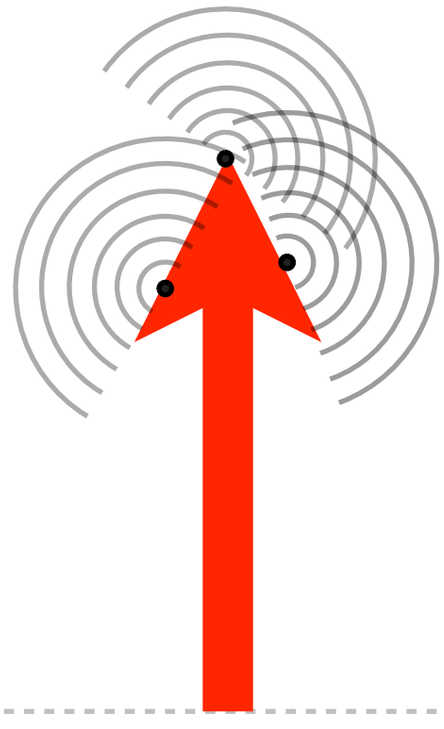
Nikon
COOLPIX S5
ZOOM NIKKOR ED 5.8-17.4mm 1:3.0-5.4

Huygens' Principle

The fundamentals of optics.







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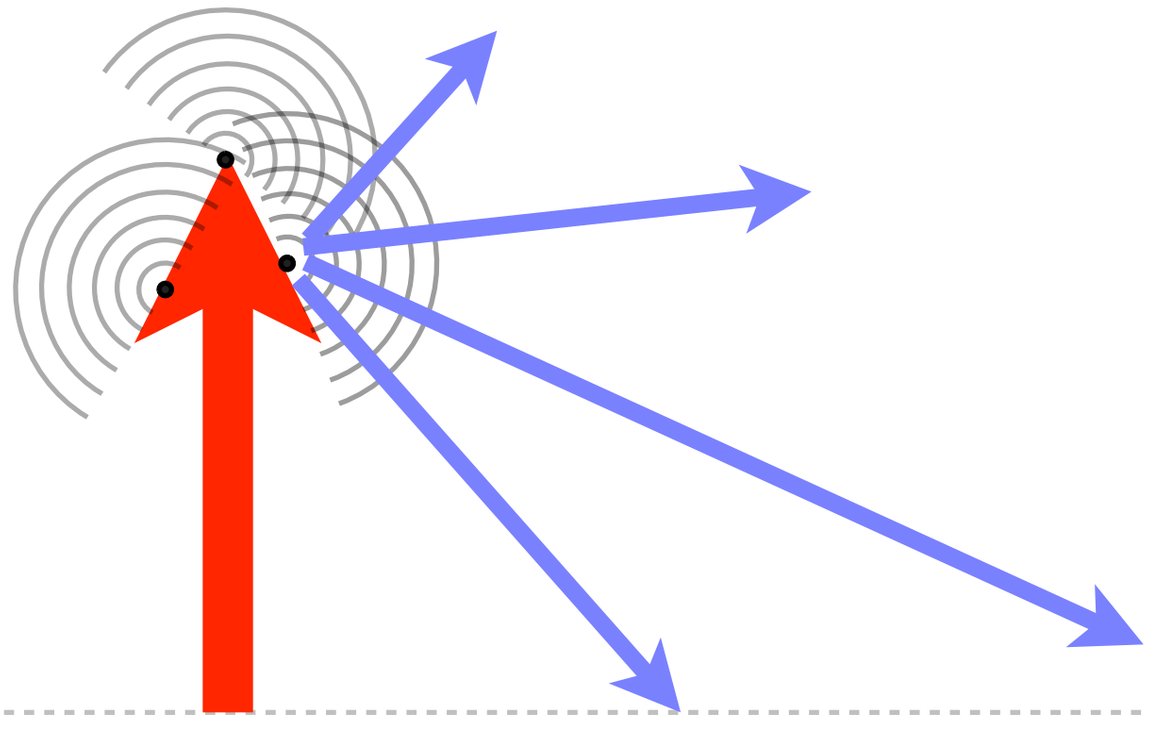

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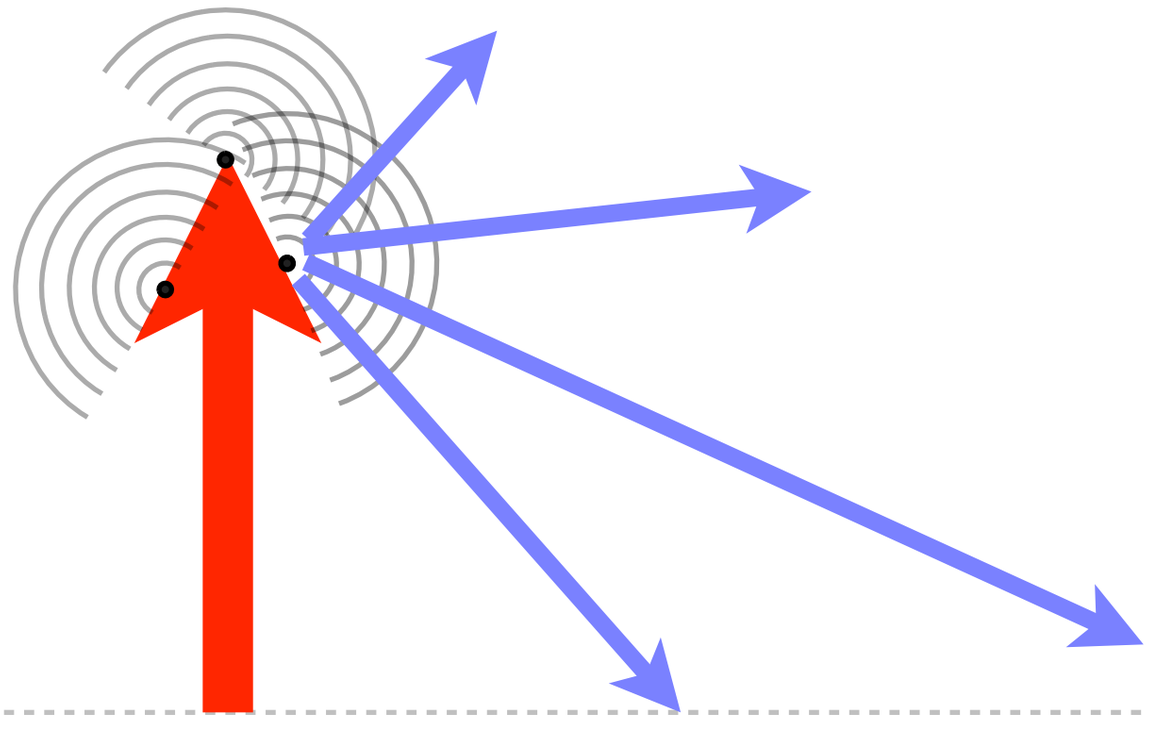

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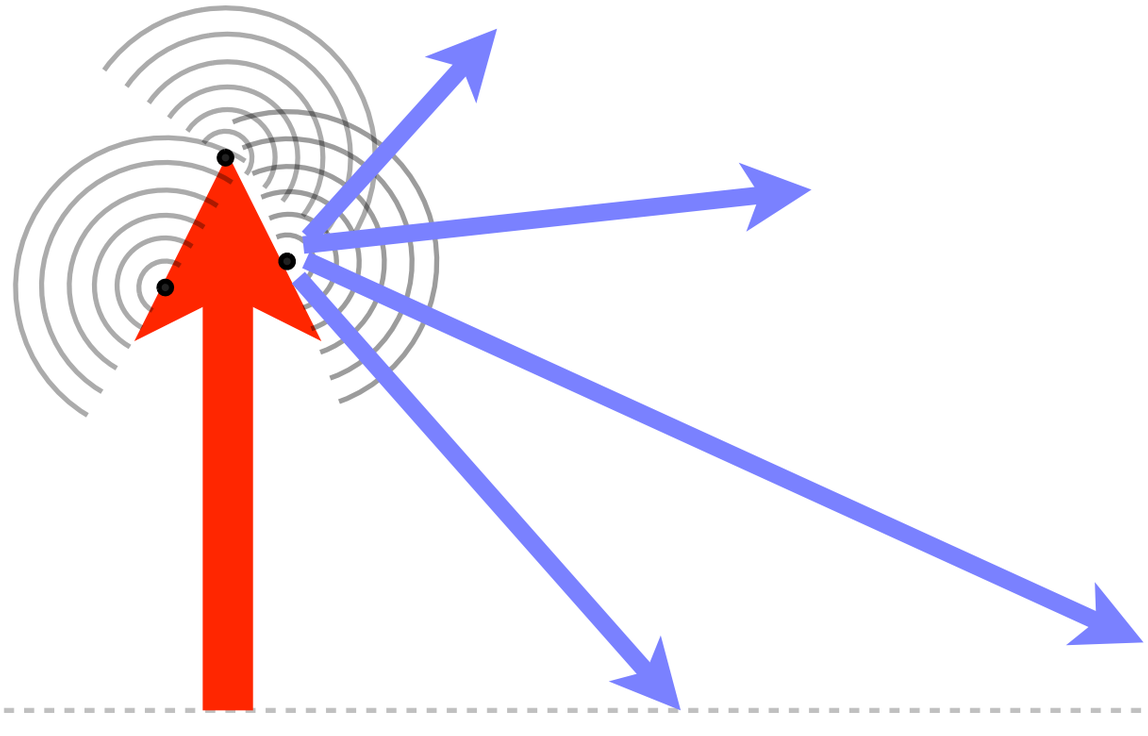

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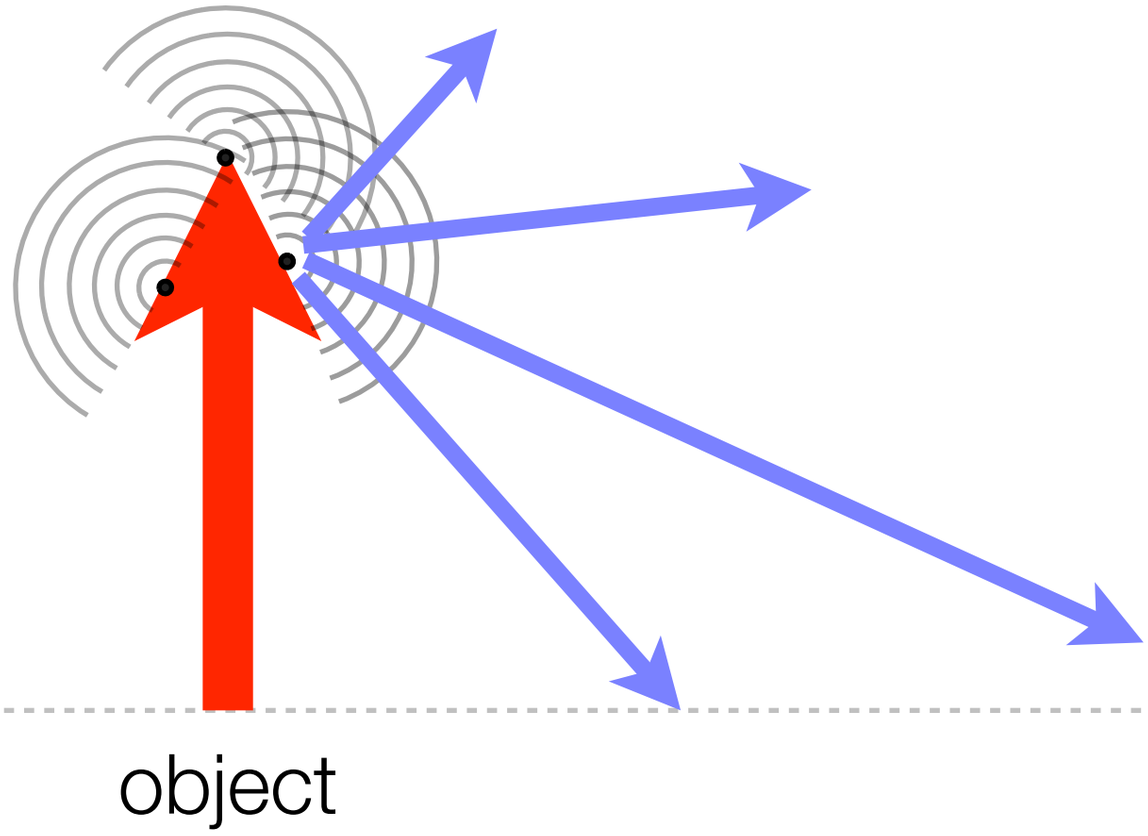

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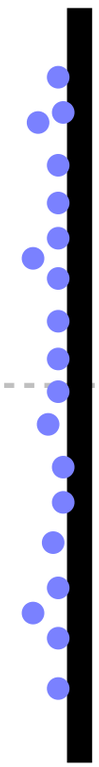

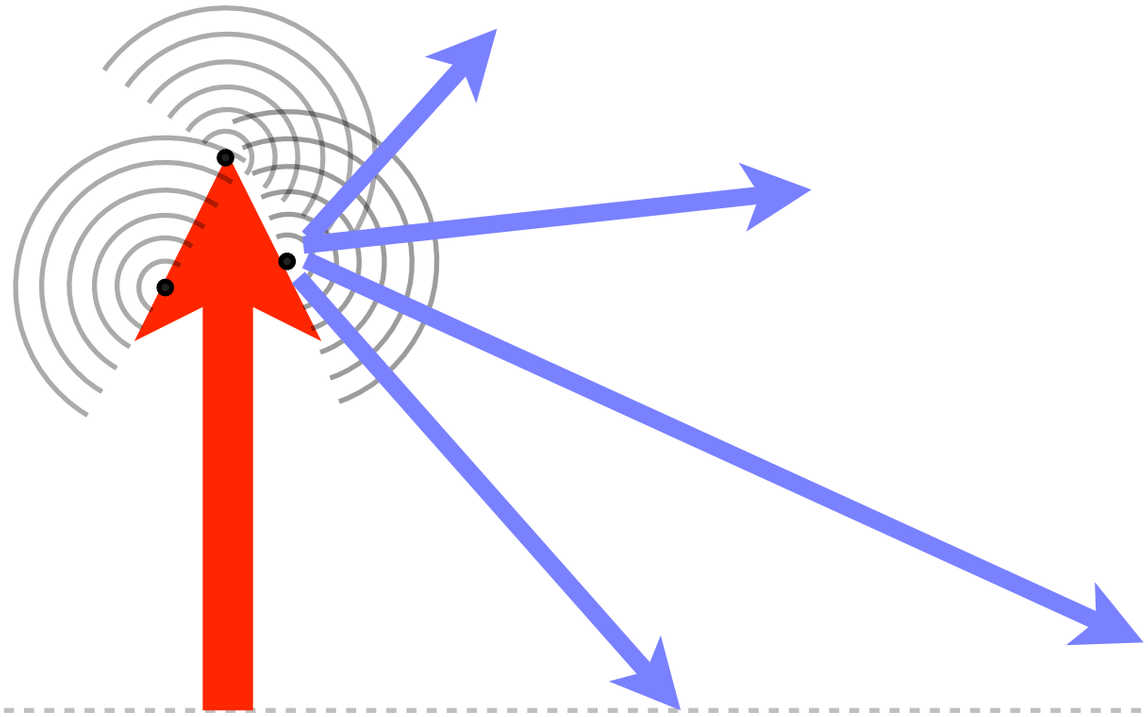

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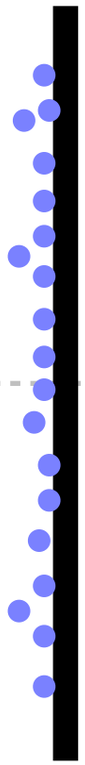

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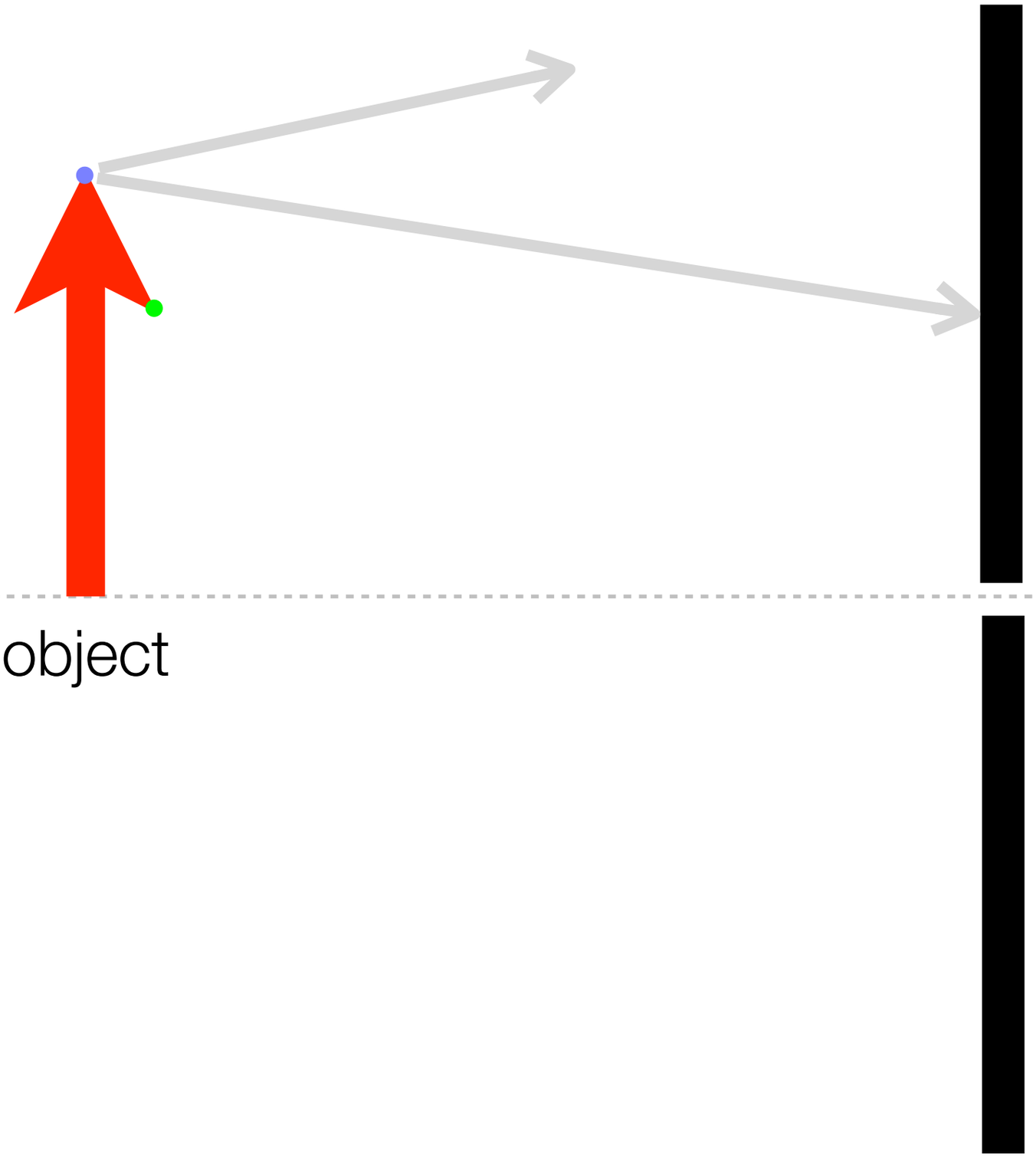
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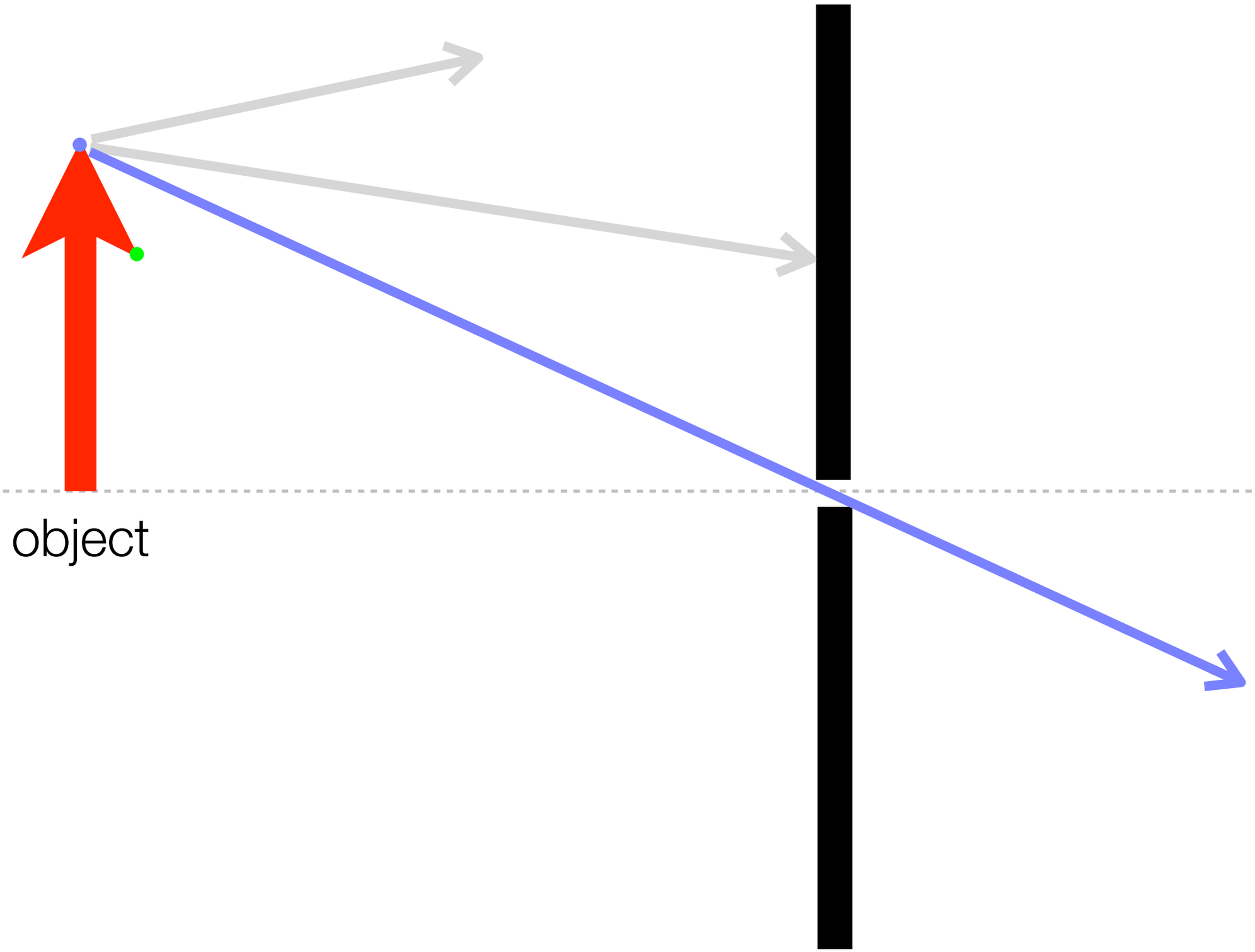

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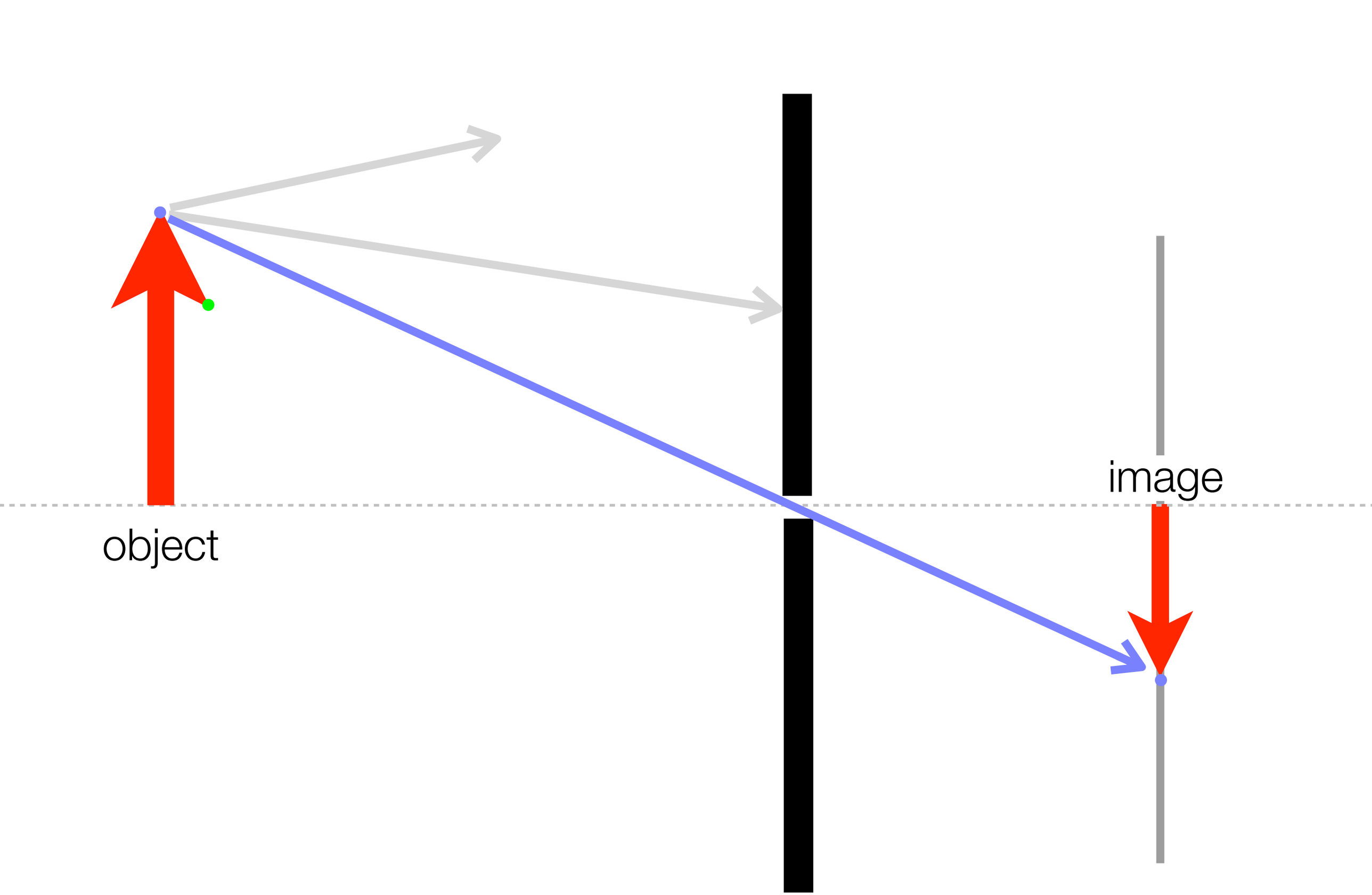
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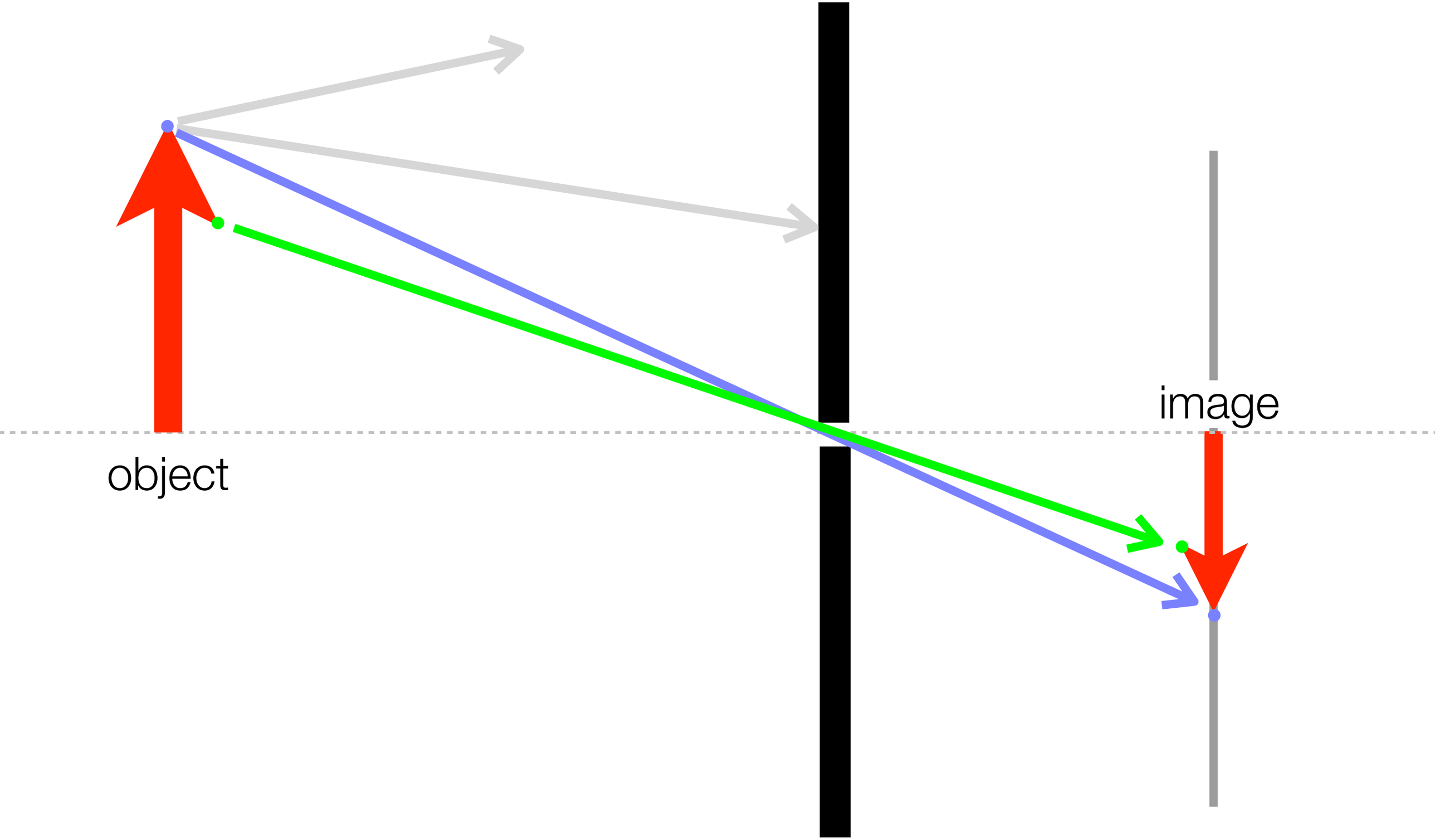
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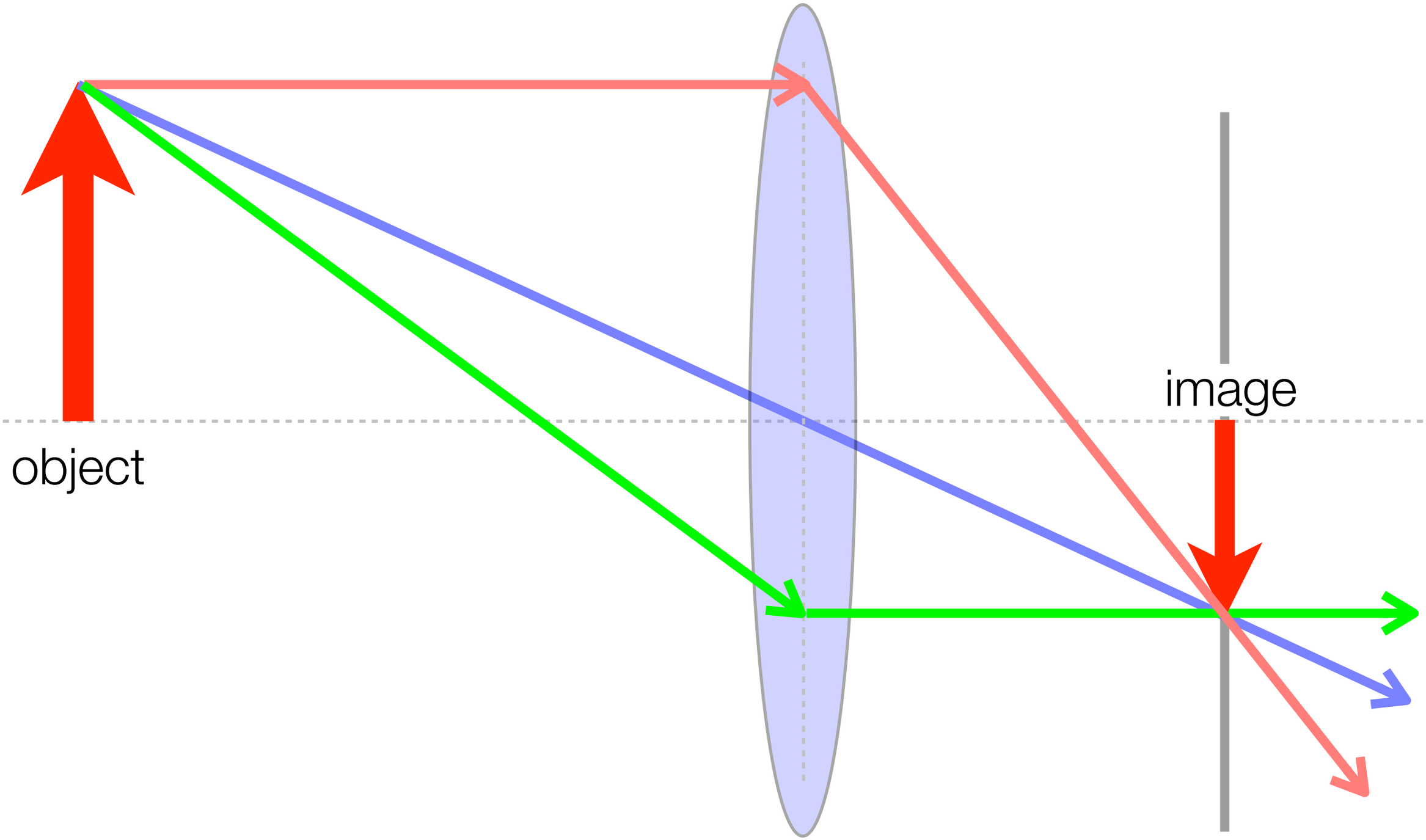
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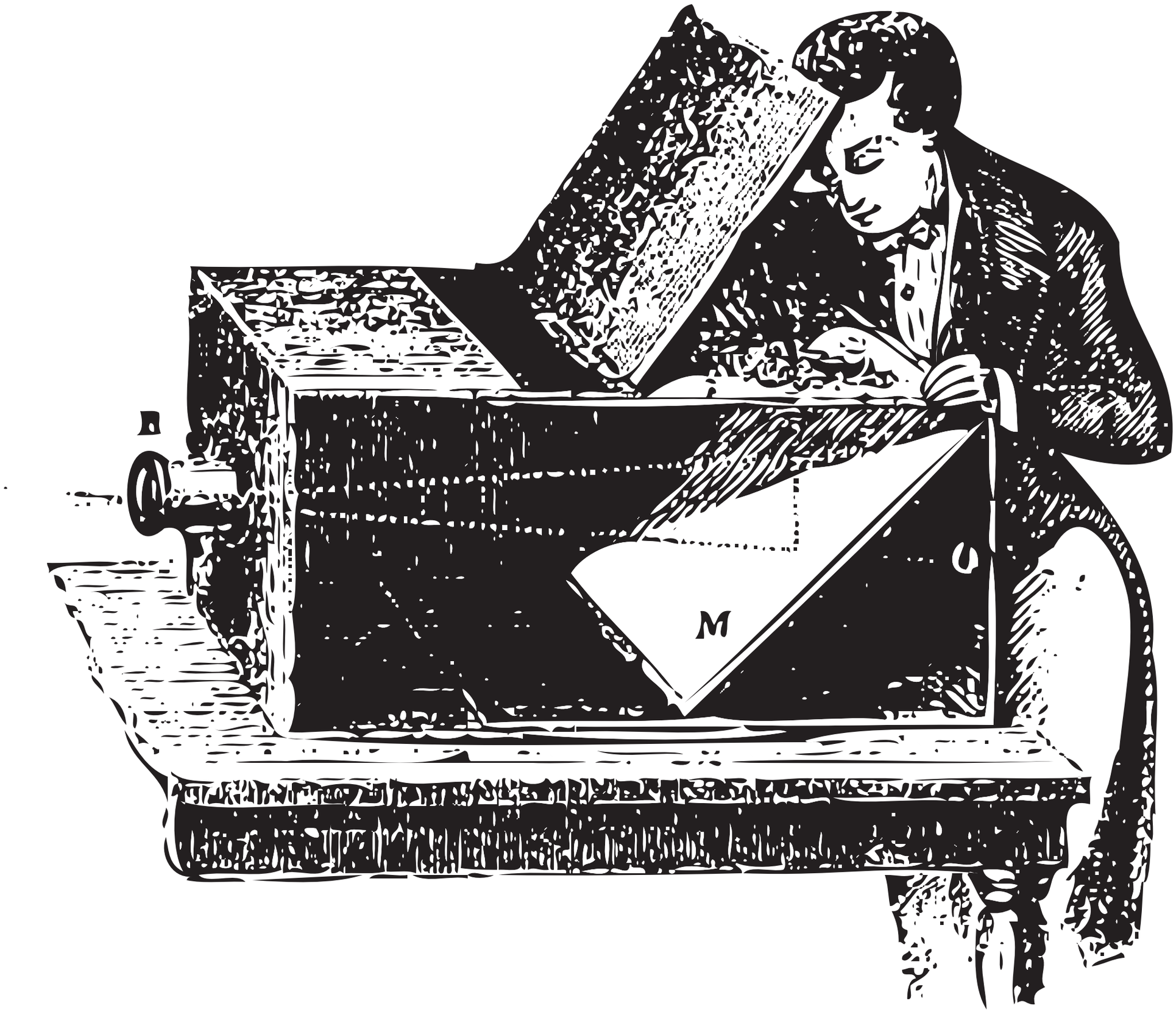
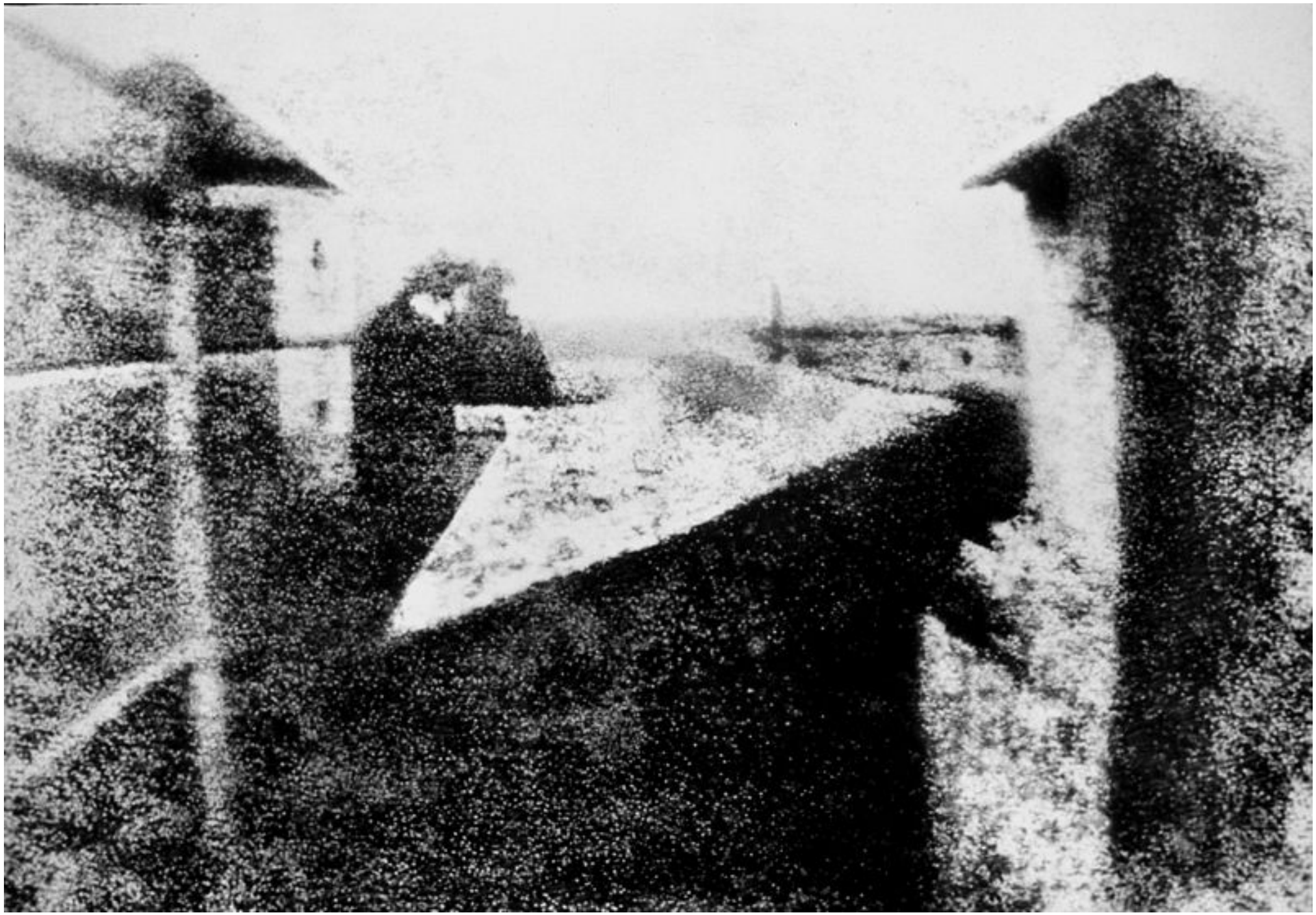
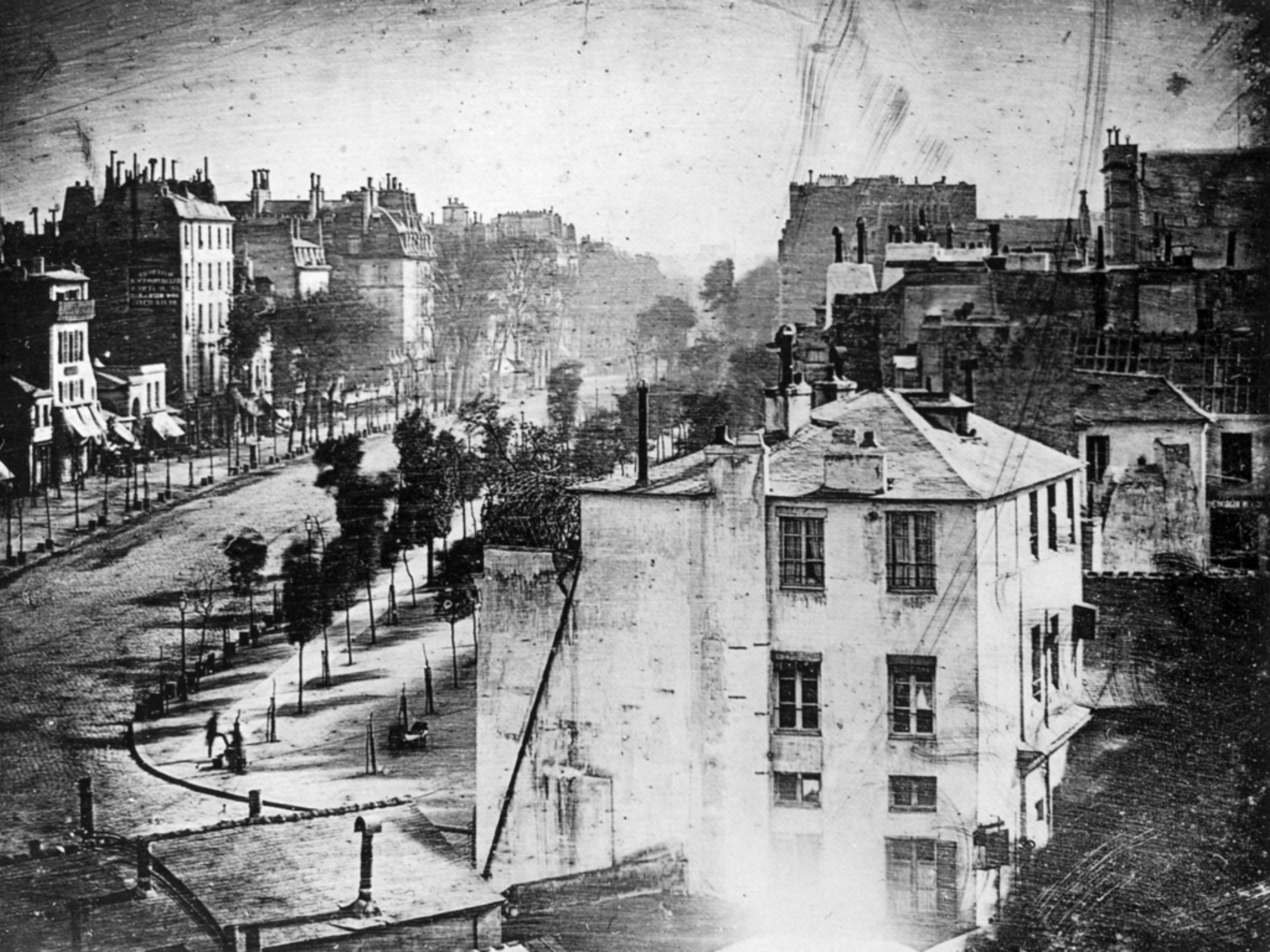

M

1790s: Thomas Wedgewood



1814: Joseph Nicéphore Niépce



EASTMAN KODAK CO^{S}

BROWNIE CAMERA $1

The Brownie Camera

makes pictures 2 1-4 x 2 1-4 inches. Loads in daylight with our six exposure film cartridges, and is so simple that it can be easily

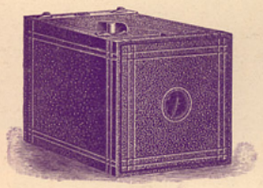
Operated by any School Boy or Girl.

Fitted with fine Meniscus lenses and our improved rotary shutter for snap shots or time exposures. Strongly made, covered with imitation leather, has nickeled fittings and produces the best results.

Forty-four-page booklet giving full directions for operating the camera, together with chapters on "Snap Shots," "Time Exposures," "Flash Lights," "Developing" and "Printing," free with every instrument.

Brownie Camera, for 2¼ x 2¼ pictures . .	$1.00
Transparent-Film Cartridge, 6 exposures, 2¼ x 2¼ . .	.15
Paper-Film Cartridge, 6 exposures, 2¼ x 2¼ . .	.10
Brownie Developing and Printing Outfit . .	.75

THE BROWNIE CAMERA CLUB *of* AMERICA

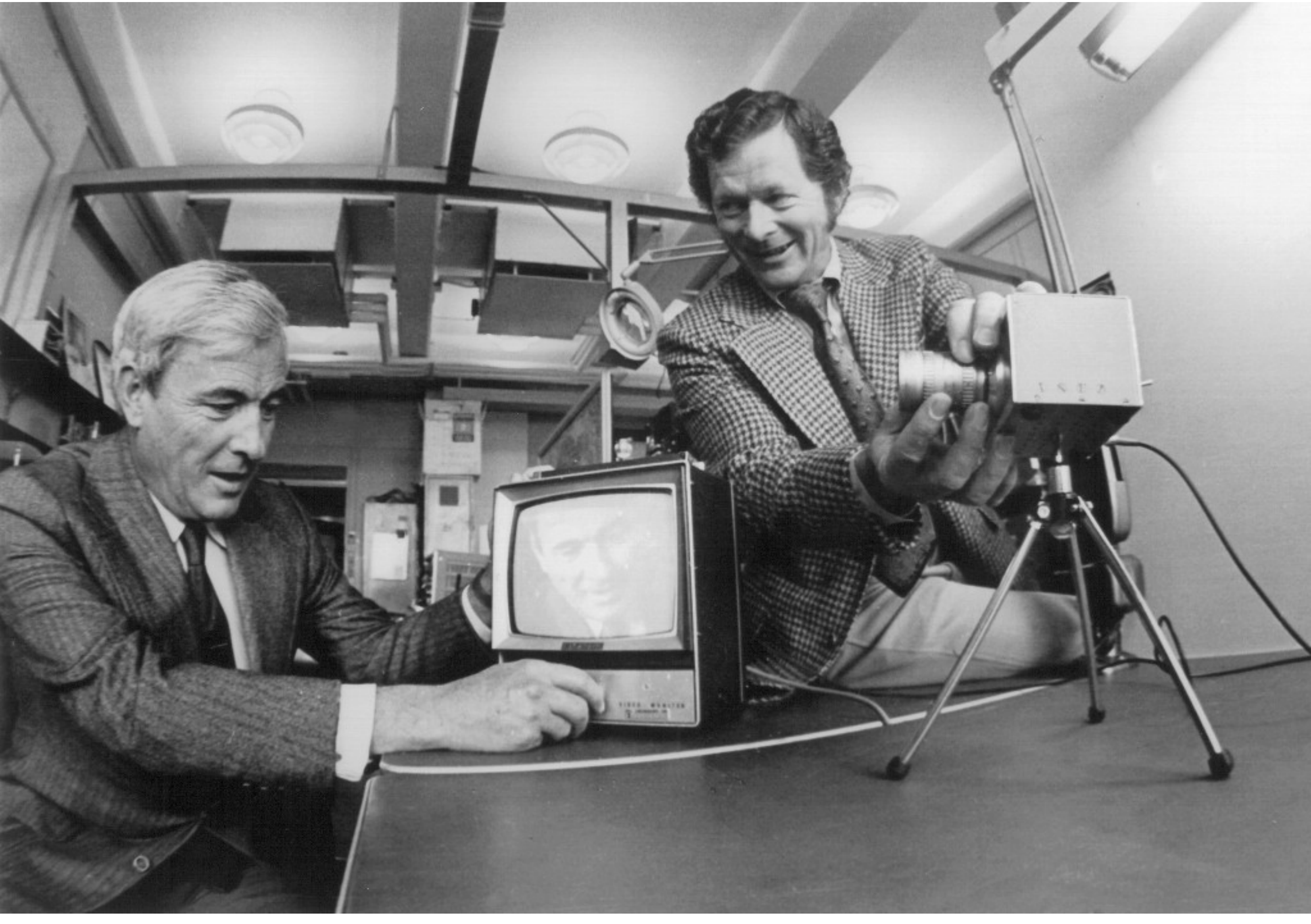


EVERY boy and girl under sixteen years of age should join the Brownie Camera Club of America. Fifty Kodaks, valued at over $500.00, will be given to members of the club as prizes for the best pictures made with the Brownie Cameras, and every member of the club will be given a copy of our Photographic Art Brochure. No initiation fees or dues if you own a Brownie. Ask your dealer or write us for a Brownie Camera Club Constitution.

Send a dollar to your local Kodak dealer for a Brownie Camera. If there is no Kodak dealer in your town, send us a dollar and we will ship the camera promptly.

Eastman Kodak Co., Rochester, N.Y.

Saturn
Bar



Nikon
HP
KODAK Professional
DCS
DIGITAL CAMERA SYSTEM

Nikon 1923062

Nikon
KODAK
DCS
Loaded

1992

in 1960 **600,000** color photos existed

(Boerdam, Martinius, 1980)

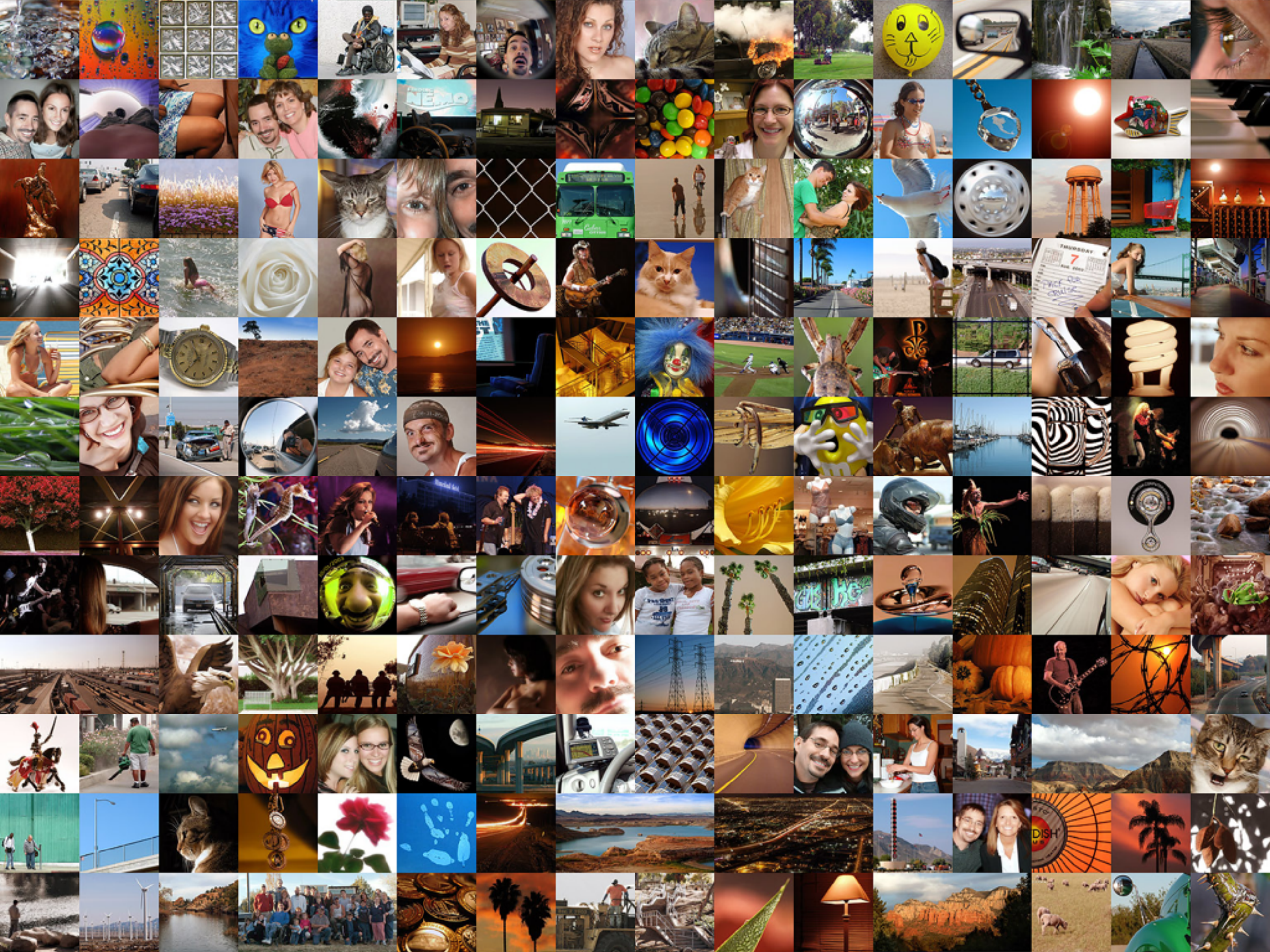
in 1974 **103 million** color photos existed

(Boerdam, Martinius, 1980)

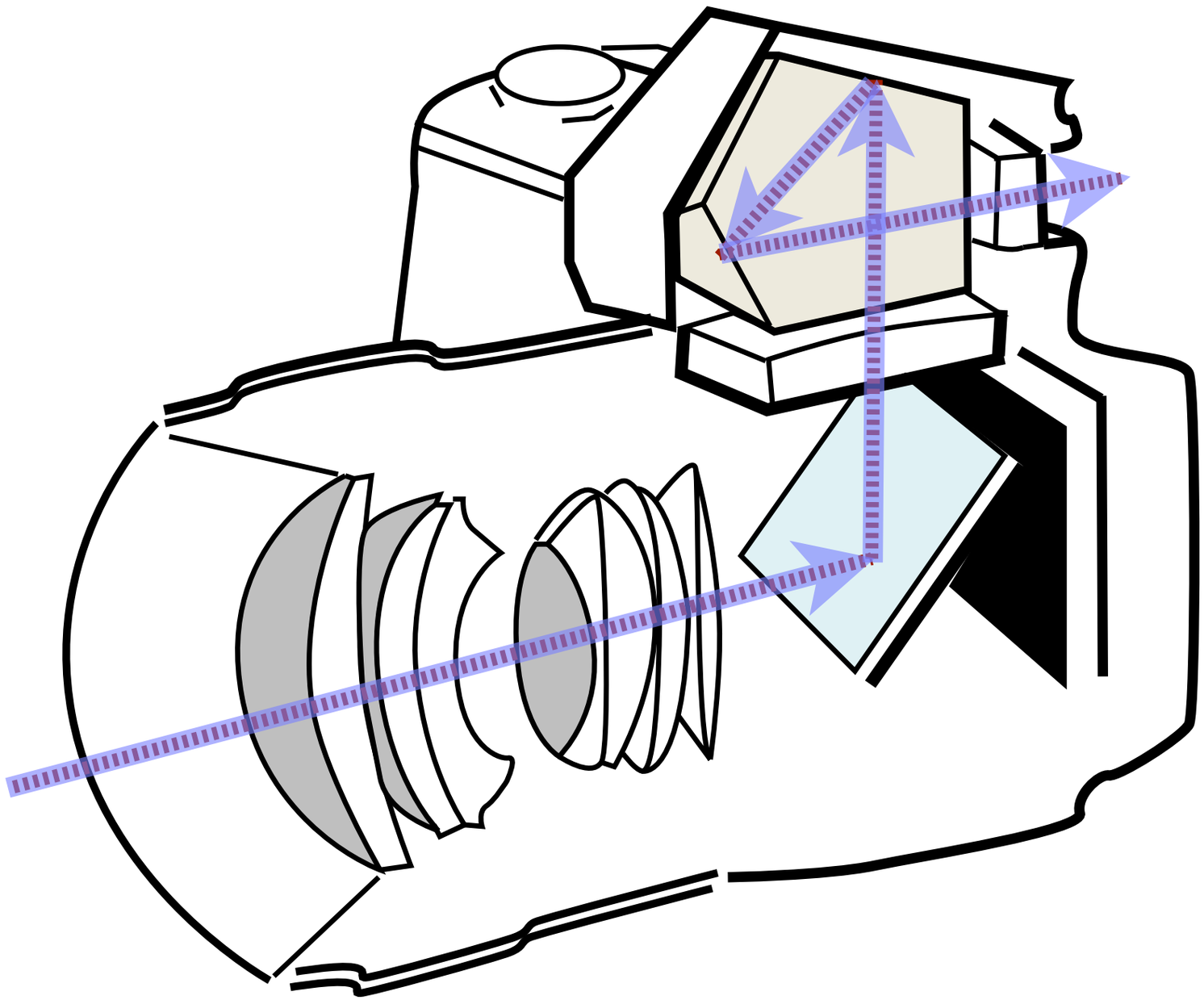
5 billion+ photos on Flickr

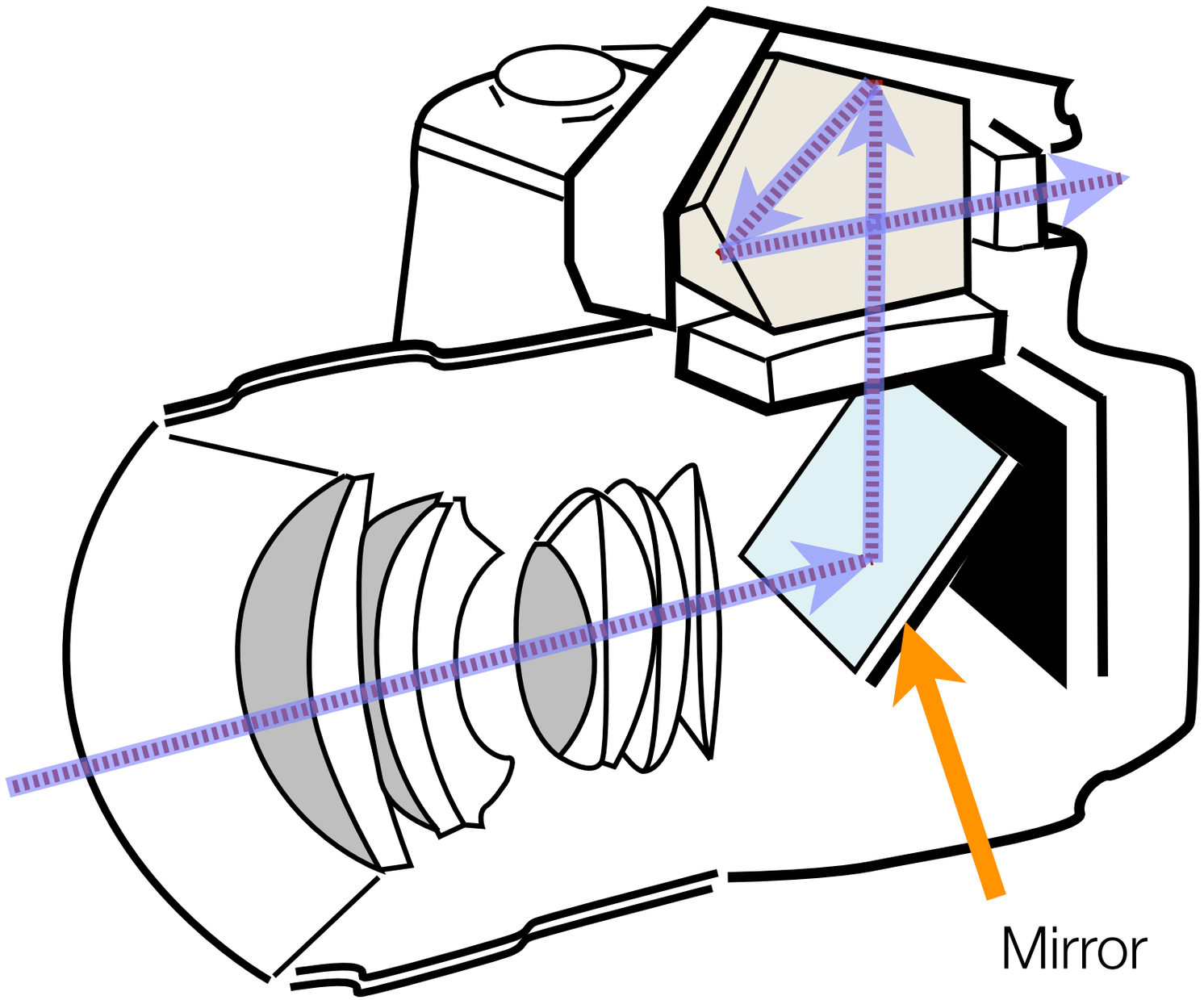
2.5 billion photos per *month* uploaded to Facebook

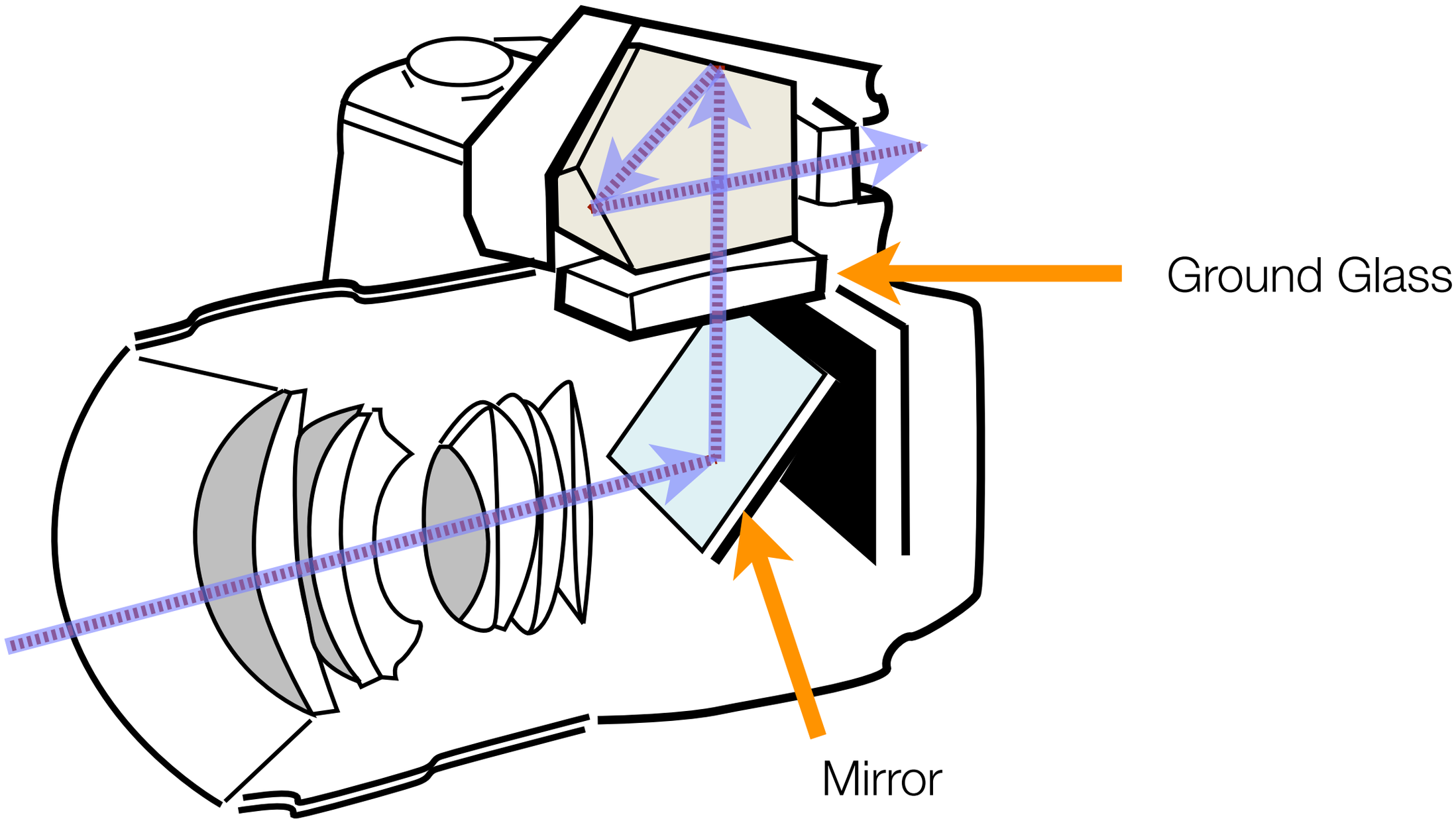
30 billion per year

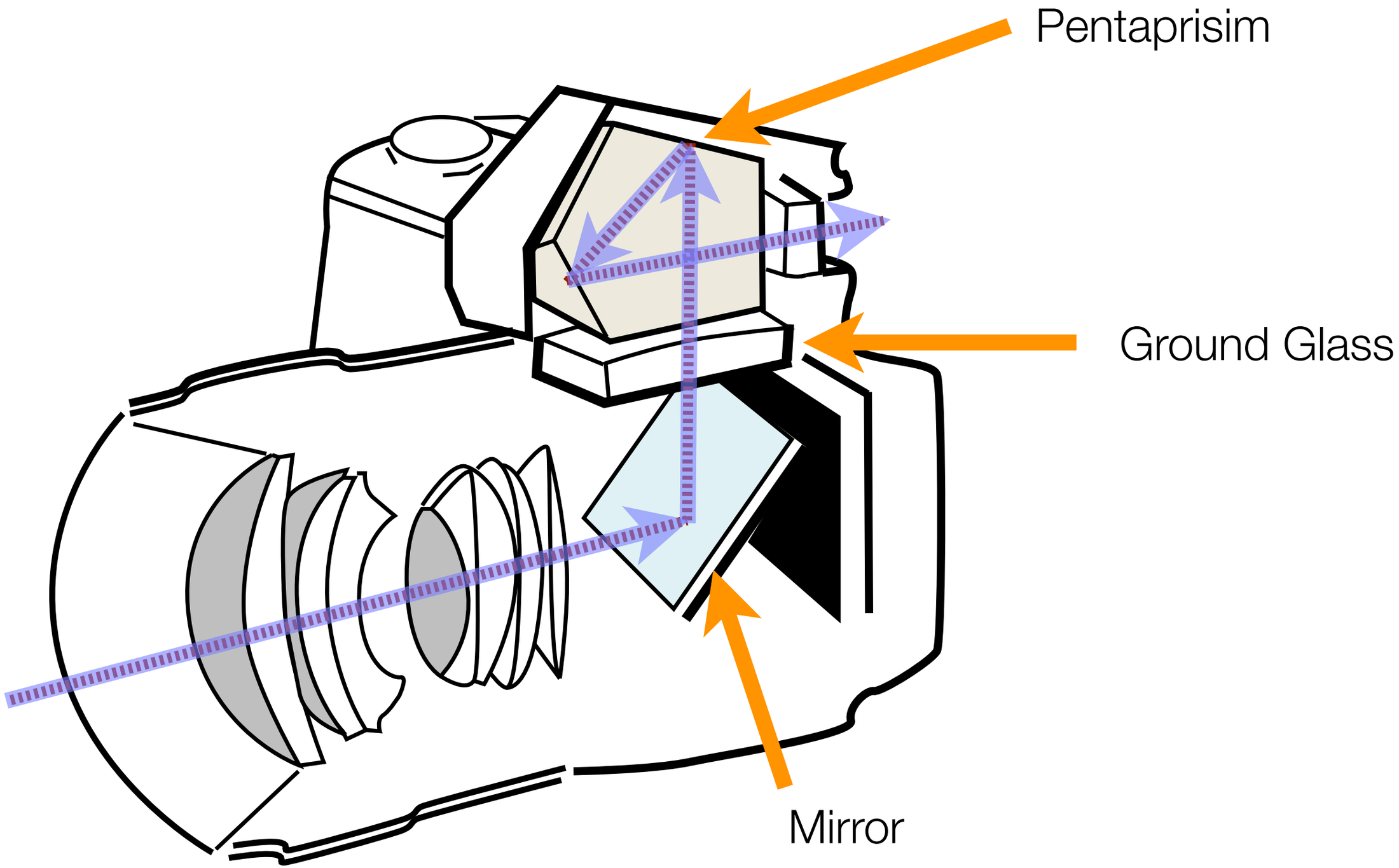

NEMO
THURSDAY
7
DISH

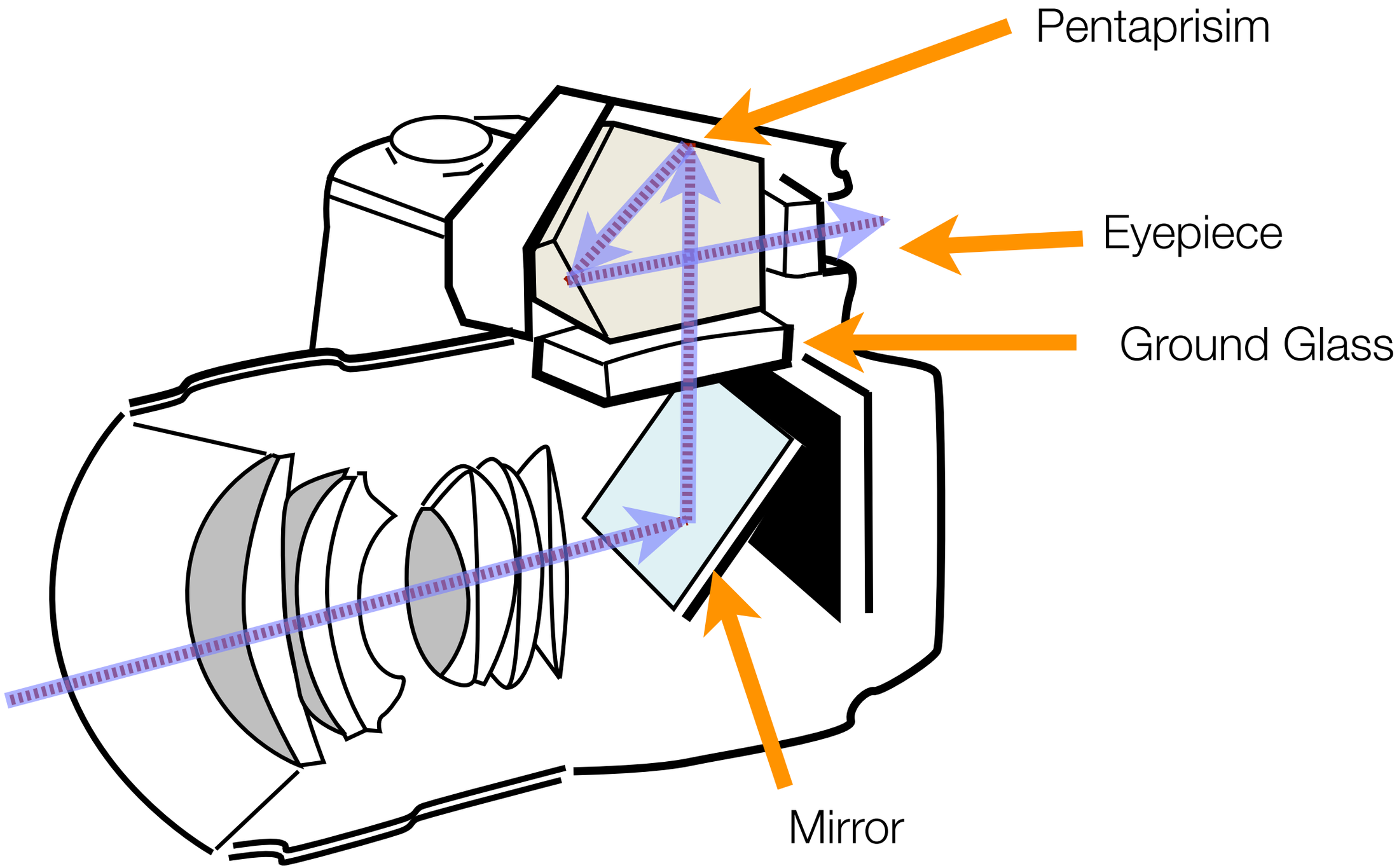
What is an SLR?

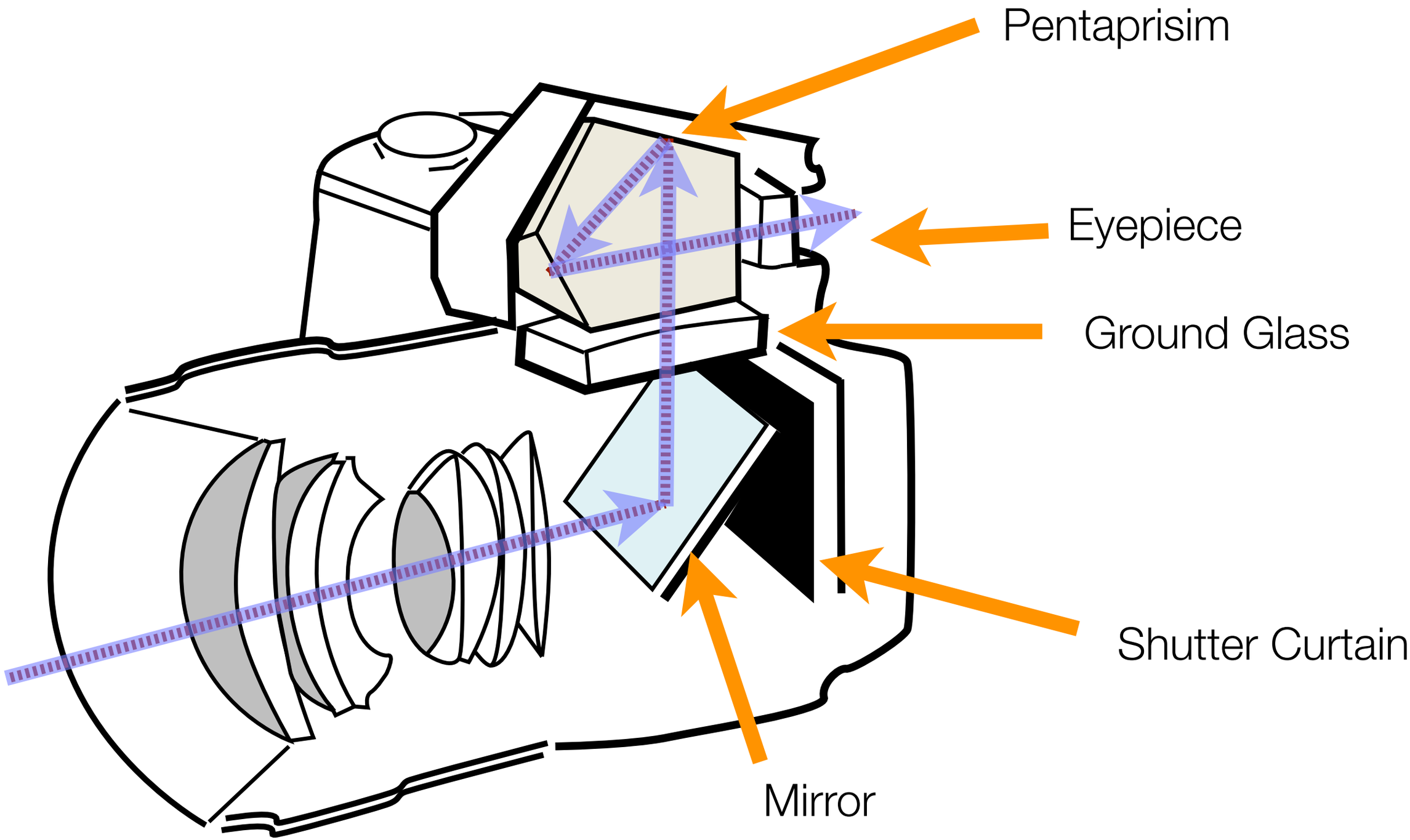


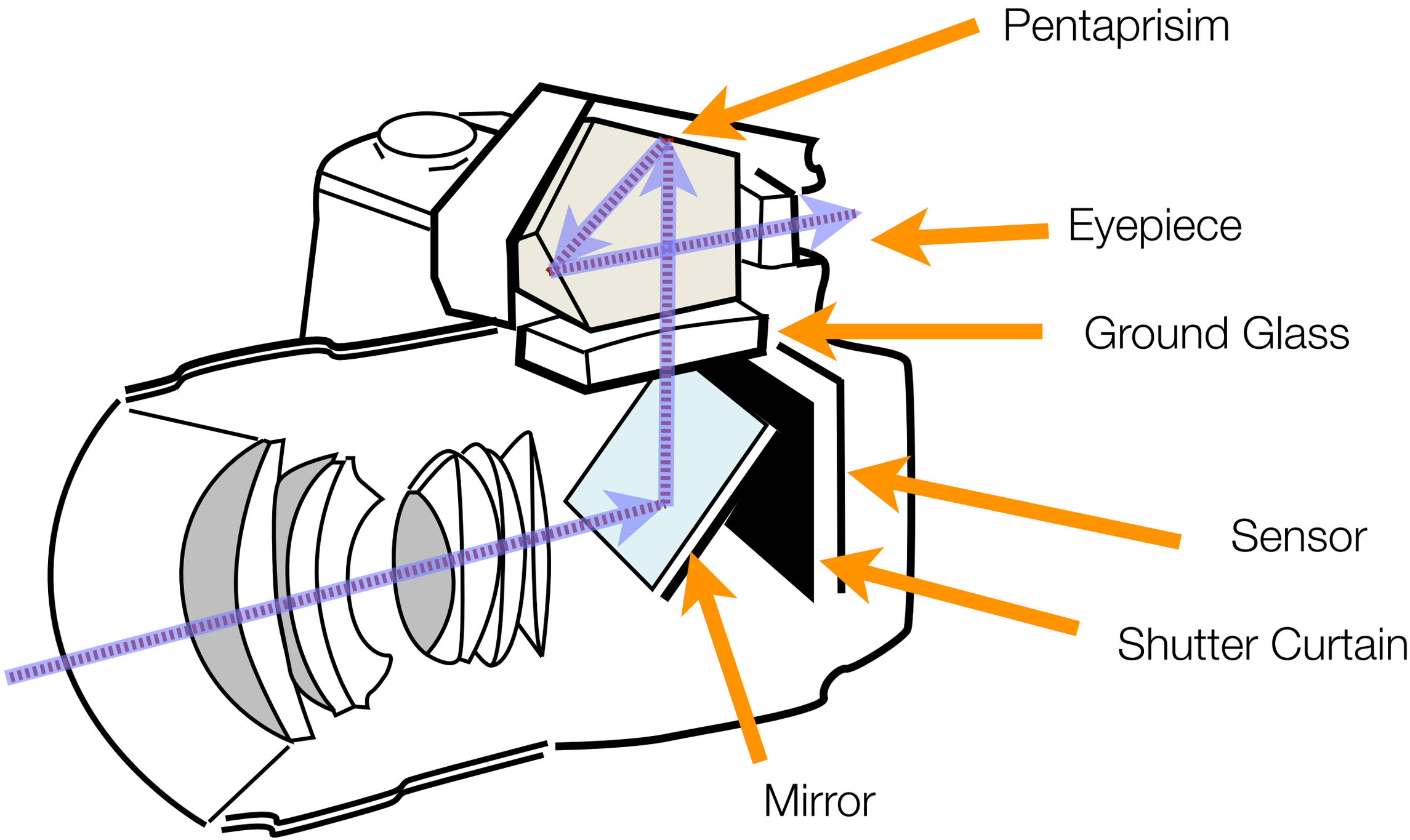

Mirror


Ground Glass
Mirror


Pentaprisim
Ground Glass
Mirror


Pentaprisim
Eyepiece
Ground Glass
Mirror

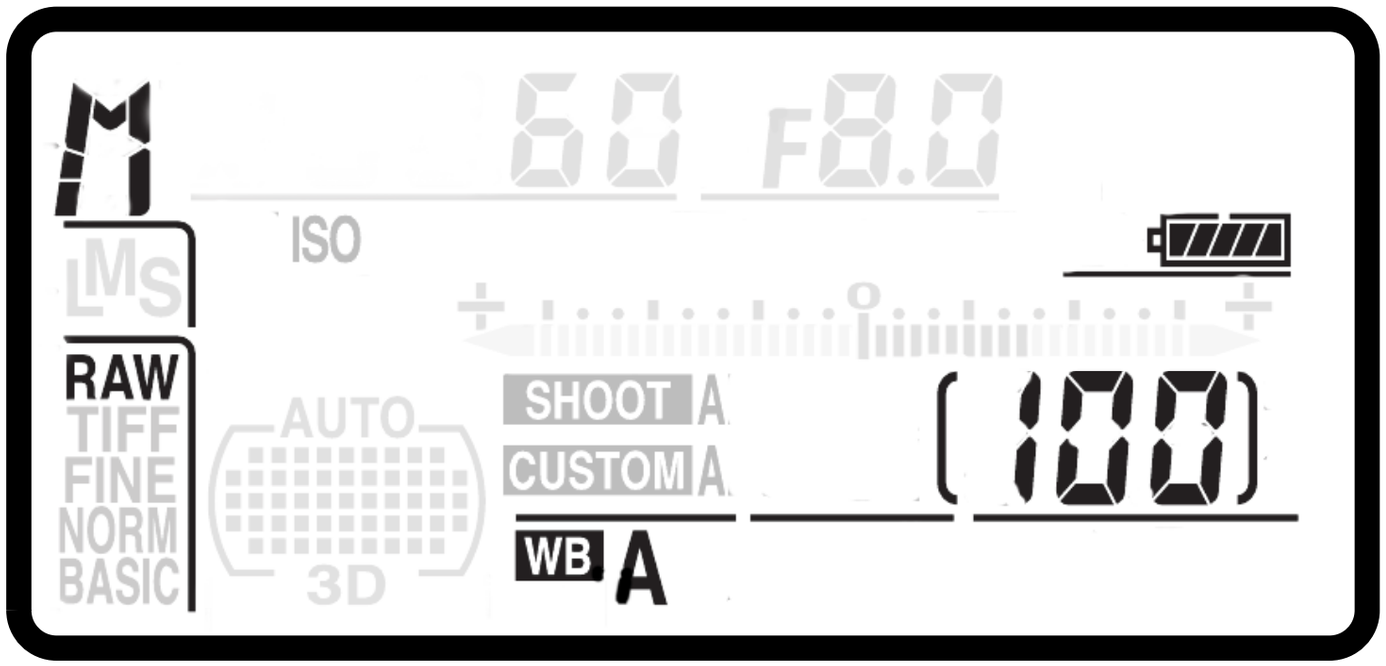

Pentaprisim
Eyepiece
Ground Glass
Shutter Curtain
Mirror


Pentaprisim
Eyepiece
Ground Glass
Sensor
Shutter Curtain
Mirror

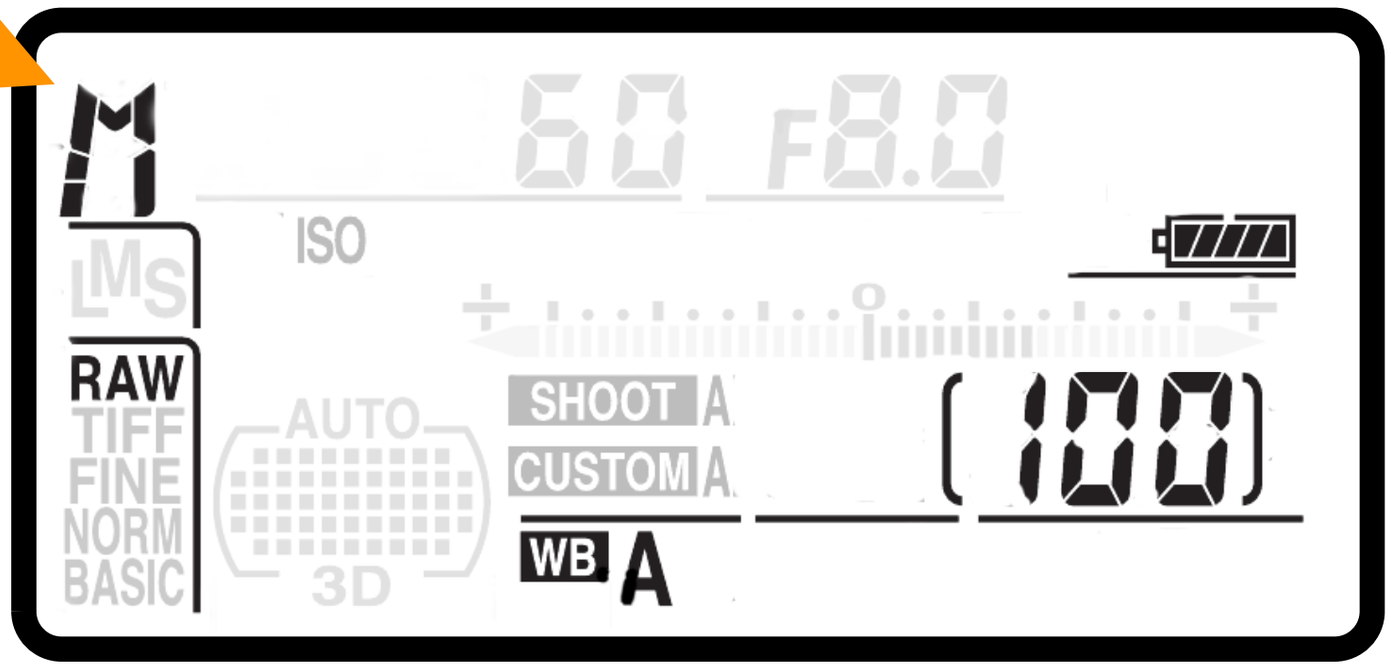
Before we begin...

Shooting Mode: Manual
White Balance: Auto
Quality: RAW (if you can)

OFF
ON
MODE


60
F8.0
ISO
RAW
TIFF
FINE
NORM
BASIC
AUTO
3D
SHOOT A
CUSTOM A
WB A
100

Shooting Mode:
Manual



Shooting Mode:
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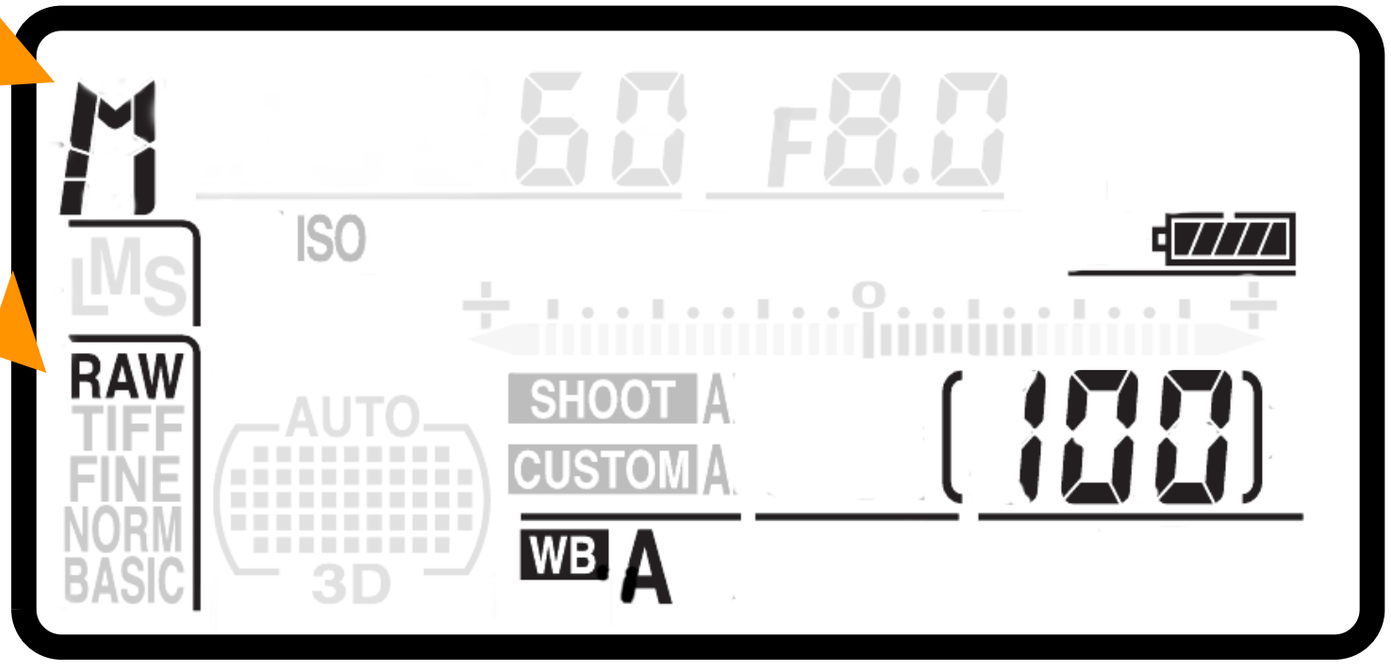
Quality: RAW



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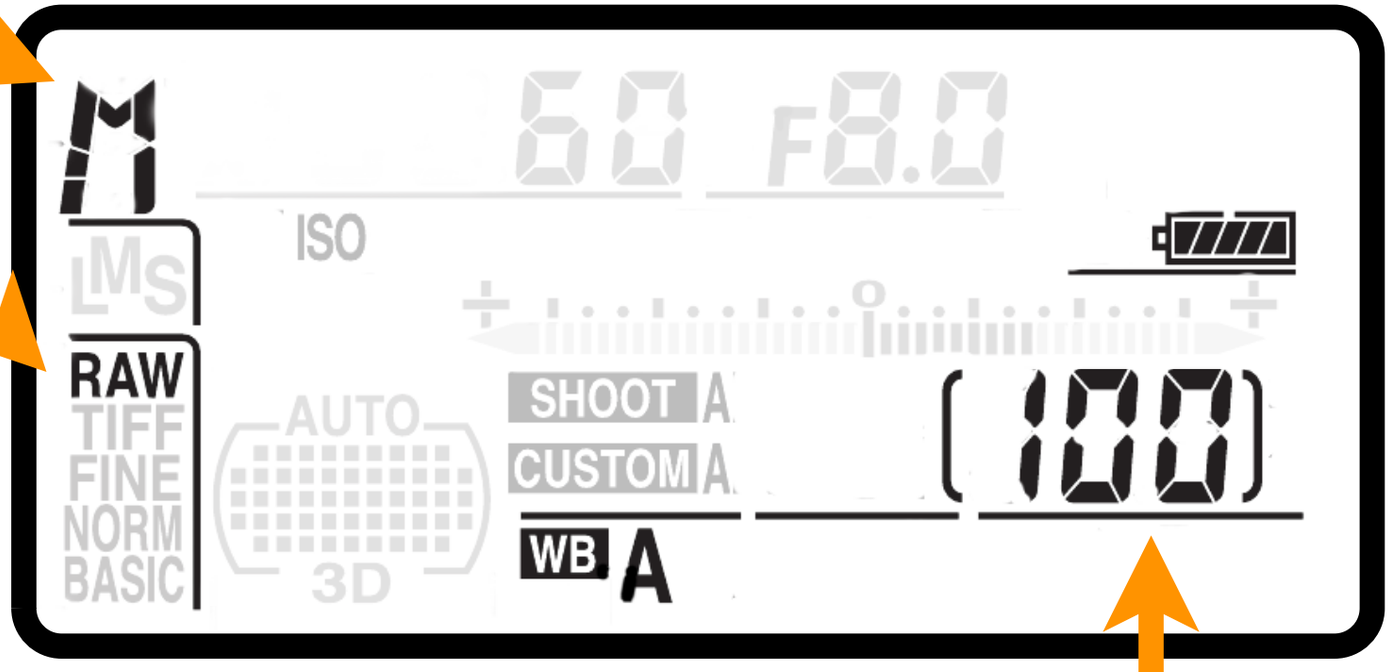
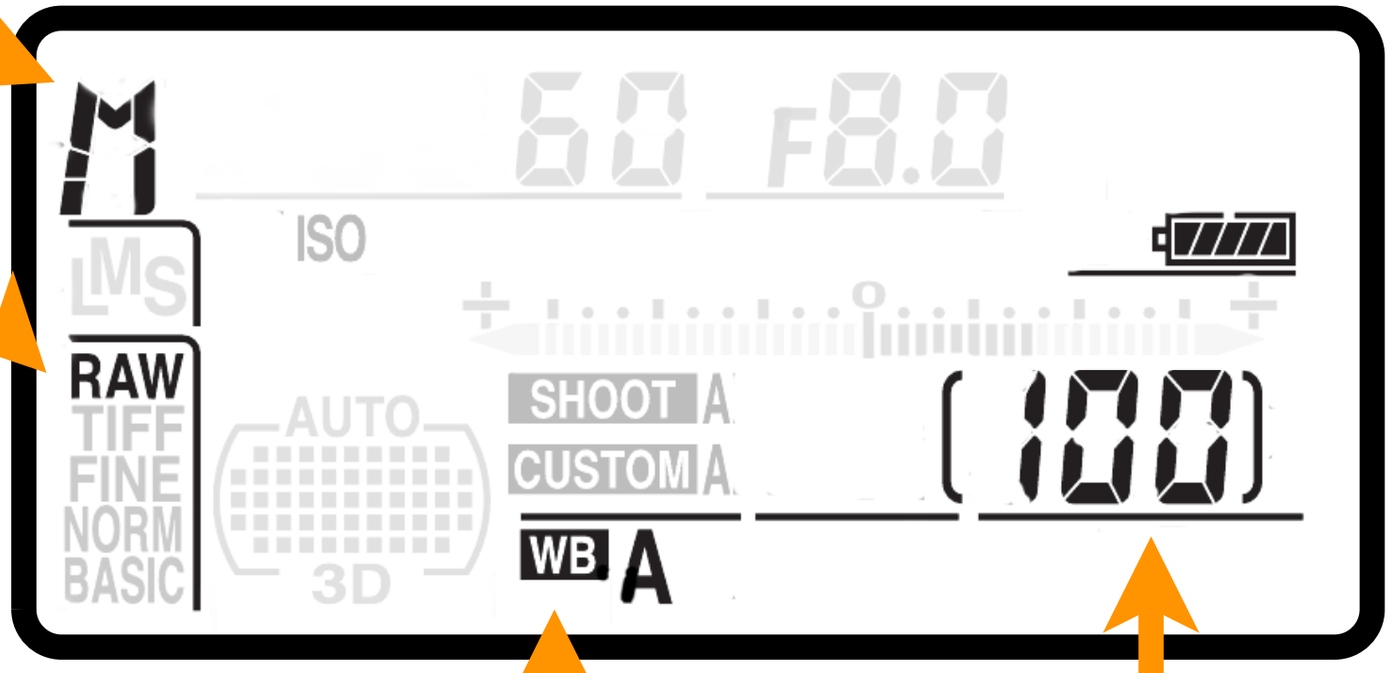
Quality: RAW



Frames
Remaining

Shooting Mode:
Manual

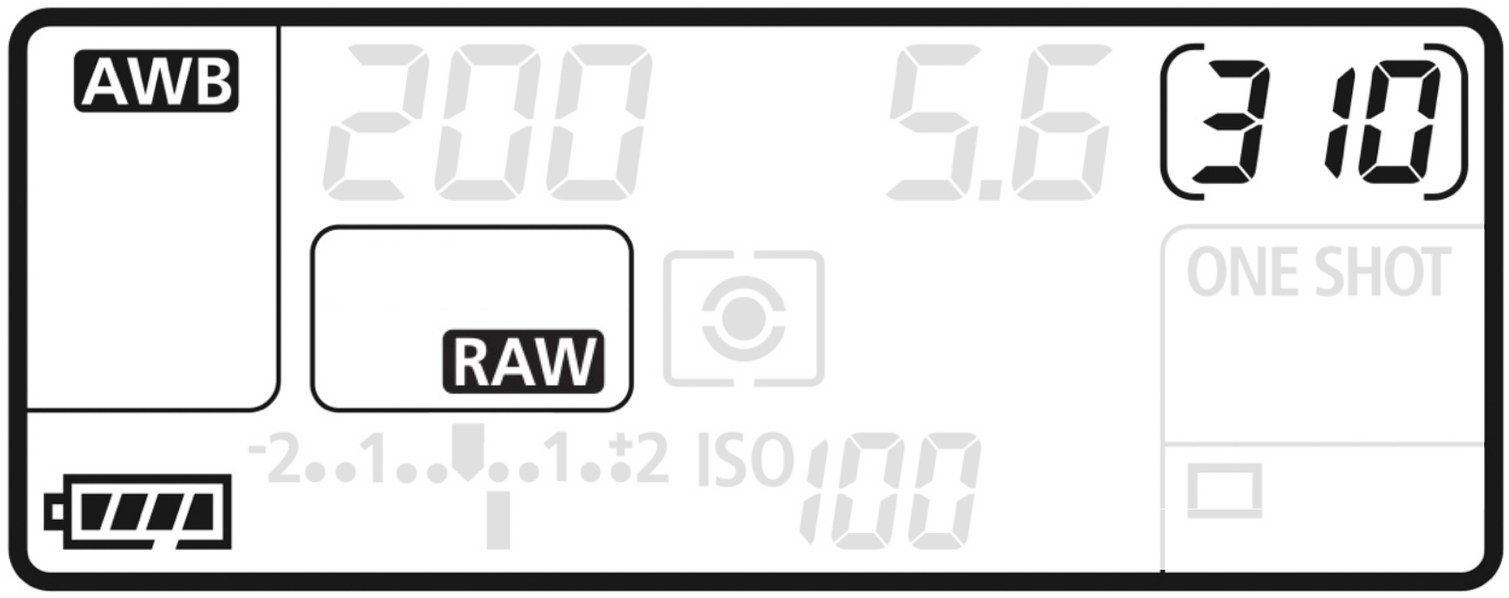
Quality: RAW



White
Balance:
Auto

Frames
Remaining

24-105mm
70
105
·WB
AF·DRIVE
ISO·
AWB
8000
5.6
93
L
RAW
ONE SHOT
ISO
6400


AWB
200
5.6
3 10
RAW
ONE SHOT
-2..1..1..+2 ISO
100

White Balance:
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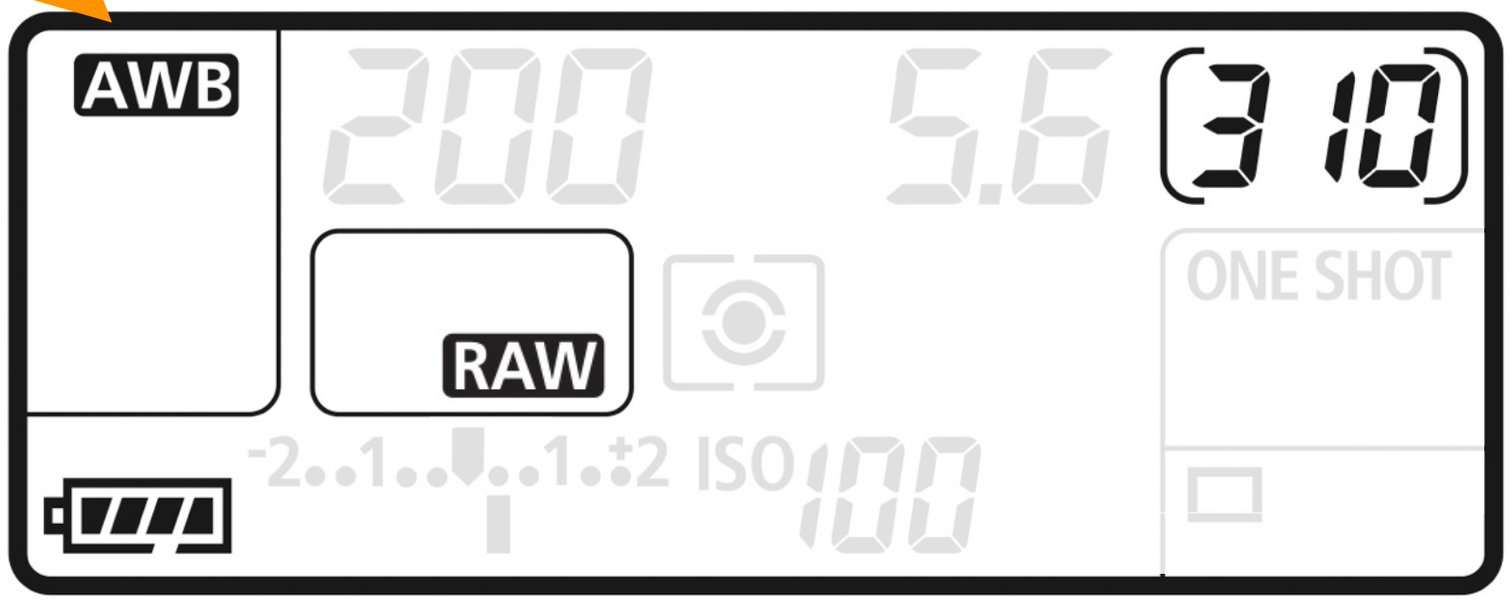

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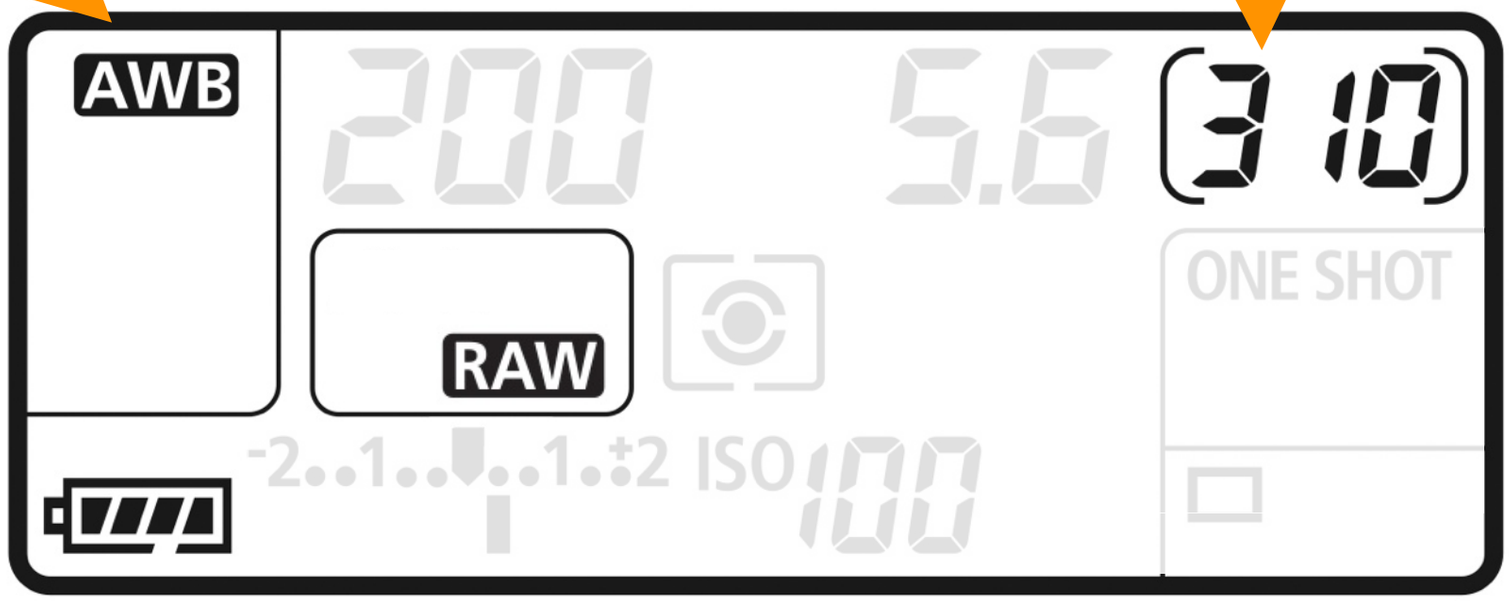
Frames
Remaining



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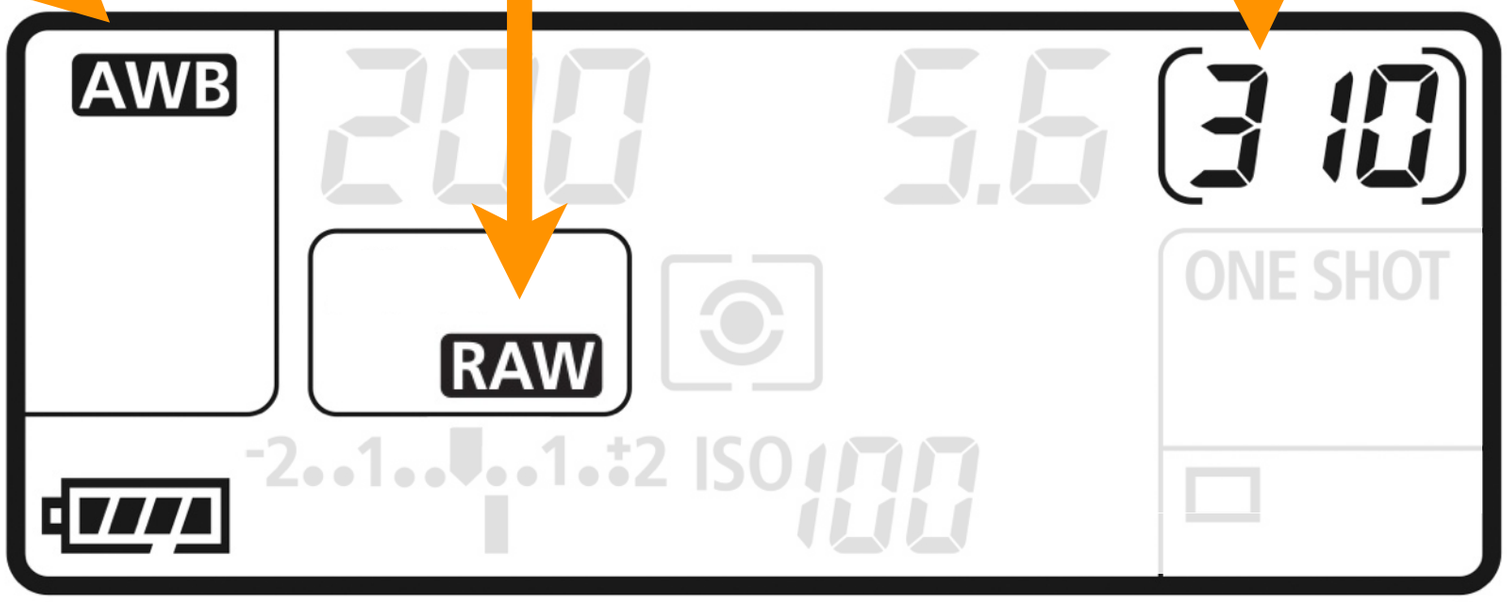
Quality:
RAW

Frames
Remaining



exposure

1. The act of presenting a photosensitive surface to rays of light.
2. The total amount of light received by a photosensitive surface or an area of such a surface, expressed as the product of the degree of illumination and the period of illumination.
3. The image resulting from the effects of light rays on a photosensitive surface.

exposure

Shutter Speed + Aperture + ISO

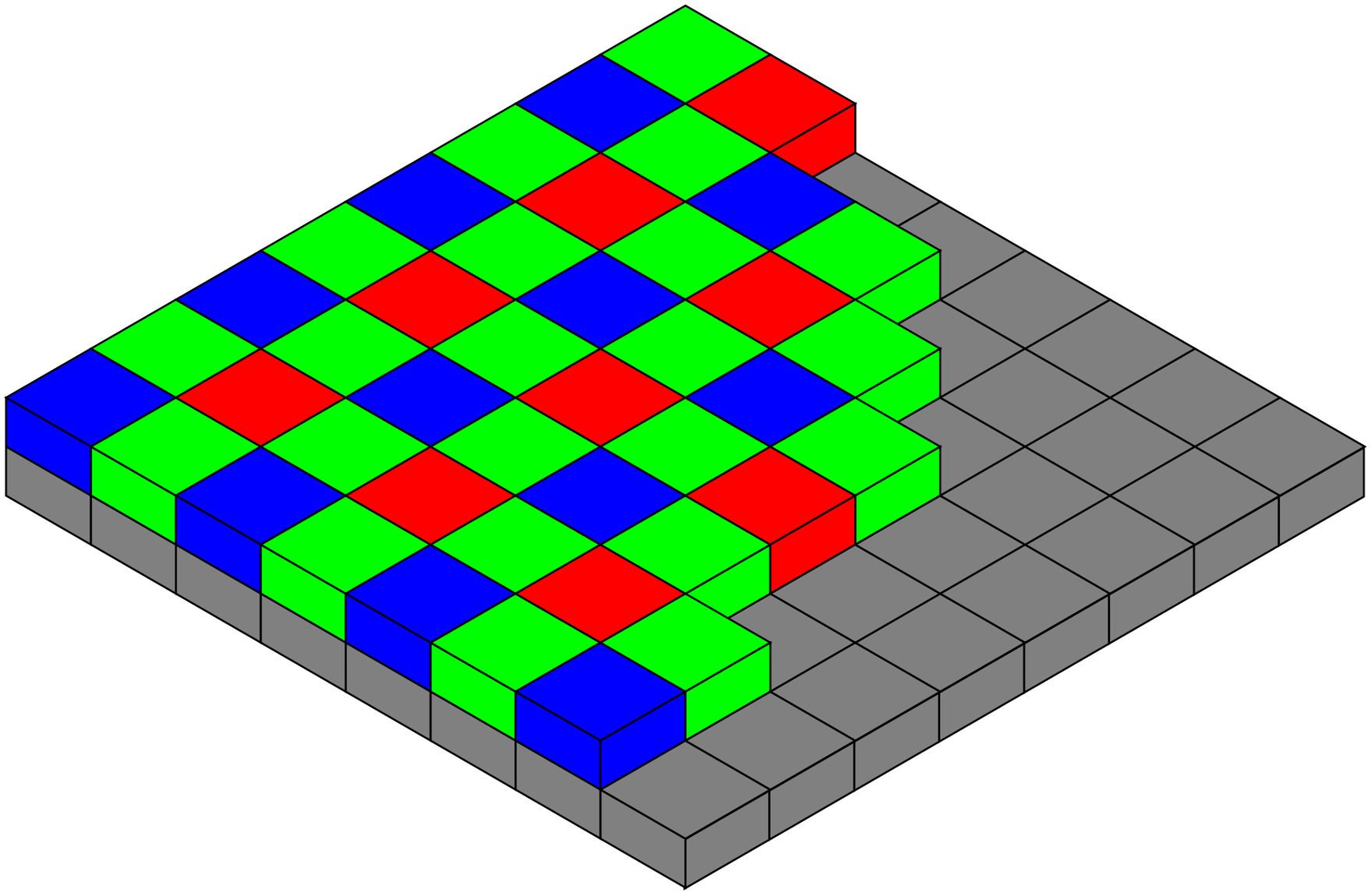
ISO

ILFORD
PAN
400
BLACK & WHITE FILM
ILFORD
PAN
400
ORWO
135-36
NP
22
NOVA
FP4
NOVA
FP4
ROLL FILM 120 ISO-125/22°
NOVA
FP4
120

Kodak
गोल्ड
सुपर 200
36
Kodak
Elite CHROME
ExtraColor
36 EXP FILM
100
Kodak Select
SERIES
Elite CHROME
100
36 EXP
Kodak Select

CCD

ISO is essentially hardware gain.

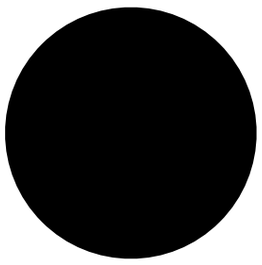


200 ISO

- Daylight
- Bright, bright studio lighting

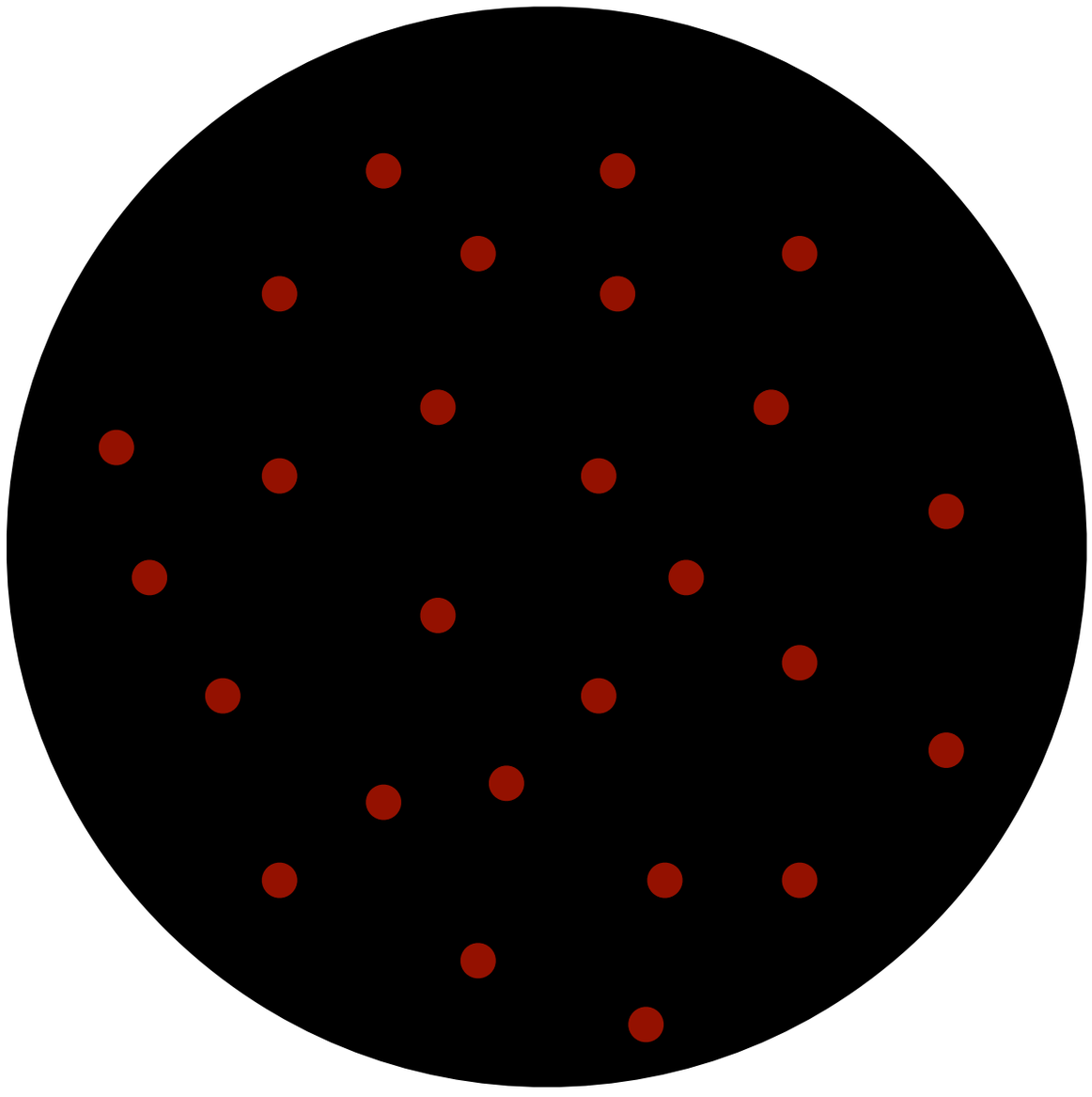
400-1600 ISO

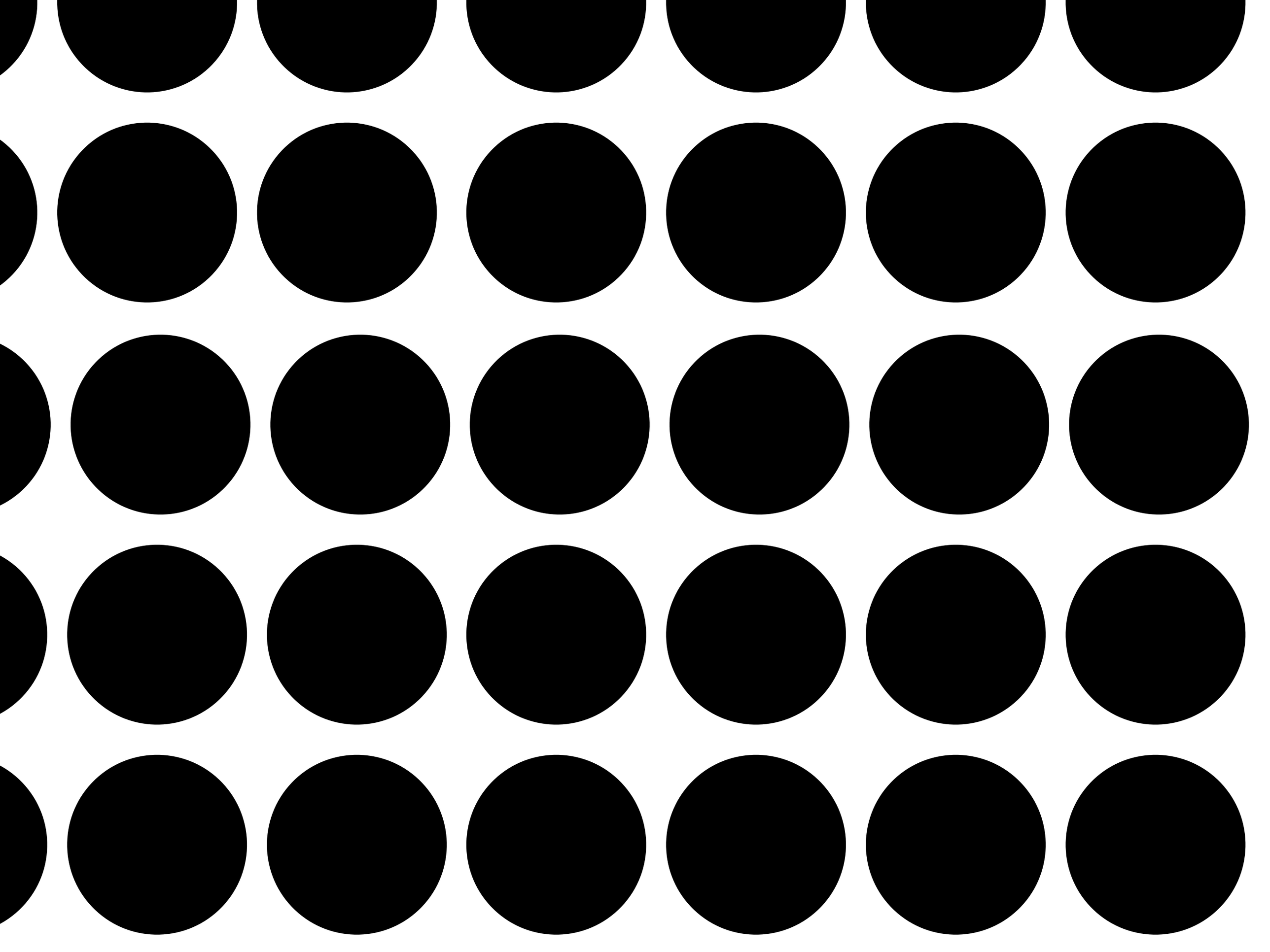
- Outdoors, action shots
- Indoors, adequate lighting
- Shade

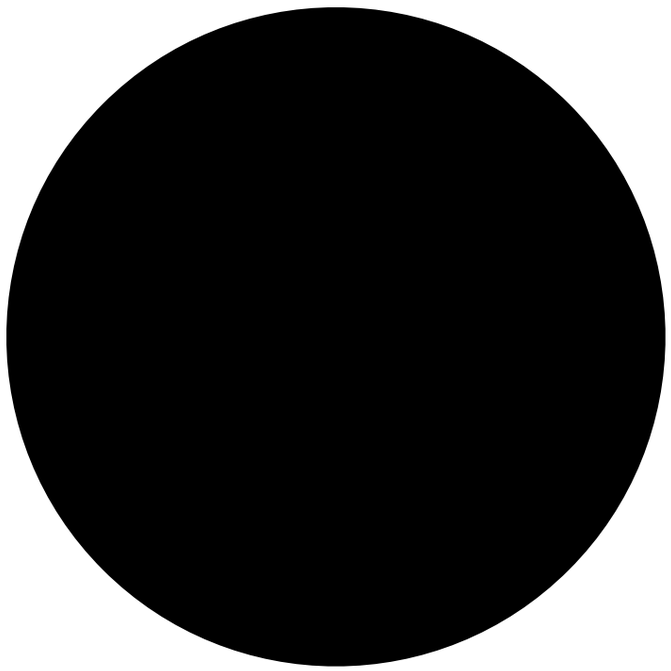
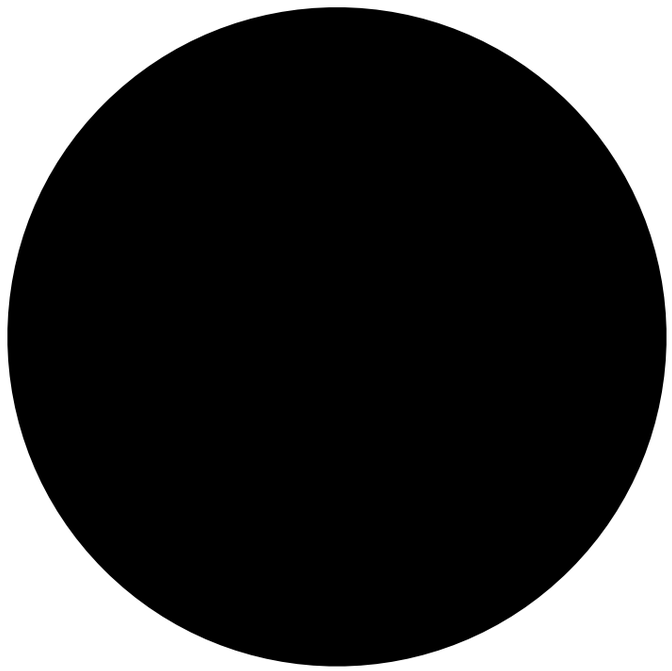
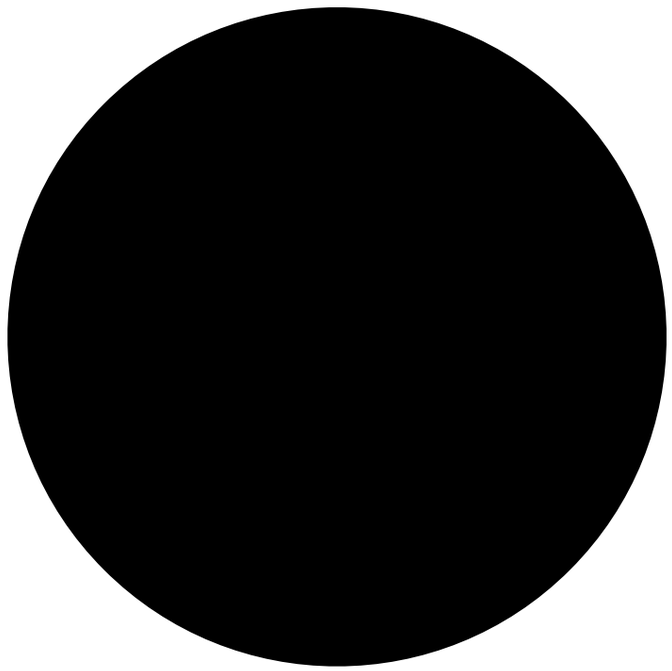
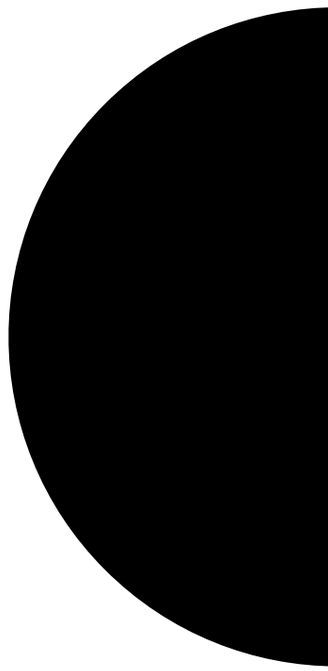
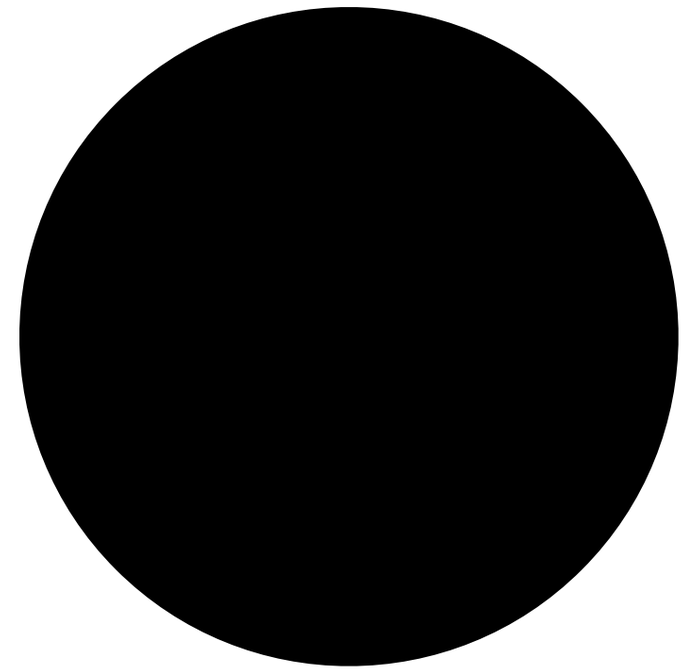
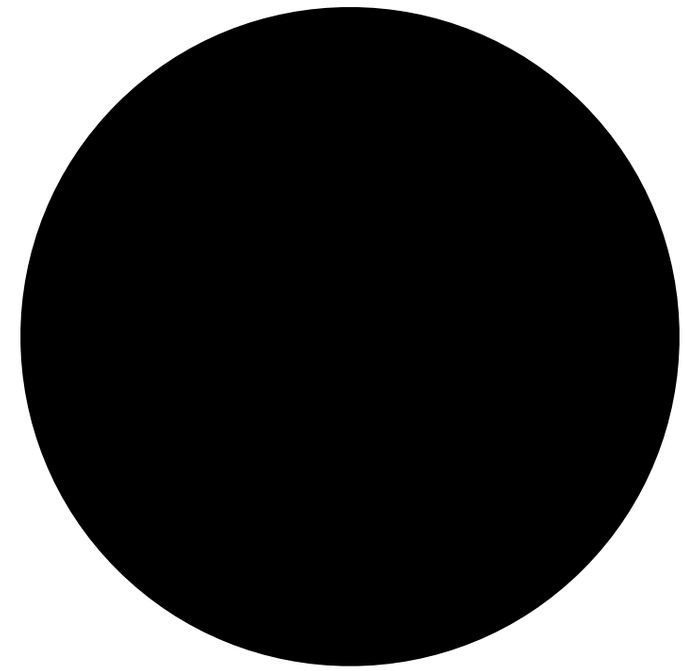
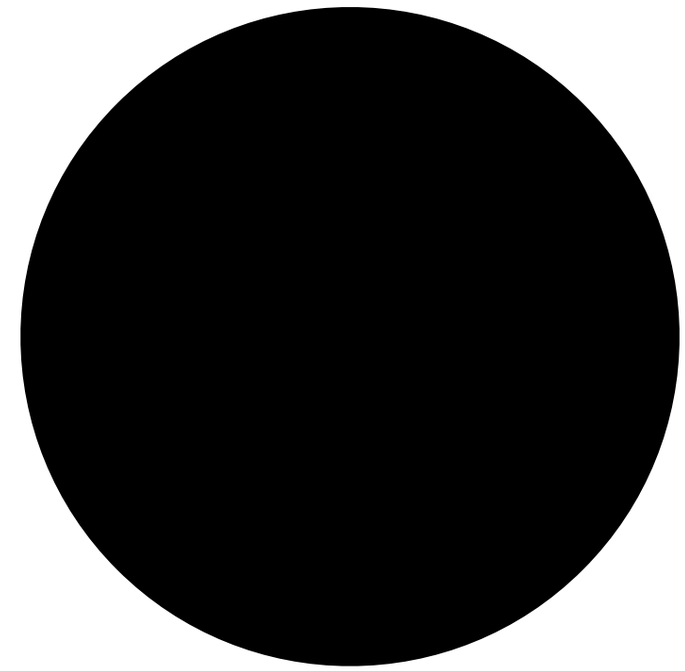
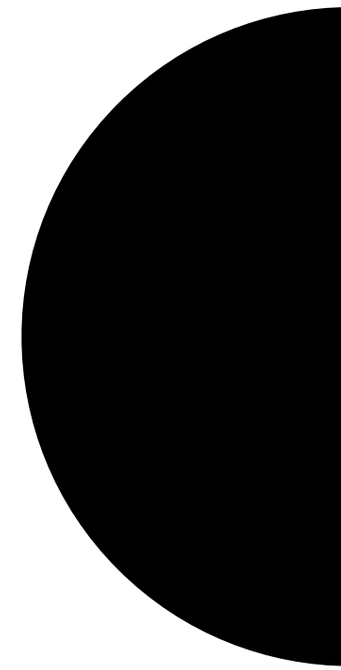
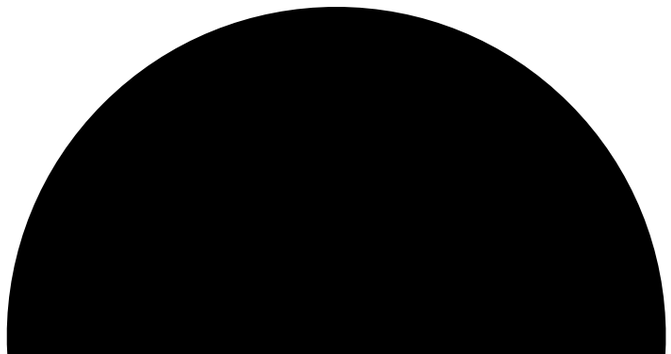
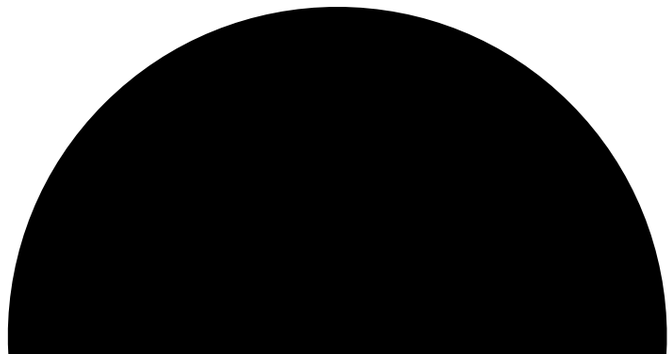
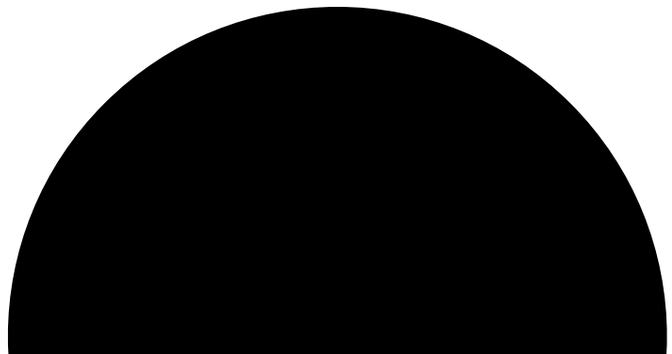
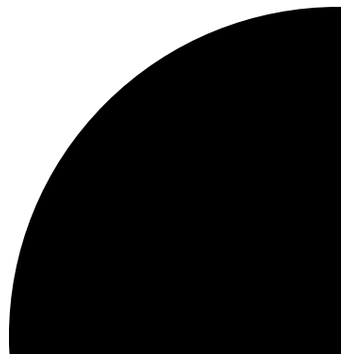


3200+ ISO

- Indoors, poor lighting
- Indoors, action shots
- Night time (+ some software gain)

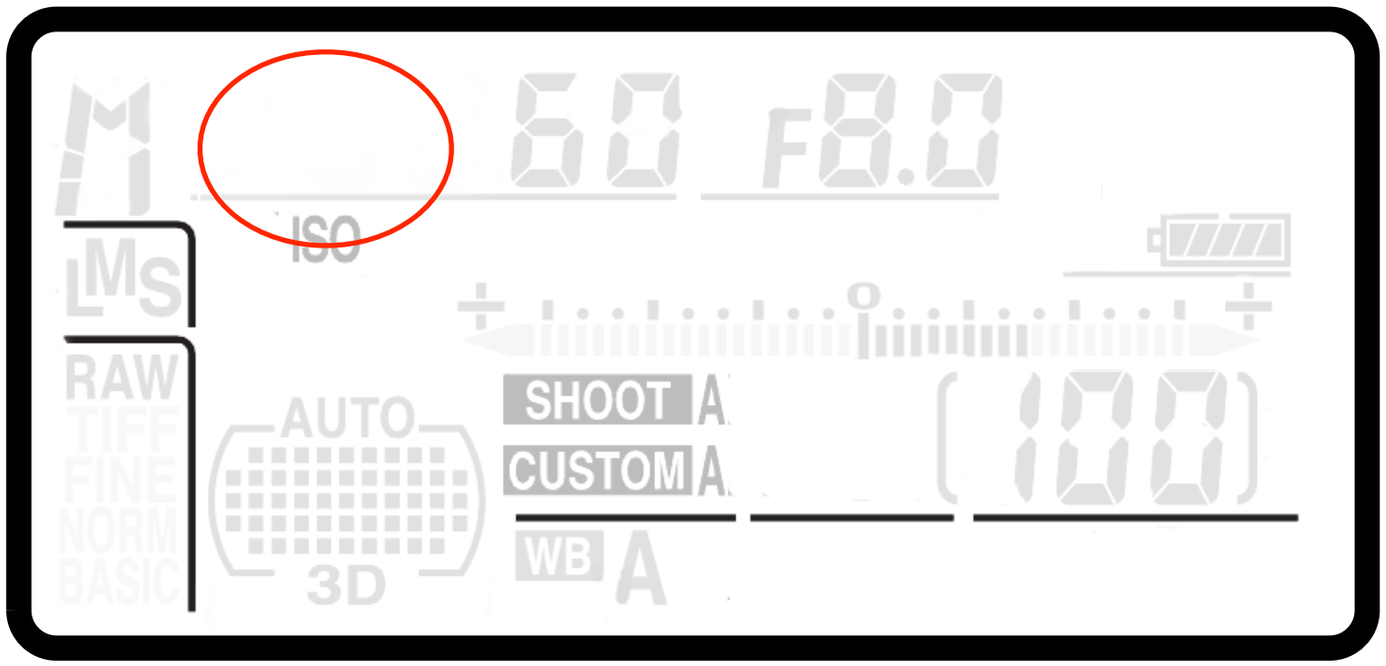




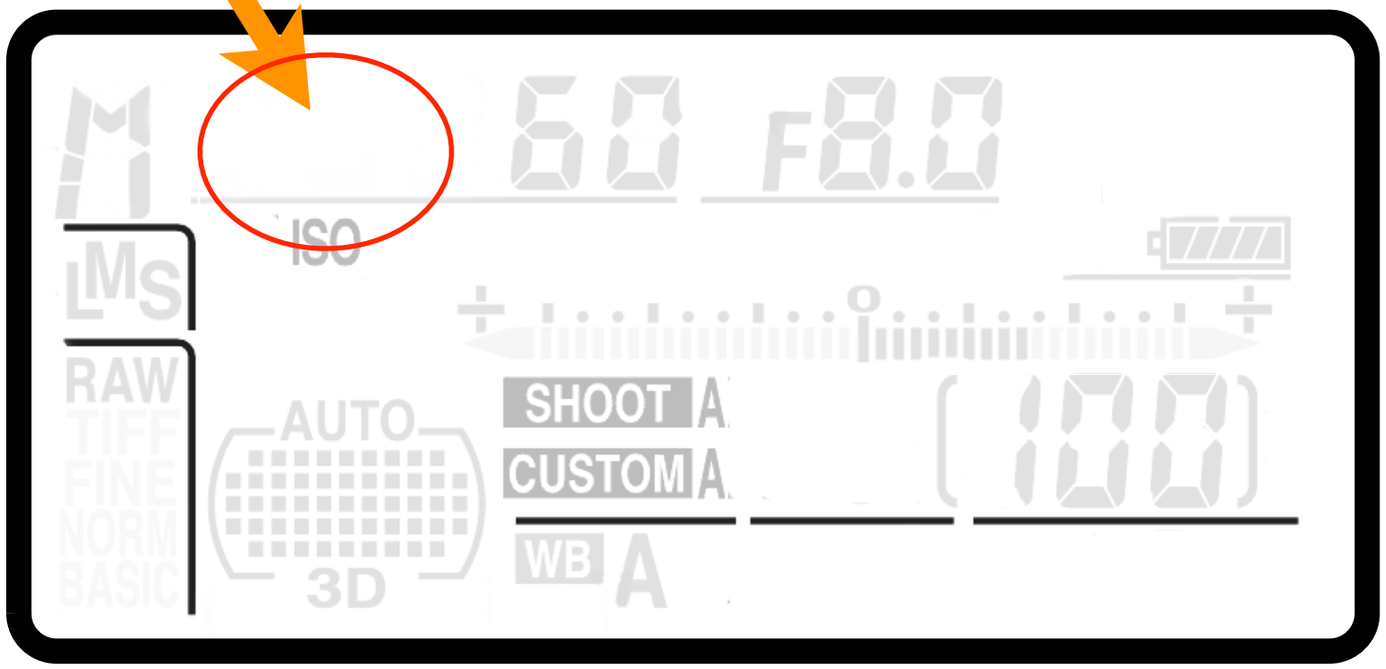













Choose your ISO!

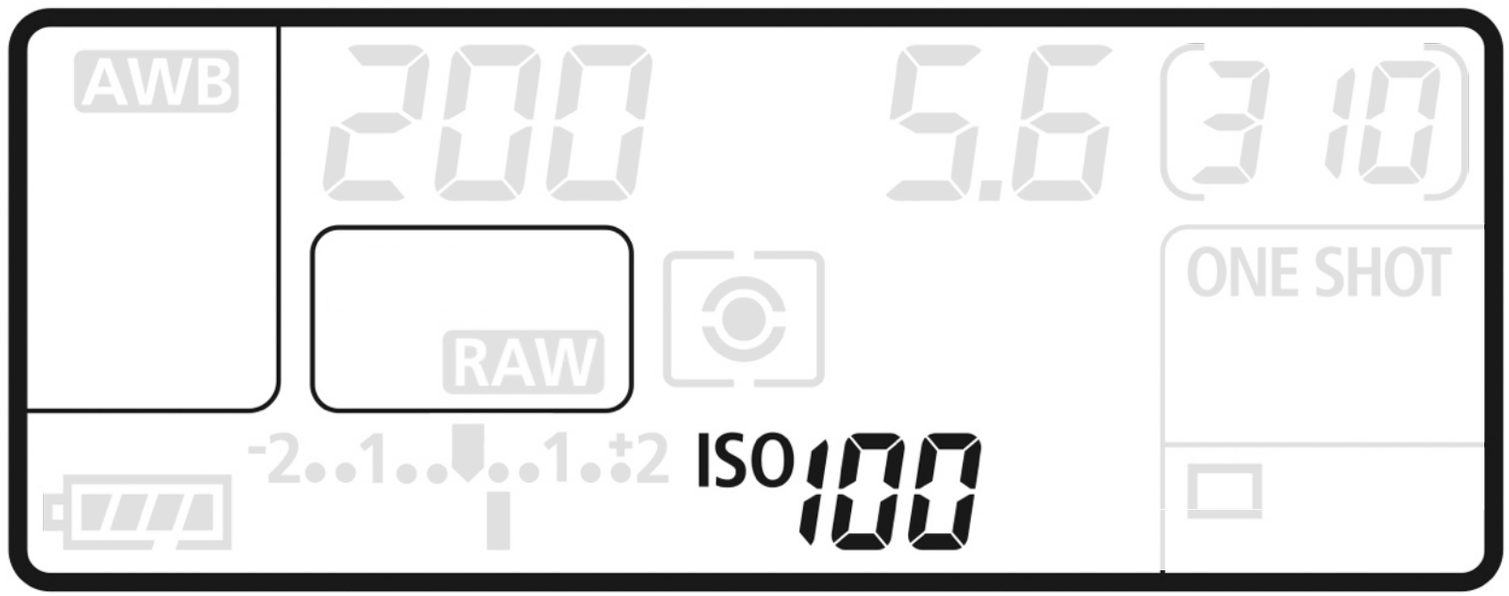
OFF
ON
MODE


M
60
F8.0
ISO
LMS
RAW
TIFF
FINE
NORM
BASIC
AUTO
3D
SHOOT A
CUSTOM A
WB A
100

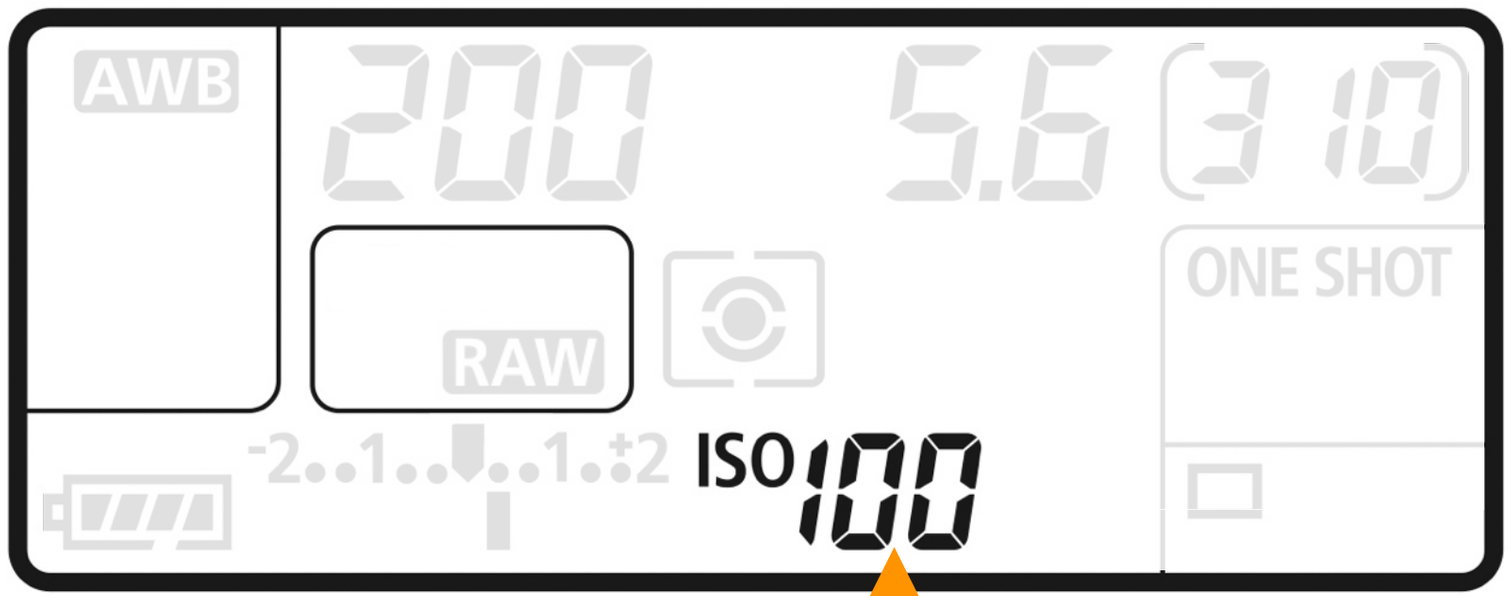
ISO number
shows here



1:4 L IS USM
24-105mm
70
105
-WB
AF-DRIVE
ISO-
AWB
8000
5.6
93
L
RAW
ONE SHOT
-2..1..0..1..+2 ISO
6400

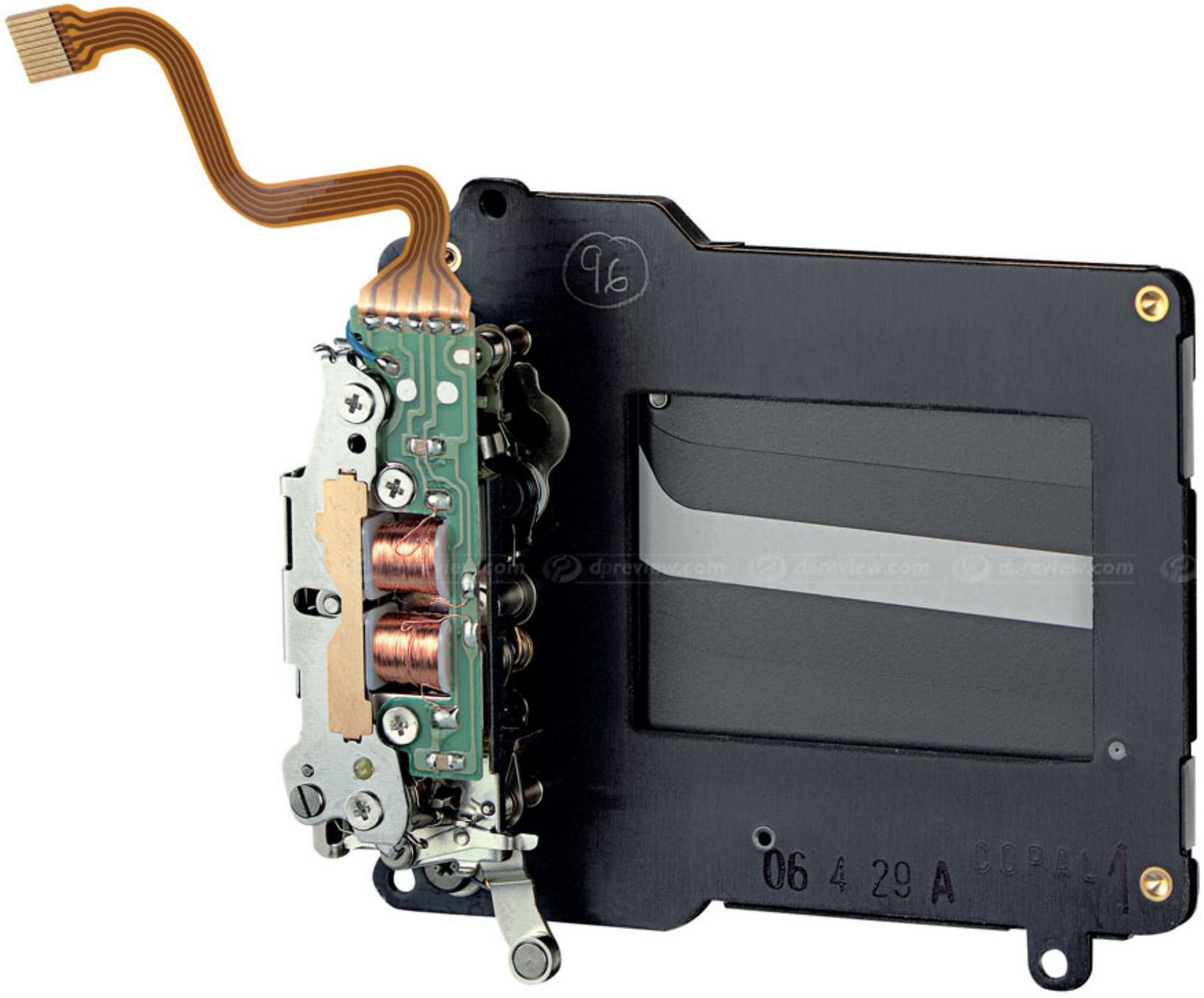

AWB
200
5.6
3
10
ONE SHOT
RAW
-2..1..0..1..+2
ISO100

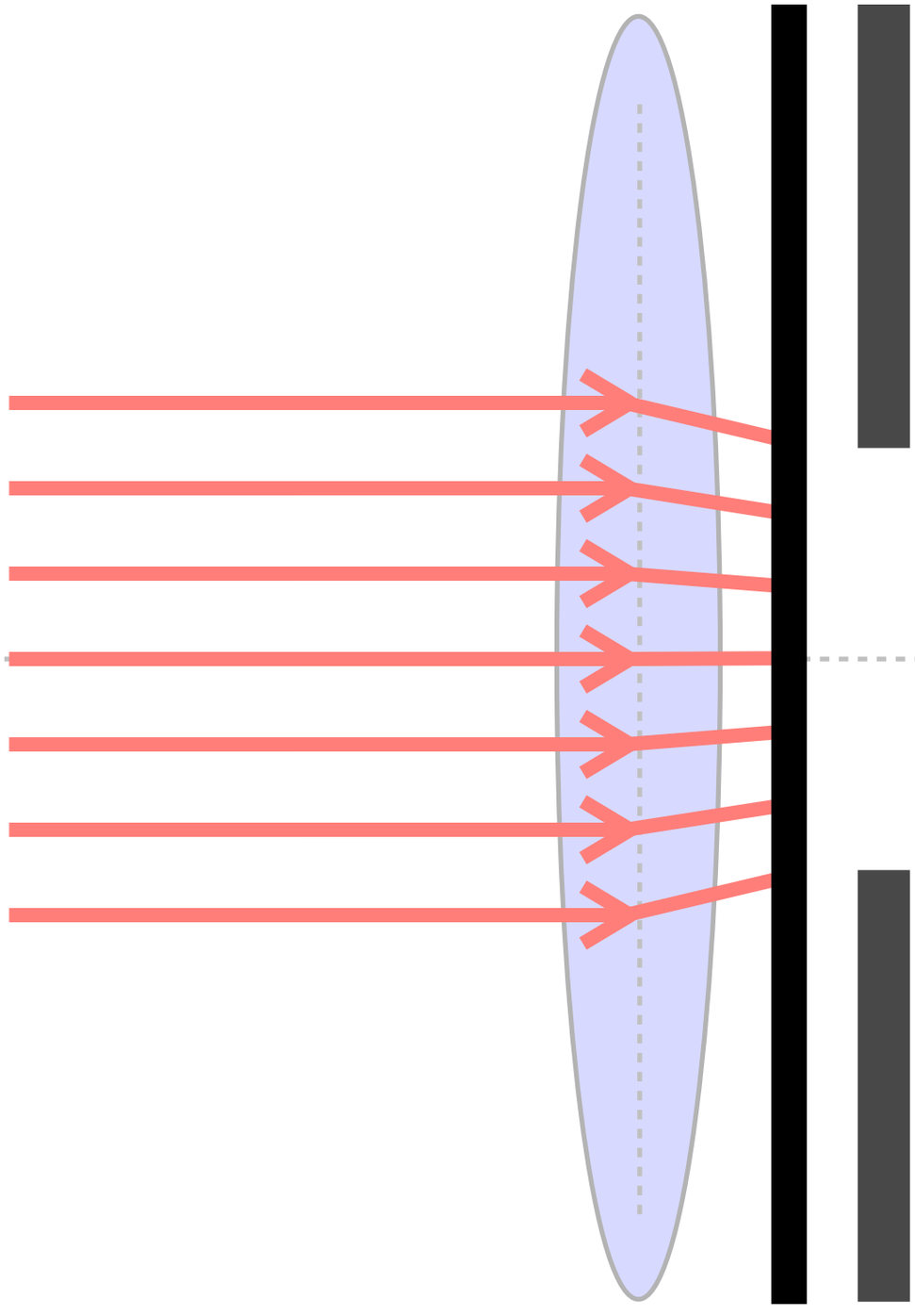
1:4 L IS USM
24-105mm
70
105
WB
AF·DRIVE
ISO
AWB
8000
5.6
93
ONE SHOT
RAW
ISO 6400

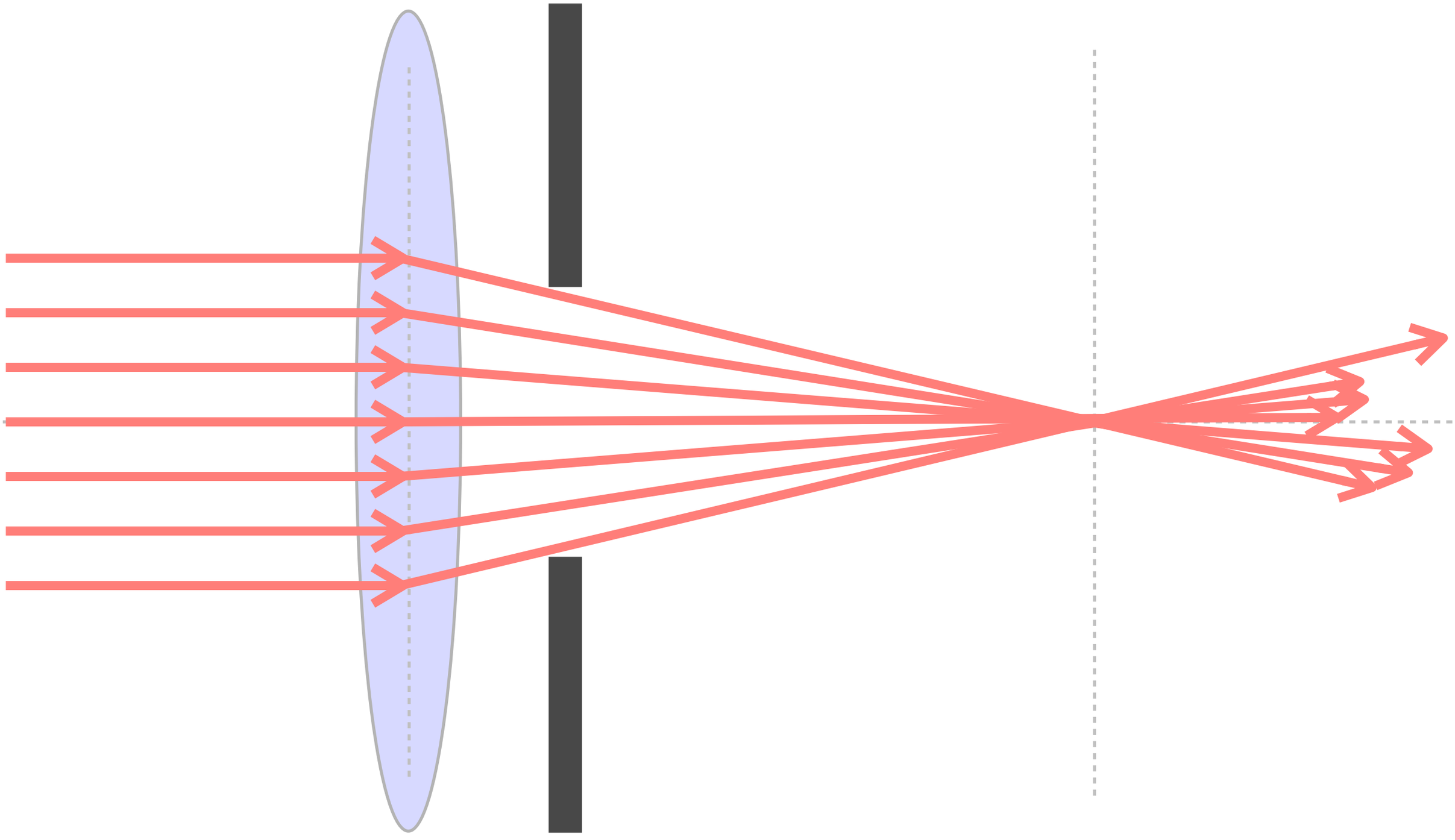

AWB
200
5.6
3 10
ONE SHOT
RAW
-2..1..1..1..+2
ISO 100

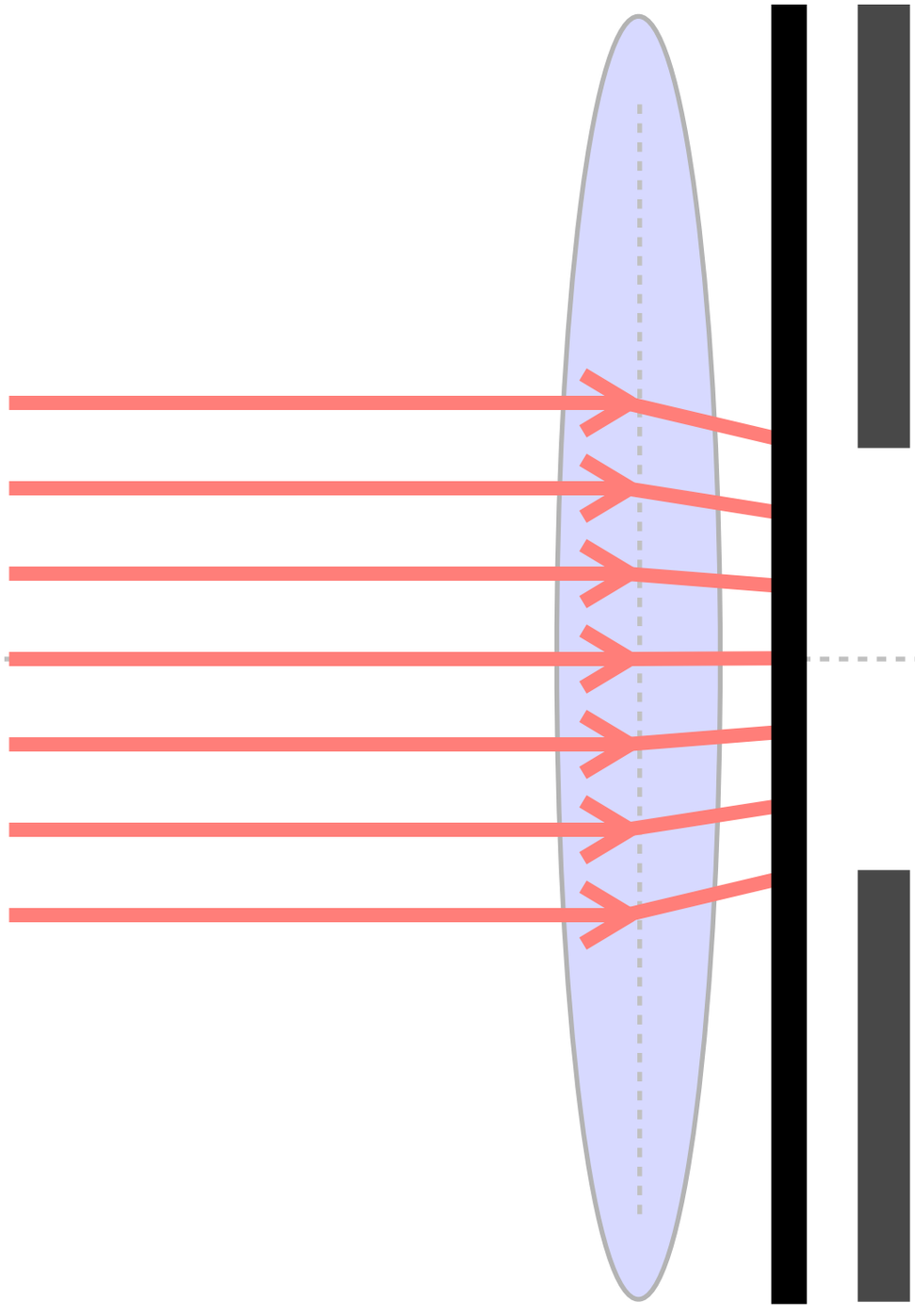
ISO

SHUTTER SPEED


96
06 4 29 A







1/1000 s

1/500 s

1/250 s

1/125 s

1/60 s

1/30 s

1/15 s

1/8 s

1/4 s

1/2 s

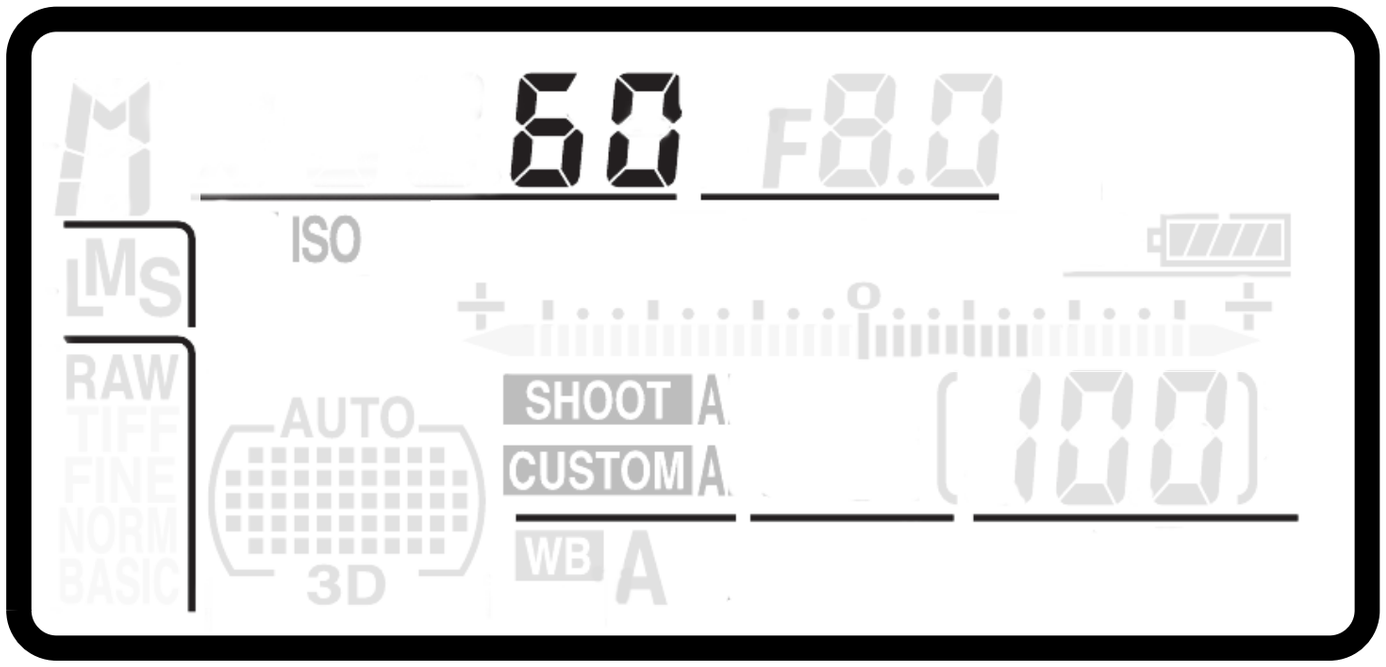
1 s

less light

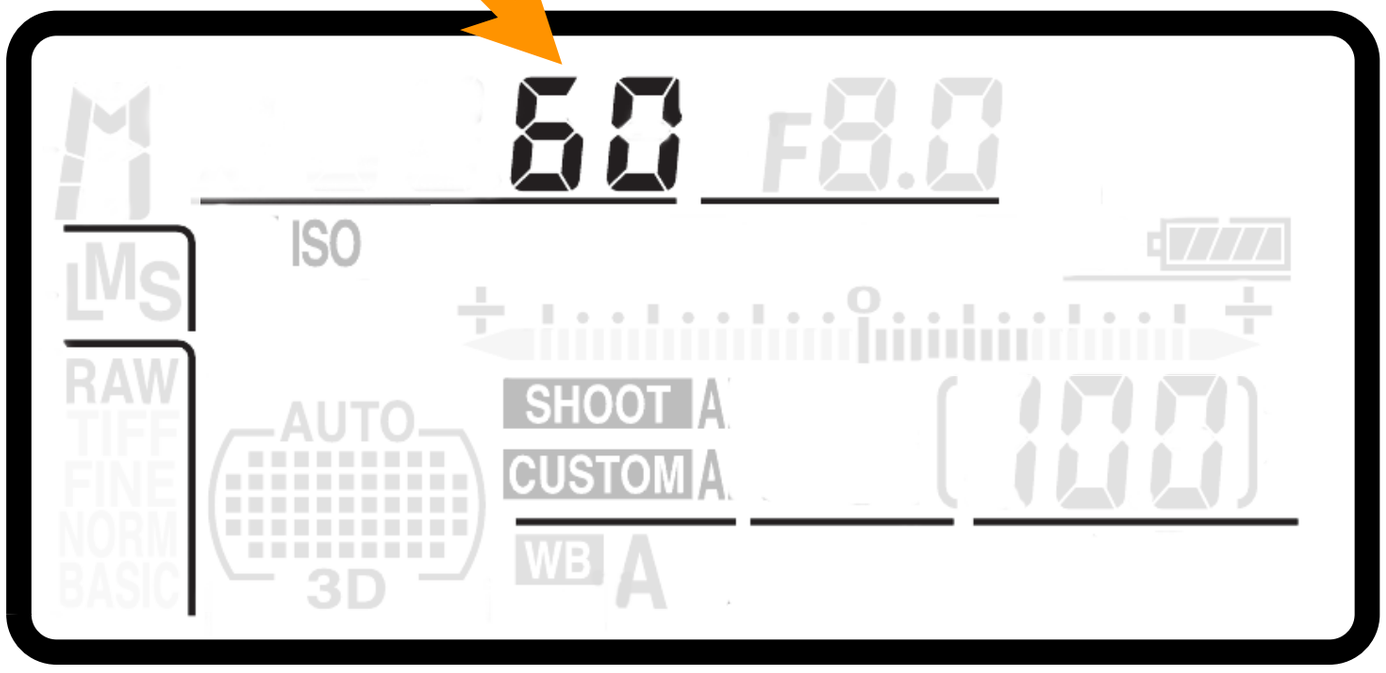
more light

change your shutter speed!

OFF
ON
MODE


60
F8.0
ISO
RAW
TIFF
FINE
NORM
BASIC
AUTO
3D
SHOOT A
CUSTOM A
WB A
100

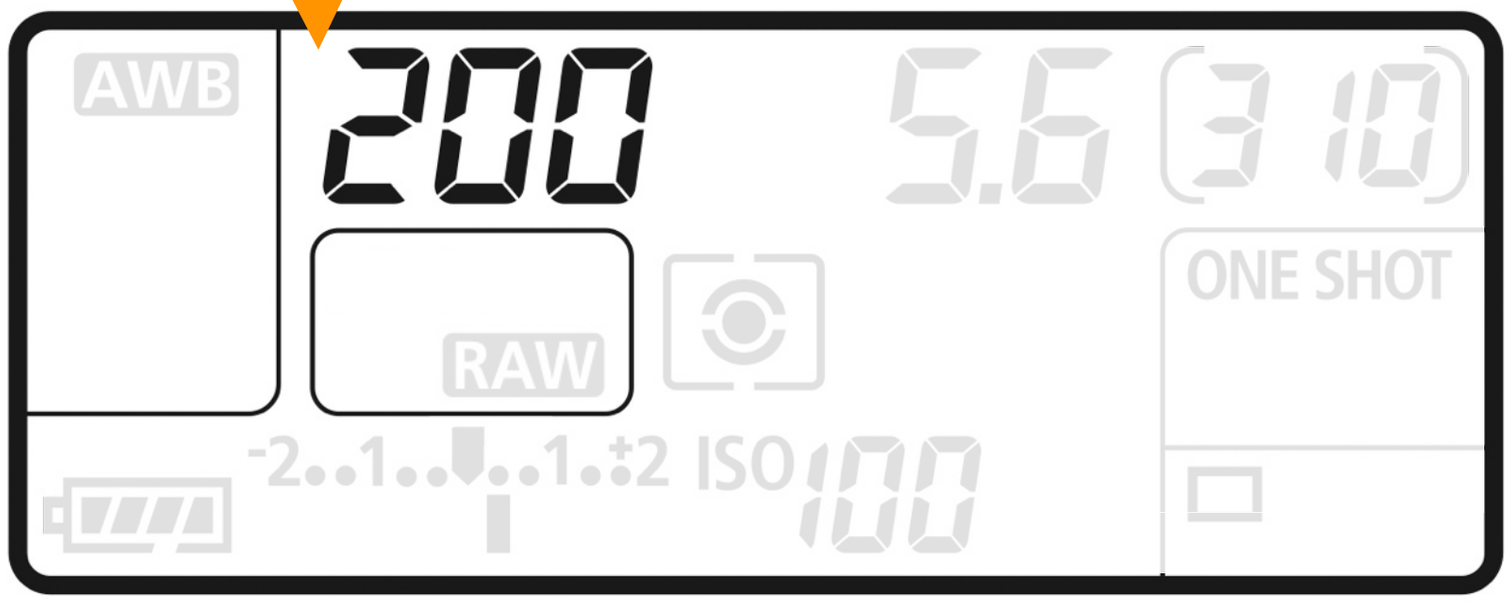
Shutter Speed



1:4 L IS USM
24-105mm
70
105
·WB AF·DRIVE ISO·
AWB
8000 5.6 93
L
RAW
ONE SHOT
-2..1..0..1..+2 ISO 6400

AWB
200
5.6
3 10
RAW
ONE SHOT
-2..1..0..1..+2 ISO 100

Shutter Speed



APERTURE

Aperture

The valve for light.

f/2

Aperture

The valve for light.

f/2.8

Aperture

The valve for light.

f/4

Aperture

The valve for light.

f/5.6

Aperture

The valve for light.

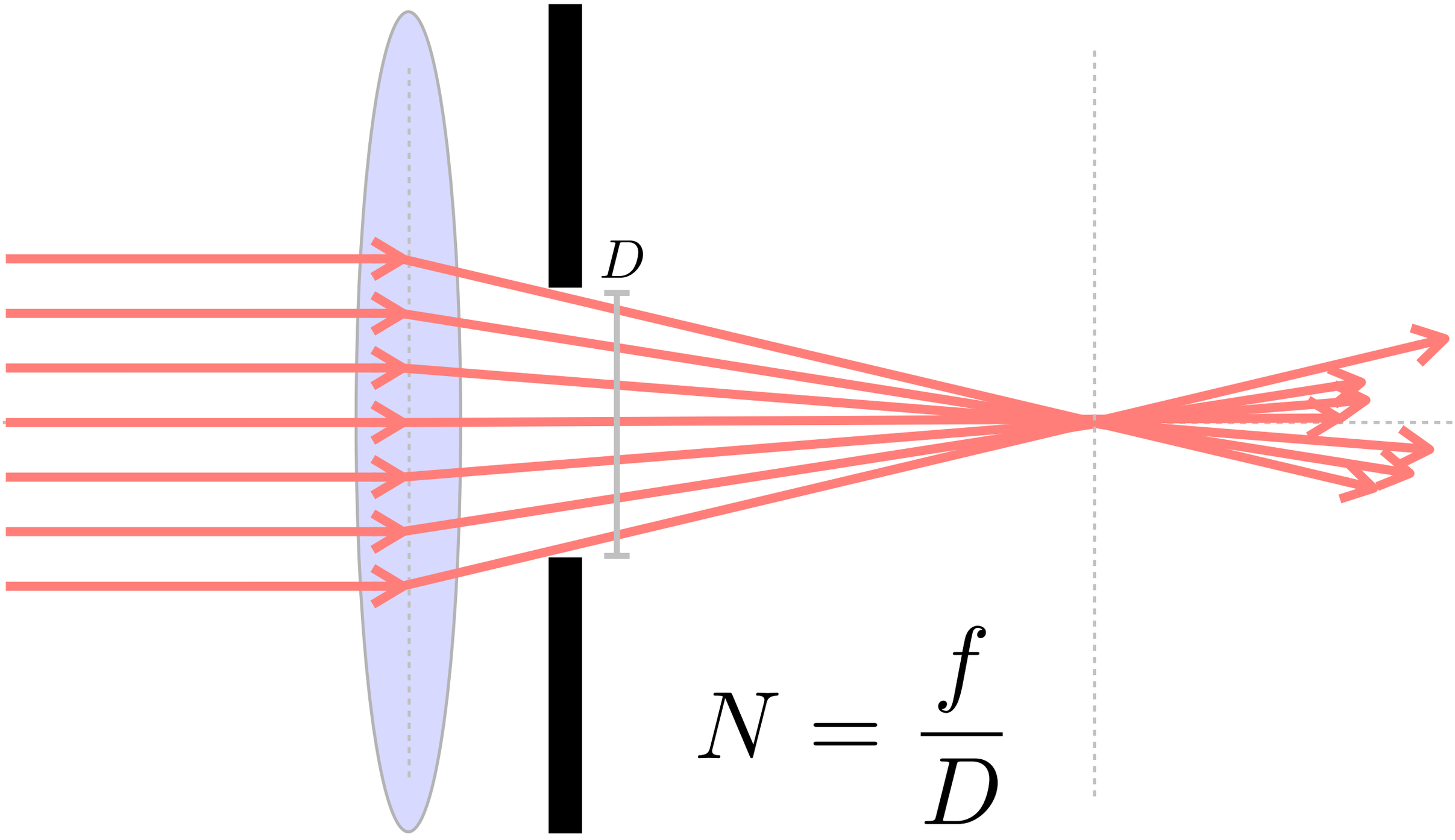
f/8

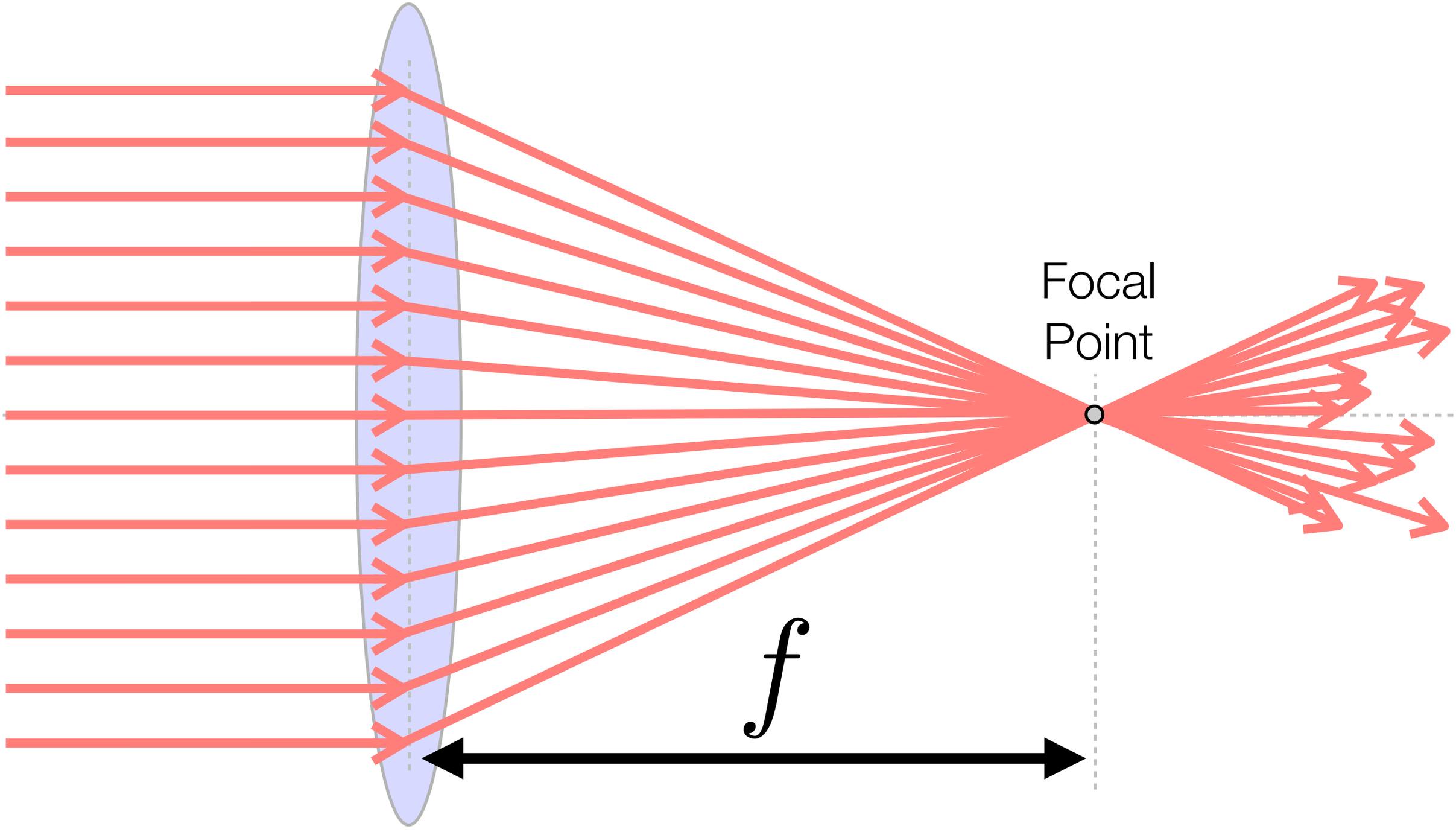
Aperture

The valve for light.

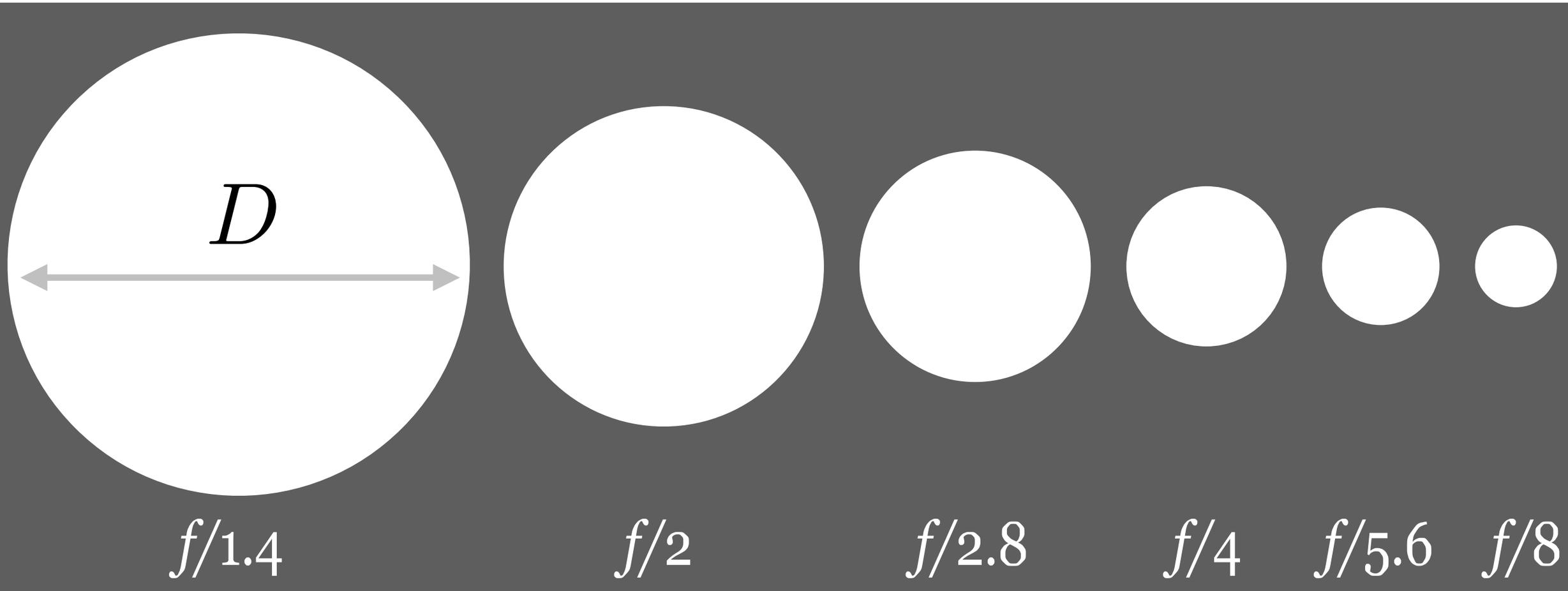
f/22

(dolcepics.com)


D
$N = \frac{f}{D}$

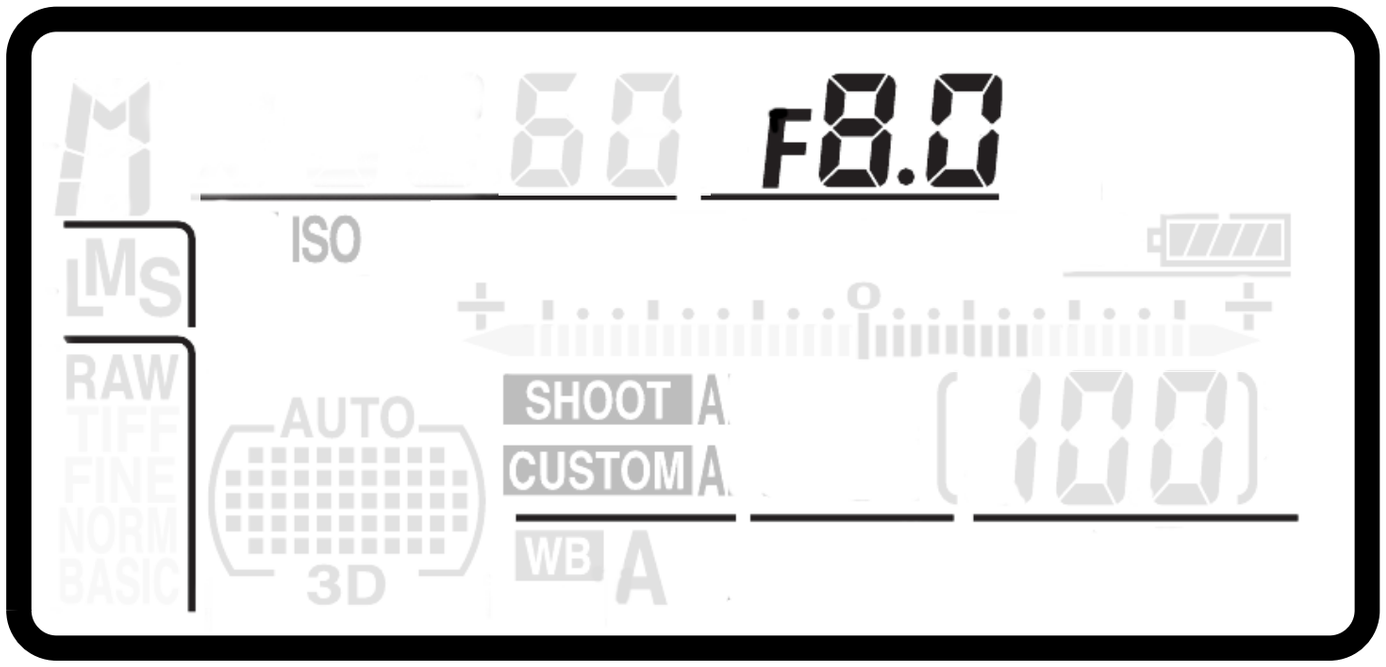

Focal
Point
f

$$N = \frac{f}{D} \qquad \text{or, typically...} \qquad D = \frac{f}{N}$$

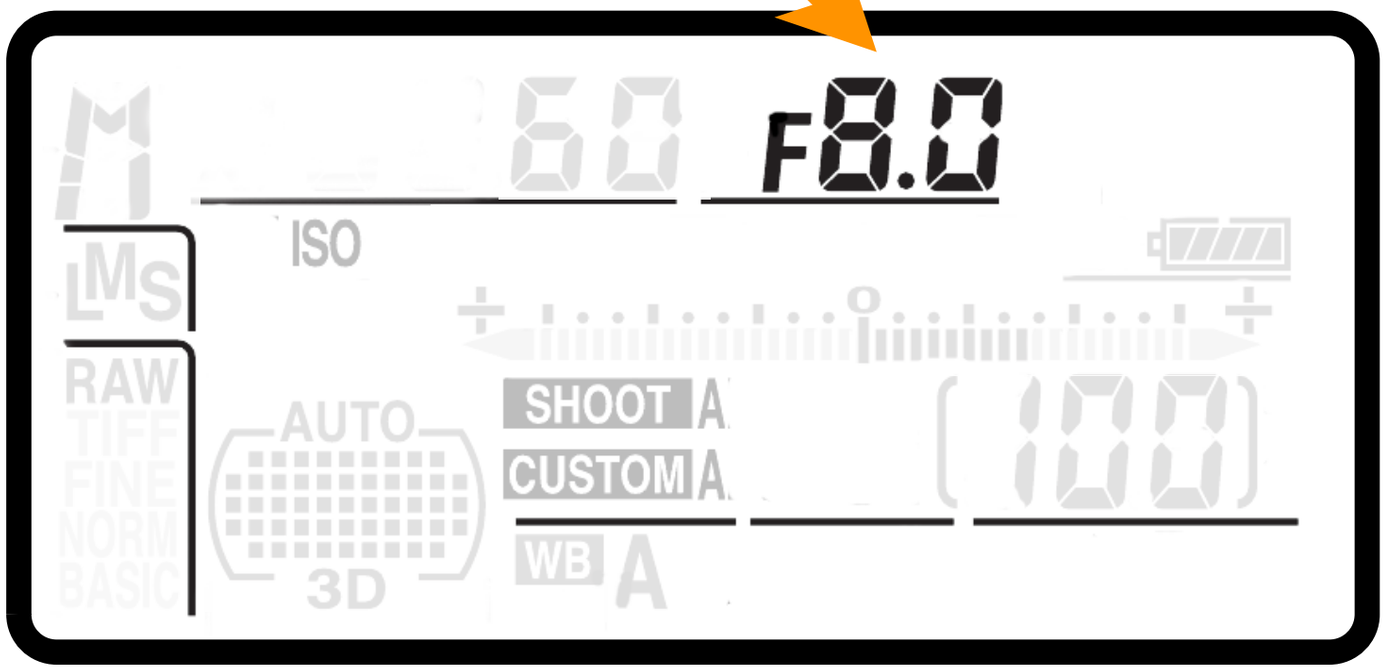


1/2 the area for each “stop”

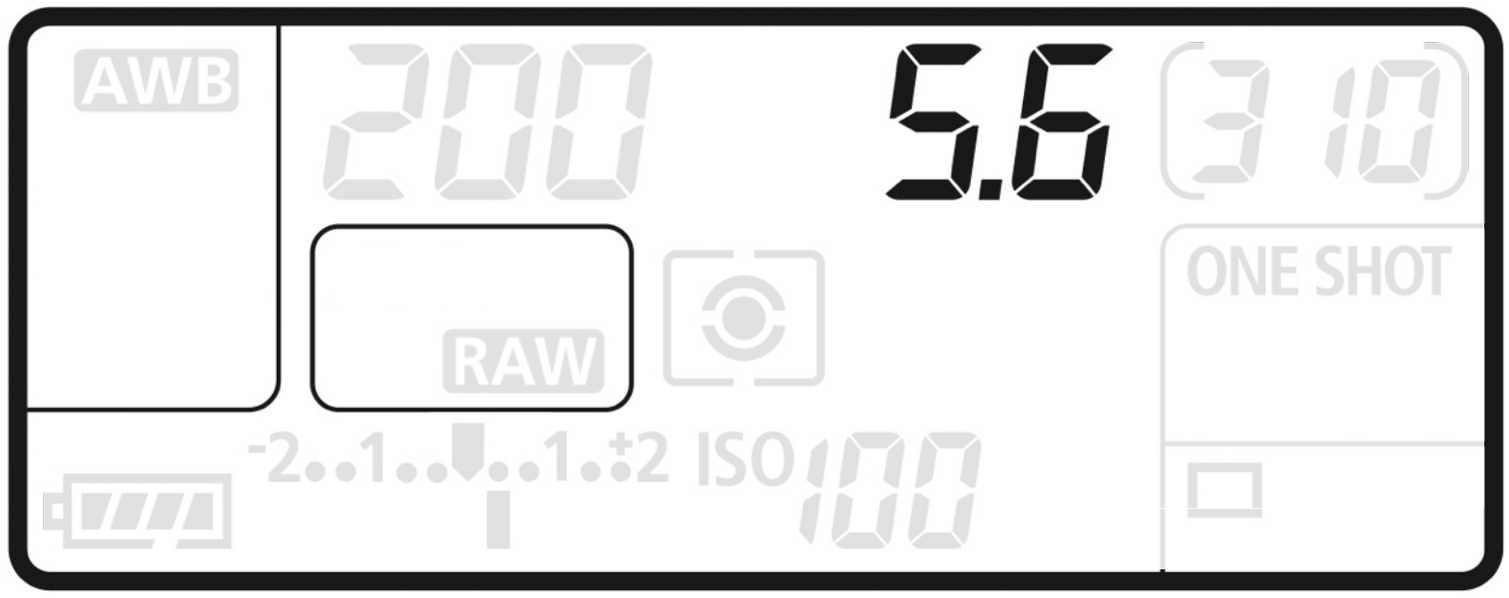
OFF
ON
MODE


F8.0
ISO
RAW
TIFF
FINE
NORM
BASIC
AUTO
3D
SHOOT A
CUSTOM A
WB A

F-Number / F-Stop



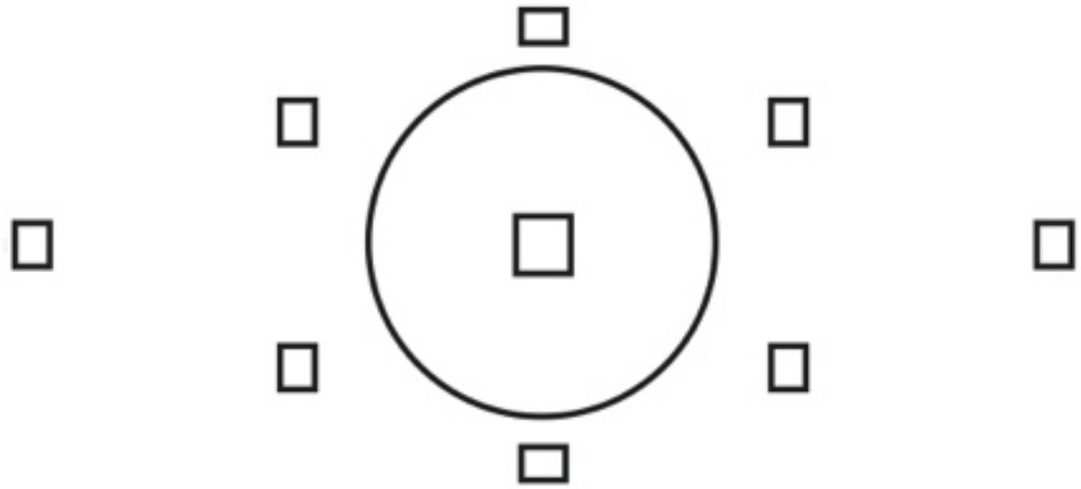
1:4 L IS USM
24-105mm
70
105
WB AF·DRIVE ISO
AWB
8000 5.6 93
L
RAW
ONE SHOT
-2..1..0..1..+2 ISO 6400


AWB
200
5.6
3 10
RAW
ONE SHOT
-2..1..0..1..+2 ISO 100

F-Number / F-Stop

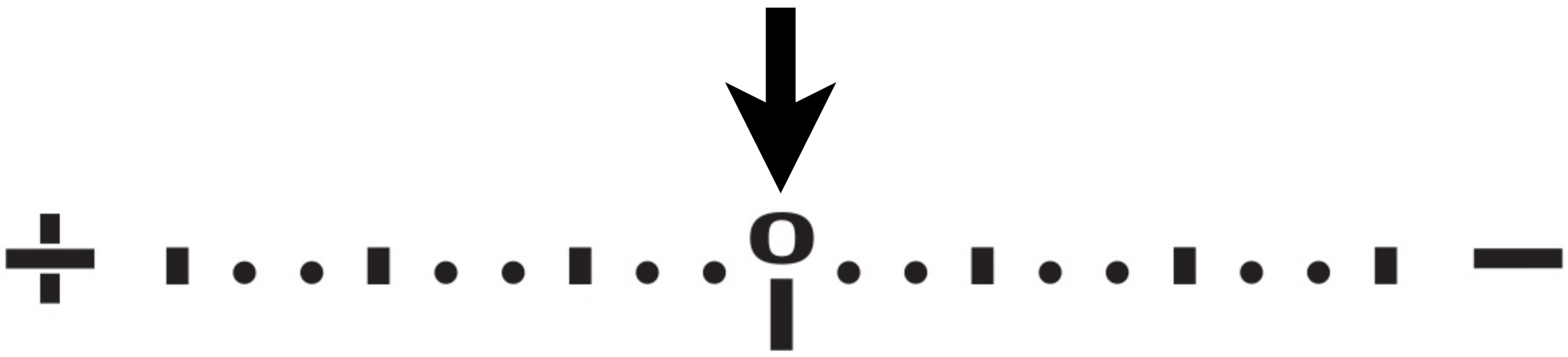
Finding a proper exposure.

The meter.



-2 -1 0 +1 +2
S0
WB
+/-
B/W

Spot on



+ Over exposed

- Under exposed

← over exposure

under exposure →

Aperture + Shutter Speed

A relationship of stops.

f/2

1/1000 s

Aperture + Shutter Speed

A relationship of stops.

f/2.8

1/2 light

1/500 s

2x **time**

Aperture + Shutter Speed

A relationship of stops.

f/4

$(1/2)^2$ light

1/250 s

2^2 x **time**

Aperture + Shutter Speed

A relationship of stops.

f/5.6

$(1/2)^3$ light

1/125 s

2^3 x **time**

Aperture + Shutter Speed

A relationship of stops.

f/8

$(1/2)^4$ light

1/60 s

$\sim 2^4$ x **time**

(dolcepics.com)

1. What ISO?

2. Meter

3. Shutter + Aperture

EXPOSURE