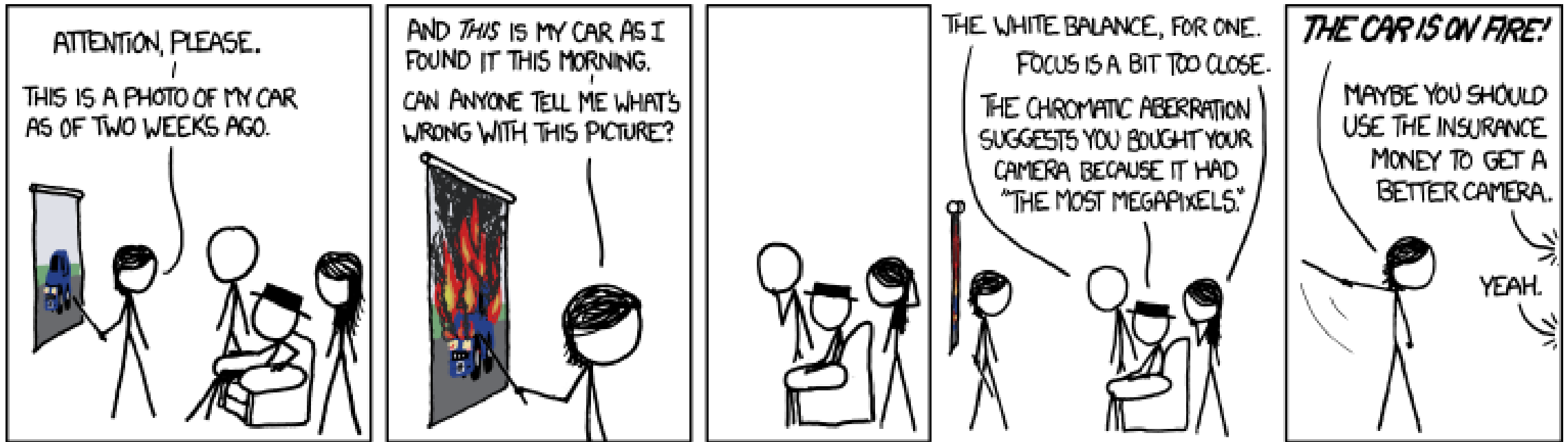


# Camera tutorial



15-463, 15-663, 15-862  
Computational Photography  
Fall 2020

# Taking a photograph with your mobile phone camera

Once you find something you want to photograph:

1. “Frame” your scene.
2. Press the “shutter release” button.

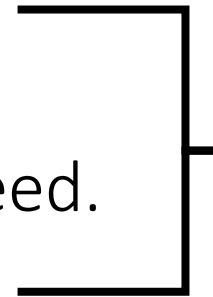


# Taking a photograph with a camera with manual controls

Once you find something you want to photograph:

1. "Frame" your scene.
2. Set the lens.
  - a) Select zoom.
  - b) Select focus.
  - c) Select aperture.
3. Set the exposure.
  - a) Select shutter speed.
  - b) Select aperture.
  - c) Select ISO.

Go back  
and do it  
again  
(possibly  
several  
times).



Appears  
twice??



4. Eventually press the shutter release.

Also decide on white balance, lighting (if possible), and so on.

# Trade-off: convenience versus creative control

Nowadays, the camera can make most lens and exposure decisions on its own.

- You still need to select the scene and do the framing (for now).

Having the option to make these decisions on our own can serve creativity.

- Also, in a few cases, we can still do a better job than the camera in deciding settings.
- (Also you need to control these settings for your homework!)



# Important

Do not agonize about setting everything correctly.

Taking slightly imperfect photos is more important than spending most of your time fiddling with settings.

# Your cameras

- Three Nikon camera models: D3300, D3400, D3500.
- Slightly different placement of controls and menu options, but otherwise very similar.
- Check your camera model! The tutorial uses photos of D3400.



# Your lenses

- Three versions of the same lens: AF-S DX Nikkor 18-55mm f/3.5-5.6 G ED, AF-S DX Nikkor 18-55mm f/3.5-5.6 G VR, AF-S DX Nikkor 18-55mm f/3.5-5.6 G VR II.
- Effectively identical as far as this course is concerned.

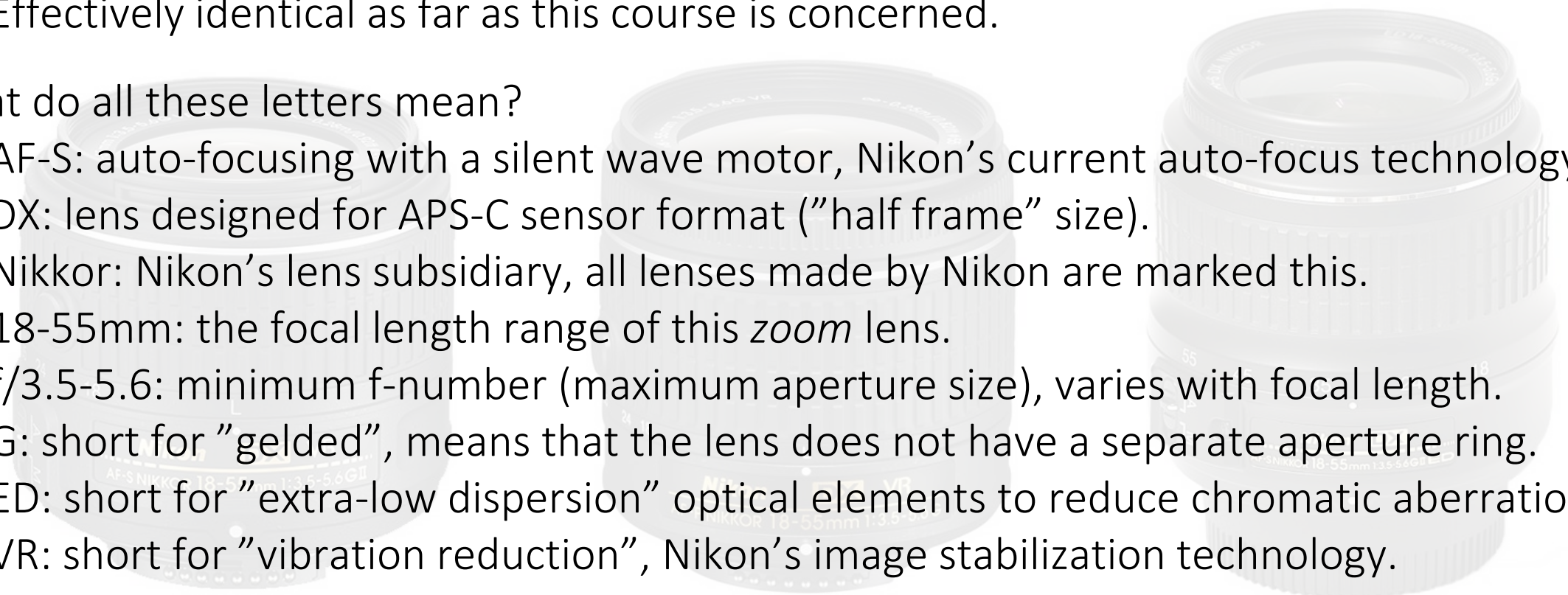


# Your lenses

- Three versions of the same lens: AF-S DX Nikkor 18-55mm f/3.5-5.6 G ED, AF-S DX Nikkor 18-55mm f/3.5-5.6 G VR, AF-S DX Nikkor 18-55mm f/3.5-5.6 G VR II.
- Effectively identical as far as this course is concerned.

What do all these letters mean?

- AF-S: auto-focusing with a silent wave motor, Nikon's current auto-focus technology.
- DX: lens designed for APS-C sensor format ("half frame" size).
- Nikkor: Nikon's lens subsidiary, all lenses made by Nikon are marked this.
- 18-55mm: the focal length range of this *zoom* lens.
- f/3.5-5.6: minimum f-number (maximum aperture size), varies with focal length.
- G: short for "gilded", means that the lens does not have a separate aperture ring.
- ED: short for "extra-low dispersion" optical elements to reduce chromatic aberration.
- VR: short for "vibration reduction", Nikon's image stabilization technology.





# Setting up the shot

Either preview the photo by looking through the viewfinder...

Or use live view to preview it on the LCD.



Toggles between the two modes.

# Deciding the lens zoom and focus

- First press the marked button and rotate to unlock the lens.

Focus ring: controls distance of lens from sensor.

(focus ring hidden here)



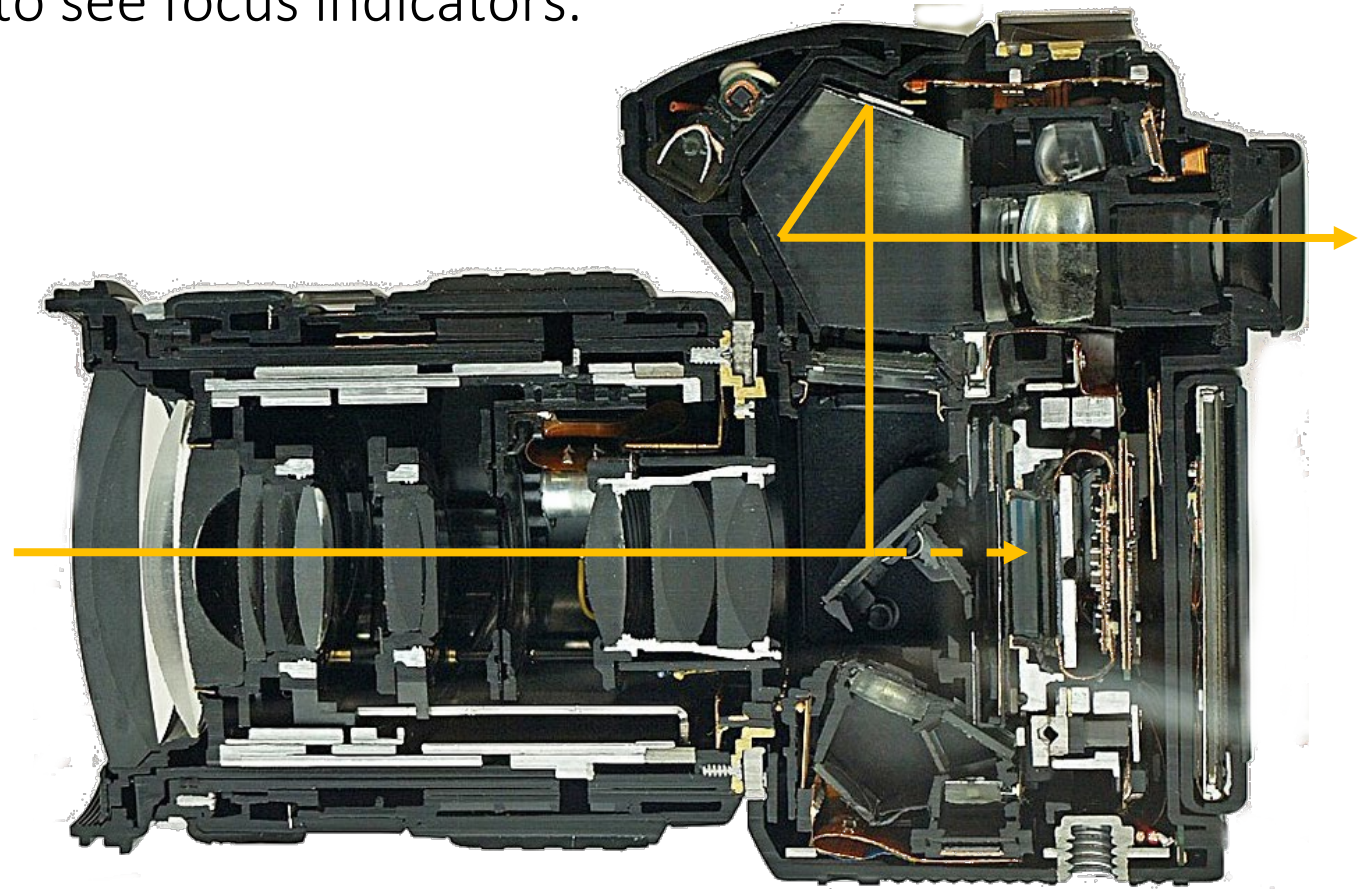
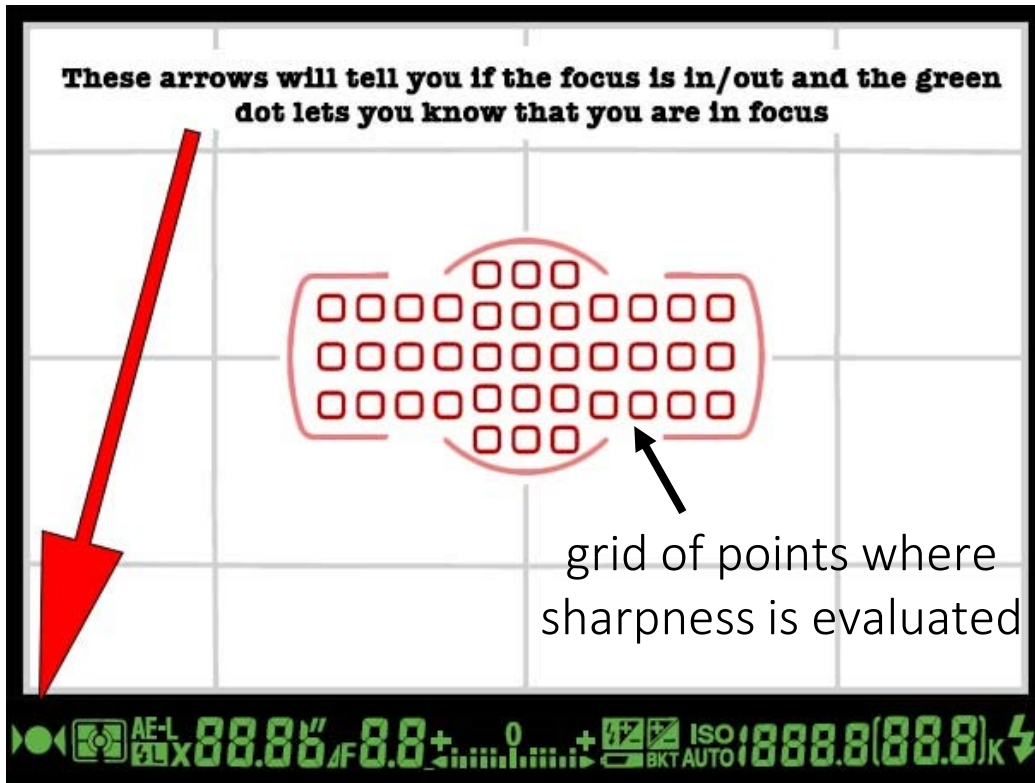
(unlock button hidden here)



Zoom ring: controls focal length of lens.

# Manual focus in DSLR cameras

- Same view as main lens.
- Just rotate the focusing ring until you are satisfied by the sharpness.
- Viewfinder indicators can help this process.
- You need to half-press shutter release to see focus indicators.



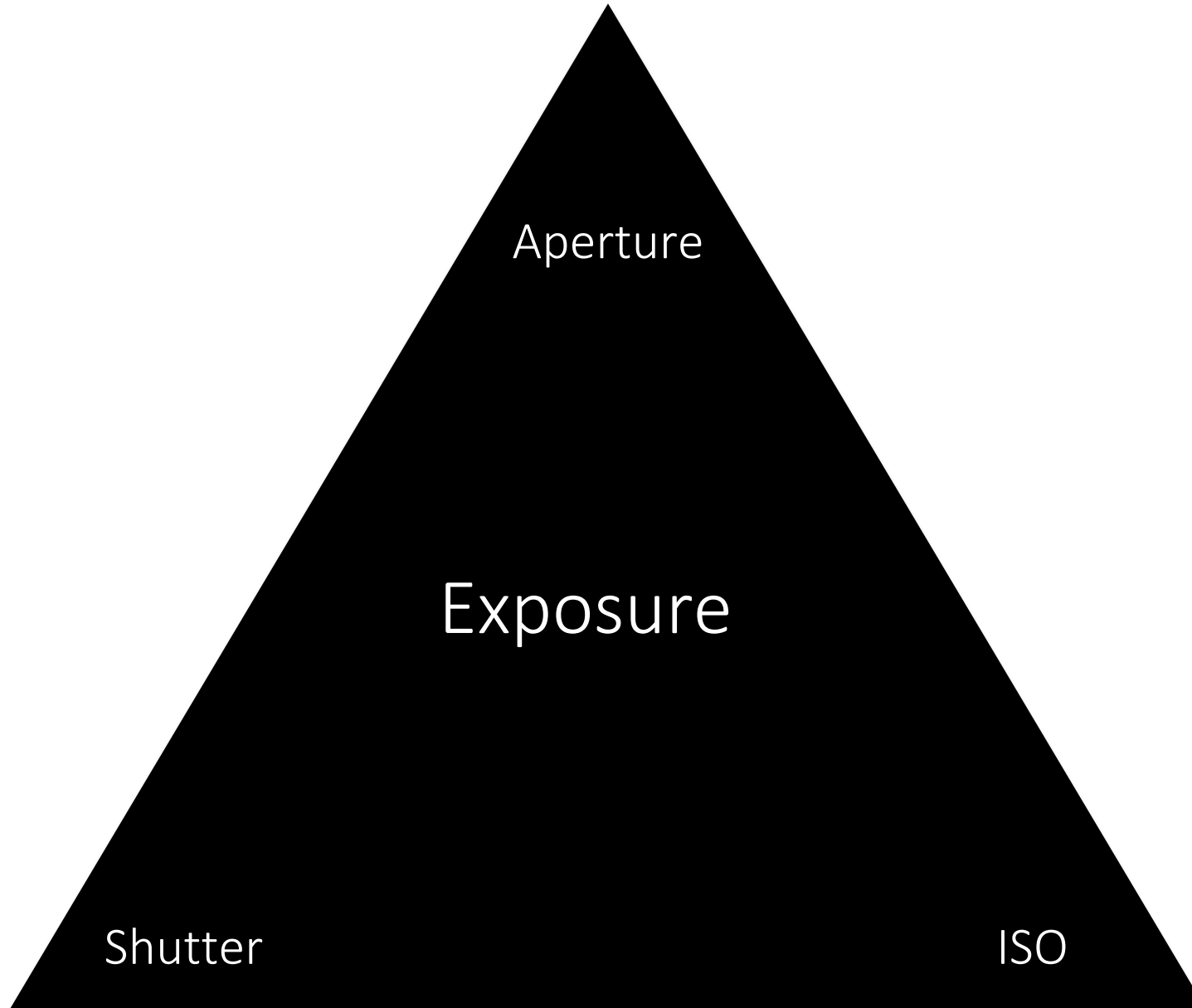
# Enabling and disabling auto-focus on your camera

MENU button can be used to access most camera settings...

And the *i* button is a quick way to access settings shown in the bottom row.



# Exposure controls brightness of image



# Exposure mode

Deciding which exposure mode to use depends on:

- The type of scene you are imaging.
- Your camera.
- Your own experience and preferences.

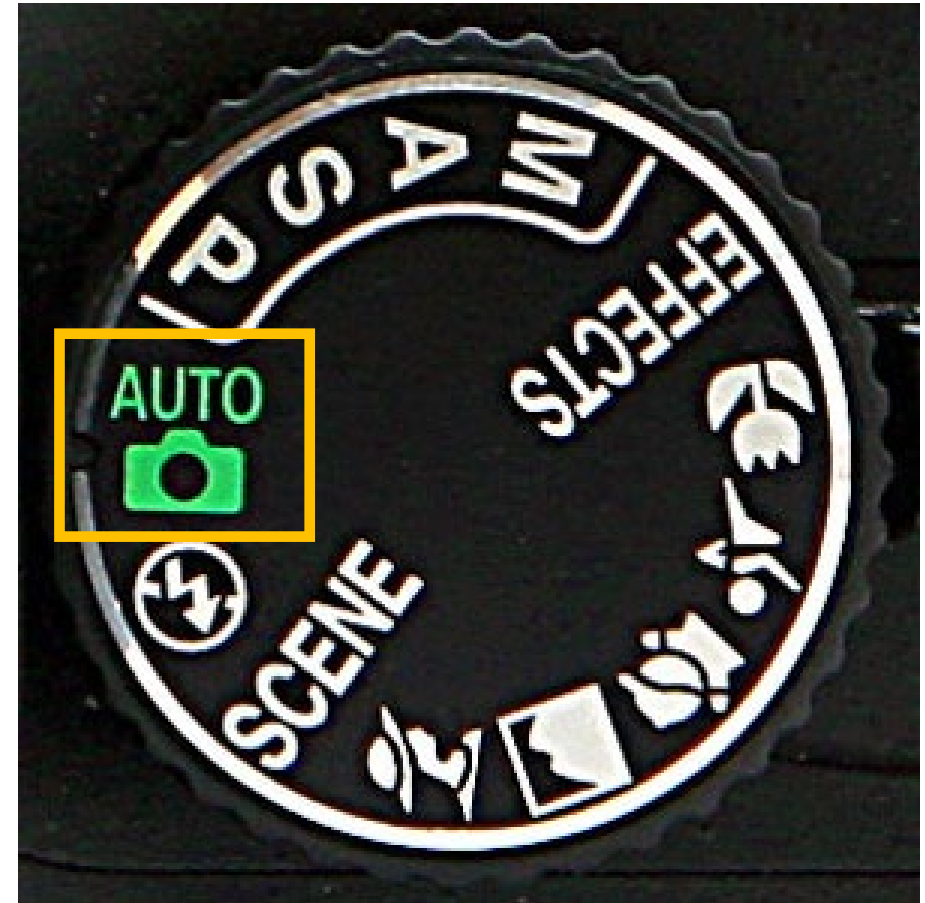


Mode dial of Nikon D3400

# Exposure mode

Auto mode:

- Camera sets aperture, shutter speed, and ISO on its own.
- “Point and shoot” mode.



Mode dial of Nikon D3400

# Exposure mode

Shutter priority mode:

- You select the shutter speed.
- Camera sets the aperture (and maybe ISO).



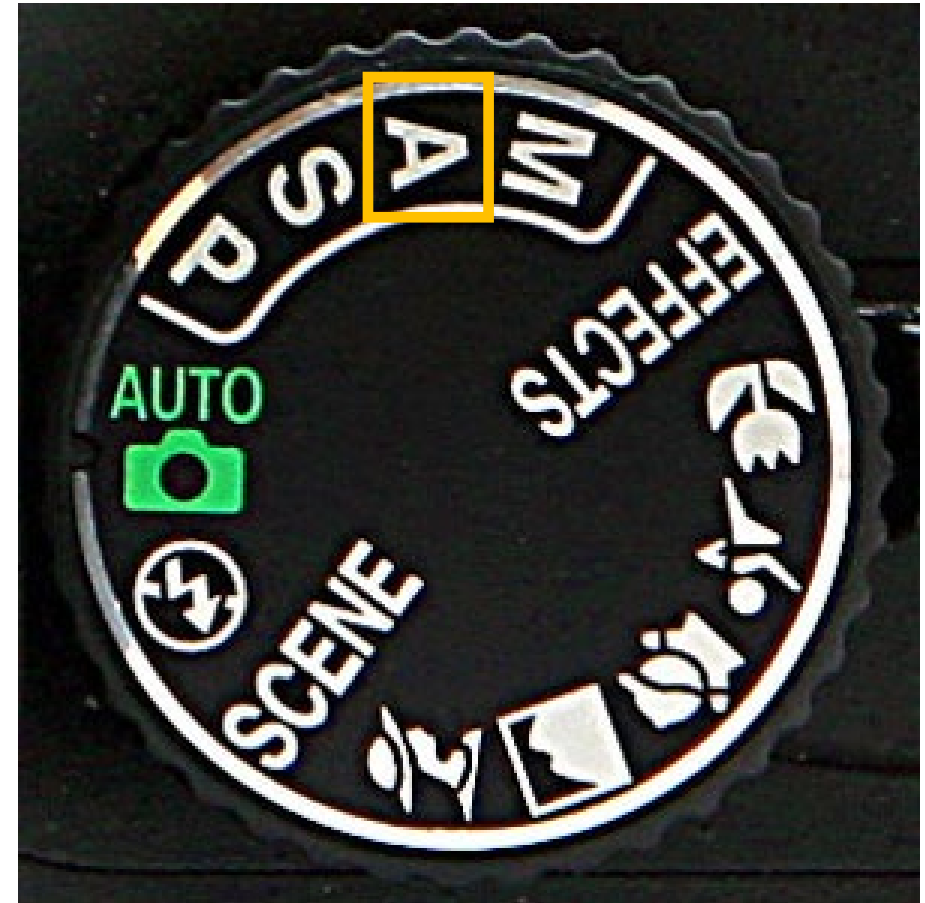
Mode dial of Nikon D3400



# Exposure mode

Aperture priority mode:

- You select the aperture.
- Camera sets the shutter speed (and maybe ISO).

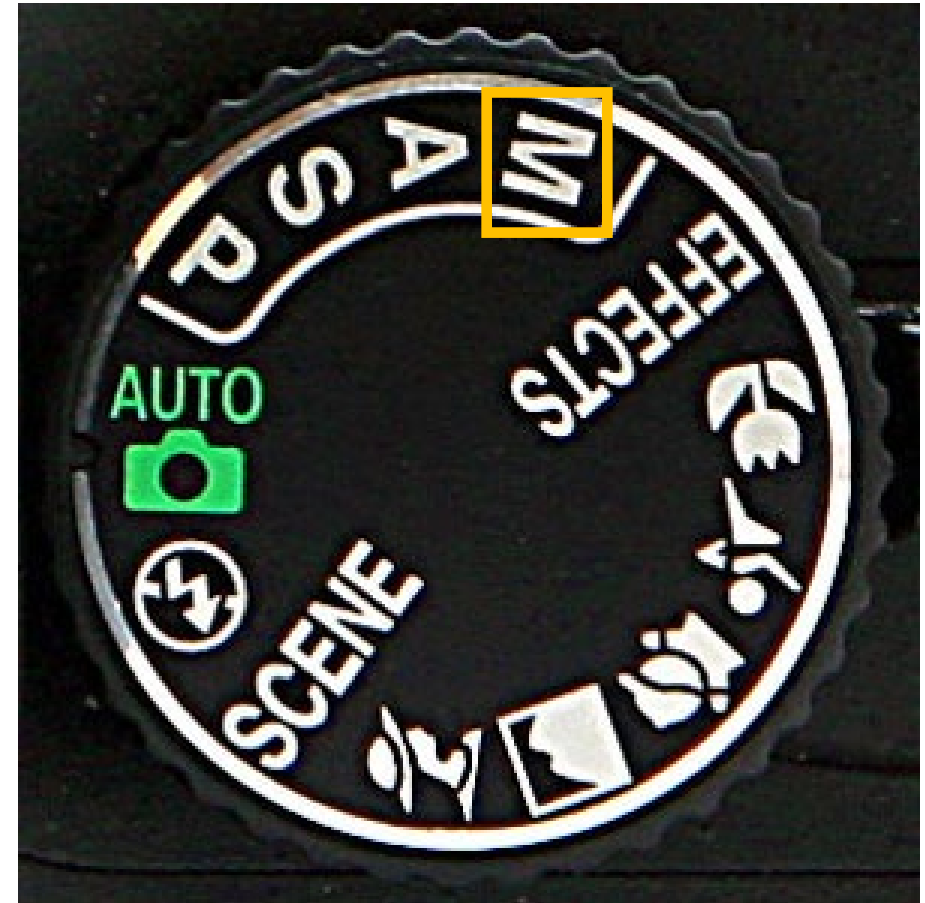


Mode dial of Nikon D3400

# Exposure mode

Manual priority mode:

- You select the both the shutter speed and aperture.
- Generally what you want to use for most assignments!



Mode dial of Nikon D3400

# How do you select aperture or shutter speed?



Control dial: Changes shutter speed or aperture, depending on exposure mode.

Display: Shows current exposure settings.

# How do you select aperture or shutter speed?



When in manual mode, hold the selector button to change aperture with the control dial.

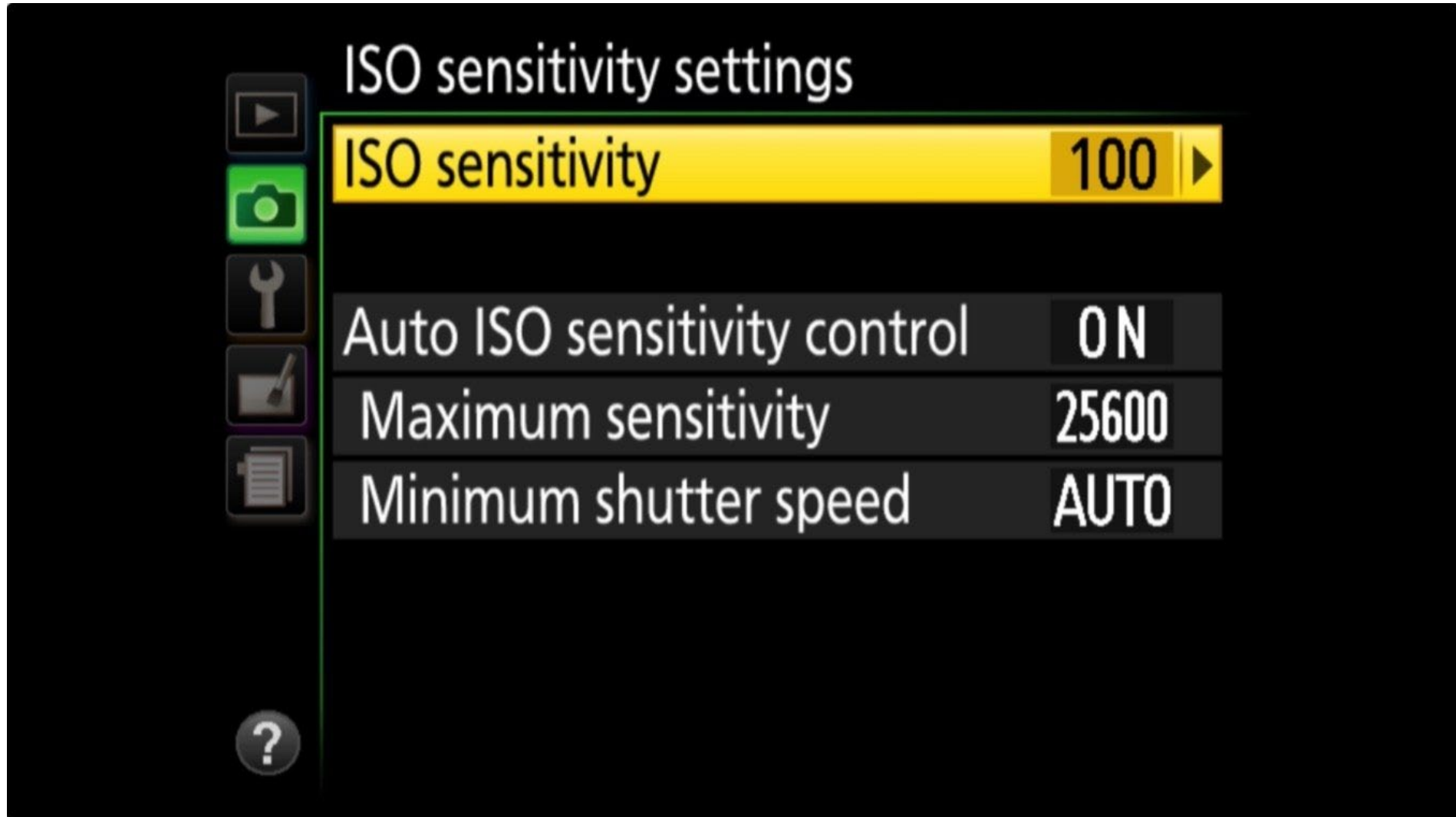
Otherwise, the selector dial changes shutter speed.

# What about ISO?



Same locations: the menu and the *i* button.

# What about ISO?



# Using flash



Default is no flash in P, S, A, M exposure modes.

Push flash button to enable flash.

Gently push down flashlight to disable.

# White balancing presets

Cameras nowadays come with a large number of presets: You can select which light you are taking images under, and the appropriate white balancing is applied.

