Nikon

DIGITAL CAMERA

D3000

User's Manual

En

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Where to Find It

Find what you're looking for from:

The Table of Contents → 📖 vi–x

Find items by function or menu name.

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Know what you want to do but don't know the function name? Find it from the "question and answer" index.

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Search by key word.

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If a warning is displayed in the viewfinder or monitor, find the solution here.

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Camera behaving unexpectedly? Find the solution here.

⚠ For Your Safety

Before using the camera for the first time, read the safety instructions in "For Your Safety" (📖 xi–xvi).

Help

Use the camera's on-board help feature for help on menu items and other topics. See page 11 for details.

Digitutor

"Digitutor", a series of "watch and learn" manuals in movie form, is available from the following website: *http://www.nikondigitutor.com/index_eng.html*

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Q&A Index

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For Your Safety

To prevent damage to your Nikon product or injury to yourself or to others, read the following safety precautions in their entirety before using this equipment. Keep these safety instructions where all those who use the product will read them.

The consequences that could result from failure to observe the precautions listed in this section are indicated by the following symbol:

> ⚠ This icon marks warnings. To prevent possible injury, read all warnings before using this Nikon product.

■■ *WARNINGS*

⚠ Keep the sun out of the frame
Keep the sun well out of the frame when shooting backlit subjects. Sunlight focused into the camera when the sun is in or close to the frame could cause a fire.

⚠ Do not look at the sun through the viewfinder
Viewing the sun or other strong light source through the viewfinder could cause permanent visual impairment.

⚠ Using the viewfinder diopter control
When operating the viewfinder diopter control with your eye to the viewfinder, care should be taken not to put your finger in your eye accidentally.

⚠ Turn off immediately in the event of malfunction
Should you notice smoke or an unusual smell coming from the equipment or AC adapter (available separately), unplug the AC adapter and remove the battery immediately, taking care to avoid burns. Continued operation could result in injury. After removing the battery, take the equipment to a Nikon-authorized service center for inspection.

⚠ Do not use in the presence of flammable gas
Do not use electronic equipment in the presence of flammable gas, as this could result in explosion or fire.

⚠ Keep out of reach of children
Failure to observe this precaution could result in injury.

⚠ Do not disassemble
Touching the product's internal parts could result in injury. In the event of malfunction, the product should be repaired only by a qualified technician. Should the product break open as the result of a fall or other accident, remove the battery and/or AC adapter and then take the product to a Nikon-authorized service center for inspection.

⚠ Do not place the strap around the neck of an infant or child
Placing the camera strap around the neck of an infant or child could result in strangulation.

⚠ Observe caution when using the flash
- Using the camera with the flash in close contact with the skin or other objects could cause burns.
- Using the flash close to the subject's eyes could cause temporary visual impairment. Particular care should be observed when photographing infants, when the flash should be no less than one meter (39 in.) from the subject.

⚠ Avoid contact with liquid crystal
Should the monitor break, care should be taken to avoid injury due to broken glass and to prevent the liquid crystal from the monitor touching the skin or entering the eyes or mouth.

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⚠ Observe proper precautions when handling batteries

Batteries may leak or explode if improperly handled. Observe the following precautions when handling batteries for use in this product:

- Use only batteries approved for use in this equipment.
- Do not short or disassemble the battery.
- Be sure the product is off before replacing the battery. If you are using an AC adapter, be sure it is unplugged.
- Do not attempt to insert the battery upside down or backwards.
- Do not expose the battery to flame or to excessive heat.
- Do not immerse in or expose to water.
- Replace the terminal cover when transporting the battery. Do not transport or store the battery with metal objects such as necklaces or hairpins.
- Batteries are prone to leakage when fully discharged. To avoid damage to the product, be sure to remove the battery when no charge remains.
- When the battery is not in use, attach the terminal cover and store in a cool, dry place.
- The battery may be hot immediately after use or when the product has been used on battery power for an extended period. Before removing the battery turn the camera off and allow the battery to cool.
- Discontinue use immediately should you notice any changes in the battery, such as discoloration or deformation.

⚠ Observe proper precautions when handling the quick charger

- Keep dry. Failure to observe this precaution could result in fire or electric shock.
- Dust on or near the metal parts of the plug should be removed with a dry cloth. Continued use could result in fire.
- Do not handle the power cable or go near the charger during thunderstorms. Failure to observe this precaution could result in electric shock.
- Do not damage, modify, or forcibly tug or bend the power cable. Do not place it under heavy objects or expose it to heat or flame. Should the insulation be damaged and the wires become exposed, take the power cable to a Nikon-authorized service representative for inspection. Failure to observe this precaution could result in fire or electric shock.
- Do not handle the plug or charger with wet hands. Failure to observe this precaution could result in electric shock.
- Do not use with travel converters or adapters designed to convert from one voltage to another or with DC-to-AC inverters. Failure to observe this precaution could damage the product or cause overheating or fire.

⚠ Use appropriate cables

When connecting cables to the input and output jacks, use only the cables provided or sold by Nikon for the purpose to maintain compliance with product regulations.

⚠ CD-ROMs

CD-ROMs containing software or manuals should not be played back on audio CD equipment. Playing CD-ROMs on an audio CD player could cause hearing loss or damage the equipment.

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Notices

- No part of the manuals included with this product may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form, by any means, without Nikon's prior written permission.
- Nikon reserves the right to change the specifications of the hardware and software described in these manuals at any time and without prior notice.
- Nikon will not be held liable for any damages resulting from the use of this product.
- While every effort has been made to ensure that the information in these manuals is accurate and complete, we would appreciate it were you to bring any errors or omissions to the attention of the Nikon representative in your area (address provided separately).

Notices for Customers in the U.S.A.

Federal Communications Commission (FCC) Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

FC **Nikon**
D3000

CAUTIONS

Modifications

The FCC requires the user be notified that any changes or modifications made to this device that are not expressly approved by Nikon Corporation may void the user's authority to operate the equipment.

Interface Cables

Use the interface cables sold or provided by Nikon for your equipment. Using other interface cables may exceed the limits of Class B Part 15 of the FCC rules.

Notice for Customers in the State of California

WARNING: Handling the cord on this product may expose you to lead, a chemical known to the State of California to cause birth defects or other reproductive harm. *Wash hands after handling.*

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Notices for Customers in Canada

CAUTION

This Class B digital apparatus complies with Canadian ICES-003.

ATTENTION

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Notice for Customers in Europe

This symbol indicates that this product is to be collected separately.

The following apply only to users in European countries:

- This product is designated for separate collection at an appropriate collection point. Do not dispose of as household waste.
- For more information, contact the retailer or the local authorities in charge of waste management.

This symbol on the battery indicates that the battery is to be collected separately.

The following apply only to users in European countries:

- All batteries, whether marked with this symbol or not, are designated for separate collection at an appropriate collection point. Do not dispose of as household waste.
- For more information, contact the retailer or the local authorities in charge of waste management.

Disposing of Data Storage Devices

Please note that deleting images or formatting memory cards or other data storage devices does not completely erase the original image data. Deleted files can sometimes be recovered from discarded storage devices using commercially available software, potentially resulting in the malicious use of personal image data. Ensuring the privacy of such data is the user's responsibility.

Before discarding a data storage device or transferring ownership to another person, erase all data using commercial deletion software, or format the device and then completely refill it with images containing no private information (for example, pictures of empty sky). Be sure to also replace any pictures selected for preset manual white balance (🕮 83). Care should be taken to avoid injury when physically destroying data storage devices.

Use Only Nikon Brand Electronic Accessories

Nikon cameras are designed to the highest standards and include complex electronic circuitry. Only Nikon brand electronic accessories (including battery chargers, batteries, AC adapters, and flash accessories) certified by Nikon specifically for use with this Nikon digital camera are engineered and proven to operate within the operational and safety requirements of this electronic circuitry.

The use of non-Nikon electronic accessories could damage the camera and may void your Nikon warranty. The use of third-party rechargeable Li-ion batteries not bearing the Nikon holographic seal shown at right could interfere with normal operation of the camera or result in the batteries overheating, igniting, rupturing, or leaking.

For more information about Nikon brand accessories, contact a local authorized Nikon dealer.

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Before Taking Important Pictures

Before taking pictures on important occasions (such as at weddings or before taking the camera on a trip), take a test shot to ensure that the camera is functioning normally. Nikon will not be held liable for damages or lost profits that may result from product malfunction.

Life-Long Learning

As part of Nikon's "Life-Long Learning" commitment to ongoing product support and education, continually-updated information is available on-line at the following sites:

- **For users in the U.S.A.**: *http://www.nikonusa.com/*
- **For users in Europe and Africa**: *http://www.europe-nikon.com/support/*
- **For users in Asia, Oceania, and the Middle East**: *http://www.nikon-asia.com/*

Visit these sites to keep up-to-date with the latest product information, tips, answers to frequently-asked questions (FAQs), and general advice on digital imaging and photography. Additional information may be available from the Nikon representative in your area. See the following URL for contact information: *http://imaging.nikon.com/*

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Introduction

Overview

Thank you for your purchase of a Nikon single-lens reflex (SLR) digital camera. To get the most from your camera, please be sure to read all instructions thoroughly and keep them where they will be read by all who use the product.

■ *Symbols and Conventions*

To make it easier to find the information you need, the following symbols and conventions are used:

- This icon marks cautions; information that should be read before use to prevent damage to the camera.
- This icon marks notes; information that should be read before using the camera.
- This icon marks references to other pages in this manual.

Use Only Nikon Brand Accessories

Only Nikon brand accessories certified by Nikon specifically for use with your Nikon digital camera are engineered and proven to operate within its operational and safety requirements. THE USE OF NON-NIKON ACCESSORIES COULD DAMAGE YOUR CAMERA AND MAY VOID YOUR NIKON WARRANTY.

Servicing the Camera and Accessories

The camera is a precision device and requires regular servicing. Nikon recommends that the camera be inspected by the original retailer or a Nikon-authorized service representative once every one to two years, and that it be serviced once every three to five years (note that fees apply to these services). Frequent inspection and servicing are particularly recommended if the camera is used professionally. Any accessories regularly used with the camera, such as lenses or optional flash units, should be included when the camera is inspected or serviced.

Camera Settings

The explanations in this manual assume that default settings are used.

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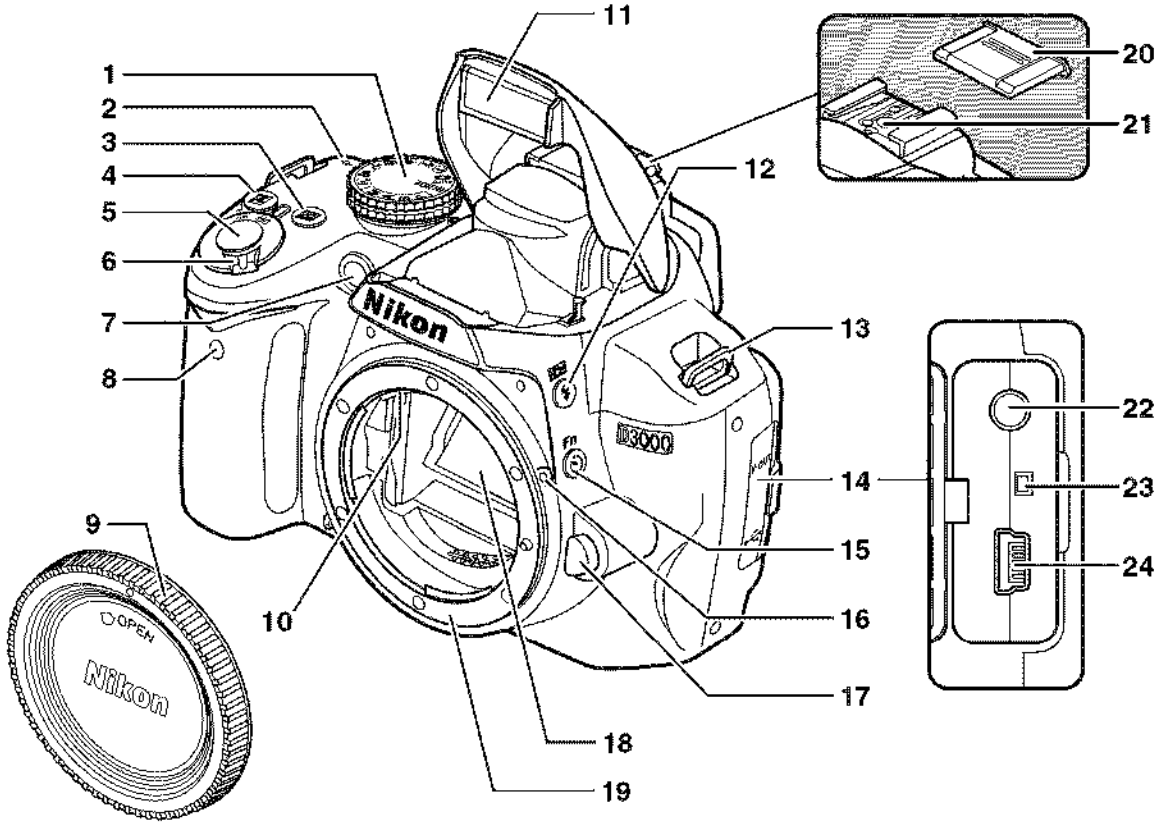
Getting to Know the Camera

Take a few moments to familiarize yourself with camera controls and displays. You may find it helpful to bookmark this section and refer to it as you read through the rest of the manual.

The Camera Body



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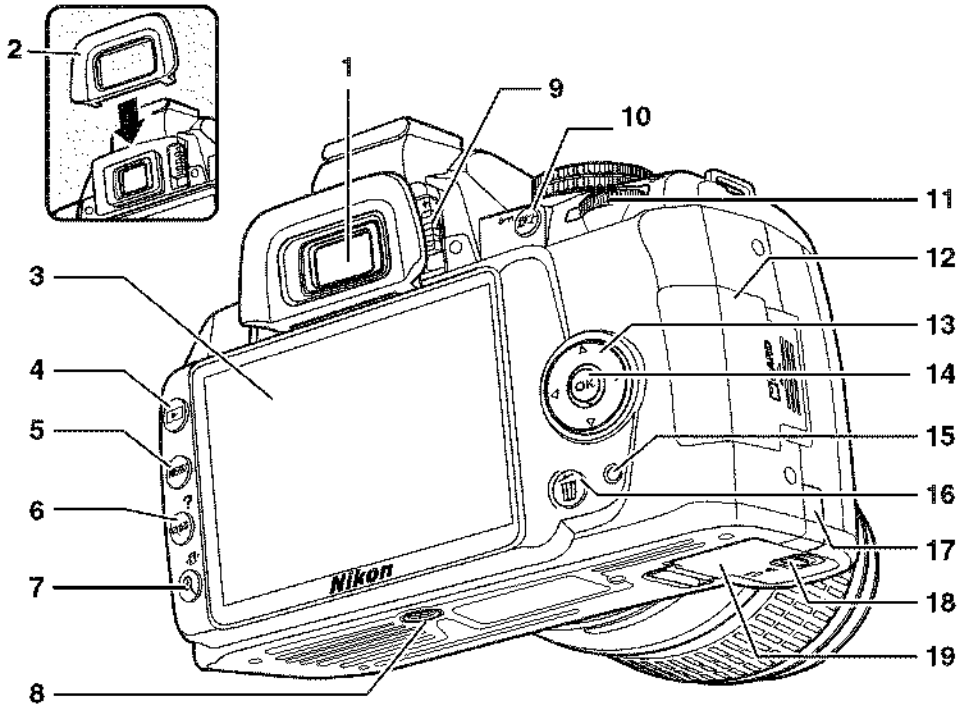

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The Mode Dial

The camera offers a choice of the following modes:

■■ *P, S, A, and M Modes*

Select these modes for full control over camera settings.

P—Programmed auto (📖 68): Camera chooses shutter speed and aperture, user controls other settings.

S—Shutter-priority auto (📖 69): Choose fast shutter speeds to freeze action, slow shutter speeds to suggest motion by blurring moving objects.

A—Aperture-priority auto (📖 70): Adjust aperture to soften background details or increase depth-of-field to bring both main subject and background into focus.

M—Manual (📖 71): Match shutter speed and aperture to your creative intent.

■■ *GUIDE Mode*

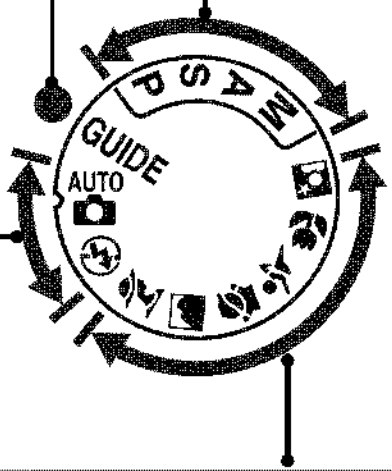
GUIDE (📖 35): Take and view pictures and adjust settings with the help of an on-screen guide.

■■ *Auto Modes*

Select these modes for simple, point-and-shoot photography.

Auto (📖 25): Camera adjusts settings automatically to produce optimal results with "point-and-shoot" simplicity. Recommended for first-time users of digital cameras.

Auto (flash off) (📖 25): As above, except that the flash will not fire even when lighting is poor.



■■ *Scene Modes*

Selecting a scene mode automatically optimizes settings to suit the selected scene.

Portrait (📖 30): Shoot portraits with background in soft focus.

Landscape (📖 30): Preserve details in landscape shots.

Child (📖 31): Create portraits of children. Clothing and background details are vividly rendered while skin tones remain soft and natural.

Sports (📖 31): Freeze motion for dynamic sports shots.

Close up (📖 31): Take vivid close-ups of flowers, insects, and other small objects.

Night portrait (📖 31): Shoot portraits against a dimly-lit backdrop.

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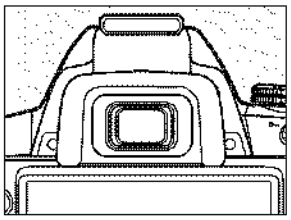
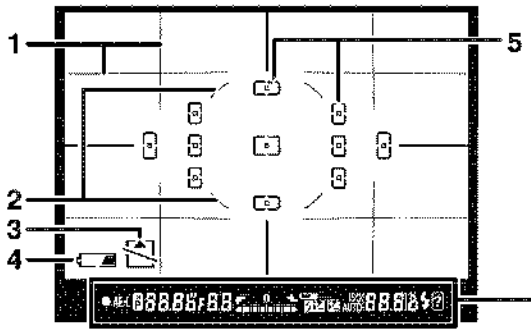
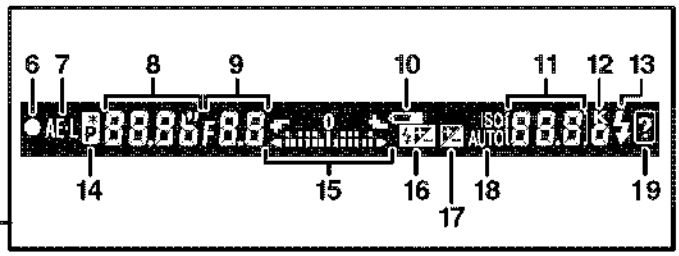
The Viewfinder







1 Framing grid (displayed when **On** is selected for **Viewfinder options** > **Viewfinder grid** in the setup menu) 132
2 Reference circle for center-weighted metering 74
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12 "K" (appears when memory remains for over 1000 exposures) 26
13 Flash-ready indicator 29
14 Flexible program indicator 68
15 Exposure indicator 71
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Electronic rangefinder 132
16 Flash compensation indicator 78
17 Exposure compensation indicator 76
18 Auto ISO sensitivity indicator 120
19 Warning indicator 183

☑ No Battery
When the battery is exhausted or no battery is inserted, the display in the viewfinder will dim. This is normal and does not indicate a malfunction. The viewfinder display will return to normal when a fully-charged battery is inserted.

☑ The Viewfinder Display
Owing to the characteristics of this type of viewfinder display, you may notice fine lines radiating outward from the selected focus point. This is normal and does not indicate a malfunction.

☑ The Viewfinder
The response time and brightness of the viewfinder display may vary with temperature.

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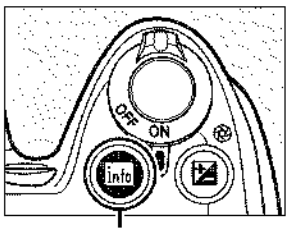
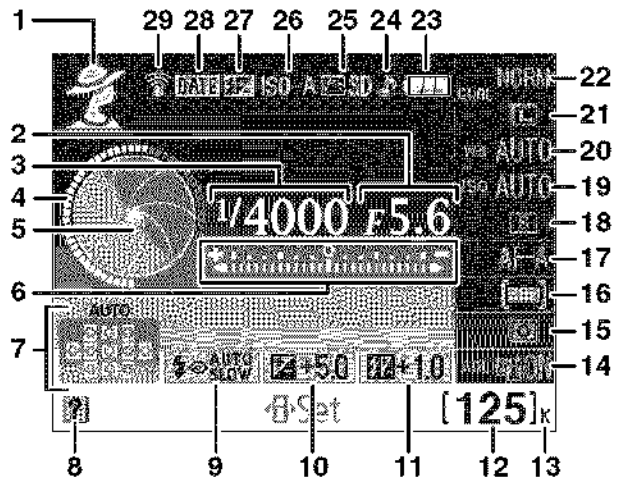
The Information Display

Shooting information, including shutter speed, aperture, and the number of exposures remaining, is displayed in the monitor when the info button is pressed.

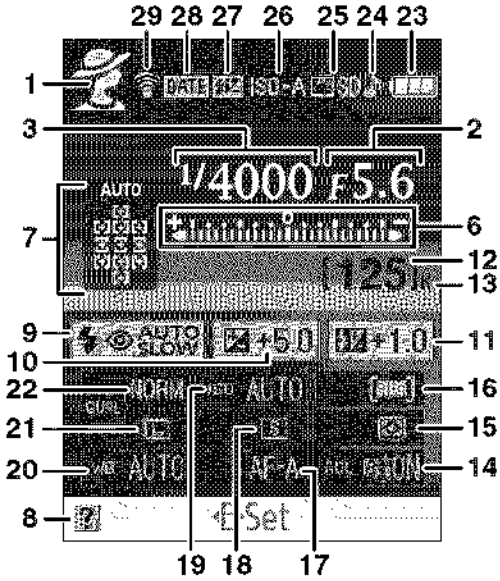


info button

Camera in normal orientation



Camera rotated 90° to shoot in tall (portrait) orientation



1 Shooting mode
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6 Exposure indicator 71
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9 Flash mode 59

10 Exposure compensation 76

11 Flash compensation 78

12 Number of exposures remaining 26

13 "K" (appears when memory remains for over 1000 exposures) 26

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27 Manual flash indicator 123
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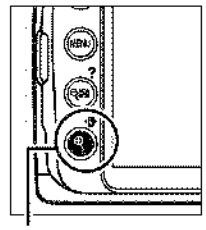
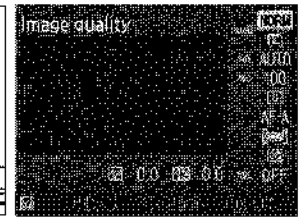
Changing Settings in the Information Display

To change settings for the items listed in the information display, press the ◂i▸ button. Highlight items using the multi selector and press OK to view options for the highlighted item. Some items can also be adjusted using the command dial and camera buttons (□ 8).

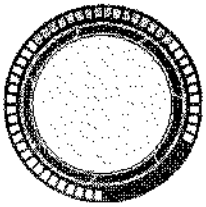
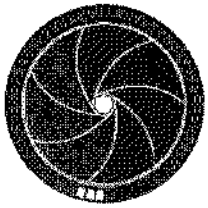


◂i▸ *button*



The Shutter-Speed and Aperture Displays

These displays provide visual indications of shutter speed and aperture.

Fast shutter speed, large aperture (small f-number). 	*Slow shutter speed, small aperture (large f-number).* 

While the mode dial is rotated, this display is replaced by an image of the mode dial.

Turning the Monitor Off

To clear information from the display, press the info button again. Note that the monitor turns off automatically while the shutter-release is pressed or if no operations are performed for 8 s (the default value). The information display can be restored by pressing the info button.

See Also

For information on choosing how long the monitor stays on, see **Auto off timers** (□ 130). For information on choosing a design for the information display, see **Info display format**, (□ 125). For information on choosing whether information is displayed when the shutter-release button is pressed; see **Auto info display** (□ 127).

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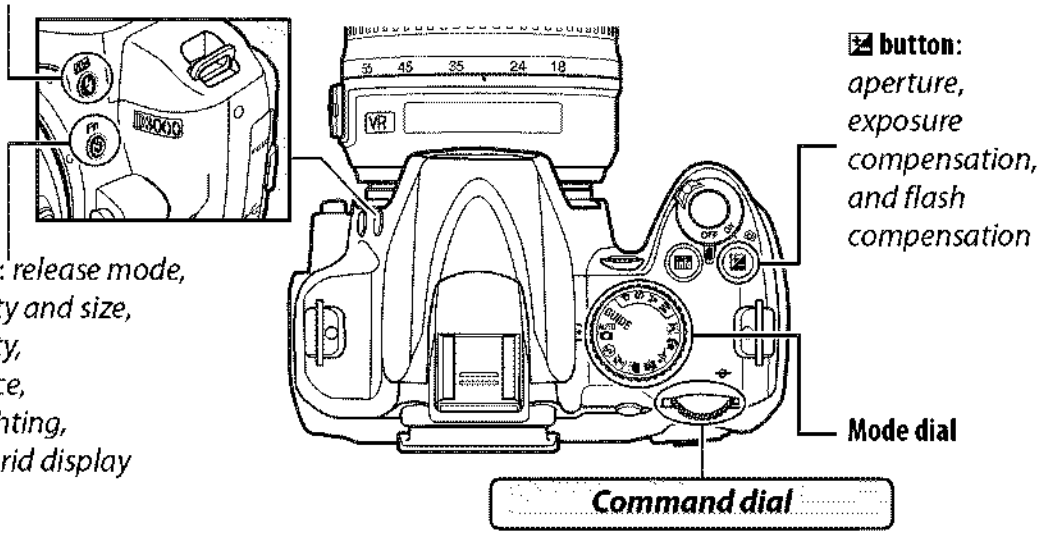
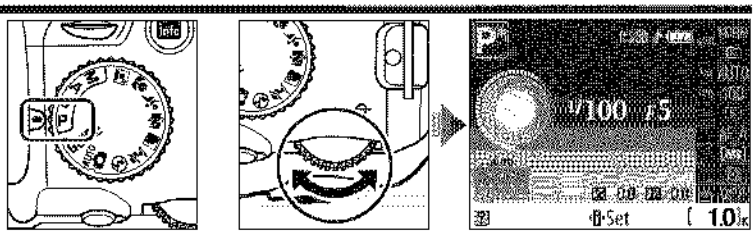
The Command Dial

The command dial can be used with other controls to adjust a variety of settings when shooting information is displayed in the monitor.

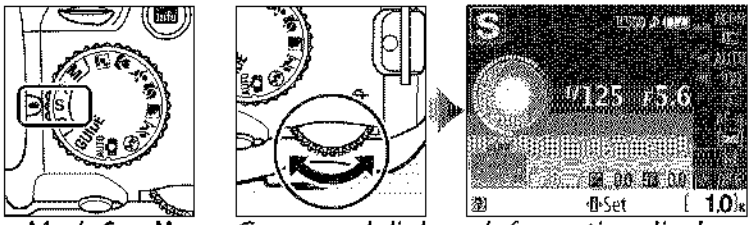
⚡ button: *flash mode and flash compensation*



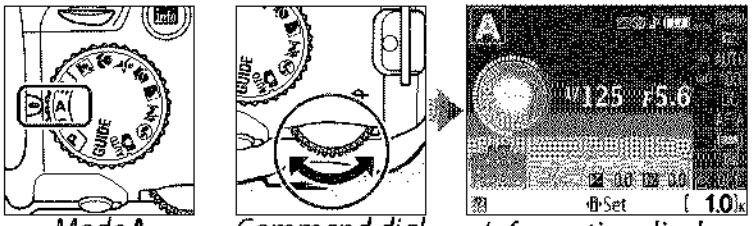
Choose a combination of aperture and shutter speed (mode **P**; 🕮 68).



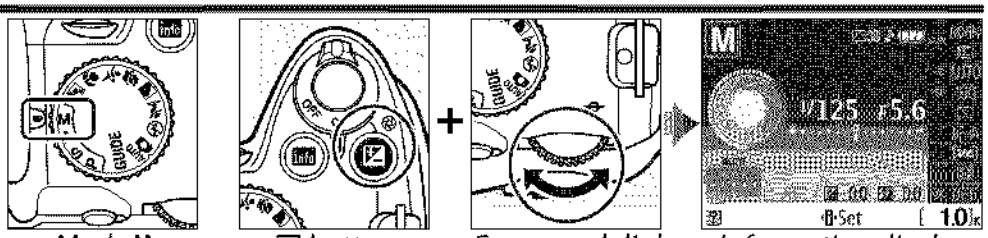
Choose a shutter speed (mode **S** or **M**; 🕮 69, 71).



Choose an aperture (mode **A**; 🕮 70).



Choose an aperture (mode **M**; 🕮 71).



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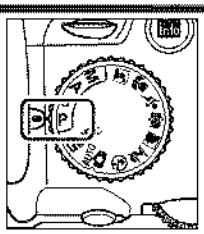
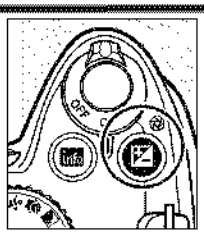
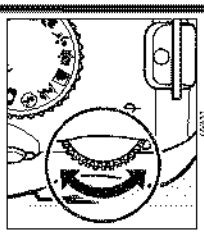
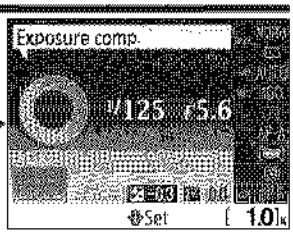
Set exposure compensation (mode **P**, **S**, or **A**; 🕮 76).


*Mode **P**, **S**, or **A***

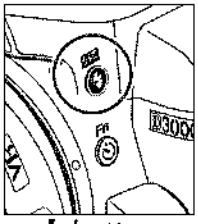

button

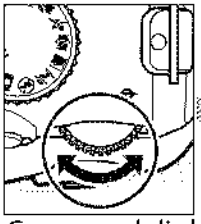

Command dial

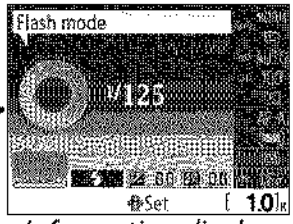


Information display

Choose a flash mode (🕮 59).

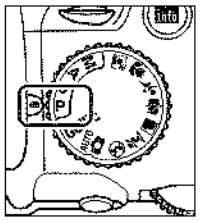

button

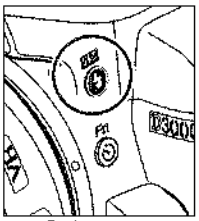

Command dial

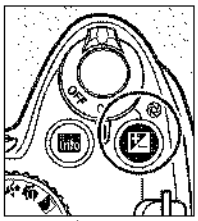


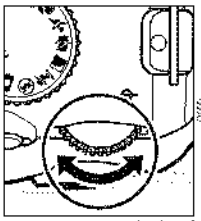
Information display

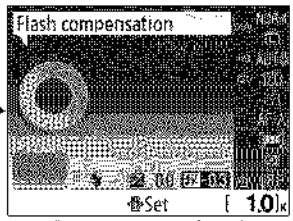
Adjust flash compensation (mode **P**, **S**, **A**, or **M**; 🕮 78).


P**, **S**, **A**, or **M


button


button


Command dial



Information display

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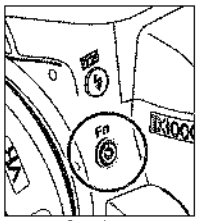
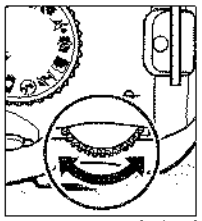
The role of the **Fn** (⏲) button can be selected using the **Buttons** > ⏲**/Fn button** option in the setup menu (🕮 134), allowing the following settings to be adjusted by pressing the **Fn** (⏲) button and rotating the command dial:

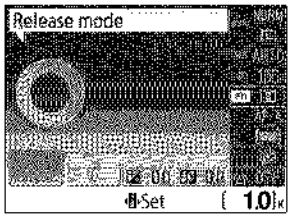


Fn (⏲) *button*



Command dial

Release mode (🕮 53)



White balance (🕮 80)

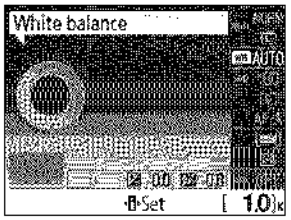
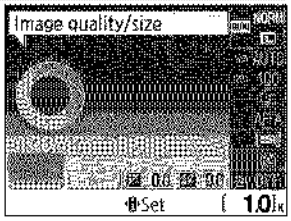
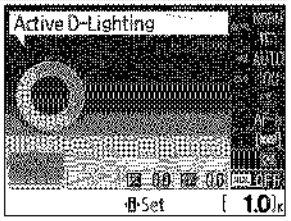


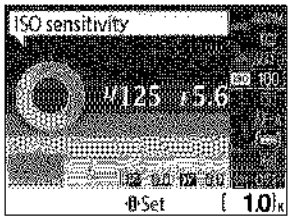
Image quality and size (🕮 50)



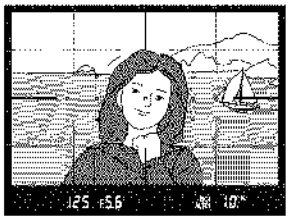
Active D-Lighting (🕮 64)



ISO sensitivity (🕮 62)



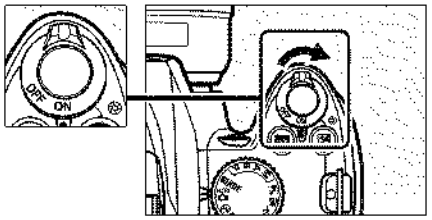
Set framing grid (🕮 132)



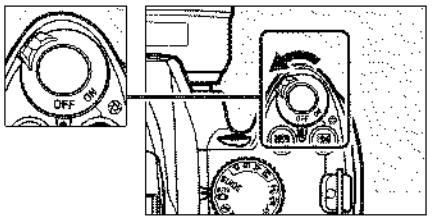
Viewfinder

The Power Switch

Rotate the power switch as shown to turn the camera on.



Rotate the power switch as shown to turn the camera off.



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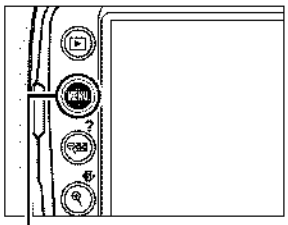
Camera Menus

Most shooting, playback, and setup options can be accessed from the camera menus. To view the menus, press the **MENU** button.

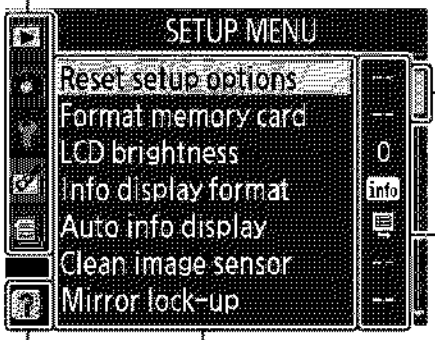


MENU *button*

Tabs

Choose from the following menus:

- ▶: **Playback** (📖 117)
- 📷: **Shooting** (📖 119)
- 🔧: **Setup** (📖 124)
- 🖌: **Retouch** (📖 140)
- 🕘: **Recent settings** (📖 155)



Slider shows position in current menu.

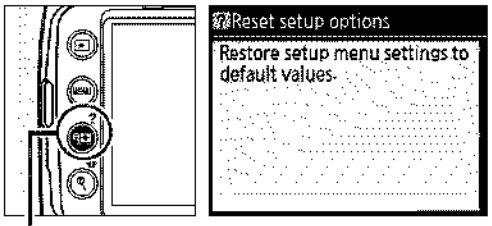
Current settings are shown by icons.

Menu options

Options in current menu.

?

If a ? icon is displayed at the bottom left corner of the monitor, help can be displayed by pressing the **?** *(?) button. A description of the currently selected option or menu will be displayed while the button is pressed. Press ▲ or ▼ to scroll through the display.*



? *(?) button*

Guide Mode

To display the guide menu, rotate the mode dial to **GUIDE** (📖 35).

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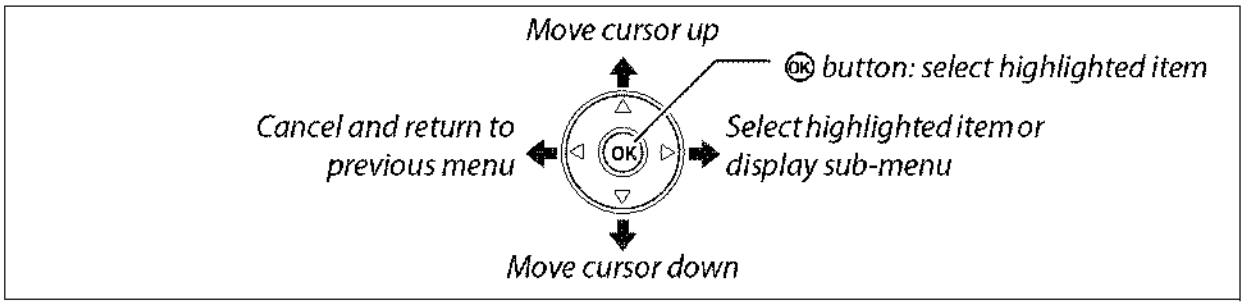
Using Camera Menus

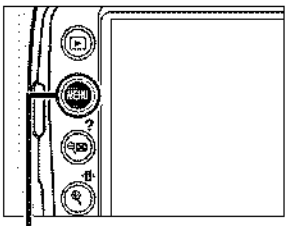
The multi selector and ⓞⓚ button are used to navigate the camera menus.



Follow the steps below to navigate the menus.

1 Display the menus.

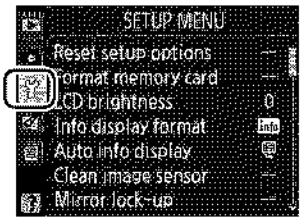
Press the **MENU** button to display the menus.



MENU *button*

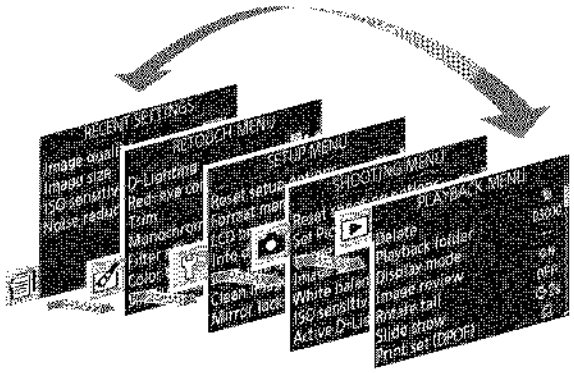
2 Highlight the icon for the current menu.

Press ◀ to highlight the icon for the current menu.



3 Select a menu.

Press ▲ or ▼ to select the desired menu.



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4 Position the cursor in the selected menu.

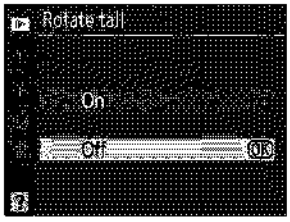
Press ▶ to position the cursor in the selected menu.

5 Highlight a menu item.

Press ▲ or ▼ to highlight a menu item.

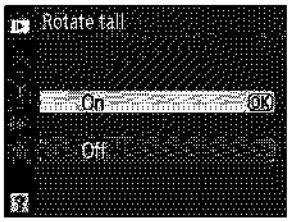
6 Display options.

Press ▶ to display options for the selected menu item.



7 Highlight an option.

Press ▲ or ▼ to highlight an option.



8 Select the highlighted item.

Press ⓞ to select the highlighted item. To exit without making a selection, press the **MENU** button.

Note the following:

- Menu items that are displayed in gray are not currently available.
- While pressing ▶ generally has the same effect as pressing ⓞ, there are some cases in which selection can only be made by pressing ⓞ.
- To exit the menus and return to shooting mode, press the shutter-release button halfway (📖 29).

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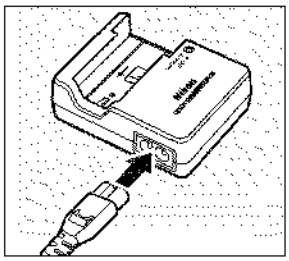
Charge the Battery

The camera is powered by an EN-EL9a rechargeable Li-ion battery (supplied). To maximize shooting time, charge the battery in the supplied MH-23 quick charger before use. About one hour and forty minutes are required to fully recharge the battery when no charge remains.

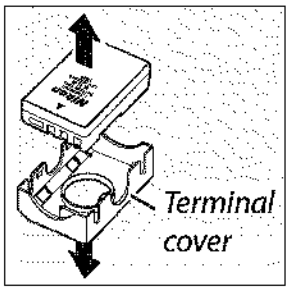
1 Plug the charger in.

Insert the AC adapter plug into the battery charger and plug the power cable into an electrical outlet.



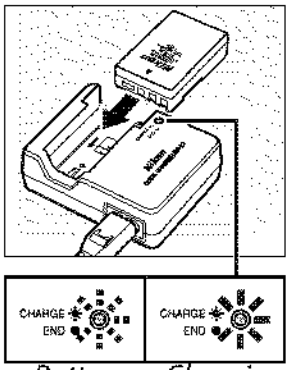
2 Remove the terminal cover.

Remove the terminal cover from the battery.



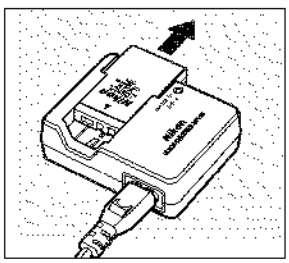
3 Insert the battery.

Insert the battery as shown in the illustration on the charger. The **CHARGE** lamp will blink while the battery charges.



4 Remove the battery when charging is complete.

Charging is complete when the **CHARGE** lamp stops blinking. Remove the battery and unplug the charger.



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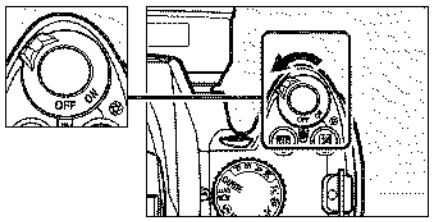
Insert the Battery

1 Turn the camera off.

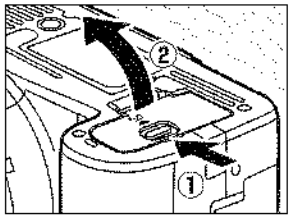
Power switch



> **Inserting and Removing Batteries**
> Always turn the camera off before inserting or removing batteries.

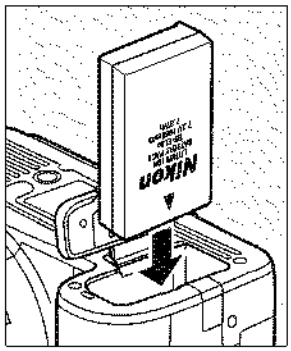
2 Open the battery-chamber cover.

Unlatch (①) and open (②) the battery-chamber cover.

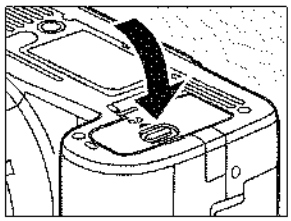


3 Insert the battery.

Insert the battery as shown at right.



4 Close the battery-chamber cover.



> **The Battery and Charger**
> *Read and follow the warnings and cautions on pages xi–xii and 174–175 of this manual.* Do not use the battery at ambient temperatures below 0°C (32°F) or above 40°C (104°F). Charge the battery indoors at ambient temperatures between 5–35°C (41–95°F); for best results, charge the battery at temperatures above 20°C (68°F). Battery capacity may temporarily drop if the battery is charged at low temperatures.
>
> The battery may be hot immediately after use. Wait for the battery to cool before recharging.
>
> Use the charger with compatible batteries only. Unplug when not in use.

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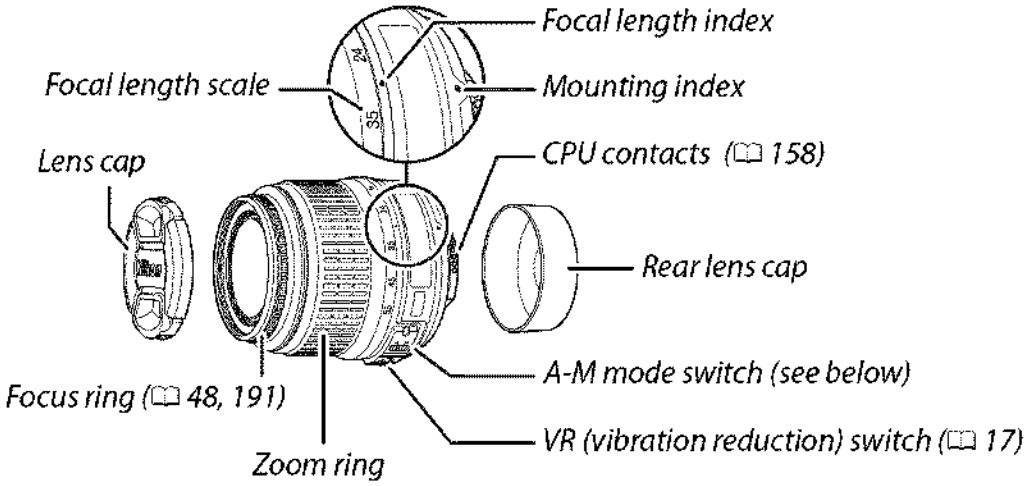
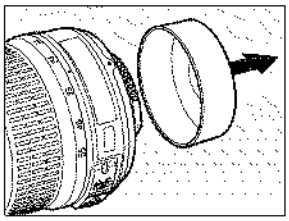
Attach a Lens

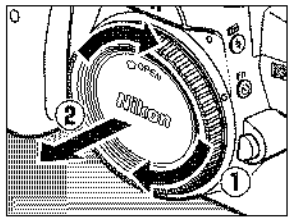
Care should be taken to prevent dust from entering the camera when the lens is removed. The lens generally used in this manual for illustrative purposes is an AF-S DX NIKKOR 18–55 mm f/3.5–5.6G VR.



1 Turn the camera off.

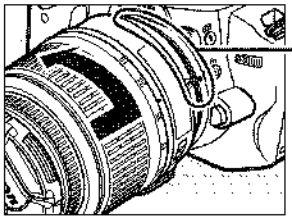
2 Remove the rear lens cap and the camera body cap.

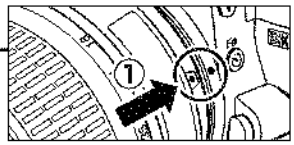


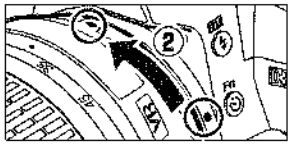


3 Attach the lens.

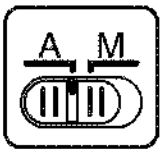
Keeping the mounting index on the lens aligned with the mounting index on the camera body, position the lens in the camera's bayonet mount (①). Being careful not to press the lens-release button, rotate the lens counter-clockwise until it clicks into place (②).

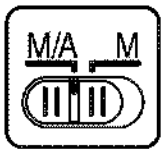






Slide the **A-M** switch to **A** (autofocus; if the lens has an **M/A-M** switch, select **M/A** for autofocus with manual priority).





Autofocus

Autofocus is supported with only AF-S and AF-I lenses, which are equipped with autofocus motors. Autofocus is not available with other AF lenses.

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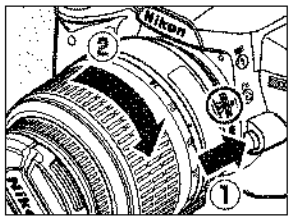
■■ *Detaching the Lens*

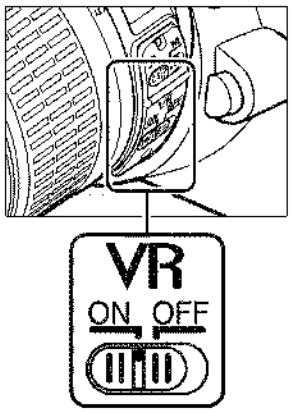
Be sure the camera is off when removing or exchanging lenses. To remove the lens, press and hold the lens release button (①) while turning the lens clockwise (②). After removing the lens, replace the lens caps and camera body cap.



■■ *Vibration Reduction (VR)*

AF-S DX NIKKOR 18–55mm f/3.5–5.6G VR lenses support vibration reduction (VR), which reduces blur caused by camera shake even when the camera is panned, allowing shutter speeds to be slowed by approximately 3 EV at a focal length of 55mm (Nikon measurements; effects vary with the user and shooting conditions).

To use vibration reduction, slide the VR switch to **ON**. Vibration reduction is activated when the shutter-release button is pressed halfway, reducing the effects of camera shake on the image in the viewfinder and simplifying the process of framing the subject and focusing in both autofocus and manual modes. When the camera is panned, vibration reduction applies only to motion that is not part of the pan (if the camera is panned horizontally, for example, vibration reduction will be applied only to vertical shake), making it much easier to pan the camera smoothly in a wide arc.



Vibration reduction can be turned off by sliding the VR switch to **OFF**. Turn vibration reduction off when the camera is securely mounted on a tripod, but leave it on if the tripod head is not secured or when using a monopod.

✓ CPU Lenses with Aperture Rings

In the case of CPU lenses equipped with an aperture ring (📖 158), lock aperture at the minimum setting (highest f-number).

✓ Vibration Reduction

Do not turn the camera off or remove the lens while vibration reduction is in effect. If power to the lens is cut while vibration reduction is on, the lens may rattle when shaken. This is not a malfunction, and can be corrected by reattaching the lens and turning the camera on. Vibration reduction is disabled while the built-in flash is charging. When vibration reduction is active, the image in the viewfinder may be blurred after the shutter is released. This does not indicate a malfunction.

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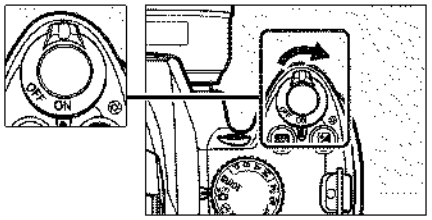
Basic Setup

A language-selection dialog will be displayed the first time the camera is turned on. Choose a language and set the time and date. Photographs can not be taken until you have set the time and date.

1 Turn the camera on.

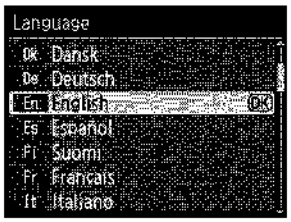
A language-selection dialog will be displayed.

Power switch



2 Select a language.

Press ▲ or ▼ to highlight the desired language and press ⓞⓚ.

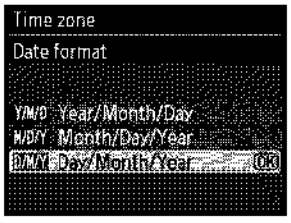


3 Choose a time zone.

A time-zone selection dialog will be displayed. Press ◀ or ▶ to highlight the local time zone (the **UTC** field shows the difference between the selected time zone and Coordinated Universal Time, or UTC, in hours) and press ⓞⓚ.

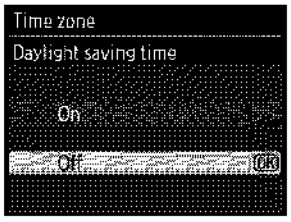
4 Choose a date format.

Press ▲ or ▼ to choose the order in which the year, month, and day will be displayed. Press ⓞⓚ to proceed to the next step.



5 Turn daylight saving time on or off.

Daylight saving time options will be displayed. Daylight saving time is off by default; if daylight saving time is in effect in the local time zone, press ▲ to highlight **On** and press ⓞⓚ.



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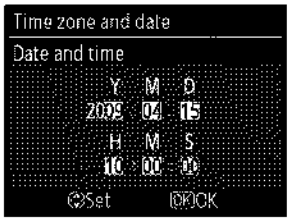
6 Set the date and time.

The dialog shown at right will be displayed. Press ◀ or ▶ to select an item, ▲ or ▼ to change. Press ⓞⓚ to set the clock and exit to shooting mode.



The Setup Menu

Language and date/time settings can be changed at any time using the **Language** (🕮 127) and **Time zone and date** (🕮 127) options in the setup menu.

The Clock Battery

The camera clock is powered by an independent, rechargeable power source, which is charged as necessary when the main battery is installed or the camera is powered by an optional EP-5 power connector and EH-5a AC adapter (🕮 168). Three days of charging will power the clock for about a month. If a message warning that the clock is not set is displayed when the camera is turned on, the clock battery is exhausted and the clock has been reset. Set the clock to the correct time and date.

The Camera Clock

The camera clock is less accurate than most watches and household clocks. Check the clock regularly against more accurate time pieces and reset as necessary.

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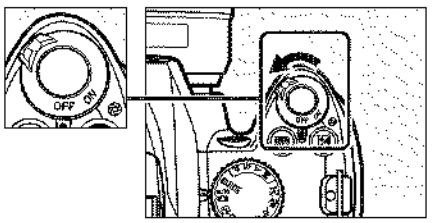
Insert a Memory Card

The camera stores pictures on Secure Digital (SD) memory cards (available separately).

1 Turn the camera off.

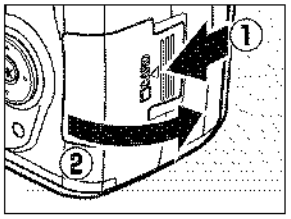
Power switch



> **Inserting and Removing Memory Cards**
> Always turn the camera off before inserting or removing memory cards.

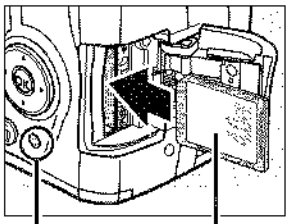
2 Open the card slot cover.

Slide the card slot cover out (①) and open the card slot (②).



3 Insert the memory card.

Holding the memory card as shown at right, slide it in until it clicks into place. The memory card access lamp will light for a few seconds. Close the memory card slot cover.



Front

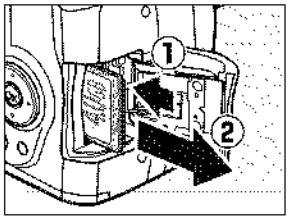
Access lamp

> **Inserting Memory Cards**
> Inserting memory cards upside down or backwards could damage the camera or the card. Check to be sure the card is in the correct orientation.

If this is the first time the memory card will be used in the camera or the card has been formatted in another device, format the card as described on page 21.

■■ *Removing Memory Cards*

After confirming that the access lamp is off, turn the camera off, open the memory card slot cover, and press the card in to eject it (①). The card can then be removed by hand (②).



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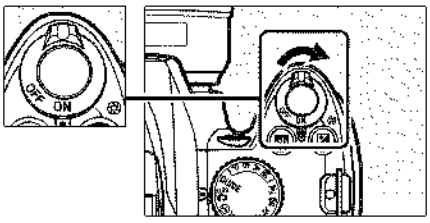
Format the Memory Card

Memory cards must be formatted before first use or after being formatted in other devices. Format the card as described below.

> **Formatting Memory Cards**
> *Formatting memory cards permanently deletes any data they may contain.* Be sure to copy any photographs and other data you wish to keep to a computer before proceeding (🕮 105).

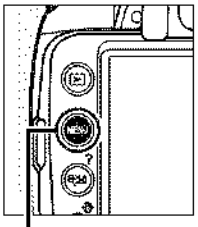
1 Turn the camera on.

Power switch

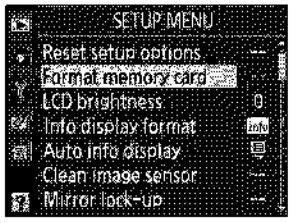


2 Display format options.

Press the **MENU** button to display the menus. Highlight **Format memory card** in the setup menu and press ▶. For more information on using the menus, see page 11.

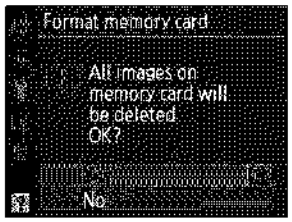


MENU *button*



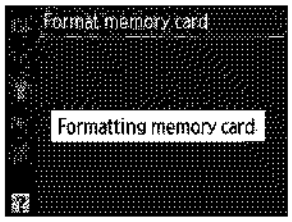
3 Highlight Yes.

To exit without formatting the memory card, highlight **No** and press ⓞⓚ.



4 Press ⓞⓚ.

The message at right will be displayed while the card is formatted. *Do not remove the memory card or remove or disconnect the power source until formatting is complete.*



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Memory Cards

- Memory cards may be hot after use. Observe due caution when removing memory cards from the camera.
- Turn the power off before inserting or removing memory cards. Do not remove memory cards from the camera, turn the camera off, or remove or disconnect the power source during formatting or while data are being recorded, deleted, or copied to a computer. Failure to observe these precautions could result in loss of data or in damage to the camera or card.
- Do not touch the card terminals with your fingers or metal objects.
- Do not bend, drop, or subject to strong physical shocks.
- Do not apply force to the card casing. Failure to observe this precaution could damage the card.
- Do not expose to water, heat, high levels of humidity, or direct sunlight.

The Write Protect Switch

Memory cards are equipped with a write protect switch to prevent accidental loss of data. When this switch is in the "lock" position, the memory card can not be formatted and photos can not be deleted or recorded (a beep will sound if you attempt to release the shutter). To unlock the memory card, slide the switch to the "write" position.

Write-protect switch

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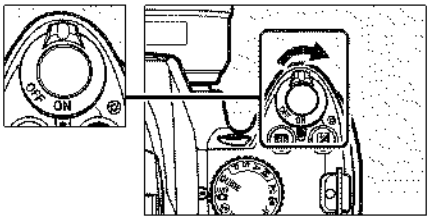
Adjust Viewfinder Focus

The camera is equipped with diopter adjustment to accommodate individual differences in vision. Check that the display in the viewfinder is in focus before framing pictures in the viewfinder.

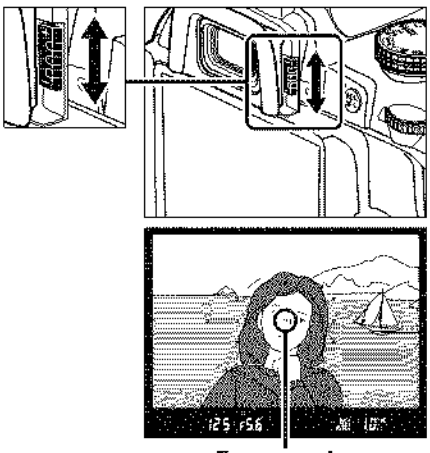
1 Remove the lens cap and turn the camera on.

Power switch



2 Focus the viewfinder.

Slide the diopter adjustment control up and down until the viewfinder display and focus point are in sharp focus. When operating the control with your eye to the viewfinder, be careful not to put your fingers or fingernails in your eye.



Focus point

Adjusting Viewfinder Focus

If you are unable to focus the viewfinder as described above, select single-servo autofocus (**AF-S**; 🕮 42), single-point AF ([▫]; 🕮 45), and the center focus point (🕮 46), and then frame a high-contrast subject in the center focus point and press the shutter-release button halfway to focus the camera. With the camera in focus, use the diopter adjustment control to bring the subject into clear focus in the viewfinder. If necessary, viewfinder focus can be further adjusted using optional corrective lenses (🕮 166).

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Basic Photography and Playback

"Point-and-Shoot" Photography (AUTO and Modes)

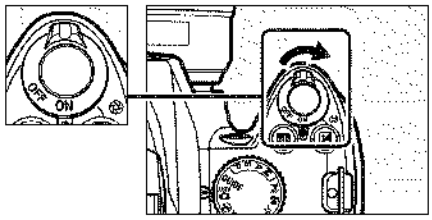
This section describes how to take photographs in AUTO (auto) mode, an automatic "point-and-shoot" mode in which the majority of settings are controlled by the camera in response to shooting conditions, and in which the flash will fire automatically if the subject is poorly lit. To take photographs with the flash off while leaving the camera in control of other settings, rotate the mode dial to to select auto (flash off) mode.

Step 1: Turn the Camera On

1 Turn the camera on.

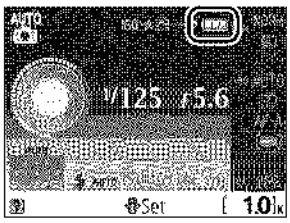
Remove the lens cap and turn the camera on. The information display will appear in the monitor.

Power switch



2 Check the battery level.

Check the battery level in the information display or the viewfinder (if the monitor is off, press the info button to view the information display; if the monitor does not turn on, the battery is exhausted and must be recharged).



Information display	Viewfinder	Description
	—	Battery fully charged.
	—	Battery partially discharged.
		Low battery. Ready fully-charged spare battery or prepare to charge battery.
(blinks)	(blinks)	Battery exhausted; shutter release disabled. Charge or exchange battery.

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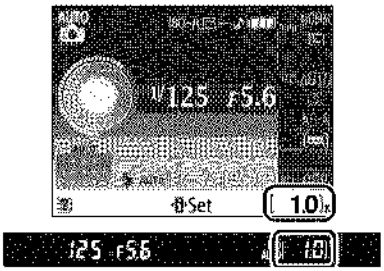
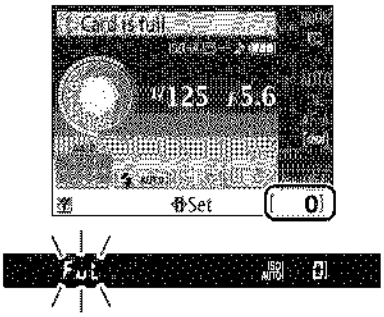
3 Check the number of exposures remaining.

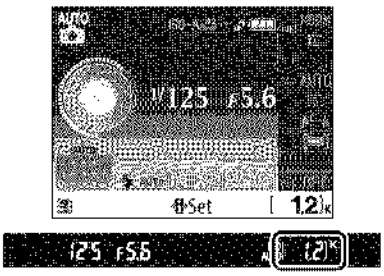
The information display and viewfinder show the number of photographs that can be stored on the memory card. Check the number of exposures remaining.



If there is not enough memory to store additional photographs at current settings, a warning will be displayed. No further pictures can be taken until the memory card has been replaced (📖 20) or photographs have been deleted (📖 33, 101).

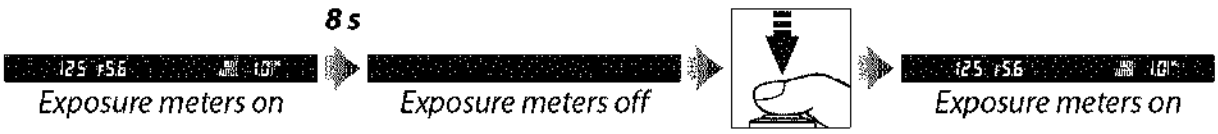


When enough memory remains on the memory card to record a thousand or more pictures at current settings, the number of exposures remaining will be shown in thousands, rounded down to the nearest hundred (e.g., if there is room for 1,260 exposures, the exposure count display will show 1.2 K).



Auto Meter Off

At default settings, the viewfinder and information display will turn off if no operations are performed for about eight seconds (auto meter off), reducing the drain on the battery. Press the shutter-release button halfway to reactivate the display (📖 29).



The length of time before the exposure meters turn off automatically can be adjusted using the **Auto off timers** option in the setup menu (📖 130).

Image Sensor Cleaning

At default settings, the camera vibrates the low-pass filter covering the image sensor to remove dust when the camera is turned on or off (📖 170).

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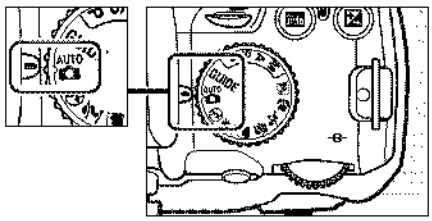
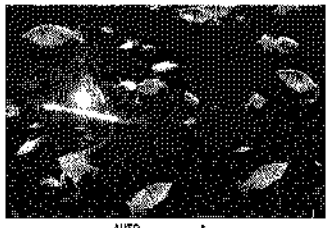
Step 2: Select AUTO or ⚡ Mode

To shoot where use of a flash is prohibited, photograph infants, or capture natural lighting under low light conditions, rotate the mode dial to ⚡. Otherwise, rotate the mode dial to AUTO.

Mode dial



⚡ *mode*

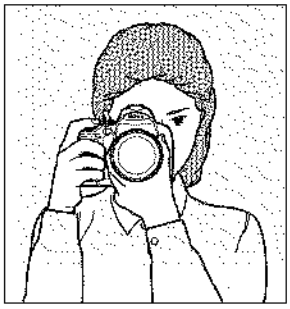


AUTO *mode*

Step 3: Frame the Photograph

1 **Ready the camera.**

When framing photographs in the viewfinder, hold the handgrip in your right hand and cradle the camera body or lens with your left. Keep your elbows propped lightly against your torso for support and place one foot half a pace ahead of the other to keep your upper body stable.

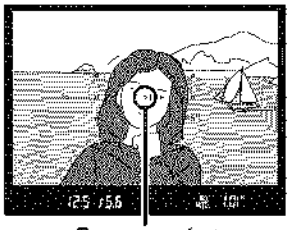


Hold the camera as shown at right when framing photographs in portrait (tall) orientation.

In ⚡ mode, shutter speeds slow when lighting is poor; use of a tripod is recommended.

2 **Frame the photograph.**

Frame a photograph in the viewfinder with the main subject in at least one of the 11 focus points.



Focus point

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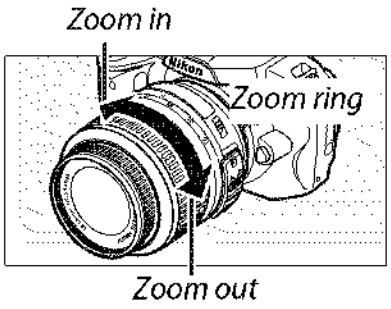
Using a Zoom Lens

Use the zoom ring to zoom in on the subject so that it fills a larger area of the frame, or zoom out to increase the area visible in the final photograph (select longer focal lengths on the lens focal length scale index to zoom in, shorter focal lengths to zoom out).



Step 4: Focus

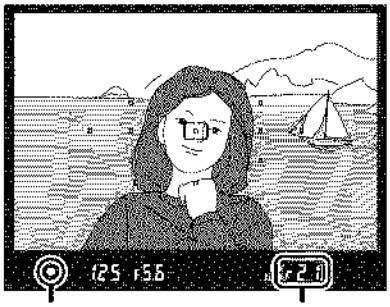
1 Press the shutter-release button halfway.

Press the shutter-release button halfway to focus. The camera will select the focus points automatically. If the subject is poorly lit, the flash may pop up and the AF-assist illuminator may light.

2 Check the indicators in the viewfinder.

When the focus operation is complete, the selected focus points will be briefly highlighted, a beep will sound, and the in-focus indicator (●) will appear in the viewfinder.

In-focus indicator	Description
●	Subject in focus.
● (blinks)	Camera unable to focus using autofocus. See page 42.



While the shutter-release button is pressed halfway, the number of exposures that can be stored in the memory buffer ("▮"; 📖 54) will be displayed in the viewfinder.

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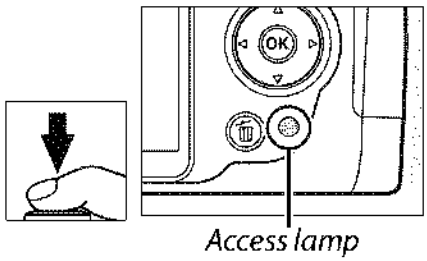
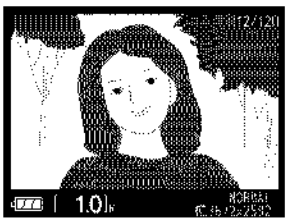
Step 5: Shoot

Smoothly press the shutter-release button the rest of the way down to release the shutter and record the photograph. The access lamp next to the memory card slot cover will light and the photograph will be displayed in the monitor for a few seconds (the photo will automatically clear from the display when the shutter-release button is pressed halfway). *Do not eject the memory card or remove or disconnect the power source until the lamp has gone out and recording is complete.*

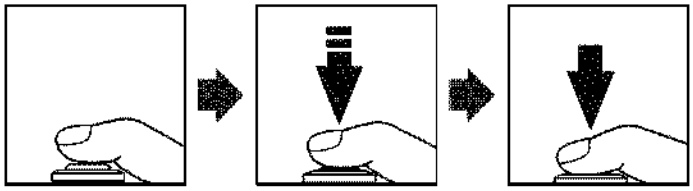


Access lamp



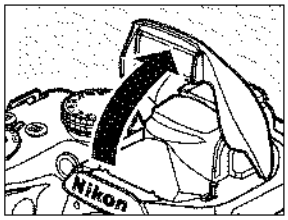
The Shutter-Release Button

The camera has a two-stage shutter-release button. The camera focuses when the shutter-release button is pressed halfway. To take the photograph, press the shutter-release button the rest of the way down.

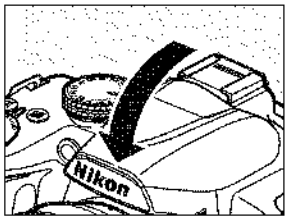


The Built-in Flash

If additional lighting is required for correct exposure in AUTO mode, the built-in flash will pop up automatically when the shutter-release button is pressed halfway. If the flash is raised, photographs can only be taken when the flash-ready indicator (ϟ) is displayed. If the flash-ready indicator is not displayed, the flash is charging; remove your finger briefly from the shutter-release button and try again.



To save battery power when the flash is not in use, return it to its closed position by pressing it gently downward till the latch clicks into place.



Using the Flash

For more information on using the flash, see page 58.

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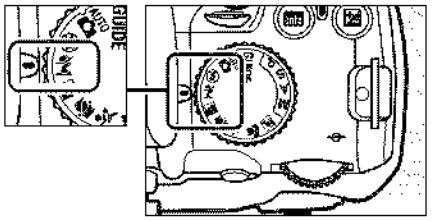
Creative Photography (Scene Modes)

The camera offers a choice of "scene" modes. Choosing a scene mode automatically optimizes settings to suit the selected scene, making creative photography as simple as selecting a mode, framing a picture, and shooting as described on pages 25–29.

The Mode Dial

The following scenes can be selected with the mode dial:

Mode dial



Mode
Portrait
Landscape
Child
Sports
Close up
Night portrait

Scene Modes

Portrait

Use for portraits with soft, natural-looking skin tones. If the subject is far from the background or a telephoto lens is used, background details will be softened to lend the composition a sense of depth.

Landscape

Use for vivid landscape shots in daylight. The built-in flash and AF-assist illuminator turn off; use of a tripod is recommended to prevent blur when lighting is poor.

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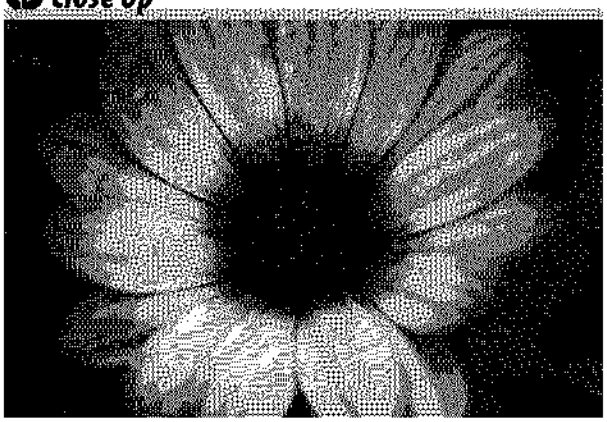
Child

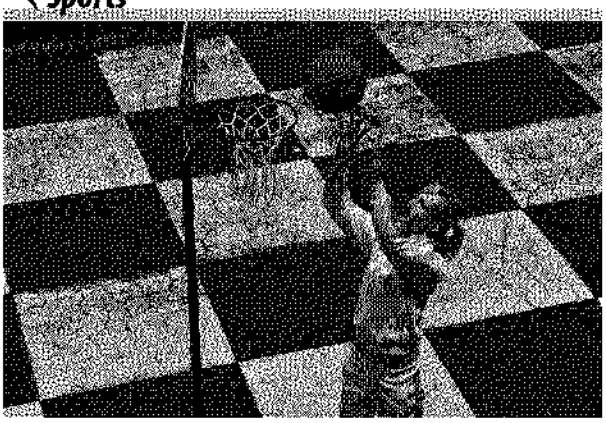
Use for snapshots of children. Clothing and background details are vividly rendered, while skin tones remain soft and natural.

Close Up



Use for close-up shots of flowers, insects, and other small objects (a macro lens can be used to focus at very close ranges). Use of a tripod is recommended to prevent blur.

Sports



Fast shutter speeds freeze motion for dynamic sports shots in which the main subject stands out clearly. The built-in flash and AF-assist illuminator turn off.

Night Portrait

Use for a natural balance between the main subject and the background in portraits taken under low light. Use of a tripod is recommended to prevent blur.

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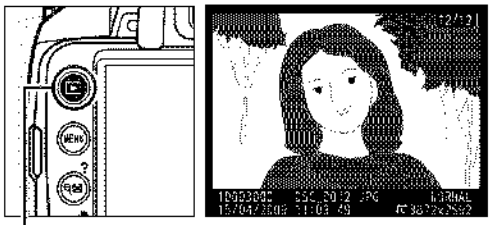
Basic Playback

At default settings, photographs are automatically displayed for about 4 s after shooting. If no photograph is displayed in the monitor, the most recent picture can be viewed by pressing the ▶ button.

1 Press the ▶ button.

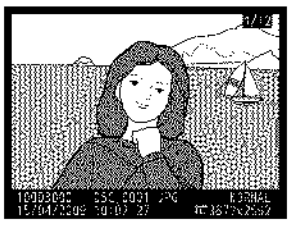
A photograph will be displayed in the monitor.



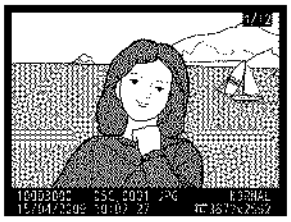
▶ *button*

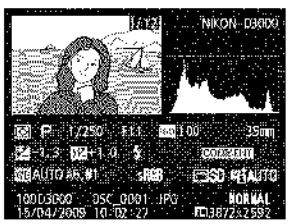
2 View additional pictures.

Additional pictures can be displayed by pressing ◀ or ▶ or rotating the command dial.



To view additional information on the current photograph, press ▲ and ▼ (🕮 92).





To end playback and return to shooting mode, press the shutter-release button halfway.

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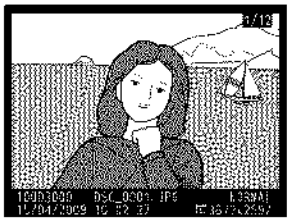
Deleting Unwanted Photographs

To delete the photograph currently displayed in the monitor, press the 🗑 button. Note that photographs can not be recovered once deleted.

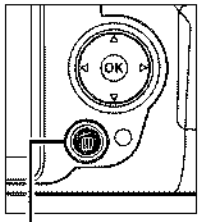
1 Display the photograph.

Display the photograph you wish to delete as described on the preceding page.



2 Delete the photograph.

Press the 🗑 button. A confirmation dialog will be displayed; press the 🗑 button again to delete the image and return to playback (to exit without deleting the picture, press ▶).



🗑 *button*

Delete

To delete selected images (📖 102), all images taken on a selected date (📖 103), or all images in the current playback folder (📖 117), use the **Delete** option in the playback menu.

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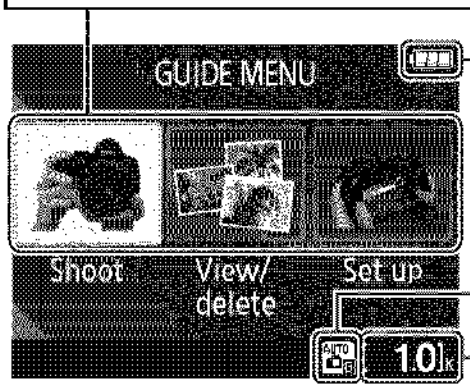
Guide Mode

The Guide Menu

The guide menu gives access to a variety of frequently-used and useful functions. The top level of the guide menu is displayed when the mode dial is rotated to **GUIDE**.

Choose from the following menus:

Shoot	View/delete	Set up
Take pictures.	View and/or delete pictures.	Change camera settings.



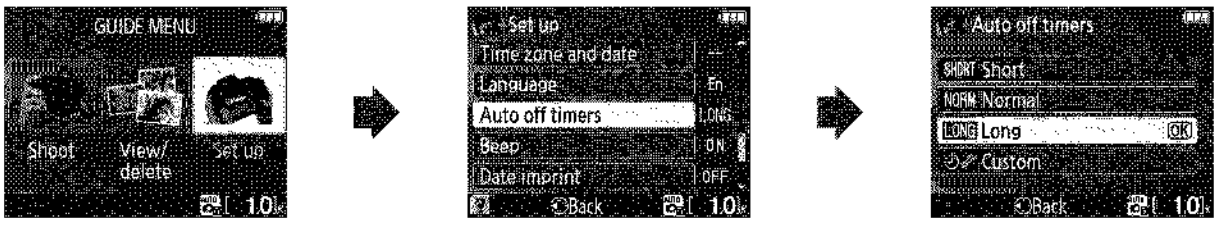
Battery indicator (📖 25)

Shooting mode: A guide mode indicator appears on the shooting mode icon.

Number of exposures remaining (📖 26)

Guide Mode

Guide mode is reset to **Easy operation** > **Auto** when the mode dial is rotated to another setting or the camera is turned off. If no other option is selected when the shutter-release button is pressed, the camera will take pictures in auto mode. If the monitor turns off, the top level menu can be displayed by pressing the **MENU** button. To increase the time the monitor remains on when no operations are performed, select **Set up** > **Auto off timers** in the guide menu.



Displaying the Top Level of the Guide Menu

Press the **MENU** button at any time to return to the top level of the guide menu.

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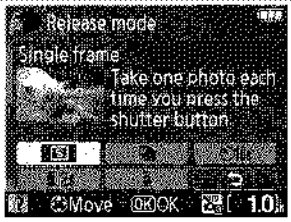
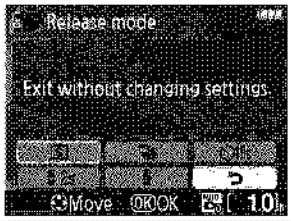
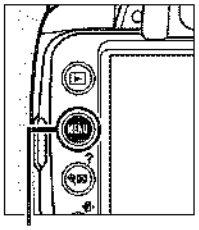
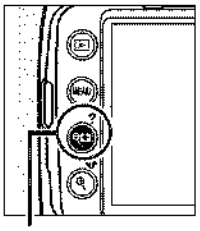
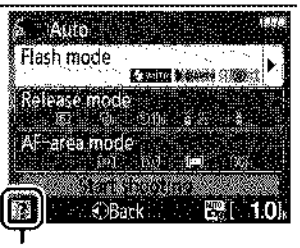
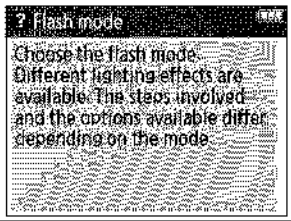
The following operations can be performed while the guide menu is displayed:

To	Use	Description
Highlight options		Press ▲ or ▼ to highlight options in the guide menu.
		Press ▲, ▼, ◀, or ▶ to highlight options in displays like that shown at right. 
Select highlighted option		Press Ⓚ to select the highlighted option.
Return to previous display		Press ◀ to return to the previous display.
		To cancel and return to the previous display from displays like that shown at right, highlight ↩ and press Ⓚ. 
Return to top level menu	 **MENU** *button*	Press **MENU** to return to the top level of the guide menu.
View help	 **?** (🔍) *button*	If a ? icon is displayed at the bottom left corner of the monitor, help can be displayed by pressing the **?** (🔍) button. A description of the currently selected option will be displayed while the button is pressed. Press ▲ or ▼ to scroll through the display.  ? *(help) icon* 

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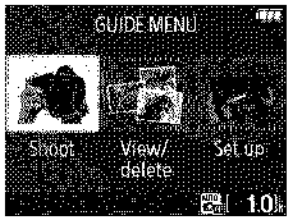
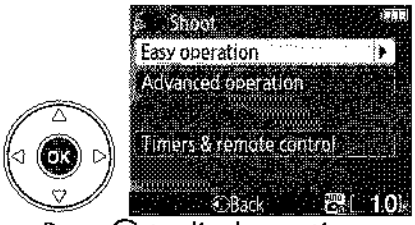
Shoot: *Taking Pictures in Guide Mode*

Select **Shoot** to take pictures using settings that suit the scene.



Press **MENU** *to display guide menu*

Highlight ***Shoot***



Press OK *to display options*

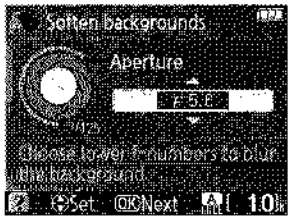
Highlight **Shoot** in the top level of the guide menu and press OK to display the following options:

Easy operation

Auto	**Close-ups**	**Landscapes** [1, 2]
No flash	**Sleeping faces**	**Portraits**
Distant subjects [1, 2]	**Moving subjects** [1, 2]	**Night portrait**

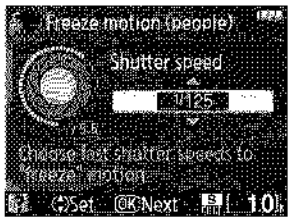
Advanced operation [3]

Soften backgrounds: Select aperture



Freeze motion (people): Select a shutter speed

Freeze motion (vehicles): Select a shutter speed



Timers & remote control

Single frame
Continuous
10-second self-timer
Delayed remote
Quick-response remote

1 Built-in flash turns off automatically. Optional flash units can still be used (📖 162).
2 AF-assist illuminator (📖 43) turns off automatically.
3 If the subject is poorly lit, you can raise ISO sensitivity as described on page 62 after selecting **Start shooting**.

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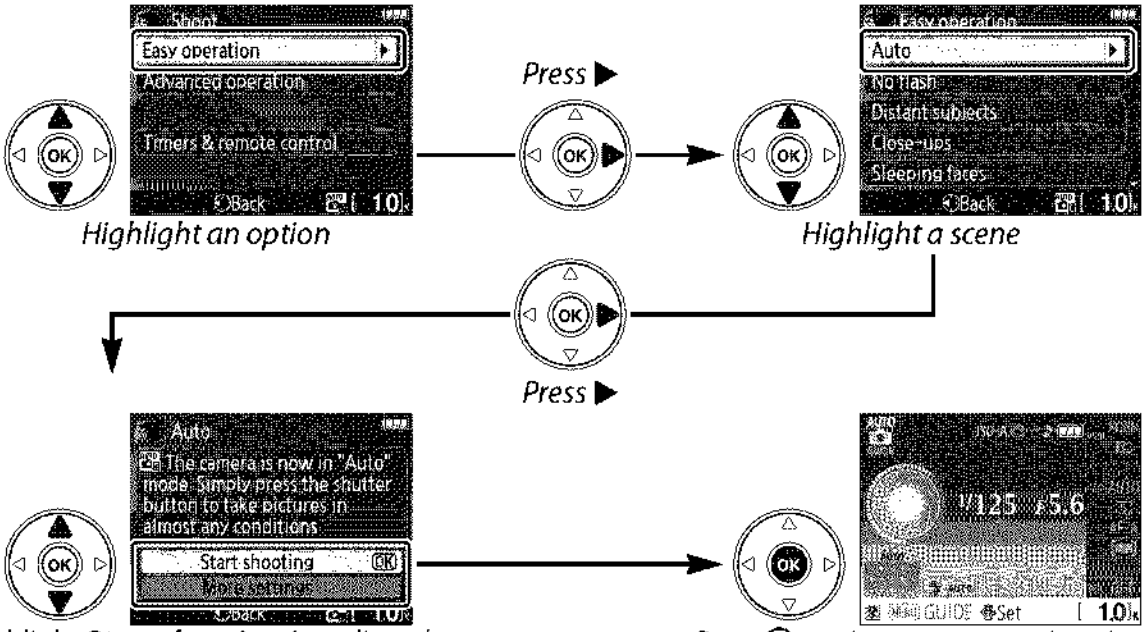
To select a scene (**Easy operation** > **Auto** in this example):

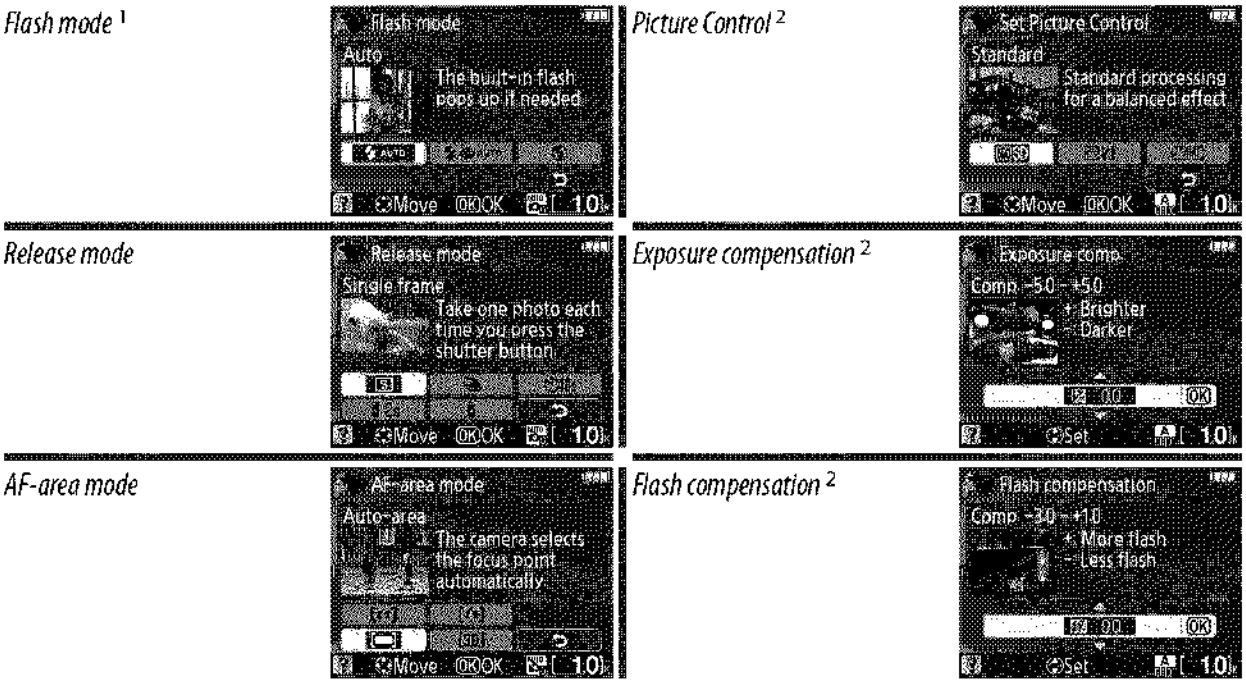


Highlight ***Start shooting*** *(to adjust the settings listed below, select* ***More settings****)*

Press OK *to view camera settings in the information display (*📖 6*)*

■■ *More Settings*

Select **More settings** to adjust the following:



1 Modes available vary with shooting option selected in guide mode.

2 **Advanced operation** only.

> **Displaying the Top Level of the Guide Menu**
> Press the MENU button at any time to return to the top level of the guide menu.

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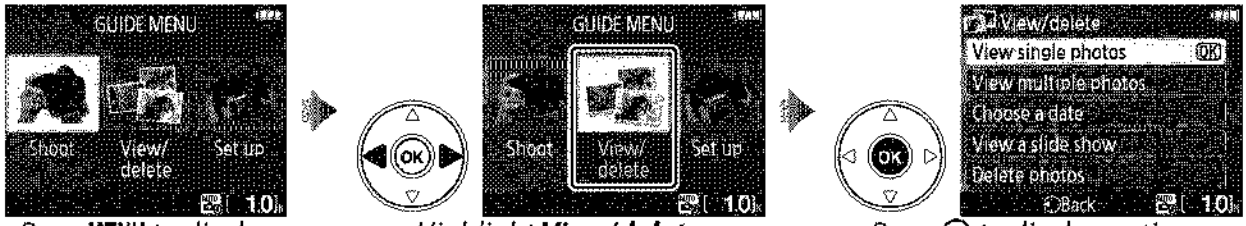
View/Delete: *Viewing and Deleting Pictures in Guide Mode*

Select **View/delete** to view and delete pictures.

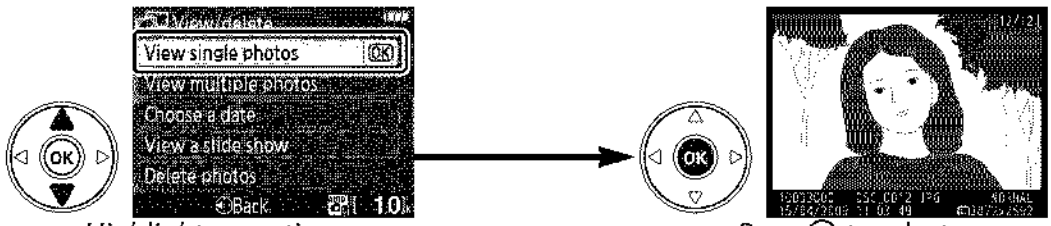


Press **MENU** *to display guide menu* — *Highlight* ***View/delete*** — *Press* OK *to display options*

Highlight **View/delete** in the top level of the guide menu and press OK to display the following options:

View single photos
View multiple photos
Choose a date
View a slide show
Delete photos

To select an option (**View single photos** in this example):



Highlight an option — *Press* OK *to select*

Displaying the Top Level of the Guide Menu
Press the **MENU** button at any time to return to the top level of the guide menu.

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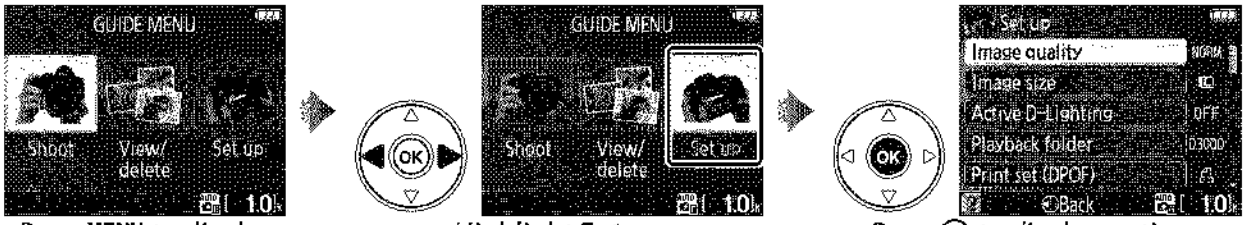
Set up: *Changing Camera Settings in Guide Mode*

Select **Set up** to format memory cards or adjust camera settings.



Press **MENU** *to display guide menu* — *Highlight* ***Set up*** — *Press* OK *to display options*

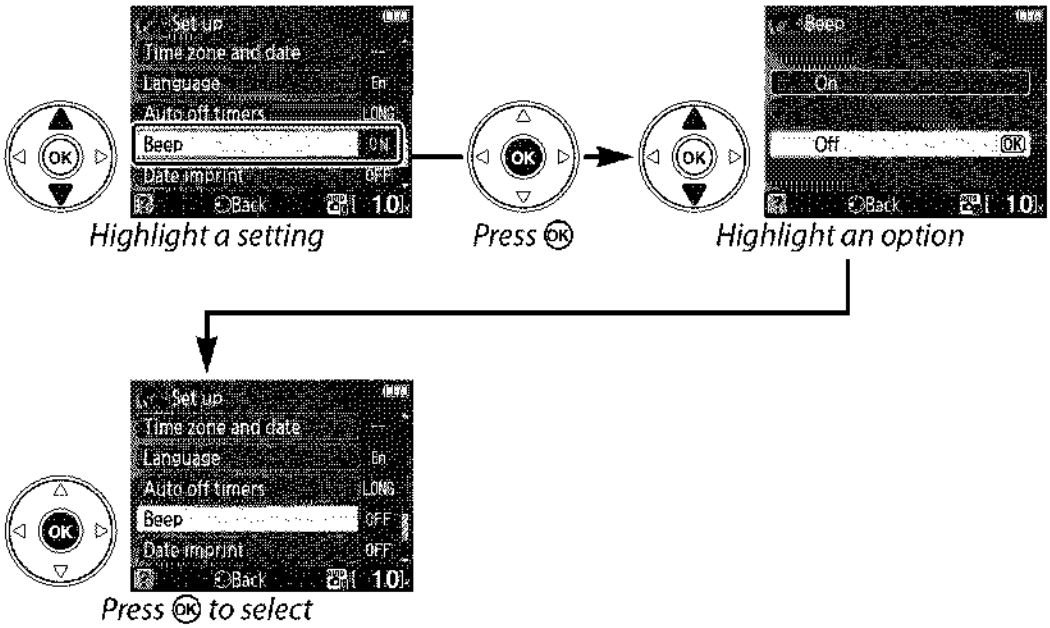
Highlight **Set up** in the top level of the guide menu and press OK to display the following options:

Image quality	**LCD brightness**	**Auto off timers**
Image size	**Info background color**	**Beep**
Active D-Lighting	**Auto info display**	**Date imprint**
Playback folder	**Video mode**	**No memory card?**
Print set (DPOF)	**Time zone and date**	**Eye-Fi upload** *
Format memory card	**Language**	

* Only available when compatible Eye-Fi memory card is inserted.

Changes to settings other than **Playback folder**, **Print set (DPOF)**, **Format memory card**, **Video mode**, **Time zone and date**, **Language**, **No memory card?**, and **Eye-Fi upload** only apply in guide mode and are not reflected in other shooting modes.

To select an option (**Beep** > **Off** in this example):



Highlight a setting — *Press* OK — *Highlight an option*

Press OK *to select*

Displaying the Top Level of the Guide Menu
Press the **MENU** button at any time to return to the top level of the guide menu.

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More on Photography (All Modes)

Focus

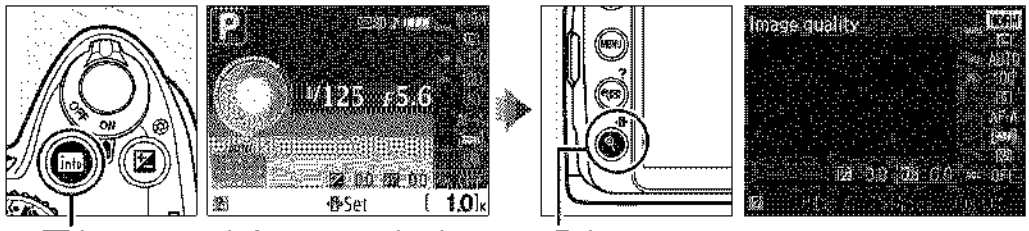
Focus can be adjusted automatically or manually (see "Focus Mode," below). The user can also select the focus point for automatic or manual focus (📖 46) or use focus lock to focus to recompose photographs after focusing (📖 46).

Focus Mode

Choose from automatic and manual focus modes.

1 Place the cursor in the information display.

If shooting information is not displayed in the monitor, press the INFO button. Press the ◀▶ button to place the cursor in the information display.



2 Display focus-mode options.

Highlight the current focus mode in the information display and press OK.

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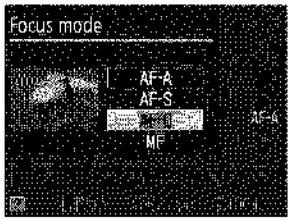
3 Choose a focus mode.

Highlight one of the following options and press ⓞ. Note that **AF-S** and **AF-C** are available only in modes **P**, **S**, **A**, and **M**.



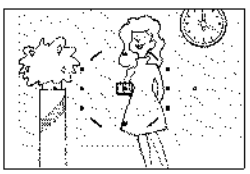
Option		Description
AF-A	**Auto-servo AF**	Camera automatically selects single-servo autofocus if subject is stationary, continuous-servo autofocus if subject is moving.
AF-S	**Single-servo AF**	For stationary subjects. Focus locks when shutter-release button is pressed halfway.
AF-C	**Continuous-servo AF**	For moving subjects. Camera focuses continuously while shutter-release button is pressed halfway.
MF	**Manual focus**	Focus manually (📖 48).

Continuous-servo Autofocus

In **AF-C** mode or when continuous-servo autofocus is selected in **AF-A** mode, the camera gives priority to shutter response and the shutter may be released before the in-focus indicator is displayed.

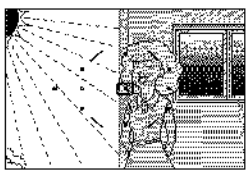
Getting Good Results with Autofocus

Autofocus does not perform well under the conditions listed below. The shutter release may be disabled if the camera is unable to focus under these conditions, or the in-focus indicator (●) may be displayed and the camera may sound a beep, allowing the shutter to be released even when the subject is not in focus. In these cases, focus manually (📖 48) or use focus lock (📖 46) to focus on another subject at the same distance and then recompose the photograph.



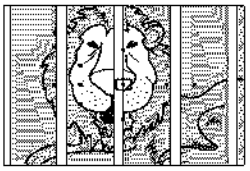
There is little or no contrast between the subject and the background.

Example: Subject is the same color as the background.



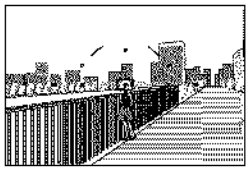
The focus point contains areas of sharply contrasting brightness.

Example: Subject is half in the shade.



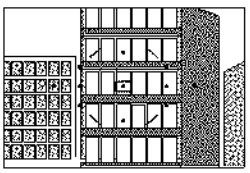
The focus point contains objects at different distances from the camera.

Example: Subject is inside a cage.



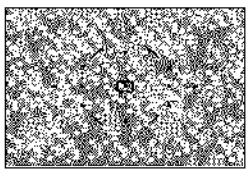
Background objects appear larger than the subject.

Example: a building is in the frame behind the subject.



The subject is dominated by regular geometric patterns.

Example: A row of windows in a skyscraper.



The subject contains many fine details.

Example: A field of flowers or other subjects that are small or lack variation in brightness.

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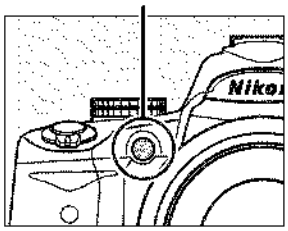
The AF-Assist Illuminator

AF-assist illuminator



If the subject is poorly lit, the AF-assist illuminator will light automatically to assist the autofocus operation when the shutter-release button is pressed halfway. The AF-assist illuminator will not light:

- During continuous-servo autofocus or manual focus
- In shooting modes in which the AF-assist illuminator can not be used (📖 176)
- If **Off** has been selected for the **AF-assist** option in the shooting menu (📖 122)

The illuminator has a range of about 0.5–3.0 m (1 ft. 8 in.–9 ft. 10 in.); when using the illuminator, use a lens with a focal length of 18–200 mm and remove the lens hood.

Focus Mode

Focus mode can also be selected from the shooting menu (📖 119).

The Beep Speaker

The **Beep** option in the setup menu (📖 131) can be used to turn the beep speaker on or off.

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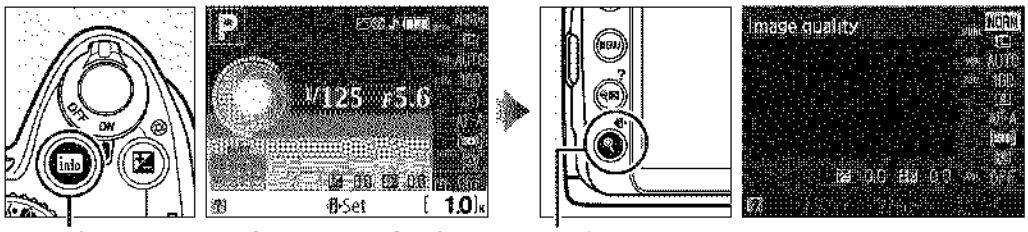
AF-Area Mode

Choose how the focus point for autofocus is selected.

1 Place the cursor in the information display.

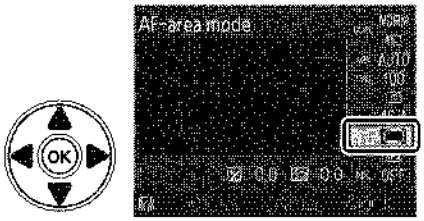
If shooting information is not displayed in the monitor, press the **info** button. Press the ◀▶ button to place the cursor in the information display.



info *button* *Information display* ◀▶ *button*

2 Display AF-area mode options.

Highlight the current AF-area mode in the information display and press OK.



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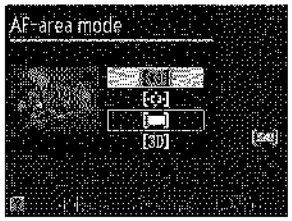
3 Choose an AF-area mode.

Highlight one of the following options and press ⊛. [3D] **3D-tracking (11 points)** is not available when **AF-S** is selected for focus mode.



Option	Description
[▪] **Single point**	User selects focus point using multi selector (🕮 46); camera focuses on subject in selected focus point only. Use with stationary subjects.
[▪] **Dynamic area**	**In AF-A and AF-C focus modes**, user selects focus point manually (🕮 46), but camera will focus based on information from surrounding focus points if subject briefly leaves selected point. Use with erratically moving subjects. **In AF-S focus mode**, user selects focus point manually (🕮 46); camera focuses on subject in selected focus point only.
[▬] **Auto-area**	Camera automatically detects subject and selects focus point.
[3D] **3D-tracking (11 points)**	**In AF-A and AF-C focus modes**, user selects focus point using multi selector (🕮 46). If subject moves after camera has focused, camera uses 3D-tracking to select new focus point and keep focus locked on original subject while shutter-release button is pressed halfway. If subject leaves viewfinder, remove your finger from shutter-release button and recompose photograph with subject in selected focus point.

AF-Area Mode

AF-area mode can also be selected from the shooting menu (🕮 119). AF-area mode selections made in shooting modes other than **P**, **S**, **A**, or **M** are reset when another shooting mode is selected.

3D-tracking (11 Points)

When the shutter-release button is pressed halfway, the colors in the area surrounding the focus point are stored in the camera. Consequently 3D-tracking may not produce the desired results with subjects that are the same color as the background.

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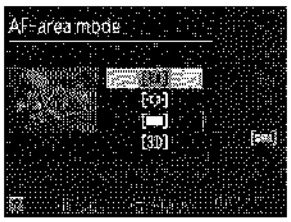
Focus Point Selection

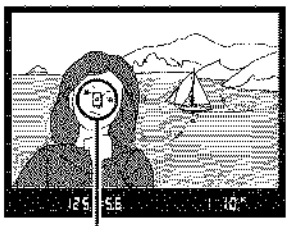
In manual focus mode or when autofocus is combined with AF-area modes other than **[▬] Auto-area**, you can choose from 11 focus points, making it possible to compose photographs with the main subject almost anywhere in the frame.

1 **Choose an AF-area mode other than [▬] Auto-area** (📖 44).

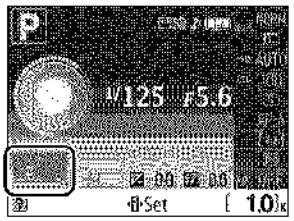


2 **Select the focus point.**

Use the multi selector to select the focus point in the viewfinder or information display. Press ⓞ to select the center focus point.



Focus point

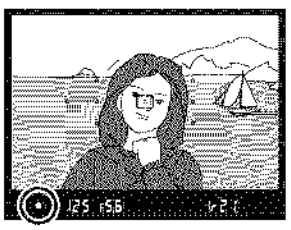


Focus Lock

Focus lock can be used to change the composition after focusing in AF-A, AF-S, and AF-C focus modes (📖 41), making it possible to focus on a subject that will not be in a focus point in the final composition. If the camera is unable to focus using autofocus (📖 42), you can also focus on another subject at the same distance and then use focus lock to recompose the photograph. Focus lock is most effective when an option other than **[▬] Auto-area** is selected for AF-area mode (📖 44).

1 **Focus.**

Position the subject in the selected focus point and press the shutter-release button halfway to initiate focus. Check that the in-focus indicator (●) appears in the viewfinder.



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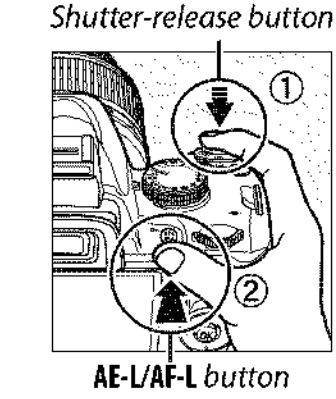
2 Lock focus.

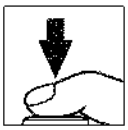
AF-A and AF-C focus modes: With the shutter-release button pressed halfway (①), press the **AE-L/AF-L** button (②) to lock both focus and exposure (an **AE-L** icon will be displayed in the viewfinder). Focus will remain locked while the **AE-L/AF-L** button is pressed, even if you later remove your finger from the shutter-release button.

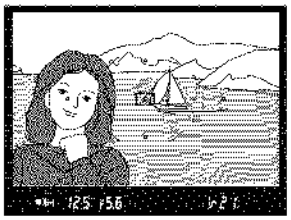


AF-S focus mode: Focus will lock automatically when the in-focus indicator appears, and remain locked until you remove your finger from the shutter-release button. Focus can also be locked by pressing the **AE-L/AF-L** button (see above).

3 Recompose the photograph and shoot.

Focus will remain locked between shots if you keep the shutter-release button pressed halfway (**AF-S**) or keep the **AE-L/AF-L** button pressed, allowing several photographs in succession to be taken at the same focus setting.





Do not change the distance between the camera and the subject while focus lock is in effect. If the subject moves, focus again at the new distance.

> **The AE-L/AF-L Button**
> The **Buttons** > **AE-L/AF-L** option in the setup menu (📖 135) controls the behavior of the **AE-L/AF-L** button.

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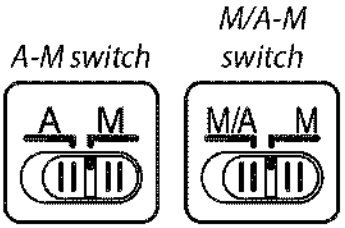
Manual Focus

Manual focus can be used when you are not using an AF-S or AF-I lens or when autofocus does not produce the desired results (📖 42).

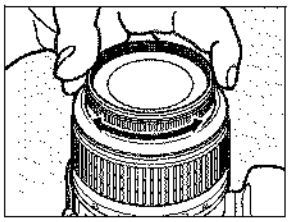
1 Set the lens focus-mode switch.

If the lens is equipped with an A-M or M/A-M switch, slide the switch to **M**.



2 Focus.

To focus manually, adjust the lens focus ring until the image displayed on the clear matte field in the viewfinder is in focus. Photographs can be taken at any time, even when the image is not in focus.



AF-S Lenses

Users of AF-S lenses (including the AF-S DX NIKKOR 18–55mm f/3.5–5.6G VR lens used in this manual for illustrative purposes; 📖 191) can select manual focus simply by setting the lens focus-mode switch to **M**.

M/A

If the lens supports M/A (autofocus with manual override, MF priority), manual focus can also be selected by setting the camera focus mode to **MF** (manual focus; 📖 41). Focus can then be adjusted manually, regardless of the mode selected with the lens.

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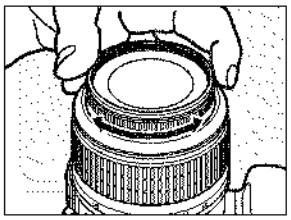
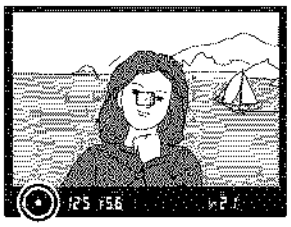
■■ *The Electronic Rangefinder*

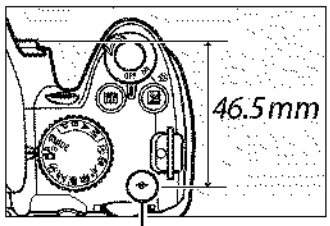
If the lens has a maximum aperture of f/5.6 or faster, the viewfinder focus indicator can be used to confirm whether the subject in the selected focus point is in focus (the focus point can be selected from any of the 11 focus points). After positioning the subject in the selected focus point, press the shutter-release button halfway and rotate the lens focus ring until the in-focus indicator (●) is displayed. Note that with the subjects listed on page 42, the in-focus indicator may sometimes be displayed when the subject is not in focus; confirm focus in the viewfinder before shooting.





Focal Plane Position

To determine the distance between your subject and the camera, measure from the focal plane mark on the camera body. The distance between the lens mounting flange and the focal plane is 46.5 mm (1.83 in.).



Focal plane mark

The Exposure Indicator

If desired, the exposure indicator can be used to determine whether the focus point for manual focus is in front of or behind the subject (📖 132).

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Image Quality and Size

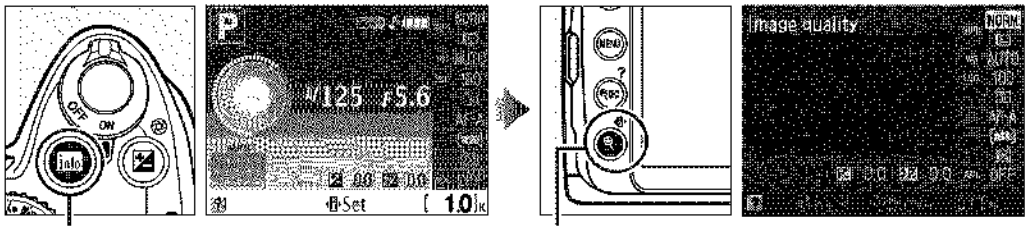
Together, image quality and size determine how much space each photograph occupies on the memory card. Larger, higher quality images can be printed at larger sizes but also require more memory, meaning that fewer such images can be stored on the memory card (🕮 177).

Image Quality

Choose a file format and compression ratio (image quality).

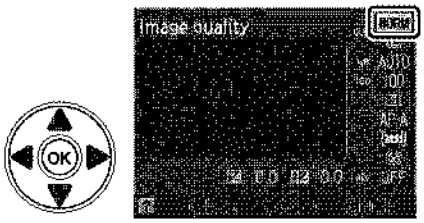
1 Place the cursor in the information display.

If shooting information is not displayed in the monitor, press the **info** button. Press the ◀ button to place the cursor in the information display.



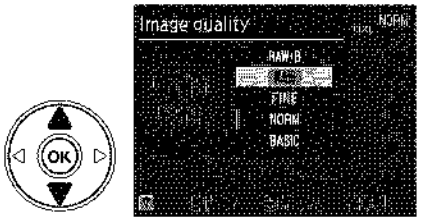
2 Display image quality options.

Highlight the current image quality in the information display and press ⓞ.



3 Choose a file type.

Highlight one of the following options and press ⓞ.



Option	File type	Description
NEF (RAW)	NEF	Raw 12-bit data from the image sensor are saved directly to the memory card. Choose for images that will be processed on a computer.
JPEG fine	JPEG	Record JPEG images at a compression ratio of roughly 1 : 4 (fine image quality).
JPEG normal		Record JPEG images at a compression ratio of roughly 1 : 8 (normal image quality).
JPEG basic		Record JPEG images at a compression ratio of roughly 1 : 16 (basic image quality).

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Option	File type	Description
NEF (RAW) + JPEG basic	NEF/ JPEG	Two images are recorded: one NEF (RAW) image and one basic-quality JPEG image.

NEF (RAW) Images

Note that the option selected for image size does not affect the size of NEF (RAW) or NEF (RAW)+JPEG images. Date imprint (📖 136) is not available at image quality settings of NEF (RAW) or NEF (RAW)+JPEG.

NEF (RAW) images can be viewed on the camera or using software such as Capture NX 2 (available separately; 📖 167) or ViewNX (available on the supplied Software Suite CD). JPEG copies of NEF (RAW) images can be created using the **NEF (RAW) processing** option in the retouch menu (📖 149).

NEF (RAW)/NEF+JPEG

When photographs taken at **NEF (RAW) + JPEG basic** are viewed on the camera, only the JPEG image will be displayed. When photographs taken at these settings are deleted, both NEF and JPEG images will be deleted.

File Names

Photographs are stored as image files with names of the form "DSC_*nnnn.xxx*," where *nnnn* is a four-digit number between 0001 and 9999 assigned automatically in ascending order by the camera, and *xxx* is one of the following three letter extensions: "NEF" for NEF images, "JPG" for JPEG images, or "AVI" for stop-motion movies. The NEF and JPEG files recorded at a setting of **NEF (RAW) + JPEG basic** have the same file names but different extensions. Small copies created with the small picture option in the retouch menu have file names beginning with "SSC_" and ending with the extension "JPG" (e.g., "SSC_0001.JPG"). Stop motion movies have file names beginning with "ASC_" (e.g., "ASC_0001.AVI"); images recorded with the other options in the retouch menu have file names beginning with "CSC" (e.g., "CSC_0001.JPG"). Images recorded with the **Color space** option in the shooting menu set to **Adobe RGB** (📖 121) have names that begin with an underscore (e.g., "_DSC0001.JPG").

The Shooting Menu

Image quality can also be adjusted using the **Image quality** option in the shooting menu (📖 119).

The Fn Button

Image quality and size can also be adjusted by pressing the **Fn** (⏲) button and rotating the command dial (📖 134).

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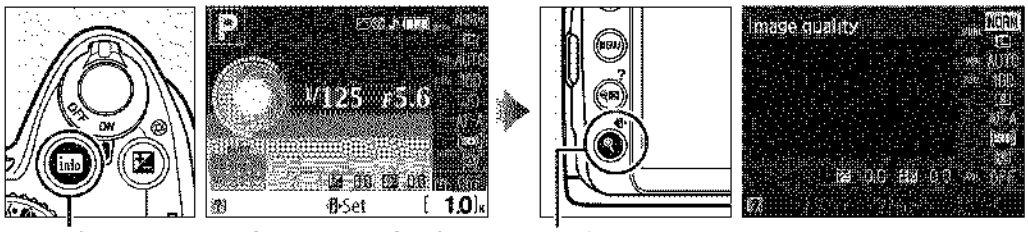
Image Size

Image size is measured in pixels.

1 Place the cursor in the information display.

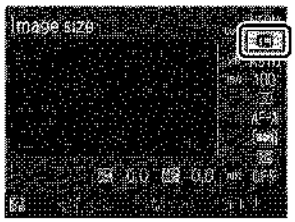
If shooting information is not displayed in the monitor, press the **info** button. Press the ◀▶ button to place the cursor in the information display.



info *button* *Information display* ◀▶ *button*

2 Display image size options.

Highlight the current image size in the information display and press ⊛.



3 Choose an image size.

Highlight one of the following options and press ⊛.

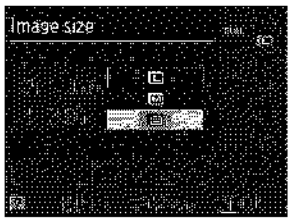


Image size	Size (pixels)	Approximate size when printed at 200 dpi
L Large	3,872 × 2,592	49.2 × 32.9 cm (19.4 × 13.0 in.)
M Medium	2,896× 1,944	36.8 × 24.7 cm (14.5 × 9.7 in.)
S Small	1,936 × 1,296	24.6 × 16.5 cm (9.7 × 6.5 in.)

The Shooting Menu

Image size can also be adjusted using the **Image size** option in the shooting menu (📖 119).

The Fn Button

Image quality and size can also be adjusted by pressing the **Fn** (⏲) button and rotating the command dial (📖 134).

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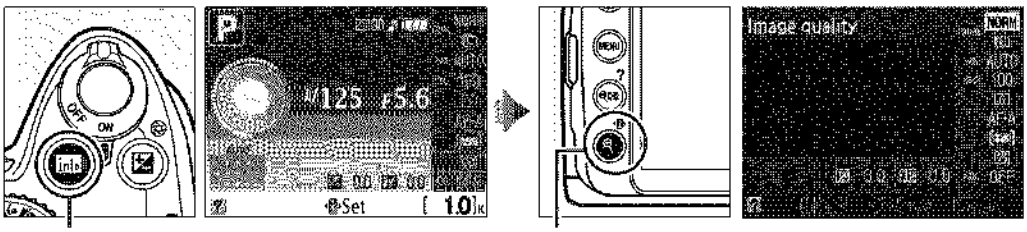
Release Mode

Release mode determines how the camera takes photographs: one at a time, in a continuous sequence, or with a timed shutter-release delay or remote control.

1 Place the cursor in the information display.

If shooting information is not displayed in the monitor, press the INFO button. Press the ◀ button to place the cursor in the information display.



INFO *button* *Information display* ◀ *button*

2 Display release mode options.

Highlight the current release mode in the information display and press OK.

3 Choose a release mode.

Highlight one of the following options and press OK.

Mode	Description
Single frame	Camera takes one photograph each time shutter-release button is pressed.
Continuous	Camera records about 3 frames per second while shutter-release button is held down.
Self-timer	Use for self-portraits or to reduce blurring caused by camera shake (📖 55).
2s Delayed remote	Optional ML-L3 wireless remote control required. Shutter is released after two-second delay (📖 55).
Quick-response remote	Optional ML-L3 wireless remote control required. Shutter is released immediately (📖 55).

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The Memory Buffer

The camera is equipped with a memory buffer for temporary storage, allowing shooting to continue while photographs are being saved to the memory card. Up to 100 photographs can be taken in succession; note, however, that frame rate will drop when the buffer is full.

While photographs are being recorded to the memory card, the access lamp next to the memory card slot will light. Depending on the number of the images in the buffer, recording may take from a few seconds to a few minutes. *Do not remove the memory card or remove or disconnect the power source until the access lamp has gone out.* If the camera is switched off while data remain in the buffer, the power will not turn off until all images in the buffer have been recorded. If the battery is exhausted while images remain in the buffer, the shutter release will be disabled and the images transferred to the memory card.

Continuous Release Mode

Continuous release mode (⊟) can not be used with the built-in flash; rotate the mode dial to ⊛ (📖 27) or turn the flash off (📖 58–59).

Buffer Size

The approximate number of images that can be stored in the memory buffer at current settings is shown in the viewfinder exposure-count display while the shutter-release button is pressed. The illustration shows the display when space remains in the buffer for about 21 pictures.

Auto Image Rotation

The camera orientation recorded for the first shot applies to all images in the same burst, even if the camera is rotated during shooting. See "Auto Image Rotation" (📖 128).

The Shooting Menu

Release mode can also be adjusted using the **Release mode** option in the shooting menu (📖 119).

See Also

For information on using the **Fn** (⏲) button and the command dial to select a release mode, see page 134. For information on the number of photographs that can be taken in a single burst, see page 177.

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Self-Timer and Remote Modes

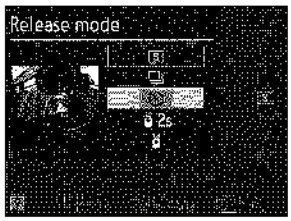
The self-timer and optional ML-L3 wireless remote control (🕮 167) can be used to reduce camera shake or for self-portraits.

1 Mount the camera on a tripod.

Mount the camera on a tripod or place the camera on a stable, level surface.

2 Select a release mode (🕮 53).

Select self-timer (⏲), delayed remote (📡 2s), or quick-response remote mode (📡).



3 Frame the photograph.

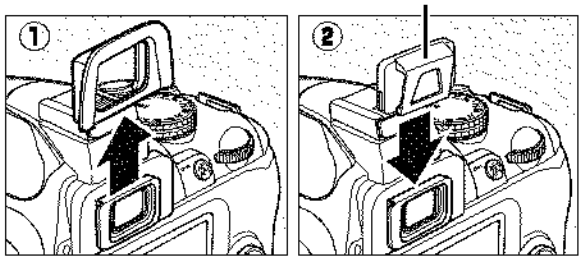
Using a Remote Control

If autofocus is in effect in delayed remote or quick-response remote mode, the camera can be focused by pressing the shutter-release button halfway (the shutter will not be released if the shutter-release button is pressed all the way down).

Cover the Viewfinder

After framing the photograph, remove the DK-20 rubber eyecup (①) and insert the supplied DK-5 eyepiece cap as shown (②). This prevents light entering via the viewfinder interfering with exposure. Hold the camera firmly when removing the rubber eyecup.

DK-5 eyepiece cap



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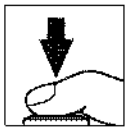
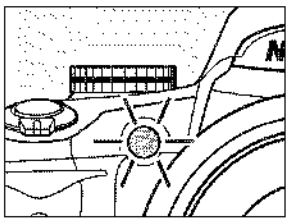
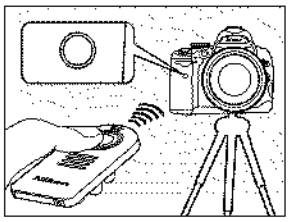
4 Take the photograph.





Self-timer mode: Press the shutter-release button halfway to focus, and then press the button the rest of the way down to start the self-timer. The self-timer lamp will start to blink and a beep will begin to sound. Two seconds before the photograph is taken, the self-timer lamp will stop blinking and the beeping will become more rapid. The shutter will be released ten seconds after the timer starts.

The timer will not start if the camera is unable to focus or in other situations in which the shutter can not be released.



Delayed remote and quick-response remote modes: From a distance of 5 m (16 ft.) or less, aim the transmitter on the ML-L3 at the infrared receiver on the camera and press the shutter-release button on the ML-L3. In delayed remote mode, the self-timer lamp will light for about two seconds before the shutter is released. In quick-response remote mode, the self-timer lamp will flash after the shutter has been released. No picture will be taken if the camera is unable to focus or in other situations in which the shutter can not be released.

If no operations are performed for about five minutes after selecting delayed remote or quick-response remote modes, the camera will automatically return to single frame or continuous mode, cancelling remote control mode.

Turning the camera off cancels self-timer and remote release modes and restores single frame or continuous mode.

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Before Using the Remote Control

Before using the remote control for the first time, remove the clear plastic battery insulator sheet.

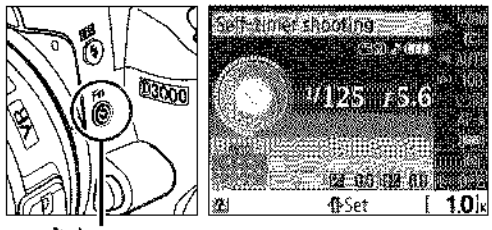
Using the Built-in Flash

Before taking a photograph with the flash in **P**, **S**, **A**, or **M** modes, press the ⚡ button to raise the flash and wait for the ⚡ indicator to be displayed in the viewfinder (📖 58). Shooting will be interrupted if the flash is raised after the self-timer or delayed remote timer has started. In auto or scene modes in which the flash pops up automatically, the flash will begin charging when delayed remote or quick-response remote mode is selected; once the flash is charged, it will automatically pop up and fire if required when the shutter-release button on the ML-L3 is pressed. The camera will only respond to the shutter-release button on the ML-L3 once the flash has charged.

In flash modes that support red-eye reduction, the red-eye reduction lamp will light for about one second before the shutter is released. In delayed remote mode, the self-timer lamp will light for two seconds, followed by the red-eye reduction lamp, which lights for one second before the shutter is released to reduce red-eye.

The ⏲ Button

Self-timer mode can also be selected by pressing the ⏲ button (📖 134).



⏲ *button*

See Also

For information on changing the duration of the self-timer, see page 131. For information on choosing the length of time the camera will remain in standby mode before remote control mode is cancelled, see page 131. For information on controlling the beeps that sound when the self-timer and remote control are used, see page 131.

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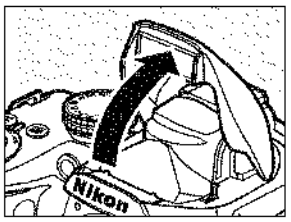
Using the Built-in Flash

The camera supports a variety of flash modes for photographing poorly lit or backlit subjects.

■■ *Using the Built-in Flash: AUTO, , , , and Modes*

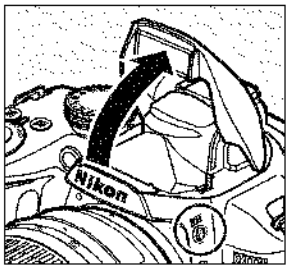
1 **Choose a flash mode (📖 59).**

2 **Take pictures.**
The flash will pop up as required when the shutter-release button is pressed halfway, and fire when a photograph is taken.



■■ *Using the Built-in Flash: P, S, A, and M Modes*

1 **Raise the flash.**
Press the ϟ button to raise the flash.



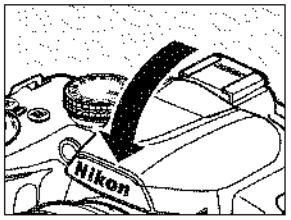
ϟ *button*

2 **Choose a flash mode (📖 59).**

3 **Take pictures.**
The flash will fire whenever a picture is taken.

■■ *Lowering the Built-in Flash*

To save power when the flash is not in use, press it gently downward until the latch clicks into place.



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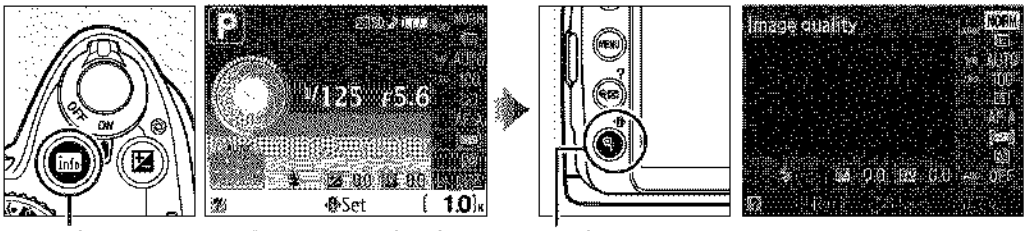
Flash Mode

To choose a flash mode:

1 Place the cursor in the information display.

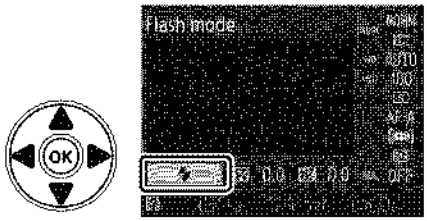
If shooting information is not displayed in the monitor, press the info button. Press the ◂i▸ button to place the cursor in the information display.



info button Information display ◂i▸ button

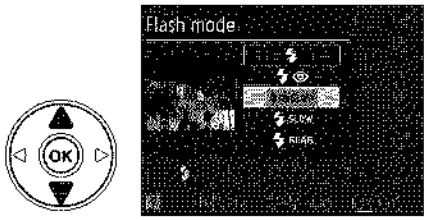
2 Display flash mode options.

Highlight the current flash mode in the information display and press OK.



3 Choose a flash mode.

Highlight a mode and press OK. The flash modes available vary with shooting mode:



AUTO, ⚡, ⚡, ⚡	
⚡AUTO	Auto
⚡👁AUTO	Auto+red-eye reduction
⊘	Off

⚡👁AUTO SLOW	Auto+slow sync+ red-eye reduction
⚡AUTO SLOW	Auto+slow sync
⊘	Off

P, A	
⚡	Fill flash
⚡👁	Red-eye reduction
⚡👁SLOW	Slow sync+red-eye reduction
⚡SLOW	Slow sync
⚡REAR*	Rear curtain+slow sync

S, M	
⚡	Fill flash
⚡👁	Red-eye reduction
⚡REAR	Rear-curtain sync

* SLOW appears in information display when setting is complete.

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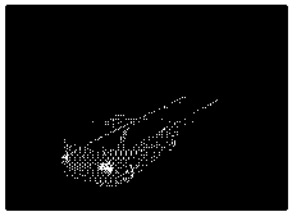
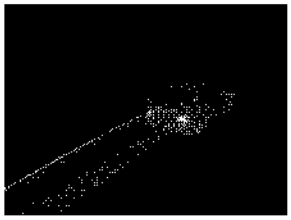
The flash modes listed on the previous page may combine one or more of the following settings, as shown by the flash mode icon:

- **AUTO (auto flash)**: When lighting is poor or subject is back lit, flash pops up automatically when shutter-release button is pressed halfway and fires as required.
- **(red-eye reduction)**: Use for portraits. Red-eye reduction lamp lights before flash fires, reducing "red-eye."
- **(off)**: Flash does not fire even when lighting is poor or subject is back-lit.
- **SLOW (slow sync)**: Shutter speed slows automatically to capture background lighting at night or under low light. Use to include background lighting in portraits.
- **REAR (rear-curtain sync)**: Flash fires just before shutter closes, creating a stream of light behind moving light sources (below at right). If this icon is not displayed, flash will fire as the shutter opens (front-curtain sync; the effect this produces with moving light sources is shown below at left).



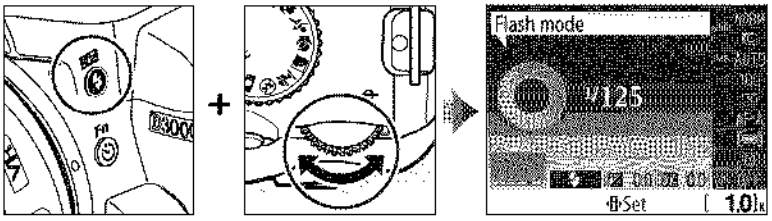
Front-curtain sync



Rear-curtain sync

Choosing a Flash Mode

The flash mode can also be selected by pressing the ϟ button and rotating the command dial (in **P**, **S**, **A**, and **M** modes, raise the flash before using the ϟ button to choose the flash mode).



ϟ *button* | *Command dial* | *Information display*

The Built-in Flash

For information on the lenses that can be used with the built-in flash, see page 160. Remove lens hoods to prevent shadows. The flash has a minimum range of 0.6 m (2 ft.) and can not be used in the macro range of macro zoom lenses.

The shutter release may be briefly disabled to protect the flash after it has been used for several consecutive shots. The flash can be used again after a short pause.

Shutter Speeds Available with the Built-in Flash

The following shutter speeds are available with the built-in flash.

Mode	Shutter speed
AUTO, , , P, A	1/200–1/60 s
	1/200–1/125 s
	1/200–1 s

Mode	Shutter speed
S	1/200–30 s
M	1/200–30 s, bulb

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Aperture, Sensitivity, and Flash Range

Flash range varies with sensitivity (ISO equivalency) and aperture.

Aperture at ISO equivalent of					Approximate range	
100	200	400	800	1600	m	ft.
1.4	2	2.8	4	5.6	1.0–8.5	3ft. 3in.–27ft. 11n.
2	2.8	4	5.6	8	0.7–6.0	2ft. 4in.–19ft. 8in.
2.8	4	5.6	8	11	0.6–4.2	2ft.–13ft. 9in.
4	5.6	8	11	16	0.6–3.0	2ft.–9ft. 10in.
5.6	8	11	16	22	0.6–2.1	2ft.–6ft. 11in.
8	11	16	22	32	0.6–1.5	2ft.–4ft. 11in.
11	16	22	32	—	0.6–1.1	2ft.–3ft. 7in.
16	22	32	—	—	0.6–0.7	2ft.–2ft. 4in.

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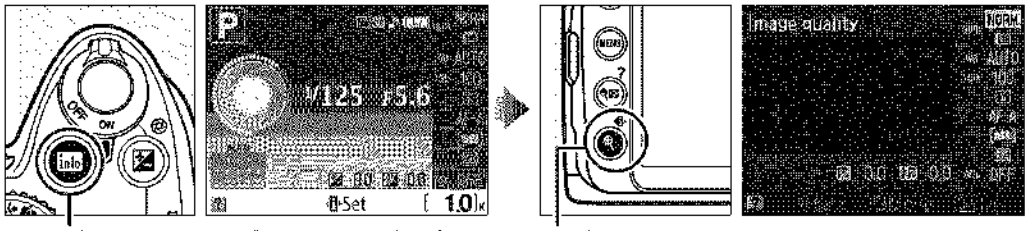
ISO Sensitivity

"ISO sensitivity" is the digital equivalent of film speed. The higher the ISO sensitivity, the less light needed to make an exposure, allowing higher shutter speeds or smaller apertures.

1 Place the cursor in the information display.

If shooting information is not displayed in the monitor, press the **info** button. Press the ◀▶ button to place the cursor in the information display.



info *button* *Information display* ◀▶ *button*

2 Display ISO sensitivity options.

Highlight the current ISO sensitivity in the information display and press OK.

3 Choose an ISO sensitivity.

Highlight an option and press OK. ISO sensitivity can be set between values roughly equivalent to ISO 100 and ISO 1600 in steps equivalent to 1 EV. For special situations, ISO sensitivity can be raised above ISO 1600 by about 1 EV (Hi 1, equivalent to ISO 3200). Auto and scene modes also offer an **AUTO** option, which allows the camera to set ISO sensitivity automatically in response to lighting conditions.

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AUTO

If the mode dial is rotated to **P**, **S**, **A**, or **M** after **AUTO** is selected for ISO sensitivity in another mode, the ISO sensitivity last selected in **P**, **S**, **A**, or **M** mode will be restored.

Hi 1

Pictures taken at this setting are more likely to be subject to noise and color distortion.

The Shooting Menu

ISO sensitivity can also be adjusted using the **ISO sensitivity settings** option in the shooting menu (📖 120).

See Also

For information on enabling auto ISO sensitivity control in **P**, **S**, **A**, or **M** modes, see page 120. For information on using the **Noise reduction** option in the shooting menu to reduce noise at high ISO sensitivities, see page 122. For information on using the **Fn** (⏲) button and the command dial to select ISO sensitivity, see page 134.

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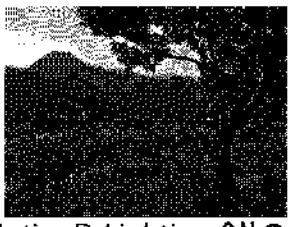
Active D-Lighting

If **On** is selected, the camera automatically adjusts Active D-Lighting during shooting to preserve details in highlights and shadows, creating photographs with natural contrast. Use for high contrast scenes, for example when photographing brightly lit outdoor scenery through a door or window or taking pictures of shaded subjects on a sunny day. It is most effective when used with ▣ **Matrix** metering (📖 74).

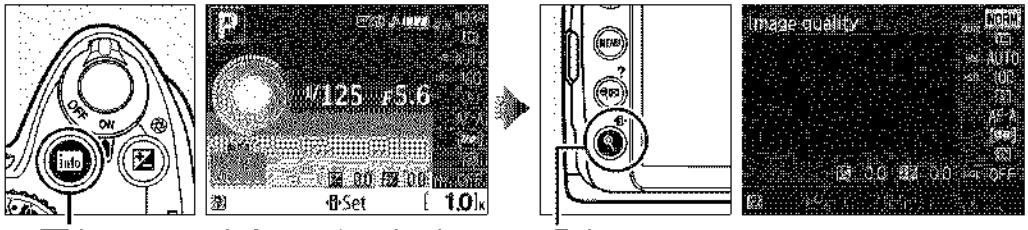
Active D-Lighting: OFF **Off**



Active D-Lighting: ON **On**

1 Place the cursor in the information display.

If shooting information is not displayed in the monitor, press the info button. Press the ◀▶ button to place the cursor in the information display.



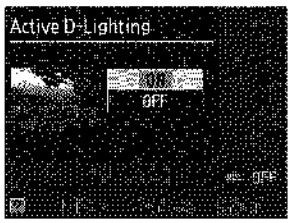
info *button* *Information display* ◀▶ *button*

2 Display Active D-Lighting options.

Highlight Active D-Lighting in the information display and press OK.

3 Choose an option.

Highlight ON **On** or OFF **Off** and press OK.



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Active D-Lighting

Noise (graininess, banding, and mottling) may appear in photographs taken with Active D-Lighting at high ISO sensitivities. More time is required to record images when Active D-Lighting is on.

"Active D-Lighting" Versus "D-Lighting"

The **Active D-Lighting** option in the shooting menu adjusts exposure before shooting to optimize the dynamic range, while the **D-Lighting** option in the retouch menu (📖 142) optimizes dynamic range in images after shooting.

The Shooting Menu

Active D-Lighting can also be adjusted using the **Active D-Lighting** option in the shooting menu (📖 119).

See Also

For information on using the **Fn** (⏲) button and command dial to turn Active D-Lighting on and off, see page 134.

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P, S, A, and M Modes

Shutter Speed and Aperture

P, **S**, **A**, and **M** modes offer different degrees of control over shutter speed and aperture:

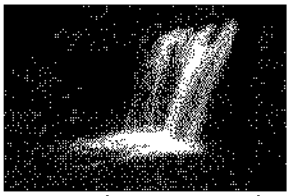
Mode		Description
P	Programmed auto (📖 68)	Camera sets shutter speed and aperture for optimal exposure. Recommended for snapshots and in other situations in which there is little time to adjust camera settings.
S	Shutter-priority auto (📖 69)	User chooses shutter speed; camera selects aperture for best results. Use to freeze or blur motion.
A	Aperture-priority auto (📖 70)	User chooses aperture; camera selects shutter speed for best results. Use to blur background or bring both foreground and background into focus.
M	Manual (📖 71)	User controls both shutter speed and aperture. Set shutter speed to "bulb" or "time" for long time-exposures.

Lens Aperture Rings

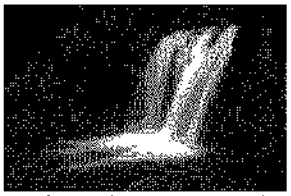
When using a CPU lens equipped with an aperture ring (📖 158), lock the aperture ring at the minimum aperture (highest f-number). Type G lenses are not equipped with an aperture ring.

Shutter Speed and Aperture

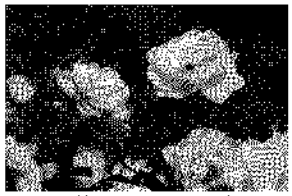
The same exposure can be achieved with different combinations of shutter speed and aperture. Fast shutter speeds and larger apertures freeze moving objects and soften background details, while slow shutter speeds and small apertures blur moving objects and bring out background details.



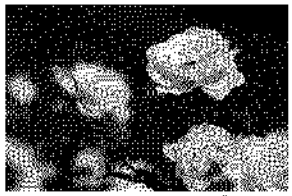
Fast shutter speed (1/1,600 s)



Slow shutter speed (1 s)



Small aperture (f/22)



Large aperture (f/5.6)

(Remember, the higher the f-number, the smaller the aperture.)

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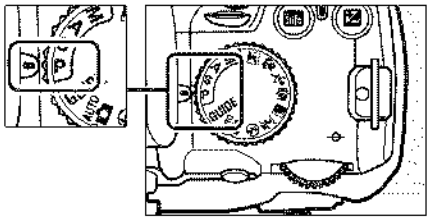
Mode P (Programmed Auto)

In this mode, the camera automatically adjusts shutter speed and aperture for optimal exposure in most situations. This mode is recommended for snapshots and other situations in which you want to leave the camera in charge of shutter speed and aperture. To take photographs in programmed auto:

1 Rotate the mode dial to P.

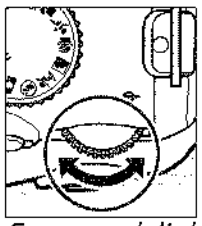
Mode dial



2 Frame a photograph, focus, and shoot.

Flexible Program

In mode P, different combinations of shutter speed and aperture can be selected by rotating the command dial ("flexible program"). Rotate the dial to the right for large apertures (low f-numbers) that blur background details or fast shutter speeds that "freeze" motion. Rotate the dial to the left for small apertures (high f-numbers) that increase depth of field or slow shutter speeds that blur motion. All combinations produce the same exposure. While flexible program is in effect, a P (P) indicator appears in the viewfinder and information display. To restore default shutter speed and aperture settings, rotate the command dial until the indicator is no longer displayed, choose another mode, or turn the camera off.



Command dial

The Exposure Program

See page 178 for information on the built-in exposure program.

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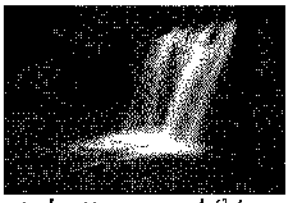
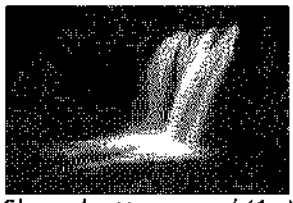
Mode S (Shutter-Priority Auto)

In shutter-priority auto, you choose the shutter speed while the camera automatically selects the aperture that will produce the optimal exposure. Use slow shutter speeds to suggest motion by blurring moving subjects, fast shutter speeds to "freeze" motion.



Fast shutter speed (1/1,600 s)

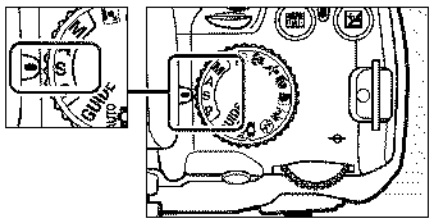


Slow shutter speed (1 s)

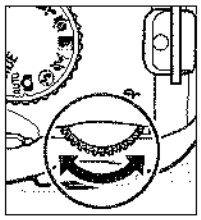
To take photographs in shutter-priority auto:

1 **Rotate the mode dial to S.**

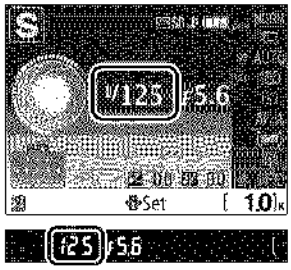
Mode dial



2 **Choose a shutter speed.**
Shutter speed is shown in the viewfinder and information display. Rotate the command dial to choose the desired shutter speed from values between 30 s and 1/4,000 s.



Command dial



3 **Frame a photograph, focus, and shoot.**

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Mode A (Aperture-Priority Auto)

In aperture-priority auto, you choose the aperture while the camera automatically selects the shutter speed that will produce the optimal exposure. Large apertures (low f-numbers) reduce depth of field, blurring objects behind and in front of the main subject. Small apertures (high f-numbers) increase depth of field, bringing out details in the background and foreground. Short field depths are generally used in portraits to blur background details, long field depths in landscape photographs to bring the foreground and background into focus.

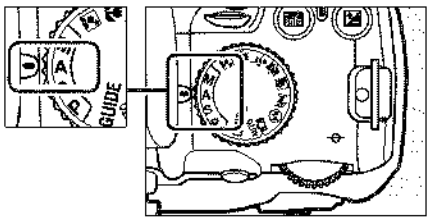
Small aperture (f/22)

Large aperture (f/5.6)

To take photographs in aperture-priority auto:

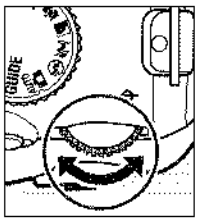
1 **Rotate the mode dial to A.**

Mode dial

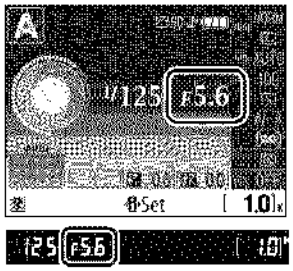


2 **Choose an aperture.**

Aperture is shown in the viewfinder and information display. Rotate the command dial to choose the desired aperture from values between the minimum and maximum for the lens.



Command dial



3 **Frame a photograph, focus, and shoot.**

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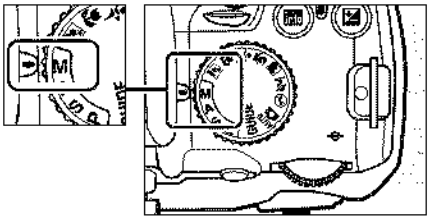
Mode M (Manual)

In manual exposure mode, you control both shutter speed and aperture. To take photographs in manual exposure mode:

1 Rotate the mode dial to M.

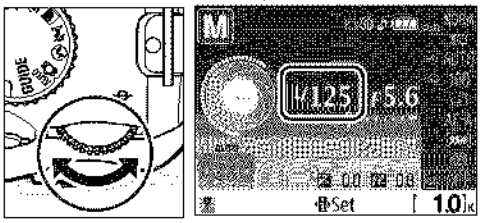
Mode dial



2 Choose aperture and shutter speed.

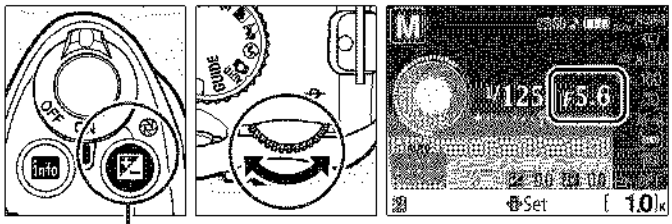
Checking the exposure indicator (see below), adjust shutter speed and aperture. Shutter speed is selected by rotating the command dial: choose from values between 30 s and $^{1}/_{4,000}$ s or select "bulb" to hold the shutter open indefinitely for a long time-exposure (📖 72). Aperture is selected by pressing the ⊛ (🖼) button and rotating the command dial: choose from values between the minimum and maximum for the lens. Shutter speed and aperture are shown in the viewfinder and information display.

Shutter speed



Command dial

Aperture



⊛(🖼) button *Command dial*

3 Frame a photograph, focus, and shoot.

The Exposure Indicator

If a CPU lens is attached and a shutter speed other than "bulb" or "time" is selected, the exposure indicator in the viewfinder and information display shows whether the photograph would be under- or over-exposed at current settings. If the limits of the exposure metering system are exceeded, the indicator will flash.

Optimal exposure	Underexposed by $^{1}/_{3}$ EV	Overexposed by over 2 EV
+. . 0 . .−	+. . 0 . .−	+. . 0 . .−

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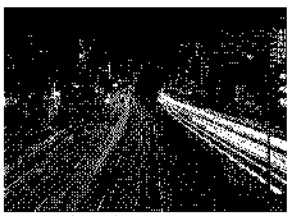
■■ *Long Time-Exposures (M Mode Only)*

Shutter speeds of "bulb" and "time" can be used for long time-exposure photographs of moving lights, the stars, night scenery, or fireworks. To prevent blurring caused by camera shake, use a tripod and an optional remote control (📖 167).



Length of exposure: 35 s
Aperture: f/25

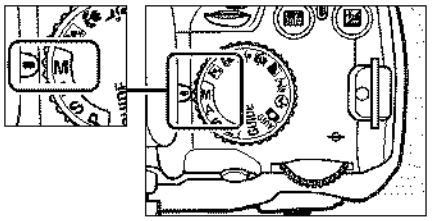
Shutter speed	Description
Bulb	Shutter remains open while shutter-release button is held down. Tripod is recommended to prevent blur.
Time	Optional ML-L3 wireless remote control required (📖 167). Shutter opens when shutter-release button on remote control is pressed and remains open for about thirty minutes or until shutter-release button is pressed a second time.

1 Ready the camera.

Mount the camera on a tripod or place it on a stable, level surface. To prevent loss of power before the exposure is complete, use a fully charged EN-EL9a battery or an optional EH-5a AC adapter and EP-5 power connector. Note that noise may be present in long exposures; before shooting, choose **On** for the **Noise reduction** option in the shooting menu (📖 122).

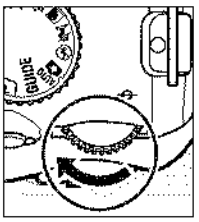
2 Rotate the mode dial to M.

Mode dial

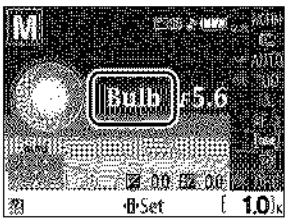


3 Choose a shutter speed.

Rotate the command dial until "Bulb" (bulb) appears in the viewfinder or information display. For a shutter speed of "Time" (- -), select delayed remote or quick-response remote mode after choosing the shutter speed (📖 53).



Command dial



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4 Open the shutter.

Bulb: After focusing, press the shutter-release button all the way down. Keep the shutter-release button pressed until the exposure is complete.

Time: Press the shutter-release button on the remote control all the way down. The shutter will open immediately (quick-response remote) or two seconds after the shutter-release button is pressed (delayed remote) and remain open until the button is pressed a second time.

5 Close the shutter.

Bulb: Take your finger off the shutter-release button.

Time: Press the shutter-release button on the remote control all the way down. Shooting ends automatically after about 30 minutes.

Self-timer Mode

In self-timer mode, a shutter speed of "Bulb" is equivalent to approximately $^1/_{10}$ s.

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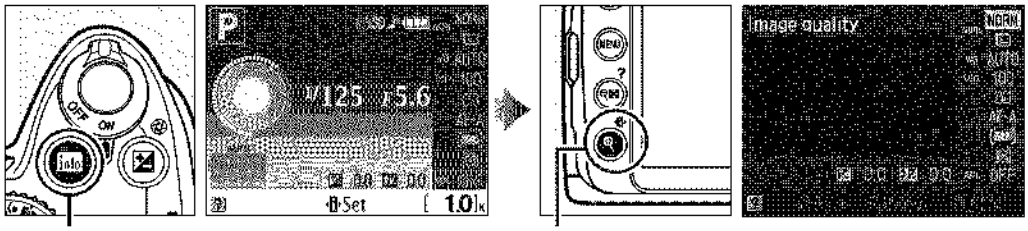
Metering

Choose how the camera sets exposure in **P**, **S**, **A**, and **M** modes (in other modes, the camera selects the metering method automatically).

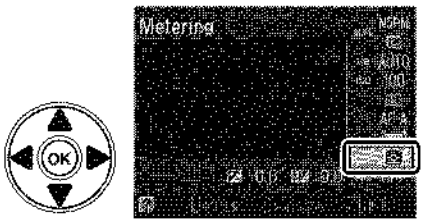
1 Place the cursor in the information display.

If shooting information is not displayed in the monitor, press the **INFO** button. Press the ◀▶ button to place the cursor in the information display.



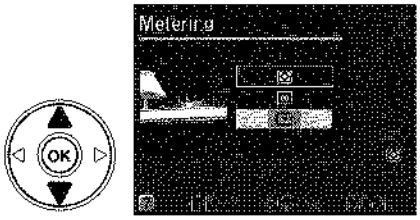
2 Display metering options.

Highlight the current metering method in the information display and press OK.



3 Choose a metering method.

Highlight one of the following options and press OK.



Method	Description
Matrix	Produces natural results in most situations. Camera uses 420-pixel RGB sensor to meter a wide area of the frame and set exposure according to tone distribution, color, composition, and, with type G or D lenses (📖 158), range information (3D color matrix metering II; with other CPU lenses, camera uses color matrix metering II, which does not include 3D range information).
Center-weighted	Camera meters entire frame but assigns greatest weight to center area. Classic meter for portraits; recommended when using filters with an exposure factor (filter factor) over 1×.
Spot	Camera meters current focus point; use to meter off-center subjects (if **[▬] Auto-area** is selected for AF-area mode as described on page 44, camera will meter center focus point). Ensures that subject will be correctly exposed, even when background is much brighter or darker.

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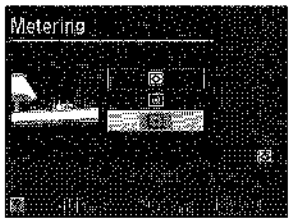
Autoexposure Lock

Use autoexposure lock to recompose photographs after metering exposure:

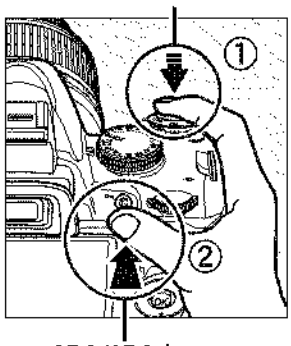
1 Select ▣ Center-weighted or ⊡ Spot metering (📖 74).

▣ **Matrix** metering will not produce the desired results.



2 Lock exposure.

Position the subject in the selected focus point and press the shutter-release button halfway. With the shutter-release button pressed halfway and the subject positioned in the focus point, press the **AE-L/AF-L** button to lock focus and exposure.



While exposure lock is in effect, an **AE-L** indicator will appear in the viewfinder.

3 Recompose the photograph.

Keeping the **AE-L/AF-L** button pressed, recompose the photograph and shoot.

The Shooting Menu

Metering can also be adjusted using the **Metering** option in the shooting menu (📖 119).

Adjusting Shutter Speed and Aperture

While exposure lock is in effect, the following settings can be adjusted without altering the metered value for exposure:

Mode	Setting
Programmed auto	Shutter speed and aperture (flexible program; 📖 68)
Shutter-priority auto	Shutter speed
Aperture-priority auto	Aperture

The metering method itself can not be changed while exposure lock is in effect.

See Also

If **On** is selected for **Buttons** > **AE lock** in the setup menu (📖 135), exposure will lock when the shutter-release button is pressed halfway. For information on changing the role of the **AE-L/AF-L** button, see **Buttons** > **AE-L/AF-L**.

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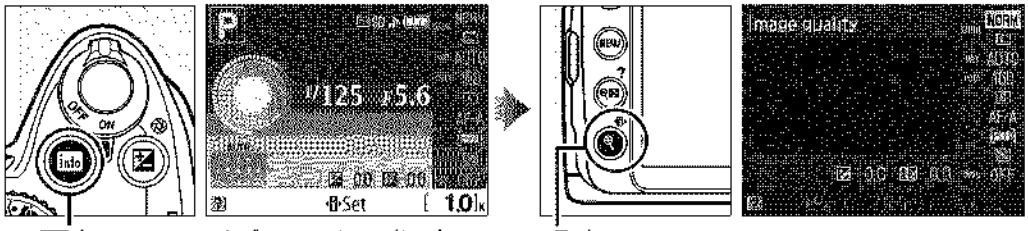
Exposure Compensation

Exposure compensation is used to alter exposure from the value suggested by the camera, making pictures brighter or darker. It is most effective when used with center-weighted or spot metering (📖 74).

1 Place the cursor in the information display.

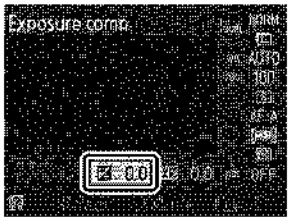
If shooting information is not displayed in the monitor, press the **info** button. Press the ◀ button to place the cursor in the information display.



info *button* *Information display* ◀ *button*

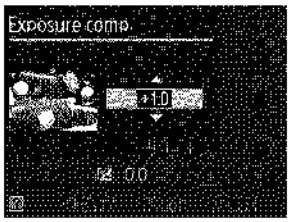
2 Display exposure compensation options.

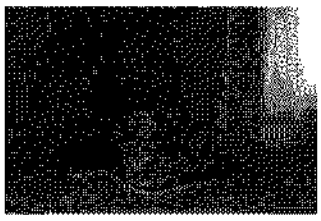
Highlight exposure compensation in the information display and press OK.



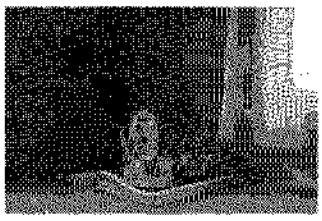
3 Choose a value.

Highlight a value and press OK. Exposure compensation can be set to values between −5 EV (underexposure) and +5 EV (overexposure) in increments of 1/3 EV. In general, choose positive values to make the subject brighter, negative values to make it darker.

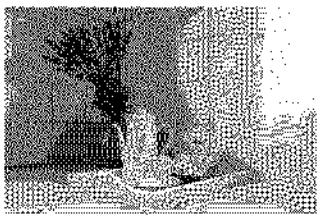




−1 EV



No exposure compensation



+1 EV

Normal exposure can be restored by setting exposure compensation to ±0. Exposure compensation is not reset when the camera is turned off.

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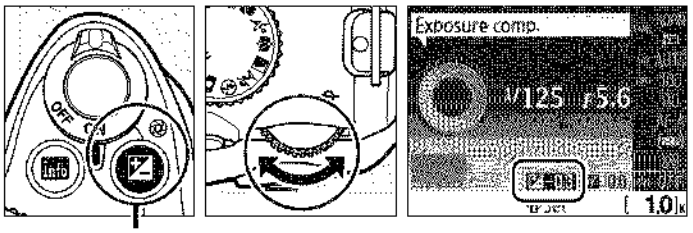
The ± Button

Exposure compensation can also be set by pressing the ± button and rotating the command dial. The selected value is shown in the viewfinder and information display.



± button Command dial

−0.3 EV +2 EV

Mode M

In mode **M**, exposure compensation affects only the exposure indicator; shutter speed and aperture do not change.

Using a Flash

When a flash is used, exposure compensation affects both background exposure and flash level.

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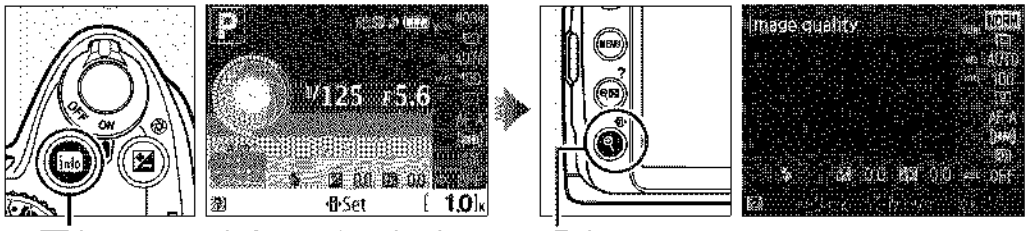
Flash Compensation

Flash compensation is used to alter flash output from the level suggested by the camera, changing the brightness of the main subject relative to the background. Flash output can be increased to make the main subject appear brighter, or reduced to prevent unwanted highlights or reflections.

1 Place the cursor in the information display.

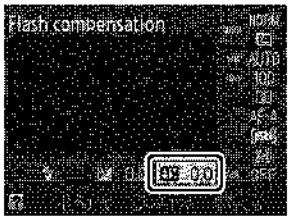
If shooting information is not displayed in the monitor, press the Info button. Press the ◀▶ button to place the cursor in the information display.



Info button *Information display* ◀▶ button

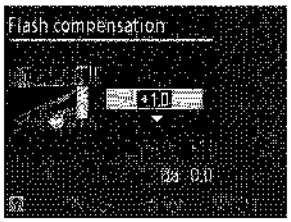
2 Display flash compensation options.

Highlight flash compensation in the information display and press OK.



3 Choose a value.

Highlight a value and press OK. Flash compensation can be set to values between −3 EV (darker) and +1 EV (brighter) in increments of 1/3 EV. In general, choose positive values to make the subject brighter, negative values to make it darker.



Normal flash output can be restored by setting flash compensation to ±0. Flash compensation is not reset when the camera is turned off.

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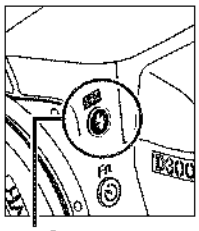
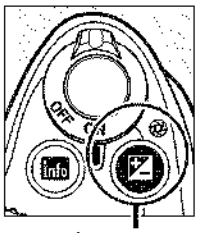
The ⚡ (ϟ) and ± Buttons

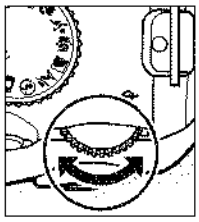
Flash compensation can also be set by rotating the command dial while pressing the ⚡ (ϟ) and ± buttons. The selected value is shown in the viewfinder and information display.



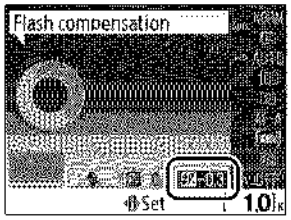
⚡ (ϟ) *button*



± *button*



Command dial



−0.3 EV

+1 EV

Optional Flash Units

Flash compensation is also available with optional SB-900, SB-800, SB-600, SB-400, or SB-R200 flash units. The SB-900, SB-800, and SB-600 also allow flash compensation to be set using the controls on the flash unit.

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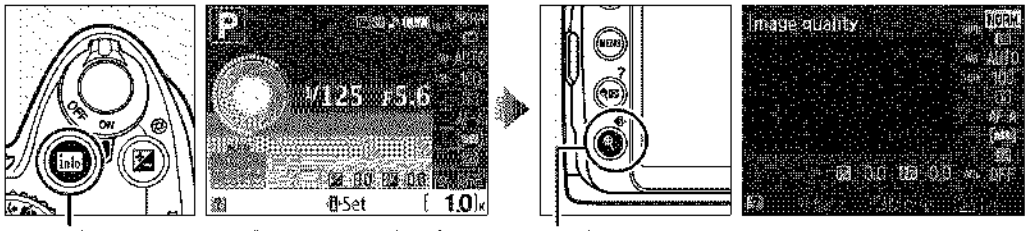
White Balance

White balance ensures that colors are unaffected by the color of the light source. Auto white balance is recommended for most light sources; in **P**, **S**, **A**, and **M** modes, other values can be selected if necessary according to the type of source:

1 Place the cursor in the information display.

If shooting information is not displayed in the monitor, press the **info** button. Press the ◀▶ button to place the cursor in the information display.



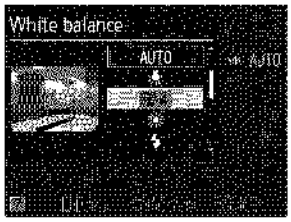
info *button* *Information display* ◀▶ *button*

2 Display white balance options.

Highlight the current white balance setting in the information display and press ⓞ.

3 Choose a white balance option.

Highlight one of the following options and press ⓞ.



AUTO **Auto**	☀ **Direct sunlight**	**Shade**
Incandescent	**Flash**	PRE **Preset manual** (📖 83)
Fluorescent (📖 81)	**Cloudy**	

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The Shooting Menu

White balance can be selected using the **White balance** option in the shooting menu (🕮 119), which also can be used to fine-tune white balance (🕮 82) or measure a value for preset white balance (🕮 83).

The **Fluorescent** option in the **White balance** menu can be used to select the light source from the bulb types shown at right.

Color Temperature

The perceived color of a light source varies with the viewer and other conditions. Color temperature is an objective measure of the color of a light source, defined with reference to the temperature to which an object would have to be heated to radiate light in the same wavelengths. While light sources with a color temperature in the neighborhood of 5,000–5,500 K appear white, light sources with a lower color temperature, such as incandescent light bulbs, appear slightly yellow or red. Light sources with a higher color temperature appear tinged with blue. The camera white balance options are adapted to the following color temperatures:

- (sodium-vapor lamps): **2,700 K**
- (incandescent)/ (warm-white fl.): **3,000 K**
- (white fluorescent): **3,700 K**
- (cool-white fl.): **4,200 K**
- (day white fluorescent): **5,000 K**
- (direct sunlight): **5,200 K**
- (flash): **5,400 K**
- (cloudy): **6,000 K**
- (daylight fluorescent): **6,500 K**
- (mercury-vapor lamps): **7,200 K**
- (shade): **8,000 K**

The Fn Button

For information on using the **Fn** (⏲) button and the command dial for white balance, see page 134.

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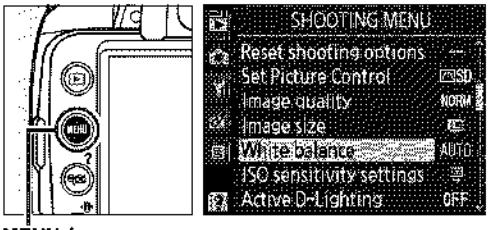
Fine-Tuning White Balance

White balance can be "fine tuned" to compensate for variations in the color of the light source or to introduce a deliberate color cast into an image. White balance is fine tuned using the **White balance** option in the shooting menu.

1 Display white balance options.

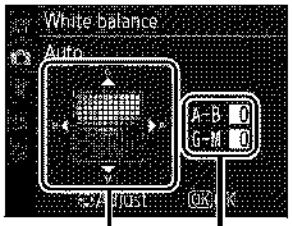
To display the menus, press the **MENU** button. Highlight **White balance** in the shooting menu and press ▶ to display white balance options.



MENU *button*

2 Select a white balance option.

Highlight an option other than **Preset manual** and press ▶ (if **Fluorescent** is selected, highlight a lighting type and press ▶). The fine-tuning options shown at right will be displayed. Fine-tuning is not available with **Preset manual** white balance.

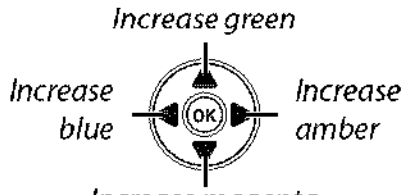


Coordinates

Adjustment

3 Fine tune white balance.

Use the multi selector to fine-tune white balance.



White Balance Fine Tuning

The colors on the fine-tuning axes are relative, not absolute. For example, moving the cursor to **B** (blue) when a "warm" setting such as ☀ (incandescent) is selected will make photographs slightly "colder" but will not actually make them blue.

4 Press OK.

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Preset Manual

Preset manual is used to record and recall custom white balance settings for shooting under mixed lighting or to compensate for light sources with a strong color cast. Two methods are available for setting preset white balance:

Method	Description
Measure	Neutral gray or white object is placed under lighting that will be used in final photo and white balance measured by camera (see below).
Use photo	White balance is copied from photo on memory card (📖 86).

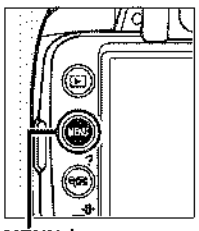
■■ *Measuring a Value for Preset White Balance*

1 Light a reference object.

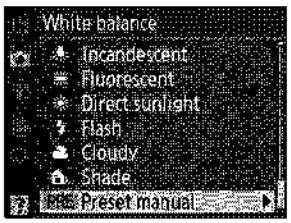
Place a neutral gray or white object under the lighting that will be used in the final photograph.

2 Display white balance options.

To display the menus, press the **MENU** button. Highlight **White balance** in the shooting menu and press ▶ to display white balance options.

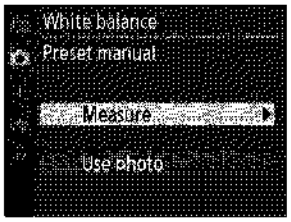


MENU *button*



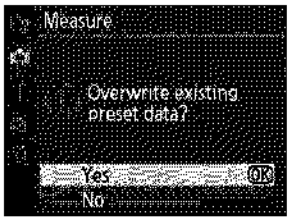
3 Select **Preset manual.**

Highlight **Preset manual** and press ▶.

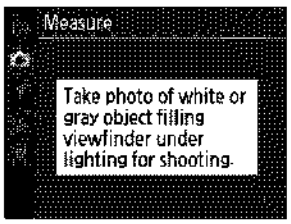


4 Select **Measure.**

Highlight **Measure** and press ▶. The menu shown at right will be displayed; highlight **Yes** and press ⓞⓚ.



The message shown at right will be displayed before the camera enters preset measurement mode.



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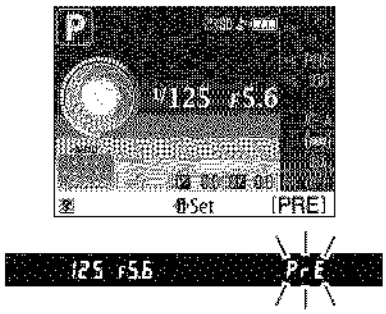
When the camera is ready to measure white balance, a flashing PrE (**PRE**) will appear in the viewfinder and information display.

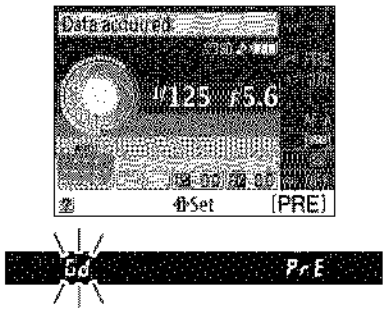


5 Measure white balance.

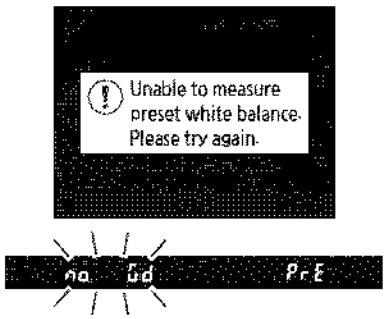
Before the indicators stop flashing, frame the reference object so that it fills the viewfinder and press the shutter-release button all the way down. No photograph will be recorded; white balance can be measured accurately even when the camera is not in focus.

6 Check the results.

If the camera was able to measure a value for white balance, the message shown at right will be displayed and Gd will flash in the viewfinder for about eight seconds before the camera returns to shooting mode. To return to shooting mode immediately, press the shutter-release button halfway.



If lighting is too dark or too bright, the camera may be unable to measure white balance. A message will appear in the information display and a flashing no Gd will appear in the viewfinder for about eight seconds. Return to Step 4 and measure white balance again.



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Measuring Preset White Balance

If no operations are performed while the displays are flashing, direct measurement mode will end when the exposure meters turn off. The auto meter-off delay can be changed using the **Auto off timers** option in the setup menu (📖 130). The default setting is eight seconds.

Preset White Balance

The camera can store only one value for preset white balance at a time; the existing value will be replaced when a new value is measured. Note that exposure is automatically increased by 1 EV when measuring white balance; when shooting in mode **M**, adjust exposure so that the exposure indicator shows ±0 (📖 71).

Other Methods for Measuring Preset White Balance

To enter preset measurement mode (see above) after selecting preset white balance in the information display (📖 80), press OK for a few seconds. If white balance has been assigned to the **Fn** (⏲) button (📖 134) and preset white balance selected by pressing the **Fn** (⏲) button and rotating the command dial, the camera will also enter preset measurement mode if the **Fn** (⏲) button is pressed for a few seconds.

Studio Settings

In studio settings, a standard gray panel can be used as a reference object when measuring preset white balance.

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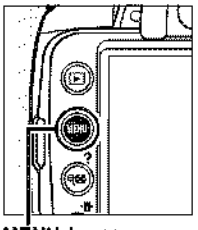
■■ *Copying White Balance from a Photograph*

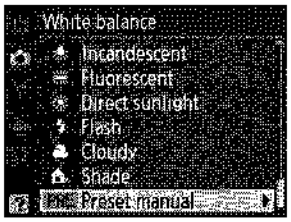
Follow the steps below to copy a value for white balance from a photograph on the memory card.

1 Select **Preset manual.**

To display the menus, press the **MENU** button. Highlight **White balance** in the shooting menu and press ▶ to display white balance options. Highlight **Preset manual** and press ▶.

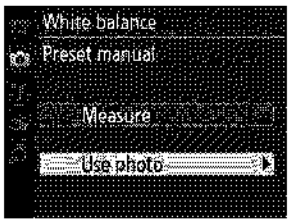


MENU *button*



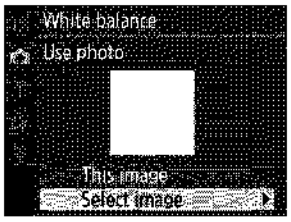
2 Select **Use photo.**

Highlight **Use photo** and press ▶.



3 Choose **Select image.**

Highlight **Select image** and press ▶ (to skip the remaining steps and use the image last selected for preset white balance, select **This image**).

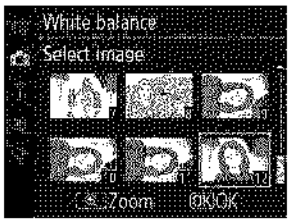


4 Choose a folder.

Highlight the folder containing the source image and press ▶.

5 Highlight the source image.

To view the highlighted image full frame, press and hold the 🔍 button.



6 Copy white balance.

Press Ⓚ to set preset white balance to the white balance value for the highlighted photograph.

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