PRETIUM CONCEPT

Digital Photography

Introduction to digital cameras

Since the 1990s, digital cameras have become more and more common— and also more affordable. Because of this, it's now easier than ever to get started with photography. Luckily, you don't need to buy a professional-level camera to get good results. The most important factor is the **skill of the photographer**. In this tutorial, we'll show you how to use **lighting**, **composition**, and your camera's **settings** to take better digital photos—no matter what kind of camera you have.

What can you do with a digital camera?

There are manythings you can do with a digital camera. Here are just a few examples:

- **Capture memories:** You can take snapshots of your friends or document your family's trip to the beach. If you want, you can print them on photo paper, or you can just view them on a computer, TV, or digital photo frame.

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Share your photos online: You can post your photos on Facebook, Flickr, Picasa, or another site. This is even easier if you have a smartphone, since you can take a photo and upload it immediately.

- **Use it as a scanner:** If you don't have a scanner, you can simply take a photograph of a document. For example, you could take a picture of your tax forms to keep a record of them.
- **Capture data:** You can use a camera to help you remember things. For example, when you park your car at the mall or airport you can take a photo of the parking lot section number so you can find your car later on. You could also take pictures of things like store hours, phone numbers, and more. A camera phone is ideal for this, since you'll always have it with you.
- **Start taking photos as a hobby:** You can hone your photography skills, get creative, and even use image-editing software to experiment with your photos. At this point, you may want to invest in a higher-quality camera to improve your photos.

  For more ideas of things you can do with a digital camera, read our article on **10 Everyday Uses for Your Phone's Camera**.

Choosing a digital camera

If you're shopping for a digital camera, the number of choices can be overwhelming. However, if you can narrow your search to a specific **price range** or **type of camera**, then it may make your choice much easier. In addition, many cameras have special features such as **red-eye correction** and **anti-blink**, so you may want to think about which features are important to you.

Types of digital cameras

Most cameras can be grouped into four main types: **digital SLR (or DSLR)**, **point-and-shoot**, **bridge cameras**, and **camera phones**. Each type has advantages and disadvantages, and some types are more expensive than others. To narrow down your search, try to determine which of these types will best fit your needs.

Compact Cameras

Compact cameras are designed to be affordable, convenient, and easy to use. They don’t feature a viewfinder, utilizing instead a screen that shows the frame or image.

DSLR Cameras

Short for "digital single-lens reflex," DSLR Cameras are large cameras with interchangeable lenses that can take very high-quality photos.

Mirrorless Cameras

Mirrorless Cameras are pocket-sized alternatives to DSLRs that feature interchangeable lenses.

TYPES OF DIGITAL CAMERAS

There are many different digital cameras that you can choose from, but most of them will fall into one of the categories below. Read about each type to decide which ones best fits your needs and budget.

Camera phone (Free – $500)

You may already have one! Many camera phones take very good photos, and the convenience can't be beat.

Pros:	Cons:
Very portable	May not have as many features or options as higher-end cameras
You'll always have it with you, so you can capture unexpected photo moments	With some phones, quality maybe fairly
It's easy to share photos right after taking them	Doesn't work as well in low light

Point-and-shoot ($60 – $400)

This is a compact camera designed to be affordable, convenient, and easy to use.

Pros:	Cons:
Less expensive than DSLRs	a a DSLR, and may not be any better than
Small enough to fit in your pocket	A bit less portable than a camera phone

Small enough to fit in your pocket	A bit less portable than a camera phone
Usually includes special features like smile detection	Generally does not have interchangeable lenses

Bridge camera ($150 – $800)

This camera bridges the gap between point-and-shoot cameras and DSLRs. It's sometimes called a "superzoom."

Pros:	Cons:
Higher quality than most point-and-shoot cameras	Much bulkier than a point-and-shoot
Includes many of the same controls as DSLRs	Usually has a smaller sensor than a DSLR, so quality is not quite as good
Often has a very powerful zoom lens (for example, 35x)	Generally does not have interchangeable lenses

Mirrorless interchangeable-lens camera ($400 – $1,400+)

This is a pocket-sized alternative to DSLRs, with interchangeable lenses.

Pros:	Cons:
Very good image quality, often comparable to DSLRs	More expensive than point-and-shoot cameras
Lighter and more portable than	Included lens generally has much less zoom range than bridge
Ability to switch lenses and change settings gives you more creative control than point-and-shoots	Additional lenses cost extra money and make the camera less portable

Some have large sensors, with good low-light capabilities

DSLR ($400 – $3,000+)

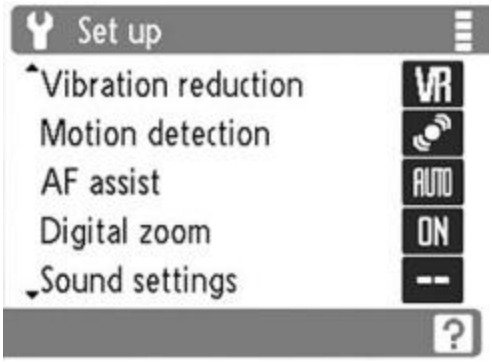
Short for "digital single-lens reflex," this is a large camera with interchangeable lenses that can take very high-quality photos.

Pros:	Cons:
Excellent image quality	Generally more expensive than other types
Ability to switch lenses and change settings gives you more creative control	To get the most out of it, you'll need to buy additional lenses
Large sensor allows for good photos in low-light situations	Heavier and less portable than other types
	Not geared toward beginners, so maybe more difficult to learn how to use

Special features

Digital cameras often have special features designed to help you take better photos. Depending on what types of photos you want to take, some of these features can be quite useful. Below are some things you may want to look for:

- **Red-eye correction:** This automatically removes red-eye, which is useful if you're taking photos with the flash on. If your camera doesn't have this feature, you can use image-editing software to remove red eye.



- **Sports/active child mode:** This allows the camera to focus more quickly to capture action shots. Some cameras also use motion detection to "freeze" a fast-moving subject, making your photos even sharper.
- **Anti-blink:** This feature automatically detects whether someone has blinked and displays a warning after the photo is taken so you know to retake it.
- **Smile detection:** This uses face-recognition technology to take the photo right when your subject smiles.
- **Blemish reduction:** This automatically retouches your photos to reduce blemishes and wrinkles.
- **Artistic effects:** This allows you to add brush stroke effects, lens distortion, or other effects to give your photos a unique look.

Keep in mind that higher-end cameras (such as DSLRs) are less likely to have some of these features. For those cameras, you'll have to rely more on your **own skill**, as well as **post-processing with Photoshop** or a similar program. For everyday snapshots, the convenience of point-and-shoot cameras often makes them a better choice.

Memory cards

Most digital cameras store photos on a separate memory card, such as a **Secure Digital**, **SDHC**, **microSD**, or **CompactFlash** card. These cards usually have several gigabytes of storage space, and the exact number of photos they can hold will vary depending on the resolution and file format of the photos. You may need to purchase a memory card separately, and it's important to choose a card that is **compatible with your camera**. You can find this information in your camera's **manual**, on the **outside of the box**, or **online**.

Generally, you'll want to use the memory card as **temporary storage** until you transfer your photos to your computer. You can then **delete the photos from the memory card** so you'll have plenty of space for your next photo shoot.

Batteries

Generally, cameras use rechargeable **lithium-ion battery packs**, although some can use **AA batteries**. The battery pack is usually included with your camera, but you may want to buy an extra one in case the battery runs out while you're shooting. Make sure to buy a battery pack that is designed to work with your camera.

Your camera will also come with a **charger** you can use with your battery. It's a good idea to recharge the battery overnight so you'll be ready to take photos the next day.

Lesson 2: Getting to Know Your Camera

Getting to know your camera

In order to take a photo, there are many different things your camera needs to take into account, such as **focus** and **exposure**. Most of the time, these things will be set automatically by your camera. However, you'll sometimes need to make manual changes to the settings to get the best possible photo.

The parts of a digital camera

Cameras come in many different shapes and sizes, so the exact buttons and features will vary. However, there are a few basic parts that almost all cameras have.

Click the buttons in the interactive below to learn about the basics parts of this compact camera:

In the images below, you can see that the camera on the left has some additional buttons. Your camera may have a different layout, so you should consult your manual to learn about which buttons your camera has.

Getting the right exposure

Every digital camera has a **sensor** located behind the lens. The sensor is the part that actually captures the photo, much like the **roll of film** in a film camera (except you'll never take the sensor out of the camera).

When you take a photo, the sensor is exposed to light for a fraction of a second, or sometimes longer. The total amount of light that is captured is called the **exposure**.

If the exposure isn't just right, your photo can come out **too dark** or **too bright**.

Normally, your camera will handle the exposure automatically, although sometimes you will have to manually adjust the settings to get the desired result.

Focusing

Whenever you take a photo, you'll want your subject to be **in focus**. This means your subject is sharp and not blurry.

If the focus is being handled automatically, your camera may try to focus on another object, which can cause your subject to be **out of focus**.

Your camera's LCD screen has a **focus indicator**, which is a box that shows what your camera is focusing on. To prevent focusing problems, you'll need to keep an eye on the focusing indicator whenever you take a photo.

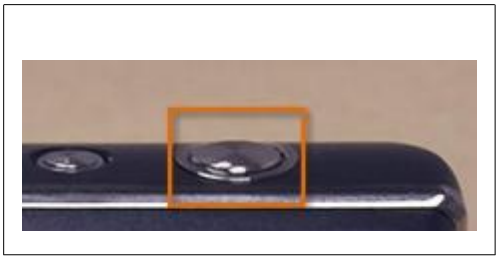
DSLR cameras show the auto-focus information in the **viewfinder** (the window above the LCD screen). They also give you the option of focusing

manually, if you prefer.

Focal Length

The **focal length** is the distance between your camera's sensor and the optical center of the camera lens. If you have a longer focal length, the overall perspective will be reduced, the subject will be closer, and areas won't be as clear. The opposite is true for a shorter focal length. It will give a wider perspective and overall be more focused.

The shutter button



Most digital cameras have a **two-stage shutter button**, which means it can either be pressed **halfway down** or **all the way down**. When you press it halfway down, your camera will **lock in the focus and exposure settings**. After a second or so, the camera will beep to indicate that it is ready, and you can then press the shutter button the rest of the way down to take the photo.

If you simply press the shutter button down all at once, your camera **won't have time to make adjustments**, and your photo may come out blurry, too dark, or too light. Therefore, you should get in the habit of pressing it halfway down for every photo.

Many **camera phones** do not have a two-stage shutter button, so you may not have this option.

Common settings

Although your camera is designed to work automatically, there are a few settings you may want to change depending on the situation. There will usually be an icon next to each button, and these icons are the same no matter what brand of camera you have.

- **Flash:** Most cameras have a built-in flash to help you take photos in low-light situations. If the flash is set to Auto, then your camera will only use it when it needs to.
- **Timer:** If you're taking a group photo, you may not always have an extra person to take the photo. By setting the timer and placing the camera on a table or tripod, you'll have time to join your friends in the photo.
- **Macro Mode:** This is a setting you can use to take closeup shots. It allows the camera to focus on objects that are only a few inches away.
- **Exposure Compensation:** If your photos are coming out too dark or too light, you can use this setting to adjust the exposure.
- **Zoom:** If your camera has a zoom lens, then you can control the optical zoom using buttons or a dial (depending on the camera). On many cameras, you can zoom in even further by using the digital zoom. However, the digital zoom will lower the quality of your photos, so it's best to avoid it.

Shutter speed, aperture, and ISO

Earlier, we talked about the importance of getting the right exposure. The exposure is actually controlled by three settings: **shutter speed**, **aperture**, and **ISO**. These settings **work together** to allow you to take photos in many different lighting situations, from bright sunlight to a dimly lit room.

Generally, your camera will **set these automatically** whenever you take a photo. However, as you'll see later on you can actually control these settings by adjusting the light or selecting a specific mode on your camera.

> DSLR cameras give you much more manual control over the exposure, which is one reason they are commonly used by professionals.

Shutter speed

The shutter speed is the **amount of time** the shutter stays open. A slower shutter speed (such as 1/4 second) allows the camera to gather more light, while a faster shutter speed (such as 1/2000 second) allows you to freeze the action and avoid blurry photos. If you are using a **tripod**, you can use much slower shutter speeds and still take sharp photos as long as your subject isn't moving.

In the images below, the left image was taken with a slow shutter speed, and the right image was taken with a fast shutter speed.

Aperture

Camera lenses have a circular "window" that controls the amount of light that can reach the sensor (much like your eye's pupil). The size of this window is called the **aperture**, **f-number**, or **f-stop**. The aperture and shutter speed work together to control how much light gets to the sensor. For example, with a wide aperture (such as f/1.4), your camera will use a faster shutter speed, while with a narrow aperture (such as f/16) your camera will use a slower shutter speed.

The aperture also has an interesting effect on how the light is focused. With a larger aperture, the background will blur, while the subject stays in focus. This is known as **shallow depth of field**. We'll talk more about depth of field on the next page.

In the images below, the left image was taken with a wide aperture, which causes the background to blur (shallow depth of field). The right image was taken with a narrow aperture, so the background stays in focus (deep depth of field).

ISO

Digital cameras can adjust the sensitivity of the sensor, and this is known as the **ISO number**. For example, ISO 100 is a lower sensitivity, so it requires more light to create a good exposure. This generally means your camera will use a **slower shutter speed** and/or a **wider aperture** to gather more light. ISO 3200 is a higher sensitivity, so it can create a good exposure with less light. However, higher ISO numbers also add more **image noise**, which may make your photo too grainy.

In the images below, the left image was taken with a low ISO number, and the right image was taken with a high ISO number. The image on the right has **lower quality** and **more image noise** due to the high ISO number.

If you want to see how different shutter speeds, apertures, and ISO numbers affect your photos, you can try the **SLR Camera Simulator**.

Depth of field

In any photo you take, you'll want your subject to be in focus. However, sometimes you may want the **background to be out of focus** to give a soft, artistic appearance to the photo. This is known as **shallow depth of field**. With a shallow depth of field, you can still focus on your subject, but objects that are closer or farther away will be out of focus. If you are using a **DSLR** or **bridge camera**, you can get this effect by choosing a wide aperture (such as f/1.4).

In the photo below, the depth of field is shallow, completely blurring the background.

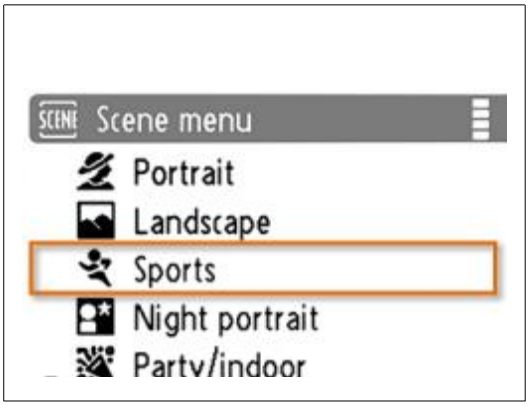
Smaller apertures (such as f/16) will give a **deeper depth of field**, which means more of the photo will be in focus. For example, if you're taking a landscape photo you'll usually want a deeper depth of field so distant objects and foreground objects will all be in focus.

In the photo below, the depth of field is very deep, allowing the flowers and the mountains to be in focus (as well as everything in between).

With a point-and-shoot camera, you won't have as much control over the aperture, so it may be difficult to get a shallow depth of field. If you want to get a shallower depth of field, you can **zoom in** or **move closer to your subject**. However, if you really want to experiment with different depths of field and have more creative control over your photos, you will usually need to use a **DSLR** or **bridge camera**.

Using scene modes

Many cameras include presets called **scene modes**, which you can access from your camera's menus or from a dial at the top. Each scene mode is geared toward a specific situation (or scene). For example, the **Sports** scene mode will use a faster shutter speed, and it may also use motion detection to help reduce blur. On the other hand, the **Portrait** scene mode is designed to easily focus on your subject, and it also adjusts the color balance so skin tones look as natural as possible.



If you don't use a scene mode, your camera will still make automatic adjustments to try to make the photo look good. However, scene modes are a great way to take more successful photos, so it's a good idea to use them as much as possible.

Lesson 3: Lighting

Lighting

Earlier, we talked about how your camera uses shutter speed and aperture to control how much light reaches the sensor. However, these settings are only part of the equation; the other part is the actual lighting. Lighting can come from the **sun**, **your camera's flash**, a **lamp**, or **ceiling lights**. The direction, brightness, and color of the lighting can have a dramatic effect on the appearance of your photos.

Lighting basics

In any photo, the light will fall on the subject in a certain way, creating **highlights** (bright areas) and **shadows** (dark areas). The highlights and shadows create **contrast**, which can help to make the photo more interesting but can also create problems in some situations. For example, if you're taking a portrait you probably don't want your subject's face to be covered in shadow or overwhelmed by harsh light. You'll usually want a balance of **highlights and shadows** so your subject's features are clearly visible.

White Balance

Cameras capture colors according to the available light and they can be changed by adjusting the color temperature. **White Balance** allows you to adjust and balance RGB colors (red, green, and blue) with black and white.

In the photo below, the subject's face has highlights and shadows, but they look natural and not overpowering.

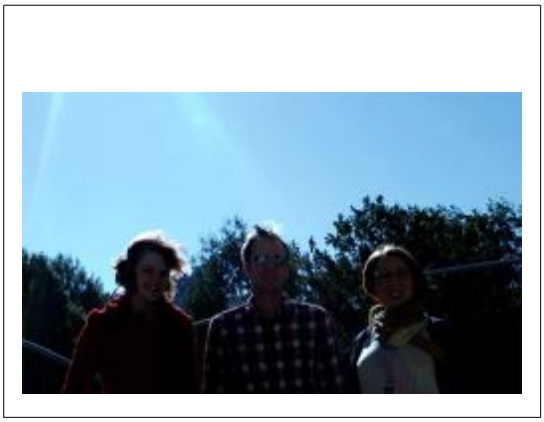
On the other hand, if you want a dramatic photo, you may want more contrast. In the photo below, the photographer has used dark shadows to add an artistic touch to the photo.

Outdoor photos

If you're taking photos outdoors during the daytime, your main source of light will usually be the sun. Depending on the time of day and the weather, the sun can give your photos a **variety of "looks."** Of course, good photo moments can happen at anytime of day, so you may not be able to wait for the perfect light. If you are aware of how the light can affect your photos, you'll be able to make adjustments to get the best results.

High-contrast situations

On bright, sunny days, having the sun behind your subject can cause the subject to look too dark. That's because the contrast is too high for your camera to capture accurately, so it adjusts the exposure to darken the entire photo. If this happens, try to find an angle where the background isn't as bright.

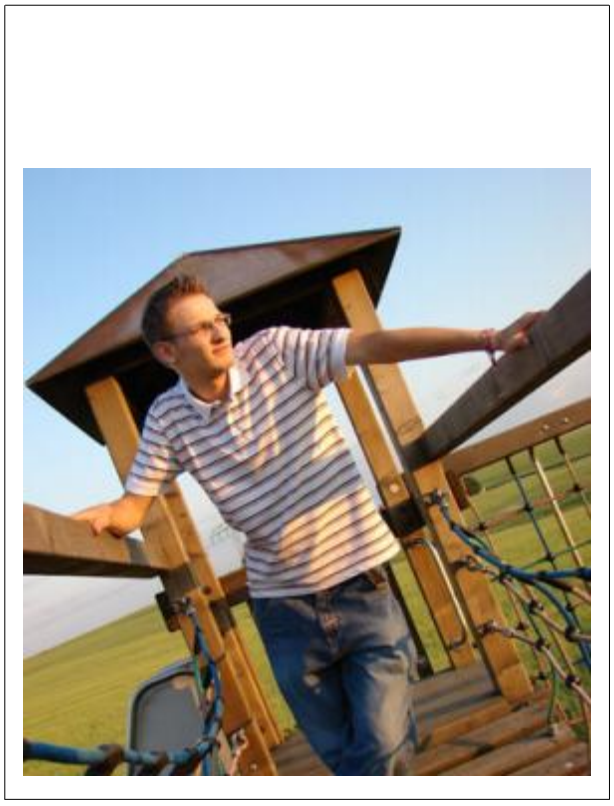


Many photographers actually use their flash on sunny days to reduce unwanted shadows. This is known as **fill flash** because it "fills in" the shadows with additional light. You should only use fill flash when you notice problematic shadows; in other situations, flash may make the photo look worse.

The golden hour

Many photographers find that their photos look best when taken just before the sun sets, or just after it rises. This is commonly known as the **"golden hour"**. Since the sun is lower in the sky, it creates **longer, softer shadows**. These shadows can add contrast to your photos while still giving them a soft, pleasant appearance. In addition, the sunlight has a more golden color, which adds warmth to your photos.

In the photo below, the subject's face has highlights and shadows, but they're not too harsh.



Midday

Around the middle of the day, the sun is higher in the sky, so it will shine down on your subject. This can create dark shadows and bright highlights, which can give your photos a **harsher appearance**. If you are taking photos of people, their eyes may be completely in shadow. Sometimes, you may be able to reduce these shadows by turning on your camera's flash, although this won't work if your subject is too far away. You can also ask your subject to face a different way to try to reduce the shadows.

In the photo below, you can see bright highlights on the subject's forehead, while her eyes and mouth are mostly shadowed.

Cloudy weather and twilight

The softest light occurs when the sun is covered by clouds, or when it's just below the horizon. Because the light is soft, your camera will be able to pick up details that may have otherwise been covered by shadows. This can also be a very goodtime to photograph flowers and other colorful objects.

In the photo below, the lighting on the subject's face is very even, with no harsh highlights or dark shadows.

Indoor photos

For indoor photography, your light sources can include **lamps**, **ceiling lights**, **sunlight through a window**, and **your camera's flash**. This gives you more flexibility, as you can move lights or turn them on or off to control the direction and brightness of the lighting.

Generally, the more light you have, the better your photos will turn out. However, you'll also need to think about the quality of the light, as some types of light are more flattering than others.

Your camera's flash

You may be tempted to use the flash for all of your indoor photography, but pictures taken with flash often have dark shadows and bright highlights that can be **harsh and unflattering**. You may want to try turning off the flash and working with the other lights you have. You can turn the flashback on if you find that your pictures aren't coming out.

In the photos below, the left photo was taken with the camera's flash, which causes harsh shadows to appear behind the subject. The right photo was taken without flash, which gives the photo a more natural look.

Indoor lighting tips

In professional studio photography, there will usually be a primary light (often called a **key light**), which is located off to the side but still in front of the subject. There can also be a second light called a **fill light**, which is located on the other side of the subject to help reduce shadows. Sometimes the photographer will use other lights as well. This type of lighting setup will usually cost hundreds or even thousands of dollars.

If you're not a professional photographer, you probably don't have these types of lights. However, if you have lamps or a sunny window you can still position your subject to make the most of the lights you have. Here are a few tips you can use to take better indoor photos:

- **Avoid having a sunny window behind your subject.** This can make the background too bright, which will make the subject look too dark. Try

moving the subject or the camera so the sunlight hits the subject from the side or at a 45-degree angle.

- **Try turning off the ceiling lights and using one or two lamps as the light source.** If you have two lamps, put one on each side of the subject to act as the key light and fill light. Remember, your camera can adjust the shutter speed and aperture to let in more light, so the picture won't necessarily be too dark.
- **Use a tripod.** If the lighting isn't ideal, a tripod will help prevent blurry photos.
- **Try using the Party/indoor scene mode.** This mode is designed for low-light situations.
- **If you must use the flash, move your subject away from the wall.** This will help to reduce dark shadows behind your subject.
- **Experiment.** The great thing about digital cameras is that you can view a photo right after you take it and then make adjustments. Try retaking the photo with different lighting, and see which version looks best.

Lesson 4: Composing Your Shot

Composing your shot

Let's imagine you're painting a picture. You can decide exactly what you want the painting to look like:

Which people or objects are in the painting, **where they are located on the canvas**, and what kind of **background** is in place.

In photography, you can do all of these things **simply by changing the position and angle of the camera**. The way everything is arranged in your photo is

called the **composition**. By paying attention to the composition of your photos, you can improve and enhance them.

Tips for composing your photos

Below are some tips for improving the composition in your photos. These are not rules you must follow all the time, but rather suggestions to help you take more successful photos. Remember, with digital cameras you can always delete photos you don't like, so don't be afraid to experiment.

- **Decide how much of the background you want.** Most of the time, you should avoid including too much unnecessary background, as it will cause your subject to look small and insignificant. If you zoom in or move closer to the subject, you can reduce the amount of background shown. On the other hand, if the background is interesting you can zoom out to show more of it.

- **Avoid mergers.** When a background object (such as a tree or streetlamp) is directly behind the subject, it may look like it is growing out of the subject's head. This is called a merger, and it can ruin an otherwise great photo. Try to find an angle in which the background is not distracting.

- **Be careful not to crop out body parts.** A common mistake is to crop out the tops of people's heads or their feet. To prevent this, include some extra space at the top and bottom of the photo. You can move farther away from the subject to give yourself more space to work with. Of course, if you're doing a closeup it's OK to have some cropping.

- **Try changing the distance from the subject.** Sometimes a closeup works best, but other times you may want a wider-angle shot. You can experiment by moving closer and farther away from your subject, or by using your camera's zoom.

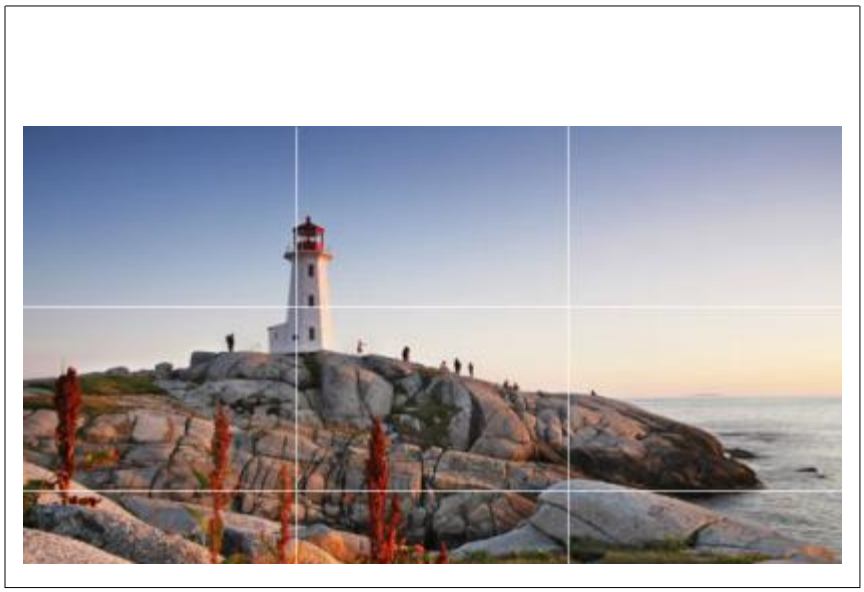
- **Try different angles.** You can try moving to the side or moving the camera higher or lower to get a different angle. This also lets you control which background objects are in the photo.

- **Experiment.** Professional photographers may take hundreds of photos just to get one great shot. Although that may not be practical in most situations, you may still want to take a variety of shots so you can pick the best one later.

The rule of thirds

When you're taking a photo, you don't have to place your subject exactly in the center. In fact, you can often make a photo look more natural by **placing your subject off center**. You can do this by using a technique photographers call the **rule of thirds**.

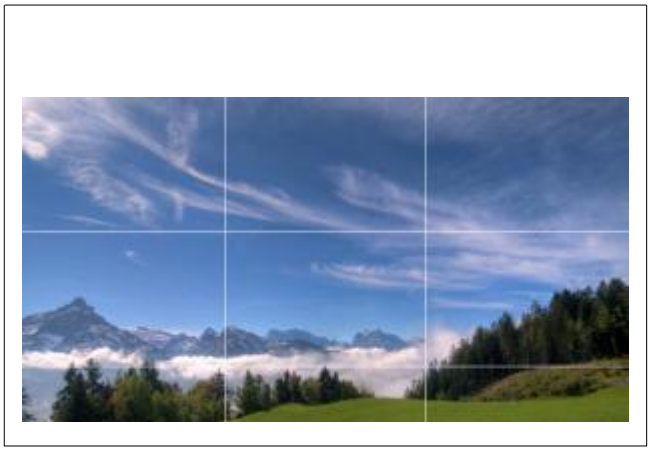
To use the rule of thirds, you'll need to imagine that the photograph is **divided into thirds horizontally and vertically**. The places where the lines intersect are called **power points**, and these are often good places to put your subject. For example, in the photo below the lighthouse is placed on the upper-left power point. This allowed the photographer to include the ocean on the right side, which makes the composition even more attractive.



Although you can place your subject on any of the four power points, there will often be one that works better than the others. For example, if your subject is **looking to one side**, you'll usually want to have **more space on that side** so the subject is looking "into" the photo.

In the photo below, the subject's eyes are placed near the upper-right power point so he is looking into the photo.

If you're shooting a landscape, try placing the horizon near the top or bottom grid line. In the photo below, the mountains are near the bottom grid line, which helps to give shape to the photo and which also allows more clouds to be shown.

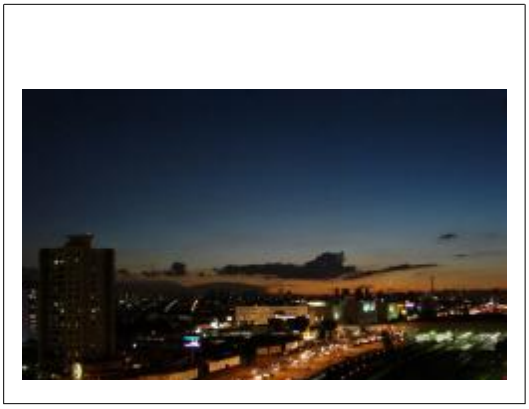


Keep in mind that the rule of thirds is only meant to be a guideline. Every photo is different, so you'll have to experiment to see whether the rule of thirds will improve it.

Lesson 5: Photographing at Night

Photographing at night

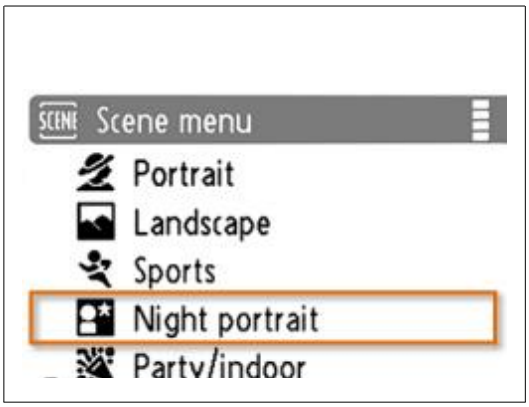
Taking photos at night can be a challenge because your camera doesn't have as much light to work with. Common problems include photos that are blurry (due to a slow shutter speed), grainy (due to a higher ISO number), or dark (if your camera can't compensate for the low light). If your camera has a built-in flash, it can add a lot more light but can also be harsh and unflattering.



In the photo below, the camera tried to reduce blurriness by increasing the ISO number. However, this added a lot of **image noise** (or **graininess**). Keep in mind that you may not be able to spot these types of problems with your camera's LCD screen; they are much more noticeable when photos are viewed at full size.

Depending on what kind of camera you have, you may find that it takes pretty good photos even in low-light situations. However, if you notice that the photos are coming out blurry or dark, you can try some of the tips below to get better results.

- **Use your camera's Night Portrait scene mode.** Using this scene mode may help your camera deal with low light.

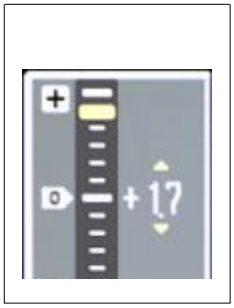


- **Hold the camera as still as possible, or use a tripod.** In low light, your camera will use a slower shutter speed, which means your photos may come out blurry. Keeping the camera still will help to keep your photos sharp.

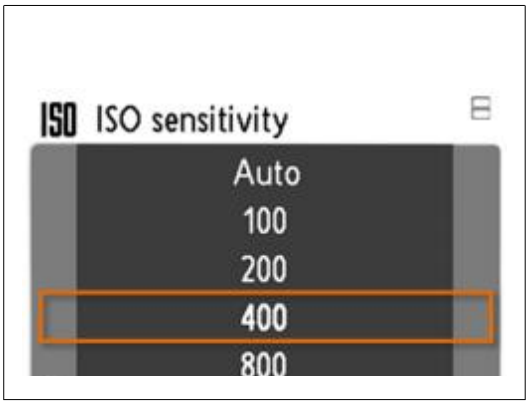
- **Use the flash if necessary.** Your camera's flash may not be the most flattering light, but it's often better than nothing. Many cameras also have a flash that is designed to reduce red eye, so check to see if this is an option on your camera. Also, keep in mind that the flash usually won't help if your subject is more than 15 feet away.

- **Adjust the exposure compensation.** If your photos are still coming out too dark, you can adjust the exposure compensation

to increase the brightness. Although this will make the photos brighter, it won't actually improve the quality, so it's not really a substitute for more lighting.



- **Try increasing the ISO setting.** If all else fails, you can manually raise the ISO number in your camera's settings. This may reduce blurriness, but it will also make your photo more grainy.



Generally, **DSLR cameras** are better than point-and-shoot cameras in low-light situations. This is because they have larger lenses and sensors that can capture more light.

Lesson 6: Capturing Motion

Capturing motion

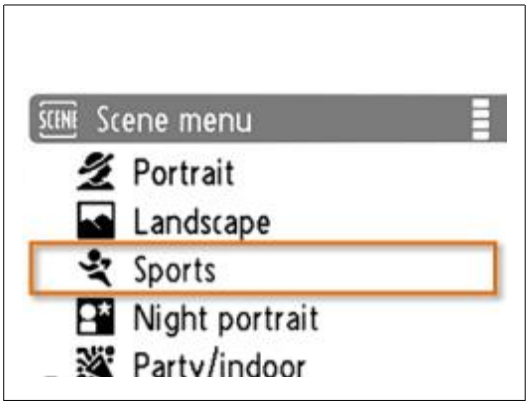
Capturing a fast-moving subject can be one of the most significant challenges for a photographer. The key to capturing any kind of fast motion is to use a **faster shutter speed**. DSLRs and bridge cameras allow you to adjust the shutter speed manually. If you're using a point-and-shoot camera, you can select the **Sports scene mode** or turn on **motion detection** to help you capture action shots.

Sometimes a little bit of blur can be a good thing, as it gives a sense of motion. If your camera lets you adjust the shutter speed manually, you can experiment with different speeds to see which one gives you the right amount of blur.

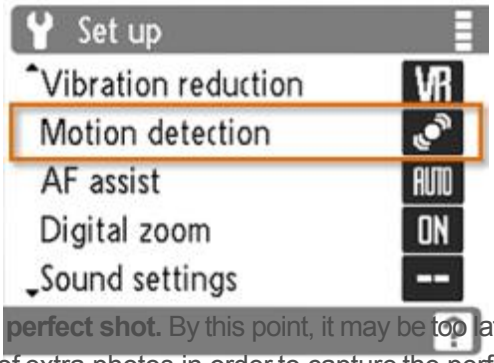
In the photos below, the first photo has motion blur, which helps to show that the car is in motion. The second photo has much more motion blur, so the subject is almost completely blurred out.

Below are some tips you can use to capture any kind of action shot, including sports, active children, and pets.

- **Use the Sports scene mode.** This mode uses a fast shutter speed to help you capture the action.



- **Turn on motion detection.** Many cameras have a motion detection setting that can help to reduce blurring by using a faster shutter speed when necessary.



- **Don't wait for the perfect shot.** By this point, it may be too late. You may need to take lots of extra photos in order to capture the perfect shot.
- **Anticipate your subject's actions.** Try to aim the camera a little bit ahead of the subject so it doesn't look like that person is running out of the photo. Also, moving the camera with the subject can help to reduce motion blur (although it may blur the background). In the photos below, the second photo has a more natural look because there is some extra space in front of the basketball players.

- **Press the shutter button halfway down ahead of time.** You'll need to give your camera time to adjust the focus and exposure; otherwise, you may miss the perfect shot. You should press it halfway down a few seconds before taking the photo so your camera will be ready to capture the exact shot you want.
- **Use continuous shooting.** Continuous shooting will take several photos every second as long as you are holding down the shutter button. This can help you capture the perfect shot, since you don't have to wait for the exact moment to take the photo. If you're using the Sports scene mode, continuous shooting may already be turned on. Otherwise, you can go into your camera's settings to turn it on.

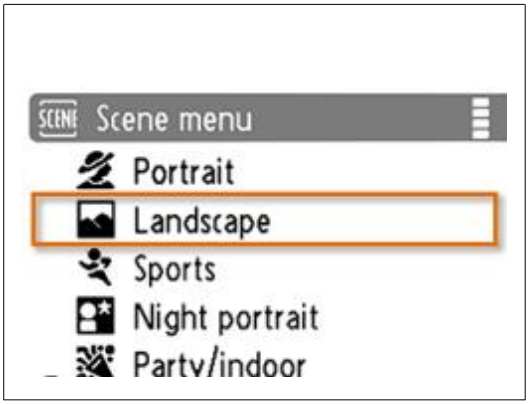
Lesson 7: Photographing Landscapes

Photographing landscapes

Landscapes are a great opportunity to experiment with photo composition. You may want to use the **rule of thirds** or **leading lines** (such as roads or rivers) to make a more pleasing image. You can also include foreground objects to give a sense of depth to the photo.

Below are a few tips you can use to improve your landscape photography:

- **Use the Landscape scene mode.** This mode automatically focuses on **infinity**, which means it focuses **as far away as possible** (and also keeps the **depth of field** as large as possible). This ensures the background landscape will be in focus, as well as the foreground objects.



- **Use a smaller aperture if possible.** If you are using a DSLR or bridge camera, use a smaller aperture (such as f/16). This will increase the depth of field and ensure the background and foreground are in focus.
- **Keep the camera level.** Landscapes usually look best when the camera is level. It will be easier to keep the camera straight if you are using a tripod.
- **Try to find an interesting foreground object.** Landscapes aren't just about the background. If you can include an interesting object in the foreground, it will add a sense of depth to the photo.

- **Use the rule** of thirds. If the horizon is visible, try to place it near one of the grid lines instead of in the middle of the photo.

- **Use leading lines.** Is there a road, sidewalk, river, or stream you can use in your landscape? These are known as leading lines because they help to lead the eye into the photograph.

Lesson 8: Capturing Close-upShots

Capturing closeup shots

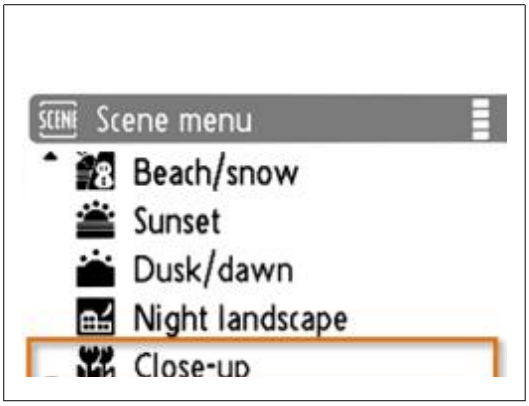
Sometimes you may want to take closeup shots of flowers, insects, food, or any kind of small object. This is known as **macrophotography**. In macrophotography, the object in the photograph is **larger than life size**, so it can reveal details and textures you might not normally see.

One of the most significant challenges with closeup shots is **focusing**. As you move the camera closer to an object, the **depth of field** becomes shallower. This means if the focus isn't exactly right, your image may be way out of focus. In fact, you may not even be able to have the entire object in focus; often, you'll have to focus on the most important part of the object and let the rest of the object be out of focus.

For example, in the photo below some of the petals are in focus, but most of them are not. This gives the photo a soft appearance while still showing the texture of the petals.

The following tips can help you get the most out of your closeup photographs:

- **Use the Closeup scene mode or Macro mode.** These modes allow the camera to focus on objects that are only a few inches away. Also, the Closeup scene mode will always focus on the center of the image, which makes focusing easier.



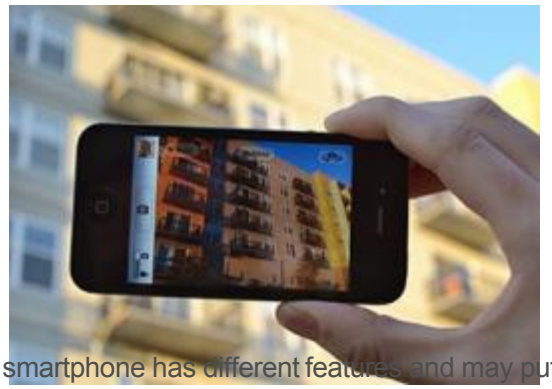
- **Watch the auto-focus.** Closeup shots have a **shallower depth of field**, so it's important to make sure the camera is focusing on the object and not the background. If you're using the Closeup scene mode, you can do this by keeping the object in the center of the frame.

- **Once the camera focuses, don't move it.** If you move your camera after it focuses, your photo may come out blurry. If you want to move the camera, you'll have to refocus it and then take the photo.
- **Avoid using flash.** Your camera's flash won't work on closeup objects, so it's best to turn it off.
- **Try shooting in cloudy weather.** If you really want to bring out details in your outdoor closeup shots, you might want to try shooting in cloudy weather. Bright sunlight can create dark shadows that block out many of the details, but sunlight that is filtered by clouds is much softer.

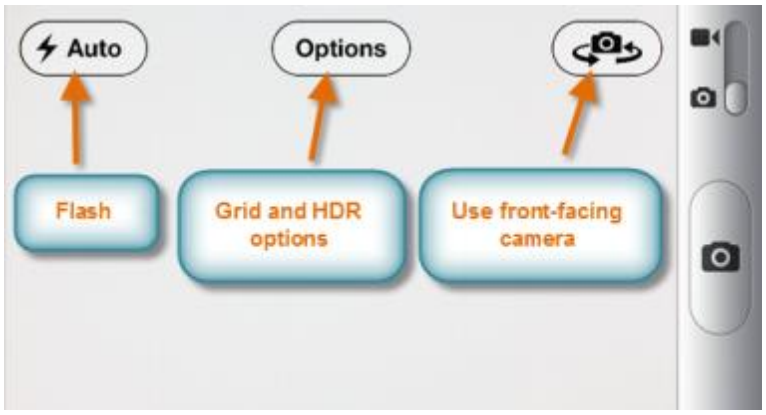
Lesson 9: Taking Photos with a Smartphone

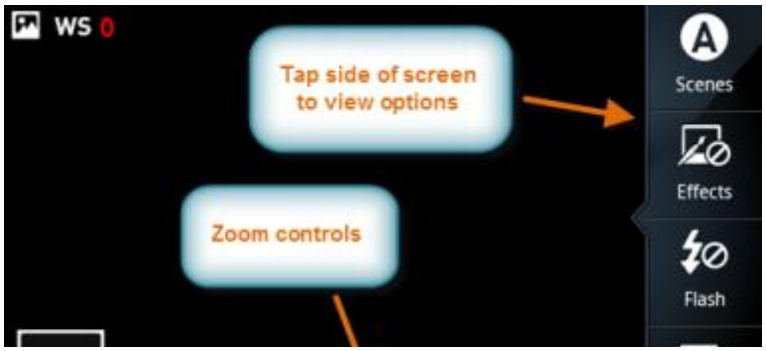
Taking photos with a smartphone

A smartphone is probably the most convenient camera you can have. You'll always have it with you, it fits in your pocket, and it doesn't require any manual adjustments before you can take a photo. Even if you own a nicer camera, you'll probably still use your smartphone to capture unexpected photo moments. Therefore, it's a good idea to learn how your phone's camera works so you'll be ready when you want to take a photo.



As you can see in the photos below, each smartphone has different features and may put common features in different places.





Focusing

Many phones have basic cameras that use a **focus-free system** (which means pretty much everything stays in focus all the time). However, more and more phones are starting to have **high-quality cameras** that require focusing.

As you learned in our lesson on **Getting to Know Your Camera**, most cameras use a **two-stage shutter button** to trigger the auto-focus. Some smartphones, such as the

Motorola Droid, have a two-stage shutter button. To auto-focus the camera, you'll simply press the shutter button halfway down. Other phones, such as the iPhone, allow you to **touch a specific area of the screen** to focus the camera. When you do this, the iPhone will also adjust the exposure so the focal point of your photo will always look good.

Zooming

Many smartphones have a **digital zoom** you can use to capture small or distant objects. On the iPhone, you can bring up the zoom slider by using a pinch gesture, while on an Android phone you can tap the **plus (+)** and **minus (-)** buttons. It's important to keep in mind that this is a digital zoom, which is of a lower quality than an optical zoom.

Scene modes

Scene modes are a great way to take better photos in specific situations. For example, the **Landscape**, **Sports**, **Night Portrait**, and **Closeup/Macro** modes are each tailored to different situations. Some smartphones allow you to select scene modes. For example, many Android phones allow you to tap the right side of the screen to access scene modes (as well as other options).

Other features

Some smartphones have additional features you can use to take better photos. Here are a few features your phone may have:

- **Grid:** The iPhone can display a rule of thirds grid on the screen to help you compose your photo. You can access this by tapping the **Options** button at the top of the screen.
- **HDR (High Dynamic Range):** This mode helps you capture more detail in the shadows and highlights of your photos. Generally, it will only work when your subject isn't moving.

- **Flash:** Many smartphones have a flash to help you take low-light photos.
- **Effects:** Some smartphones allow you to apply effects to your photos, which can include **black-and-white**, **tinted**, or **vintage** filters. On Android phones, you can tap the right side of the screen to access the effects.
- **Front-facing camera:** The iPhone has a second camera just above the screen. This makes it easier to take a photo of yourself, since you can see the screen while you're taking the photo.

Lesson 10: 10 Everyday Uses for Your Phone's Camera

10 everyday uses for your phone's camera

Most mobile phones have built-in cameras, and their image quality is getting better and better. They're also convenient because people keep their phones with them wherever they go. Because of this, the built-in camera is actually a really useful tool—not just for snapshots, but also for **scanning documents** and **recording almost any type of information** you want to remember.

Here are 10 situations in which a camera phone is useful.

1. Nutrition Facts labels

If you're keeping track of calories or other nutritional information, it may be easier to take a picture of the labels and then write everything down at the end of the day. You can find this information on boxes, restaurant menus, or online.

2. Comparing prices

When you're out shopping, you may want to compare prices at different stores. Just take a picture of the item's price, and try to include the item itself in the photo. The price isn't the only thing that matters; if one store sells a pack of 48 plastic cups and another store sells a pack of 96, you'll need to include this information in the photo so you can make an accurate comparison.

3. Product dimensions

If you're shopping for furniture, shelves, or appliances, it's best to measure the space before going to the store. But if you forget to do this, you can take a picture of the item's dimensions (on the front or back of the box), then measure the space when you get home. This is usually easier than buying it and having to return it if it isn't right, especially if it is large or heavy.

4. Parking lots

If you've parked at an airport or the mall, you might forget where your car is. Right after you park, take a picture of your car, and be sure to include an identifying feature like a sign or a building. When you're looking for your car, the photo can help jog your memory. Similarly, if you're visiting another city, you can take a picture of the street signs near your hotel so it's easier to find after a long day of sightseeing.

5. Car accidents

If you're involved in a car accident, it's a good idea to take pictures of your car and all other cars that were involved. If there is a dispute about who's at fault, the photos may help support your side of the story.

6. Scanning documents

You don't need a scanner to keep a record of documents. If your phone has a good camera, you can just take pictures of tax forms, bills, letters, and other documents. Even if the quality isn't perfect, it still may be good enough to read small text. For higher quality, keep the papers as flat as possible by putting them on a table or floor.

7. Rental cars

Most rental car companies require you to return the car with the same amount of gas in the tank (or more) to avoid extra fees. They'll give you a document that shows the current fuel level, but it's easy to misplace it. The first time you start the car, take a picture of the gas gauge. You can then check the photo before refueling the car.

8. Confirmation numbers

If you're buying tickets online for a movie, concert, or baseball game, you may need to bring your confirmation number to the ticket window. If you take a picture of the confirmation number on your computer screen, you won't have to worry about bringing it with you.

9. Making repairs

If you've ever taken something apart to repair it, you know that the hardest part is putting it back together. Before you start disassembling something, take a photo of it, and if necessary take more photos as you take it apart. Later, when you forget which part goes where, you'll be glad you have the photos to remind you.

> **Note**: Do not take apart any electrical appliance or device unless you know how to do it safely. Electric shocks can cause injury or death.

10. Saving evidence

Remember that Twilight Zone episode where William Shatner (or John Lithgow in the movie version) sees a gremlin on the wing of the airplane and no one believes him? A camera phone would have been helpful in that situation. If you're telling your friends about something unbelievable that happened (for example, catching a really big fish), it's nice to have proof. Take several photos, just in case your friends are still skeptical.

With all of these tips, you'll have better luck if you know the basics of taking photos. To learn how to take photos with the iPhone, you can review our **iPhone Basics** tutorial. For more general photography tips, review our **Digital Photography** tutorial.