

# DIGITAL DEVICES AT WORK

The workplace has seen a significant change over recent years and there are now many digital devices in operation there. Whether it be for communication, production, monitoring, research,

or virtually any other activity you could imagine in the workplace, there are now digital devices to assist.

## Computers In The Workplace

The most common **digital device** you are likely to find in any workplace is the **computer**. Computers are not new to the workplace, but they do regularly change in many ways including their size and the uses they are applied to. Computers are usually either portable (such as laptops) or desk-bound. A desk-bound computer, commonly referred to as a desktop computer, usually remains in the same place. It can be moved, but this takes time. Desktop computers are usually found in offices and are used for finance, general administration, marketing, sales, and the like. A laptop computer is a portable computer that can be taken almost anywhere. It can be operated using its own battery or it can be connected to a normal power supply. This means that it can be used in a variety of locations either at a desk or in transit such as on a train or aeroplane.

You'd expect to find computers in offices. But they are now quite common on the factory floor and in industrial and scientific locations. Laptops make it possible to take work computers out on field trips.



## Robotics In Production

Many factories and production centres that have become automated use digital devices such as robots. Robots are used for many factory operations such as machine loading, parts transfer, welding, spray painting, order picking, assembly, and much more.

These robots are controlled by computers with special programs that transmit instructions in a digital format. Robots are commonly used in very repetitive operations in production processes where quality is essential, and include building cars and electronics.

## Other Workplace Digital Devices

Of course, most of the digital devices you'd use personally are also used in the workplace. For example, digital phones, digital cameras, and digital television can be found in almost every workplace.

# HOW DIGITAL DEVICES WORK

Most people have heard of the term **digital** – you probably own a digital clock, digital camera and digital television. Few people, however, actually know what **digital** means and how **digital**

**devices** work. Today most electronic devices that you use are digital simply because of the great advantages that digital technology has over its **analogue** predecessor.

## Digital Versus Analogue

**Digital** best describes systems or devices that are based on *discontinuous* data or events. The opposite of digital is **analogue** where data or events appear *continuous* and unbroken.

The simplest example here is the clock. Analogue clocks are those where the second hand travels smoothly (or continuously) around the face, as shown below left. Clocks that have numbers presented across the face and where the numbers change to reflect the time are digital clocks, as shown below to the right.



*The hands on this analogue clock travel continuously around the face of the clock so an **infinite** number of times can be shown e.g. with sharp eyes you may see the time 10:10:25.5.*

*The numbers on this digital clock change every second. Therefore, only a **limited** number of times can be shown. E.g. times of less than a second are not shown on this digital clock.*



Digital signals have several advantages over analogue signals. Some of these include being more secure, enable simultaneous multi-directional transmission, enable transmission of signals over a long distance and at a higher rate, are not corrupted by noise, and they can be processed by digital circuit components which are cheap and easily produced in many components on a single chip.

## Digital Actually Means Numbers

In the digital world data and events are converted into **binary values**. Binary values have only an **on state** (represented by the number **1**) and an **off state** (represented by the number **0**). These very simple values can be joined together into complex combinations to create numbers which in turn can represent data or an event.

A typical example is television. All television programs are received as a **signal**.

With analogue the television signal is sent as one continuous wave from a television studio to your television set, either using broadcast towers, or cables.

Digital television is a more complex process. With digital television the signal is first converted to numbers – this step is sometimes referred to as **sampling**. It is then **quantized** (made smaller) and **encoded**. The signal is then transmitted to your television as a series of numbers. Your digital television then **reconstructs** the original signal using the sampled numbers and the encoding information.

Even if your location only receives digital television signals, you can continue to use your old analogue television, providing you have a special **set-top box** which receives the digital signals and reconstructs them back to an analogue signal for your television.

## Digital Music

All music that is recorded through a microphone is analogue. However, today that music is then converted into numbers (**sampled** and **encoded**). The music can then be stored on CDs, on computer hard disks, portable players, USB sticks and cards, and more.

Your music player (it can be a portable device such as an **iPod**, your car sound system, your home theatre, or even your phone) then reconstructs those numbers using the instructions found in the encoding. Once the reconstruction has occurred you'll hear your music through your ear-phones or speakers in an analogue form.

## Digital Cameras

In a digital camera an image is captured on a light-sensitive sensor. The camera then converts that image into numbers and stores those numbers in a file. The file is usually stored on a special storage card that can be inserted into the camera.

When you take the card to a camera store the store's equipment has special software that reconstructs those numbers in the file to produce a printed photograph.

# THE BENEFITS OF DIGITAL DEVICES

Analogue devices work with data and events in one continuous stream, while digital devices work with a broken and discontinuous stream of data and events. Since digital devices first convert

data to numbers, then reconstruct the data again later, it would be easy to assume that analogue would be more efficient. The opposite is in fact the case with digital offering many benefits.

## Transmitted Data

Transmitted data, such as television or radio signals and mobile phone calls, are best as digital signals because:

- Analogue signals which travel as wave forms are constantly subjected to interference (known as noise) from devices such as motor vehicles, electric motors, fluorescent lights, and the like and will therefore suffer in quality. Digital signals remain comparatively uniform and are not as easily distorted by noise. If they are, it is possible for the software that handles the reconstruction to rebuild the original signal without the noise – this is done using special programs known as *checksums*.
- Digital signals can sometimes be *compressed* (made smaller) which means they are easier and cheaper to transmit.
- Since digital signals consist of numbers it is possible to add more data to the signal that will benefit the recipient. With digital television, for example, it is possible to transmit information about the program such as promo literature and the like. With mobile phones it is possible to transmit caller details so that you know who is calling you when the phone rings.

## Stored Data – Photography

Before looking at the benefits of digital technology for stored data, it is important to know how data was managed and stored in earlier times.

With cameras and photography, for example, images were captured on photo-sensitive film. A roll of film would be placed in the camera and once the available number of pictures had been taken (24, 36 etc), the film would have to be removed and chemically processed in a darkroom to prevent accidentally spoiling the film through too much light.

With digital technology, there are a range of benefits for photography:

- Images are now stored on a disk in the camera – the number of images that can be stored varies depending upon the size of the disk, but usually range into the hundreds.
- Since there is no film processing, images can be immediately previewed on the camera and unwanted images can be deleted freeing up space on the storage card.
- There is no longer a requirement for chemical processing of the film – and the chemicals used were often harmful to the environment.
- Film, once processed, was subject to deterioration over time. Images captured on a digital camera can easily be reproduced and stored on multiple storage devices which have an indefinite shelf-life.

## Stored Data – Music

With music, albums were first recorded onto magnetic tape to create a master tape. This master tape was then used to produce plastic disks, known as *records* and sometimes referred to as *vinyl*. These vinyl disks could then be played on record players. A record player had a swing out arm with a very fine needle that would run through the grooves on the vinyl disk. The sound from this would be amplified to reproduce the music. Digital technology, again, provides many benefits:

- Music is either recorded direct to a digital storage device, or is recorded to a master tape which is then converted to digital storage. Shelf-life of digital storage media is far superior to tape.
- An infinite number of copies can be made of digital music without any loss or degradation to the quality of the sound.
- Music stored digitally can usually be played on a number of different devices (as opposed to vinyl records and cassette tapes which required specific players).
- Additional information such as album, artist, name of track, etc, is displayed on digital players.

# ACTIVITY – DIGITAL DEVICES



Individual  
Activity



Group  
Activity

## How Many Digital Devices Do You Use?

Digital devices are everywhere – there is no doubt about that. In this activity put on your thinking cap and work out how many of the devices listed below you use either daily or occasionally. These devices may be at home, at school, or in the workplace. Tick the ones that you use. The last rows are left blank in case you use other digital devices that are not listed here.

Tick if used	Device	Is it Digital? Yes/No	How Do You Know It Is Digital?
	Camera		e.g. Because it doesn't have film
	Television		
	iPod		
	MP3 Player		
	Car Sound System		
	Mobile Phone		
	Radio		
	Computer		
	Home Theatre System		
	Clock		
	Watch		

## CHAPTER 2

## InFocus

# PREPARING A DIGITAL DEVICE

Most digital devices, especially those required for personal use such as cameras, phones, music players, and the like, need some sort of initial preparation when you first take them out of the box and begin to use them.

**In this session you will:**

- ✓ gain an understanding of how to use the operating manual
- ✓ learn how to obtain replacement instruction manuals
- ✓ gain an understanding of the download process
- ✓ learn how to download an instruction manual
- ✓ gain an understanding of identifying the important items packaged with a digital device
- ✓ gain an understanding of the various components of a digital device
- ✓ learn how to turn on digital devices
- ✓ gain an understanding of how settings are changed on digital devices
- ✓ gain an understanding of the security options
- ✓ learn how to save power when using a digital device.

# THE OPERATING MANUAL

Most new digital devices that you purchase will be supplied with a printed operating manual. This manual goes under various names: operating guide, instruction manual, operations guide, and

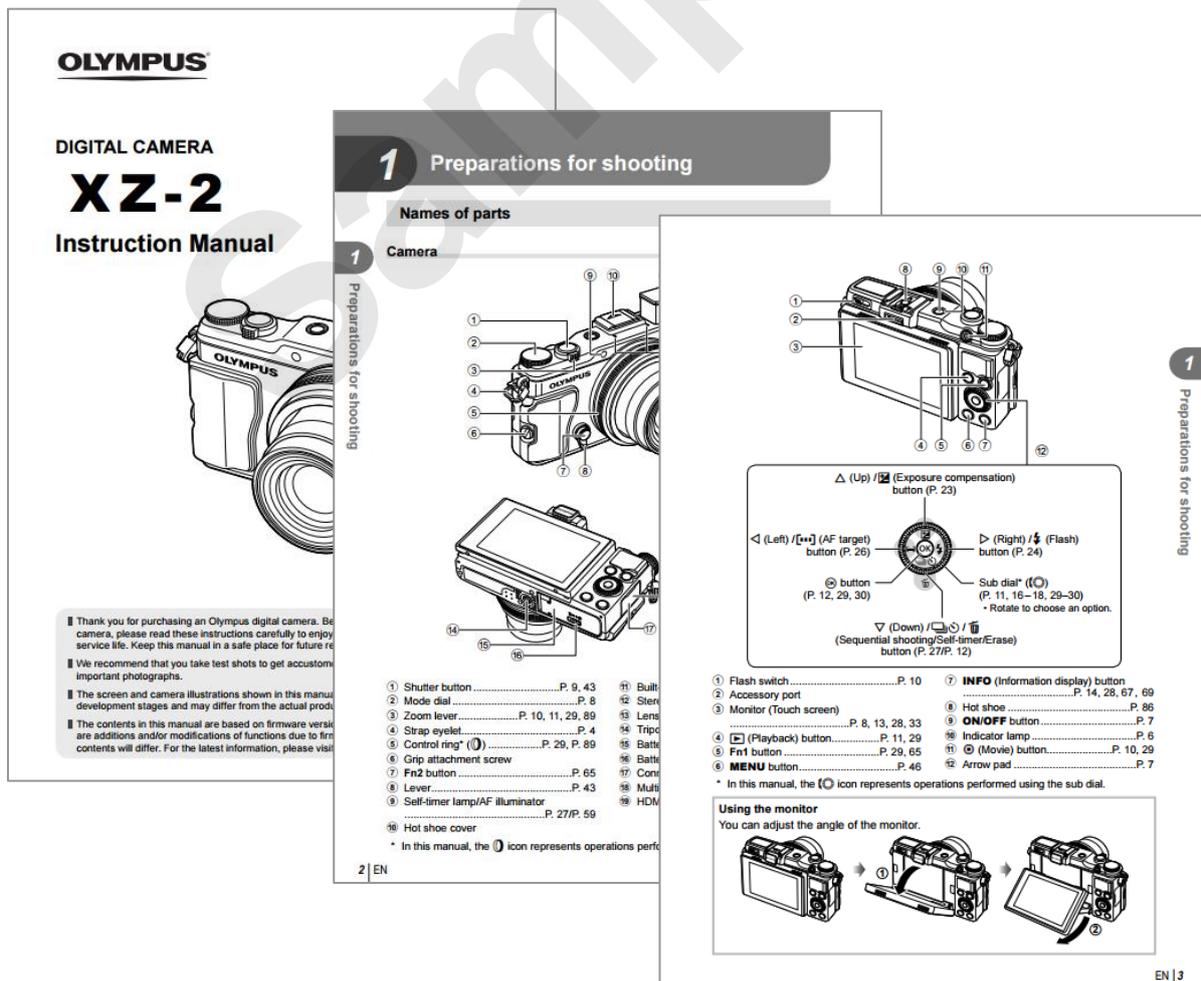
the like. These manuals come in various sizes depending upon the product and the manufacturer. As soon as you get your new device you should immediately look for this manual.

## What To Do First

When you first purchase a new digital device and locate the manual you'll probably notice that it tells you to read the manual before using your new product. If the manual is only small then this is a good idea. If the manual is very large you'll spend hours reading about things that will most likely just confuse you even more.

However, this said, there are things you should do using information supplied in the manual:

1. Locate the section in the manual that tells you what you should have received in the box and check to make sure all of the those items are there – if items are missing and you have purchased a new device you should contact the retailer immediately to arrange an exchange.
2. Most digital devices use a battery. If this is the case locate the section in the manual that tells you how to charge the battery.
3. If your device has a battery, once you have charged it locate the section in the manual that shows you how to properly insert the battery. Follow these steps to insert the battery and any other operational items, such as storage cards, into the device.
4. Locate that part of the manual that tells you how to switch on the device (sometimes this can be a bit obscure) then follow the steps to switch the device on to ensure that it works.



# GETTING A REPLACEMENT MANUAL

Unfortunately, one of the first things that usually goes missing with a new device is the operating manual. Whether you've lost your manual or it didn't come with a manual, or perhaps you have

bought a second-hand item that didn't come with a manual. In most cases, you can obtain a copy of the manual directly from the manufacturer's website.

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## Digital Devices Have Digital Manuals

The printing industry is one that has undergone huge change in technology over recent years. Virtually all instruction and operating manuals are now produced on a computer and saved to a digital file to send to the printer.

To make things easier for their spare parts and technical support departments, most manufacturers actually put a copy of the operating manual file on their website so that people can easily **download** them. Downloading is the process of creating a copy of the file on your computer from the manufacturer's website.

Most manufacturers will provide this copy for free, while some may require that you register the product that you purchased with them first. Some manufacturers make manuals available for free but restrict what can be done with the manual – for example, some can't be printed or copied to another computer once downloaded.

The really good thing here is that many manufacturers will keep online manuals available even long after the actual device may have been superseded and finished in production.

## Understanding Downloaded Files

The instruction manuals created by manufacturers can be originally created using a number of different software packages. Some of these might include word processing applications such as *Microsoft Word* or very high-end desktop publishing applications such as *Adobe InDesign*. So that you don't have to have these expensive software packages on your computer, the manufacturers usually convert their instruction manual files to a more common type of file known as a **portable document file** (or **PDF** for short).

Your computer will still need special software, usually *Adobe Reader* or the *Windows Reader* app, to allow you to open the file and work with it, but since this software is very common and free, there is a good chance that the computer you are using already has it installed.

## Obtaining a Printed Copy of the Manual

Another option for you would be to approach the manufacturer directly to obtain a new printed copy of the manual. This can be difficult as you need to make contact with the manufacturer, usually through a retail outlet where the device is sold. You will almost certainly have to purchase the manual and this could be expensive. Finally, you'll also have to wait for the manual to be shipped from the manufacturer.

## Third Party Manuals And Books

Some digital devices are so popular that technology publishers have published their own user guides for these devices. The *Apple* products, such as the *iPhone* and the *iPad*, come to mind here. A browse through any bookstore with technology books will reveal multiple books detailing the operation and care of these devices.

# THE DOWNLOAD PROCESS

Downloading a copy of an instruction manual from the manufacturer's website on the internet is a great way of quickly getting hold of a replacement manual. While the download

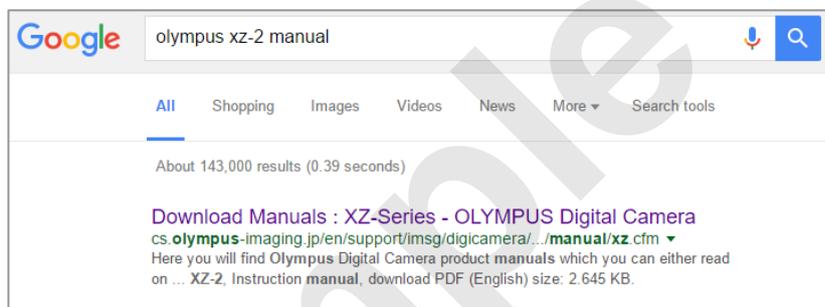
process itself is relatively straightforward, you sometimes need to do a bit of detective work to find out where to download the manual as each manufacturer's website is different.

You'll need at least two pieces of key information before looking online (on the web) for a manual:

- The name of the manufacturer
- The model number of the device you need the manual for.

Obviously, you'll also need to work on a computer that has access to the internet. Once all of this has been organised you can download an instruction manual using the following general steps:

1. Start the computer and access the internet using a web browser on the computer such as **Chrome** or **Edge**
2. In the search box type the name of the manufacturer and the model number, then press  to display matches for the name



3. Find an item where the website would seem to belong to the manufacturer (e.g. for *Olympus*, you may receive *www.olympus.com* possibly followed by the name of your country). Click on the item that you think will take you to the manufacturer's website
4. On the manufacturer's website look for a link that would take you to **Support** or **Product Help**, then click on this link
5. If the manufacturer provides access to online manuals, a link should appear somewhere on the support page. Click on this link
6. To proceed further you will now probably have to look for the model number details of the product. If the manufacturer produces several different types of devices (e.g. television sets, cameras, phones, etc.) you may first need to select the type of device you have. Click through the relevant links

XZ-Series		
XZ-2	Instruction manual	download PDF (English) size: 2.645 KB
XZ-1	Quick Start Guide	download PDF (English) size: 1.188 KB
	Instruction manual	download PDF (English) size: 2.560 KB
XZ-10	Instruction manual	download PDF (English) size: 2.259 KB

# DOWNLOADING AN INSTRUCTION MANUAL

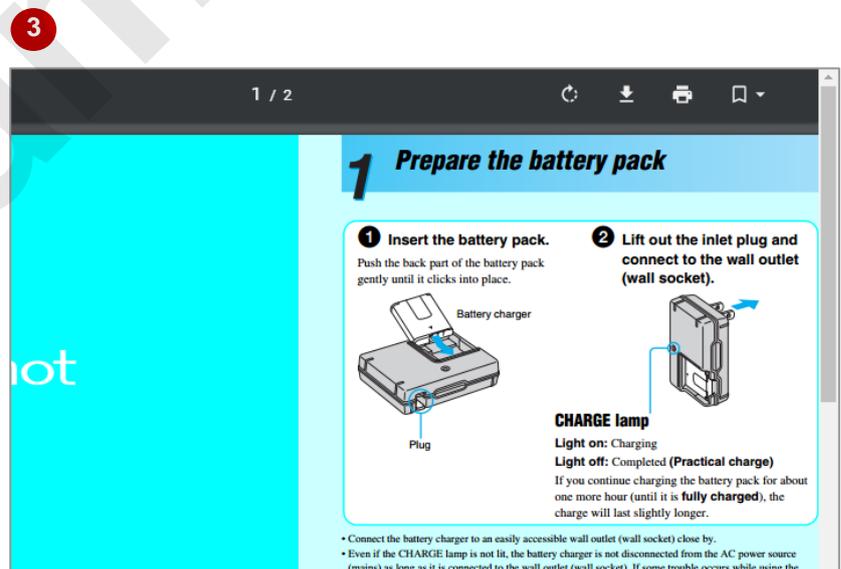
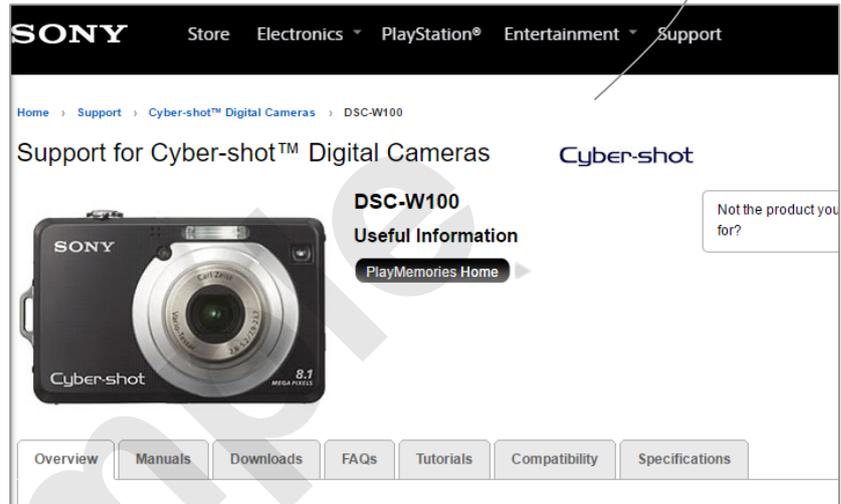
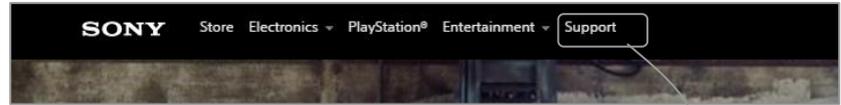
There's nothing like having a practice run to see how things are done. You'll now actually download an instruction manual for a *Sony Cyber-shot DSC-W810* digital camera. You'll

need access to a computer that is connected to the internet. If you are not familiar with computers, get a friend or relative who is able to assist you with these steps.

## Try This Yourself:

Ensure that the computer is switched on...

- 1 Display the browser window for your browser of choice, click in the search box, type **Sony**, then press **Enter**
- 2 Click on a link to **sony.com.au** to display the **Sony Australia** home page
- 3 Click on **Support** near the top of the page to display available options
- 4 Click in the search box under **Product Support** and type **DSC-W100** and press **Enter**
- 5 Click on the **Manuals** tab
- 6 Click on **Instruction Manual** to download the pdf file and display it in the browser window



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## For Your Reference...

To **download** an **instruction manual**:

1. Click on the **Browser** icon at the bottom of the screen
2. Type the manufacturer's name in the search box, then click on the appropriate website and follow the links to the manual

## Handy to Know...

- Once the file has been saved on the computer, you can double-click on it to open it up. Again, you may need some assistance from a friend the first time you need to do this.

# ACTIVITY – OPERATING MANUAL



Individual  
Activity



Group  
Activity

## Download An Instruction Manual

Obtain access to a computer that is connected to the internet and use it to download an instruction manual for a digital device that you have. The digital device may be a digital camera, mobile phone or even a television set.

As you work through this activity write down the following details:

Details	
Type of digital device (e.g. camera, phone, etc)	
Name of the manufacturer	
Model number of the digital device (it should be shown somewhere on the device)	
Website address of the manufacturer	www.
Name of the downloaded file	
Location of the downloaded file (folder location that it was saved to)	

## CHECKING THE BOX

When you purchase or get a new digital device, one of the first things to do is to locate the instruction manual and then check to ensure that all of the accessories for the device have been

supplied. Most instruction manuals will have a section that either shows pictures of the accessories or lists them so that you can do the check.

### Understanding The Items List

At the right you'll see the box contents list for an *Sony Cyber-shot DSC-W100* camera. The accessories supplied with a digital device fall into two categories:

- those that are essential to have for the device to work properly
- those that enhance the operation or understanding of the device but that are not critical for its operation.

Note that there are similar items in both lists. For example, they both have:

- An AC adaptor for charging the battery
- A rechargeable battery
- A CD containing special software to install on a computer so that you can download and manipulate images
- A USB cable to connect the camera to the computer
- A carrying strap.

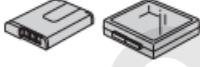
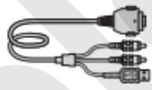
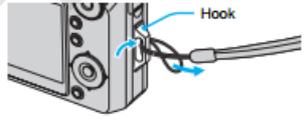
Of these the most important items are the charger and the rechargeable battery. The battery must first be charged before you can use the camera. Without the battery the camera would not operate.

If you intend to download images onto a computer, the USB cable is also important. Unfortunately, manufacturers use varying types of cables so a cable for an Olympus generally won't work for a Samsung and vice versa.

The software CD is probably least important as most computers already contain built-in software that allows you to download images from a camera or other device.

If any of these items are missing you will need to decide whether to return the digital device. For example, it is not that important if the wrist strap is missing, but it is critical if the rechargeable battery is not in the box.

Most manufacturers will allow you to purchase these items from their websites if you can't return the device to the retailer.

Checking the accessories supplied	
<ul style="list-style-type: none"> <li>• Battery charger BC-CSG/BC-CSGB (1)</li> </ul> 	<ul style="list-style-type: none"> <li>• Wrist strap (1)</li> </ul> 
<ul style="list-style-type: none"> <li>• Rechargeable battery pack NP-BG1 (1)/Battery case (1)</li> </ul> 	<ul style="list-style-type: none"> <li>• CD-ROM (Cyber-shot application software) (1)</li> <li>• Operating instructions: "Read This First" (this manual) (1)</li> <li>• Operating instructions: "User's Guide/Troubleshooting" (1)</li> </ul>
<ul style="list-style-type: none"> <li>• USB, A/V cable for multi-use terminal (1)</li> </ul> 	<p><b>A "Memory Stick Duo" is not supplied.</b> The camera has its own internal memory (64 MB), however, purchase of a "Memory Stick Duo" is recommended for shooting more images.</p> <p><b>"Memory Stick Duo": you can use a "Memory Stick Duo" with your camera.</b></p>  <p><b>"Memory Stick": you cannot use a "Memory Stick" with your camera.</b></p>  <p><b>Other memory cards cannot be used.</b></p> <p>• For details on "Memory Stick Duo" → "User's Guide/Troubleshooting" (page 97)</p>
Notes	
<ul style="list-style-type: none"> <li>• Charge the battery pack (supplied) before using the camera for the first time.</li> <li>• The LCD screen is manufactured using extremely high-precision technology so over 99.99% of the pixels are operational for effective use. However, there may be some tiny black points and/or bright points (white, red, blue or green in color) that constantly appear on the LCD screen. These points are normal in the manufacturing process and do not affect the recording in any way.</li> </ul>  <p>• The camera is a precision instrument. Be careful not to bump the lens or the LCD screen, and not to apply force to it. Attach the strap to prevent the camera from damage by being dropped, etc.</p>	
<ul style="list-style-type: none"> <li>• Designed for use with compatible Sony batteries.</li> </ul>	

# ACTIVITY – CHECKING THE BOX



Individual  
Activity



Group  
Activity

## Important Accessory Items

Carefully study the items list from an **Apple iPhone** instruction manual.

**Accessories**  
The following accessories are included with iPhone:



**Apple headset.** Use the Apple EarPods with Remote and Mic (iPhone 5 or later) or the Apple Earphones with Remote and Mic (iPhone 4s) to listen to music and videos, and make phone calls. See [Use an Apple headset](#) on page 39.



**Connecting cable.** Use the Lightning to USB Cable (iPhone 5 or later) or the 30-pin to USB Cable (iPhone 4s) to connect iPhone to your computer to sync and charge.



**Apple USB power adapter.** Use with the Lightning to USB Cable or the 30-pin to USB Cable to charge the iPhone battery.



**SIM eject tool.** Use to eject the SIM card tray. (Not included in all areas.)

The *Apple EarPods with Remote and Mic* allow you to listen and speak on the phone rather than use the built in speaker and microphone. The *Connecting Cable* serves two purposes – firstly it allows you to connect the phone to your computer so that you can transfer data, and secondly it connects the phone to the USB power adapter so that you can charge the phone. The *USB power adapter* is a battery charger that allows you to charge the battery that is pre-installed in the phone. Finally, the *SIM eject tool* is a special tool that allows you to remove the SIM card supplied by the telephone company should you ever need to.

Write the names of the items in order of importance (put the most important item first and the least important item last) and write a reason for your decision for each item.

Importance	Reason