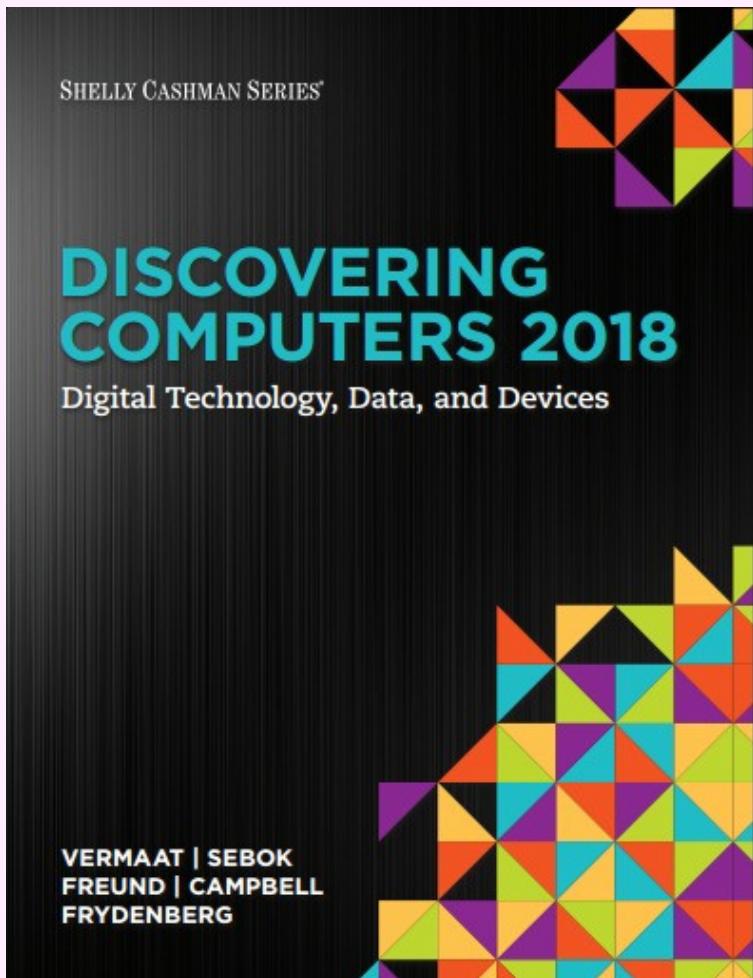


DISCOVERING COMPUTERS 2018

Digital Technology, Data, and Devices



Module 3

Computers and Mobile Devices: Evaluating Options for Home and Work

Objectives Overview (1 of 3)

- Describe the characteristics and uses of laptops, tablets, desktops, and all-in-ones.
- Describe the characteristics and types of servers
- Differentiate among POS terminals, ATMs, and self-service kiosks.
- Describe cloud computing and identify its uses.
- Describe the characteristics and uses of smartphones, digital cameras, portable and digital media players, e-book readers, and wearable devices.

POS: PointOfSale

ATM: Automated TellerMachine

Objectives Overview (1 of 3)

1. Personal Computers

- Laptops
- Tablets
- Desktops
- All-in-Ones

2. Servers

3. Specialized Terminals

- POS Terminals
- ATMs
- Self-Service Kiosks

4. Cloud Computing

5. Mobile and Portable Devices

- Smartphones
- Digital Cameras
- Portable and Digital Media Players
- E-Book Readers
- Wearable Devices

Objectives Overview (2 of 3)

- Describe the characteristics of and ways to interact with game devices.
- Identify uses of embedded computers.
- Differentiate a port from a connector, identify various ports and connectors, and differentiate among Bluetooth, Wi-Fi, and NFC wireless device connections.
- Identify safeguards against hardware theft and vandalism and hardware failure.

Wi-Fi: Wireless Fidelity

NFC: Near Field Communication

Objectives Overview (2 of 3)

6. Game Devices

7. Embedded Computers

8. Ports, Connectors, and Wireless Connections

- Port vs. Connector
- Common Ports and Connectors
- Bluetooth
- Wi-Fi
- NFC

9. Safeguards

- Hardware Theft
- Vandalism
- Hardware Failure

Objectives Overview (3 of 3)

- Discuss ways to prevent health-related injuries and disorders caused from technology use, and describe ways to design a workplace ergonomically.

10. Health and Ergonomics

- Preventing Injuries
- Ergonomic Workplace Design

Summary

- Characteristics of and ***purchasing guidelines*** for laptops, tablets, desktops, smartphones, digital cameras, and portable and digital media players
- **Servers, supercomputers, point-of-sale terminals, ATMs, self-service kiosks**, e-book readers, wearable devices, game devices, embedded computers, and cloud computing
- **Ports** and connections
- Ways to protect hardware
- Health concerns of using technology and preventative measures

C

Computers and Mobile Devices

Types of **computers** and **mobile devices** include:

- Laptops, tablets, and desktops
- Servers and terminals
- Smartphones, digital cameras, e-book readers, portable and digital media players and wearable devices
- Game devices
- Embedded computers

Mobile Computers and Desktops (1 of 7)

- A **mobile computer** is a portable personal computer, designed so that a user easily can carry it from place to place.
- A Personal Computer (PC) is a mobile computer or desktop that can perform all of its input, processing, output, and storage activities by itself and is intended to be used by one person at a time.



Figure 3-1 Computers and mobile devices are available in various shapes and sizes.

- A **laptop**, also called a notebook computer, is a thin, lightweight mobile computer with a screen in its lid and a keyboard in its base



Figure 3-3 Traditional laptops weigh more than ultrathin laptops.

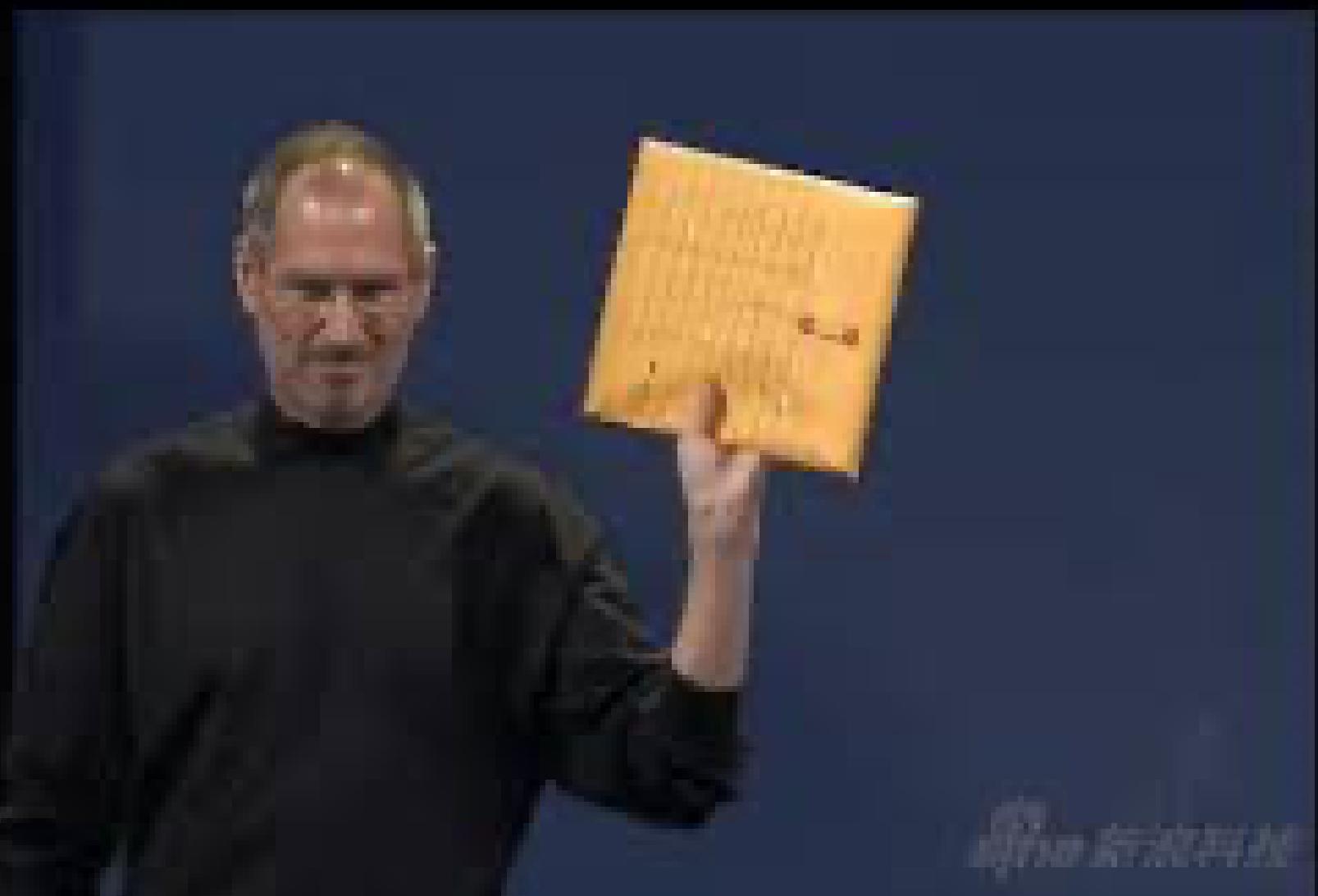






Figure 3-2

Shown here is a partial motherboard in a laptop.

Partial motherboard :

僅包含核心晶片(CPU、GPU等), 很多 I/O
功能需要額外的小板或 daughter
board 才能運作。

優點：

方便散熱、降低成本、模組化維修

motherboard



© rawgroup / Fotolia

- A **tablet** is a thin, **lighter-weight** mobile computer that has a touch screen



Figure 3-4 Examples of slate and convertible tablets.

Figure 3-5

A phablet combines features of a smartphone and a tablet.



© iStockPhoto / Krystian Nawrocki

- A handheld computer is a computer small enough to fit in one hand.



Figure 3-6 This handheld computer is a lightweight computer that enables warehouse employees to take inventory and check supplies.

With the abundance of mobile computer manufacturers, research each before making a purchase. The following are purchasing considerations unique to mobile computers.



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- 1. Determine which mobile computer form factor fits your needs.** Consider a tablet or ultrathin laptop if you require a lightweight device and the most mobility. If you require additional ports or want the computer's capabilities to be more comparable to a desktop, consider purchasing a traditional laptop.
- 2. Consider a mobile computer with a sufficiently large screen.** Laptops and tablets are available with various screen sizes. For example, most traditional and ultrathin laptop screens range in size from 11 to 18 inches, while most tablet screens range in size from 7 to 12 inches.

- A **stick computer** is a small computer which usually is the same size as, or a little larger than, a USB flash drive



USB: Universal Serial Bus
HDMI: High-Definition Media Interface
TV: TeleVision

Figure 3-7 Stick computers are approximately the same size as USB flash drives and can connect to an HDMI port on a TV or computer monitor.

- A **desktop**, or desktop computer, is a personal computer designed to be in a stationary location, where all of its components fit on or under a desk or table



Figure 3-8 The desktop with a tower shown in this figure is a Windows computer, and the all-in-one is a Mac computer.

Today, desktop manufacturers emphasize desktop style by offering bright colors, trendy displays, and theme-based towers so that the computer looks attractive if it is in an area of high visibility. If you have decided that a desktop is most suited to your technology needs, the next step is to determine specific software, hardware, peripheral devices, and services to purchase, as well as where to buy the computer. The following considerations will help you determine the appropriate desktop to purchase.



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© Alexey Salo / Photos.com

1. **Determine the specific software to use on the desktop.** Decide which software contains the features necessary for the tasks you want to perform. Your hardware requirements depend on the minimum requirements of the software you plan to use on the desktop.



動畫重播



伺服器未回應



1 聖騎之王

換區 >

開始遊戲

App v1.35.1.2 Res v1.35.1.15 Build0001R417289 D0-437548



- A **server** is a computer dedicated to providing one or more services to other computers or devices on a network
 - Rack server
 - Blade server
 - Tower server

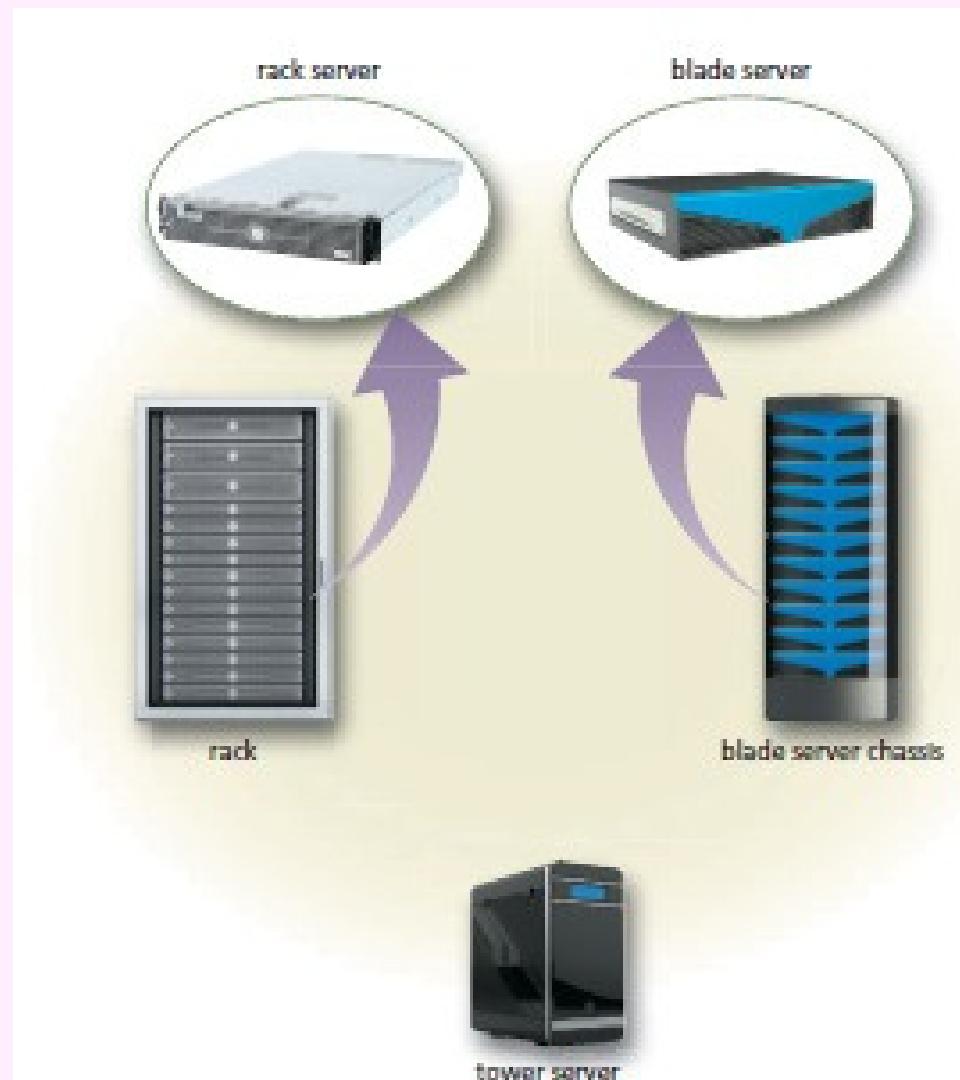


Figure 3-9 Shown here are a rack server, blade server, and tower server.

Table 3-1 Dedicated Servers

Type	Main Service Provided
Application server	Stores and runs apps
Backup server	Backs up and restores files, folders, and media
Database server	Stores and provides access to a database
Domain name server	Stores domain names and their corresponding IP addresses
File server (or storage server)	Stores and manages files
FTP server	Stores files for user upload or download via FTP
Game server	Provides a central location for online gaming
Home server	Provides storage, Internet connections, or other services to computers and devices in a household
List server	Stores and manages email lists
Mail server	Stores and delivers email messages
Network server	Manages network traffic
Print server	Manages printers and documents being printed
Web server	Stores and delivers requested webpages to a computer via a browser

Servers (3 of 3)

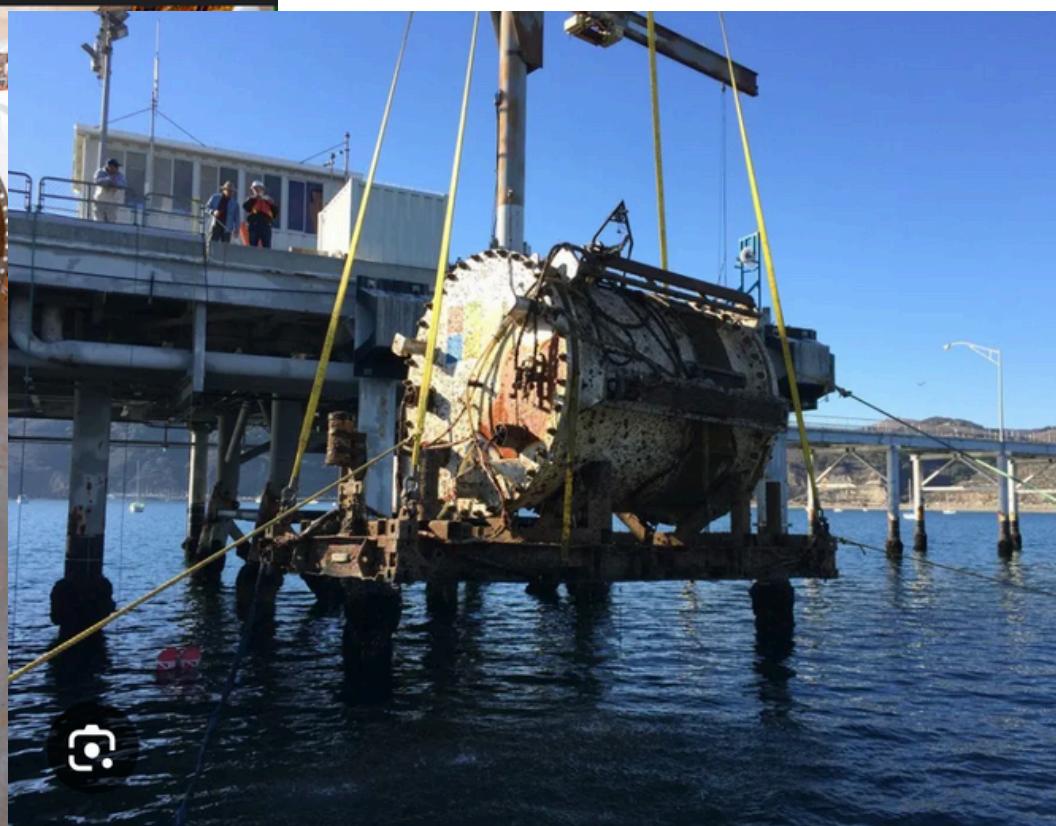
- Virtualization is the practice of sharing or pooling computing resources, such as servers and storage devices.
 - Server virtualization uses software to enable a physical server to emulate the hardware and computing capabilities of one or more servers, known as virtual servers.
- A **server farm** is a network of several servers together in a single location.
- A mainframe is a large, expensive, powerful server that can handle hundreds or thousands of connected users simultaneously.

Servers (2 of 2)

微軟在 2018年就做此實驗([Project Natick](#))，將一整套 Data center (共864台 Server、27.6PB 的資料)，打包起來丟到 35.6公尺深的蘇格蘭海底。



An Undersea Microsoft Server
Stays Cool While Processing Data...



Microsoft Built a Cloud Server in
the Pacific Ocean to Save Water...

圖片可能受著作權保護。 [瞭解詳情](#)

前往 >

Figure 3-9

Server farms and mainframes can handle thousands of connected computers and process millions of instructions per second.



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Terminals (1 of 4)

- A **terminal** is a computer, usually with limited processing power, that enables users to send data to and/or *receive* information from a server, or host computer.
- A thin client is a terminal that looks like a desktop but has limited capabilities and components.
- Most retail stores use a POS terminal to record purchases, process credit or debit cards, and update inventory.

POS: Point Of Sale

POS: Point Of Sale



Figure 3-10 Many grocery stores offer self-service checkouts, where consumers use POS terminals to scan purchases, scan their store or saver card and coupons, and then pay for the goods.

- An ATM (Automated Teller Machine) is a self-service banking terminal that connects to a host computer through a network.



Figure 3-11 An ATM is a self-service banking terminal that allows customers to access their bank accounts.

teller = 出納

- **Exiting:** Do not count cash in public; immediately put it in your pocket or fold it in your hand. If you receive a receipt, take it with you and do not discard it in a trash can near the area. As you leave, be certain you are not being followed. If you suspect someone is tracking you, immediately walk to a populated area or business, or drive to a police or fire station.
- **Statements:** Review your balances and bank statements frequently. Be certain all deposits and withdrawals are listed, and look for unusual or unfamiliar activity.



© photobeginner / Shutterstock

- A self-service kiosk is a freestanding terminal that usually has a touch screen for user interaction

Table 3-2 Self-Service Kiosks

Type	Typical Services Provided
Financial kiosk	Pay bills, add money to prepaid cards and phone plans, and perform other financial activities.
Photo kiosk	Print photos from digital images. Some allow editing of digital photos. Users may print directly at the kiosk or may send an order to a photo lab to be printed.
Ticket kiosk	Print tickets. Located in airports, amusement parks, movie theaters, rental companies, and train stations.
Vending kiosk	Dispense item after payment is received. Examples include DVD rentals and license plate renewals.
Visitor kiosk Manage and track visitors upon check-in.	Located in businesses, police stations, schools, hospitals, and other areas where access is controlled or registration is required.

kiosk

noun [C]

UK /'ki:.ɒsk/ US /'ki:.əsk/

Add to word list

a small building where things such as chocolate, drinks, or newspapers are sold through an open window

(售糖果、飲料、報紙等的) 小亭；售貨亭

• *a station kiosk*

車站售貨亭

+

UK formal

(also **telephone kiosk**)

a telephone box UK

公用電話亭 (同 telephone box)

kiosk

noun [C]

UK /'kiːɒsk/ US /'kiːəsk/



terriblexima 2024-12-15

強烈建議情侶都要去拍一次洗衣機主題拍貼機 🤗
有一個會一起陪我做奇怪事情的另一半真的是非常lucky 😍💖✨



223

3

4

445



Figure 3-12

DVD: Digital Versatile Disk

A DVD kiosk is a self-service DVD rental terminal.



Courtesy of Redbox

Supercomputers

- A supercomputer is the fastest, most powerful computer – and the most expensive
 - Capable of processing many trillions of instructions in a single second



Figure 3-13 Supercomputers can process more than one quadrillion instructions in a single second.

Cloud Computing

- **Cloud computing** refers to an environment that provides resources and services accessed via the Internet



Figure 3-14 Users access resources on the cloud through their Internet connections.

Mobile Devices (1 of 10)

- A **smartphone** is an Internet-capable phone that usually also includes a calendar, an address book, a calculator, a notepad, games, browser, and numerous other apps.
- Many smartphones have touch screens. Instead of or in addition to an on-screen keyboard, some have a built-in mini keyboard on the front of the phone or a keyboard that slides in and out from behind the phone.



on-screen
keyboard



swipe
keyboard app



mini keyboard



keypad



slide out keyboard



portable keyboard



virtual keyboard



speech to text

Figure 3-15 A variety of options for typing on a smartphone.

Mobile Devices (3 of 10)

- Short Message Service (SMS)
 - Mobile to mobile
 - Mobile to email
 - Mobile to provider
 - Web to mobile
 - Multimedia Message Service (MMS)
 - Mobile to mobile
 - Mobile to email
- 簡訊服務，只能傳送文字
- 多媒體簡訊，可以傳送
圖片、聲音、影片等

- A **digital camera** is a mobile device that allows users to take photos and store the photographed images digitally
 - Smart digital camera
 - Point-and-shoot camera 優瓜相機
 - SLR camera

SLR: Single-Lens Reflex



Figure 3-16 SLR digital cameras have lenses and other attachments, whereas the lenses on point-and-shoot cameras are built into the device. Many smartphones also have built-in digital cameras.

功能 Feature	智慧型數位相機 Smart Digital Camera	傻瓜相機 Point-and-Shoot Camera	單眼相機 SLR Camera (DSLR)
鏡頭 Lens	固定鏡頭 Fixed lens	固定或伸縮鏡頭 Fixed or retractable	可更換鏡頭 Interchangeable
連線 Connectivity	Wi-Fi / 藍牙 / 雲端 Wi-Fi / Bluetooth / Cloud	很少內建 Rarely included	通常沒有 (需配件) Usually none (needs accessory)
手動控制 Manual Control	部分控制 Partial	幾乎沒有 Very limited	完整控制 Full



How a Digital Camera Might Work

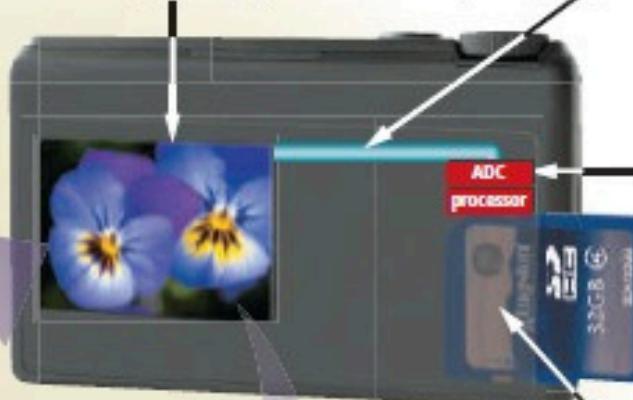
Step 1

Point to the image to photograph and take the photo. Light passes into the lens of the camera.



Step 2

The image is focused on a chip called a charge-coupled device (CCD).



Step 3

The CCD generates an analog signal that represents the image.



Step 4

The analog signal is converted to a digital signal by an analog-to-digital converter (ADC).

Step 5

A processor in the camera adjusts the quality of the image and usually stores the digital photo on media inserted in the camera.

Figure 3-17 This figure shows how a point-and shoot digital camera might work.

How a Digital Camera Might Work

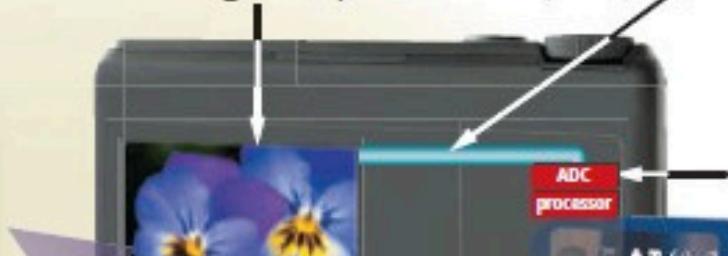
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Figure 3-17 This figure shows how a point-and shoot digital camera might work.

- **Resolution** is the number of horizontal and vertical pixels in a display

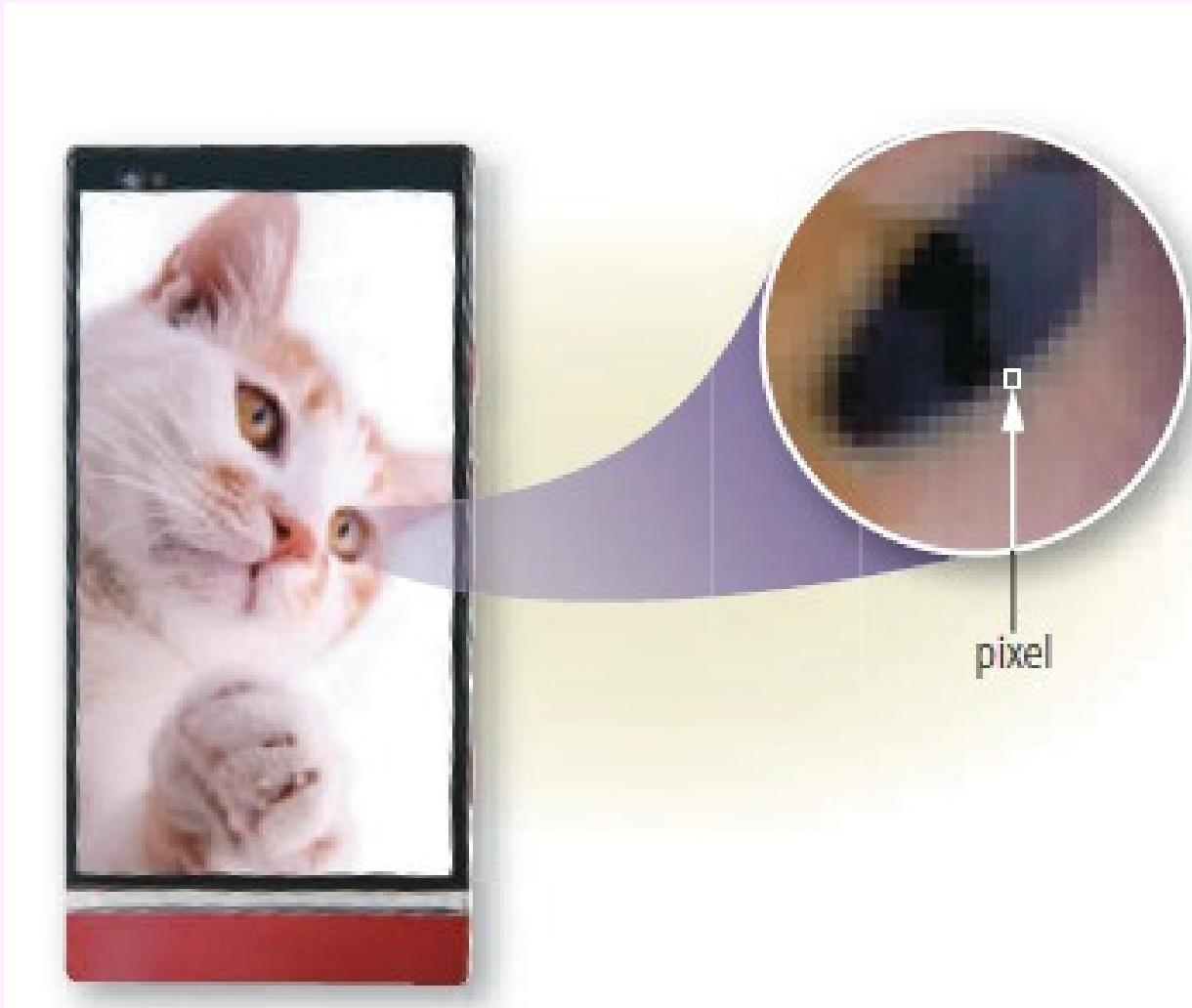


Figure 3-18 A pixel is the smallest element in an electronic image.

C

- A **portable media player** is a mobile device on which you can store, organize, and play or view digital media



Figure 3-19 Some portable media players have touch screens; others have touch-sensitive pads or buttons that enable you to access your media library.

- A **digital media player** or streaming media player is a device, typically used in a home, that streams digital media from a computer or network to a television, projector, or some other entertainment device



Figure 3-20 A digital media player streams media to a home entertainment device.

6. Make sure your smartphone has enough memory and storage for contacts, email messages, photos, videos, and apps.
7. Consider purchasing accessories such as extra batteries, earbuds, screen protectors, and carrying cases.



© iStockphoto / iStock. Courtesy of Nokia
Courtesy of Nokia

2. Choose a camera with an appropriate resolution.
3. Evaluate memory cards, because different cameras require different memory cards.



© iStockphoto / tomprout

5. Make sure that you can see the screen easily.
6. If the photos you plan to take will require you to zoom, choose a camera with an appropriate optical zoom.
7. Purchase accessories such as extra batteries and battery chargers, extra memory cards, lenses, and carrying cases.



2. Consider how the portable or digital media player will connect to the Internet. Some devices connect using a wired and/or wireless connection. Choose a player that is compatible with the type of connection you can provide.
3. Read reviews about sound quality. If you are purchasing a portable device, consider higher-quality earbuds, headphones, or external speakers.



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© Terry Morris / Photos.com

- An **e-book reader** (short for electronic book reader), or e-reader, is a mobile device that is used primarily for reading e-books and other digital publications



Figure 3-21 E-book readers enable you to read e-books and other digital publications such as newspapers and magazines.

- An **e-book reader** (short for electronic book reader), or e-reader, is a mobile device that is used primarily for reading e-books and other digital publications

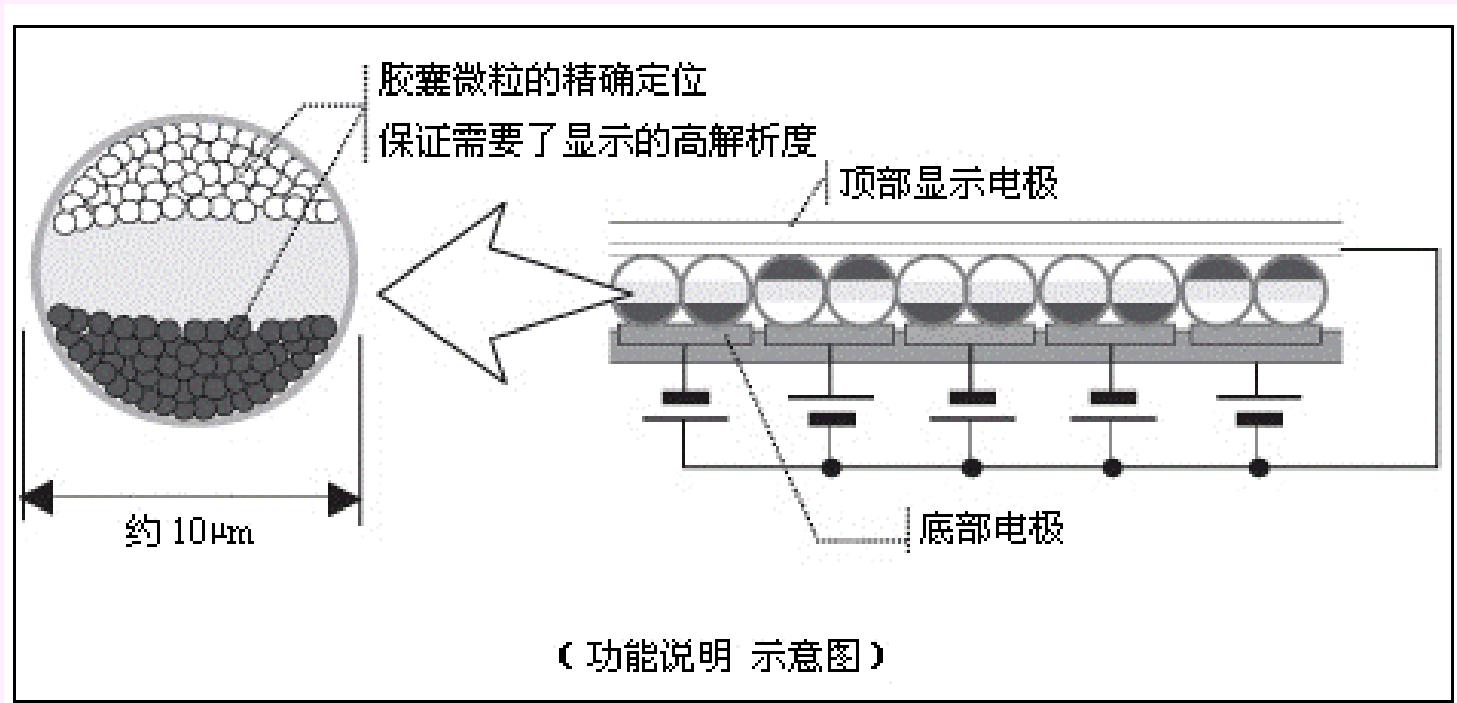


Figure 3-21 E-book readers enable you to read e-books and other digital publications such as newspapers and magazines.

- A **wearable device** or wearable is a small, mobile computing device designed to be worn by a consumer



Figure 3-22 Three popular wearable devices include activity trackers, smartwatches, and smart glasses.

- A **wearable device** or wearable is a small, mobile computing device designed to be worn by a consumer



Figure 3-22 Three popular wearable devices include activity trackers, smartwatches, and smart glasses.

C

C

Game Devices (1 of 2)

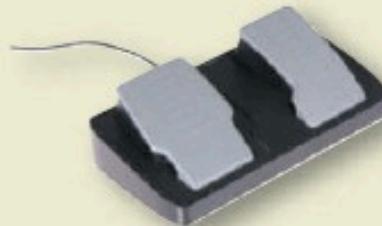
- A **game console** is a mobile computing device designed for single-player or multiplayer video games.
- A **handheld game device** is a small mobile device that contains a screen, speakers, controls, and game console all in one unit.
- Game controllers include gamepads, joysticks and wheels, dance pads, and a variety of motion-sensing controllers.



gamepad



joystick



pedals and wheel



dance pad



motion-sensing game controller



balance board

Figure 3-23 Gamers have various ways to direct movements and actions of on-screen objects.

Embedded Computers (1 of 2)

- An **embedded computer** is a special-purpose computer that functions as a component in a larger product
 - Consumer electronics
 - Home automation devices
 - Automobiles
 - Process controllers and robotics
 - Computer devices and office machines



Figure 3-24 Some of the embedded computers designed to improve your safety, security, and performance in today's vehicles.

Putting It All Together

Table 3-3 Categories of Computers and Mobile Devices

Category	Physical Size	Number of Simultaneously Connected Users	General Price Range
Personal computers (desktop)	Fits on a desk	Usually one (can be more if networked)	Several hundred to several thousand dollars
Mobile computers and mobile devices	Fits on your lap or in your hand	Usually one	Less than a hundred dollars to several thousand dollars
Game consoles	Small box or handheld device	One to several	Several hundred dollars or less
Servers	Small cabinet to roomful of equipment	Two to thousands	Several hundred to several million dollars
Supercomputers	Full room of equipment	Hundreds to thousands	Half a million to several billion dollars
Embedded computers	Miniature	Usually one	Embedded in the price of the product

- A **port** is the point at which a peripheral device attaches to or communicates with a computer or mobile device so that the peripheral device can send data to or receive information from the computer or mobile device



Figure 3-25 Most computers and mobile devices have ports so that you can connect the computer or device to peripherals.

- A **port** is the point at which a peripheral device attaches to or communicates with a computer or mobile device so that the peripheral device can send data to or receive information from the computer or mobile device

	<p>字　　詞 埠 [土部-8畫-共11畫]</p>
<p>注　　音 (一)ㄅㄨˋ (二) (又音) ㄈㄨˋ (點各音查相關詞)</p>	
<p>漢語拼音 (一)bù (二) (又音)fù</p>	
<p>釋　　義 (一)ㄅㄨˋ 名</p>	<p>1. 碼頭，停泊船隻的地方。明·張自烈《正字通·土部》：「埠，船船埠頭。」如：「港埠」。</p>
<p>(二) (又音) ㄈㄨˋ (一)之又音。</p>	<p>2. 通商的口岸。如：「商埠」、「開埠」。</p>
	<p>3. 地方、城市。如：「本埠」、「外埠」、「埠際」。清·徐珂《清稗類鈔·棍騙類·販豬仔》：「所往之地，大抵為新加坡、庇能等埠。」</p>

- A **port** is the point at which a peripheral device attaches to or communicates with a computer or mobile device so that the peripheral device can send data to or receive information from the computer or mobile device



Figure 3-25 Most computers and mobile devices have ports so that you can connect the computer or device to peripherals.

Ports and Connections (2 of 6)

- A **connector** joins a cable to a port
- A connector at one end of a cable attaches to a port on the computer or mobile device, and a connector at the other end of the cable attaches to a port on the peripheral device

Table 3-4 Popular Ports and Connectors

Port Type	Connector Photo	Port Photo	Port Type	Connector Photo	Port Photo
DisplayPort (audio/video)			Mini USB		
DVI (digital video interface)			Mini HDMI (audio/video)		
HDMI (audio/video)			Network (Ethernet)		
High-Definition Media Interface					
Headphones			Speaker		
Lightning			Thunderbolt		
Microphone			USB (Type A)		
Micro USB			USB (Type B)		
Mini DisplayPort			USB (Type C)		
VGA: Video Graphics Array					

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Ports and Connections (4 of 6)

- A **USB port**, short for universal serial bus port, can connect up to 127 different peripheral devices together with a single connector
- Instead of connecting peripheral devices directly to ports on a mobile computer, some mobile users prefer the flexibility of port replicators and docking stations



Figure 3-26 Docking stations often are used with tablets and other mobile computers, providing connections to peripheral devices.

Ports and Connections

- Instead of connecting computers and mobile devices to peripheral devices with a cable, some peripheral devices use wireless communications technologies

Wi-Fi: Wireless-Fidelity

NFC: Near Field Communication

Bluetooth

Wi-Fi

NFC

Ports and Connections (6 of 6)

- Instead of connecting computers and mobile devices to peripheral devices with a cable, some peripheral devices use wireless communications technologies
 - Bluetooth
 - Wi-Fi: Wireless Fidelity
 - NFC: Near Field Communication

(

Protecting Hardware (1 of 5)

- To help reduce the chances of theft, companies and schools use a variety of security measures
 - Physical access controls
 - Alarm system
 - Physical security devices
 - Security or device-tracking app
 - Require identification



Figure 3-27 Some mobile computers and devices include fingerprint readers, which can be used to verify a user's identity.

Protecting Hardware (3 of 5)

- Hardware can fail for a variety of reasons: aging hardware; random events such as electrical power problems; and even errors in programs or apps
 - **Undervoltage**
 - **Overvoltage or power surge**

- A **surge protector**, also called a surge suppressor, uses electrical components to provide a stable current flow and minimize the chances of an overvoltage reaching the computer and other electronic equipment



Figure 3-28 Circuits inside a surge protector safeguard against electrical power variations.

- An **Uninterruptible Power Supply (UPS)** is a device that contains surge protection circuits and one or more batteries that can provide power during a temporary or permanent loss of power.



Figure 3-29 If power fails, a UPS uses batteries to provide electricity for a limited amount of time.

Health Concerns of Using Technology (1 of 2)

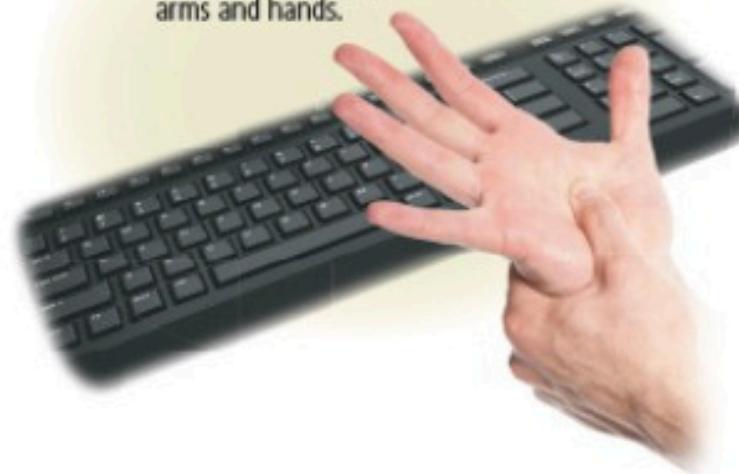
- A Repetitive Strain Injury (RSI) is an injury or disorder of the muscles, nerves, tendons, ligaments, and joints
- **Computer Vision Syndrome** (CVS) is a technology-related health condition that affects eyesight
- **Ergonomics** is an applied science devoted to incorporating comfort, efficiency, and safety into the design of items in the workplace
- **Technology addiction** occurs when the technology consumes someone's entire social life

Figure 3-30

To reduce the chance of developing tendonitis or carpal tunnel syndrome, take frequent breaks during computer sessions to exercise your hands and arms.

Hand Exercises

- Spread fingers apart for several seconds while keeping wrists straight.
- Gently push back fingers and then thumb.
- Dangle arms loosely at sides and then shake arms and hands.



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Following these tips may help reduce eyestrain while using technology.

Techniques to Ease Eyestrain

- Every 10 to 15 minutes, take an eye break.
 - Look into the distance and focus on an object for 20 to 30 seconds.
 - Roll your eyes in a complete circle.
 - Close your eyes and rest them for at least one minute.
- Blink your eyes every five seconds.
- Place your display about an arm's length away from your eyes with the top of the screen at or below eye level.
- Use large fonts.
- If you wear glasses, ask your doctor about computer glasses.
- Adjust the lighting.



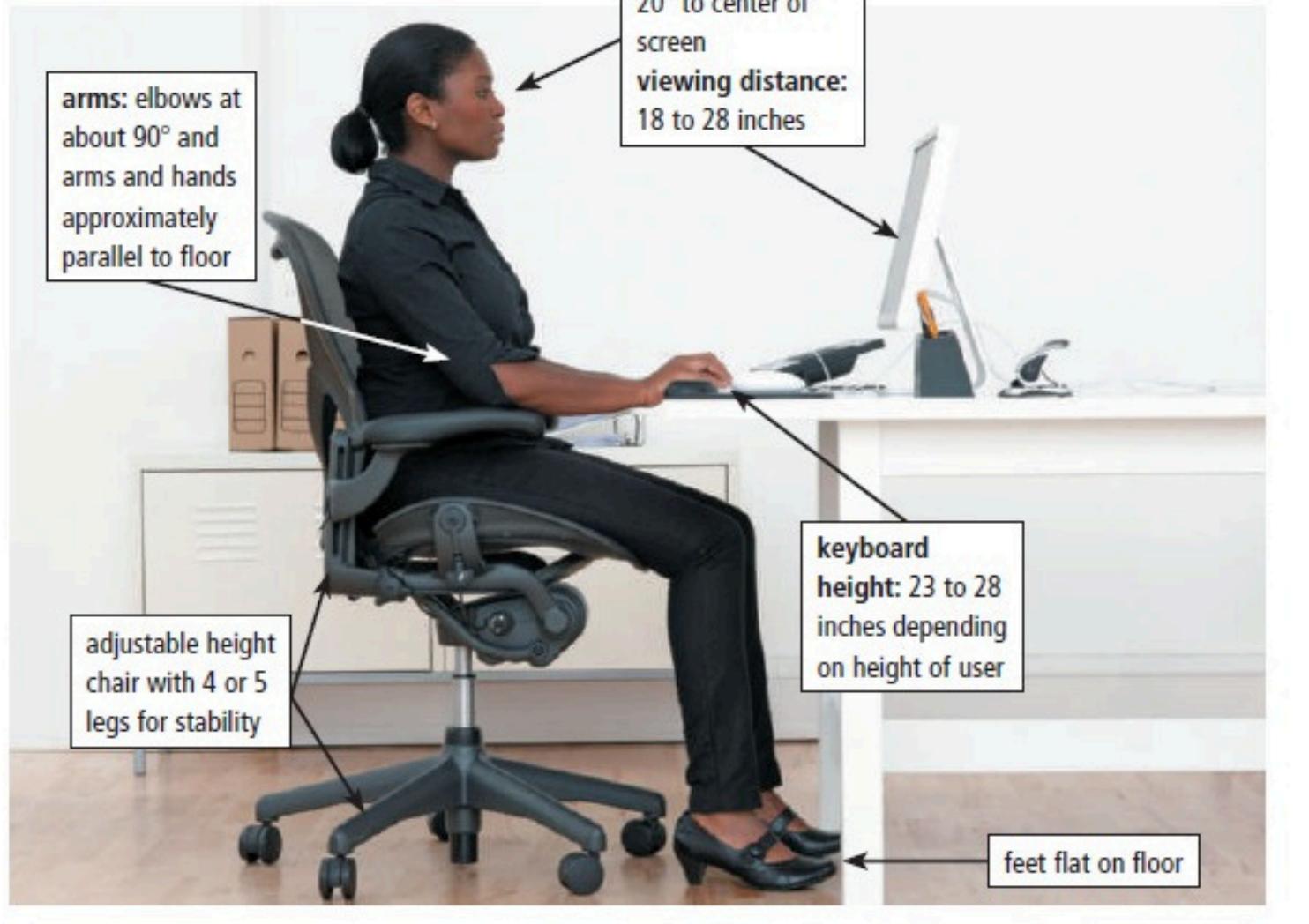


Figure 3-32 A well designed work area should be flexible to allow adjustments to the height and build of different individuals.

higher temperature to conserve energy. Some systems used in hotel rooms may include motion sensors that turn off the air conditioner if they sense no motion or noise in the room. Cruise ship cabins and hotel rooms with doors to a balcony may automatically shut down the air conditioner if the door is left open. Air conditioning systems often are one of the largest consumers of energy, and money spent toward automating one of these systems often can be recovered in smaller electricity bills. In addition to controlling the air conditioning system, building automation systems also can control and monitor lighting. Many newer buildings include motion and sound sensors in each room and automatically turn off lights when the rooms are unoccupied. Lighting in common areas of these buildings might turn off after hours when the building is unoccupied. Alternatively, if the building has plenty of natural light coming in, sensors automatically can turn off lights when sufficient sunlight is available, or turn on the lights when the sunlight decreases.

The energy management field has made significant advancements because of computer technologies. Businesses not only are able to reduce their energy costs, but they also are conserving energy at the same time.

Consider This: In what other ways do computers and technology play a role in the energy management field?



Summary

- Characteristics of and ***purchasing guidelines*** for laptops, tablets, desktops, smartphones, digital cameras, and portable and digital media players
- Servers, supercomputers, point-of-sale terminals, ATMs, self-service kiosks, e-book readers, wearable devices, game devices, embedded computers, and cloud computing
- Ports and connections
- Ways to protect hardware
- Health concerns of using technology and preventative measures

- 1. What is a server?**
- 2. What is a terminal?**
- 3. What is NFC?**
- 4. Give 2 examples of embedded computers.**
- 5. How an e-reader function different from an iPad?**

