IN THIS CHAPTER

- Seeing what you can do with computers
- Getting an overview of hardware
- Understanding the roles of input and output devices
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- Identifying the ports you want
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Chapter 1
Buying a Computer

If you've never owned a computer and now face purchasing one for the first time, deciding what to get can be a somewhat daunting experience. You have lots of technical terms to figure out and various pieces of *hardware* (the physical pieces of your computer such as the monitor and keyboard) and *software* (the brains of the computer that help you create documents and play games, for example) that you need to understand.

In this chapter, I introduce you to the world of activities your new computer makes available to you, and I provide the information you need to choose just the right computer for you.

Remember as you read through this chapter that figuring out what you want to do with your computer is an important step in determining which computer you should buy. You have to consider how much money you want to spend, how you to connect your computer to the Internet, and how much power and performance you need from your computer.

What Can You Do with a Computer?

Perhaps your friends and family have been telling you that you need a computer, but have they explained why? Today's computers can do some pretty amazing feats. Not only can they connect you to the wide world of the Internet, but they can run applications that let you store and organize photos, write your memoirs, make your own greeting cards, play all kinds of games, track your investments, and so much more.

The following list walks you through some of the activities a computer enables you to do. Depending on what activities are important to you, you can make a more-informed purchasing choice.

- **Keep in touch with friends and family.** The Internet makes it possible to communicate with other people via email; share video images by using built-in video recorders or webcams (tiny video cameras that capture and send your image to another computer); and make phone and video calls by using your computer and Internet connection to place calls with services such as Zoom, Skype, and FaceTime. You can also chat with others by typing messages and sending them through your computer by using a technology called *instant messaging* (IM). These messages are exchanged in real time, so that you and your grandchild, for example, can see and reply to text or share images immediately. Part 3 of this book explains these topics in more detail.

- **Research any topic from the comfort of your home.** Online, you can find many reputable websites that help you get information on anything from expert medical advice to the best travel deals. You can read news from around the corner or around the world. You can visit government websites to get information about your taxes and Social Security benefits, and go to entertainment sites to look up your local television listings or movie reviews.
- **Explore the possibilities that artificial intelligence offers.** In Chapter 13, you find out about how artificial intelligence (AI) is transforming the personal computing experience, helping with everything from improving web search results to providing on-demand reports about almost any topic you may be curious about.
- **Create greeting cards, letters, or home inventories.** Whether you're organizing your holiday card list, tracking sales for your home business, or figuring out a monthly budget, computer programs can help.
- **Pursue hobbies such as genealogy or sports.** You can research your favorite team online or connect with people who have the same interests. The online world is full of special-interest discussion groups where you can talk about a wide variety of topics with others.
- **Play interactive games with others over the Internet.** You can play everything from shuffleboard to poker and even participate in action games in virtual worlds. Love backgammon? Got you covered. Online bridge league? There are hundreds. Any game that you love offline, you can play online. You can play games with the computer, with total strangers, or (my favorite) with family and friends.
- **Share and create photos, drawings, and videos.** If you have a digital camera or smartphone, you can transfer photos to your computer (called *uploading*) or copy photos off the Internet (if their copyright permits it) and share them in emails or use them to create your own greeting cards. If you're artistically inclined, you can create digital drawings. Many popular websites make sharing your homemade videos easy, too. If you have a digital video camera or smartphone and editing software, you can use

editing tools to make a movie and share it with others via video-sharing sites such as YouTube or through social media. Steven Spielberg, look out!

- **Shop online and compare products easily, day or night.** You can shop for anything from a garden shed to travel deals or a new camera. Using handy shopping site features, you can easily compare prices from several stores or read customer product reviews. Many websites, such as `pricegrabber.com`, list product prices from a variety of vendors on one web page, so you can find the best deals. Beyond the convenience, all this information can help you save money.
- **Manage your financial life.** You can do your banking or investing online and get up-to-the-minute data about your bank account, credit card balances, and investments.

Get Up to Speed on Hardware

Your computing experience consists of interactions with hardware and software. I can explain both of those details, but I start with hardware. The *hardware* is all the tangible computer equipment — the parts you can see and touch.


REMEMBER

You should know a little something about computer hardware before you buy your first computer because the various components are available in a variety of quality and performance levels, and the component choices affect both a computer's price and its suitability for certain tasks.


WARNING

Buying a top-of-the-line computer is not always a good value. In fact, unless you want to do something really specific and high-end, like professional graphic arts or movie production, high-end computers aren't usually worth the price. If all you want to do is write letters, share photos, and surf the Internet, don't waste your money. Get a moderately priced model that has the components you need.

In this and the next few sections, I break down the major hardware components you need to be aware of and explain how they affect your computing experience. When shopping for a computer, you'll see many different models with different amounts, speeds, and quality levels of the essential internal parts. The best internal parts cost more money, but offer better performance and perhaps will become obsolete less quickly.

All computers consist of some type of metal-framed case. Within the case is a collection of parts that make the computer work its magic for you. All those internal parts are connected together by a large circuit board inside the case named a *motherboard*. These internal components have three main functions:

- **Processing:** The computer's ability to receive input, perform an operation on it, and deliver output. The component in charge of processing is the *central processing unit (CPU).* It's a small, very high-tech semiconductor chip mounted on the motherboard. Some people call the entire computer case the CPU, but that's not accurate.

  
  TIP

  CPU speed is rated in billions of hertz (*gigahertz*). The higher the GHz, the faster the processor. Generally speaking, the faster your CPU, the faster most applications run. That's not always true, though, because other components can cause bottlenecks, such as slow Internet speeds, that can make a computer seem slow when its processor is just fine. The speed and features of the CPU make a big difference in the price of the computer.

  Lots of highly technical features distinguish one CPU from another, but you don't need to worry about those for the most part; they're mostly of interest to people who are a lot geekier than you. For a basic home computer, any of the CPUs available in new PCs today are fine.

- **Memory:** The computer's ability to juggle the digital data that is active while the computer is running. Another name for memory is *random access memory (RAM).* Its capacity is measured in billions of bytes (*gigabytes*). A *byte* is a group of eight binary digits (*bits*).

For the average home PC user, a far greater performance enhancer is the amount of RAM (memory) in the computer. The more RAM, the better. So, if your budget allows you to have a fabulous CPU *or* a greater amount of RAM, definitely go with the RAM. The absolute minimum amount of RAM I would consider in a new PC is 16 gigabytes (GB). By the time you read this, though, the minimum may be higher — perhaps 32 GB.


REMEMBER

The more RAM a computer has, the more actions it can perform simultaneously. For example, a computer with a lot of RAM can run several complicated applications at once without bogging down.

» **Storage:** The computer's ability to keep a lot of data and many applications permanently on hand, ready to be copied into memory and used at a moment's notice. Every computer has at least one permanent storage component inside its case, known generically as a *hard drive* (or hard disk drive).


REMEMBER

A hard drive's capacity is measured in gigabytes (billions of bytes) or terabytes (trillions of bytes). More capacity costs more. The more storage you have, the more applications can be installed on your computer, and the more data you can save (photos, documents, videos, and so on).

Hard drives can also use different technologies, which offer different data access speeds. Traditional hard drives (often referred to as *hard disk drives*, or HDDs) use a mechanical and magnetic storage system; they are slower and cost less for the same amount of capacity. *Solid-state drives* (SSDs) use storage media that is technologically similar to RAM, and they are faster, quieter, more reliable, cooler, and more expensive.


REMEMBER

There's a PC for every budget and every set of needs — with prices to match. Before making your PC purchase, you need to think about how you'll use the computer and what specs it should have in order to enable you to do all the things you want to do with it.

Input Devices: Putting Stuff In

Any computer system must provide at least one way for you to convey your wishes — in other words, to provide *input*. Almost all computers today offer at least two methods of accepting input: a keyboard and some type of pointing device.

REMEMBER

- A *keyboard* is similar to a typewriter keyboard. In addition to typing text, you can press certain key combinations to quickly issue commands for common activities such as selecting, copying, and pasting text.

  All personal computers come with a keyboard. A desktop computer may have a detachable keyboard that you can replace with a different model if you want. Nowadays, you can get some spiffy third-party keyboards that have extra features and are designed to be more comfortable to use. A laptop keyboard is built-in, and you can't swap it out for a different one. (You can, however, connect a second, external keyboard to a laptop and use it instead of the built-in one.)

- A *pointing device* is a device that moves an on-screen pointer (usually shaped like an arrow). A pointer enables you to point at what you want and then select it by pressing a button on the pointing device. The three most popular types of pointing devices are:

  - **Mouse:** A mouse (Figure 1-1) is a little device about the size and shape of a bar of bath soap, with an LED and optical sensor on its underside. You slide the mouse across a flat surface with your hand, and that moves the pointer around onscreen. A mouse can be either wired (that is, have a cord that attaches to the computer) or wireless, operating via radio frequency (RF) signals or via Bluetooth.
  - **Trackball:** A trackball (Figure 1-2) is like an upside-down mouse. It has a stationary base with a ball on top, and you roll the ball with your fingers to move the onscreen pointer.

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FIGURE 1-1

Popova Olga/Adobe Stock Photos

FIGURE 1-2

- **Touchpad:** On a laptop PC, a touch-sensitive rectangular pad in front of the keyboard serves as a pointing device. You move your finger across the touchpad to move the onscreen pointer, and tap the touchpad to select items on the screen. Figure 1-3 shows a touchpad.

REMEMBER

All computers come with either a mouse (on a desktop PC) or a touchpad (on a laptop). You can buy third-party pointing devices that you may like better than the default ones you get with your computer.

chapay/Pixabay

FIGURE 1-3

Many specialty pointing devices are available. Some monitors have touchscreen capabilities; if you have one of these, you can move your finger across the monitor screen to move the pointer or select things, like you do on a touchpad.

Multimedia input devices enable you to input sound or video, which is important if you want to participate in a video chat, record voice narration for a slide show, or take a photo of yourself to send to a friend. Most laptops have a built-in camera named a *webcam* built into the edge of the display screen; most desktop PCs do not. You can buy an external webcam separately and plug it into one of the ports on a desktop PC to add this capability. A *microphone* enables you to input sound. You can also use a microphone to dictate text rather than typing it. Most laptops have a microphone built-in, and most desktops do not.

With the right hardware and software, you may be able to use *biometrics* (that is, unique features of your body) to enable you to access your computer securely. For example, one of the uses for a webcam is facial recognition (with the appropriate software). Some computers also have a fingerprint sensor that enables you to authenticate your identity by scanning a finger.

Output Devices: Getting Stuff Out

It would be a pretty one-sided and unsatisfying experience if you never got anything back from your computer, right? The most common way a computer provides feedback is through the display screen. The *display* is the graphical panel where you see the operating system interface, the applications you run, the websites you visit, and the data files you create, such as documents, spreadsheets, and messages. When a display is a separate unit from the computer, it's often referred to as a *monitor*.

A *printer* is another popular output device. A printer turns onscreen data to a paper copy that you can share with others. Chapter 3 covers printers in detail.

Yet another output device is a *speaker* (or a set of speakers). A computer speaker works basically the same way the speaker on your stereo system works — it enables you to hear the sound effects your computer generates as it operates, such as dings and beeps that accompany error messages. It also enables you to listen to music and watch videos that include sound using your computer. Chapter 16 explains how to play music on your computer.

What Is Software?

Software is what makes computer hardware work and lets you get things done, such as writing documents with Microsoft Word or playing a game of solitaire. A computer uses two types of software: operating systems and applications.

All computers have an *operating system (OS)*, which is system software that starts up the computer and keeps it running as you use it. Examples for desktop and laptop computers include Microsoft Windows, macOS (for computers made by Apple), Linux (a free operating system popular with techie-types), and ChromeOS (for low-cost computers designed primarily to access the Internet).

Most of the chapters in this book explain how to interact with Microsoft Windows; I picked Windows to talk about in this book because it has the largest market share.


TIP

If you happen to have an Apple Mac (formerly "Macintosh") computer, you may want to check out the book *Macs For Seniors For Dummies,* 4th Edition. It can help you get up to speed with this popular, user-friendly operating system.

Mobile devices such as tablets and smartphones have different operating systems. The most popular operating systems for mobile devices are iOS for Apple devices (iPhones and iPads) and Android for most other phones and tablets.

The operating system is responsible for the *graphical user interface (GUI),* which is pronounced *gooey*. The pictures, text, menus, boxes, and other items you see on the computer's screen are all part of the GUI. It also handles various housekeeping tasks such as saving and opening files, talking to the hardware on your behalf, and starting and exiting applications.

An *application* (sometimes called an app or a program) is software that does something that's directly useful or beneficial to the human using the computer. For example, Microsoft Word is an application that helps you write letters and other documents, and Microsoft Edge is a web browser application that helps you view web pages.

Each operating system comes with a few basic apps. For example, Microsoft Windows comes with a simple word processing program called WordPad, a simple drawing program called Paint, and a digital music player called Windows Media Player. Chapter 4 showcases several of these built-in Windows apps.

An operating system also comes with *utilities,* which are applications designed to perform tasks that keep your computer in top shape. For example, antivirus apps protect your computer from viruses, and Windows Update keeps Windows current. I cover both of these in Chapter 18.

WINDOWS VERSIONS AND EDITIONS

Each application has a version number or name, which is like a generation. Some version numbers correspond to the year the software was released, such as Microsoft Office 2021. Other version numbers indicate how many versions have come before, such as PostgreSQL 15 (that is, there were 14 previous versions). Still others have nonnumeric names, such as Adobe Acrobat CC. In that case, CC refers to Creative Cloud.

Microsoft used to assign different version numbers or names to each generation of Windows (such as Windows XP, Windows 7, Windows Vista, and so on), but they stopped doing that for Windows back in 2015, after they released Windows 10. Windows 10 was supposed to have been the last numbered version, but then Windows 11 came out in 2021, and that's the current version at this writing. A feature called Windows Update runs automatically in the background, downloading and installing fixes and new features whenever they are available. Chapter 18 explains more about Windows Update.

Because not every computing situation has the same needs, Microsoft produces different editions of Windows with different subsets of features. The two main ones you will probably encounter are Home and Pro. As you may guess, the Home edition is for people who use their computers at home or in small businesses. It's a less expensive edition because it doesn't include some business-oriented networking and security features. All the instructions and advice in this book apply equally well to either of those editions. Also, you can find an academic edition and a corporate enterprise edition, each with some specialty features its target audience may need.

TIP

You can actually do quite a bit with just the free apps that come with Windows, but if you ever want more, "more" is certainly available. For example, Microsoft Office is a suite of professional-quality business applications that you can subscribe to for about $100 a year, and use it on up to five computers. Chapter 4 covers applications in detail, and explains how to acquire, install, update, and remove them.

REMEMBER

Each app is written for one specific operating system; you can't mix and match them. However, most of the popular apps are available for multiple operating systems, so you just have to make sure you are getting the version of the app that is for your OS.

Decide on a Type of Computer

A *personal computer (PC)* is a computer designed to be used by one person. The word *personal* helps distinguish PCs from a variety of other computer types, everything from the powerful servers that calculate trajectories at NASA to the computer chip that controls the temperature in your refrigerator.

There are two basic categories of PCs: those that are easily portable and those that aren't. So your first decision is: *how important is portability*? Will you be sitting at the same desk each time you use the computer, or will you be out-and-about in coffee shops, hotel rooms, and such? The more portable models are *laptops* (sometimes called *notebooks*), and the less portable ones are *desktops*.

Desktop PCs are big and rather heavy; you can't just throw one in a briefcase and hit the open road. But you tend to get more features and power for your money with a desktop, and they're easy to repair and upgrade. Desktops can have very large external monitors, which is good news if your eyesight isn't great and you need a big screen. And because the keyboard is detachable, you can use any keyboard that works well for you, such as an ergonomically designed model that's easy on the hands and wrists.

Laptops are lightweight and easy to handle. They can run on battery power for hours at a time, so you can use one anywhere, such as in the passenger seat of a car, or in the middle of a national park. The built-in display, keyboard, and touchpad means no cables to get tangled or come unplugged, too. Because there is less space for fans, laptops sometimes run hot to the touch. Laptops tend to be more expensive for the same hardware capabilities, though, and more difficult (read: expensive) to repair. Most laptops have very limited upgrade possibilities.

WARNING

Tablets, such as the iPad, offer many basic computing capabilities and are extremely lightweight and portable. You can read books, check your email, play games, listen to music, watch videos, and more. A tablet can't take the place of a real PC, though. It doesn't have a real keyboard (although you can buy an add-on wireless keyboard if you really want one), so your finger on the touchscreen has to substitute for both keyboard and mouse. There's limited expandability or upgradability (for example, you can't add RAM to one), and most tablets can't interface with wired peripherals designed for desktop and laptop PCs because they lack the connection ports. Enjoy your tablet — or your mobile phone — but don't expect it to have all the same capabilities as a PC.

The traditional type of desktop PC is a tower design, which is a big rectangular box that sits upright on or under your desk. All the other components plug into it with cables: monitor, keyboard, mouse printer, and so on. Figure 1-4 shows an example.

BillionPhotos.com/Adobe Stock Photos

FIGURE 1-4

A tower case has plenty of room to add upgrades and new capabilities. It has powerful inside fans that keep everything cool. It's easy to open the case and easy to remove and replace parts.

Another form of desktop computer is an *all-in-one*, such as the one shown in Figure 1-5. With this type of computer, there is no big separate case for the processing components. All the components that would normally be inside the tower case are instead compactly sandwiched into a smaller box built into the back of the monitor. All-in-ones are often sleek and modern looking, involve fewer cables, and save you from using floor space for a computer tower. However, repairing or customizing the hardware is awkward and difficult, and replacing parts can be expensive because they don't usually use generic, off-the-shelf parts.

Kaspars Grinvalds/Adobe Stock Photos

FIGURE 1-5

Both desktop towers and all-in-ones take up more surface space than a laptop computer, but if you don't need portability in your computer or more space, a desktop may be the best choice.

Laptops come in a variety of sizes, mostly determined by the screen size (which is measured diagonally). The smallest mini laptops have screen sizes as small as 9 inches; the largest ones have screen sizes of 17 inches and upward. Larger displays are easier to see, but larger laptops are also bulkier and heavier (sometimes as much as 8 to 10 pounds), use more power, and can't run as long on a single battery charge. The smallest laptops may have undersized keyboards that are awkward to type on, and may have fewer features or less capability. For many people, a screen size of between 14 and 16 inches is a good compromise. Figure 1-6 shows a moderately sized model.

Engin_Akyurt/Pixabay

FIGURE 1-6

Another laptop feature to consider is a touchscreen. Many of today's laptops (and some desktops) have touchscreens that enable you to interact with them by using your finger or a digital pen, like you would with a tablet computer. See Chapter 2 for advice on using a touchscreen computer.

TIP

If you can't decide between a small touchscreen laptop and a tablet computer, you might consider a two-in-one laptop (see Figure 1-7), which enables you to either rotate the monitor to rest on the back of the keyboard or remove the monitor so you can use the laptop like a tablet. When you have no active physical keyboard, you have to use the touchscreen feature to interact with the laptop.

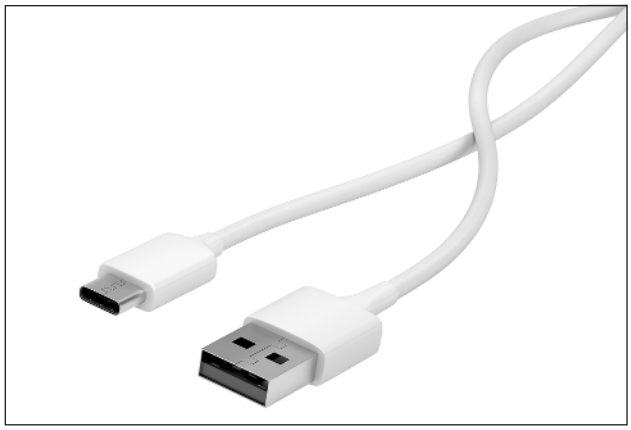
artiemedvedev/Adobe Stock Photos

FIGURE 1-7

Pick Your Connection Methods

Each desktop or laptop PC has one or more *ports* (connectors) to enable you to plug in external peripherals, such as printers, speakers, scanners, and so on. A *peripheral* is a computer component that isn't built into the main case. Desktop PCs tend to offer more ports than laptops do.

Universal serial bus (USB) is a very common, generic port type used for many different kinds of devices. Nearly every external device type comes in a USB version.



magraphics/Adobe Stock Photos

FIGURE 1-8

There are two types of USB ports. USB-A is an older style; it's been the standard for connecting external devices for 20+ years. Just recently a newer style, USB-C, has been released and is quickly gaining traction; it is expected to replace USB-A within a few years. Whatever computer you buy should have at least one of each. You can get an inexpensive adapter if your device has a different connector type than your computer, but it's more convenient if you don't have to deal with that. Figure 1-8 shows a USB-C connector on the left and a USB-A connector on the right.

Having more USB ports on a computer is nearly always better. The more USB ports your computer has, the more peripherals it can support at once. That may not seem like a big deal . . . until that moment when you need to plug in an external keyboard *and* mouse *and* printer *and* webcam all at once.

TIP

Pause a moment on that scenario of needing to plug in more USB peripherals than your computer has ports to accommodate. One way around that is to connect a USB hub (which is kind of like a power strip, but for USB instead of electricity) to a USB port. Then you can connect multiple USB devices to the hub and run them all off of a single USB port on the computer. It's not ideal, but it's a workable workaround.

Modern computers can also support wireless peripherals. Almost all laptops — and many desktops — include *Bluetooth*, a short-range

wireless transmitter/receiver that enables you to connect Bluetooth-capable wireless keyboards, pointing devices, and more. If using wireless peripherals appeals to you, make sure the computer your purchase supports them.

If you want to use wireless peripherals but the computer you are interested in doesn't have Bluetooth capability, all is not lost. You can add Bluetooth to almost any computer. In a desktop, you can have a computer repair shop install a Bluetooth card that can add it. With a laptop (or desktop, for that matter), you can alternatively connect a device to one of its USB ports that adds Bluetooth.

Yet another alternative is to choose wireless peripherals that don't use Bluetooth. An older technology for wireless devices predates Bluetooth, and wireless keyboards and mice are available that still use it. Such devices come with a tiny wireless transmitter/receiver that plugs into a USB port. It then communicates wirelessly with the keyboard or mouse. Figure 1-9 shows a wireless mouse and its USB-based transmitter/receiver.

FIGURE 1-9

Another important wireless connection you want is *Wi-Fi,* which is how you connect wirelessly to home networks and shared Internet connections in public places such as coffee shops. You read more about it in Chapter 7, but as you are shopping, make sure the computer you buy has Wi-Fi. All modern laptops do, but on a desktop PC it may not be a standard feature. You can always add it — the same as you might add Bluetooth — but it's better if it's already included.

One final consideration is the monitor port(s) that the PC supports. A desktop PC needs to connect to an external monitor, which is typically not included in the purchase price. You need to make sure that your PC and your monitor both can use the same type of connector. A built-in display screen on a laptop or all-in-one desktop doesn't require any special connection because it's hard-wired into the computer.

Over the years, monitor connector types have evolved; today, the standard is *High Definition Multimedia Interface (HDMI)*, the same type of connector that modern TVs use to connect to cable boxes and DVD players. Figure 1-10 shows an HDMI connector.

Evan-Amos/Wikimedia Commons/Public domain

FIGURE 1-10

Some computers also have another kind of monitor connection called *DisplayPort (DP)*, or a smaller version of it called *Mini DisplayPort.* Experts debate over which is better — DP or HDMI — but for our purposes they are pretty much equal. Figure 1-11 shows a regular DP

connector (left) and a Mini DP connector (right). The main reason to care is to make sure that your computer and your external monitor (if you are using one) share a common connection type.

kasarp/Adobe Stock Photos

FIGURE 1-11

Choose a Display Type

A display screen is the window to your computer's contents. The right display can make your computing time easier on your eyes. The crisper the image, the more impressive your vacation photos or that video of your last golf game looks.

REMEMBER

The display consists of two parts: the display screen you look at, and the display adapter that tells the screen what to display. On a laptop or an all-in-one desktop, you're stuck with the display screen and display adapter that it comes with; you can't usually upgrade them. That means you need to choose carefully when you purchase. Many online retailers enable you to choose the display adapter and display screen specifications when you place your order. On a tower desktop you can usually swap out both the display adapter and the monitor for better ones later.

The *display adapter* (also known as video or graphics card) is the translator between the software and the display screen. It does the calculations that result in certain parts of the screen lighting up

with certain colors. A high-end display adapter can add hundreds of dollars to the overall cost of a computer, so you don't necessarily want the fanciest and best one out there unless you plan on playing graphics-intensive games competitively or creating your own animated cartoon movies. The standard display adapter that comes with the average desktop or laptop PC today should be fine for ordinary home needs such as email, word processing, and Internet exploration.

Some desktop computers come with a monitor; if the one you're interested in doesn't then you need to buy a monitor separately. It is often actually better to buy the computer and the monitor separately because then you get exactly what you want.

Consider these factors when choosing a monitor:

- **Size:** Monitors for the average computer user come in all sizes, from tiny 9-inch screens on smaller laptops to 28-inch or larger desktop models. Larger screens are typically more expensive. Although a larger monitor can take up more space side to side and top to bottom, many don't have a bigger footprint (that is, how much space their base takes up on your desk) than a smaller monitor.
- **Image quality:** The image quality can vary greatly between monitors. You can use objective measurements of quality to compare different models, but it's often better to simply go to a retail store that sells monitors and view the screens in action, like you do when shopping for a television. You can see at a glance which monitor's picture you prefer without having to fuss with technical specifications.
- **Resolution:** A monitor's resolution represents the number of tiny dots (called *pixels*) that form the images you see on the screen. The higher the resolution, the more pixels it contains and the crisper the image. Most new monitors are at least High Definition (HD), which is a resolution of 1920x1080 pixels. HD is often referred to as 1080p. Higher end models will support 4K resolution, which is 3840x2160 pixels. It's called 4K because it is four times the resolution of standard HD.

- **Aspect ratio:** A monitor's aspect ratio is the ratio of its height to its width. A ratio of 1:1 would be a square, but monitors are almost always rectangles. The standard aspect ratio for most modern monitors is 16 horizontal to 9 vertical (referred to as 16:9). Some monitors designed for gaming are even wider than that, with a ratio of 21:9.
- **Cost:** The least-expensive monitor may be the one that comes with your desktop computer, and many of these are perfectly adequate. You can often upgrade your monitor when you buy if you customize a system from a company such as Dell or Hewlett-Packard. Monitors purchased separately from a computer can range from around $100 to $2,000 or more. Check out monitors in person if possible to verify whether their image quality and size are worth the money.
- **Touchscreen technology:** Windows provides support for using a touchscreen interface, which enables you to use your fingers to provide input by tapping or swiping on the screen itself. If you opt for a touchscreen device, you can still use your keyboard and mouse to provide input, but touchscreen technology can add a wow factor when performing tasks such as using painting software or browsing around the web or an electronic book (ebook).


WARNING

Displays with touchscreens usually cost more, and a lot of people who get them find that they don't use the touchscreen as much as they thought they would.

Evaluate Your Storage Options

Storage is an important part of a personal computer. You need to be able to store important software and data inside the computer case — in other words, internally. That's because internal storage is always available, and usually quite fast to access. You also need a way of getting access to external storage, such as external DVD and hard drives, USB flash drives, and online storage services.

All PCs have some sort of built-in storage device. Until recently, in nearly every system that was the *hard disk drive (HDD)*, sometimes

just called the hard disk or hard drive. A hard disk drive is a sealed metal cartridge containing metal platters on which data is stored in patterns of magnetic polarity.

Today, a new technology of internal storage called a *solid-state drive (SSD)* is fast replacing HDDs as the storage medium of choice in PCs. SSDs use the same technology as RAM uses, and they are faster, more reliable, quieter, and cooler — in other words, all-around better. The one way that HDD wins that match-up is on price: SSD drives are more expensive for the same capacity.

Capacity is the other big decision point when computer-shopping. The higher capacity the internal storage device, the more applications and data you are able to store without running out of room. Storage is measured in *gigabytes* (billions of bytes, abbreviated GB) or *terabytes* (trillions of bytes, abbreviated TB). More is better — to a point. When you get into very high-capacity storage devices (multiple terabytes), the price begins to get so much higher that it's not worth the cost for most casual users.

WARNING

You also don't need to waste your money on an obscene amount of storage that you will never use. The average home user won't even need a single terabyte of storage in their lifetime. And keep in mind that you can have external storage as well as internal; at any point you can buy an external SSD or HDD and connect it to your computer to offload data that you may not need in the near future.

DO I NEED A DVD DRIVE?

In the recent past, most computers came with an optical drive where you could insert a DVD and play a movie or music. If you bought an application, it usually came on a DVD.

Today, most new computers and laptops don't include an optical drive for reading DVDs, partially because you can so easily stream video or download a new application from an online source without ever handling a DVD. People who still have software or videos on DVD that they need to be able to access by using their

computer can purchase an external DVD drive and connect it to the computer using a USB port whenever the drive is needed. And with most desktop tower PCs, it's a fairly simple matter to have an internal DVD drive installed at any local PC repair shop if you decide you want one later.

If you want to play the latest optical discs on your PC, get a computer with a Blu-ray player (or buy an external Blu-ray player that you can connect to your PC via USB port). Blu-ray is a great medium for storing and playing back feature-length movies because it can store 50GB or more, about ten times as much as the average DVD.

Consider How You Will Get Online

You also have to decide how you can connect to the Internet. You need Internet access because so much of the usefulness of a PC depends on being able to access online content.

From a computer-buying perspective, you have just one important consideration: How will your computer physically connect to your home Internet connection? Your two choices are *wired* (that is, with a cable) and *wireless* (with radio waves). A wired connection is faster and more reliable, but it keeps your computer tethered to one spot in the house. If you're going with a desktop PC, that's not a problem; in fact, most desktop PCs come with a port for plugging in a network cable. This port is commonly called an *Ethernet port*, or an RJ-45 jack, or wired networking. Figure 1-12 shows this port, so you can make sure it is present on the computer you plan to buy if you think you will need it. It's like a telephone connector except wider.

Some desktop PCs also support wireless networking; if yours doesn't, it's easy enough to upgrade it to have that capability. Any local PC repair shop can install it.

崇正 魚谷/Adobe Stock Photos

FIGURE 1-12

If you decide on a laptop, it had better have wireless networking capabilities built in, because you'll be roaming around the house with your laptop — and perhaps farther afield than that. There have been various standards for wireless networking (also named Wi-Fi) over the years, but all the standards start with 802.11 and have one or more letters following that number. The current consumer-level standard at this writing is 802.11ax, also named WiFi 6; the slightly older standard of 802.11ac (WiFi 5) is also still in use. A new laptop should support 802.11ax. And there's a new standard coming down the pipeline soon: WiFi 7 (802.11be). Devices that support it are starting to become available, but there's no need to pay extra for that support at this point.

Internet service doesn't just magically appear at your home when you buy a computer; you have to subscribe to an Internet service through a company called an Internet Service Provider (ISP), which operates similarly to a cable TV company. (In fact, most cable TV companies also provide Internet service.) See Chapter 7 to read how to choose and set up a home Internet connection.

MAKING YOUR CHOICES SIMPLE . . .

If you're a bit overwhelmed by all this new vocabulary, never mind all that: Just answer these questions.

- **Question 1: Desktop or laptop?** Desktops are good for people who plan on using the PC from the same desk every day. You get more computing capability for your money with a desktop. Laptops offer more mobility and flexibility, but they have smaller screens and keyboards and are more difficult and costly to repair and upgrade.
- **Question 2: Do you need high performance?** If you're going to be working extensively with video editing, music production, or the latest shoot-em-up games, look for a fast processor and a top-quality display adapter. If you're just interested in email, writing, and photo sharing, the latest processing and graphics technology will be wasted on you.
- **Question 3: Are you a multitasker?** If you think you'll be doing a dozen tasks at once on your computer, such as watching a video, editing photos, switching between different websites, and video chatting with a friend, you will need extra RAM (memory).
- **Question 4: Do you plan on using a lot of external devices?** If you think you'll be plugging in many different devices, such as an external keyboard, mouse, webcam, phone charger, speakers, and so on, you want a model with as many USB ports as possible. Make sure you have at least one USB-A port and one USB-C port.
- **Question 5: Wired or wireless Internet?** A desktop PC should have an Ethernet port for connecting a cable that links your computer to your Internet connection at home. A laptop PC should have 802.11ax wireless networking support.

Where to Shop for Your New PC

You can buy a PC for anywhere from about $199 to $5,000 or more, depending on your budget and computing needs. You may start shopping thinking that you want a "just the basics" model, but when you start thinking about extras such as a larger monitor or larger storage capacity, you may find that the price goes up quickly.


TIP

A good rule to follow is to buy just as much computer as you need *now*, and don't plan too aggressively for what you may need in the future. By the time the future gets here, a new computer with better capabilities will probably be a lot cheaper than it is now.


TIP

You can shop in a retail store for a computer or shop online using a friend's computer (and perhaps get their help if you're brand new to using a computer). Consider researching different models and prices online with the help of a computer-savvy friend and using that information to get the best buy. Be aware, however, that most retail stores have a small selection compared to all you can find online on websites such as `Amazon.com` and `Newegg.com`. Additionally, retail stores sometimes carry slightly older models than those available online.

You can also shop online at the websites for individual brands. These websites enable you to fine-tune the configuration of the computer you want, so you don't have to settle for anything less than your exact preferences. Personally, I like Dell (`dell.com`), but there are many other well-known, reliable brands, such as Hewlett-Packard (`hp.com`), Lenovo (`lenovo.com`), and Apple (`apple.com`). The brand matters, not only because you know it uses good parts and has good quality control, but because you want to be able to rely on the company's technical support and warranty services.

Buying a computer can be confusing, but here are some guidelines to help you find a computer at the price that's right for you:

- **Determine how often you will use your computer.** If you'll be working on it eight hours a day running a home business, you will need a better-quality computer to withstand the use and provide good performance. If you turn on the computer once or twice a week just to check email, it doesn't have to be the priciest model in the shop.
- **Consider the features that you need.** Do you want (or have room for) a 28-inch monitor on your desk? Is it critical that your

computer runs very fast, or runs many programs at once? Do you need to store a great deal of data, such as hundreds of hours of video footage? (I cover computer speed and storage earlier in this chapter.) Each feature or upgrade adds dollars to your computer's price. Understand what you need before you buy.

- **Check software requirements.** If there is a certain application you know you want to use, check its system requirements to make sure the computer you buy meets them.
- **Shop wisely.** If you walk from store to store or do your shopping online, you'll find that the price for the same computer model can vary by hundreds of dollars at different stores. See if your memberships in organizations such as AAA, AARP, and Costco, or using a certain credit card, make you eligible for better deals. Consider shipping costs if you buy online, and keep in mind that many stores charge a restocking fee if you return a computer you aren't happy with. Some stores offer only a short time period, such as 14 days, in which you can return a computer.
- **Buying used or refurbished is an option, though new computers have reached such a low price point that this may not save you much.** In addition, technology gets out of date so quickly that you may be disappointed buying an older model, which may not support newer software or hardware.
- **Online auctions are a source of new or slightly used computers at a low price.** However, be sure you're dealing with a reputable store or person by checking reviews others have posted about them or contacting the online Better Business Bureau (`www.bbb.org`). Be careful not to pay by check (this gives a complete stranger your bank account number); instead use the auction site's tools to have a third party handle the money until the goods are delivered in the condition promised. Check the auction site for guidance on staying safe when buying auctioned goods.

TIP

Some websites enable you to compare several models of computers side by side, and others, such as `Pricegrabber.com`, enable you to compare prices on a particular model from multiple stores.

TIP

New to all this? Find a computer-savvy friend to help you shop for your first computer. People who have been using computers for a while usually have an informed opinion about what features are important, what's a good value, and what pitfalls to avoid.