Instructor's Manual

Exploring Computing Concepts 2016, Chapter 1

Available Instructor Resources

Resource	File Name	Found
Student Data Files	Various, click link to see file list	Online Instructor Resource Center
Solution Files	Various, click link to see file list	Online Instructor Resource Center
Answer Keys Matching Multiple Choice Concepts Checks	 cc01_answerkey_match.docx cc01_answerkey_mc.docx cc01_answerkey_concepts.docx	Online Instructor Resource Center
Scorecards	Various, example: cc01_b2StockData _scorecard.xlsx	Online Instructor Resource Center
Scoring Rubrics	cc01 _rubric.docx	Online Instructor Resource Center
Annotated Solution Files	Various, example: cc01_b2StockData_annsolution.pdf	Online Instructor Resource Center
PowerPoint Presentation	cc01_powerpoints.pptx	Online Instructor Resource Center
Testbank	cc01_testbank.doc	Online Instructor Resource Center
Instructor's Manual (lesson plans incl.)	cc01_instructormanual.docx	Online Instructor Resource Center
Assignment Sheet	cc01_assignsheet.docx	Online Instructor Resource Center
File Guide	cc01_file_guide.xlsx	Online Instructor Resource Center
Objective Map	cc01_objectivesmap	Online Instructor Resource Center

CHAPTER OBJECTIVES

When students have finished reading this chapter, they will be able to:

- Identify types of computer hardware
- Work with software
- Classify networks
- Connect to the Internet
- Identify network components
- Collaborate over the Internet
- Communicate over the Internet
- Get information from the Web
- Understand computer threats
- Protect yourself and your digital property
- Use technology ethically

CHAPTER OVERVIEW

Students will learn how to identify different types of computers, hardware, and software. They will learn how to connect to and communicate and collaborate on the Internet. Finally, students will learn how to identify various types of computer threats and ways to protect against them, and describe how to use technology ethically.

The major sections in this chapter are:

1. **Computer Hardware and Software.** In this section, students will learn how to identify different types of computers, input and output devices; describe the CPU, RAM, and virtual memory; and identify devices used to store data. They will also identify desktop and mobile operating systems, describe the primary functions of an operating system, and describe various types of application software and their uses.

2. **The Internet and Networking.** This section covers how to describe the primary ways networks are classified and explains how to connect to the Internet using wired and wireless technology.

3. **Electronic Collaboration and Communication**. This section explains how to collaborate by sharing documents and using online tools as well as methods used to communicate over the Internet. In addition, this section describes web browsers and their functions, and will show how to identify and describe the components of a URL.

4. **Computer Security, Privacy, and Ethics**. In this section, students will learn how hackers, viruses, and malware are threats to computer systems. This section also explains how security software and firewalls protect data and devices from computer threats and describes methods used to backup data. In addition, how to use technology ethically is discussed.

CLASS RUN-DOWN

1. Have students turn in homework assignments.
2. Talk about the chapter using the discussion questions listed below.
3. Use a PowerPoint presentation to help students understand the chapter content.
4. Have students complete the Capstone Exercise for Computing Concepts.
5. Use MyITLab for in-class work or to go over homework.
6. Give students the homework handout for the next class period.

LEARNING OBJECTIVES

At the end of this lesson students should be able to:

- Identify different types of computers
- Identify input devices
- Identify output devices
- Describe the CPU
- Describe RAM and virtual memory
- Identify devices used to store data
- Identify desktop and mobile operating systems
- Describe the primary functions of an operating system
- Describe various types of application software and their uses
- Describe the primary ways networks are classified
- Explain how to connect to the Internet using wired technology
- Explain how to connect to the Internet using wireless technology
- Identify the main components of a simple network
- Explain how to collaborate by sharing documents and using online tools
- Explain the methods used to communicate over the Internet
- Describe Web browsers and their functions; identify and describe the components of a URL
- Explain how hackers, viruses, and malware are threats to computer systems
- Explain how security software and firewalls protect data and devices from computer threats
- Describe methods used to back up data
- Discuss how to use technology ethically

Key Term Matching Answer Key
Exploring Getting Started, Computer Concepts

1. A software or hardware component that prevents unauthorized access to or from a computer connected to the Internet.

   g. Firewall

2. Concerned with specific user tasks, such as creating documents, sending email, or working with digital photographs.

   b. Application software

3. This technology is a wireless communication that uses low-bandwidth, short-range wireless connections (usually less than 30 feet) between computers and peripherals.

   c. Bluetooth

4. A type of portable computer that converts into a tablet.

   a. 2-in-1 PC

5. A maliciously written software program that can result in small user annoyances or total destruction of data or system components.

   s. Virus

6. A type of connection for multimedia devices to play HD audio and video content.

   i. HDMI

7. Computer memory that stores data and programs that are currently in use.

   o. Random Access Memory (RAM)

8. An email scam in which the sender tries to dupe you into revealing credit card, bank account, or other personal information that could be used to steal your identity.

   m. Phishing

9. Uses glass fibers to transmit data at the speed of light.

   f. Fiber optics

10. Data turned into meaningful content.

    j. Information

11. Enables you to use your Internet connection as a telephone to make domestic or international calls.

    t. Voice over Internet Protocol (VoIP)

12. Means for mobile devices to connect to the Internet wirelessly.

k. Mobile broadband

13. Someone who gains unauthorized access to a computer system for the purpose of stealing information or performing malicious acts.

h. Hacker

14. Newer technology for monitors that provides higher contrast and better viewing angles because it works without a backlight.

l. Organic light-emitting diode (OLED)

15. Representing someone else's work as your own.

n. Plagiarism

16. Software that has been downloaded and installed onto your computer to track your Internet travel, gather personal information, or change computer settings.

q. Spyware

17. A silicon chip containing the circuitry that controls all the computer's activities.

e. Central processing unit (CPU)

18. An Internet connection that divides a transmission path into channels to accommodate more data traffic. Examples include DSL and cable.

d. Broadband

19. An application that performs special functions related to coordinating system resources and file management.

r. Utility program

20. A type of storage device that has no moving parts.

p. Solid state drive

Guide to Home Networking and Online Computing

Home Networking

Home networks offer wired and wireless access to the Internet and facilitate sharing files and peripherals between network users. Home networks can be described as the following:

- Peer-to-peer
- Local area network
- Ethernet

Hardware

Most home networks include basic hardware components. These components include:

- Modem:
- Router
- Network Adapter

Wireless vs. Wired

Wired and wireless connections are necessary in most home networks. The best performance will come from a wired connection, but often a wireless connection offers the most convenience, especially with portable devices such as laptops, tablets, and smartphones. In fact, many new devices do not have dedicated Ethernet ports that are used for wired connections.

Current Wireless (Wi-Fi) Standards

- 802.11g
- 802.11n
- 802.11ac

Broadband Wired Internet Connections

- Fiber Optic
- Cable
- Digital Subscriber Line
- Satellite

Network Security

- Firewall
- Virus protection software

Online Computing

Once you are connected to the Internet, you have access to a variety of tools to help you collaborate and communicate online. In addition, the Web offers access to a world of information.

Getting information from the Web

- Web browsers

- Protocols
- Top-level domains

Collaborate over the Internet

- Collaborating with web-based productivity software
- Sharing files with online storage accounts

Communicate over the Internet

- Email
- Blogs

Capstone Rubric
Getting Started Computing Concepts

You may use the following rubrics as a guide to evaluate the student work, but, of course, you may impose any additional grading criteria you choose.

Performance Elements	**Level 3 Exceeds Expectations**	**Level 2 Meets Expectations**	**Level 1 Below Expectations**
Identify Types of Computers	More specifications than expected are given, and a detailed explanation of the choice is provided. Speaker notes offer greater detail.	Identifies the type of computer needed, provides specifications for the chosen device, and gives rationale for the choice. Speaker notes are complete.	Specifications do not include primary needs; operating system is not specified. Speaker notes are missing or incorrect.
Identify Hardware and Software	Details about the CPU, RAM, internal storage, and software applications are greater than expected.	Details about the CPU, RAM, internal storage, and software applications are sufficient.	Some details about the CPU, RAM, internal storage, and software applications are missing or incorrect.
Connecting To and Working on the Internet	Network and wireless connections are property identified with added details; collaborative and online tools are specified with added details, and URLs are provided in the speaker notes.	Network and wireless connections are property identified; collaborative and online tools are specified, and URLs are provided in the speaker notes.	Some details about network or wireless connections, and collaborative and communication tools are missing or incorrect. Some or all URLs are not provided in the speaker notes.
Protecting Against Computer Threats	Details about preventing computer threats and backup options are greater than expected.	Details about preventing computer threats and backup options are sufficient.	Details about preventing computer threats and backup options are incomplete or incorrect.
Using Technology Ethically	Acceptance letter is submitted and includes a paragraph on how the technology will be used ethically with greater detail than expected.	Acceptance letter is submitted and includes a paragraph on how the technology will be used ethically.	Acceptance letter is missing, or paragraph on how the technology will be used ethically is incomplete or incorrect.
Formatting	Presentation and letter are formatted properly and do not include spelling or grammatical errors.	Presentation and letter are formatted properly and include few spelling or grammatical errors.	Presentation and letter are not formatted properly and include many spelling or grammatical errors.

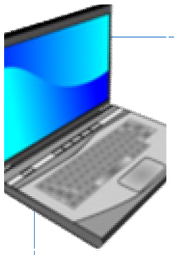
Computer Concepts: Guide to Computers

StudentFirst StudentLast

Identifying Types of Computers

Desktop

- Not mobile
- Usually in components



Laptop

- Portable

Smartphone

- Compact
- GPS, camera, phone

Supercomputer

- High processing power
- Limited in function

Main Frame

- Manages large amounts of data

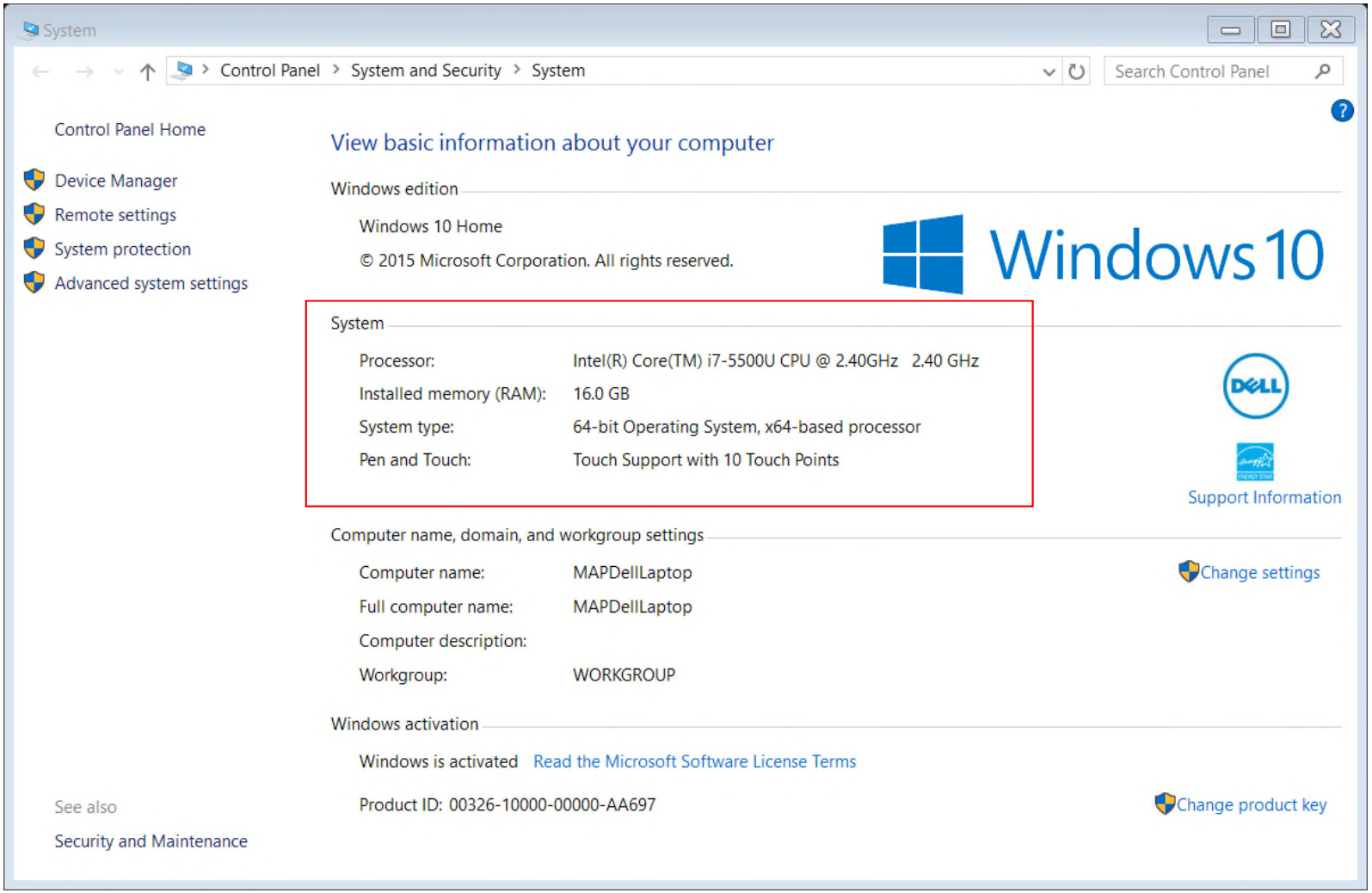
Embedded

- Used in everyday items
- Task-oriented

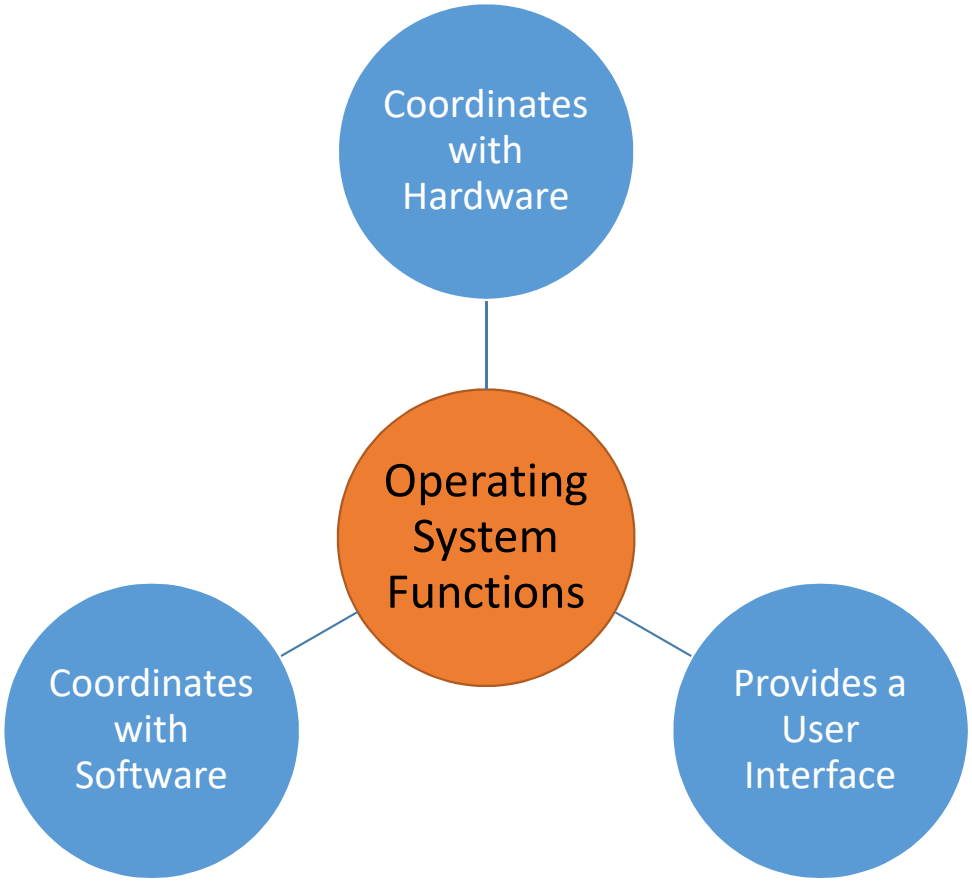
Identifying hardware components

Input	Output	Processing/ Memory	Storage
• Mouse • Keyboard • Microphone	• Monitor • Printer	• CPU • RAM	• SSD • Flash Drive • Cloud

Finding computer specifications



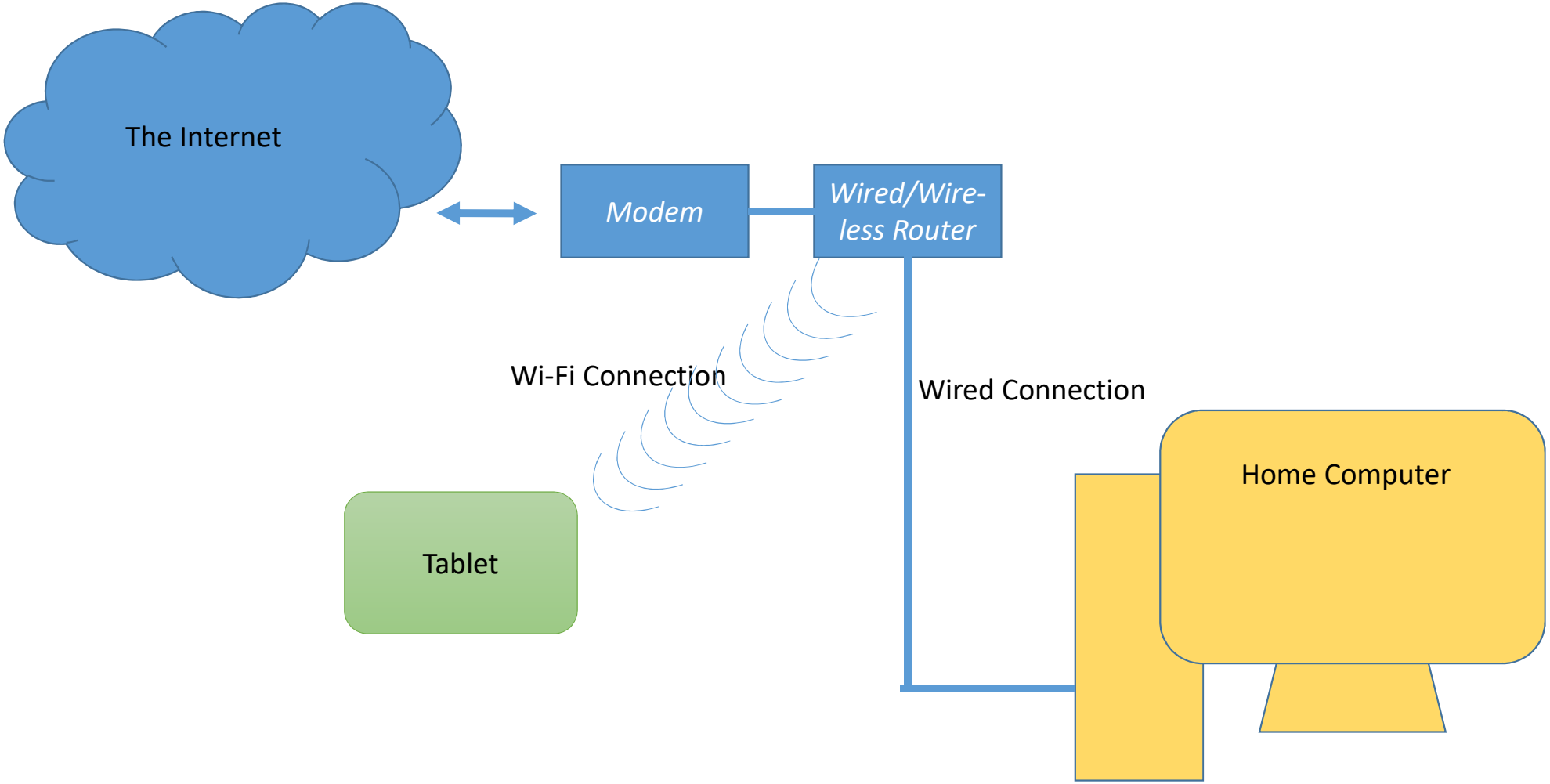
Identifying Operating System Functions



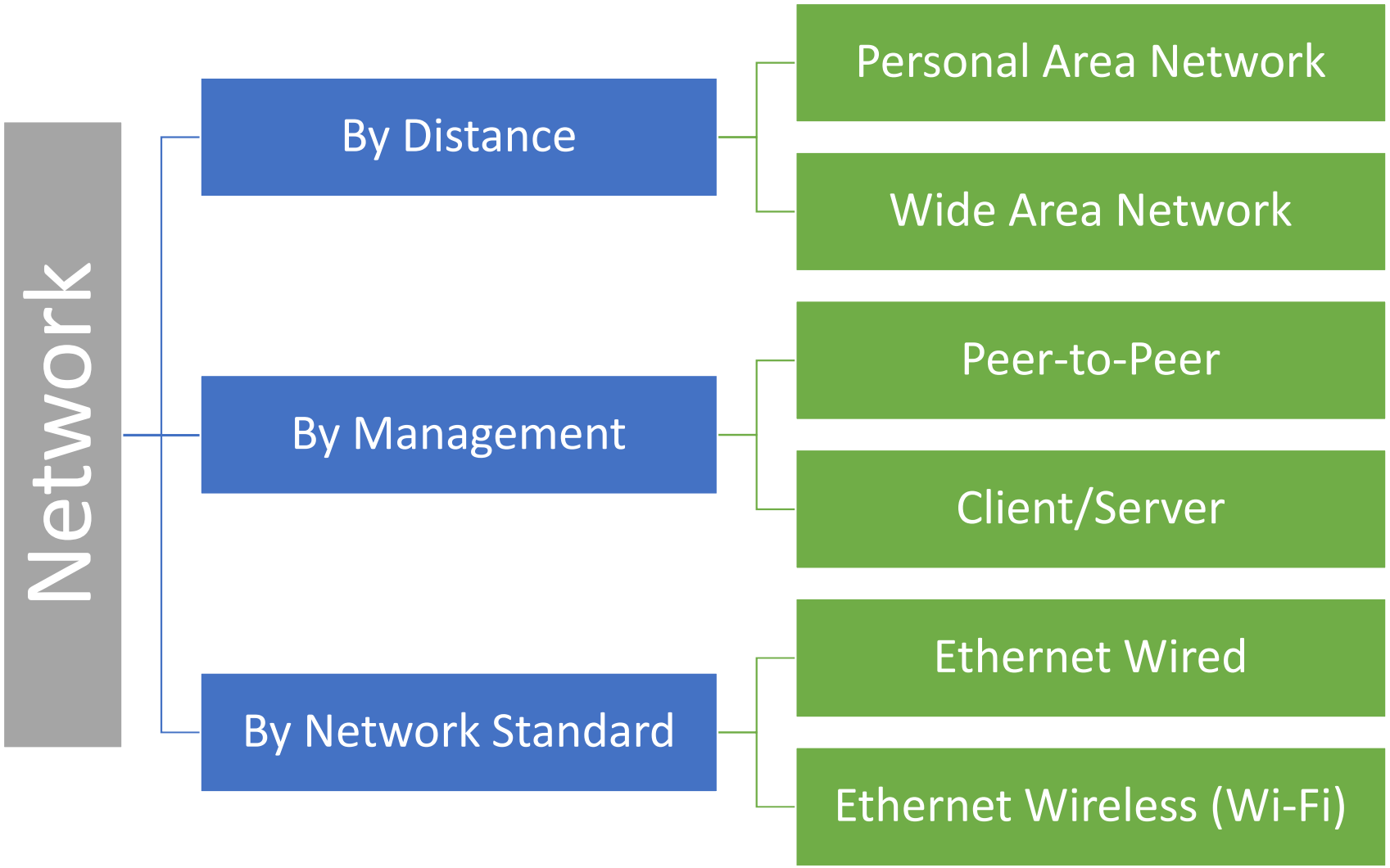
Working with software

	Desktop Operating System	Mobile Operating System	Application Software
Example	Windows macOS	Android iOS	Word Excel

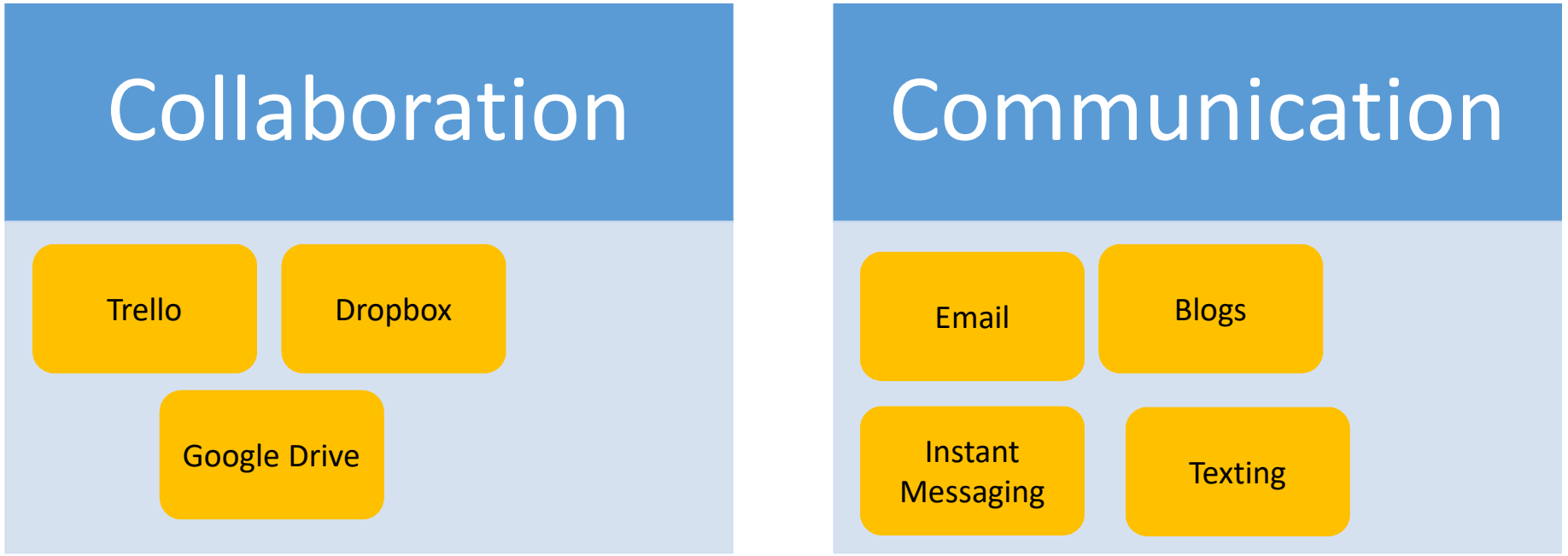
Connecting to the Internet



Classifying a Network



Classifying online tools

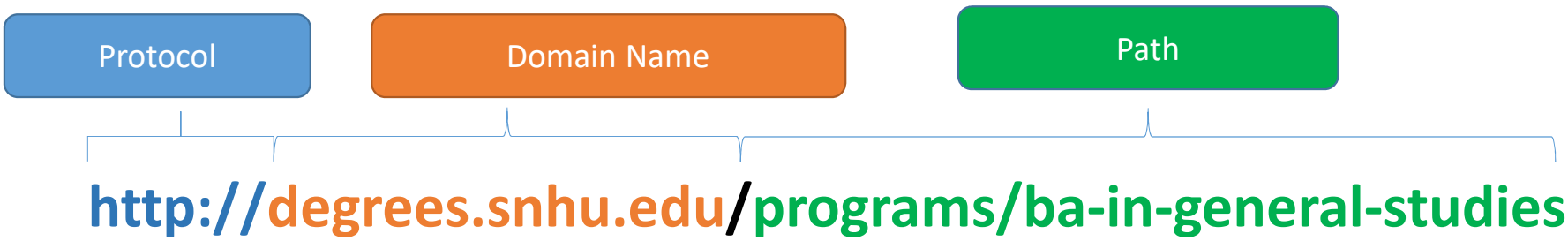


Collaboration and Communication Tools

The Anatomy of a URL

URL: Uniform Resource Locator

- Definition: A unique address on the Internet by which specific Web pages may be reached.



Understanding security types

	Firewall	Anti-virus	Anti-malware
Protects against	Hackers	Viruses	Malware
Example	Router, Operating System	Norton Anti-virus	Spy Sweeper

Using technology ethically

Plagiarism

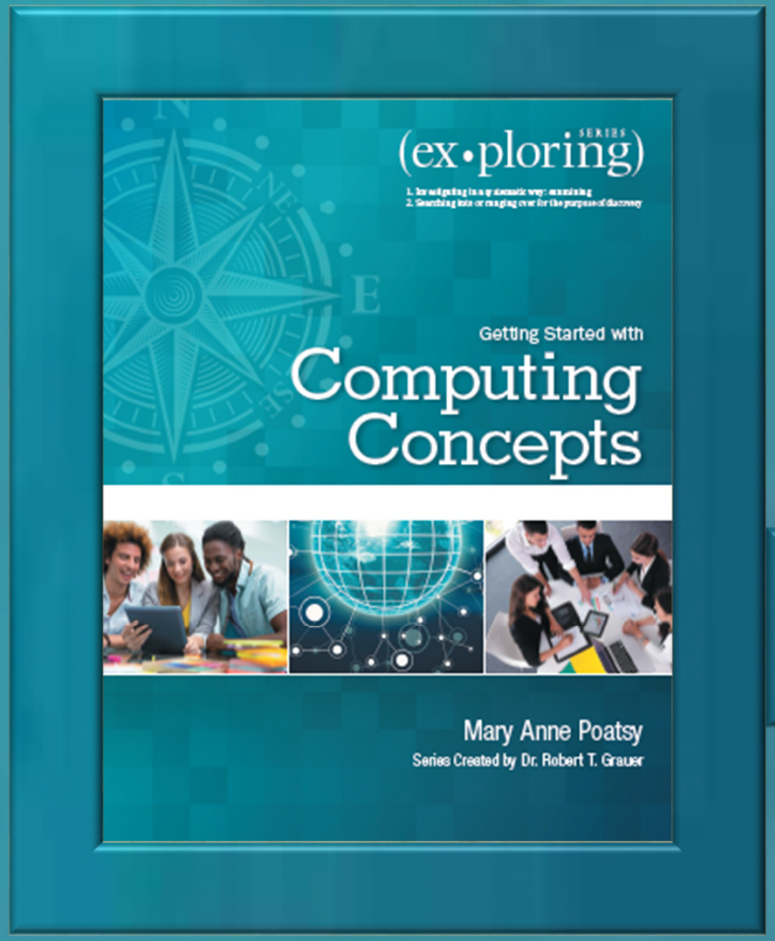
- Representing other's ideas as your own
- Not illegal, but not accepted practice

Academic Fair Use

- Limited copyright use for educational purposes
- Credit should still be given to copyright holder

Creative Commons

- Varying levels of copyright protection
- Used mainly by artists and musicians



Exploring

Getting Started with Computing Concepts

Mary Anne Poatsy

Series Created by Dr. Robert T. Grauer

SERIES (ex·ploring)

1. Investigating in a systematic way: examining. 2. Searching into or ranging over for the purpose of discovery.

Chapter 1

Computing Concepts

Getting Started with Computing Concepts

Objectives

- Identify Types of Computer Hardware
- Work with Software
- Classify Networks
- Connect to the Internet
- Identify Network Components
- Collaborate Over the Internet

Objectives

- Communicate Over the Internet
- Get Information from the Web
- Understand Computer Threats
- Protect Data and Digital Devices
- Use Technology Ethically

SERIES
(ex·ploring)

1. Investigating in a systematic way: examining. 2. Searching into or ranging over for the purpose of discovery.

Objective 1: Identify Types of Computer Hardware

Skills: ◆ Identify Different Types of Computers ◆ Identify Input Devices ◆ Identify Output Devices ◆ Describe the CPU ◆ Describe RAM and Virtual Memory ◆ Identify Devices Used to Store Data

Identify Types of Computer Hardware

- Computers—input, process, output, and store data and information
- Data—raw facts
- Information—data that has been converted into a usable and meaningful format

Identify Types of Computer Hardware

Personal Computers:

- Stationary
  - Desktop
- Mobile
  - Notebook or Laptop/Ultrabook/2-in-1/Chromebook
  - Tablet
  - Smartphone

Identify Types of Computer Hardware

Business and other use computers:

- Supercomputers—most powerful systems in the world
- Mainframes—used to manage large amounts of data
- Embedded computer—specifically designed computer chip within another device

Identify Types of Computer Hardware

Identify Types of Computer Hardware

Input devices:

- Keyboard
- Mouse
- Touchpad
- Stylus
- Microphone
- Webcam/Digital camera
- Scanner

Identify Types of Computer Hardware

Output devices:

- Monitor
  - LCD, LED, or OLED
- Printer
  - Inkjet or laser
- Speakers

Identify Types of Computer Hardware

System unit components:

- Central processing unit or processor
- Computer memory
- Storage devices
  - Drive storage—magnetic, solid state, and optical media
  - Portable storage—flash or USB drive

SERIES (ex·ploring)

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Objective 2: Work with Software

Skills: ◆ Identify Desktop and Mobile Operating Systems ◆ Describe the Primary Functions of an Operating System ◆ Describe Various Types of Application Software and Their Uses

Work with Software

- Software—instructions that tell computer hardware how to input data and produce output
- Two types of software:
  - System—group of programs that controls how a computer functions
  - Application—computer program that helps organize and complete productive tasks at work, school, or home

Work with Software

- Computer operating systems:
  - Microsoft Windows
  - Mac OS
  - Linux
- Mobile operating systems:
  - iOS from Apple
  - Android from Google
  - Windows 10 from Microsoft

Work with Software

Work with Software

Application software:

- Productivity software—suite of applications
- Apps—single function or single purpose software
- Commercial software—not allowed to copy
- Shareware—software that is available as a free trial before purchasing
- Freeware—free software that comes with a less restrictive licenses

SERIES
(ex·ploring)

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Objective 3: Classify Networks

Skills: ◆ Describe the Primary Ways Networks Are Classified

Classify Networks

- Network—two or more connected computers
- Internet—world's largest network
- Network classifications:
  - Distance between nodes
  - Way in which the network is managed
  - Means by which data is exchanged between nodes

Classify Networks

- By distance:
  - Personal area network (PAN)
  - Local area network (LAN)
  - Wide area network (WAN)
- By management:
  - Centrally—client/server network
  - Locally—peer-to-peer network
- By network standard:
  - Ethernet protocol

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Objective 4: Connect to the Internet

Skills: ◆ Explain How to Connect to the Internet Using Wired Technology

◆ Explain How to Connect to the Internet Using Wireless Technology

Connect to the Internet

- Wired broadband connections:
  - Fiber-optics
  - Cable
  - Digital subscriber line (DSL)
  - Satellite technology
- Dial-up

Connect to the Internet

Wireless connections:

- Wi-Fi hotspot
- Mobile broadband
- Bluetooth

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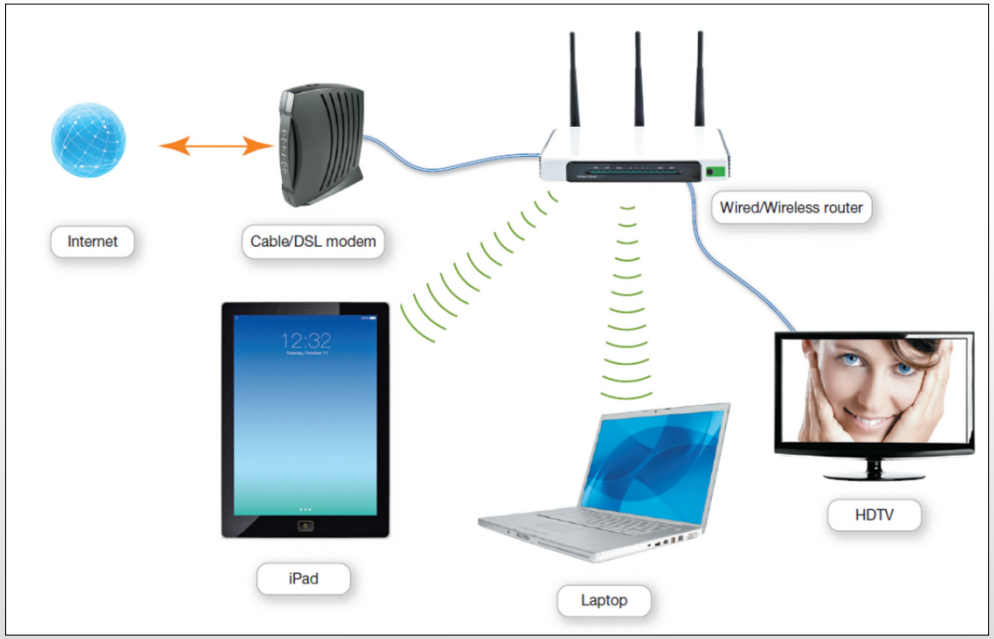
Objective 5: Identify Network Components

Skills: ◆ Identify the Main Components of a Simple Network

Identify Network Components



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Objective 6: Collaborate Over the Internet

Skills: ◆ Explain How to Collaborate by Sharing Documents and Using Online Tools

Collaborate Over the Internet

- Share and collaborate online using:
  - Online storage sites
  - Productivity software
- A team member can access, modify, and make a document available for others
- Team members can simultaneously modify the same document

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Objective 7: Communicate Over the Internet

Skills: ◆ Explain the Methods Used to Communicate Over the Internet

Communicate Over the Internet

Internet communication:

- Email (or electronic mail)
- Instant messaging (IM)
- Texting (SMS)
- Blog (weblog)
- Voice over Internet Protocol (VoIP)

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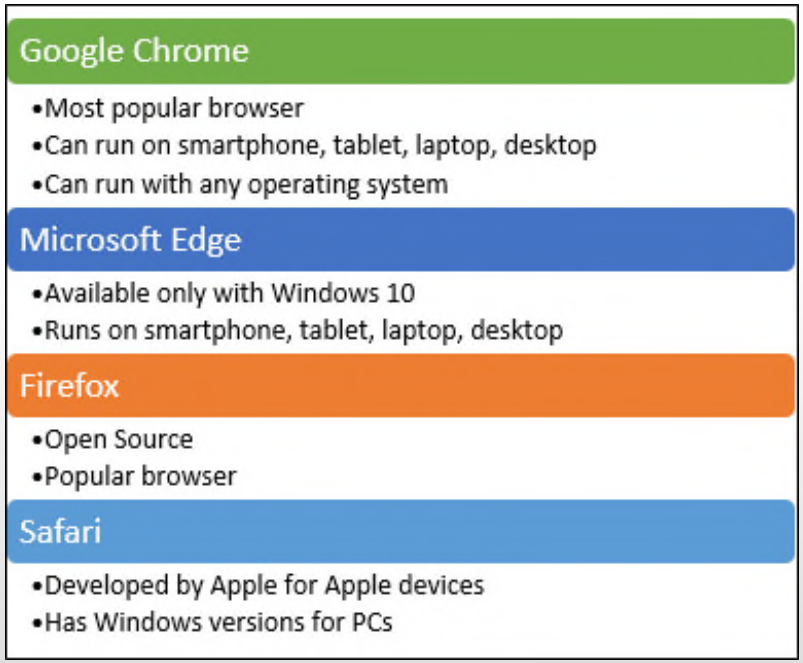
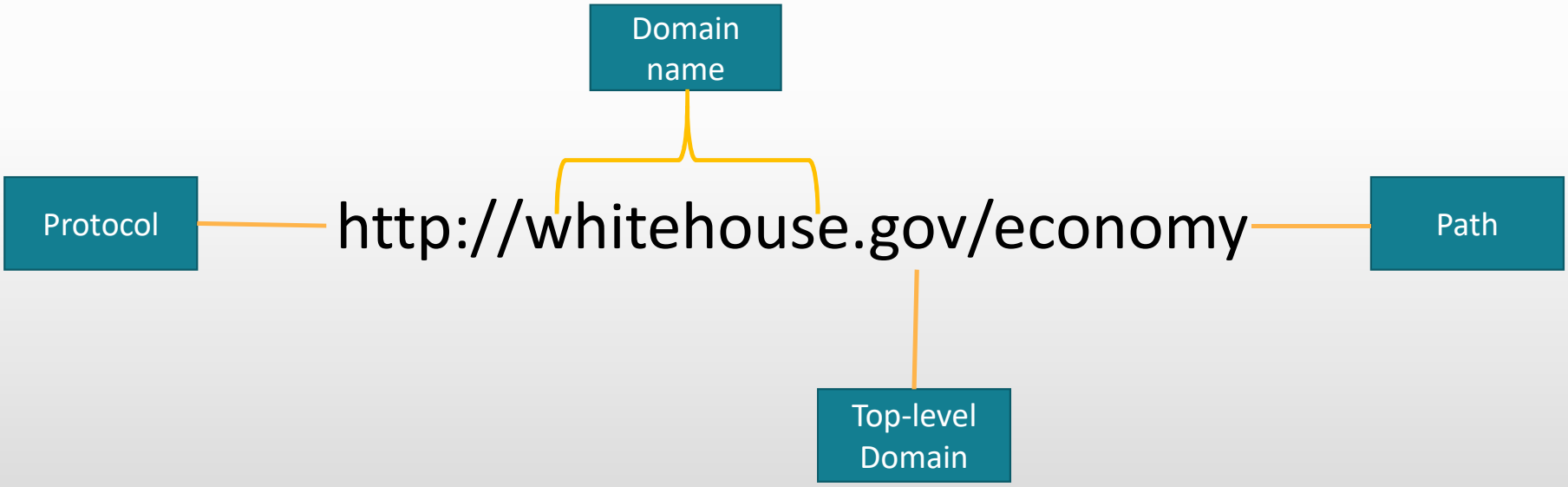
Objective 8: Get Information from the Web

Skills: ◆ Describe Web Browsers and Their Functions ◆ Identify and Describe the Components of a URL

Get Information from the Web



Get Information from the Web



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Objective 9: Understand Computer Threats

Skills: ◆ Explain How Hackers, Viruses, and Malware are Threats to Computer Systems

Understand Computer Threats

- Hacker—someone who breaks into a computer system without permission
- Computer virus—program that attaches itself to another program
- Adware—software that automatically displays or downloads unwanted advertising materials

Understand Computer Threats

- Spyware—adware that collects personal information without consent
- Phishing software—lures you to reveal personal information
- Scareware—displays a warning that the computer is infected
- Cookies—small text files stored on your hard drive

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(ex·ploring)
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Objective 10: Protect Yourself and Your Digital Property

Skills: ◆ Explain How Security Software and Firewalls Protect Data and Devices from Computer Threats ◆ Describe Methods Used to Back Up Data

Protect Yourself and Your Digital Property

Protection:

- Antivirus software—identifies and removes viruses
- Antispyware software—removes or prevents spyware
- Parental controls—enable parents to protect children
- Firewall—hardware or software that protects your computer from unauthorized access
- Backup—a copy of your most important files

SERIES (ex·ploring)

1. Investigating in a systematic way: examining. 2. Searching into or ranging over for the purpose of discovery.

Objective 11: Use Technology Ethically

Skills: ◆ Discuss How to Use Technology Ethically

Use Technology Ethically

- Intellectual property
- Plagiarism
- Academic fair use
- Copyleft

Summary

- Hardware and software work together to manage data and present information.
- Networks enable you to communicate with other computers to share and collaborate.
- It is important to be proactive against computer threats and to use technology ethically.

Questions

Copyright