

REVIEW LESSON

MTA Course: 10753 Windows Operating System Fundamentals

Lesson name: Windows Operating System Fundamentals 5.1-5.2

Topic: Connect devices and understand storage (One 50-minute class period)

File name: 10753_WindowsOS_RL_5.1-5.2

Lesson Objectives

5.1: Connect devices. *This objective may include but is not limited to:* connecting plug-and-play devices, connecting and disconnecting printers, installing third-party software for devices.

5.2: Understand storage. *This objective may include but is not limited to:* understanding disk types (NTFS, FAT, etc.), security (encryption), storage device types (eSATA, USB, USB 2.0, IEEE 1394, iSCSI), storage drive types (basic, primary, extended, logical, dynamic disk, VHDs), and cloud storage (Windows Live[®] SkyDrive[®], OneNote[®] to SkyDrive, Live mesh).

Preparation Details

Prerequisite student experiences and knowledge:

This MTA Certification Exam Review lesson is written for students who have learned about Microsoft[®] Windows[®] fundamentals. Students who do not have the prerequisite knowledge and experiences cited in the objective will find additional learning opportunities using resources such as those listed in the “Resources” section at the end of this review lesson.

Instructor preparation activities:

- Make copies available of the Student Activity document 10753_WindowsOS_SA_5.1-5.2.
- The instructor should have access to an existing system running Windows 7 Professional or a virtual machine with Windows 7 Professional installed for the purpose of demonstrating how to connect devices and understanding storage types.

Resources, software, and additional files needed for this lesson:

- 10753_WindowsOS_SA_5.1-5.2
- 10753_WindowsOS_SA_5.1-5.2_key
- 10753_WindowsOS_PPT_5.1-5.2

Teaching Guide

Essential Vocabulary

basic disk—a physical disk that contains primary partitions, extended partitions, or logical drives. Partitions and logical drives on basic disks are known as *basic volumes*.

device driver—a component that Windows uses to provide I/O services for and interact with an underlying device, such as a modem or network adapter. Rather than access the device directly, Windows loads device drivers and calls functions in the drivers to carry out actions on the device. The driver functions contain the device-specific code needed to carry out actions on the device.

device manager—a component that provides a graphical view of the hardware that is installed on your computer. All devices communicate with Windows through a piece of software called a *device driver*. Use Device Manager to install and update the drivers for your hardware devices, modify hardware settings for those devices, and troubleshoot problems.

dynamic disk—a disk that provides features that basic disks do not, such as the ability to create volumes that span multiple disks (spanned and striped volumes), and the ability to create fault-tolerant volumes (mirrored and RAID-5 volumes). All volumes on dynamic disks are known as *dynamic volumes*.

external Serial Advanced Technology Attachment (eSATA)—an interface for SATA external drives that competes with FireWire and USB for speed but requires a separate power connector. SATA is the replacement interface technology for the older ATA interface for hard disk drives (HDDs).

IEEE 1394—a serial bus interface standard for high-speed communications and isochronous real-time data transfer, frequently used by personal computers, as well as in digital audio, digital video, automotive, and aeronautics applications.

iSCSI—an Internet Protocol (IP)–based storage networking standard for linking data storage facilities. By carrying SCSI commands over IP networks, iSCSI is used to facilitate data transfers over intranets and to manage storage over long distances. iSCSI can be used to transmit data over local area networks (LANs), wide area networks (WANs), or the Internet and can enable location-independent data storage and retrieval.

Plug and Play—a technology that provides a combination of software and hardware support that enables Windows to detect and configure hardware with little or no user involvement. Plug and Play makes it easier to add and configure hardware on a computer running Windows without the user needing special knowledge about hardware configurations.

Plug and Play Manager—the component responsible for determining the hardware resources requested by each device (for example, input/output ports [I/O], interrupt requests [IRQs], direct memory access [DMA] channels, and memory locations) and assigning hardware resources appropriately. Plug and Play Manager reconfigures resource assignments when necessary, such as when a new device added to the system requires resources already in use.

redundant array of independent drives (RAID)–1—creates an exact, simultaneous copy of the same data on two separate hard drives. RAID 1 volumes are also known as mirrored volumes.

Universal Serial Bus (USB)—a specification to establish communication between devices and a host controller. USB can connect computer peripherals such as mice, keyboards, digital cameras, printers, personal media players and flash drives.

virtual hard disk (VHD)—a publicly available image format specification that specifies a virtual hard disk encapsulated in a single file, capable of hosting native file systems while supporting standard disk and file operations.

Lesson Sequence

Activating prior knowledge/lesson staging (5 minutes):

Direct students to answer each question in their notes.

1. What can be used to view and update the device installed on your computer and check to see if hardware is working properly? (Device Manager)
2. What technology detects newly attached devices and attempts to load the proper drivers? (Plug and Play)
3. What disk type in Windows supports RAID-1? (Dynamic)

Lesson activity (40 minutes):

1. Teacher instruction (20 minutes; see the “Suggested best practices” section below regarding this presentation.)
 - a. Use the included Microsoft PowerPoint® presentation to review devices and storage.
2. Guided practice (20 minutes)
 - a. Direct students to complete the Student Activity document 10753_WindowsOS_SA_5.1-5.2.

Assessment/lesson reflection (5 minutes):

1. In the same notes that they created for the “Activating prior knowledge/lesson staging” section at the beginning of the class, direct students to check their initial answers and make any changes if necessary.
2. Instruct students to submit any questions they have or any topics about which they would like more assistance.
3. After class, look through student responses and follow up with any student requiring additional help.

Resources:

- **Microsoft: Windows 7 features: Device Management**
<http://windows.microsoft.com/en-us/windows7/products/features/device-management>
- **Microsoft: TechNet: What is a device driver?**
[http://technet.microsoft.com/en-us/library/cc776246\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/cc776246(WS.10).aspx)
- **Microsoft: TechNet: Plug and Play Technical Reference**
[http://technet.microsoft.com/en-us/library/cc736617\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/cc736617(WS.10).aspx)
- **Microsoft: Install a printer (video)**
<http://windows.microsoft.com/en-us/windows7/Install-a-printer>
- **Wikipedia: iSCSI**
<http://en.wikipedia.org/wiki/ISCSI>
- **Wikipedia: eSATA**
<http://en.wikipedia.org/wiki/ESATA>
- **Wikipedia: IEEE 1394**
http://en.wikipedia.org/wiki/IEEE_1394_interface
- **Wikipedia: eSATA**
<http://en.wikipedia.org/wiki/USB>
- **Microsoft: Live Mesh**
<http://explore.live.com/windows-live-mesh?os=other>
- **Microsoft: SkyDrive**
<http://explore.live.com/windows-live-skydrive>

Suggested best practices:

- Students should have a fundamental understanding of computer device connection types, such as USB, IEEE 1394, and eSATA. Ask students to list any external devices that they have connected to their computers at home and to describe the types of connections that the devices use.