Overview

This activity is designed to ensure that you understand the topics covered in your courseware. You are required to know the different display devices and their characteristics including Projectors, CRT, LCD, LCD technologies. You should be able to identify the different Connector types for VGA, HDMI, S-Video, Component / RGB, DVI pin compatibility as well as configure various video settings including refresh rate, resolution, multi-monitor and de-gaussing. You should be able to summarize the function and types of adapter cards such as PCI, PCIe and AGP video cards as well as Multimedia devices such as TV Tuner cards and capture cards.

Activities

- Exercise 1: Understanding Display Technology (CRT, LCD, HD, Plasma)
- Exercise 2: Identify Connectors, Cables, Cards and Slots
- Exercise 3: Troubleshooting Monitors, Connectors and Displays

Exercise 1: Understanding Display Technology (CRT, LCD, HD, Plasma)

Overview: Video is dependent on the capability of the computer system to display it. The motherboard, BIOS and operating system all have limitations. Your computer may be limited by the number or type of slots available. It’s important to understand that different types of slots and cards exist for video and to ensure that your system is compatible before purchasing them.

1. List the four common form factors for video cards.
   a. ____________________________________________
   b. ____________________________________________
   c. ____________________________________________
   d. ____________________________________________

2. What is SLI technology? ____________________________________________________________

3. What is the native resolution and color depth of VGA? ____________________________________________

4. What is the native resolution and color depth of SVGA? ____________________________________________

5. What is the advantage of using LCD monitors over CRT? ____________________________________________

6. Which display type is most often found on laptops? ____________________________________________

7. Contrast ratio is the comparison of which colors? ____________________________________________

8. Fill in the native resolution and the Aspect Ratio for each video standard.

<table>
<thead>
<tr>
<th>Video Standard</th>
<th>Native Resolution</th>
<th>Aspect Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>eXtended Graphics Array (XGA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Super Extended Graphics Array (SXGA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Super Extended Graphics Array (SXGA+)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Ultra eXtended Graphics Array (UXGA)

Widescreen Ultra eXtended Graphics Array (WUXGA)

**Exercise 2: Identify Connectors, Cables, Cards and Slots**

**Overview:** Research and understand each type of the video card to be able to identify the different types of cables, cards and slots.

1. Fill in the DVI standard supported devices.

<table>
<thead>
<tr>
<th>DVI Standard</th>
<th>Supported devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVI-A</td>
<td></td>
</tr>
<tr>
<td>DVD-D</td>
<td></td>
</tr>
<tr>
<td>DVI-I</td>
<td></td>
</tr>
</tbody>
</table>

2. Match the video connectors with their definition

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. HDMI</td>
<td>This technology uses the 4-pin mini DIN connector and is used for flat-panel LCD monitors. This connector uses analog video signal that carries video data as two separate signals: <em>luma</em> (luminance) and <em>chroma</em> (color).</td>
</tr>
<tr>
<td>2. VGA</td>
<td>This technology sends digital information from a computer to a digital display, such as a flat-panel LCD monitor. It uses TMDS (transition minimized differential signaling) to transmit large amounts of digital data from the source to the display, resulting in a high-quality image. The image is better than S-Video</td>
</tr>
<tr>
<td>3. S-Video</td>
<td>This interface can transmit both audio and video data. There is no analog conversion so data can be transferred more quickly and seamlessly than other cable types.</td>
</tr>
<tr>
<td>4. DVI</td>
<td>The oldest and most common video monitor connection. Uses and D15 male connector.</td>
</tr>
</tbody>
</table>
W o r k s h e e t:  M o n i t o r s,  C o n n e c t o r s  a n d  V i d e o  D i s p l a y s

3. Name the connectors, cables, cards and/or slots.

4. Name all of the possible video connections that you can locate on this very colorful board.
   1. ____________________________
   2. ____________________________
   3. ____________________________
   4. ____________________________

5. An AGP card is an example of what type of motherboard architecture? ______________________

6. Which type of cards capture Video images and convert them to digital imaging that can be displayed on a computer?________________________________________________________

7. Which type of card allows you to watch TV on your computer? ________________________________

8. Some of these cards can do PAL to NTSC conversion? ________________________________
Exercise 3: Troubleshooting Monitors, Connectors and Displays

Overview: Fill in the names for the definitions listed using the word list. Each word will only be used one time.

1. You install a touch screen monitor but where an individual touches the screen doesn’t match up with what should be recognized. How do you fix this?

_______________________________________________________________________
_______________________________________________________________________

2. You install a new operating system, your display looks distorted and when you access the properties you can see that it is configured at 16-colors. You attempt to increase the screen resolution but are unable. What should you do?

_______________________________________________________________________
_______________________________________________________________________

3. You want to use dual monitors. You purchase the new monitor and connect it to the computer, power it on and install the drivers. The screen is blank. What should you do?

_______________________________________________________________________
_______________________________________________________________________

4. You replace your CRT monitors, you no longer need the CRTs and plan to get rid of them. Your boss tells you to dispose of them. How do you properly dispose of the monitors?

_______________________________________________________________________
_______________________________________________________________________

5. You are having driver issues. You believe the issues are related to a DirectX driver. Which utility should you use to diagnose the problem?

_______________________________________________________________________
_______________________________________________________________________

6. You have finished a presentation. You no longer need the projector you were using. How do you properly shut down the projector?

_______________________________________________________________________
_______________________________________________________________________

7. You install a new LCD. The screen is shifted to the right and some windows go off of the screen. How do you fix the problem?

_______________________________________________________________________
_______________________________________________________________________

_______________________________________________________________________
**Worksheet Answers**

Exercise 1: Understanding Display Technology (CRT, LCD, HD, Plasma)

1. List the four common form factors for video cards.
   1. Integrated
   2. Peripheral Component Interconnect (PCI)
   3. Accelerated Graphics Port (AGP)
   4. PCI Express

2. What is SLI technology? *SLI compatible chipsets support dual PCI-express graphics for faster graphics output*

3. What is the native resolution and color depth of VGA? *640x480 and a supported color depth of up to 256 colors*

4. What is the native resolution and color depth of SVGA? *800x600 with a 16-bit color depth*

5. What is the advantage of using LCD monitors over CRT? *LCD monitors have crisper graphics, less flicker and have a smaller desktop profile so they take up less space and look better on a desk*

6. Which display type is most often found on laptops? *LCD*

7. Contrast ratio is the comparison of which colors? *The luminance of the whitest color (white) to the darkest color (black)*

8. Fill in the native resolution and the Aspect Ratio for each video standard.

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<tr>
<td>eXtended Graphics Array (XGA)</td>
<td>1024X768</td>
<td>4:3</td>
</tr>
<tr>
<td>Super Extended Graphics Array (SXGA)</td>
<td>1280X1024</td>
<td>5:4</td>
</tr>
<tr>
<td>Super Extended Graphics Array (SXGA+)</td>
<td>1400X1050</td>
<td>4:3</td>
</tr>
<tr>
<td>Ultra eXtended Graphics Array (UXGA)</td>
<td>1600X1200</td>
<td>5:4</td>
</tr>
<tr>
<td>Widescreen Ultra eXtended Graphics Array</td>
<td>1920X1200</td>
<td>16:10</td>
</tr>
<tr>
<td>(WUXGA)</td>
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**Exercise 2**

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<td>DVD-D</td>
<td>Digital only</td>
</tr>
<tr>
<td>DVI-I</td>
<td>Both analog and digital</td>
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2. Match the video connectors with their definition

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<th>C</th>
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<td>B. VGA</td>
<td>D</td>
<td>This technology sends digital information from a computer to a digital display, such as a flat-panel LCD monitor. It uses TMDS (transition minimized differential signaling) to transmit large amounts of digital data from the source to the display, resulting in a high-quality image. The image is better than S-Video</td>
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<td>D. DVI</td>
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<td>The oldest and most common video monitor connection. Uses and D15 male connector.</td>
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</table>
3. Name the connectors, cables, cards and/or slots.

- **D15 connector**

- **DVI (DVI-I) Male**

- **S-Video**

- **AGP**

4. Name all of the possible video connections that you can locate on this very colorful board.
   a. 2X16 blue PCI Express Slots
   b. 1X4 PCI Express pastel/orange PCI-E slot
   c. 2X1 black PCI Express slots
   d. 2 PCI Slots

5. An AGP card is an example of what type of motherboard architecture? **BUS slot architecture**

6. Which type of cards capture Video images and convert them to digital imaging that can be displayed on a computer? **Video Capture Cards**

7. Which type of card allows you to watch TV on your computer? **TV Tuner Card**

8. Some of these cards can do PAL to NTSC conversion? **TV Tuner Cards**

**Exercise 3**

1. You install a touch screen monitor but where an individual touches the screen doesn’t match up with what should be recognized. How do you fix this? **After installing a touch screen monitor, you should run the calibration utility. This utility has you touch the screen to line up the signal with the input**

2. You install a new operating system, your display looks distorted and when you access the properties you can see that it is configured at 16-colors. You attempt to increase the screen resolution but are unable. What should you do? **A default adapter driver is always available but may not provide optimal resolution. If you are unable to change the settings, the OS did not install the display adapter driver through plug and play. Obtain the drivers and install them manually**

3. You want to use dual monitors. You purchase the new monitor and connect it to the computer, power it on and install the drivers. The screen is blank. What should you do? **Open the display properties and click the Advanced tab, choose the “Extend My Windows Desktop” onto this Monitor checkbox**
4. You replace your CRT monitors, you no longer need the CRTs and plan to get rid of them. Your boss tells you to dispose of them. How do you properly dispose of the monitors? **You should take them to a licensed recycler.** CRTs have a capacitor in them that holds a high voltage charge that is lethal if discharged.

5. You are having driver issues. You believe the issues are related to a DirectX driver. Which utility should you use to diagnose the problem? **The dxdiag utility is a command line utility that allows you to diagnose problems with DirectX drivers.** These drives allow games and movies to play correctly.

6. You have finished a presentation. You no longer need the projector you were using. How do you properly shut down the projector? **Follow the manufacturer’s instructions, which are typically to shut off the lamp but keep the fan running for a few minutes to properly cool the bulb.**

7. You install a new LCD. The screen is shifted to the right and some windows go off of the screen. How do you fix the problem? **You should configure the LCD for its default resolution.** This is typically listed on the screen or in the manufacturer’s documentation.