Name _____ Date _____

Chapter 0: IT Essentials Introduction
Chapter 1: Introduction to the Personal Computer

After completion of this chapter, students should be able to:
- Explain IT industry certifications and technician jobs
- Select the appropriate computer components to build, repair, or upgrade personal computers.
- Explain how personal computer system components work together.
- Select the appropriate computer components.
- Explain how hardware is configured for task-specific computers.

0.2 Explain it industry certifications and technician jobs

1. What is Information Technology (IT)? – You may need to search this

2. What does name CompTIA stand for?

3. Using the CompTIA website, of the two exams must you pass to become A+ certified, what does each exam focus on?
• CompTIA A+ 220-901 -
• CompTIA A+ 220-902 -

4. What must a technician do to maintain their certification and in what time frame?

5. What is the EUCIP and which modules will this course work towards? (Online research)

1.1 Personal Computer Systems
1.1.1.1 Describe a Computer System

1. What is a computer?

2. What makes up a computer system?

3. What is hardware?

4. What are examples of hardware?

5. What is software?

6. What is the function of an operating system?

1.1.1.1 Computer Cases

7. What is the function of a computer case?

8. What are computer cases made of?

9. What is the design and look of a case called?

10. What are the basic form factors for computer cases?
    1.
    2.
    3.
    4.

11. What are some other names for computer cases?

12. How are internal components grounded?

1.1.1.2 Power Supplies

13. What if the function of a power supply?

14. What is a keyed connector?

15. What does a Molex connector connect? (sketch it) – HINT: Look in the other figures or Google Images

16. What does a Berg connector connect? (sketch it)

17. What does a SATA connector connect?

18. What kind of connection is used to connect the motherboard?

19. What connector supplies power to all areas of the motherboard?

20. What does a PCIe connector supply power to?

21. What is the voltage and use of the yellow wire?

22. What is the voltage and use of the blue wire?

23. What is the voltage and use of the orange wire?

24. What is the voltage and use of the red wire?

25. What is the voltage and use of the white wire?

26. What is the voltage and use of the black wire?

1.1.1.3 Power Supply Wattage

27. What is Ohm's Law?

28. What is voltage and how is it measured?

29. What is current and how is it measured?

30. What is power and how is it measured?

31. What is resistance and how is it measured?

32. Lower resistance allows _____ current

33. When building a computer select a power supply with sufficient _____ to power all components.

34. Where to you find wattage information for a component?

35. T or F When choosing a power supply, choose one that has more than enough power for the current components.

36. A power supply with a higher wattage rating has more _____; therefore it can handle more devices.

37. What is the name of the small switch on the back of most power supplies called?

38. How is the correct voltage determined?

39. In the U.S., where should the voltage selector be positioned?

40. What can happen if the voltage is set incorrectly?

41. T or F It is okay to open a power supply.

42. What holds a charge for an extended period of time?

Complete 1.1.1.4 Worksheet - Ohm's Law

1.1.2.1 Motherboards

43. What are other names for the motherboard?

44. What is the motherboard?

45. What is a motherboard bus? (You may need to look this up)

46. What items are on the motherboard?

47. What does form factor pertain to?

48. What does the form factor describe?

49. What is the most common form factor in desktop computers?

50. What is the newer motherboard form factor?

51. What smaller form factor was designed to be backward compatible with ATX?

52. T or F You can use a Micro-ATX in a full-size ATX case.

53. What is an advantage of the Mini-ITX?

54. What is a chipset?

55. What determines the type of CPU that can be installed?

56. What are the two components that make up the chipset?

57. Which component controls access to the RAM, video card and the speeds at which the CPU can communicate with them?

58. Which component allows the CPU to communicate with the hard drives, sound card, USP ports and other I/O ports?

1.1.2.2 CPU Architectures

59. What is the brain of the computer?

60. Who are the most common CPU manufacturers?

61. What is the connector that interfaces between the motherboard and the processor?

62. What is PGA? Answer question and then sketch it.

63. What is LGA? Answer question and then sketch it.

64. What does ZIF refer to?

65. What is the difference between PGA and LGA architecture?

66. What is a program?

67. What are the two major CPU architecture instruction sets?

68. What does RISC stand for?

69. What does CISC stand for?

70. Which architecture takes fewer steps per operation?

1.1.2.3 Enhancing CPU Operation

71. What is hyperthreading?

72. How is the power of a CPU measured?

73. How the speed of a CPU rated?

74. What determines the amount of data that a CPU can process at one time?

75. The wider the processor bus, the more _____ the processor.

76. What size processor data bus do current processors have?

77. What is overclocking?

78. Is overclocking a reliable way to improve computer performance? (explain fully)

79. What is CPU throttling?

80. What is throttling commonly used on?

81. T or F The latest processor technology incorporated more than one CPU core onto a single chip.

82. T or F A triple-core CPU has actually has 4 cores inside a single CPU, but one is disabled.

83. What is a single core CPU?

84. What are some of the most common, high performance multiple-core processors today? (Research on Newegg.com)

85. How can the NX bit be used?

1.1.2.4 Cooling Systems

86. What generates heat?

87. How can you remove heat?

88. What makes the cooling process more efficient?

89. What is the function of a heat sink?

90. How does a water-cooling system work?

1.1.2.5 ROM

91. What does ROM stand for?

92. What is stored in ROM?

93. What is another name for ROM?

94. Do ROM chips retain their contents when the computer is powered down?

95. What are the different types of ROM?

96. Can a PROM chip be erased or rewritten?

97. Which type of PROM can be erased and rewritten without having the remove the chip from the computer?

1.1.2.6 RAM

98. What does RAM stand for?

99. What is meant by volatile memory?

100. Why would you want to have more RAM in a computer?

101. What are the different types of RAM?

1.1.2.7 Memory Modules

102. Which type of RAM speeds up the access time to retrieve data from memory because the CPU does not have to wait for one data access cycle to end before another begins?

103. What are the different types of memory modules? (List 4)

104. T or F Memory modules can be single sided or double sided.

105. What are the two configurations of SIMM chips?

106. What type of DIMM chips are there?

107. What is SODIMM used for?

108. What does the speed of memory impact?

109. What is cache memory used for?

110. What are the three types of cache memory?

111. When do memory errors occur?

112. What are the three methods of error checking?

1.
2.
3.

1.1.2.8 Adapter Cards and Expansion Slots

113. What do adapter cards do?

114. Why would you use adapter cards?

115. What does RAID stand for?

116. What does USB stand for?

117. What expansion slot is used for video adapters?

118. Where would a Mini-PCI bus be used?

119. There are three form factors for a Mini-PCI. List them.

120. What expansion slot can run up to 16 times faster than PCI? How can they be differentiated?

1.1.2.9 Storage Devices

121. What do storage drives do?

122. What are some common types of storage devices?

123. What does the hard drive contain?

124. How is the storage capacity of a hard drive measured?

125. How is the speed of a hard drive measured?

126. How do magnetic hard drives spin magnetic platters and drive heads?

127. Do solid state drives (SSDs) have moving parts?

128. What interfaces are used to connect magnetic and solid state drives?

129. What are magnetic tape drives used for?

130. How do optical drives read data on optical media?

131. What are three types of optical drives?

132. What is the storage capacity of a CD?

133. What is the storage capacity of a DVD?

134. What is the storage capacity of a BD?

135. Which optical media is a CD that can be recorded, erased, and re-recorded?

136. Which optical media is a DVD that can be recorded one time?

137. Which optical media contains pre-recorded movies, games, or software?

138. Which optical media can record HD video and PC data storage one time?

139. What is another name for an external flash drive?

1.1.2.10 Storage Device Interfaces and RAID

140. Which type of hard drive interface uses a 40-pin connector?

141. What size connector does the SATA interface use?

142. Which cable can be up to 2 meters in length?

143. How many devices can a SCSI controller connect?

144. What type of connector do SCSI interfaces use?

145. What is RAID used for?

146. What are the terms that describe how RAID stores data on various disks?

147. What is the advantage of RAID 0?

148. What are the advantages of RAID 5?

149. How many drives are required for RAID 5?

150. T or F RAID 10 must have an even number of drives.

1.1.3.1 Video Ports and Cables

151. What is the purpose of a video port?

152. T or F Converting a digital signal to an analog signal usually results in higher image quality.

153. List and describe the video ports and connectors.

1.1.3.2 Other Ports and Cables

154. T or F An Ethernet cable carries power.

155. Describe a serial port and (sketch it)

156. What is the maximum length of a serial cable?

157. What type of connector is used for a telephone cable?

158. How many devices can a single USB port in a computer support?

159. What is the transmission speed of USB 3.0?

160. T or F USB 3.0 is backward compatible with previous versions of USB.

161. What is FireWire?

162. How many devices can a single FireWire port support?

163. What standard does FireWire use?

164. What is the difference between 1394A and 1394B?

165. What type of parallel connector is used for a printer?

166. How much data can a parallel cable transport at one time?

167. What is the standard for parallel cable?

168. What is the maximum length of a parallel cable?

169. Describe an eSATA cable.

170. What is another name for a network port?

171. What is the maximum length of a network cable?

172. What does a PS/2 port connect?

173. What kind of a connector does a PS/2 port use? (sketch it)

174. What are the five common audio ports?

1.1.3.3 Adapters and Converters

175. Define the term Adapter:

176. Define the term Converter:

1.1.4.1 Input Devices

177. What is an input device used for?

178. What are the two most commonly used input devices?

179. What is a hardware device that can be used to control more than one computer using a single keyboard, monitor, and mouse

180. What is the input device used for playing games?

181. What input devices create images that can be stored on magnetic media?

182. T or F   A webcam is an input device.

183. What is used for biometric identification?

184. What causes a touch screen to work?

185. What is a digitizer?

186. What does a scanner do?

187. What type of scanner reads UPC bar codes?

1.1.4.2 Output Devices

188. What is an output device used for?

189. What are the primary output devices for a computer?

190. What are the six display technologies?

191. What is the important difference between monitor types?

192. How is the image created on the screen in CRT technology? (May need to search for this)

193. Which technology is commonly used in flat panel monitors and laptops?

194. What is the difference between active matrix and passive matrix?

195. What is the difference between LED and OLED?

196. How large can Plasma displays be?

197. How does DLP technology work?

198. What is the function of an All-in-One Printer?

199. What devices are used for output of audio signals?

1.1.4.3 Monitor Characteristics

200. What does monitor resolution refer to?

201. What is a pixel?

202. What is dot pitch?

203. Which dot pitch produces a better image?

204. What is the contrast ratio?

205. What is the refresh rate?

206. Does a higher or lower refresh rate produce a better image?

207. Explain the difference between interlaced and noninterlaced monitors.

208. What is the horizontal resolution?

209. What is the vertical resolution?

210. What is color resolution?

211. What is aspect ratio?

212. What is native resolution?

213. T or F To use multiple monitors, you need two or more video ports.

1.2 Selecting Computer Components

1.2.1.1 Building a Computer

214. What has to be determined before performing upgrades or purchasing components? What are the three questions you should ask?

1.2.1.2 Selecting Motherboards

215. What components must a motherboard support?

216. What two components must be compatible with the motherboard?

217. What two things does the chipset determine?

218. What is a CPU package?

219. What are the two parts of a bus?

220. What is the function of the data bus?

221. What is the function of the address bus?

222. What is the difference between a 32-bit bus and a 64-bit bus?

223. What is clock speed?

224. What are PCI expansion slots being replaced with?

1.2.1.3 Selecting the Case and Fan

225. A case must be able to accommodate what?

226. T or F : Do cases often come with a power supply already installed?

227. What must be considered when choosing case fans? List 7 factors:

228. What will cause airflows to work against each other in the case?

1.2.1.4 Selecting the Power Supply

229. How do you determine the total wattage required?

230. What various factors must be considered when selecting a power supply? List 5 factors:

1.2.1.5 Select the CPU and CPU Cooling System

1.   Where is the best place to check for compatibility between CPUs and other devices?

2.   What two factors can limit the speed of a processor?

3.   T or F Data can travel in both directions across the FSB.

4.   When choosing a heat sink or fan, what factors must be considered? List 4 factors:

1.2.1.6 Selecting RAM
5.   When might new RAM be needed?

6. When selecting RAM, what must be considered?

1.2.1.7 Selecting Adapter Cards
7. What questions must be asked before purchasing an adapter card?

8. What factors must be considered when purchasing a new graphics card?

9. T or F Some GPUs are integrated into the CPU.

10. What do you need to consider when purchasing a new sound card?

11. How can a customer get improved sound accuracy?

12. What is a storage controller?

13. What factors need to be considered when purchasing a storage controller?

14. What needs to be considered when purchasing an I/O card?

15. What needs to be considered when purchasing a NIC?

16. What is a capture card?

17. What has to be considered when purchasing a capture card?

1.2.1.8 Selecting Hard Drives

18. What are some signs that a storage device may be failing?

19. What must be considered when purchasing a new hard drive?

20. T or F SATA and eSATA cables are interchangeable.

21. What does hot-swappable mean?

1.2.1.9 Selecting a Media Reader

22. When is RAM-based SSD used?

23. T or F Solid state drives have no moving parts.

24. What factors would warrant purchasing a solid state drive?

25. What is a media reader?

26. What are some common media cards?

1.2.1.10 Selecting Optical Drives
27. What needs to be considered when purchasing an optical drive?

28. T or F A Blu-ray reader can only read Blu-ray discs.

1.2.1.11 Selecting External Storage
29. What do you need to consider when purchasing external storage?

30. What are the benefits of external storage?

1.2.1.10 Selecting Input and Output Devices
31. What are the factors in selecting input and output devices?

1.2.1.13 Lab – Research Computer Components

1.3 Configurations for Specialized Computer Systems
1.3.1.1 Thick and Thin Clients
32. What is the difference between a Thin client compared to a Thick client?

1.3.1.2 CAx Workstations
33. What is a CAx workstation?

34. What needs to be considered when purchasing hardware to run CAx software?

1.3.1.3 Audio and Video Editing Workstations
35. What is an audio workstation used for?

36. What is a video workstation used for?

37. What needs to be considered when purchasing hardware to run audio and video editing

    software?

1.3.1.4 Virtualization Workstation
38. What is virtualization?

39. What is Virtual Desktop Infrastructure (VDI)?

40. List some additional functions of virtual computing.

41. What hardware is required to run virtual computers?

1.3.1.5 Gaming PCs
42. What hardware is required when building a gaming pc?

1.3.1.6 Home Theater PCs
43. What is a HTPC?

44. What are some of the features that a HTPC can be designed to do?

Complete 1.3.1.7 Lab- Build a Specialized Computer System