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| **TEXAS CTE LESSON PLAN**  [www.txcte.org](http://www.txcte.org) | |
| **Lesson Identification and TEKS Addressed** | |
| **Career Cluster** | Information Technology |
| **Course Name** | Networking |
| **Lesson/Unit Title** | Networking Fundamentals |
| **TEKS Student Expectations** | **130.305. (c) Knowledge and Skills**  (1) The student demonstrates the professional standards/employability skills as required by business and industry.  (E) The student is expected to solve problems and think critically  (F) The student is expected to demonstrate leadership skills and function effectively as a team member  (4) The student acquires an understanding of telecommunications and data network services.  (H) The student is expected to differentiate between types of networks  (5) The student analyzes several types of configurations and upgrading.  (C) The student is expected to distinguish between several types of cables used in the telecommunications and data networking  (D) The student is expected to describe telecommunications and data networking media and connectors  (7) The student develops a network design plan.  (C) The student is expected to identify common peripheral ports and common network components such as hubs, routers, and switches |
| **Basic Direct Teach Lesson**  (Includes Special Education Modifications/Accommodations and  one English Language Proficiency Standards (ELPS) Strategy) | |
| **Instructional Objectives** | **Performance Objective:**  Upon completion of this assignment, the student will be able to setup and configure a basic network, recognize networking devices and the types of media available for today’s computers.  **Specific Objectives:**   * Define terms associated with the lesson * Identify various types networks * Identify various types networking media * Configure TCP/IP settings * Build networking cables * Connect and configure a hub or switch and a PC(s) |
| **Rationale** | Students need to stay current with technology for employment and learn to set up networks for today’s computers. |
| **Duration of Lesson** | 180-300 minutes |
| **Word Wall/Key Vocabulary**  *(ELPS c1a, c, f; c2b; c3a, b, d; c4c; c5b) PDAS II (5)* |  |
| **Materials/Specialized Equipment Needed** | **Instructional Aids:**   1. Networking Exam 2. Networking Exam Key 3. Lab 1: Networking Lab 4. Lab 2: Cable Building Lab   **Materials Needed:**   1. Various types of NIC’s 2. Category 5 cable 3. RJ-45 plugs 4. PC(s) connected to either a hub or switch 5. (Alternate)- Virtual networking simulation software   **Equipment Needed:**   1. Network cable building tools (wire cutter, wire stripper, crimp tool) 2. Cable testers 3. Switch or Hub 4. PC(s)- 2 minimum |
| **Anticipatory Set**  (May include pre-assessment for prior knowledge) | **SAY:** Networking plays an important part in our computer communications today.  **ASK:** Does anyone know the 3 types of cables used to connect network devices? *[Straight-Through: Unlike devices (switch to hub, hub to PC, etc.); Crossover: Like* *devices (switch to switch, PC to PC); Console: PC to console port of network* *devices (router, switch)*  **ASK:** Does anyone know the purpose of TCP/IP? *[It is the protocol that allows devices to communicate over the Internet.]*  **ASK:** How do networks benefit their users? *[Allows shared resources, network administration can be centralized, allows* *computers to communicate directly over larger distances]* |
| **Direct Instruction \*** | 1. Introduction to networking    1. Explain what a network is and how it is used    2. Explain the types of networks (peer- to-peer, client-server, LAN, WAN)    3. Explain transmission types (simplex, half-duplex, full-duplex)    4. Explain the types of topologies (physical and logical)    5. Explain the types of media (STP, UTP, Coaxial, Fiber, Wireless)    6. Demonstrate how to build networking cables    7. Explain the types of networking devices    8. Explain the different types of networking standards    9. Explain different bandwidth technologies    10. Explain TCP/IP    11. Demonstrate how to configure TCP/IP settings    12. Demonstrate TCP/IP utilities    13. Demonstrate file and print sharing |
| **Guided Practice \*** | The teacher demonstrates how to build a cable and setup a simple network. The teacher provides guidance when warranted. |
| **Independent Practice/Laboratory Experience/Differentiated Activities \*** | Students work in pairs on lab assignments; demonstrating their skills in building cables and configuring and troubleshooting TCP/IP:  Lab 1: Networking Lab  Lab 2: Cable Building Lab |
| **Lesson Closure** | **Q:** What is the typical transfer speed of a PC within a LAN?  **A:** 100 Mbps  **Q:** What type of cable is used to connect unlike devices?  **A:** A straight-through cable   1. Why would like devices need to use a “cross connect” cable versus a “straight-through” cable? 2. To avoid the transmit and receive connectors of each device from lining up together. In other words, the transmit from one should connect to the receive connector from the other. |
| **Summative/End of Lesson Assessment \*** | **Informal Assessment**  Monitor student progress during independent practice and provide independent re- teach/redirection as needed.  **Formal Assessment**  Use the Networking Exam and Key to assess student understanding of concepts. |
| **References/Resources/**  **Teacher Preparation** |  |
| **Additional Required Components** | |
| **English Language Proficiency Standards (ELPS) Strategies** |  |
| **College and Career Readiness Connection[[1]](#footnote-1)** |  |
| **Recommended Strategies** | |
| **Reading Strategies** |  |
| **Quotes** |  |
| **Multimedia/Visual Strategy**  **Presentation Slides + One Additional Technology Connection** |  |
| **Graphic Organizers/Handout** |  |
| **Writing Strategies**  **Journal Entries + 1 Additional Writing Strategy** |  |
| **Communication**  **90 Second Speech Topics** |  |
| **Other Essential Lesson Components** | |
| **Enrichment Activity**  (e.g., homework assignment) | As an alternate way of running the lab: Install “virtual” networking software which allows students to create and test complex network configurations without the actual equipment or cables. |
| **Family/Community Connection** |  |
| **CTSO connection(s)** | SkillsUSA, TSA |
| **Service Learning Projects** |  |
| **Lesson Notes** |  |

1. Visit the Texas College and Career Readiness Standards at <http://www.thecb.state.tx.us/collegereadiness/CRS.pdf>, Texas Higher Education Coordinating Board (THECB), 2009. [↑](#footnote-ref-1)