

My Network, My Home: The Development of Modern Home Systems in the United States

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*“No man is an island, entire of itself; every man is a piece of the continent,
a part of the main . . .”*

—*John Donne, Meditation XVII*

INTRODUCTION

According to the Merriam-Webster Dictionary, a network is an interconnected or interrelated chain, group, or system. This definition may be small, but its impact is global. A network is a collection of various tasks and or abilities that allow an event to happen. I remember listening to an old blues song that asked, “How can a brown cow eat green grass, and make white milk?” Most of us do not think about the technicalities of how milk is made, but we do realize that cereal or coffee without milk would be an unusual, if not strange event. Whether we like it or not, everything owes its existence or success to something else. Think about it: Kellogg and Post companies wouldn’t be what they are today if it weren’t for cows. Most of the time people label these interdependencies as chains or cycles. We use terms like the “food chain” and “life cycle” to explain how living things eat, grow, and survive. The word network, however, is treated a little bit differently. Most of us refer to a network when we speak of the Internet. However, a network’s purpose expands beyond the job of sending and receiving email, listening to a favorite song, or downloading games.

My primary teaching responsibility as an instructor for the Cisco Networking Academy is to teach students how to build, troubleshoot, and maintain computer networks. However, the concept of data networks and networking can sometimes be a difficult task to teach to students who may have very limited exposure to computer technology. It is my goal for beginning CNA students to incorporate networks and networking into their everyday lives. I want them to gain a true appreciation for networks and begin to recognize that networks are an important part of our world. I believe one of the most effective ways to teach this concept is by bringing it to my students’ homes.

I can identify with many of my students because at one time, computers meant nothing to me. The computer was, in my opinion, a confusing, and sometimes stressful, waste of time. I remember a time when computers were still for businesses, the rich, and math people. Microsoft and Apple were still small companies with some strange ideas about using a window and a mouse. The Internet was still primarily for governmental use. Nevertheless, I took programming classes during my senior year in high school. I

can still recall how wonderful it was to get a computer to add up $2 + 2 = 4$ or have it display “Hello” on the computer monitor.

After graduation, all my keyboarding and computing skills were quickly obscured by my attempts to choose the right major or determine how to get all of my classes scheduled after 10:00am. Even though I attended Texas Christian University—a private institution noted as having one of the highest tuition rates in the state—there were only three student computer labs on campus. The first was designated for computer science, the next lab was for the school of business, and the last was a Macintosh lab for the rest of the student population. Most of the computers were Macintosh LC computers with external 5.5-inch floppy drives. I will admit that the computer lab was the last place I wanted to go. It was cramped and boring, and anytime I was there, it meant I had a paper due. Unfortunately, I had chosen to major in Sociology and minor in Political Science, so I was there all the time. From then until graduation, I saw the computer as a last resort solution to finishing assignments, and in no way as a key to a future profession.

I am so amazed that the computer has become such an important part of my life. Computers have become part of both my home and work. Most of my co-workers and friends own Personal Data Assistants (PDAs) and have Internet access at home. I now use terms like “dial-up,” DSL,” and “LAN” in everyday conversation like one says “good morning” or “what’s for lunch?” Just like in the movie “My Fair Lady,” when the character Henry Higgins declares his growing love for Eliza by singing “I’ve grown accustomed to her face,” I too have grown to love both computers and networks.

Almost three years ago, I became part of the Cisco Networking Academy (CNA) program. Today the term “network” has become, along with the computer, a permanent aspect of both my professional and personal life. When I was introduced to the CNA program, I felt overwhelmed by the mountain of acronyms and calculations I had to memorize. Data networks were just like the computers introduced to me in high school and college: a foreign entity to be used and put away as quickly as possible. Just like before, I looked forward to getting away from anything referring to networks and Cisco. However, my attempts were futile. I soon discovered the network was closer to me than I ever thought. This realization became especially clear to me when I became a homeowner and discovered home improvement.

Since I was a little girl, I have always loved houses. I loved the way the roofs sloped, the colors, the windows, and the way they were decorated. For years, my father believed that I would eventually study to become an architect. I guess this assumption came from the fact that I constantly built houses out of Lego blocks and shoeboxes. As the years passed, I began to take great interest in magazines, and other media dedicated to home renovation, restoration, and decoration. I believe “This Old House” and “Bob Vila” are two of the best shows on television. One of the most fascinating items I discovered is how they were able to update old home systems such as plumbing, and transform rundown homes into palaces. Unfortunately, this task is easier said than done. Each

system has its own set of standards that must be addressed. If not, major problems are destined to happen. For example, water leaks can rot wood framing, and electrical shorts can lead to electrical fires. Anyone who has experience with a clog in a sink drain or a broken telephone jack knows that small problems like these can easily get out of hand if not taken care of quickly.

Being a homeowner has been one of the most satisfying accomplishments so far in my life. However, I realize that all the responsibility for maintenance and repair is mine and mine alone. In the past I could call a landlord or the rental office when a repair was needed. Those days are long gone, and now I find myself on the weekend checking, repairing, and replacing those items around the home that need attention. By adapting the principals learned from Cisco Networking Academy instructor training, I have gained a deeper understanding of how my home functions. First, I divide my home into definable functions. Next, I test each section and make notations of any problems. Last, I research possible solutions, create a plan, and execute the plan. I also keep documentation of the entire process for future reference.

We depend on our homes to be ready to give us cool air if it is hot, heat if it's cold, light when it is dark, fresh water, dependable plumbing, and a way to call the repairman if anything goes wrong. Take out any aspect of the modern home, and most of us would be in great distress. We depend on a well functioning home for both comfort and survival. Each system or network is governed by a basic set of rules or protocol to operate. As a result, each functioning network works both separately and ultimately together to provide a livable dwelling.

UNIT BACKGROUND

Since this unit will be used as an introductory tool for first year studies in the Cisco Networking Academy, students will be challenged to explore the issue of the importance of networks in the American home. This will be accomplished by taking the term "network" home. We will focus upon the electrical, communication, plumbing, and environmental controls (air conditioning and heating) networks. With the use of this curriculum, students will begin to identify these protocols and in turn associate the networks contained in the home with the networks we will study, build, and troubleshoot in the Cisco Networking Academy.

Even though my students live in a variety of dwellings such as houses and apartments, many of them do not recognize that they all have common features. The majority of my students live in a place that has electricity, a telephone, some type of heating and cooling system, running water, and at least one bathroom. They couldn't imagine having to go outside to fetch water or wood or having to use an outhouse every time they needed to go to the restroom. Telephones, including cellular phones, are commonplace and have become essential to everyday life. Most of my students are

second and third generation immigrants from Mexico and South America. They are very much Americanized and are very dependent on all of our society's conveniences.

I have discovered that many of my students have parents who work in construction and home improvement. For example, one student's father owns a business that acts as a subcontractor for homebuilders such as Kimball Hill, Plantation, and David Weekly Homes. This student has gone on job assignments with his father and even had the opportunity to observe and work on various building projects such as the Silverlake master planned community in Pearland, Texas. Other students have experience in installing flooring, electrical fixtures, and plumbing. I even had one student who worked on the construction of the Cesar Chavez High School swimming facility.

Even though these students have worked in the installation and upgrade of modern home networks, they still have very limited knowledge of how these networks were developed. Because of my upbringing in the United States, I can identify with my students' lack of understanding concerning how different degrees of home networks operate. Even today, there are many people who live in homes with no air conditioning and even no indoor plumbing. I was raised in a modern home with a two-car garage that offered the best in central air and heat. Unfortunately, many people in developing countries do not have all the advantages that my students and I have to use. For example, during my last trip to visit my grandmother in Jamaica, I recall that her home was just being wired for electricity and that there was no inside plumbing or kitchen. Two outhouses stood in the back of the house, and the kitchen was located in the front yard. All water came from a nearby stream and was collected in great big Igloo containers. I have to admit that I was happy about seeing my grandmother, but not about the house. Every day I had to go to a neighbor's house to take a bath, and even then I never felt totally clean. I knew this was a poor way to look at the situation, but it's hard to let go of a lifestyle that you have known for the majority of your life. As the days passed I became used to the daily procedure of having to walk to get water, use Kerosene lamps at night, and even use a outhouse that doubled as an occasional shelter for goats that wanted out of the rain. I did not realize it at the time, but I had become a part of my grandmother's home system/network. I have since then developed a great respect for the modern conveniences of my own home, and I make a great effort to keep every network in good working condition.

As I began to review information for my unit, I realized that my students would really appreciate learning about how the living standards of the past had such a major influence on the way we live today. The fourth chapter of *Houston's Forgotten Heritage* by Dorothy Knox Howe Houghton (316 – 317) focuses on how homes and other dwellings began to be enhanced by "modern" conveniences such as indoor bathrooms, intercoms, and refrigerators at the end of the 19th and the beginning of the 20th centuries. Dorothy Knox Howe Houghton points out these types of developments in the construction of the Savoy Apartments near downtown Houston. She states, "The seven-story Savoy Apartments, constructed by Daniel Ripley on Main and Peace in 1906, were considered

the first high-rise units in the city. There were three apartments per floor, electric lights, steam heat, hot and cold water, cold storage, and ‘unsurpassed’ plumbing and sewerage facilities, including a private water well”(317). The development of the Savoy Apartments exemplifies the types of enhancements made to homes and other dwellings built during the early 20th century. Even though the Savoy had a steam furnace, plumbing, and electricity, there is no mention of central air conditioning.

The innovations made towards the development of the modern home were not easily made and accepted by American society. For example, in the early 20th century, electricity for home use was seen as something for the rich or something to be used by big cities and businesses. The standard for lighting the majority of American homes was still kerosene. In fact, during my trip to my grandmother’s home in Jamaica, I remember having to use kerosene lamps to light the house because of rolling electrical brownouts due to an overworked national power grid.

With the development of the modern home network, a new freedom came to American citizens. People could now plan for activities and not be limited by the changes that took place in nature. They could now work and play into the night and not be concerned with the chores of chopping wood or storing coal. People could now put their efforts into other pursuits and leave their everyday drudgery to the new home networks that seemed to work in an almost autonomous fashion.

TYPES OF NETWORKS USED FOR STUDY

Plumbing Network

Plumbing is probably one of the most essential networks in today’s home. Without it we would be relegated back “toting” water and making trips to the outhouse. Fortunately, the innovators of our past saw the need for bringing fresh water and septic facilities indoors and developed a network for which we should say “thank you” with every turn of a faucet knob and with every flush. Students who choose this topic will learn about why the issue for the modern day septic and plumbing systems was one of health and safety. Many of us would be horrified to have to throw out solid waste into open ditches, streets, and back yards. However, at the turn of the century, this type of practice was commonplace. Even though sewer systems date back to the times of Ancient Rome, plumbing with pipes, conduits, and ducts for the automatic transportation of fresh water and the removal of waste did not become commonplace until the beginning of the 20th century.

There are four essential parts of the plumbing network: pipes, valves, water, and gravity. Pipes direct water to the inside and from a structure. Today most pipes are made of polyvinyl chloride (PVC). At the beginning of the 20th century, plumbing pipes were mostly made of cast iron or lead. Cast iron pipes were heavy, brittle, and prone to rusting. Lead piping leached into the water and caused lead poisoning. As time passed,

copper piping replaced cast iron, and by the end of the 20th century, PVC and polybutylene (PB) pipes were introduced. PVC and PB pipes were cheaper and easier to install because they did not require the use of solder or butane torches for installation. Unfortunately, minerals, chemicals, extreme heat, and cold can affect both PVC and PB pipe. Today the use of PB pipe has been made illegal in plumbing systems due to micro cracking and disintegration.

The development of today's home plumbing network has been greatly influenced by advances in technology and increasing demands by consumers. The first indoor plumbing primarily consisted of a table, washbowl, and a small ceramic pot to use when getting to the outhouse was difficult or inconvenient. By the first half of the 20th century, the outhouse and washroom began to develop into the modern home bathroom. This new bath offered a single bowl sink, a toilet and a bathtub with shower. As time passed, technology, design, and demand influenced the development of the items. Now the bathtub, sink, and toilet have grown out from being simple tools of necessity into being items that can be considered works of art. For example, companies such as Kohler offer a large line of bathtubs that combine the features of a sauna, whirlpool, hot tub, and even a waterfall.

The home plumbing network stands as an example of technology, necessity, and art. Technology has allowed both consumers and manufacturers to transform a simple bathroom into a virtual oasis. The home plumbing network is a well functioning, beautiful, and essential part of today's homes.

Environmental Control Network

The environmental control network focuses on the development of air conditioning and heating for use today. Even though controlling home temperature is an old practice, air conditioning is actually one of the most recent networks to be developed for home use in the 20th century. For many Americans, the only way to stay cool prior to the introduction of air conditioning was to open a window or go sit in the shade and fan oneself. In *Houston's Forgotten Heritage*, Dorothy Knox Howe Houghton points out that those who were privileged built sleeping porches onto their homes to provide relief from the hot summer nights (279). For others who were not so privileged, they opened the front and back doors of their homes and made pallets on the floor where they could hopefully catch a cool breeze on a hot night (279). Through innovators like Haviland Carrier, modern air conditioning units were developed in the early 20th century. However, these units were mostly purchased and utilized by families of means and did not become popular until the end of World War II (279).

The development of the modern heating network, though not as big an issue in Houston due to an almost constant warm climate, was provided mainly by a fireplace and or stove. Wood may have been a cheap alternative, but had its limitations. Wood burned quickly, smoked, and created ash that constantly needed to be discarded. In addition, it

was limited in the area it could heat safely and efficiently. Coal was a popular alternative to wood because it burned longer and generated more heat. By the end of the 19th century, coal was being used to power locomotives, factories, and even electricity in homes. Coal was, for many homes, an essential source of heat for warmth and cooking. In *Houston's Forgotten Heritage*, the author discusses how homes and apartments in early 20th century Houston were built to use furnaces, boilers, and even radiant-heating systems (279). All of these systems were primarily powered directly by coal. Today, most homes and rentals receive their heat from either gas or electric powered systems. Even though these new systems have standards to safeguard against fire and even high energy-efficiency standards, coal is still the primary source of power in the United States.

Electrical Network

The development of electricity for home use is one of the most significant events in American history. Most of us could not survive without its existence. With the advent of Edison's light bulb, the practical use of electricity has become an essential part of daily life. The wide use of electricity is a relatively new technology. Less than 100 years ago, many people were still able to live fairly comfortable lives with coal, wood, and kerosene. It was not unusual to live in a middle class home that had a wood burning stove for cooking and heating water and either a fireplace or additional stoves for heat.

Many Victorian homes utilized conduits for gas and had built-in chests for wood and coal to be used in furnaces. Coal was delivered to homes and people would split logs for wood. Even though electricity was available for home use, only the most affluent were in the position to pay to either have homes built with or have an existing structure furnished with the new technology. In addition, there were safety issues. Because electrical systems were a new technology, homeowners were limited to being able to turn on one light at a time. There was a real danger of electrical fire and death due to electrocution. Nevertheless, innovators like Thomas Alva Edison and George Westinghouse were determined to see electricity become the standard for the delivery of power in the United States.

An electrical system is comprised of a grouping of electrical circuits. For an electrical circuit to function, there needs to be a source, a path, a load, and a switch. Most of us do not realize that every time a light is turned on or off, the switch merely opens and closes a circuit. A source can be a battery or a generator. A source's power comes from natural resources such as coal or water and converts the property of that resource to energy. In fact, the first electrical generators were powered by steam. Eventually towns and cities received their electricity from generators powered by rivers and other waterways. For example, two of America's most powerful generators are located at Niagara Falls and at the Hoover Dam. The majority of electrical power today comes from two sources: coal and nuclear energy. These two sources, however, have their limitations. First, coal is a natural resource that contains impurities such as sulfur. The smoke that comes from burning coal can mix with the air and cause acid rain. In

addition, coal has been listed as a contributor to the ozone hole that affects our earth's climate. Nuclear power is a cleaner source of energy but has a higher level of safety issues to combat. For example, a by-product of nuclear energy is nuclear waste. This waste must be disposed of in areas away from people so that they do not become victims of radiation poisoning. Nuclear plants also have to operate at higher safety levels than other power plants due to the potential for dangerous radiation exposure to the surrounding public.

The majority of today's home electrical systems utilize copper wiring for electricity to flow from one room to the next. Because the copper wiring produces heat, it is covered with a thick layer of rubber or plastic. In the past, layers of fire retardant asbestos and treated cloth covered electrical wiring. I can remember visiting my grandmother's home in East Texas and seeing old lamps with wiring with fabric coating and her telling me not to bother them because they were not safe for little children. An electrical load is the force that pushes the electricity through a path. Amperes or amps are measures of this force. Most home electrical circuits carry between 15 and 50 amps. Depending on homeowner needs, amps may be decreased or increased with additional wiring and/or equipment.

Today's home electrical needs far surpass those of the past that consisted mainly of lights. Many home electrical networks must provide power for lighting, heating, cooling, security, and even medical support. Many homeowners possess a variety of devices that require electricity to run, and the home electrical network provides safe and reliable power to assure that these devices stay operational. As a result, the electrical home network must be efficient, powerful, and reliable.

Communications Network

The communications network is the most complex of the four home networks. This particular network encompasses the technologies of telecommunications, digital communications, and even broadcast communications. As a result, the communications network has grown into a network that has the greatest influence over home living today.

The development of today's home communications network originated with the invention of the telephone. Even though the concept of communicating by wire was actually established with the introduction of the telegraph in the middle 19th century, the telephone gave people the power of communication over long distances without extensive training or assistance. The telephone began in homes as a tool that was centrally located and had limited capabilities. Many families had one phone that was connected through a wire to a group of wires outside the house. Moving the phone was limited to the length and location of the wire. If homeowners wanted another phone or wanted to have the present one moved, it meant having the phone company technician come out and paying for whatever adjustments were made.

One of the most important individuals in the invention of the telephone was Alexander Graham Bell. Bell's contribution to the area of telecommunications far surpassed his initial goal of creating a fast functioning telegraph machine. His innovations have had a profound impact upon home life in the United States and throughout the world.

From the telephone and now to the development of home automation, the communications network has allowed home owners to integrate a variety of home functions under a common set of controls. One of the most innovative aspects of the communications network is the development of the Internet and of data networking for home use. According to a study by NewsFactor Network at www.newsfactor.com, home Internet access topped approximately 500 million by March 2002. The United States and Canada lead with 191.7 million people having Internet access at home.

Many associate home networking with the Internet, but this is just part of a larger endeavor. This type of home network is a system that gives the homeowner the ability to adjust the function and operation of their home through a centralized control. One prime example of this type of network is the CompUSA Digital Living program. This program allows a homeowner to create an automated home environment. For example, this system provides automated control of a home's lights, appliances, cooling, heating, security, safety, and entertainment. The CompUSA Digital Living system also provides high speed DSL/Cable broadband networking and even a home based Local Area Network (LAN). According to Chris Taylor, CompUSA Design Consultant and information technology professional at the Canyon Gate community in Northwest Houston, this system gives a homeowner the power to create a home environment tailor-made for his/her family's lifestyles.

The home communications network is the most influential and powerful of all four home networks. First, this network provides reliable communication. Next, the communications network provides homes with innovative technologies that give occupants the power to optimize their living conditions. Finally, the communications network is the only home network that can directly influence the operation of the other three networks. For example, this network allows the homeowner to adjust his/her home environment via the Internet, activate lights with wireless controls, and even unlock doors with a thumbprint instead of a key. In addition, this system can be adjusted to lower a selected set of lights for entertainment and to provide the owner the power to monitor people in and around the house. Even appliance operations can be monitored and reported to technicians when they fail. The home communications network gives homes a type of functionality that enhances all other home networks and allows occupants to have a greater level of livability.

IMPLEMENTATION STRATEGIES

This unit will be used to introduce students to the Cisco Networking Academy. This curriculum will allow entering students with limited knowledge of network technology to gain insight and confidence in their CNA studies. The Texas Essential Knowledge and Skills (TEKS) for Technology Applications, Internetworking Technologies I, Social Studies, Technology Systems, and Science will be used in the teaching of this curriculum. Students will be given an opportunity to choose one network for study and create an electronically based presentation.

To introduce the curriculum, I will display the question “What is a network?” by digital projector. Student suggestions/answers will be entered and displayed. Next, students will receive a copy of the curriculum bibliography and use the listed reference tools to locate various definitions of the word “network.” After looking at various definitions, they will use the Inspiration software to create concept maps that will be saved and used in the creation of a multimedia project featuring one of the networks featured in the curriculum.

Group participation will be required for this project. I have found that smaller groups work more efficiently than larger ones. Students will be limited to no more than three persons per group. Each group will be given the responsibility of choosing a network as well as a group name. Each group will be posted in the room, and a chart will be created displaying progress on their particular project. Since the curriculum unit will be limited to a six-week period, the project will be divided into six parts. The first week will be on the creation of the concept map and the creation of folders to hold documents and the finished presentation. The second and third weeks will be dedicated to research of the chosen network. Students will use this time to do both online and library research. My classes will be given a list of sources to be used for research as well as instruction on how to use the online search engine Google. Students will also be given instruction on Copyright laws and citing sources. At the end, all student groups should have a statement of intent and a preliminary bibliography using EasyBib, located at easyBib.com.

During the fourth and fifth weeks, students will begin to build their projects. Lessons on the usage of digital cameras, scanners, and online graphics such as pictures and sound will be presented. All students will have an opportunity to practice using these devices. Even though it may be difficult, I would like to see one digital camera checked out to each student group so they can take pictures to use in their projects. There will also be additional lessons on importing digital video from digital recorders, sampling and creating sound clips, using graphic file types, and editing graphics for presentational use.

Each student presentation must contain one video clip. To accomplish this, Apple G4 computers with the program iMovie will be utilized to import videos and create a finished video clip. Suggested clips can be video of their network in action or interviews of those who may have been either involved in or witnessed the development of their network

from the past to the present. All clips, files and other graphic materials created will become part of the students' finished projects. The projects themselves will be created using MovieWorks software. I have chosen this software because of its ease of use, its affordability, and the Houston Independent School District's district-wide license for its use. In addition, all presentations can be saved for use in PowerPoint and the Internet.

The sixth week will be dedicated to completion of the project. During this week, I will assist students with troubleshooting, finalizing documents, and proofreading. All finished projects made in MovieWorks will be saved in both MovieWorks and QuickTime file formats. The last two days will be for student presentations. To save time, all students will start their presentation on a designated computer and each group will walk from one station to another to view work. All grades will be dependent on the completion of each component of the student projects. The TEKS objectives and a rubric will be used for assessment. One of my favorite resources for multimedia presentation rubrics comes from *Integrating Technology Into the Curriculum* (51 – 53). I will utilize this information to develop an assessment rubric for the student presentations. For example, page 52 contains a five-point rubric that evaluates the graphics, text and quality of the presentations. In addition, this guide includes a student self-assessment that will be very instrumental in encouraging students to do their best.

The rubric for this unit will be applied to all student projects turned in by the end of the first six-week period. Students will be given a copy of this rubric at the introduction of the unit and will use their copy as a self-assessment as they complete their projects. First, all projects must begin with a title, the names of the students in the group, the class period, date and class period. This information may be centered or located to the left margin. Second, there must be a disclaimer/fair use page included stating that all materials used are used for educational purposes and are not to be duplicated for profit. This statement will acknowledge that there are copyrighted materials used and that those materials will only be used for educational purposes according to U.S. copyright law. Third, all presentations will include a concept map, a timeline, a sample of a network made with the Incredible Machine, and a chart or graph representing results of a home network survey. All MovieWorks scenes must have a title, a short narrative about the scene, and a graphic such as a picture or animation. In addition, every student presentation must include a music or sound clip. In order to avoid conflict with copyright, I will supply license-free audio files for student use. Finally, all students must save their projects as MovieWorks documents and export them to QuickTime.

LESSON PLANS

Lesson Plan 1: What is a Network?

Introduction

This lesson will be used as an introduction to the curriculum unit. “What is a Network?” will be approximately 90 minutes and require students to create a concept map utilizing the concept mapping software Inspiration.

Objectives

Students will participate in a brainstorming activity to define the term “network.” Students will then utilize the Internet to research the word with the aid of the Ask Jeeves search engine. With this information, students will build a concept map focused on giving meaning to the term in their own words.

Materials

Students will need computers, Internet access, a browser program such as Microsoft Internet Explorer or Netscape, and Inspiration software to complete their assignment. In addition, the teacher will need a computer attached to either a digital projector or an LCD panel with a compatible overhead. Finally, students will need to create a folder either on their computer’s hard drive or in a designated place on the school server to save their work. Printers are also needed so that students may print out copies of necessary documents and completed work.

Description

I will begin this lesson by displaying the word “network” on a screen large enough for the entire class to see clearly. Since students will be using Inspiration, I will use this program to model the various steps they will take to build their concept maps. After displaying the word “network,” I will ask for various students to volunteer to give a brief description of the term. As students speak, I will enter the information into Inspiration. I will model and explain how I create each link to the main word (Figure 1). I will also show students how to change their web’s view from diagram to outline. Finally, students will be instructed to save their work to their designated folder as first an Inspiration document and then exported as a graphic in the jpeg format. Students will be told that the use of these two formats allows them to revise their web in the Inspiration format but also allows them ease in using the .jpeg format in their six-week projects (Figure 2).

Students will open Inspiration and begin their map by entering the word “network” into the main idea section. They will then create links from the main idea and enter various explanations for the word. To make the assignment more vivid, I will encourage my students to use the various pictures in the Inspiration Symbol Pallet window to make a more interesting web. All students must use words and phrases that relate back to the main idea (Figure 3).

All students will be given the opportunity to display and present their finished webs to their peers. Printed copies of the finished work must be submitted, and those copies will be part of a display of ongoing class assignment to be added to throughout the school year. This display will be used to motivate my students as well as give them a sense of pride concerning their participation in the Cisco Networking Academy.

Assessment

I will assess student work according to the TAKS objective for Social Studies and Multimedia Development. This assessment will also require that all assignments submitted must be complete and have at least three descriptive links to the main idea. These descriptions must be in the students' own words. I will also check for the use of pictures and make sure the assignments were saved to their folder and in both formats, as instructed. Finally, a printed copy of the web must be turned in before the end of class.

Lesson Plan 2: My "Incredible" Network

Introduction

This lesson will give my students the opportunity to design, build, test, and finalize their first network. Since most of my students love to play computer games, they will use "The Incredible Machine" educational game software to build their first simple network. I chose this software because of its ease of use, its ability to give students instant feedback, and its ability to give students multiple opportunities to enhance learning.

Materials

All student computers will need copies of "The Incredible Machine," Microsoft Paint, and Microsoft Word installed. I will also have those three items installed on my teacher's workstation and will have a digital projector connected to display instructions and examples to the students. Students will also need a folder set up on either their own computers or on the school server. Finally, students will need access to color printers. However, if that is not possible, they will print using the two existing laser printers in my room.

Description

This lesson, including the student activities, should take between 90 to 100 minutes to complete. "The Incredible Machine" is primarily a program that allows students to apply problem-solving techniques to complete or build functioning machines. A variety of parts, options, and hints are provided to aid students in their tasks. Students must choose which parts work best in order to complete a machine and accomplish the displayed goal at the bottom of the activity's screen. Students must also make adjustments to a variety of attributes that control gravity, pressure, background color, music, sound effects, volume and part action.

For this lesson, students will select "Professor Tim's Workshop" from the main menu. I will explain that they will have an opportunity to build a machine from parts that

will work together to accomplish a goal. The students will make this goal. I will also explain that the machine they build will represent an example of a network because a network brings various parts together so that they may work together to accomplish a particular task or goal.

After modeling how to use the login screen (Figure 4), the main menu (Figure 5), and the parts of “The Incredible Machine” windows, I will also model how they can save their program as an activity for others to try as well as a future part of their project. All students must save their machine to the correct folder. Next, they will make a copy of this game to be entered into Word by pressing the “Print Scrn” button on their computer’s keyboard. After making their copies, students will then open Word, select either the Paste button, Edit-Paste option from the menu bar or the key combination CTRL-V on the keyboard to paste a picture of their completed game into the new document (Figure 6).

Students will save their new document. To complete this assignment, students will add a title, a list of the parts, and a brief explanation of how they built their network. I will encourage students to save the document frequently to cut down on potential loss of work. At the end of the activity, all students will print their work and turn in a copy of their word document; they will also open their new networks for all to see.

Assessment

After allowing enough time for students to visit each other’s networks, I will assess each assignment according to the TAKS objectives for Secondary Science and Technology Applications for Multimedia Development. I will also check the assignment for completeness, neatness, grammatical correctness, and timeliness. All students will be aware of these requirements and will be encouraged to work together to create the best product possible.

Lesson Plan 3: Home Network Survey

Introduction

This lesson will allow students to develop surveys that assess various attributes about their peers’ current home networks. This lesson, including the activities, should take approximately 90 to 100 minutes to complete. All students will be required to build a usable online survey, record the results, discuss the results, and create a chart/graph depicting the results.

Objectives

Students will develop a multi-answer online survey with the Survey-Em! Website. Students will develop criteria to evaluate both qualitative and quantitative data and will compile the results on a chart or graph using Microsoft Excel. Students will learn the difference between a questionnaire and a survey and will learn the reasons why each is used for research.

Materials

Students will need computers, Internet access, Internet Explorer or Netscape browser, and “Survey-Em!” to build their online surveys. Microsoft Excel will also be needed to create charts and graphs. Students will also need a folder on the computer or school server to save their work and printers so they may print out a hard copy of their work. Finally, I will need a computer with Internet access, a digital projector, and a copy of a sample survey.

Description

This lesson will begin by displaying a sample survey for students to view. I will tell students that they will create a survey similar to the one displayed to gather information about their project’s topic. In addition, I will point out that surveys are research tools utilized to gather information and to further research.

According to the Research Methods Knowledge Base website at <http://trochim.human.cornell.edu/kb/>, William M. Trochin of Cornell University states that surveys can generally be divided into two categories. These two categories are the questionnaire and the interview. Questionnaires gather information through written responses while interviews require the verbal responses.

I will ask students to give examples of surveys that they may have taken. Next, I will instruct my students to build a seven- to 10-question survey to gather information concerning their topic. Students will utilize the “Survey-Em!” website to build an online multi-answer survey that will be sent to others via email. I will model this process by creating a five-question survey, submitting it to my own email, following the instructions, and completing and submitting the survey (Figure 7).

All student survey questions will have from two to four answer choices. Completed surveys will be sent by email to other individuals or student groups in the same class. These surveys will then be completed, submitted, and verified on the “Survey-Em!” website. For security purposes, all students will de-select the box for the option to make their responses viewable to the public. All survey results will be printed and the results recorded in the Microsoft Excel spreadsheet program (Figure 8). Students will then convert their spreadsheets into either charts or graphs (Figure 9). Finally, students will save the charts or graphs in their folders and print out and submit copies to be graded.

Assessment

I will assess this assignment according to TAKS objectives for Social Studies as well as for Technology Applications. Each student must submit a copy of his/her survey, the result page, and a chart or graph created in Microsoft Excel. I will check the assignment for completeness, neatness, grammatical correctness, and timeliness. All students will be aware of these requirements and will be encouraged to work together to create the best product possible.

APPENDIX

Figure 1

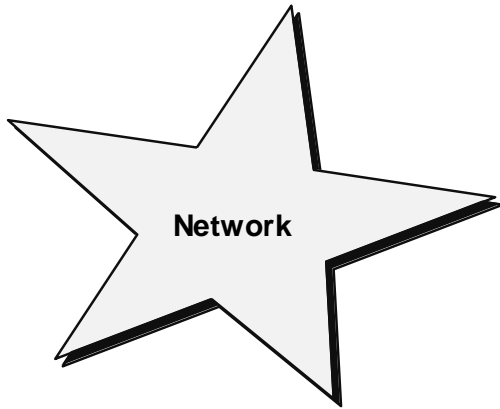


Figure 2



Figure 3

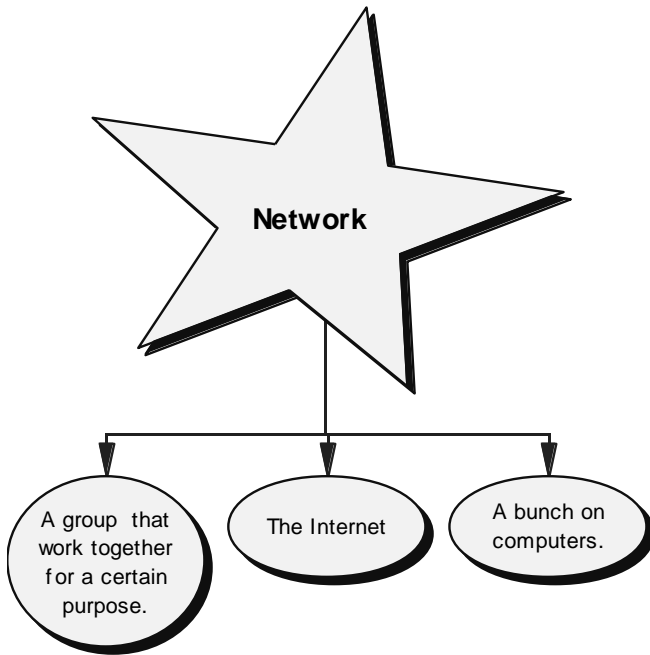


Figure 4



Figure 5

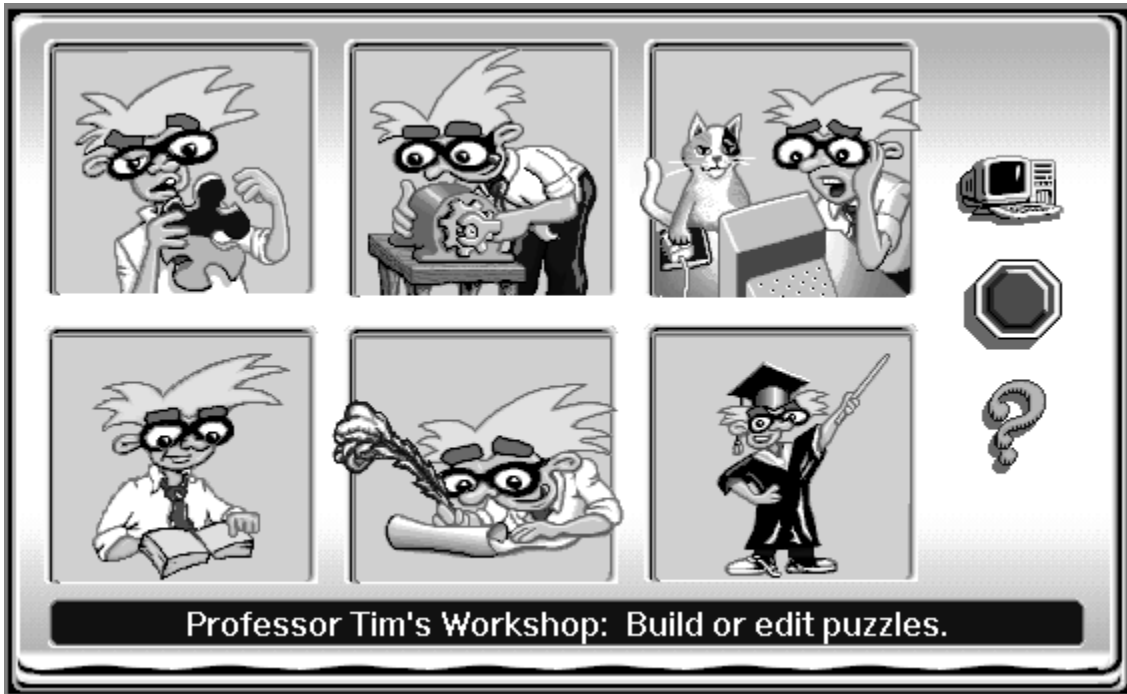


Figure 6

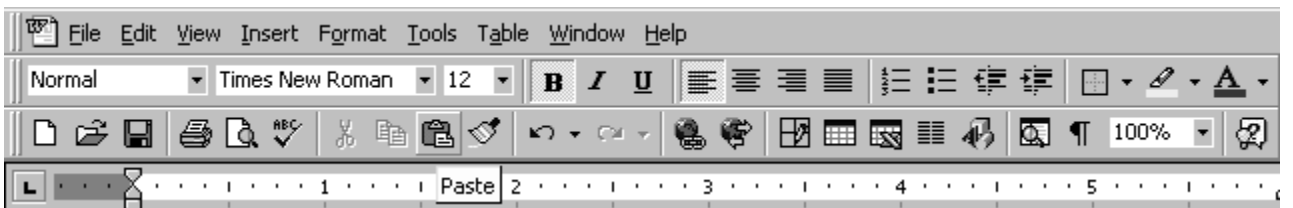


Figure 7

My First Survey

1. How many computers do you own?

- More than three.
- 2
- 1
- 0

2. What operating systems do they run?

- Linux
- Mac OS
- Other
- Windows

Figure 8

<input type="checkbox"/>	Sender	Subject	Date ▾	In Folder	Size
<input type="checkbox"/>	Mary Smith	Here are your survey results from survey-em.com!	Mon 06/23	Inbox	2k
<input type="checkbox"/>	Mary Smith	You've been invited to take a survey!	Mon 06/23	Inbox	2k

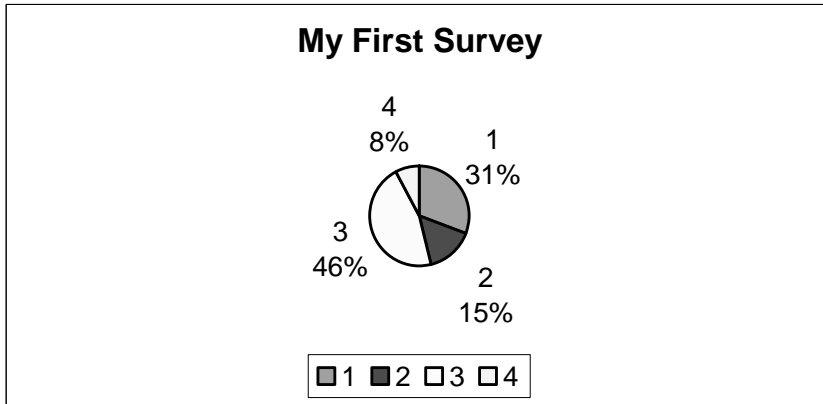
[Check All](#) - [Clear All](#)

The Board

Here is a list of people that have been sent the survey.

Name	E-mail	Taken?
sd	s_dd1@yahoo.com	Yes

Figure 9



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