



Desk &
Scanner

24-pin
netgear
switch

5-pin switch
& printer

To Library



Hallway

ELEMENTARY COMPUTER LAB

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Statement of Purpose

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The purpose for this proposal is to set up an instructional Computer Lab in a K-5 elementary school that has a maximum capacity of 600 students. Technology is a specialized instructional time that is offered once a week for 45 minutes. The elementary technology curriculum is designed for students in Grades 1-5. Kindergarteners are encouraged to learn how to use computers at times pre-arranged with the classroom and technology teachers.

The location for the computer lab should be centrally-located and near the Grade 3-5 classrooms. The lab should also be in close proximity to the media center for collaborative research and literacy projects. A portion of the hallway outside of the media center was “boxed” in a few years ago and would make an ideal location. It measures 15’ wide x 36’ deep. Power is available on the inside wall and there are entrances at either end. A network plug is available by the rear exit.

There are five (5) classes per grade level with no more than 24 students per class. The computer lab should be equipped with 24” state-of-the-art” PCs to accommodate for each student. To enhance our technology integration, I would recommend adding a black & white printer (a color printer is already available in building), a scanner, and a CD/DVD burner. Digital cameras, video camcorders, and multimedia projectors are available through the media center. The lab can be easily connected into the district’s existing WAN network which allows for the communication between buildings and beyond. A local Ethernet cabling network will grant the PCs access to this infrastructure while sending and receiving to/from the labs peripheral devices.

This computer lab can teach students how to use today’s technology efficiently. It would enhance a student’s education by providing “real life” learning experiences through various visual and audio resources. Technology is a tremendous tool which provides differentiated instruction to meet the needs of all learners.

Purchasing

The desktops, monitors, printer, and scanner were priced through PC Connections. PC Connections is a well-established statewide business that has had a solid working relationship with this district for the last 10 years. Their service department and customer service are far superior and very reliable. Their technicians are knowledgeable and are some of the top IT experts available in the state. They've agreed to set-up the lab, troubleshoot any equipment failures, and monitor the functionality of the equipment for 90 days.

The electronic components were priced through Tiger Direct, the best electronic supplier on the Internet. The pricing for on-line accessories, network, and electrical components were 25% less than local suppliers. This district has been using Tiger Direct since 1998 and has always received top-notch customer service. They have never had trouble with shipments or when returning products. Tiger Direct offers the most aggressive pricing discounts for any educational customer.

Operating System Requirements

The operating system must be compatible with the existing network software. This district is running a Windows platform so when I inquired about compatibility, it was advised to have the lab running Windows XP with the Service Pack 2.

HARDWARE

Desktop

The HP dx2200 desktop workstation has the ability to be independent from or as a part of a network. It has its own hardware and processing abilities which makes it more efficient for a learning environment. Terminals have a tendency to slow down and often not work when students are "interactive" or "steaming" from the Internet. A part of a student's learning experience is the "real-life" component and technology can make this happen. Plus, workstations allow you to download and save individualized software onto the hard drive to accommodate for students with IEPs or special education requirements.

The Intel's Pentium 4 processor is faster at the front side bus than the Athlon which allows for faster graphics and memory communication with the CPU. The instantaneous experience technology can bring for students is more powerful when it comes to intensive graphics and multimedia applications. Pentium 4 is more powerful to support these powerful applications.

The 1 GB DDR2 SDRAM optimizes video streaming because there is no wait time when accessing memory. The SDRAM is synchronized to the clock speed. The

DDR (double data rate) activates the output on both the rising and falling edges of the system clock which doubles the amount of output. This desktop has two memory slots available so the RAM could be increased up to 2 GB.

The 80GB Hard Drive of storage is pertinent to running the school-wide student data files often required when running simulation/tutorial software programs such as a typing or an assistive-technology program.

Student work should be stored digitally and be portable. The CD/DVD R-W Combo offers the electronic medium choices that are available for students now and in the future.

Connecting onto the Network requires the desktops to have Ethernet speeds that will move data quickly from the server to the individual workstations. A fast Ethernet network protocol comes standard with this system.

Monitor

The technology on the 17" LCD Monitor has advanced to a point where the viewing quality is comparable to that of a CRT. LCD's are not as bulky as the CRT's and are often flicker-free. They are overall less expensive because they have a longer lifespan and use lower power consumption.

Today's color TFT LCD (Thin Film Transistor Liquid Crystal Display) monitors are a sandwich-like structure with liquid crystal filled between two glass plates. Liquid crystals move according to the difference in voltage between the Color Filter Glass and the TFT Glass. This monitor delivers crisp, clean text and bright, vivid colors.

Dot pitch refers to the space between the pixels that make up the images on your screen and is measured in millimeters. The less space the better the image quality. To get the best quality, you are going to want to look at something in the 0.26 mm or smaller range.

Monitor resolution is measured in pixels, width by height. This is the physical number of horizontal and vertical pixels that make up the LCD matrix on the display. LCD monitors display information well at only the resolution they are designed for, which is known as the native resolution.

All LCD screens get their brightness from lighting behind the actual LCD films. The contrast ratio of a LCD flat panel is the rating of how distinguishable various shades of color are. The higher the contrast ratio of the screen, the better the color representation is by the monitor.

When you look at an LCD monitor from an angle, the image can look dimmer or even disappear. To compensate for this problem, LCD monitor makers have designed wider viewing angles. Manufacturers give a measure of viewing angle in degrees (the greater number of degrees the better). In general, look for angles between 120 and 170.

Printer

As much as I would love to have elementary students printing in color, the school could not afford it, which is why I am suggesting a black and white printer in this computer lab. The HP LaserJet 1320N does a better job with text which is 90% of the documents. The printing is faster, less expensive, and will serve you better. The main advantages of laser printers are their speed, precision and economy. A laser can move very quickly, so it can "write" with much greater speed than an ink jet. Typically, a laser printer is used as the "work horse" machine.

The duty cycles for laser printers are listed as 10,000 pages per month, which is quite common. The printers' printing speeds are stated in terms of pages per minute (ppm). You can figure that the numbers listed are maximums. Laser printers are faster, especially when printing a multi-page document or more than one copy of something.

The resolution refers to the dots of ink or electronic pixels that make up a picture when it is printed on paper. The higher dots per inch the better the quality. The majority of printing will be text so high quality is not a major consideration.

Scanner

The HP Scanjet 4370 is a great way to bring technology into student's learning experiences because of its ability to provide the means of transferring paper images and text into digital signals.

Scanning documents would be sporadic therefore a flatbed scanner would meet our needs more than a sheet-fed. The flatbed is less expensive to purchase and maintain. If there is need to scan archived documents, upgrading to a sheet-fed would then be considered. At this time I visualize only having student's artwork and writings scanned into the computers.

Resolution numbers indicate how many dots the scanner can capture in each linear inch of the scan head (called the optical resolution). The higher the numbers the sharper the scanned images will be.

Accessories

The anti-microbial protection in the mouse pad will allow the rubber pad to last longer and stand up against everyday wear and tear. It provides superior tracking for ball and optical mice and help protect the countertop surface.

The Logitech Headset will be used for students with hearing difficulties and for creating audio recordings that will be incorporated in with the curriculum.

Sony's Over-the-Head Headphones will be available at all workstations for students to use with simulation/tutorial programs such as Type to Learn.

The cable network kits are equipped with enough cable, tools, and connectors to supply the lab with cabling for all the equipment.

Network Switches

Netgear network switches provide a cost-effective way to boost performance by delivering larger amounts of multimedia, images, and video to end users. Each port senses and operates at the proper speed to take the burden off of the user. Network switches are capable of inspecting data packets as they are received, determining the source and destination device, and forwarding it appropriately. By delivering each message only to the connected device it was intended for, a network switch conserves network bandwidth and offers generally better performance than a hub.

Fast Ethernet supports a maximum data rate of 100 Mbps. It is so named because original Ethernet technology supported only 10 Mbps. A key element of Fast Ethernet's success is its ability to coexist with existing network installations. Today, many network adapters support both traditional and Fast Ethernet. These so-called "10/100" adapters can usually sense the speed of the line automatically and adjust accordingly.

The name *10BASE-T* is derived from several aspects of the physical equipment. The *10* refers to the transmission speed of 10 Mbit/s. The *BASE* is short for baseband which means only one Ethernet signal is present on the send and/or receive pair. And, the *T* comes from twisted pair, which is the type of cable that is used. *100BASE-TX* is the predominant form of Fast Ethernet, providing 100 Mbit/s Ethernet which runs over two pairs of wires on Category 5 cables. Twisting cables reduce electrical radio frequency interference which causes crosstalk.

CLASSROOM SET-UP

The high school went through a renovation in the science department and there are countertops available for us to use in the lab. Maintenance sees no problems with attaching and securing these counters per the room design. 24 extra chairs are attainable from other schools in the district.

The room does need to be electrically wired to meet the electrical demands and draw of this equipment. The district contracts out all electrical work and the estimate given is for mounting electrical strips, adding GFI switches, and installing an independent circuit breaker into the electrical panel.

SOFTWARE

Classroom Management

It is important for teachers to have a level of control over the learning environment. Computer lab management software can help maintain this control by providing features that change the way a teacher presents content and teaches skills. It helps to retain student attention and enhance instructional delivery.

PC Management

Symantec Ghost Solutions Suite is a comprehensive PC management tool for OS deployment, software distribution, back-up, and disaster recovery. This software will create standard system images for new workstations and is being used on all workstations and terminals within the district.

Information Processing

Information processing includes tasks such as word processing, spreadsheets, databases, desktop publishing, and graphics. Students will be exposed to creating, storing, updating, and publishing a wide range of written communications using a variety of software tools. The software programs were chosen so they coincide with the other schools along with exposing students to the latest technology.

Instructional Technology

Instructional technology are the software applications designed to support the educational approaches of analyzing, designing, developing, implementing, and evaluating which help to solve learning or performance problems. The software applications being used are multimedia, tool-based, simulation/tutorial, and computer programming.

Communication

A solid communication network involves instantaneous connections which address how information is exchanged through the use of facilities, such as electronic mail, on-line conferencing, group collaborations, and electronic bulletin boards. The program, First Class, will manage e-mail, conferences, and collaborations. Eboard will be used as an on-line cork board where you can post information for staff, students, and parents.

Network Access

The network access is a gateway between our internal network and an external communications network (the Internet). Comcast is the high speed Internet provider for our area. They offer all schools a free residential service. To shield the network, all workstations must have their own firewall and anti-virus/spyware protection along with access privileges to the server.