

## Part 1: Cabling Plan and Budget

### Network outlet requirement:

- Each classroom and office requires 2 live network outlets

### Assumptions and floorplan sizing:

- Maury High School is approximately 300 ft. wide
- There are 3 primary floors which are the basement, first, second, and third floors. The basement is the core equipment room.
- Each floor has an estimated 20 classrooms/ offices
- Total estimated: 60 rooms x 2 outlets = 120 outlets.

### Telecom closet locations:

- Basement: Main equipment room
- First floor: Small circled offices at each wing
- Second and third floors: Same layout as first floor

### Estimated cable runs:

Average run per outlet: 200 ft

Total cable 120 outlets = 24,000 ft

Adding a 15% buffer is about 27,600ft total

Item	Qty	Unit cost	Total	Source
Cat6 Solid Bulk Cable (1,000 ft)	28 boxes	\$150	\$4,200	Monoprice, Amazon
RJ45 Keystone Jacks	120	\$2.00	\$240	Amazon
Faceplates (2-port)	60	\$2.50	\$150	Amazon
Patch Panels (24-port)	6	\$60	\$360	Amazon
Wall Boxes	60	\$3.00	\$180	Amazon

Cabling Subtotal: ~\$5,130

## Part 2: Network Equipment Plan and Budget

### Port requirement:

- 120 outlets + 10% = 132 Ethernet ports needed minimum

### Hardware plan:

Item	Qty	Unit cost	Total	Notes
24-port managed switch (PoE optional)	6	\$250	\$1,500	TP-Link Jetstream
Core 48-port managed switch	1	\$500	\$500	Ubiquiti/Netgear
Patch cables (3ft)	150	\$3	\$450	Monoprice
Wall mounts	4	\$150	\$600	For closets
UPS battery backup (optional)	4	\$200	\$800	Optional for reliability

Equipment Subtotal: ~\$3,850

### Part 3: Security and network segmentation

#### Firewall Recommendation:

- Firewalla Gold Plus
- Supports 300+ users, VLANs filtering, monitoring
- Cost: \$600-\$850

#### Network Design:

- Staff VLAN: 192.168.10.0/24
- Student VLAN: 192.168.20.0/24
- Management VLAN: 192.168.30.0/24

#### Routing/ Security:

- Inter-VLAN routing handled by core switch or firewall
- Firewall rules to restrict student access to management network
- NAT and DNS/DHCP handled internally
- All internet-bound traffic filtered via firewall

Security Subtotal: ~850

### Final Budget Summary

Category	Subtotal
Cabling and installation	\$5,130
Network hardware	\$3,850
Firewall and security	\$850
Total Estimated cost:	\$9,830

**Extra notes:**

- Prices are estimates from Amazon, Monoprice, and CDW.
- A scaled diagram with equipment rooms and cable runs is in the labeled picture
- This network can be expanded and future VLANs

# Subnet Diagram

