

# CAREERS THROUGH MATHS: IT SUPPORT TECHNICIAN



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## JOB DESCRIPTION

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An IT Support Technician is the frontline problem-solver in any modern organisation, responsible for ensuring that technology functions seamlessly for end-users. On a daily basis, this involves responding to support tickets, troubleshooting hardware and software issues, configuring new equipment, and maintaining network infrastructure. A technician might start their day at a National Health Service (NHS) trust by re-imaging a laptop for a new staff member using deployment software like Microsoft Endpoint Manager, then move on to diagnosing a faulty biometric scanner at a reception desk. The work environment is incredibly varied, ranging from dedicated service desks in large corporations like Barclays or BT, to being the sole IT point of contact in a small-to-medium enterprise (SME) or a school, requiring adaptability and clear communication.

The role is fundamentally centred on logical, mathematical problem-solving. Every incident is a puzzle: a user cannot print, a server is running slowly, an application is crashing. The technician must systematically gather data, isolate variables, and apply a structured methodology to identify the root cause. This process is deeply mathematical, involving binary logic to understand how systems process information, number systems to work with IP addressing and subnetting, and data analysis to spot trends in recurring issues. For example, resolving a network outage in a London-based financial firm requires calculating subnet masks to ensure devices are on the correct network segment and analysing bandwidth usage data to identify potential bottlenecks or malicious activity.

Beyond reactive support, technicians play a proactive role in projects. This could involve planning the rollout of new software across a local council's offices, which requires calculating software licence costs, forecasting storage requirements based on user data growth, and scheduling the deployment in phases to minimise disruption—a direct application of project management mathematics. They also contribute to cybersecurity posture by analysing firewall logs using statistical models to detect anomalies, a critical task for complying with UK regulations like the Data Protection Act 2018 (GDPR). Ultimately, the IT Support Technician uses mathematics not just to fix what is broken, but to optimise, secure, and future-proof the technological backbone of UK business and public services.

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## HOW MATHEMATICS IS USED

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- **Binary Logic & Number Systems:** The entire foundation of computing is built on binary (base-2) and hexadecimal (base-16) number systems. Technicians use this daily when configuring network devices. For instance, assigning a static IP address to a server in a Manchester-based e-commerce company requires understanding subnetting. Calculating a subnet mask (e.g., 255.255.255.0) involves converting the decimal notation to binary to understand which part of the address defines the network and which part defines the host, ensuring devices can communicate without conflicts. Similarly, working with MAC addresses or memory dumps requires fluency in hexadecimal notation.
- **Boolean Algebra & Set Theory:** Troubleshooting is an exercise in Boolean logic (AND, OR, NOT). Diagnosing a problem involves creating logical trees: "IF the user can ping the gateway (TRUE) BUT cannot access the internet (FALSE), THEN the issue is likely with the DNS configuration." This application of logical operators allows for the efficient isolation of faulty components. When managing user access permissions in Active Directory for a university, technicians use set theory principles to add users to security groups, defining sets of individuals who have access to specific resources like research databases or financial systems.
- **Data Analysis & Statistics:** A key proactive duty is analysing support ticket data to identify trends and prevent future problems. Using a ticketing system like ServiceNow or Jira, a technician might calculate the Mean Time To Resolution (MTTR) for different issue types. They could perform statistical analysis to discover that 30% of all calls in a retail head office are related to a specific printer

model, providing the quantitative evidence needed to justify its replacement to management, thereby improving efficiency and reducing downtime.

- **Computational Thinking & Algorithms:** While not always writing complex code, technicians apply algorithmic thinking to automate repetitive tasks. This involves creating precise, step-by-step procedures for common fixes or deployments. For example, writing a PowerShell script to automate software installation on hundreds of PCs across a UK housing association requires breaking down the process into a logical sequence of commands, with conditional checks (if/else statements) to handle different scenarios, drastically reducing manual effort and human error.
- **Resource Estimation & Scaling:** Planning for growth is a critical mathematical function. When a growing tech startup in Bristol needs to scale its infrastructure, the technician must estimate future storage needs. This involves analysing current data growth rates (e.g., 5% per month), projecting this trend forward, and calculating the required investment in new storage area network (SAN) hardware. They must also calculate licence costs for new employees, ensuring the software budget scales accurately with headcount.

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## KEY SKILLS & TOOLS

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Skill/Tool	Application
Ticketing Systems (e.g., ServiceNow)	Used to log, track, and analyse support incidents. Mathematical application includes generating reports on ticket volume, calculating first-contact resolution rates, and analysing trends over time using descriptive statistics to inform IT strategy and resource allocation in UK organisations.
Network Diagnostic Tools (e.g., Wireshark)	Used to capture and analyse network traffic. Technicians use mathematical analysis to interpret packet data, calculate latency and jitter values, identify anomalous traffic patterns that could indicate a security breach, and verify network performance against service level agreements (SLAs).

PowerShell/Bash Scripting	Used for automation and bulk administration. Involves writing scripts with logical operators and loops to perform calculations, such as iterating through all user accounts in Active Directory to find those that have not logged in for 90 days, or calculating disk space usage across all servers.
Remote Desktop Software	The primary tool for remote support. While the tool itself is graphical, its use is governed by logical problem-solving. Technicians apply methodical, step-by-step logic to diagnose issues on a user's machine without being physically present, a common requirement for supporting hybrid workforces across the UK.
Configuration Management (e.g., Intune, Jamf)	Used to deploy software and settings en masse. The setup involves mathematical planning for phased rollouts (e.g., deploying to 10% of devices per day) and creating compliance policies that use logical conditions to check device health status before granting access to corporate resources.
Documentation (e.g., Confluence, SharePoint)	Critical for creating knowledge base articles. This involves distilling complex troubleshooting procedures into clear, logical steps and flowcharts. Good documentation is a mathematical exercise in clarity, precision, and logical sequencing, ensuring reproducibility and efficiency.
Diagnostic Hardware (e.g., Cable Testers, Multimeters)	Used for physical layer troubleshooting. Technicians use multimeters to take precise electrical measurements (voltage, resistance) to diagnose faulty power supplies or network cabling, applying fundamental principles of electronics and physics.

**Typical Pathway:** The most common entry route is through an apprenticeship, such as the Level 3 Information Communications Technician apprenticeship, which combines paid work with study. Alternatively, many technicians start by gaining vendor-specific qualifications like CompTIA A+ and Network+ while in a first-line support role. For career progression, technicians often specialise by obtaining advanced certifications from UK-recognised bodies like BCS (The Chartered Institute for IT) or vendors like Microsoft (Azure Administrator Associate) or Cisco (CCNA). With experience, one can progress to second- or third-line support, IT team lead, or specialise in areas like cybersecurity or network engineering. Some may choose to pursue a part-time foundation degree or BSc in Computer Science through institutions

like The Open University to complement their practical experience and open doors to more senior, architecture-focused roles.

**Industry Demand:** Demand for IT Support Technicians in the UK remains consistently high. According to the Office for National Statistics (ONS), IT technicians are listed among the roles with a high projected growth rate. This is driven by the continuous adoption of new technologies, the rise of hybrid working models requiring robust remote support, and an increased focus on cybersecurity. The UK government's national cyber strategy further amplifies the need for technicians with skills in secure configuration and threat analysis. Recruiters such as Hays Technology frequently report competitive salaries and a candidate-short market for skilled technicians.

**Real-World Impact:** IT Support Technicians are essential to the UK's digital economy and public services. They ensure the smooth operation of critical infrastructure, from the systems used by the NHS to treat patients to the trading platforms in the City of London. During the pandemic, they were instrumental in enabling the rapid shift to remote working for millions, a project that involved immense logistical and technical planning. Their work in maintaining secure systems protects UK citizens and businesses from cyber threats, safeguarding personal data and national economic interests. By solving technical problems and improving system efficiency, they directly contribute to the productivity and innovation of every sector they serve.