

# CAREERS THROUGH MATHS: SUPPLY CHAIN ANALYST



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## JOB DESCRIPTION

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A Supply Chain Analyst is a data-driven professional who optimises the flow of goods, information, and finances from raw material sourcing to the final customer. In the UK, this role is critical across major sectors such as retail (e.g., Tesco, John Lewis), manufacturing (e.g., Rolls-Royce, Unilever), and the thriving logistics hubs in regions like the Midlands and the Golden Triangle for distribution. Their daily work involves analysing complex datasets to identify inefficiencies, reduce costs, and improve resilience within the supply chain, a function that has become paramount since the UK's departure from the EU and subsequent shifts in trade patterns.

The work environment is typically a fast-paced office setting within a central logistics function, a retail head office, or at a manufacturing site. Key duties include monitoring inventory levels across UK distribution centres, forecasting product demand to ensure shelves are stocked without excess, and analysing transport routes to minimise fuel costs and delivery times. For example, an analyst at J Sainsbury's might be tasked with modelling the impact of a new supplier in Spain on lead times and customs documentation requirements, ensuring a steady supply of fresh produce to their supermarkets.

Mathematics is the bedrock of this role. Analysts employ quantitative methods to solve real-world logistical puzzles. They don't just report what has happened; they use mathematical models to predict what *will* happen and prescribe the best course of action. This could involve calculating the optimal safety stock level for a high-demand component at a Jaguar Land Rover factory to prevent production line

stoppages, or using statistical analysis to assess the risk of disruption from a specific supplier, thereby strengthening the supply chain against potential shocks.

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## HOW MATHEMATICS IS USED

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- **Statistics and Forecasting:** This is the primary mathematical toolset. Analysts use time-series analysis and regression models to predict future demand. For instance, they might analyse five years of sales data for a popular product at Boots, accounting for seasonal trends (like the surge in cough medicine sales during winter) and promotional events (like "3 for 2" offers), to create an accurate sales forecast for the next quarter. This prevents both costly overstocking and lost sales from understocking.
- **Linear Programming and Optimisation:** This area is used for resource allocation and routing. A Supply Chain Analyst at DHL might use linear programming to determine the most efficient delivery routes for a fleet of lorries from a central hub in Coventry to multiple stores across the West Midlands. The model would mathematically balance constraints like vehicle capacity, driver hours in compliance with UK regulations, road tolls, and delivery time windows to find the solution with the lowest total cost.
- **Probability and Risk Analysis:** With supply chains becoming more volatile, quantifying risk is essential. Analysts use probability distributions to model the likelihood of disruptive events. For example, they might calculate the financial impact of a potential dockworkers' strike at the Port of Felixstowe on the import of consumer electronics, enabling the company to create contingency plans, such as rerouting shipments via mainland European ports.
- **Calculus:** Calculus, particularly concepts of rates of change and derivatives, is used for dynamic optimisation. An analyst at British Airways might use calculus to model the optimal fuel burn rate for its cargo planes on the London Heathrow to New York JFK route, considering variables like air traffic, weather patterns, and aircraft weight, to minimise fuel costs—a significant operational expense.
- **Data Analysis and Mathematical Modelling:** This encompasses the entire workflow. It involves using statistical software to clean and analyse large

datasets, building mathematical models that simulate supply chain behaviour. For example, before ASOS opens a new fulfilment centre in the UK, analysts will build a simulation model to test how different layouts and automation technologies will affect order processing times and staffing requirements, ensuring the multi-million-pound investment is sound.

## KEY SKILLS & TOOLS

Skill/Tool	Application
Microsoft Excel & Power BI	The cornerstone tool for most UK analysts. Used for everything from basic data cleansing and pivot tables to building complex optimisation models using Solver and creating interactive dashboards to visualise key performance indicators (KPIs) like On-Time-In-Full (OTIF) delivery rates for senior management.
SQL (Structured Query Language)	Essential for extracting and manipulating large volumes of data from corporate databases, such as SAP or Oracle systems. An analyst might write a SQL query to pull all inventory transaction data for the past year from a Nestlé warehouse to identify slow-moving stock and recommend discounting strategies.
Python/R	Used for advanced statistical analysis, forecasting, and building machine learning models. A Python script might be written to scrape UK freight cost data from a logistics provider's API and integrate it into a total landed cost model for imported goods, factoring in currency exchange rates and customs duties.
Enterprise Resource Planning (ERP) Systems	Proficiency in systems like SAP or Oracle is crucial. These systems are the source of truth for data. Analysts use them to understand material requirements planning (MRP) logic, run reports on procurement spend, and validate the outputs of their mathematical models against real-world operational data.
Transport Management Systems (TMS)	Used to analyse and optimise shipping and freight. An analyst at a retailer like Marks & Spencer would use a TMS to mathematically compare the cost and carbon footprint of different shipping modes (road, rail, sea) for moving goods from a supplier to their distribution centres.

Data Visualisation Tools (Tableau, Qlik)	Critical for communicating complex mathematical findings to non-technical stakeholders. An analyst might build a Tableau dashboard that visually represents supplier performance metrics across the UK, highlighting bottlenecks with red-amber-green (RAG) status indicators for easy interpretation by the Head of Procurement.
Statistical Process Control (SPC)	A mathematical method for quality control. Used in manufacturing settings, for example at a BAE Systems plant, to monitor production processes. Control charts are used to detect variations in component dimensions, ensuring they remain within specified tolerances and preventing defects in the final product.

**Typical Pathway:** A strong foundation in Mathematics at GCSE and A-Level (or Scottish Highers) is essential. Most entrants hold an undergraduate degree in a highly numerate discipline such as Mathematics, Operational Research, Economics, or Business with a strong analytical component. Many UK universities, like the University of Warwick and Lancaster University, offer specialised degrees in Supply Chain Management or Logistics. Entry-level positions, such as a Supply Chain Graduate Scheme at companies like Procter & Gamble or Amazon UK, provide structured training. Career progression can lead to roles like Senior Analyst, Supply Chain Manager, or Head of Logistics. Key UK qualifications that enhance prospects include gaining Chartered Status with the Chartered Institute of Procurement & Supply (CIPS) or the Chartered Institute of Logistics and Transport (CILT).

**Industry Demand:** The demand for Supply Chain Analysts in the UK is robust and growing. According to the Office for National Statistics (ONS), roles in logistics and operational research are projected to see significant growth. Factors such as Brexit-related trade complexities, the e-commerce boom, and a heightened focus on supply chain resilience and sustainability are driving UK businesses to invest heavily in analytical talent to optimise costs and manage risk effectively.

**Real-World Impact:** Supply Chain Analysts play a vital role in the UK economy by making businesses more competitive, efficient, and environmentally responsible. Their work ensures the smooth flow of essential goods, from food and medicine to automotive parts. For instance, analysts at Ocado use advanced algorithms to optimise their highly automated fulfilment centres and delivery routes, directly contributing to reduced food miles and faster, more reliable grocery deliveries for communities across the UK. Their mathematical expertise is fundamental to building the resilient, data-driven supply chains that underpin modern British industry.