

CAREERS THROUGH MATHS: LOGISTICS COORDINATOR



JOB DESCRIPTION

A Logistics Coordinator is the operational hub of the supply chain, responsible for ensuring goods move efficiently from suppliers to customers. On a daily basis, they plan and monitor the shipment of goods, liaise with hauliers, warehouses, and customers, and solve any issues that arise, such as delays at ports like Felixstowe or Dover, customs clearance problems post-Brexit, or last-minute changes to customer orders. They work in a fast-paced office environment, often within sectors like retail (e.g., for companies like Tesco or ASOS), manufacturing, or for specialist third-party logistics (3PL) providers such as Wincanton or XPO Logistics. The role is heavily reliant on communication, organisation, and specialised software systems to track inventory and coordinate transport.

Key duties include booking freight using the most cost-effective and reliable methods, preparing shipping documentation (including customs declarations for EU trade), updating inventory records, and providing customers with real-time tracking information. A significant part of the role involves analysing data to identify inefficiencies. For example, they might review a month's worth of delivery times from a Midlands-based warehouse to Scottish stores to pinpoint recurring delays on specific routes. They are also responsible for ensuring compliance with UK and international trade regulations, a task that has grown in complexity since the UK's departure from the EU.

Mathematics is central to virtually every aspect of this role. It is not merely about basic arithmetic but involves applying complex mathematical concepts to solve real-

world logistical problems. A Logistics Coordinator uses geometry to calculate the optimal pallet configuration for a shipping container, algebra to model the relationship between fuel surcharges and total freight costs, and statistics to forecast seasonal demand for products, ensuring a UK retailer like John Lewis has sufficient stock ahead of the Christmas peak without overstocking. This mathematical application turns raw data into actionable business intelligence, directly impacting the company's bottom line and service quality.

HOW MATHEMATICS IS USED

- **Geometry & Spatial Reasoning:** This is fundamental for maximising space utilisation in warehouses and transport vehicles. Coordinators must calculate the volume of goods (using $\text{length} \times \text{width} \times \text{height}$) and determine the most efficient way to pack them. For instance, they might use palletisation algorithms to arrange mixed products on a pallet destined for an Argos distribution centre, ensuring maximum stability and space usage while adhering to weight limits for road freight. Similarly, they plan how to load 40-foot containers for export from the Port of Liverpool, minimising wasted space to reduce shipping costs per unit.
- **Algebra & Financial Mathematics:** Algebra is used extensively for cost analysis and budgeting. A coordinator will work with formulae to calculate total landed cost, which includes: $(\text{Goods Cost}) + (\text{Freight Cost}) + (\text{Import Duty}) + (\text{Insurance})$. They model the impact of variables; for example, if fuel prices rise by 10%, they can algebraically determine the new total cost for a fleet of lorries. They also perform break-even analysis to decide between different transport options, such as comparing the cost of slower sea freight versus faster but more expensive air freight for a shipment of pharmaceuticals from the UK to a new market in Asia.
- **Statistics & Probability:** Logistics is fraught with variability, and statistics are used to manage this uncertainty. Coordinators analyse historical data to forecast future demand, using measures of central tendency (mean, median) and dispersion (standard deviation). For example, they might analyse five years of sales data for umbrellas to predict regional stock requirements for a chain like Boots, factoring in probabilistic weather forecasts. They also use probability to assess carrier performance, calculating the likelihood of a specific haulier delivering on time based on their past performance records.

- **Optimisation & Linear Programming:** This advanced mathematical area is used to solve complex routing and scheduling problems. The goal is to minimise distance, time, or cost while meeting all constraints. A typical problem involves determining the most efficient delivery route for a fleet of vans making multiple drops in Central London, considering variables like traffic congestion (using real-time TfL data), time windows for delivery, and vehicle capacity. Software often handles the complex calculations, but the coordinator must understand the principles to input correct constraints and interpret the results effectively.
- **Data Analysis & Statistical Process Control (SPC):** Coordinators use data analysis to monitor and improve supply chain performance. They create dashboards in tools like Microsoft Power BI to track Key Performance Indicators (KPIs) such as On-Time In-Full (OTIF) rates, warehouse picking accuracy, and freight cost per unit. Using SPC, they can create control charts to monitor processes over time. For example, they might track the time taken to process orders at an Amazon fulfilment centre, identifying and investigating any data points that fall outside the control limits, which signals an unexpected process variation that needs correction.

KEY SKILLS & TOOLS

Skill/Tool	Application
Transport Management System (TMS)	A TMS like Mandata or Microlise is used to mathematically optimise route planning. The coordinator inputs delivery postcodes, time constraints, and vehicle specs, and the software uses algorithms to calculate the most fuel-efficient and time-effective routes for a UK-wide delivery network, saving thousands of pounds in fuel annually.
Microsoft Excel & Power BI	Excel is indispensable for mathematical modelling. Coordinators use it with advanced functions (VLOOKUP, SUMIFS) and PivotTables to analyse freight spend, calculate customs duties using HMRC commodity codes, and create demand forecasts. Power BI is then used to visualise this data, creating interactive reports for management on logistics performance.

Enterprise Resource Planning (ERP) Systems	Systems like SAP or Oracle are used to manage inventory levels mathematically. The software can be set up with reorder point formulae (e.g., $\text{Reorder Point} = \text{Lead Time Demand} + \text{Safety Stock}$) to automatically generate purchase orders when stock for a component in a Jaguar Land Rover factory falls below a pre-calculated threshold.
SQL & Basic Programming (e.g., Python)	SQL is used to query large databases to extract specific logistics data for analysis. A coordinator might use a Python script with libraries like Pandas and NumPy to automate the analysis of carrier performance data, calculating on-time delivery percentages and identifying statistically significant trends over time.
Warehouse Management Systems (WMS)	A WMS such as JDA or a custom system uses geometry and algorithms to assign storage locations (slotting) based on product dimensions, weight, and turnover rate. This ensures fast-moving items are placed in the most accessible locations, mathematically minimising the average travel time for pickers.
Communication & Data Presentation	The ability to translate complex mathematical findings into clear, actionable insights for non-technical stakeholders is crucial. A coordinator may present a cost-benefit analysis, using charts and graphs to show senior management at a company like DHL why investing in a new Midlands warehouse will reduce overall logistics costs by 15% within two years.
Lean Six Sigma Methodology	This quality control methodology is rooted in statistical analysis. Coordinators use tools like DMAIC (Define, Measure, Analyse, Improve, Control) and calculate process capability indices (C_p , C_{pk}) to reduce waste and variation in logistics processes, such as streamlining the returns process for an online fashion retailer like ASOS.

Typical Pathway: A common entry route is via an apprenticeship, such as a Supply Chain Warehouse Operative (Level 2) or a Supply Chain Leadership (Level 6) degree apprenticeship. Alternatively, one can enter with A-levels, often with Mathematics or Business Studies being advantageous, and progress from a logistics administrator role. Many universities offer relevant BSc degrees in Logistics and Supply Chain Management (e.g., at Aston University or the University of Huddersfield). Career progression typically moves from Coordinator to Logistics Manager, and then to Head

of Supply Chain. Key UK qualifications for professional development include the Chartered Institute of Procurement & Supply (CIPS) certificates and diplomas or the Chartered Institute of Logistics and Transport (CILT) qualifications, which can lead to Chartered status.

Industry Demand: The demand for skilled Logistics Coordinators in the UK remains strong. According to the Office for National Statistics (ONS), the transportation and storage sector is a key growth area. Factors such as the expansion of e-commerce, the complexity of post-Brexit international trade, and a focus on supply chain resilience are driving demand. Employers specifically seek candidates with strong analytical and mathematical skills to optimise costs and improve efficiency in a competitive market.

Real-World Impact: Logistics Coordinators play a vital role in the UK economy by ensuring the smooth flow of goods that businesses and consumers rely on. Their mathematical work in optimising routes directly reduces fuel consumption and CO2 emissions, contributing to corporate sustainability targets. They were instrumental in managing the complex logistics of the COVID-19 vaccine rollout across the UK, ensuring temperature-sensitive vials were stored and transported correctly. By making supply chains more efficient and resilient, they help keep shelves stocked in supermarkets, enable next-day delivery for online orders, and support the UK's position as a global trading nation.