



Essential Knowledge	Teaching Points
<ul style="list-style-type: none"> • Use input/output diagrams; • Use axes and coordinates to specify points in all four quadrants in 2D; • Identify points with given coordinates and coordinates of a given point in all four quadrants; • Find the coordinates of points identified by geometrical information in 2D (all four quadrants); • Find the coordinates of the midpoint of a line segment; • Read values from straight-line graphs for real-life situations; • Draw straight line graphs for real-life situations, including ready reckoner graphs, conversion graphs, fuel bills graphs, fixed charge and cost per unit; • Draw distance–time graphs and velocity–time graphs; • Work out time intervals for graph scales; • Interpret distance–time graphs, and calculate: the speed of individual sections, total distance and total time; • Interpret information presented in a range of linear and non-linear graphs; • Interpret graphs with negative values on axes; • Find the gradient of a straight line from real-life graphs; • Interpret gradient as the rate of change in distance–time and speed–time graphs, graphs of containers filling and emptying, and unit price graphs. 	<ul style="list-style-type: none"> • Clear presentation of axes is important. • Ensure that you include questions that include axes with negative values to represent, for example, time before present time, temperature or depth below sea level. • Careful annotation should be encouraged: it is good practice to get the students to check that they understand the increments on the axes. • Use standard units of measurement to draw conversion graphs. • Use various measures in distance–time and velocity–time graphs, including miles, kilometres, seconds, and hours.
<p>Assumed Prior Knowledge/ Links / Interleaving</p>	
<ul style="list-style-type: none"> • Students should be able to substitute into a formula • Students should be able to plot coordinates and read scales 	
<p>Potential Barriers to Access / Misconceptions</p>	<p>Opportunities for Reasoning/Problem Solving/Proofs</p>
<ul style="list-style-type: none"> • With distance–time graphs, students struggle to understand that the perpendicular distance from the x-axis represents distance. 	<ul style="list-style-type: none"> • Students should be able to decide what the scales on any axis should be to be able to draw a correct graph. • Conversion graphs can be used to provide opportunities for students to justify which distance is further, or whether or not certain items can be purchase in different currencies.
<p>Key Mathematical Vocabulary</p>	<p>Linear, graph, distance, time, coordinate, quadrant, real-life graph, gradient, intercept, function, solution, parallel</p>