

Lesson 7 Overview

Understanding straight line graphs

Activity	Time (min)	Description/Prompt	Materials
Introduction	15	<p>Introduce the context of bike/scooter hire and ask students to determine a pricing option that meets Edwin's requirements for the charge for an average pedal bike hire. Develop an equation to represent the situation and draw the graph of the equation.</p> <p>The context used here has been chosen so that the role of the constant (fixed charge per hire) and the gradient (charge per minute) make sense to students and provides an opportunity for them to think more deeply about mathematical structure, and how a straight line graph relates to its equation and the situation that it describes.</p>	<p>Mini whiteboards 'Pedal bike hire' GeoGebra app Slides 2–11</p>
Explore 1	10	<p>Ask students to work in pairs to complete the missing descriptions, equations and graph on the 'Pricing' handout and identify which option Debbie and Edwin should choose for each type of hire.</p> <p>Providing students with partial information and asking them to complete the other ways of representing it helps to develop their understanding of the ways in which the different representations are connected.</p>	<p>'Pricing' handout Sharp pencils Slides 12 and 13</p>
Discuss 1	10	<p>After students have had sufficient time for the task, hold a class discussion to check students' understanding. Establish which options Debbie and Edwin should choose and discuss the features of the different graphs in terms of gradient and y-intercept and how they relate to the equations.</p> <p>Bring students' thinking together by asking them to match graphs and descriptions based on common properties.</p>	<p>Mini whiteboards Slides 14–17</p>

Explore 2	20	<p>Ask students to work in pairs to place the cards in the correct blanks and complete the graphs on the 'Hire charges' handout.</p> <p>The linear relationships have been chosen such that the variation requires students to think carefully about the mathematical structure of the relationship whilst making connections between different mathematical concepts.</p>	<p>'Hire charges' handout, 'Cards' and scissors (optional)</p> <p>Slide 18</p>
Discuss 2	10	<p>Discuss each row of the table and ask students to explain their thinking as they complete the task.</p> <p>The focus of this discussion is on checking students' understanding and establishing key mathematical concepts. It is important that the mathematical structure of the linear relationships is explored as part of the discussion.</p>	Slides 19–22
Review	10	<p>Remind students that Debbie and Edwin are interested in how competitive their charges are compared to two other companies. Review how Debbie's and Edwin's charges compare to companies A and B and help students to see the connections between the gradient of the line, where it crosses the y-axis and the equation of a straight line in its general form $y = mx + c$.</p>	<p>Mini whiteboards</p> <p>Slides 23–25</p>
Practice questions/ Discuss 3	15	<p>Give each student a copy of the 'Practice questions' handout and ask them to work on the questions individually.</p> <p>Once students have completed both practice questions, hold a class discussion. Discuss different student approaches and check understanding. It is important that students feel that their approach has value and that all students are able to contribute to the class discussion.</p>	<p>'Practice questions' handout</p> <p>Slides 26 and 27</p>