

In partnership with



**Dr Frost  
LEARNING**

# STRIDE INTO *THE FUTURE* OF ASSESSMENT

Teacher Companion Guide

**Graphs**



# Table of Contents

2	<a href="#">Overview and Rationale</a>
3	<a href="#">Concept Map and Key Features</a>
4	<a href="#">G1 Read the values on a linear scale</a>
5	<a href="#">G2 Read the values on a measuring device</a>
6	<a href="#">G3 Recognise charts by type</a>
7	<a href="#">G4 Read and plot coordinates in the first quadrant</a>
8	<a href="#">G5 Read and construct 2-way tables</a>
9	<a href="#">G6 Complete a table of values</a>
10	<a href="#">G7 Read and plot coordinates in four quadrants</a>
11	<a href="#">G8 Plot from a data table</a>
12	<a href="#">G9 Find the midpoint of 2 coordinates</a>
13	<a href="#">G10 Read and compare bar and line charts</a>
14	<a href="#">G11 Read and compare pie charts</a>
15	<a href="#">G12 Understanding and interpreting keys</a>
16	<a href="#">G13 Read conversion graphs</a>
17	<a href="#">G14 Interpret scatter diagrams (including comparison)</a>
18	<a href="#">G15 Line of best fit</a>
19	<a href="#">G16 Identify the key features of a graph</a>
20	<a href="#">G17 Find the gradient</a>
21	<a href="#">G18 Lines parallel to the axes</a>
22	<a href="#">G19 Interpreting <math>y = mx + c</math></a>
23	<a href="#">G20 Parallel gradients</a>
24	<a href="#">G21 Linear v non-linear graphs</a>
25	<a href="#">G22 Interpret time series (including comparison)</a>
26	<a href="#">G23 Distance/time graphs (including comparison)</a>
27	<a href="#">Contributors</a>

## Overview

Stride is a new offering from AQA which is designed to empower students and quickly identify and close their knowledge gaps in mathematics. Designed to help students starting their GCSEs – either for the first time or as a resit – the tests are accessible for all and adapt to students' knowledge, delivering the right amount of challenge.

Our new maths tests will allow teachers to pinpoint gaps in their students' conceptual knowledge - saving them time and empowering students, who will understand how to improve. They're fully funded for schools and colleges, easy to use for teachers and engaging for students.

The five short tests, created with the [Key Stage 1 and 2](#) and [Key Stage 3](#) guidance in mind, focus on key areas of maths that experts have identified as the most impactful for GCSE success. They come with personalised learning and next steps to allow students to develop in both knowledge and confidence.

### Rationale

We know that maths is a hierarchical subject, with knowledge being built upon foundational maths which underpins the new concept. We have analysed data from hundreds of thousands of exam questions and found that even though content is first encountered in the early stages of a learner's schooling, a significant proportion of learners answer questions on the foundations of maths incorrectly.

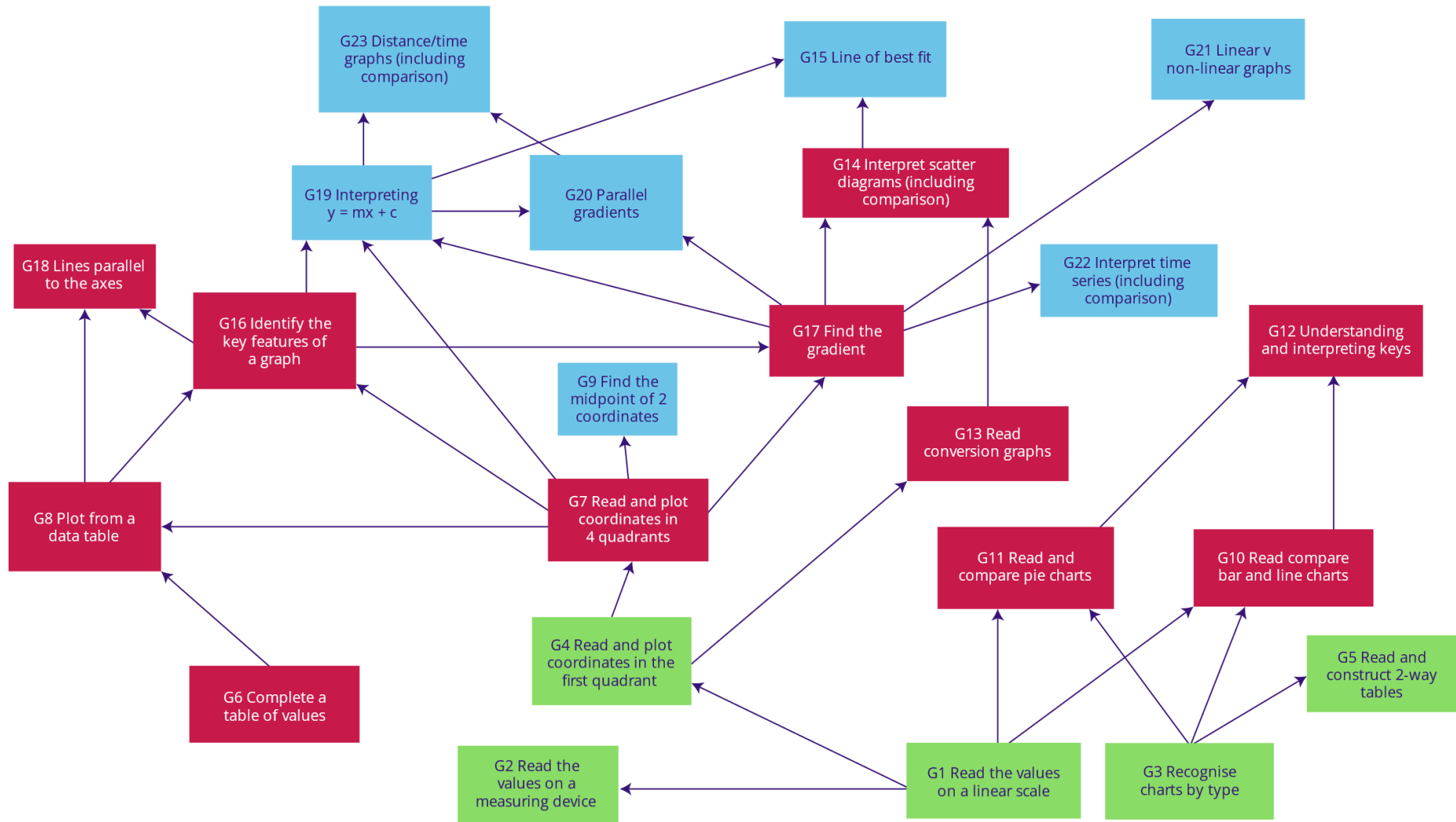
With this in mind, we want to empower teachers to take control of their classrooms and provide a nurturing environment in which gaps within key prerequisite understanding are identified and corrective instruction is deployed, filling the gaps and ensuring that more complex content can be taught, safe in the knowledge that learners have the underlying knowledge required to be successful in their lessons, and thrive in the GCSE examinations.

### Key features

The Concept Map, shown on the next page, shows that the key foundational knowledge for success with Graphs is the ability to read and plot coordinates in all four quadrants of the Cartesian plane, as well the ability to interpret scales in a variety of graduations, finding values which aren't provided on the scales.

It can also be seen that the gatekeeper to greater success is G17 Find the Gradient, which is a predecessor to five other areas including G19 Interpreting  $y=mx+c$  and G21 Linear v Non-linear Graphs. Understanding the concept of gradient is a key development to success with the Higher tier of GCSE mathematics.

## 4. Graphs



## G1 Read the values on a linear scale

What is being tested	Learners are being tested on their understanding of the number line and reading scales given with different graduations.
Learning Objectives	<p>G1.1 Input the missing values on the number line (decimals tenths)</p> <p>G1.2 Input the missing values on the number line (decimals hundredths)</p> <p>G1.3 Read an integer scale on a line</p> <p>G1.4 Read an integer scale on a vertical line</p> <p>G1.5 Read a decimal scale on a line</p> <p>G1.6 Input the numbers on a number line (integers)</p>
Predecessors	None
Successors	<p>G2 Read the values on a measuring device</p> <p>G4 Read and plot coordinates in the first quadrant</p> <p>G10 Read compare bar and line charts</p> <p>G11 Read and compare pie charts</p>
KS2 & KS3 Guidance	Learners are introduced to the number line in Year 1 (page 18, KS1 and KS2 guidance) and improve their understanding through KS1 and KS2.
Dr Frost Learning Platform References	<b>DF Index skills</b>
	6 Understanding (positive) whole numbers on a number line
	14 Reading integer values off a scale
	34 Numbers above 100
	69 Place value of the tenths, hundredths and thousandths digits
	<b>New Lesson Resources</b>
<a href="#">Decimal Number Lines</a>	
<b>Legacy Lesson Resources</b>	
N/A	

## G2 Read the values on a measuring device

What is being tested	Learners are being tested on their ability to read values from different scales.
Learning Objectives	G2.1 Recognise the correct value displayed on speedometer G2.2 Recognise the correct value displayed on the weighing scale G2.3 Recognise the correct value displayed on thermometer
Predecessors	G1 Read the values on a linear scale
Successors	None
KS2 & KS3 Guidance	Learners begin to read values from measuring devices in Year 3 (page 91, KS1 and KS2 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	15 Measuring using scales of lengths, mass and capacity
	<b>New Lesson Resources</b>
	<a href="#">Decimal Number Lines</a>
	<b>Legacy Lesson Resources</b>
	<a href="#">GCSE/KS3 - Reading Scales</a>

## G3 Recognise charts by type

What is being tested	Learners are being tested on their ability to recognise different types of charts.
Learning Objectives	G3.1 Identify a pictogram G3.2 Identify a bar chart G3.3 Identify a pie chart G3.4 Identify a line graph
Predecessors	None
Successors	G5 Read and construct 2-way tables G10 Read compare bar and line charts G11 Read and compare pie charts
KS2 & KS3 Guidance	Learners begin to encounter basic charts in Year 2 (page 53, KS1 and KS2 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	31 Pictograms
	65 Bar charts and vertical line charts
	114 Interpreting and presenting data in simple graphs
	131 Pie charts with simple fractions and percentages
	<b>New Lesson Resources</b>
N/A	
<b>Legacy Lesson Resources</b>	
<a href="#">Charts &amp; Averages</a>	

# G4 Read and plot coordinates in the first quadrant

What is being tested	Learners are being tested on their ability to describe positions in the first quadrant of the Cartesian plane using coordinate notation.
Learning Objectives	<p>G4.1 Plot coordinates in the first quadrant (integers)</p> <p>G4.2 Plot coordinates in the first quadrant (decimals)</p> <p>G4.3 Identify coordinates in the first quadrant (integers)</p> <p>G4.4 Identify coordinates in the first quadrant (decimals)</p> <p>G4.5 Plot coordinates when axes are spaced differently</p> <p>G4.6 Plot 2 variables (x, y) on scatter graph</p> <p>G4.7 Plot a point with coordinates in the first quadrant</p> <p>G4.8 Identify coordinates of a given point in the first quadrant</p>
Predecessors	G1 Read the values on a linear scale
Successors	<p>G7 Read and plot coordinates in four quadrants</p> <p>G13 Read conversion graphs</p>
KS2 & KS3 Guidance	Learners begin to use coordinate notation to describe positions in Year 4 (page 193, KS1 and KS2 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	83 Coordinates in the first quadrant
	244 Scatter graphs and correlation
	<b>New Lesson Resources</b>
	<a href="#">Coordinates</a>
	<b>Legacy Lesson Resources</b>
<a href="#">GCSE Coordinates</a>	
<a href="#">Scatter Diagrams</a>	

## G5 Read and construct 2-way tables

What is being tested	Learners are being tested on their ability to interpret and construct two-way tables.
Learning Objectives	<p>G5.1 Categorise data using a Carroll diagram</p> <p>G5.2 Interpret Carroll diagrams</p> <p>G5.3 Interpret 2-way tables</p> <p>G5.4 Complete a 2-way table using existing values</p> <p>G5.5 Construct a 2-way table from a set of data</p> <p>G5.6 Construct a simple frequency table for a discrete data set</p>
Predecessors	G3 Recognise charts by type
Successors	None
KS2 & KS3 Guidance	2-way tables are a method for sorting information which learners begin to use in Key Stage 2.
Dr Frost Learning Platform References	<b>DF Index skills</b>
	27 Reading values from a table of discrete or categorical data
	28 Tally charts (discrete and categorical data)
	238 Two-way tables
	<b>New Lesson Resources</b>
	N/A
<b>Legacy Lesson Resources</b>	
	N/A

## G6 Complete a table of values

What is being tested	Learners are being tested on their ability to construct a table of values to identify coordinates which lie on a specified graph, drawing on their understanding of substitution.
Learning Objectives	<p>G6.1 Construct a table of values for <math>x</math> and <math>y</math></p> <p>G6.2 Construct a table of values for <math>x</math> and <math>y</math> for <math>y = x^2</math> including negative values of <math>x</math></p> <p>G6.3 Construct a table of values for <math>x</math> and <math>y</math> for <math>y = x^2 + c</math> including negative values of <math>x</math></p>
Predecessors	None
Successors	G8 Plot from a data table
KS2 & KS3 Guidance	Learners begin to plot linear graphs in Year 8 (page 137, KS3 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	267 Plotting a straight line from a table of values
	366 Plotting quadratic graphs from a table of values
	<b>New Lesson Resources</b>
	<a href="#">Plotting Straight Line Graphs</a>
	<a href="#">Plotting Quadratic Graphs</a>
	<b>Legacy Lesson Resources</b>
<a href="#">Straight Line Equations (pre-GCSE)</a>	
<a href="#">Curved Graphs (GCSE)</a>	

## G7 Read and plot coordinates in four quadrants

What is being tested	Learners are being tested on their ability to describe positions in all four quadrants of the Cartesian plane using coordinate notation.
Learning Objectives	<p>G7.1 Plot coordinates in four quadrants (integers)</p> <p>G7.2 Plot coordinates in four quadrants (decimals)</p> <p>G7.3 Identify coordinates in the fourth quadrant (integers)</p> <p>G7.4 Identify coordinates in the third quadrant (integers)</p> <p>G7.5 Identify coordinates in the second quadrant (decimals)</p> <p>G7.6 Identify coordinates in the fourth quadrant (decimals)</p>
Predecessors	G4 Read and plot coordinates in the first quadrant
Successors	<p>G8 Plot from a data table</p> <p>G9 Find the midpoint of 2 coordinates</p> <p>G16 Identify the key features of a graph</p> <p>G17 Find the gradient</p> <p>G19 Interpreting <math>y=mx+c</math></p>
KS2 & KS3 Guidance	Learners begin to use coordinate notation to describe positions in Year 4 (page 193, KS1 and KS2 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	152 Coordinates in all four quadrants
	<b>New Lesson Resources</b>
	<a href="#">Coordinates</a>
	<b>Legacy Lesson Resources</b>
	<a href="#">GCSE Coordinates</a>

## G8 Plot from a data table

What is being tested	Learners are being tested on their understanding that pairs of numbers from a table of values represent coordinates, plotting these points to construct the graph of a specified equation.
Learning Objectives	G8.1 Plot (x,y) values on a graph from a table G8.2 Plot (x,y) values for $y = x^2$ on a graph from a table G8.3 Plot (x,y) values for $y = ax^2 + bx + c$ on a graph from a table
Predecessors	G6 Complete a table of values G7 Read and plot coordinates in four quadrants
Successors	G16 Identify the key features of a graph G18 Lines parallel to the axes
KS2 & KS3 Guidance	Learners begin to plot non-linear graphs in Year 8 (page 258, KS3 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	267 Plotting a straight line from a table of values
	366 Plotting quadratic graphs from a table of values
	<b>New Lesson Resources</b>
	<a href="#">Plotting Straight Line Graphs</a>
	<a href="#">Plotting Quadratic Graphs</a>
	<b>Legacy Lesson Resources</b>
<a href="#">Straight Line Equations (pre-GCSE)</a>	
<a href="#">Curved Graphs (GCSE)</a>	

## G9 Find the midpoint of 2 coordinates

What is being tested	Learners are being tested on their ability to find the midpoint of two coordinates on the Cartesian plane.
Learning Objectives	<p>G9.1 Identify the midpoint of a line segment with two coordinates in the first quadrant</p> <p>G9.2 Find the midpoint of a line segment with two coordinates in the first quadrant</p> <p>G9.3 Find the midpoint of a line segment with coordinates in the first and third quadrant</p>
Predecessors	G7 Read and plot coordinates in four quadrants
Successors	None
KS2 & KS3 Guidance	Learners begin to use coordinate notation to describe positions in Year 4 (page 193, KS1 and KS2 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	265 Midpoint of two points
	<b>New Lesson Resources</b>
	<a href="#">Midpoint of a Line Segment by Inspection</a>
	<a href="#">Midpoint of a Line Segment by Using the Formula</a>
	<a href="#">Problem Solving Using the Midpoint of a Line Segment</a>
<b>Legacy Lesson Resources</b>	
<a href="#">GCSE Coordinates</a>	

## G10 Read and compare bar and line charts

What is being tested	Learners are being tested on their ability to interpret data represented in bar and line charts.
Learning Objectives	G10.1 Match discrete data to bar charts G10.2 Interpret data displayed in a bar chart G10.3 Compare data displayed in 2 bar charts
Predecessors	G1 Read the values on a linear scale G3 Recognise charts by type
Successors	G12 Understanding and interpreting keys
KS2 & KS3 Guidance	Learners begin to encounter basic charts in Year 2 (page 53, KS1 and KS2 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	65 Bar charts and vertical line charts
	114 Interpreting and presenting data in simple graphs
	<b>New Lesson Resources</b>
	N/A
	<b>Legacy Lesson Resources</b>
	<a href="#">Charts &amp; Averages</a>

## G11 Read and compare pie charts

What is being tested	Learners are being tested on their ability to interpret data represented in pie charts.
Learning Objectives	G11.1 Compare 2 pie charts G11.2 Describe the data presented on a pie chart G11.3 Compare data displayed in 2 pie charts G11.4 Compare 2 pie charts (different population size)
Predecessors	G1 Read the values on a linear scale G3 Recognise charts by type
Successors	G12 Understanding and interpreting keys
KS2 & KS3 Guidance	Learners encounter pie charts in KS2 and build upon this knowledge in Year 8 (page 160, KS3 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	131 Pie charts with simple fractions and percentages 246 Pie charts with any proportion
	<b>New Lesson Resources</b>
	N/A
	<b>Legacy Lesson Resources</b>
	<a href="#">Charts &amp; Averages</a>

## G12 Understanding and interpreting keys

What is being tested	Learners are being tested on their ability to interpret data represented in various charts.
Learning Objectives	G12.1 Describe a pictogram based on its key G12.2 Describe the data presented on a bar graph G12.3 Describe the data presented on a line graph
Predecessors	G10 Read compare bar and line charts G11 Read and compare pie charts
Successors	None
KS2 & KS3 Guidance	Learners begin to encounter basic charts in Year 2 (page 53, KS1 and KS2 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	65 Bar charts and vertical line charts
	114 Interpreting and presenting data in simple graphs
	131 Pie charts with simple fractions and percentages
	239 Dual and stacked bar charts
	246 Pie charts with any proportion
	<b>New Lesson Resources</b>
	N/A
	<b>Legacy Lesson Resources</b>
	<a href="#">Charts &amp; Averages</a>

## G13 Read conversion graphs

What is being tested	Learners are being tested on their ability to interpret a linear graph, converting between units of measure.
Learning Objectives	<p>G13.1 Estimate an x-value for a corresponding y-value using a graph representing linear rates of change</p> <p>G13.2 Estimate a y-value for a corresponding x-value using a graph representing linear rates of change</p> <p>G13.3 Estimate an x-value for a corresponding y-value using a graph representing non-linear rates of change</p> <p>G13.4 Estimate a y-value for a corresponding x-value using a graph representing non-linear rates of change</p>
Predecessors	G4 Read and plot coordinates in the first quadrant
Successors	G14 Interpret scatter diagrams (including comparison)
KS2 & KS3 Guidance	Learners encounter linear graphs for conversion in Year 7 as part of their study of multiplicative relationships (KS3, page 104).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	178 Conversion graphs
	268 Relationship between a line and its equation
	<b>New Lesson Resources</b>
	<a href="#">Equations of Simple Lines</a>
	<b>Legacy Lesson Resources</b>
N/A	

## G14 Interpret scatter diagrams (including comparison)

What is being tested	Learners are being tested on their ability to identify a relationship between two variables using a scatter diagram.
Learning Objectives	<p>G14.1 Describe the relationship that a linear graph shows</p> <p>G14.2 Categorise graphs based on the strength of their linear relationship</p> <p>G14.3 Match scenarios to their descriptions</p> <p>G14.4 Categorise scatter diagrams based on the correlation of their points</p>
Predecessors	<p>G13 Read conversion graphs</p> <p>G17 Find the gradient</p>
Successors	G15 Line of best fit
KS2 & KS3 Guidance	Learners encounter scatter diagrams for the first time in Year 8 (page 167, KS3 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	244 Scatter graphs and correlation
	<b>New Lesson Resources</b>
	N/A
	<b>Legacy Lesson Resources</b>
	<a href="#">Scatter Diagrams</a>

## G15 Line of best fit

What is being tested	Learners are being tested on their ability to describe a relationship between two variables on a scatter diagram using a straight line.
Learning Objectives	<p>G15.1 Match scatter diagrams to their lines of best fit</p> <p>G15.2 Draw a line of best fit</p> <p>G15.3 Identify the correct line of best fit of given data in a scatter plot (positive)</p> <p>G15.4 Identify the correct line of best fit of given data in a scatter plot (negative)</p>
Predecessors	<p>G14 Interpret scatter diagrams (including comparison)</p> <p>G19 Interpreting <math>y = mx + c</math></p>
Successors	none
KS2 & KS3 Guidance	Learners encounter scatter diagrams for the first time in Year 8 (page 167, KS3 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	244 Scatter graphs and correlation
	245 Line of best fit
	<b>New Lesson Resources</b>
	N/A
	<b>Legacy Lesson Resources</b>
	<a href="#">Scatter Diagrams</a>

## G16 Identify the key features of a graph

What is being tested	Learners are being tested on their understanding of the gradient of a graph and the point that it intercepts the axes.
Learning Objectives	<p>G16.1 Identify the y-intercept</p> <p>G16.2 Identify the x-intercept</p> <p>G16.3 Recognise a gradient in a coordinate system</p> <p>G16.4 Match graphs to their equations</p> <p>G16.5 Label the x and y axes, the intercepts and the line</p>
Predecessors	<p>G7 Read and plot coordinates in four quadrants</p> <p>G8 Plot from a data table</p>
Successors	<p>G17 Find the gradient</p> <p>G18 Lines parallel to the axes</p> <p>G19 Interpreting <math>y = mx + c</math></p>
KS2 & KS3 Guidance	Learners explore graphs in Year 8 (page 141, KS3 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	269 $x$ and $y$ intercepts of a line
	270 Gradient of a line
	271 Understanding the equation of a straight line in slope-intercept form ( $y = mx + c$ ) or standard form ( $ax + by = c$ )
	272 Determining the equation of a straight line in slope-intercept or standard form
	273 Drawing a line from its equation
	<b>New Lesson Resources</b>
	<p><a href="#">Equations of Simple Lines</a></p> <p><a href="#">Understanding <math>y = mx + c</math></a></p> <p><a href="#">Applying <math>y = mx + c</math></a></p> <p><a href="#">Finding the Equation of a Line Given the Gradient and a Point (including Parallel Lines)</a></p>
	<b>Legacy Lesson Resources</b>
	<p><a href="#">Straight Line Equations (pre-GCSE)</a></p> <p><a href="#">Straight Line Equations (GCSE)</a></p>

## G17 Find the gradient

What is being tested	Learners are being tested on their understanding of gradient, and their ability to calculate the gradient of a straight line.
Learning Objectives	<p>G17.1 Recall that gradient of a straight line is constant</p> <p>G17.2 Recall that gradient is change in <math>y</math>/change in <math>x</math></p> <p>G17.3 Identify a straight line with a given gradient</p> <p>G17.4 Calculate a positive gradient from 2 points (first quadrant) with diagram</p> <p>G17.5 Calculate a negative gradient from 2 points (first quadrant) without diagram</p>
Predecessors	<p>G7 Read and plot coordinates in four quadrants</p> <p>G16 Identify the key features of a graph</p>
Successors	<p>G14 Interpret scatter diagrams (including comparison)</p> <p>G19 Interpreting <math>y = mx + c</math></p> <p>G20 Parallel gradients</p> <p>G21 Linear v non-linear graphs</p> <p>G22 Interpret time series (including comparison)</p>
KS2 & KS3 Guidance	Learners explore graphs in Year 8 (page 141, KS3 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	270 Gradient of a line
	<b>New Lesson Resources</b>
	<a href="#">Gradient of a Line Segment</a>
	<a href="#">Gradient of a Line on Axes</a>
	<a href="#">Gradient of a Line from Given Points</a>
<b>Legacy Lesson Resources</b>	
<a href="#">Straight Line Equations (pre-GCSE)</a>	
<a href="#">Straight Line Equations (GCSE)</a>	

## G18 Lines parallel to the axes

What is being tested	Learners are being tested on their ability to recognise graphs of straight lines which are parallel to the axes in the Cartesian plane.
Learning Objectives	<p>G18.1 Recognise a vertical line in a coordinate system</p> <p>G18.2 Recognise a horizontal line in a coordinate system</p> <p>G18.3 Identify straight lines of <math>x = 0</math></p> <p>G18.4 Identify straight lines of <math>x = a</math> where <math>a, b</math> are integers constant</p> <p>G18.5 Identify straight lines of <math>y = b</math> where <math>a, b</math> are integers constant</p> <p>G18.6 Identify straight lines of <math>y = 0</math></p>
Predecessors	<p>G8 Plot from a data table</p> <p>G16 Identify the key features of a graph</p>
Successors	None
KS2 & KS3 Guidance	Learners investigate the graphs of lines parallel to the axes in Year 7 (page 67, KS3 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	268 Relationship between a line and its equation
	<b>New Lesson Resources</b>
	<a href="#">Equations of Simple Lines</a>
	<b>Legacy Lesson Resources</b>
	<a href="#">Straight Line Equations (pre-GCSE)</a> <a href="#">Straight Line Equations (GCSE)</a>

## G19 Interpreting $y = mx + c$

What is being tested	Learners are being tested on their understanding of the general form of a linear graph, drawing on their knowledge of the gradient.
Learning Objectives	<p>G19.1 Match straight line graphs with their equations</p> <p>G19.2 Identify the gradient in <math>y = mx + c</math></p> <p>G19.3 Know that <math>m</math> is the gradient in <math>y = mx + c</math></p> <p>G19.4 Identify the intercept in <math>y = mx + c</math></p> <p>G19.5 Categorise lines with positive and negative gradients given in the form <math>y = mx + c</math></p> <p>G19.6 Identify the <math>y</math> intercept of a straight line</p>
Predecessors	<p>G7 Read and plot coordinates in four quadrants</p> <p>G16 Identify the key features of a graph</p> <p>G17 Find the gradient</p>
Successors	<p>G15 Line of best fit</p> <p>G20 Parallel gradients</p> <p>G23 Distance/time graphs (including comparison)</p>
KS2 & KS3 Guidance	Learners explore graphs in Year 8 (page 141, KS3 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	269 $x$ and $y$ intercepts of a line
	270 Gradient of a line
	271 Understanding the equation of a straight line in slope-intercept form ( $y = mx + c$ ) or standard form ( $ax + by = c$ )
	272 Determining the equation of a straight line in slope-intercept or standard form
	273 Drawing a line from its equation
	<b>New Lesson Resources</b>
	<a href="#">Equations of Simple Lines</a>
	<a href="#">Understanding <math>y = mx + c</math></a>
	<a href="#">Applying <math>y = mx + c</math></a>
	<b>Legacy Lesson Resources</b>
	<a href="#">Straight Line Equations (pre-GCSE)</a>
	<a href="#">Straight Line Equations (GCSE)</a>

## G20 Parallel gradients

What is being tested	Learners are being tested on their understanding of the relationship between the gradients of two parallel lines.
Learning Objectives	G20.1 Recognise parallel lines in a coordinate system G20.2 Identify parallel lines from their equations G20.3 Match parallel lines from their equations G20.4 Know that parallel lines have the same gradient
Predecessors	G17 Find the gradient G19 Interpreting $y = mx + c$
Successors	G23 Distance/time graphs (including comparison)
KS2 & KS3 Guidance	Learners explore the gradient of parallel lines in Year 8 (page 145, KS3 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	274 Equations of parallel lines
	<b>New Lesson Resources</b>
	<a href="#">Finding the Equation of a Line Given the Gradient and a Point (including Parallel Lines)</a>
	<b>Legacy Lesson Resources</b>
	<a href="#">Straight Line Equations (pre-GCSE)</a> <a href="#">Straight Line Equations (GCSE)</a>

## G21 Linear v non-linear graphs

What is being tested	Learners are being tested on their ability to distinguish between linear, and non-linear, graphs.
Learning Objectives	<p>G21.1 Categorise linear and non-linear graphs</p> <p>G21.2 Identify diagrams that represent linear rates of change</p> <p>G21.3 Identify diagrams that represent non-linear rates of change</p> <p>G21.4 Match graphs to scenarios</p>
Predecessors	G17 Find the gradient
Successors	None
KS2 & KS3 Guidance	Learners begin to distinguish between linear and non-linear rates of change in Year 9 as part of their study of real-world graphs (KS3, page 258).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	178 Conversion graphs
	332 Real-life linear graphs
	<b>New Lesson Resources</b>
	N/A
	<b>Legacy Lesson Resources</b>
	<a href="#">GCSE Rates of Change</a>

## G22 Interpret time series (including comparison)

What is being tested	Learners are being tested on their ability to interpret data represented as a time series graph.
Learning Objectives	<p>G22.1 Estimate a y-value for a corresponding x-value using a trend line on a time series graph</p> <p>G22.2 Estimate a x-value for a corresponding y-value using a trend line on a time series graph</p> <p>G22.3 Estimate a y-value for a corresponding x-value not displayed using a trend line on a time series graph (extrapolation)</p> <p>G22.4 Use a trend line to estimate y-values, given an x-value</p> <p>G22.5 Compare 2 time series graphs</p> <p>G22.6 Interpret the features of a time series graph</p>
Predecessors	G17 Find the gradient
Successors	None
KS2 & KS3 Guidance	Learners begin to work with non-linear graphs in Year 8 (page 258, KS3 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	114 Interpreting and presenting data in simple graphs
	400 Time series and moving averages
	<b>New Lesson Resources</b>
	N/A
	<b>Legacy Lesson Resources</b>
N/A	

## G23 Distance/time graphs (including comparison)

What is being tested	Learners are being tested on their ability to interpret data represented as a distance-time graph, as well as calculating speed from a specified graph.
Learning Objectives	<p>G23.1 Know that a horizontal line on a distance/time graph represents zero speed</p> <p>G23.2 Know that the gradient of a distance/time graph represents speed</p> <p>G23.3 Compare 2 distance/time graphs</p> <p>G23.4 Interpret distance/time graphs</p> <p>G23.5 Calculate the speed from a distance/time graph</p>
Predecessors	<p>G19 Interpreting <math>y = mx + c</math></p> <p>G20 Parallel gradients</p>
Successors	None
KS2 & KS3 Guidance	Learners work with distance-time graphs in Year 9 (page 258, KS3 guidance).
Dr Frost Learning Platform References	<b>DF Index skills</b>
	327 Constructing and reading distance-time graphs
	<b>New Lesson Resources</b>
	<a href="#">Distance-Time Graphs</a>
	<b>Legacy Lesson Resources</b>
<a href="#">GCSE Rates of Change</a>	

## Contributors

### AQA

We're an independent education charity, providing high quality assessments that are fair, reliable, and support students in their educational journey.

Our qualifications expertise dates back to 1903, when our predecessor boards were founded by five leading universities. Today, we're the largest provider of academic qualifications taught in schools and colleges.

We set and mark the papers for over half of all GCSEs and A-levels taken every year. But exams are only part of the story – we also make sure the content of our qualifications support great teaching.

Our qualifications are designed to suit a range of abilities and include GCSEs, AS and A-levels, the Extended Project Qualification and Technical Awards. Our qualifications are internationally recognised and taught in more than 40 countries around the world and they're highly-valued by employers and universities.

We're led by our Executive Team and governed by a Board of Trustees drawn from schools, colleges, higher education, children's services and the business community.

### Dr Frost Learning

The vision of Dr Frost Learning is to provide high quality education for all regardless of income, centred around the core philosophy that education is a fundamental right and central to addressing social inequality on a global level. We believe learning is for everyone. Dr Frost Learning has helped students in isolated communities, prisons, and students outside of a mainstream school environment. Additionally, Jamie Frost received the Global Teacher Prize Covid Hero Award 2020 for the role of the platform in supporting schools during Covid lockdowns.

Our platform includes over 1500 question generators, with more in development, along with videos to support student understanding, which can be set as homework tasks for students or used for independent learning. We also provide advanced data analytics for teachers to track student progress. We're constantly striving to innovate, with research into AI to provide tailored learning plans for students based on their activity.

Sometimes one size doesn't fit all and we have worked hard to ensure coverage for curricula worldwide. In addition to our own question generators, we work with exam boards in the UK and internationally to contribute to our bank of over 40,000 exam questions and create courses for teachers and students on the platform.

Our offering also includes free comprehensive classroom resources, with a focus on teaching for understanding. Each lesson is designed to both scaffold and stretch students on their mathematics journey, and reduce teacher workload.

Dr Frost Learning is a registered charity. Subscription fees and donations allow us to continue operating as a charity and all fees are invested in improving our offering. No subscription is

required for individual teachers for up to three classes. For whole school use there is a fee of £600 per year. However, as part of our charity's vision to make sure our services are available to all schools regardless of budget, we allow schools to apply for a discount. More information on our offering and pricing can be found here: <https://www.drfrost.org/pricing.php>

### Notes from Dr Frost Learning:

- Though the DF Index provides a comprehensive framework of mathematical ideas, not all of the subskills have associated live Question Generators as yet. As such, you may find some subskills are unavailable at this time. These are being continually updated and we aim to have much of the KS1-4 content completed by Summer 2025.
- It is important to note that each skill can include ideas across various Key Stages or levels of prior attainment, with the subskills higher in the alphabet including more complexity. As such, **not all subskills within these listed skills will be applicable** to the content listed here or for the specific misconceptions held by their students. Teachers should use their discretion as to whether the full skill or just a portion of subskills should be assigned to their students
- Resources are split into 'New' and 'Legacy' categories. Any 'New' resources have been published after October 2023 to fulfil out charitable aims. These have a new format and a focus on teaching for understanding, stretch and scaffold. Anything published before this is referred to as 'Legacy' – these resources were created by Jamie Frost for use with his own classes, and shared before establishing the charity, and thus the content or pacing may not be appropriate for your students.