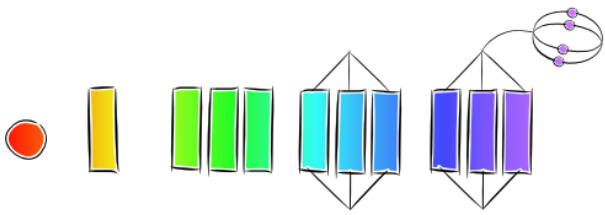



Lesson Topic	Calculating a Gradient			
Learning Outcome	Being able to identify the rise and run to calculate the gradient.			
Success Criteria Using SOLO	Uni-structural	Multi-structural	Relational	Extended abstract
	Draw a third point to form a line.	Describe how the third point was located.	Apply Rise and Run method to calculate gradient.	Evaluate the hidden formulae in Google Sheets.
				
Links with the New Zealand Curriculum	Year 10 Curriculum Level: 5 Learning Area: Mathematics Strand: Number and Algebra Achievement Objective: NA5-9: Relate tables, graphs, and equations to linear and simple quadratic relationships found in number and spatial patterns.			
Key Competencies	<ul style="list-style-type: none"> • Thinking - Rising like the sun (vertically) and running on a road (horizontally). • Relating to others - Working together by swapping devices on Desmos activity. • Using language, symbols, and texts - Using new vocabulary and notation. • Managing self - Demonstrating RISE values while engaging in task • Participating and contributing - All voices in the group to be heard 			
Prior knowledge	The previous lesson, which introduced the direction and steepness of gradients.			
Lesson Sequence 	Session Outline			
	Student Activity		Teacher Activity	
	- Begin, the Student Desmos activity, Put the Point on the Line . - Follow through slides and participate in class discussion about calculating the gradient.		- Begin by reviewing previous lesson. - Share Put the Point on the Line activity to the students. - Go through the slides to introduce the Rise and Run method for calculating gradients.	
	- Open up Workspace to begin working on Calculating a Gradient , an activity on Google Sheets.		- Direct students to Workspace to begin working on Calculating a Gradient . - Circulate class encouraging and helping students with their calculations.	
	- Give peer feedback by reviewing each other's work. - Investigate the formulae on the Google Sheets to see how it gives automatic feedback.		- Get students who finish to investigate the formulae that gives them feedback.	

Resources	Google Slides - Calculating a Gradient Google Sheets - Calculating a Gradient Student Desmos - Put the Point on the Line Workspace - Linear Algebra
Next Steps	Get the students to think about x and y intercepts and then combine this with the gradient to be able to describe different lines.
Reflection and Analysis	
<p>What went well? Using the mnemonic Rise and Run to help learn a method for calculating gradients was effective. Students were able to relate these words to the gradient and then built confidence calculating basic gradients.</p> <p>The Google Sheets activity went really well - the students were engaged by the new method they had learned and were kept motivated by the automatic feedback provided by the instant feedback, that I created using the IF function.</p> <p>What still needs work? The Student Desmos activity didn't resonate with the students, as I had hoped, and I ended up finishing that activity earlier than I had anticipated. I think that if I had partially modelled what the activity was expecting them to do, then it would have been a success.</p> <p>Although the Google Sheets activity went well, I could have included harder questions towards the end. This could have included more decimal and fraction answers.</p> <p>Also, I did not effectively explain, to the students who had finished the work, how to analyse the formulae on Google Sheets. Instead these students helped their classmates who were still working. To improve this I could have sent students a link to a video explaining the IF function.</p>	