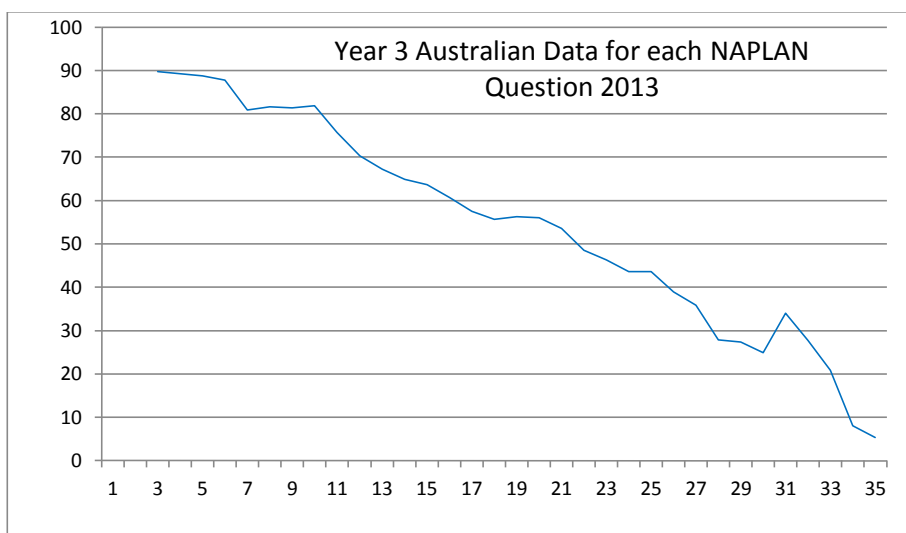
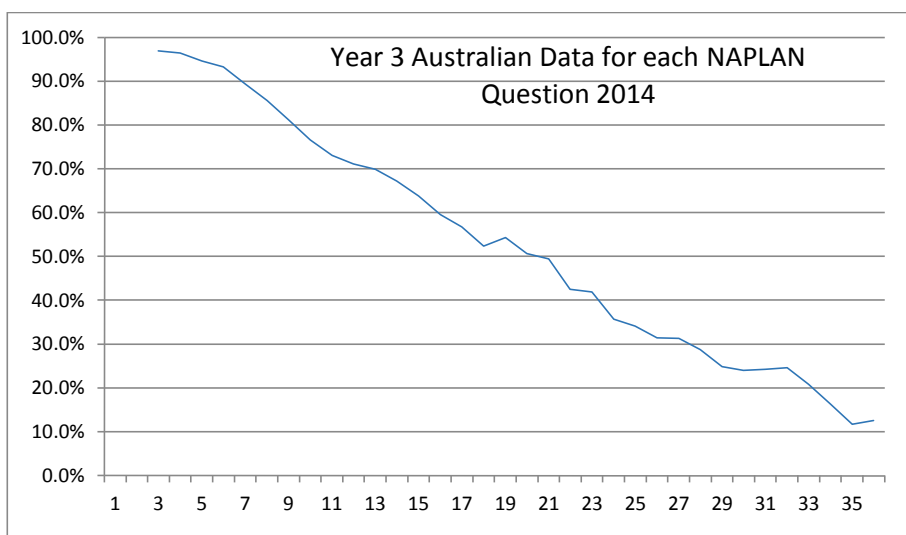
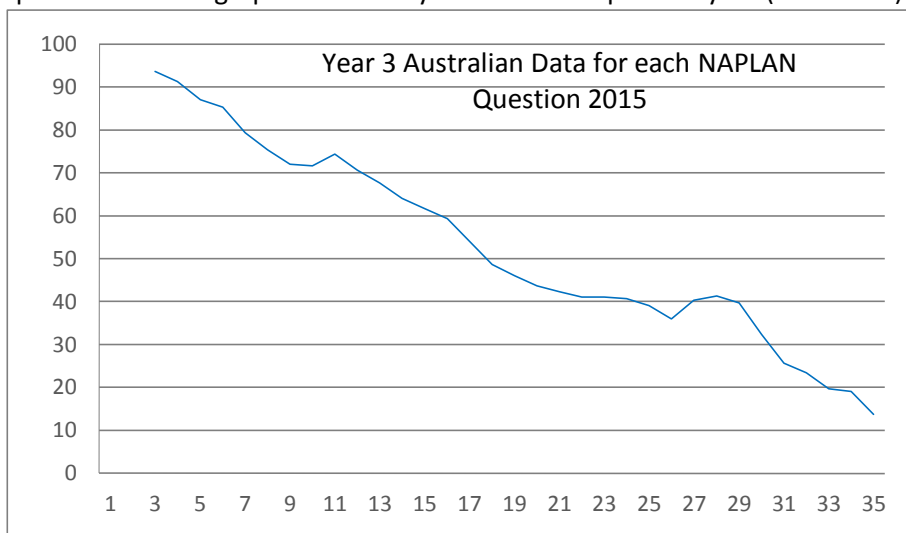


Simple analysis of NAPLAN data trends:

We all know that more kids answer the earlier questions in NAPLAN correctly than the last few. What you might not be aware of is that in general, the number of students who correctly answer each question forms a graph with a fairly consistent shape each year (see below).



Interpreting data shape:

This consistency of data shape is one key to interpreting NAPLAN results. The features of the shape, compared with the same features of your own data help us to see what to focus on.

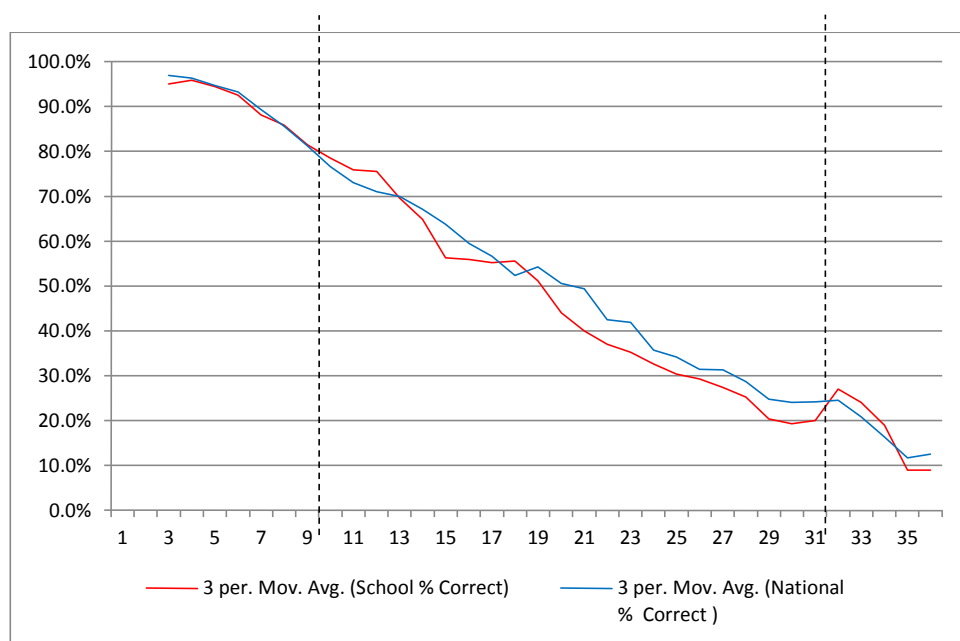
The following features appear consistently in NAPLAN tests:

1. The first 8-10 questions contain fairly routine, fluency-based questions. These show whether or not your students have memorised the maths you have taught.
2. The last 5 or so questions contain problem-solving questions. These show whether you have high achieving (gifted students), or whether you have developed problem-solving capacity.
3. The middle questions (from around question 8-10 to question 27-35 depending on the grade) contain understanding questions that show whether or not your students really understand maths, as opposed to just memorising it.

What this means:

1. If your line is “above” for the first 8-10 questions, your students have good factual knowledge and routine content. If it is “below”, you need to work on more routine questions and “drilling” content.
2. If your line is “above” for the middle questions, your students have good understanding of mathematics and do not have many misconceptions. If it is “below”, you need to work on developing connections and dealing with underlying misconceptions rather than fluency.
3. If your line is “above” for the last few questions, you have a good approach to problem solving, or a higher than average number of gifted students. If it is “below”, you should use more unfamiliar questions that make student think hard.

An example:



This school shows a typical result for those that use lots of routine-style questions, but have been told to have a focus on extending their “upper two bands”. Students have performed at the expected standard on routine-style questions (1-10). They are under-performing in understanding questions (10-31), but their results in problem-solving (31-35) are higher than would be expected. This school would have a large gap between their high-performing and mid-range students, with the mid-range students underperforming.

How to graph your data:

1. Open your data in excel. You will need the question numbers, the percentage of your students who answered each correctly and the percentage of the nation who answered each correctly. This can be in rows or columns depending on what you are given.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Item	NC01	NC02	NC03	NC04	NC05	NC06	NC07	NC08	NC09	NC10	NC11	NC12	NC13	NC14	NC15
2	% Correct: School	98.8%	95.7%	85.1%	93.2%	90.1%	94.4%	77.0%	88.8%	89.4%	75.2%	77.6%	74.5%	75.8%	65.8%	67.7%
3	% Correct: National	93.6%	88.4%	87.2%	92.2%	86.7%	84.3%	71.5%	89.1%	83.5%	72.9%	70.9%	67.1%	63.6%	64.1%	63.4%

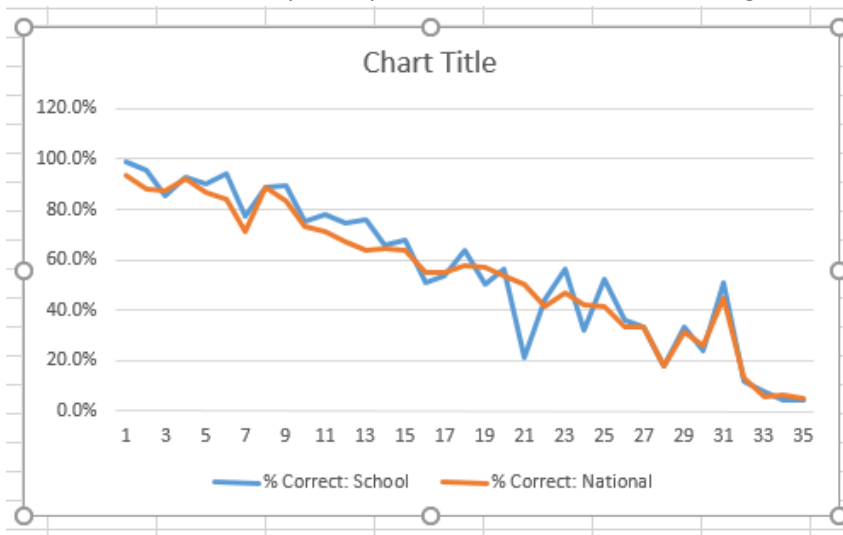
2. Using your mouse, select the data for your school and the nation, including the header for the row or column. Click on the "Insert" tab. Click on the tiny little square at the bottom right of "Charts", that lets you "See all charts".

The screenshot shows the Excel interface with the 'Insert' tab selected. The 'Charts' group is visible, and a blue arrow points to the 'See All Charts' button. The spreadsheet data from the previous table is visible in the background.

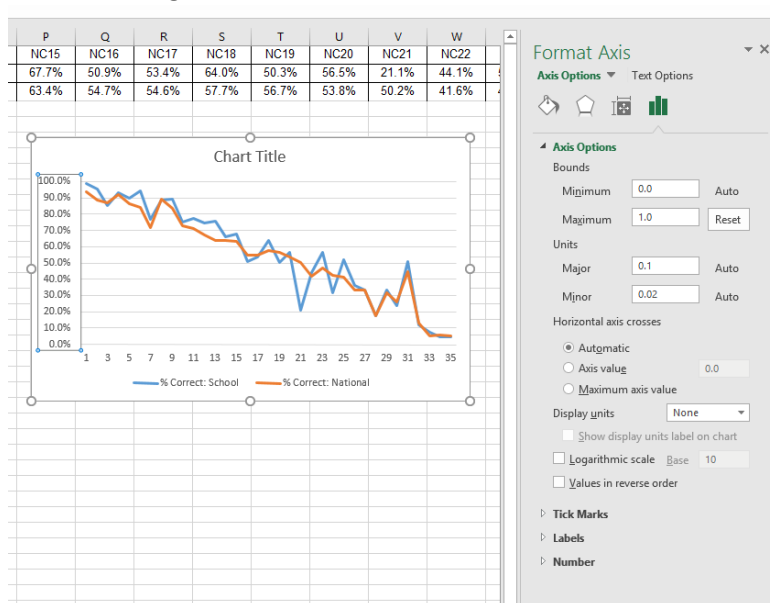
3. Choose a line chart and press OK.

The 'Insert Chart' dialog box is shown with the 'Line' chart type selected. The 'OK' button is highlighted. The dialog box also displays a preview of the line chart and a description: "A line chart is used to display trends over time (years, months, and days) or categories when the order is important. Use it when there are many data points and the order is important."

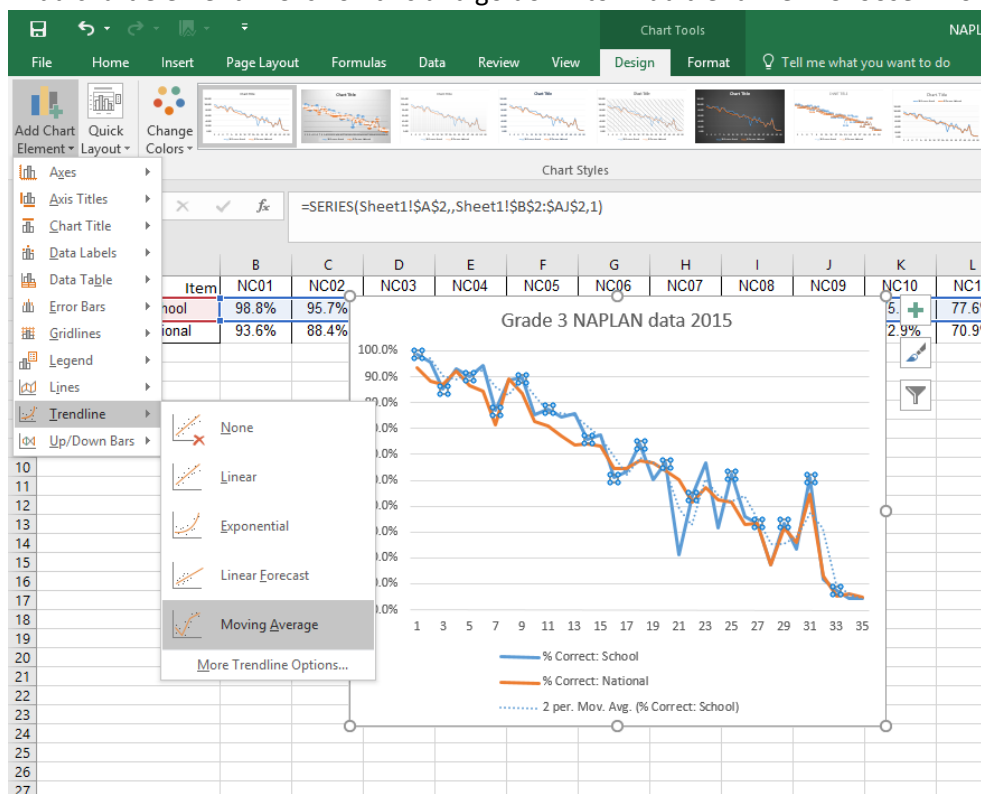
4. You will now have a very messy line chart that looks something like this:



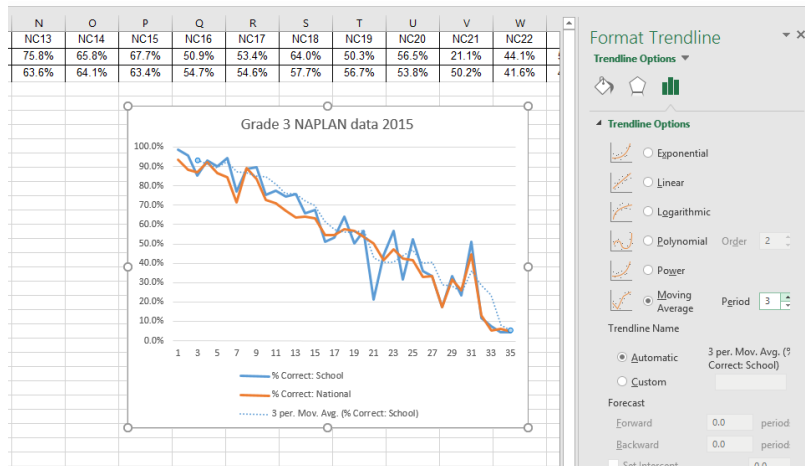
5. To make our chart easier to see the trends, we need to change some things and add some extra features. For starters, right click on the vertical axis and choose “format axis” from the drop down menu. Change the maximum to 1.0 or 100 to reflect your data rather than leaving it at 1.2. You can also change the title as needed.



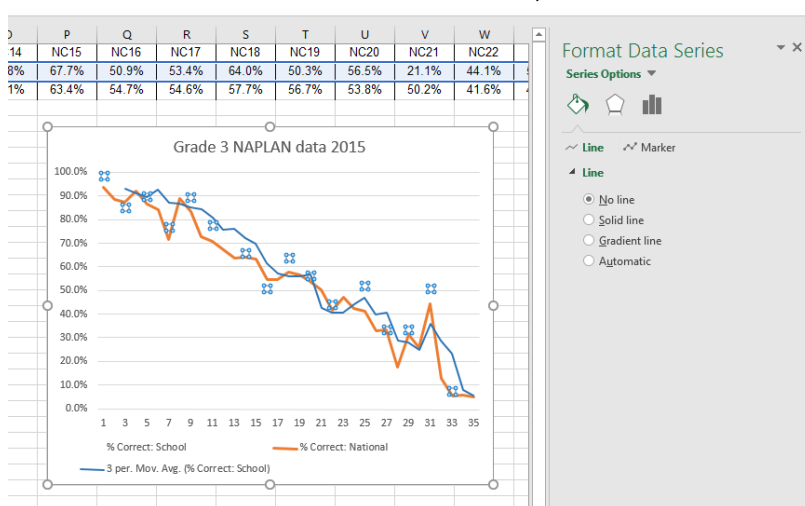
6. At the moment the lines are not easy to interpret because of the data going up and down all over the place. We need to add a trend line to smooth out the bumps. Click on one of the coloured lines on your graph. Next, go up to the Design tab and click on it. On the left is an option called “Add chart element”. Click on this and go down to “Add trendline”. Choose “Moving average”.



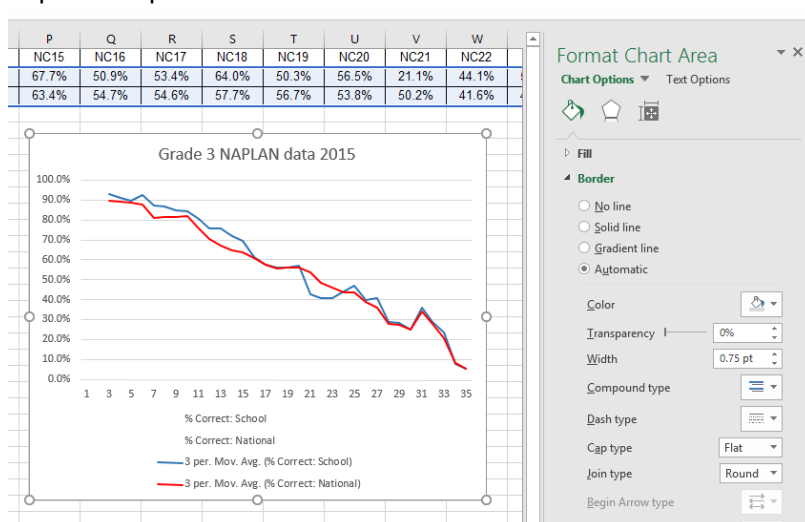
- Click on your new trendline. Now a window on the pane on the right should open, called “Format Trendline”. In the option that looks like a graph, change the moving average period to 3.



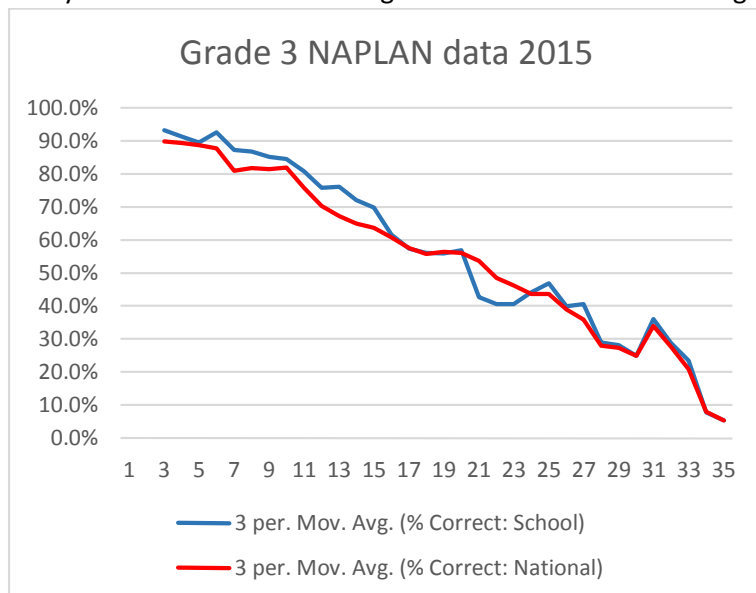
- Next, click on the symbol of the paint can. Choose an appropriate style and colour for your trendline. Once you have done this, click back on the line that you originally added the trendline for. Now we want to make this line invisible, so choose “no line”.



- Repeat this process for the second line.



10. Next we want to get rid of the titles in the key that are unnecessary. Click on the key, then on the title you want to delete. It will get little blue circles at the edges once it is selected. Delete it.



11. Now we can better see the shape of the graph. For the graph above we can see where we are above and below the National Average. We should be roughly parallel to it, whether above or below. If we find that we are above in some areas (e.g. the graph above shows higher data for Fluency) but below in others (e.g. mixed in Understanding, on average for Problem solving), it can tell us where to focus our efforts. If it is still too difficult to see, try changing the period to 4.