

Langdon Park School Maths

Tuesday 25th March

We all hope you are well and safe in this difficult situation. This sheet gives some ideas for mathematics learning you can do in the next week or so. We will provide more comprehensive learning programmes for the period ahead soon.

As well as the school website you can access lots of maths resources on the maths faculty website which is at: langdonparkmaths.weebly.com

This has direct links to:

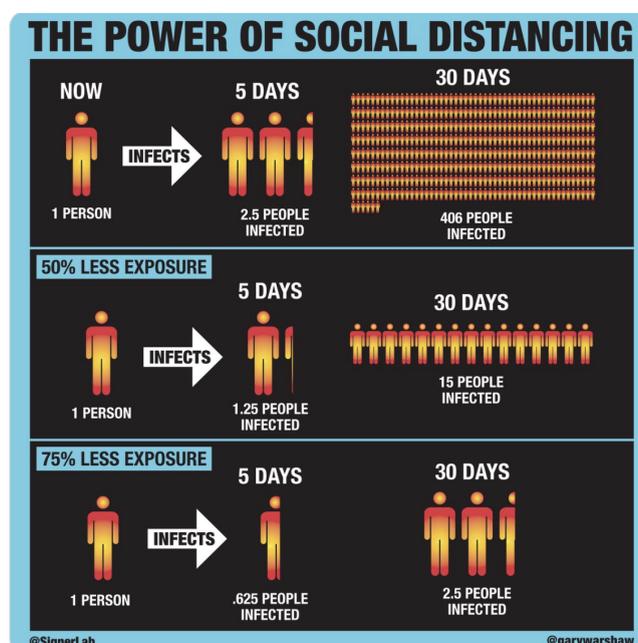
Maths Workout (no password or login needed) which is great for practicing all the basic maths skills.

Maths Genie (no login needed) which has videos and exercises on all the maths curriculum.

Kerboodle digital textbooks and activities (you will need your Kerboodle login for this and the institution code zbb0 - we will post a full list of Kerboodle logins soon for those who have not yet got theirs).

MyMaths - login: langdon password: variable and then your own login. If any student needs a login please email us on mcgarrp@langdonpark.org

We hope that you are keeping yourselves safe by social distancing and self isolating, if necessary. This image shows the maths of why it is so important!



Covid 19 Maths challenges:

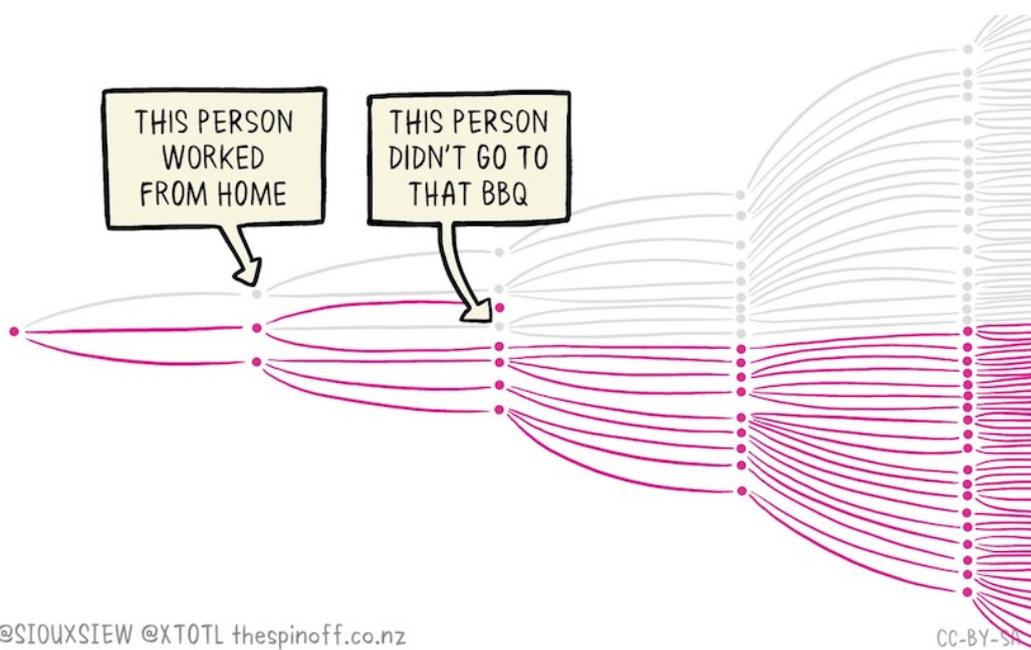
Complete a challenge by making a poster, video, presentation or anything you like which shows your work and send to macdivittp@langdonpark.org Entries will be posted on our website and we will choose one winning piece of work for a £10 voucher of your choice.

All year Groups: How much toilet roll does your family really need?

| | |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none">• How many rolls in this pack• How many sheets per roll?• How many sheets needed per “use”• How many people in the household?• Are all “uses” the same?• How many “uses” per day? |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

So.... How long will it last your family?! Make some sensible estimates of various things and do some calculations and justify your conclusions. (keep your responses to this “clean” or we will not be able to post them!)

Getting Harder: How many people will you save by social distancing?



- The average person with Covid 19 infects 3 others every 5 days, without social distancing.

Calculate how many people are infected by 1 person with Covid19 in 1 month.

Use the image above to help you.

- With social distancing this infection rate can be reduced to each person only infecting 1 other over the 5 day period.

Calculate how many people will be saved from infection

Harder still: Using a spreadsheet to model the spread of Covid19

Without action by the government, the number of people infected with Covid19 increases by between 20% and 30% per day.

- Using the 20% per day increase, can you write a formula using algebra for the number of infected people after any number ("N") of days? *Hint, what is the multiplier that increases a number by 20%?*
- How long would it take for half a million people to be infected?
- Now change the starting number to 6300 which is the number of confirmed cases in the UK on Monday 23rd march, how long will it now take for half a million to be infected?

If you have access to a computer with a spreadsheet (like Excel or Numbers) you can explore all this and see it graphically.

- If you have access to a computer click this link to a template that is already partly done <https://tinyurl.com/LPSCovid19Model> (choose "make a copy" from the file menu to get a copy you can edit)
- In the first column A on your spreadsheet put "day number" in the first cell. Then enter 1 in the cell below, 2 in the cell below that, 3 in the cell below that. Now highlight all three cells and drag the bottom corner down - it should fill up the day number - go to about day 30.

- In the second column put “number infected” in the top cell. Below that enter 1. In the cell below that enter a formula: type $=1.2^*$ and click on the cell above and return. This multiplies the number in the cell above by 2 (the case where 1 person infects 1 person a day).
- Your second cell should now show 1.2. Click on it and drag the bottom corner down to opposite day 30 and it will calculate the number infected on each day.
- Try changing the number infected on day 1 to the current daily total of infections and see what happens (6300 on monday evening). This will show you how infections will increase if we dont socially distance.
Warning: this is quite scary
- The multiplier of 1.2 is an estimate to experiment with changing it to 1.3* or another multiplier of your choice and see how things change.
- If you want to see what this looks like on a graph just highlight all the cells in the days and number infected columns down to about 30. Now go to insert and click “recommend charts”.

Watch this video which explains this type of growth called “exponential growth”

<https://youtu.be/Kas0tlxDvrg>

Much more challenging (most suitable for year 11, 12 and 13 - but any interested student could look at them and try at least some of the activities)

If you want to explore the maths of disease and epidemics further here are some good places to look. Both of these have interesting articles and lots of activities you can investigate

<https://plus.maths.org/content/mathematics-diseases>

<https://nrich.maths.org/epidemic>

Your own investigation of the Maths of Covid19:

Find an aspect of the current situation and study the maths of it, make your work into some kind of presentation we can share on the website.