Note: All text underlined in blue are hyperlinks to external resources

PART 2: This resource is the second instalment of the maths resources which will be focussing on maths in a scientific context. If you haven't already, please also check out Part 1 which covers some fundamental maths topics! For each topic, there are links to websites and videos, which will firstly run through the topic and then there are some provided practice questions for each.
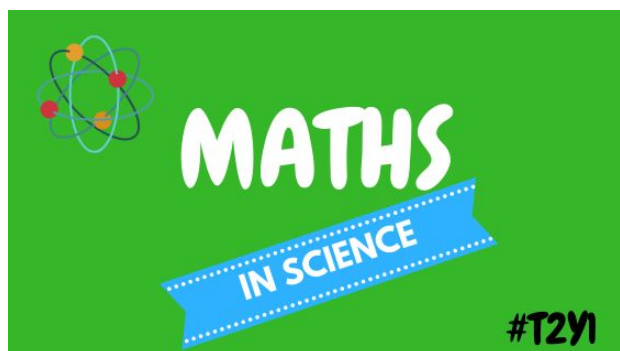
Key topics:
- Weights to moles conversions
- Dilution and dilution factors
- Drug calculations
- pH equations
- Henderson-Hasselbalch equations

Weights to moles conversions:

➔ *Tutorials:*
- Check out this video which gives basic examples on how to calculate molar mass - this will be a recap from A level chemistry!
- Here is a nice summary video which explains the concept of moles, as well as how to do equations involving moles. As with many of these maths topics, you may have learnt different methods at A level, so as long as you understand and can answer the questions that's fine, don't worry about learning their method if it's different from what you were taught!
- Read this article which summarises the concepts with some embedded videos. Please note that "atomic mass units", often shortened to "amu" - are also referred to as Daltons (aka 1 Da = 1 g/mol)

➔ *Practice:*
- Here are a set of questions to practice converting between moles and mass

Dilution and dilution factors:

➔ *Tutorials:*
- This is a great video because runs through dilutions briefly
- *Advice from Lizzie, 1st year medic: "At uni I found some of the maths was given in a different context than I was used to at A level so this video just runs through different ways dilution can be resented - don't worry about learning these, it's just useful background knowledge (I would recommend speeding it up though otherwise it will run very slowly!)*
- Here is another alternative explanation with some worked examples in the video
- This is a written resource which gives a nice overview with some practice questions (although these get very advanced by the end so don't worry about final part)

➔ *Practice:*
- Try out these practice questions with explained answers
- Are you up for a challenge? Try this question! Don't worry it is nicely explained in the video and it is great practice for unit conversions too (especially some of the harder conversions that you may not have done much of at A level)

Drug calculations:

It is likely that you will have done some dosage questions in the maths station of the MMI, luckily the maths in first year is pretty much this standard! You may have used the medic portal to prepare for this, but if not you can find some of their questions here and here are some further practice questions!

pH Equations: pH plays a key role in physiology and homeostasis which you will cover the basics of in first year. At this stage, the most important thing is that you understand the concept of acids, bases and buffers and how they interact:

➔ *Tutorials:*
   - This video is a nice summary of pH to an A level standard
   - An alternative resource can be found by clicking on 'Topic 12 notes' on this website. The sections on Bronsted-Lowry Theory and buffers are useful reminders of some key concepts.
   - This is a summary of some variables used in pH calculations

➔ *Practice:*
   - Have a go at these practice questions which also have worked examples

The Henderson-Hasselbalch equation: For some this may actually be a new concept which you have not covered at A level – it is a very clinical application of pH which you cover in the first term.

   - This is a nice video running through the equation, although it is quite detailed so don't worry if it feels like a lot; the main thing to take away is that there is an equation to work out pH (you won't need to memorise it) and that it is key for clinical use.
   - Here are some further worked examples of a higher difficulty!