Learning to fly in **Computer Science**

These are the skills and habits which outstanding students of Computer Science develop. Do as many of these as possible to become completely independent in the subject and to develop the skills and knowledge needed to attain 8/9 at GCSE and A* at A Level. **Remember that just doing what your teacher tells you - in your lessons and beyond - is not enough to develop your full potential in the subject.**

In your lessons

- Asking specific questions and asking for help.
- Thinking critically and computationally about your own work and finding ways to improve it.
- Listening to other students and the teacher, but often challenging and arguing with them!
- Thinking about ways in which new knowledge you encounter in the lesson fits in with what you already know.
- Taking notes to aid your memory.
- Be prepared to try new approaches to problem solving (Think laterally) .
- Accept programs will not work on first attempt (90% of the time!)

Between your lessons

- Look back over your notes and activities from the last lesson.
- Review the work of a lesson - making sure you know what you have or haven't understood.
- Writing down questions from your reading about concepts and ideas you don't understand to bring to your next lesson.
- Make notes of any questions to ask your teachers or look up.
- Go to see your teacher to ask for clarification and guidance.
- Start or joining a Group Chat on this subject.
- Post questions or queries to One Note and/or the Group Chat.
- Practice programming concepts/techniques covered in class.

Beyond your lessons

- Start or Join a group chat about computing
- Discussing and arguing about what you have done on group chats.
- Try to practice programming. Programming is like learning a musical instrument, the more you practice the better you become. Exercises are on SharePoint or there are lots of free courses you can subscribe to. **E.g. Coursera, Code Academy, Hour of Code (Beyond an hour of code), iTunesU**.
- Reading and watching information about developments in digital technology. This can be done by subscribing to on line information services such as **BBC Click, TechCrunch, MIT Watching** high quality film and TV and writing a critical reaction.
- Keeping a blog or vlog about your experiences with technology
- Playing stimulating video games. Experience a variety of different game genres. Write a brief critical evaluation of the game, its purpose, goals, gameplay, graphics etc.
- Developing a sense of the big picture – Technology is developing all the time and you need to be aware of the latest developments.
- Subscribing to **MOOCs** (Massive Open Online courses). These are free and supplied by many Universities and exam boards. You can use these to supplement your notes. Such as **Harvard University Introduction to Computer Science**:
  - https://www.edx.org/course/introduction-computer-science-harvardx-cs50x
- Keeping a vocabulary log to keep track of new words/terms you encounter or an app you use.

eXtension Zone

- Visit the National Museum of Computing - Bletchley Park. www.tnmoc.org
- Alice - 3D programming in Java www.alice.org
- Coder - Raspberry Pi web coding project (HTML5, Javascript, CSS) http://googlecreativelab.github.io/coder/
- British Informatics Olympiad - Programming competition. www.olympiad.org.uk
- GCHQ Code-breaking challenge. https://canyoufindit.co.uk
- National Cipher challenge. www.cipher.maths.soton.ac.uk
- Code.org - Resources and information on learning to code. www.code.org
- Codecademy - Excellent site for learning various programming languages. www.codecademy.com
- Raspberry Pi - News and resources relating to the Raspberry Pi. www.raspberrypi.org
- MagPi - Projects and resources for the Raspberry Pi. www.themagpi.com
- Adafruit Learning System - Raspberry Pi projects and resources. http://learn.adafruit.com/category/raspberry-pi
- Bitesize – www.bbc.co.uk/education/subjects/Z34K7TY
- BBC Make it Digital – www.bbc.co.uk/makeitdigital
- Cambridge – www.cl.cam.ac.uk/freshers
- GCSE online support – www.cambridgegcsecomputing.org/new-course
- Web Development – www.3schools.com
- MIT Online Courses – ocw.mit.edu/courses/find-by-topic

Of course we recognise that our students have busy lives and that this level of engagement is not always possible all the time - but this is what you should aim for if you want to reach the highest level in the subject. You don't need to do ALL of these things to improve - just doing one or two of them will have an impact. Decide on two or three to focus on to improve your skills.