



FEARNHILL
SCHOOL

Year 13

Super Curriculum

The Fearnhill School Super Curriculum

The super curriculum at Fearnhill is designed to give you something extra outside of the learning you do in the classroom to:

- build your independence as a curious thinker,
- fire your passion for your favourite subjects,
- and broaden your knowledge of the wider world.

In this booklet, you will find a range of challenges for each subject for you to complete in your own time. They can be done in any order you like.

There are three challenges per subject divided into three levels of difficulty and effort: 'Figuring It Out' (easiest), 'Freewheeling' (more challenging), and 'Flying' (most challenging).

As you complete the challenges, you'll be given reward points, and if you complete all the 'Flying' challenges in any subject, you will be put forward to join our Fearnhill Flyers programme. Just show your teacher (or Miss Corbishley) evidence of what you've done!

So whether you are developing an art sketchbook, learning to play a musical instrument, vying to be captain of a sports team, or developing code breaking skills, I hope these challenges will inspire you to think about your own development as a learner.

Please do discuss these challenges with your friends and family – there are no rules saying you have to complete them on your own.

I hope you find these enjoyable, and wish you luck!

Yours, Miss Corbishley.

Contents

Art.....	4
Business	6
Chemistry	7
Computing.....	8
English.....	9
History.....	10
Maths.....	11
Media.....	12
PE.....	13
Physics.....	14
Psychology.....	15

Art

	Figuring It Out (2 reward points each)	Freewheeling (5 reward points each)	Flying (10 reward points each)
Challenge 1	<p>Watch extracts from the BBC Series 'The Power of Art' with Simon Schama and make bullet point notes, thinking about how you apply this to your A level study.</p> <p>https://www.bbc.co.uk/arts/powerofart/intro.shtml</p>	<p>Join a life drawing class and use the drawings to include in your portfolio.</p>	<p>Volunteer to support a KS3 lesson of Art during one of your study periods.</p>
Challenge 2	<p>Read 'The illustrated story of Art' by DK and make bullet point notes, thinking about how you apply this to your A level study.</p>	<p>Lead an art club and run sessions for younger learners. Take responsibility for creating exciting art work across the school.</p>	<p>Present your experience as an annotated journal and include it in your portfolio to share at interview.</p> <p>Share it through Fearnfile.</p>
Challenge 3	<p>Listen to the Grayson Perry Reith lectures:</p> <ol style="list-style-type: none"> 1. Democracy has bad taste: http://www.bbc.co.uk/programmes/b03969vt 2. Beating the Bounds: http://www.bbc.co.uk/programmes/b03dsk4d 3. Nice rebellion, welcome in! http://www.bbc.co.uk/programmes/b03f9bg7 4. I found myself in the art world: http://www.bbc.co.uk/programmes/b03g9mn1 	<p>Visit the Saatchi Gallery</p> <p>https://www.saatchigallery.com/</p>	<p>Learn a new technique- Enrol on one of the ART VAN GO Creative Workshops</p> <p>https://www.vycombe-arts.co.uk/</p>

Biology

	Figuring It Out (2 reward points each)	Freewheeling (5 reward points each)	Flying (10 reward points each)
Challenge 1	<p>Visit a local nature reserve. Consider each active management point and investigate if there are examples of:</p> <ul style="list-style-type: none"> •Controlled grazing. •Restricting human access. •Controlling poaching. •Feeding animals. •Reintroduction of species. •Culling and removal of invasive species. •Halting succession. •Coppicing. <p>Write a short report of your findings include photographs.</p>	<p>Join a volunteer group or spend a day volunteering with a group that works with countryside or conservation.</p> <p>Write up your experience explaining what was being done and why it was being done. Include photographs of the work – perhaps before and after!</p>	<p>Based on either your visit to a local nature reserve or your experience volunteering with the practical conservation volunteers, design strategy/strategies with reasons that would improve or enhance the existing conservation measures in that location.</p>
Challenge 2	<p>Transpiration – Create a 3-D replica of a plant species of your choosing. Label and provide a key on the transpiration stream.</p>	<p>Navigate to the following website and complete the lab. http://glencoe.mheducation.com/sites/dl/free/0078802849/383946/BL_10.html</p> <p>Create a data table and graph based on the experiment and the effect of different stimuli on the rate of transpiration.</p>	<p>Research the difference between small surface area:volume and large surface area:volume. Compare and contrast their anatomy and state why it is beneficial for each plant species.</p>
Challenge 3	<p>Plasma Membranes: Create a model of the phospholipid bilayer. Clearly label the different types of proteins, phospholipid head and tail.</p>	<p>Watch a video on the egg osmosis lab. https://www.youtube.com/watch?v=SSS3EtKAZc)</p> <p>After watching the video, conduct the experiment at home and calculate the percent change of the egg mass.</p>	<p>Conduct the water potential / osmosis lab on two – three different vegetables. After, calculate the percent change and compare your results. Using your data table and graph, draw a conclusion as to why certain vegetables may have different cellular water potentials.</p>

Business

	Figuring It Out (2 reward points each)	Freewheeling (5 reward points each)	Flying (10 reward points each)
Challenge 1	Keep a scrapbook or folder of business news articles that you have read that you believe are of significant importance- highlight the parts that you believe to be most important.	Read an autobiography written by an entrepreneur that has inspired you.	Set up a working group blog for Year 13 Business students to discuss exam technique, specification content and business news.
Challenge 2	Watch a TED Talk that relates to a topic from any part of the course. Talk to somebody in your class about the TED Talk and share your opinions about it.	Create a timeline of the key events surrounding Brexit and keep this up to date throughout the year.	Write an article about the strategy that a business of your choice has used to grow. You should use models such as Ansoff's Matrix, The Boston Matrix and Porter's Five Forces to support your writing.
Challenge 3	Research a global business and think about how they have considered the following when expanding: cultural differences, different tastes, language, unintended meanings, inappropriate/inaccurate translations, inappropriate branding and promotion.	Interview somebody you know about the corporate culture of the business that they work for- if you have a job, you could think about the corporate culture of the business you work for. Write a blog post about the corporate culture, using the classification of cultures to guide you.	Create a presentation about how the economy has grown and is developing in a MINT country of your choice.

Chemistry

	Figuring It Out (2 reward points each)	Freewheeling (5 reward points each)	Flying (10 reward points each)
Challenge 1	History of Science challenge - to understand chemistry well you have to understand how the discipline has changed over time. Research and draw up a list of the 10 chemists you believe are most important in the history of chemistry.	History of science challenge -Identify one famous chemist whose work and achievements inspire you. Identify a biography you would like to read and ask your chemistry teacher to purchase. Read the biography and report back to the class.	Consider the ways that you organise data, objects or things to do in your everyday life. See if you can organise and group some data in a table like the periodic table where going across the table has one set of information and down it another.
Challenge 2	Take photos of methods used to separate mixtures in your household, explain how they work.	Choose several ordinary items and explain what they are made of and how the bonding of that material helps the object do its job.	Imagine you are a bowl of washing up water. Describe the contents of your mix and how you are changed and treated as you travel from the drain to a river.
Challenge 3	Make a list of products made from the products of crude oil around the home and street.	Help your parent or carer the next time they visit the local recycling centre. Take note of the different elements in the objects you are recycling.	Try to make a natural descaler from food ingredients. Take photos of how well it works.

Computing

	Figuring It Out (2 reward points each)	Freewheeling (5 reward points each)	Flying (10 reward points each)
Challenge 1	<p>Watch the film: https://www.imdb.com/title/tt_2084970/</p> <p>Maybe this will inspire you seeing how computers have aided us in the past.</p>	<p>The GCHQ Puzzle Book: Why not pit your wits against the people who cracked the Enigma?</p> <p>This book will have you scratching your head for hours trying to solve some challenging problems.</p>	<p>CyberFirst – Get hands on with Cyber Security course run by GCHQ. They offer a variety of residential and non-residential courses. https://www.gchq-careers.co.uk/early-careers/cyberfirst.html</p>
Challenge 2	<p>Use the Prospects website to research IT job roles. For example: https://www.prospects.ac.uk/job-profiles/software-engineer</p>	<p>Search UCAS for courses that would help you to start a career in IT. Research apprentice opportunities in IT.</p>	<p>Start looking to see what IT jobs are available in this area www.jobserve.com</p>
Challenge 3	<p>Follow computer science topics on the BBC news https://www.bbc.co.uk/news/technology and click https://www.bbc.co.uk/programmes/b006m9ry and follow @computerworld and @computerweekly on Twitter</p>	<p>Keep a journal of technology issues from the sources listed in 'Figuring It Out'.</p>	<p>Pick a range of technology issues and write an A4 page for each that describes the legal and ethical issues that these raise.</p>

English

	Figuring It Out (2 reward points each)	Freewheeling (5 reward points each)	Flying (10 reward points each)
Challenge 1	<p>Read this article about the potential uses of the 'body text'</p> <p>https://fivedials.com/fiction/the-body-text-speaks-alan-trotter/</p>	<p>Find an example of an author using the 'body text' in an interesting way.</p>	<p>Write a form of literature which utilises the possibilities of the 'body text'.</p>
Challenge 2	<p>Read a long form newspaper article, like this one about the 'ideal woman':</p> <p>https://www.theguardian.com/news/2019/aug/02/athleisure-barre-kale-tyranny-ideal-woman-labour</p>	<p>Read another long form article from the guardian website and identify the ways that longform writers (like fiction writers) engage the reader.</p>	<p>Write your own long form article about a subject that interests you.</p>
Challenge 3	<p>Watch Inua Ellan talk about the way that he uses literature to discuss race:</p> <p>https://www.youtube.com/watch?v=ISy73_dPKbA</p>	<p>Watch Inua Ellams perform his poetry. An example is this:</p> <p>https://www.youtube.com/watch?v=iV3TvHYGjh8</p>	<p>Attend a poetry slam in London or Cambridge.</p> <p>http://www.hammerandtongue.com/cambridge/</p>

History

	Figuring It Out (2 reward points each)	Freewheeling (5 reward points each)	Flying (10 reward points each)
Challenge 1	Keep a reading journal of articles, essays and additional books you have read.	Write a journal article on a controversial topic we have studied giving your historical view.	Deliver a presentation on the following topic “Historical fiction degrades society’s understanding of the past” There are many historical fiction books in the History department you can use to research this.
Challenge 2	Read a biography / autobiography of a historical figure we have studied as part of your A-Level.	Analyse a historical source from the Tudor era. Create a presentation for your class on its usefulness	Write an academic review of a recently published historical work in a field you are interested in. We have looked at examples of academic reviews as part of our coursework.
Challenge 3	Listen to Dan Snow’s “History Hit” podcast: https://www.historyhit.com/podcasts/ There are hundreds to choose from!	Create a detailed timeline for each historical period we have studied including a minimum of 50 events.	Read a Historical non-fiction book about a period of history you have never studied before e.g. Ancient China.

Maths

	Figuring It Out (2 reward points each)	Freewheeling (5 reward points each)	Flying (10 reward points each)
Challenge 1	<p>Watch the videos from the examsolutions website to support your learning in lessons:</p> <p>https://www.examsolutions.net/a-level-maths/edexcel/</p>	<p>Consolidate a set of notes from these and ensure that all worked solutions you use are fully understood.</p>	<p>Explore some of the problems from the nrich.maths site to develop your problems solving skills:</p> <p>https://nrich.maths.org/9088</p>
Challenge 2	<p>Use Dr Frosts Maths resources and PowerPoints, like this one on proof by contradiction:</p> <p>https://www.drfrostmaths.com/resource.php?rid=301</p>	<p>Find out and attempt Fermat's Last Theorem:</p> <p>What is the Last Theorem? - Simon Singh</p>	<p>Look at some of the TedEd videos that show maths in a more interesting way:</p> <p>https://www.youtube.com/user/TEDEducation In particular a clip which was recommended to us by a student:</p> <p>https://www.youtube.com/watch?v=Uj3_KqkI9Z0</p>
Challenge 3	<p>Visit Mechanical, Art & Design museum Stratford-upon-Avon</p> <p>www.themadmuseum.co.uk/</p>	<p>Try the online homework tasks on mymaths / mathswatch.</p>	<p>Look at the site Underground Maths and try some of the challenging questions:</p> <p>https://undergroundmathematics.org/</p>

Media

	Figuring It Out (2 reward points each)	Freewheeling (5 reward points each)	Flying (10 reward points each)
Challenge 1	<p>TODOROV'S THEORY</p> <ol style="list-style-type: none"> 1. Narrative starts with an equilibrium. 2. Something disrupts the equilibrium. 3. Quest to restore the equilibrium. 4. The narrative continues to a climax. 5. Resolution occurs and equilibrium is restored. <p>Apply this to one of your favourite films.</p>	<p>MICRO ANALYSIS</p> <p>Watch this scene from Fincher's Zodiac:</p> <p>https://www.youtube.com/watch?v=Vly-X8-pEoU.</p> <p>How do the micro elements contribute meaning? Refer to editing, cinematography, mise en scène and sound, alongside the macro elements: genre, narrative and representation.</p>	<p>ADVERTISING</p> <p>Create a print advert for your favourite drink. Think about your USP. You will need to take the photo, considering a focus on product or lifestyle. Add your wording, think about font and colour choices, as well as the wording of your slogan.</p>
Challenge 2	<p>PERSONNEL</p> <p>Imagine you are the Production Manager for the filming of an artist's music video. Plan a production schedule containing personnel, the timing of their roles, milestones and deadlines.</p>	<p>STORYBOARD</p> <p>You are in pre-production for an artist's music video. Create a storyboard for the opening, or ending. You need to include details about: shot sizes, camera angles & movement, timings and any sounds in addition to the music.</p>	<p>FILMING</p> <p>You are now producing your artist's music video. Use your storyboard to film the beginning, or ending (or really stretch to try the whole song). You can use an existing song, but will need to reference for copyright reasons.</p>
Challenge 3	<p>PRINT ANALYSIS</p> <p>Choose a magazine cover and label all the elements, including masthead, cover lines, cover image, mode of address etc.</p>	<p>SCRIPT WRITING</p> <p>Record a conversation with a friend, then write it as a script. Include conventions, such as slug lines.</p>	<p>WATCHING</p> <p>Try to tick off as many films as you can on Empire's 'The 100 Greatest Movies' list.</p>

PE

	Figuring It Out (2 reward points each)	Freewheeling (5 reward points each)	Flying (10 reward points each)
Challenge 1	<p>Read the journals of:</p> <ul style="list-style-type: none"> -Applied physiology, sport and society -Sport and exercise psychology <p>Ask your PE teacher about how to locate these</p>	<p>Write a glossary of anatomy and physiology used in your sport.</p>	<p>Write an article for Fearnfile on an area of interest.</p>
Challenge 2	<p>Visit the University of Hertfordshire or Bedfordshire Physiology laboratories.</p>	<p>Write a report on the tests and investigations carried out.</p>	<p>Create a coaching plan for any sport.</p>
Challenge 3	<p>Watch the following documentaries/films:</p> <ul style="list-style-type: none"> • Icarus (2017) Bryan Fogel,Netflix • Sports Science (2013) ESPN • The Program (2015) 	<p>Write a report on one of the films/documentaries you've watched and state the main findings from it.</p>	<p>Assess another performance and highlight areas of strength and areas for development.</p>

Physics

	Figuring It Out (2 reward points each)	Freewheeling (5 reward points each)	Flying (10 reward points each)
Challenge 1	Electricity: Produce a set of flash cards which summarise the symbols and function of components	Electricity: Use your knowledge to design a switching circuit in an application. Imagine you are pitching your idea to a company, produce a PowerPoint slide which summarises how your idea works	Electricity: Research transistors. Design / build a circuit which makes use of them as a switch.
Challenge 2	Motion: Summarise the forces and acceleration which takes place during a rocket launch. How do the key parameters (e.g. mass / velocity) change.	Motion: Research the bloodhound supersonic car. What aerodynamic features are there that limit drag / air resistance. Produce a slide which you could use to teach a friend.	Motion: Create a model of projectile motion on an excel spreadsheet / computer program.
Challenge 3	Waves: Imagine you have been asked to help a Year 11 with revision – make a plan for how you would teach the key concepts in waves (electromagnetic and compression)	Waves: Investigate how the wave velocity of sound changes in different mediums. Design a device which could make use of this and produce a one page summary.	Waves: Research how earthquakes are detected and monitored on Earth. Research the Insight lander (NASA). Create a poster which summarises the differences in detecting earthquakes on Mars.

Psychology

	Figuring It Out (2 reward points each)	Freewheeling (5 reward points each)	Flying (10 reward points each)
Challenge 1	Identify the difference between using twin studies, adoption studies and family studies when conducting research on the onset of the development of mental health. Then, identify which of the studies listed above would be the most beneficial.	Research the genetic influences on the development of mental illness. Focus your research on disorders such as depression and bipolar in order to identify the concordance rates between families.	Create an information leaflet to be handed out to individuals suffering from mental health problems. The aim of this leaflet is to educate people on the genetic influences on mental health.
Challenge 2	Identify the difference between using biological treatments and non- biological treatments in order to treat patients with mental health. Then, report on the benefits and drawbacks of each.	Share an article that interests you from the British Psychological Society Research digest on Social media and start a discussion about it, evaluate the methodology of the research.	Research how CBT is carried out, then create a CBT program for a patient suffering from clinical depression.
Challenge 3	Research the work done by Bowlby and Ainsworth on the development of attachment. Identify the importance of early attachment and explain the effects that children may suffer from if they fail to develop a strong attachment with their primary caregiver in the first years of life.	Distinguish between the three different types of attachments that Ainsworth has identified. Based on your research, how do we educate new parents on the importance of attachment and the drawbacks of lack of attachment?	Advise the management of a new nursery on how to improve the attachment levels they have between children and key workers. Do this by creating a PowerPoint that has all the details on the importance of attachment and how to maintain staff members.