



FEARNHILL  
SCHOOL

**Year 12**

**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.

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## Art

	<b>Figuring It Out (2 reward points each)</b>	<b>Freewheeling (5 reward points each)</b>	<b>Flying (10 reward points each)</b>
<b>Challenge 1</b>	<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><a href="https://www.bbc.co.uk/arts/powerofart/intro.shtml">https://www.bbc.co.uk/arts/powerofart/intro.shtml</a></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>
<b>Challenge 2</b>	<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><a href="https://www.amazon.co.uk/illustrated-story-art-dk/dp/1409316084/ref=sr_1_7?s=books&amp;ie=UTF8&amp;qid">https://www.amazon.co.uk/illustrated-story-art-dk/dp/1409316084/ref=sr_1_7?s=books&amp;ie=UTF8&amp;qid</a></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>
<b>Challenge 3</b>	<p>Listen to the Grayson Perry Reith lectures:</p> <ol style="list-style-type: none"> <li>1. Democracy has bad taste: <a href="http://www.bbc.co.uk/programmes/b03969vt">http://www.bbc.co.uk/programmes/b03969vt</a></li> <li>2. Beating the Bounds: <a href="http://www.bbc.co.uk/programmes/b03dsk4d">http://www.bbc.co.uk/programmes/b03dsk4d</a></li> <li>3. Nice rebellion, welcome in! <a href="http://www.bbc.co.uk/programmes/b03f9bg7">http://www.bbc.co.uk/programmes/b03f9bg7</a></li> <li>4. I found myself in the art world: <a href="http://www.bbc.co.uk/programmes/b03g9mn1">http://www.bbc.co.uk/programmes/b03g9mn1</a></li> </ol>	<p>Visit the Saatchi Gallery</p> <p><a href="https://www.saatchigallery.com/">https://www.saatchigallery.com/</a></p>	<p>Learn a new technique- Enrol on one of the ART VAN GO Creative Workshops</p> <p><a href="https://www.vycombe-arts.co.uk/">https://www.vycombe-arts.co.uk/</a></p>

## Biology

	<b>Figuring It Out (2 reward points each)</b>	<b>Freewheeling (5 reward points each)</b>	<b>Flying (10 reward points each)</b>
<b>Challenge 1</b>	<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"> <li>•Controlled grazing.</li> <li>•Restricting human access.</li> <li>•Controlling poaching.</li> <li>•Feeding animals.</li> <li>•Reintroduction of species.</li> <li>•Culling and removal of invasive species.</li> <li>•Halting succession.</li> <li>•Coppicing.</li> </ul> <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>
<b>Challenge 2</b>	<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.  <a href="http://glencoe.mheducation.com/sites/dl/free/0078802849/383946/BL_10.html">http://glencoe.mheducation.com/sites/dl/free/0078802849/383946/BL_10.html</a></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>
<b>Challenge 3</b>	<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.  <a href="https://www.youtube.com/watch?v=SSS3EtKAZc">https://www.youtube.com/watch?v=SSS3EtKAZc</a></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

	<b>Figuring It Out (2 reward points each)</b>	<b>Freewheeling (5 reward points each)</b>	<b>Flying (10 reward points each)</b>
<b>Challenge 1</b>	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.	Read an autobiography written by an entrepreneur that has inspired you.	Deliver a presentation about how a business of your choice uses branding and promotion to maximise their brand value. You should deliver this to the class.
<b>Challenge 2</b>	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.	Design a presentation about the marketing mix of a product of your choice. Your presentation should have a section on each of the 4 P's.	Write your own case study about a business of your choice. Your case study should focus on the different methods of production the business could use to maximise productivity.
<b>Challenge 3</b>	Research a business that has failed. Explain the financial and non-financial factors that led to the failure of this business.	Using research to support your findings, create an organisational structure for a business of your choice, with an explanation about the benefits and limitations of it.	Write an article about the benefits and drawbacks of Britain leaving the European Union (Brexit). Take into account possible changes in: inflation, interest rates, government taxation, exchange rates and the business cycle.

## Chemistry

	<b>Figuring It Out (2 reward points each)</b>	<b>Freewheeling (5 reward points each)</b>	<b>Flying (10 reward points each)</b>
<b>Challenge 1</b>	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.
<b>Challenge 2</b>	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.
<b>Challenge 3</b>	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

	<b>Figuring It Out (2 reward points each)</b>	<b>Freewheeling (5 reward points each)</b>	<b>Flying (10 reward points each)</b>
<b>Challenge 1</b>	<p>Plan a visit to the Centre of Computing History Rene Court, Coldhams Road, Cambridge, CB1 3EW</p> <p><a href="http://www.computinghistory.org.uk/">http://www.computinghistory.org.uk/</a></p>	<p>Create a timeline of computing milestones.</p> <p>Start in 1940 and go up to the current day.</p>	<p>Test your problem solving and computational thinking skills through a series of challenging mathematical/computer programming problems</p> <p><a href="http://projecteuler.net/">http://projecteuler.net/</a></p>
<b>Challenge 2</b>	<p>Do some online research into books that interest you for both computing and IT and let us know which books are helpful!</p>	<p>Write a book review on a page of A4 for the book that you read.</p>	<p>Use Google search to see if you can find IT jobs that were mentioned in the book or relate to the technology in the book.</p>
<b>Challenge 3</b>	<p>Use the Prospects website to research IT job roles. For example:</p> <p><a href="https://www.prospects.ac.uk/job-profiles/software-engineer">https://www.prospects.ac.uk/job-profiles/software-engineer</a></p>	<p>Search UCAS for courses that would help you to start a career in IT.</p> <p><a href="https://www.ucas.com/">https://www.ucas.com/</a></p>	<p>Write a summary of your skills that would help you in some of the IT jobs that you have found.</p>



## English

	<b>Figuring It Out (2 reward points each)</b>	<b>Freewheeling (5 reward points each)</b>	<b>Flying (10 reward points each)</b>
<b>Challenge 1</b>	Visit this website and listen to a podcast. This is a great insight into a writer's process! <a href="https://longform.org/">https://longform.org/</a>	Now read 2 articles from the longform website and identify the ways that longform writers (like fiction writers) engage the reader.	Write your own long form article about a subject that interests you.
<b>Challenge 2</b>	Visit this website and read 2 stories from the fiction section. <a href="https://hazlitt.net/fiction">https://hazlitt.net/fiction</a>	Research other literary fiction websites. You could also try: <a href="https://www.onethrone.com/">https://www.onethrone.com/</a>	Write your own fiction inspired by the stories you have read inside and outside of class.
<b>Challenge 3</b>	Listen/ watch Scroobius Pip's spoken word poetry	Research more spoken word poetry- there's plenty of videos online.	Attend a poetry slam in London or Cambridge. <a href="http://www.hammerandtongue.com/cambridge/">http://www.hammerandtongue.com/cambridge/</a>

## History

	<b>Figuring It Out (2 reward points each)</b>	<b>Freewheeling (5 reward points each)</b>	<b>Flying (10 reward points each)</b>
<b>Challenge 1</b>	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.
<b>Challenge 2</b>	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.
<b>Challenge 3</b>	Listen to Dan Snow’s “History Hit” podcast: <a href="https://www.historyhit.com/podcasts/">https://www.historyhit.com/podcasts/</a>  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

	<b>Figuring It Out (2 reward points each)</b>	<b>Freewheeling (5 reward points each)</b>	<b>Flying (10 reward points each)</b>
<b>Challenge 1</b>	<p>Watch the videos from the e Exam Solutions website to support your learning in lessons:</p> <p><a href="https://www.examsolutions.net/a-level-maths/edexcel/">https://www.examsolutions.net/a-level-maths/edexcel/</a></p>	<p>Consolidate a set of notes from these and ensure that all worked solutions you use are fully understood.</p>	<p>Read the book: Life of Fred Maths, by Stanley F. Schmidt</p> <p>This is a series of stories based on maths genius Fred Gauss</p>
<b>Challenge 2</b>	<p>Use Dr Frosts Maths resources and PowerPoints, like this one on binomial expansion:</p> <p><a href="https://www.drfrostmaths.com/resource.php?rid=276">https://www.drfrostmaths.com/resource.php?rid=276</a></p>	<p>Try the online homework tasks on mathswatch or mymaths.</p>	<p>Research Dr Igor Kntorovich</p> <p>You will learn about problem solving, proving and more.</p>
<b>Challenge 3</b>	<p>Research graph theory and Euler and then try:</p> <p>Bridge crossing question</p> <p>Activity: The Seven Bridges of Königsberg - Math is Fun</p>	<p>Watch and try the puzzles from Dara O Briain School of Hard Maths.</p>	<p>Film: The Story of 1</p> <p>The Story of 1 is a BBC documentary about the history of numbers, and in particular, the number 1.</p> <p>It is presented by former Monty Python member Terry Jones. It was released in 2005.</p>

## Media

	<b>Figuring It Out (2 reward points each)</b>	<b>Freewheeling (5 reward points each)</b>	<b>Flying (10 reward points each)</b>
<b>Challenge 1</b>	<p><b>MEDIA AUDIENCES TERMINOLOGY</b> Create a description, with example, for each of the following:</p> <p>Conglomerate, Independent, Cross media ownership, Commercial, Public service broadcaster, Joint venture, Vertical integration, Horizontal integration, Synergy, Production process</p>	<p>Watch Christopher Nolan's Movies That Made Me (<a href="https://www.bbc.co.uk/iplayer/episode/p05q4k47/movies-with-ali-plumb-christopher-nolan-movies-that-made-me">https://www.bbc.co.uk/iplayer/episode/p05q4k47/movies-with-ali-plumb-christopher-nolan-movies-that-made-me</a>)</p> <p>What are Nolan's key abilities as a director?</p>	<p><b>STORYBOARD</b> Create a storyboard of the opening of one of your favourite books. Ensure you include camera shots, angles and movements, alongside information about sound and dialogue.</p>
<b>Challenge 2</b>	<p><b>KEY THEORIES</b> Summarise the following theories:</p> <ul style="list-style-type: none"> <li>•Todorov's Narrative</li> <li>•Mulvey's Male Gaze</li> <li>•Rick Altman's Genre</li> <li>•Hyperdermic Needle</li> <li>•Uses and Gratifications</li> </ul>	<p><b>MICRO-ANALYSIS</b> Find a screen shot from one of your favourite films – label which camera shot &amp; camera angle has been used. Identify the mise en scène elements within the shot: costume, lighting, props, positions, setting. Explain why you think it is effective.</p>	<p><b>FILMING</b> Film a vlog where you review a film you have recently watched. Express your opinions and support your criticism with evidence from the film. Consider the acting, directing, plot, cinematography without giving away any spoilers!</p>
<b>Challenge 3</b>	<p><b>ADVERTISING</b> Research the Vogue brand, Look specifically for the festivals that the brand sponsors. Think of ways in which Vogue might be promoted across the media platforms it operates over.</p>	<p><b>WRITING</b> Write an article, on a subject of your choice, for EMC Media Magazine. Email your to 1,000 – 1,500 word article to <a href="mailto:jenny@englishandmedia.co.uk">jenny@englishandmedia.co.uk</a>. It could be about media careers, genres or concepts e.g. media representations or detailed analysis of an artist's coverage.</p>	<p><b>EDITING</b> Download this, or any unedited footage you can get, <a href="https://www.youtube.com/watch?v=W3vi4HPblw0">https://www.youtube.com/watch?v=W3vi4HPblw0</a> and use some editing software to create an intro to a TV programme of your own genre choice.</p>

## PE

	<b>Figuring It Out</b> (2 reward points each)	<b>Freewheeling</b> (5 reward points each)	<b>Flying</b> (10 reward points each)
<b>Challenge 1</b>	<p>Read the journals of:</p> <ul style="list-style-type: none"> <li>-Applied physiology, sport and society</li> <li>-Sport and exercise psychology</li> </ul> <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>
<b>Challenge 2</b>	<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>
<b>Challenge 3</b>	<p>Watch the following documentaries/films:</p> <ul style="list-style-type: none"> <li>• Icarus (2017) Bryan Fogel,Netflix</li> <li>• Sports Science (2013) ESPN</li> <li>• The Program (2015)</li> </ul>	<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

	<b>Figuring It Out (2 reward points each)</b>	<b>Freewheeling (5 reward points each)</b>	<b>Flying (10 reward points each)</b>
<b>Challenge 1</b>	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.
<b>Challenge 2</b>	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.
<b>Challenge 3</b>	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

	<b>Figuring It Out (2 reward points each)</b>	<b>Freewheeling (5 reward points each)</b>	<b>Flying (10 reward points each)</b>
<b>Challenge 1</b>	Identify the functions of the left hemisphere of the brain and discuss how damage to this side of the brain might affect behaviour.	Conduct an experiment on three different individuals to test the effects of auditory inattention. Use the study conducted by Grant et al. as a guide. Report on your aim, procedures, and results.	Research the importance of context on memory and create a PowerPoint that could be shared with key stage 3 in order to advise them on how to improve their study habits for exams.
<b>Challenge 2</b>	Distinguish between the biological and social factors that influence crime. Research at least two biological and two social factors and discuss which ones you agree the most with and why.	Watch a court case at Stevenage Magistrates court in order to understand the judicial system and the effects of society on crimes.  <a href="https://courttribunalfinder.service.gov.uk/courts/stevenage-magistrates-court?aol=All&amp;postcode=SG2%207JP">https://courttribunalfinder.service.gov.uk/courts/stevenage-magistrates-court?aol=All&amp;postcode=SG2%207JP</a>	Write an article about how you think the criminal justice system could be improved based on the court case that you observed:  <a href="https://www.prisonexp.org/">https://www.prisonexp.org/</a>
<b>Challenge 3</b>	Watch the documentary “BBC Mental: A History of the Madhouse” and identify the differences between mental asylums in the past in comparison to mental health institutes now.  <a href="https://www.youtube.com/watch?v=oswUssXzFIY">https://www.youtube.com/watch?v=oswUssXzFIY</a>	Get involved with ‘Time to change’ by becoming a ‘time to change Champion’, writing a blog about attitudes to mental health. Take part in a time to talk day.  <a href="https://www.time-to-change.org.uk/get-involved">https://www.time-to-change.org.uk/get-involved</a>	Research the “care into the community act” that took place in the 1990s and write a critical analysis of this movement in order to identify its strengths and limitations and its effects in the wider society.