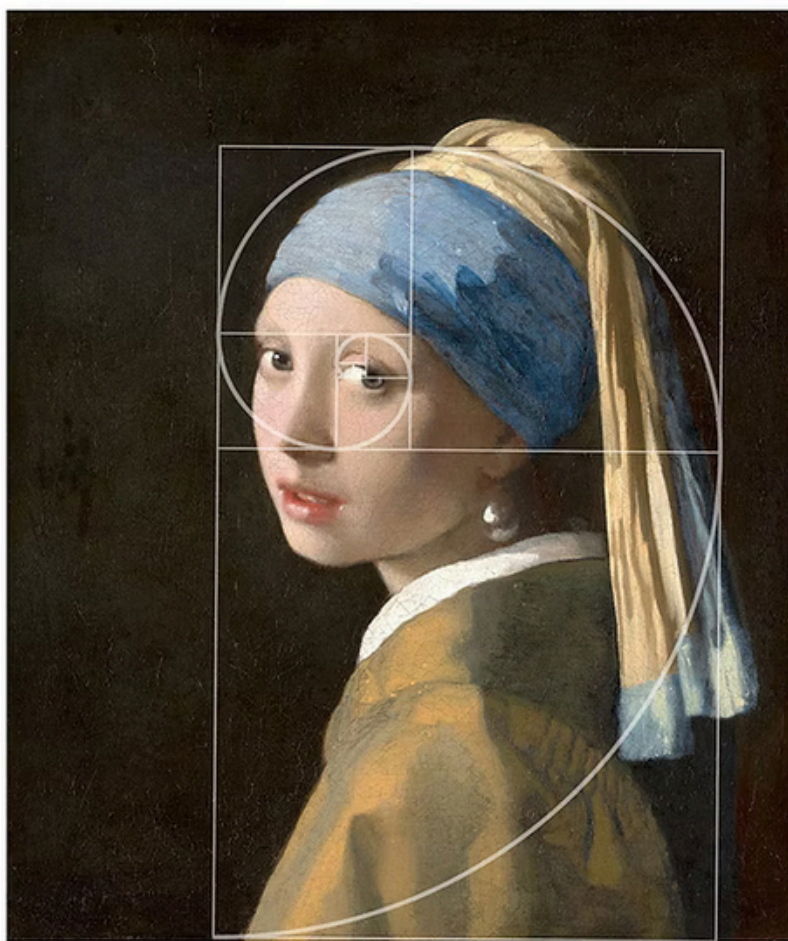




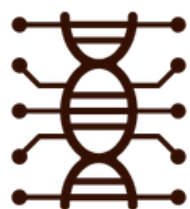
BRI Journal

DECEMBER 2025

**A fascinating dive into the research carried out by students in the
Baltic Research Institute at Liverpool Life Sciences UTC and the
Studio School located in Liverpool's Baltic Triangle**



**In this winter edition, read about the Golden Ratio in art. We also dive
into the worlds of AI, Endometriosis, Telemedicine, and more!**



BRI

Baltic Research Institute

Liverpool
Life Sciences UTC **THE STUDIO**



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In this issue

Meet the Editorial Team / Foreword **3**

Original Research Articles

The Relationship Between Mathematics and Art **4-5**

Investigation into the Potential of Mealworms to Degrade Non-Recyclable Plastic **6-7**

Is there a North-South Division in England? **8-9**

Using Nanoparticles to Improve the Sustainability of the Concrete Industry **10-11**

Tackling Endometriosis: A View on Our Next Steps **12-13**

Telemedicine **14-15**

Special Features and Activities

Artificial Intelligence **16**

Word Search & Answers **17-18**

Golden Ratio Template **19**

Next Edition, Acknowledgements and Links **20**

Meet the editorial team...

Foreword from the editorial team

Happy Christmas and New Year to all of our readers from the new team of year 12 students running the Baltic Research Institute.

This 2025 winter edition of the Baltic Research Journal is the new team's first edition. We primarily feature amazing original research carried out by students completing extended projects (EPQs) in the Baltic Research Institute. Our new team has been working hard to edit six original research articles to keep you entertained over the festive period! We also include a fascinating dive into the world of AI and its impact on the global economy by our new features editor Antony Williams.

We hope you enjoy this issue and we look forward to hearing any feedback. Thanks for taking the time to read our articles.



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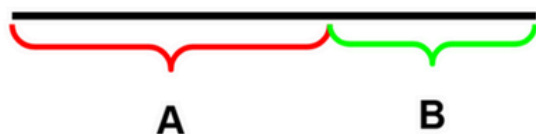
The relationship Between Mathematics and Art

Mathematics and art may seem like opposites—one logical, the other creative—but history shows they are deeply intertwined. From the symmetry of Islamic mosaics to the precise geometry of Renaissance paintings, maths has often been the hidden scaffolding behind beauty.

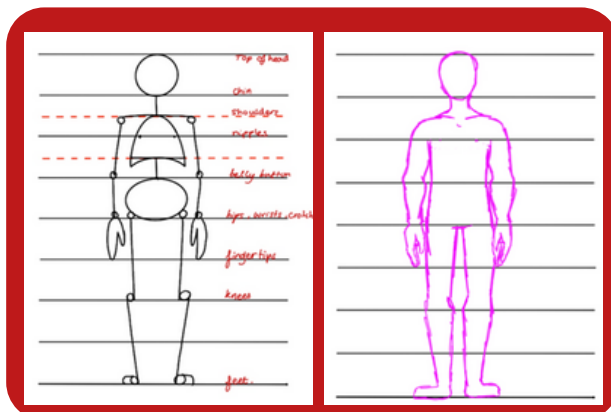
In realism especially, proportions are everything. Artists often rely on mathematical guides to make figures look natural. For example, when sketching a body, artists may start with the head, then measure its height and mark seven equal spaces below—this ensures the figure's proportions remain balanced. Maths also appears in perspective. Renaissance artists like Albrecht Dürer used grids and vanishing points to create depth, while modern graphic designers use similar techniques digitally. In this way, maths doesn't just support art—it transforms it.

What is the Golden Ratio?

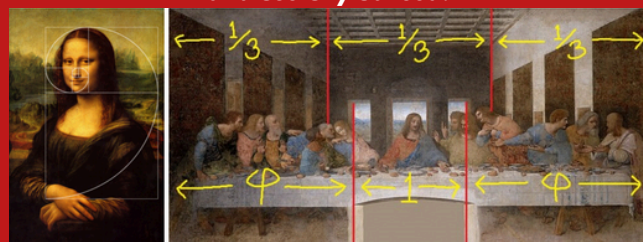
The Golden Ratio (approximately 1.618) is a mathematical proportion long associated with beauty. It's defined by dividing a line into two parts so that the ratio of the whole to the larger part equals the ratio of the larger part to the smaller.



This ratio generates the famous Golden Spiral, which expands according to the Fibonacci sequence. Nature is full of these spirals: sunflower seed arrangements, seashells, pinecones, even hurricanes.



Artists have used this ratio for centuries. Leonardo da Vinci's *Mona Lisa* and *The Last Supper* are often cited as examples where the Golden Ratio is clearly and usefully utilised.



TESTING THE GOLDEN RATIO

For her project, Zoe wanted to test whether applying the Golden Ratio actually changes how people view art. She created pairs of drawings: one using the Golden Ratio, the other without. Participants were then asked to choose which they preferred.

Zoe found these results:

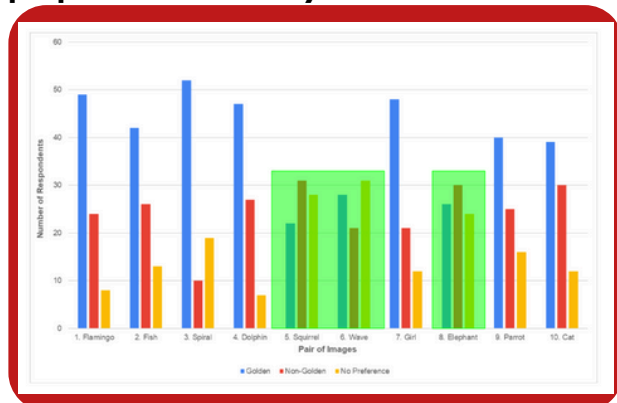
Overall trend: People tended to prefer the Golden Ratio versions.

Exceptions: In some cases—like a squirrel drawing—participants chose the non-Golden version, often citing reasons unrelated to proportion (e.g., “the spiral is bigger”).

No demographic bias: Age and gender didn’t strongly affect choices.

Art interest mattered: Those who rated themselves highly interested in art (5/5) were more likely to prefer Golden Ratio pieces.

This suggests that while the Golden Ratio may not universally dictate beauty, people with a trained eye for art value its proportional harmony more.



Reflections

This EPQ project by Zoe Steele showed me that maths can indeed alter preferences in art—but not always predictably. The Golden Ratio seems to enhance appeal in many cases, but personal taste, cultural context, and even randomness play roles too.

In my opinion, the seemingly most rewarding part to them was seeing how maths and art, two subjects they loved, can merge into something both analytical and creative. It proved that maths isn’t just numbers; it can be a language of beauty and patterns.

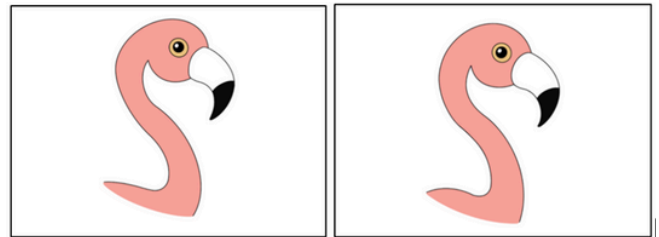
Conclusion

So, does using maths improve art? The answer is nuanced. The Golden Ratio often makes art more appealing, especially to those who value proportion, but it isn’t a universal rule. What this project highlights is the fascinating dialogue between logic and creativity—between numbers and beauty.

And perhaps that’s the real lesson: art and maths aren’t opposites at all. They’re partners in shaping how we see the world.

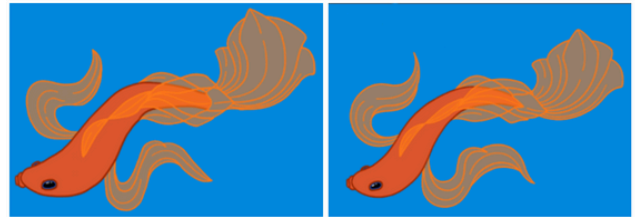
TEST YOURSELF !

Choose the picture you think utilises the golden ratio



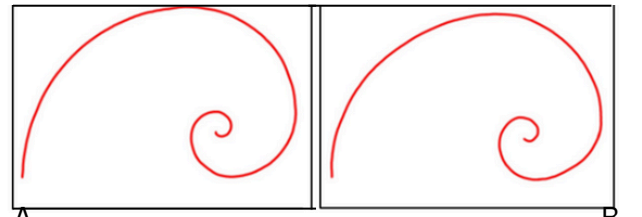
A

B



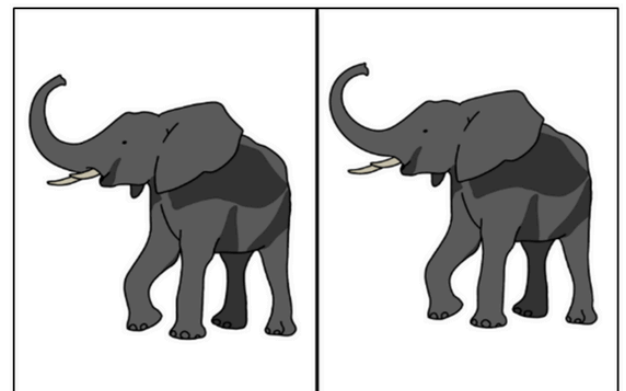
A

B



A

B



A

B



A

B

ANSWERS!
Flamingo - B
Betta fish - B
Spiral - A
Elephant - B
Squirrel - A

Original research project

Investigation into the potential of mealworms to degrade non-recyclable plastic.

Researcher: Tamino Merk
Editor: Freya Doran

At this school, the topic of mealworms' ability to degrade and digest plastic waste is a popular issue which a few previous students have chosen to research for their EPQs. Last year, however, former student Tamino Merk took this one step further by researching and evaluating the viability of using meal worms to reduce non-recyclable plastic pollution. During his extended research project (EPQ), Tamino reported the global severity of plastic in the environment, highlighting the importance of reducing such pollution.

Tamino discovered some staggering statistics ...

- 1 in 3 fish caught for human consumption contains plastic
- Only 9% of the plastic produced worldwide has ever been recycled
- The average person consumes 70,000 pieces of microplastics each year
- 100,000 animals die from plastic entanglement each year

Tamino reported plastic pollution as one of the largest problems we face in the modern world. He discovered that around 35% of all plastic currently produced is non-recyclable. This lack of recycling results in landfills full of non-biodegradable plastic waste that takes several centuries to decompose. These plastics are often infused with harmful chemicals that have been proven to trigger inflammation, damage DNA, and disrupt gut health, all processes that promote cancer growth. This is particularly concerning as we are at a greater risk of ingesting these chemicals if such plastics dissolve into our groundwater.



Before reading Tamino's EPQ, I was oblivious to the extent of plastic's prevalence in our everyday routine, however, Tamino discovered plastic is used in almost every aspect of our daily lives. The clothes you wear most likely contain hydrocarbon chains known as polyester, and the food you eat is also presumably packaged in plastic. Tamino reported that the presence of plastic itself is not necessarily a problem, but when considering the percentage of recycled plastic is currently less than 10%, Tamino was alarmed, concluding that something must be done to reduce the amount of plastics ending up in landfills.

In order to address his concerns on the impact of plastic pollution, Tamino took a practical approach to his research, hypothesising that mealworms would be able to digest plastic in their gut biome.

In his EPQ, he chose to focus on a mix of quantitative and qualitative analysis of the process and product of mealworm efficiency when digesting plastic. He wanted to do this by using two plastics; expanded polystyrene (EPS) and polyether foam (as these are two very common packaging plastics and are not widely recycled) to test whether feeding them to mealworms would be a possible alternative to complicated recycling or ineffective disposal. He made observations of mealworms after eating plastic as well as numerically analysing how well they were able to digest plastic.

He began by researching the insect, discovering that mealworms grow to roughly 2.5cm and prefer dark, warm, and humid climates. They live for around 6 to 12 weeks of which they spend between 150 to 200 days in the larvae stage. This was the relevant stage in his investigation as during this stage, mealworms are able to consume and digest plastic. Tamino acknowledged that there are different subspecies of mealworms - some better suited than others at digesting plastics - however, he found that these specific strands were hard to obtain, so instead conducted his research on a strand of mealworms half the size.

After creating appropriate environments that mimicked the *Tenebrio Molitor*'s (mealworm's) natural habitat, Tamino divided a selection of mealworms into 3 equal groups, weighing and recording the mass of each group. He then provided each group with 10g of oats, and two of the groups with a further 1.7g of non-recyclable plastics (each group having a different type of plastic). Tamino then left the mealworms for 2 weeks. After this time, he observed an increase in mass of mealworms, and a decrease in the mass of oats and both plastics.



These results allowed Tamino to conclude that mealworms are in fact able to consume and digest non-recyclable plastics.

Tamino was also concerned of the impact that digesting plastic would have on the mealworms, so decided to additionally research biodegradable and compostable plastics, as an alternative to their non-biodegradable counterparts. Usually manufactured from agricultural waste, or specifically grown for the purpose of producing plastics, these plastics can be converted by microorganisms to CO₂, CH₄, and microbial biomass. The most common process of producing such plastics is using starch from potatoes or corn, or even seaweed. This compostable plastic can be used instead of regular plastic, an example being certain brand shopping bags. Tamino found that there had been attempts made of applying this concept to produce food packaging, however this remained complicated, as plastic is not allowed to degrade while in contact with food, but needs to be able to be broken down when composted. Due to this difficulty, as well as the plastic being quite weak under stress-tests, these plastics are not widely used and will not be able to replace conventional plastics in the foreseeable future.

Is there a North-South divide in England?

The aim of James' research was to prove the socioeconomic and cultural division between both distinct areas of the country as he believes that it is important to prove from an economic standpoint the southern part of the country is significantly outperforming the north of the country. James also wanted to prove different traits that come with cities from either ends of the country.

For decades people have wondered whether England is split in two, the industrial, working class north and the opportunity filled south. But as James researched, this divide didn't appear overnight it is rooted from the industrial revolution and spiked in the 1980's during Margaret Thatcher's government closing down of the mines and shipyards and steelworks across the north of the country. That leads us to today where there is a large gap between both ends of the country.

Economics: Unequal opportunities

As far as we may believe that a Modern England would close the gap between the North and the South, James' research shows that Southern regions enjoy stronger economies, better job availability and higher education results. London leads the country with top universities, major employers and global investment. Meanwhile, many northern and midlands areas continue to recover from the decline of heavy industry, despite regeneration efforts in cities like Manchester, Leeds and Newcastle.

Culture & Identity

Culturally, the divide remains visible. Northerners are often seen as friendlier and more down-to-earth, and many take strong pride in their region—stronger, in fact, than their pride in England as a whole. Southerners, by contrast, report feeling more proud of their country than their specific region.



Politics & Society

Dialects also vary widely: northerners are more likely to say “tea” for the evening meal, midlanders are famous for calling a bread roll a “cob”, and southerners tend to stick with “dinner” and “bread roll”.

Contrary to popular belief, the North isn't always Labour and the South isn't always Conservative. Political differences today are more about urban vs rural living than geography. However, the North's historical struggles under Conservative governments do still influence attitudes.

Life expectancy, smoking rates, and obesity levels tend to be worse in the North, reflecting long-term inequalities. London remains the most diverse part of the country—so diverse, in fact, that only about a third of its population is White British.

The Midlands: Stuck in the Middle, or Part of the North?

One of the most interesting findings was how the public sees the Midlands. Many respondents viewed cities like Birmingham, Coventry and Derby as “more northern” than southern, despite their central location. When mapped, these answers didn’t create a straight dividing line—it formed a surprising U-shape, dipping beneath Birmingham and rising again above Norwich.

This suggests that the cultural gap might actually be between the South and the rest of England, rather than strictly North vs South.

Sports, Religion & History

Sport contributes to the divide too. Football dominance lies with northern clubs, while rugby splits the country in two—Rugby League in the North and Rugby Union in the South. Historically, the North held onto Catholic roots longer, though today the country is increasingly secular.

Voices from the survey

Across 160 respondents:

- The North and Midlands showed strong regional pride.
- The South showed stronger national pride.
- Friendliness, cultural differences, investment, food and diversity were the top themes people used to explain the divide.

One comment summed up the public mood:

“North and South feels like a class divide. Birmingham feels more industrial and working-class, and therefore more northern, even if it isn’t.” Fig 1



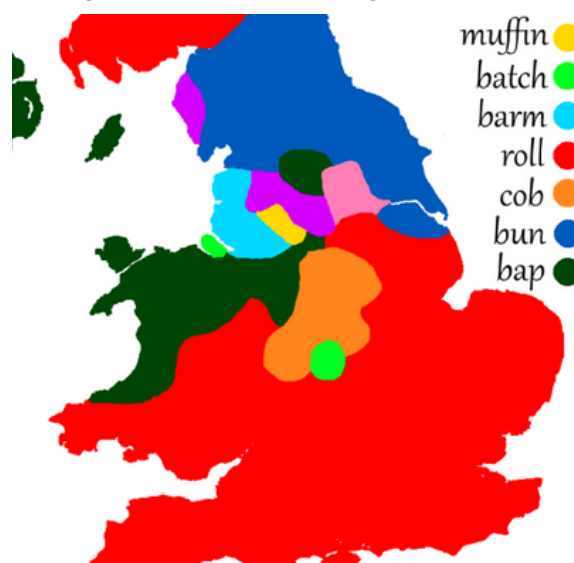
	Country	Neither/Can't Decide	Region
North	13.6%	33.3%	53.1%
Midlands	10.6%	44.7%	44.7%
South	34%	50%	16%

Fig1

So, Does the Divide Still Exist?

Yes—but not in the simple way people often imagine. The South, powered by London, continues to enjoy greater investment, stronger education outcomes and better economic opportunities. The North and Midlands share a close sense of identity shaped by industrial history and years of underinvestment.

With promises from recent governments to “level up” the country, there is hope that the divide could shrink. But for now, the cultural, social and economic differences remain a defining feature of life in England.



Original research project

Using nanoparticles to improve the sustainability of the concrete industry

Researcher: Alex Bunting
Editor: Gbolahan Adeshina

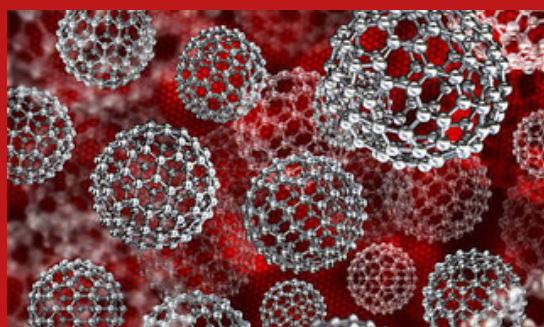
The aim of Alex's EPQ was to explore the use of nanoparticles in order to improve the sustainability of the concrete industry due to concrete having issues, such as; lack of strength and durability issues due to certain mechanical, chemical and physical properties.

What is Nanotechnology?

Nanotechnology refers to materials and structures with dimensions below 100 nanometres and the technologies that allow control at this scale. It is an interdisciplinary field, combining biology, chemistry, physics, engineering, material science, and medicine. Although modern in practice, its origins date back to 1959, when Richard Feynman proposed atomic-scale precision without violating physical laws.

Types of nanoparticles include:

- Metal nanoparticles
- Oxide nanoparticles
- Semiconductor nanoparticles
- Composite nanoparticles



Current Uses of Nanotechnology

Nanotechnology is already widely used:

- Sunscreen – TiO_2 and ZnO nanoparticles reflect UV light while remaining transparent
- Automotive coatings – improved appearance using less material
- Solar cells – improved cooling and efficiency
- Medicine – targeted drug delivery and therapies
- Ferrofluids – controlled movement in seals and dampers
- Nanobots – operate in environments like the bloodstream
- Electrochemistry & catalysis – enhanced reactions
- Lithium-ion batteries – significantly increased storage capacity

Alex used a Hitachi TM4000 SEM to view her nanospheres. This was loaned to the school through a scheme led by IRIS and involving the Royal Microscopical Society, the Natural History Museum, Hitachi High Technologies, the Gauntlet Trust, the Quekett Microscopical Club and Oxford Instruments



The Advantages and Disadvantages

Advantages

- Reduced energy consumption
- Improved material performance
- Increased sustainability
- Lower carbon emissions

Disadvantages

- Long-term risks not fully understood
- Inhalation risks linked to respiratory and cardiovascular disease
- Most scientists agree benefits outweigh risks, especially in construction.

Concrete and Sustainability

Concrete is made from sand, gravel, cement, and water and is the most widely used construction material globally. However, the cement and concrete industry contributes significantly to global warming.

Concrete has been slow to adopt nanotechnology due to:

- Limited understanding of nanoscale mechanisms
- Uncertainty about practical benefits
- Strength also affected by mixture ratios and moisture content

Problems with Concrete

Concrete deterioration occurs due to:

- Mechanical damage (abrasion)
- Chemical damage (alkali-silica & alkali-carbonate reactions)
- Physical damage (thermal expansion & high temperatures)

However, nanoparticles can:

- Increase strength and durability
- Reduce abrasion
- Increase melting point, reducing heat damage

Economic Impact

- Poor UK road conditions cost billions annually
- 480,000 vehicle breakdowns in 2024 caused by potholes
- Estimated economic cost: £14 billion
- Improving concrete durability would reduce accidents, repairs, and financial loss.

Aim and Objectives of the Project

To synthesise nanospheres that could theoretically be added to concrete to improve durability and sustainability.

Methodology

PMMA Nanospheres:

PMMA (polymethyl methacrylate) nanospheres were synthesised using soft nanotechnology and self-organisation via polymerisation.

Reactants used:

- Methyl methacrylate
- Potassium persulfate
- Water
- Temperature range: 60–80°C

Key Experimental Findings

- Higher temperatures → higher yield & better iridescence
- Dissolving potassium persulfate improved reactions
- Immediate filtration increased yield
- Optimal temperature: 75–80°C
- Best ratio:

10 ml methyl methacrylate : 0.2 g potassium persulfate

The most successful experiment produced high mass and clear iridescence, indicating well-formed nanospheres. While further work is required to test their direct application in concrete, the findings support the potential of nanotechnology to enhance durability, sustainability, and economic efficiency in construction materials.

Tackling Endometriosis: A view on our next steps



Endometriosis is a common condition that primarily affects 1 in 10 women of childbearing age which equates to roughly 190 million women worldwide. This condition is a result of the endometrial tissue beginning to grow outside of the uterus and in other parts of the body. Olamide Adeleke has chosen to research into this topic as it aligns with what they are wanting to study in the future as well as wanting to research something completely new that other women can relate to.

Background information

Endometriosis was first described in medical literature roughly 300 years ago by physicians including the preeminent 17th century physician Thomas Sydenham, who described an endometriosis-like disease as “hysterical lumps...throughout the body”, “pain in the bladder” etc as the disorder’s most reliable diagnostic feature.

Causes and risk factors for endometriosis

While genetics play a significant role in predisposing women to endometriosis, environmental factors such as exposure to Polychlorinated Biphenyls (PCBs) and dioxins also contribute to the risk. Studies indicate a notable increase in endometriosis risk with PCB and dioxin exposure, although PCB usage has plateaued despite restrictions. Dioxins, found globally in soils, sediments, and certain foods, further elevate this risk. Other factors like short menstrual cycles, long periods, and not having children are also implicated, but the exact mechanisms remain unclear. Despite these identified risk factors, diagnosis remains challenging. Recent genetic studies, like the one from the University of Oxford, have identified genes linking endometriosis to conditions like migraines and back pain, offering potential for targeted treatments. Research suggesting endometriosis’s cancer-like behavior opens avenues for repurposing cancer treatments. Understanding the origins and risk factors is crucial, with potential for identifying existing drugs that can be repurposed for treatment, offering a more cost-effective approach.

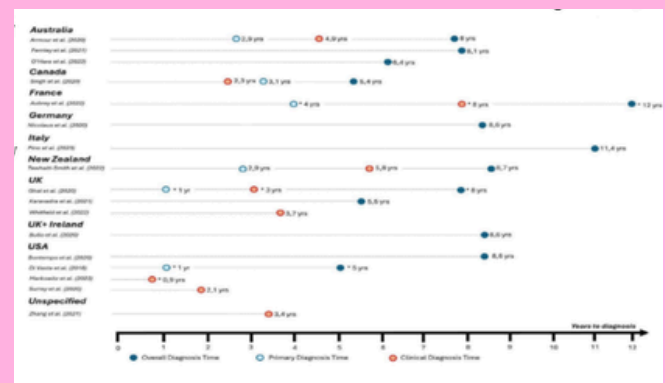


Fig 1

Treatment options for endometriosis

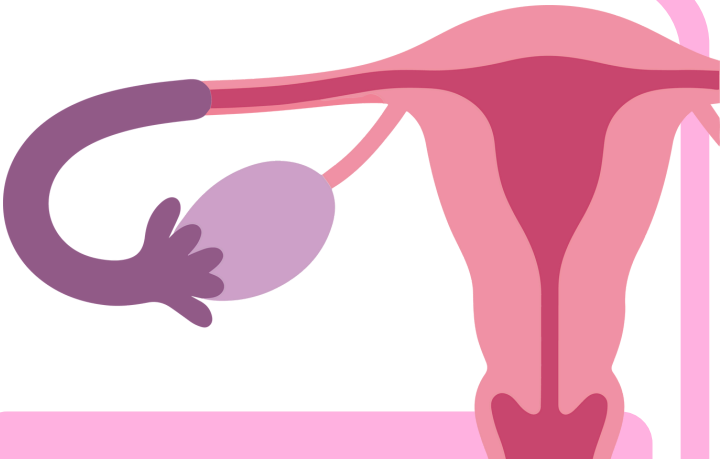
Currently the only way of diagnosing endometriosis is through laparoscopic surgery which involves your healthcare provider using a laparoscope to look inside your pelvis. Once they see where the tissue is, they can remove a sample of tissue and send it to a lab for testing according to the Cleveland Clinic 2024. However, there are more methods of treating endometriosis. For example, you could use simple pain reliefs such as paracetamol or ibuprofen as it is affordable and easy to get. However it poses some health risks, including irritation of the lining of the stomach. You could also use progesterone-only medications or the combined contraceptive pill however the symptoms may reoccur when treatment is stopped. Furthermore, you could use GnRH Analogues which are temporary menopause-inducing medications used with or without hormone replacement. This method is very effective in reducing pain related to endometriosis and stops endometriosis growth in most cases. However, it can cause some serious side effects such as bone thinning if used for more than six months. Moreover, endometriosis symptoms may reoccur when treatment is stopped. Hysterectomy and the removal of endometriosis is another treatment

that can be used. This process achieves a long term cure in over 90 percent of women as well as reducing or eliminating the need to use medications in the long term. However, the risk of surgery is greater than laparoscopy with treatment of endometriosis alone. It can remove fertility completely and hormone replacement therapy may be required if the ovaries are removed which may not cure the pain.

Next steps in endometriosis in medical schools

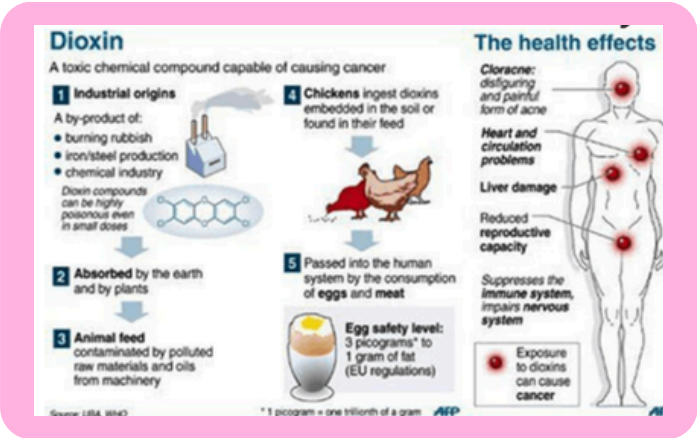
From the research, the researcher has concluded that we should target the education system in medical schools. Targeting the education system through medical schools in the UK allows us to conduct further research in order to develop new treatments as well as improving current treatments. In the UK, there is at least a £50 billion turnover relating to life sciences research with a big part of it being generated from research in medical schools. Therefore, medical schools are a great means of communicating with other research funders as well as the government (Medschools.ac.uk 2025).

Taking a look at prostate cancer in men for example, at least 1 in 8 men will be diagnosed with prostate cancer in their lifetime. Kings College London was at the forefront of developing technology-aided alternative, robotic radical prostatectomy that has evolved over the last 20 years for laparoscopy to become the most effective and common form of surgery in the UK. Therefore, seeing how much development that has been done for treating prostate cancer for men using laparoscopy, we can apply this similar framework to treating endometriosis and researching the technological side of things that can make it more effective for endometriosis to be caught earlier on .



Endometriosis Stage	Manifestation of the Condition
Stage I (1-5 points)	- Minimal - Few superficial implants
Stage II (6-15 points)	- Mild - More and deeper implants
Stage III (16-40 points)	- Moderate - Many deep implants - Small cysts on one or both ovaries - Presence of filmy adhesions
Stage IV (>40 points)	- Severe - Many deep implants - Large cysts on one or both ovaries - Many dense adhesions

Overall, this EPQ written by Olamide Adeleke conveys how Endometriosis is a condition that isn't as widely talked about yet still deserves our attention. It is a truly devastating disease for women especially considering how common it is and how painful it can get if not caught on time or managed properly. We are in need for better treatment options and more research into existing treatment options to help more women with this issue especially as other the treatments already discovered offer some serious side effects as well as symptoms reoccurring after treatment has stopped. Olamide has explained how using the education system can help do this through research and developing new technology for endometriosis.



Original research project

Telemedicine

Researcher: Affeynaya Raveenthirajah
Editor: Michael Kinealy

In this project Affeynaya discusses the development of telemedicine. That's just the tip of the iceberg, she covers history, different applications, experiences from different countries and evaluating the impact of telemedicine on the NHS. Enjoy and immerse yourself in this fascinating review of telemedicine.

Introduction

Telemedicine is basically using technology to give people medical care without them having to be in the same place as the doctor. Instead of always going to the hospital or GP, patients can get help through phone calls, video chats, or even apps. This idea became especially important during the COVID-19 pandemic, when hospitals were packed and people needed safer ways to get treatment. Telemedicine isn't about replacing doctors—it's about helping them reach more people quickly and making healthcare easier to access.

A Short History

Even though telemedicine feels modern, it's been around in different forms for centuries. In the Middle Ages, towns used bonfires to warn each other about the plague. Later, telegraphs and telephones were used to send medical updates. By the 20th century, radios helped doctors give advice to sailors at sea. Over time, technology improved, and now we use things like X-rays, MRI scans, and video calls as part of telemedicine.



Telemedicine Today

Today, telemedicine works in two main ways. One is “real-time,” like a live video call with your doctor. The other is “store-and-forward,” where medical data is sent and reviewed later, kind of like an email. Telemedicine is now used in almost every area of medicine, especially radiology (scans and X-rays) and nuclear medicine (using special tracers to diagnose problems).

Telemedicine Around the World

Different countries have taken telemedicine in different directions:

- Cyprus has advanced projects like MARTE, which tested remote heart exams in ambulances.
- Norway uses telemedicine for mental health and cancer screening, often with AI to help doctors spot problems earlier.
- Sri Lanka shows how telemedicine can help rural areas where hospitals are far away, with systems that connect local doctors to experts abroad.
- The USA has widely adopted telemedicine, with hospitals using it for radiology, psychiatry, and cardiology. At-home monitoring systems have even reduced hospital readmissions and saved millions of dollars.
- The UK started using telemedicine more, especially during COVID-19, but progress has been slower compared to other countries.

Telemedicine During COVID-19

The pandemic showed just how useful telemedicine can be. In the UK, online consultations increased rapidly, helping reduce the spread of the virus and freeing up hospital beds for people who needed urgent care. Millions of people were able to get treatment without leaving home. This proved that telemedicine can be a powerful tool in emergencies and could save even more lives if improved further.

Telemedicine and the NHS

The NHS is one of the UK's greatest strengths, offering healthcare to everyone regardless of income. But it struggles with long waiting times and outdated technology. Telemedicine could help make the NHS more efficient, but it requires funding, training, and public acceptance. Importantly, telemedicine should be seen as a tool to support doctors, not replace them.

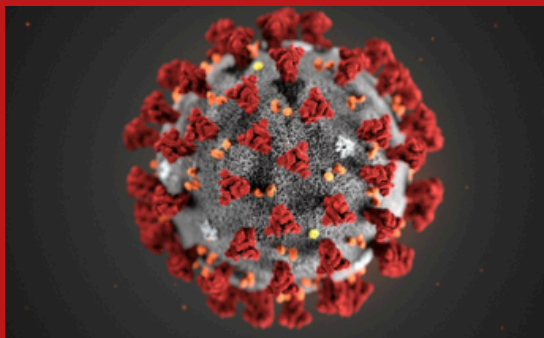
Pros and Cons

Telemedicine has clear benefits:

- It helps people in remote areas access care.
- It reduces waiting times.
- It allows at-home monitoring for chronic illnesses.
- It proved vital during COVID-19.
- It can use AI tools to give quick advice before seeing a doctor.

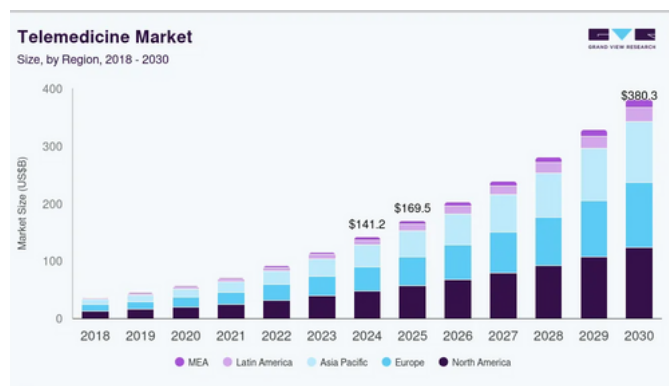
But there are also challenges:

- Doctors can't do physical exams remotely.
- Privacy concerns remain.
- Setting up systems can be expensive.
- Not everyone has the technology or skills to use it this requires further training that could come as a cost



Conclusion

Telemedicine has huge potential to change healthcare for the better. From bonfires in the Middle Ages to video calls today, it has always been about connecting people to medical help across distances. The COVID-19 pandemic proved how valuable it can be, and countries around the world are finding new ways to use it. For the UK and the NHS, investing in telemedicine could reduce waiting times, improve access, and save lives. While challenges like cost and privacy remain, the benefits show that telemedicine is a tool worth developing for the future.



What is the AI Bubble and will it burst?

A bubble, in an economic context, is a period where asset prices surge far above their intrinsic value due to speculation.

A Company's intrinsic value is hard to truly know, but using a price to earnings ratio you can determine how speculative a stock's value is. Ford currently has a PE ratio of 11.2 this tells us that investors believe it is likely to be low growth. The current average for the S&P 500 (a major US stock market index that tracks the performance of 500 large, publicly traded American companies) is 24. In contrast, AI stocks have very high PE's. Specifically, Nvidia has a PE of 45.9 meaning investors believe it to have the potential of incredibly high growth; more growth than the 10x they have increased by since January of 2023 and becoming the most valuable company in the World. AI stocks in general now make up 44% of the S&P 500.

Investors believe Nvidia will have incredibly high growth because they are selling the shovels for the AI goldrush (Graphics Processing Units) to companies like Open AI, Google, and Oracle.

However, companies are yet to find gold. After billions of dollars and millions of gallons of water, no company has succeeded in figuring out how to enable AI to make money.

Clearly there is an AI bubble then. PE ratios of AI companies are extremely high and they make up a large majority of the S&P 500's current value. Fortunately there is no problem with a bubble as long as the bubble doesn't pop. so the question then is the speculation correct will AI make money? I think AI companies have had thousands of the world's smartest people working for multiple years in any way to make money and they have yet to come up with anything.



Figure 1 - the stock price of Cisco (the main sellers of network hardware) during the dot com bubble on top of Nvidia's current stock price)

The consequences if the bubble does pop will be large and will affect the whole world. The dot com bubble of 2001 left hundreds of thousands unemployed, pensions in ruin and America with a minor recession. Michael Burry, famous for predicting the 2008 financial crisis, is one of AI's biggest doubters "OpenAI is the next Netscape, doomed and haemorrhaging cash." (1). Netscape is infamous for starting the dotcom bubble with its IPO.

There is debate about whether the current AI bubble is similar to the dot com bubble but it is clear that huge amounts of money are involved and if the bubble does burst the impact on the global economy could be catastrophic.

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J L C I L E R J Y C A H H X H X W C T P Z J V A F
S W J M M W G M U G I A E Z S R B O Z G D F R G C
P O E N D O M E T R I O S I S K R N E S R U Y B O
J A G S Y B P M A D U P E F S X Y C E F K D Q D C
Z N R M T E L O W V D B O Y G L E R U T D O F M M
H B O T Q I K Q E S R N P E U O A E M G B Q P A P
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P Q H N S F M E B F J N M N X G L E M L Z Z T W B
X J U U A B I Y N Z J O K C I A O S E D B D E R Y
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H R I N E H D I I G P A T Z N F R M L N D J E S Q
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T L J Z A Y I S Z D Z F T H S B U I K F W I V O H
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A T Q H T H D X P K Y T L F B A F O U F B C L I V
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J L C I L E R J Y C A H H X H X W C T P Z J V A F
 S W J M M W G M U G I A E Z S R B O Z G D F R G C
 P O E N D O M E T R I O S I S K R N E S R U Y B O
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 L V J B Z E B S R R H C N L V M E E M I G G I O K
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 N F P G W O E A Z T K Q A W L S L E K K Z G E N K
 T L J Z A Y I S Z D Z F T H S B U I K F W I V O H
 L P O D C I C T R C T G A C J H S I G I N Q M M L
 F V C N N S C I F F C V O C E B G O M E K Y S I H
 T P U O Q F P C U D G Z O W B H P L A W N O P C Q
 A T Q H T H D X P K Y T L F B A F O U F B C L I V
 U F Y P D D V N Q F Z S K P M Q F R O T R Q E B L

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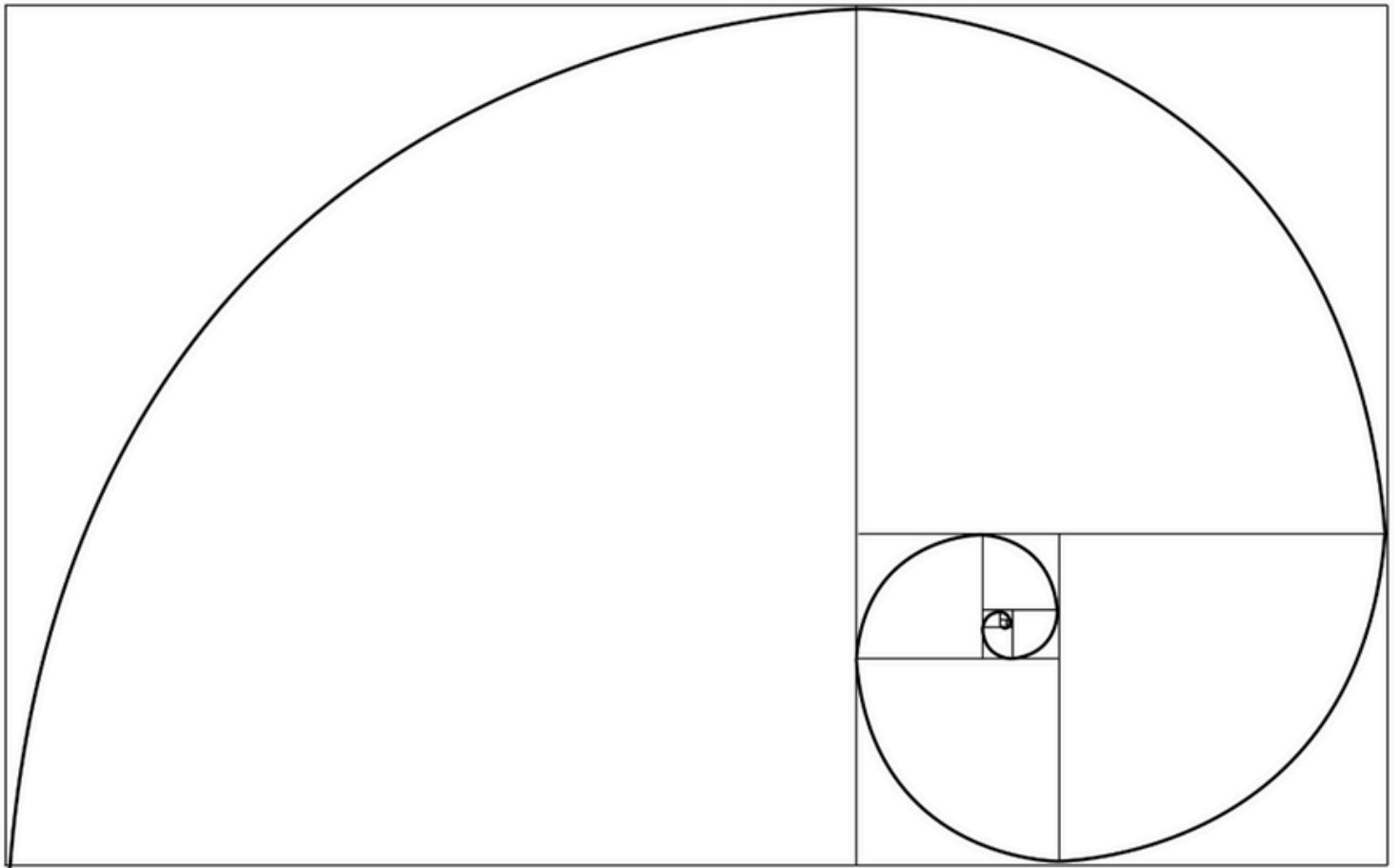
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Attempt your own artwork using the golden ratio as guidance!



In the Next Edition...

Following Olamide Adeleke's insightful EPQ on endometriosis, we want to pursue the topic of inequalities in health-care further, so for the next edition we are planning an journal specific to that issue.

If you are interested in working with us on this next edition or have any topics suggestions for the future please contact us [here](#).

Acknowledgements

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Merry Christmas and Happy New Year from all at the Baltic Research Institute

