



Pearson

# **GCE A Level Advanced Art and Design**

**Graphic Communication  
Component 1  
Roger**

**Total Mark 63 (52+PS11)**

	<b>AO1 Develop</b>	<b>AO2 Explore and Select</b>	<b>AO3 Record</b>	<b>AO4 Realise</b>	<b>Personal Study</b>
<b>Mark</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>13</b>	<b>11</b>
<b>Performance Level</b>	<b>5</b>	<b>5</b>	<b>4</b>	<b>5</b>	<b>4</b>
				<b>Total out of 90</b>	<b>63</b>





## Alternative projects

### Josef Muller-Brockmann

Josef Muller-Brockmann was born in Switzerland in 1914 and studied architecture and art & design before working as a designer, photographer and exhibition designer. During the Mid-20<sup>th</sup> Century he established his position as the country's leading practitioner and theorist of 'Swiss Style' graphic design.



### Armin Hofmann

Armin Hofmann was born in Switzerland in 1920 is a Swiss graphic designer. He began his career in 1947 as a teacher at the Allgemeine Gewerbeschule Basel School of Art and Crafts. Hofmann's colleagues and students at the university were important in developing the Swiss International Style, which believed in an 'absolute and universal style of graphic design'.

The designers who worked in this style used to use the following creative techniques: photo splicing, photo montage, experimental composition and sans-serif typography. Hofmann brought that one of the most efficient forms of visual communication was the poster and he created many posters for many important clients.



## Assignment 1

### Quote by Josef Muller Brockmann:

*"Illustrations are always understood as an artistic product, a subjective statement. Photography is a credible reflection of reality that enables me to make an objective statement. Emotion in images ... can produce genuine works of art, but in advertising I value as much objectivity as possible".*

**Question:** Do you agree with Muller- Brockmann's belief that using photographs in designs that are meant to communicate information to the public (such as advertising) as opposed to hand drawn illustrations are more appropriate and has the potential to communicate the message in a better way?

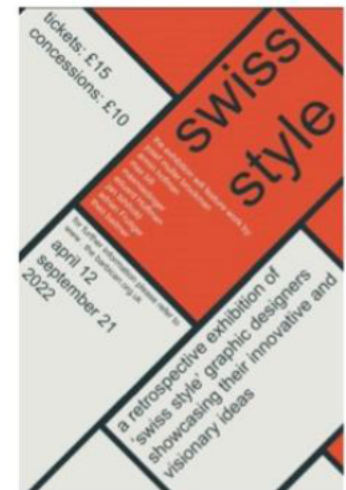
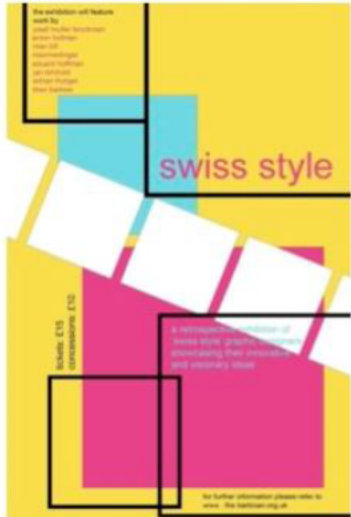
I somewhat agree with him, photographs will only depict what is right in front of the camera, it will not alter the products image. However, this does not mean that all emotion is removed from the from the image itself. Photographers can manipulate the image in real life by changing the lighting and background to make what they are trying to sell more appealing or not depending on their own personal biases. I do however strongly agree that illustrations are more subjective. Illustrations are far more personal to the artists as they are putting in their own style and opinions into the piece. This means the piece would be far more emotional.

I agree to an extent. Advertising should be very objective as it is trying to sell something. It should be factual about what its product or service will provide as to not deceive potential customers. However, it might not fully convince them, they would be far more likely to be engaged if the advert created an emotional response.

## Swiss style Squares



## Rectangles





Final designs





Final outcome




*I used a simple swiss colour palette of 3 colours. For this piece I decided to tilt the rectangle to further exaggerate the element of asymmetry. I consider this to be the best one as I prefer this darker colour palette. Also it has a better, more visually pleasing use of negative space than the other two posters.*

Joy Division





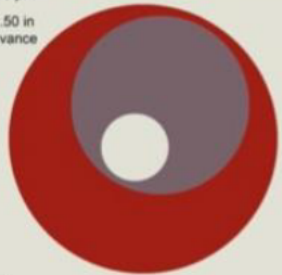
7:30 pm  
£2.50 in advance



joy friday october 26 1979  
electric ballroom  
camden town, london  
with the distractions a  
certain ratio

division

7:30 pm  
£2.50 in advance




joy friday october 26 1979  
electric ballroom  
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joy division

friday october 26 1979

electric ballroom  
camden town, london

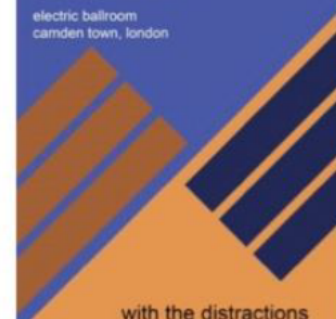


with the distractions  
a certain ratio

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friday october 26 1979  
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joy division

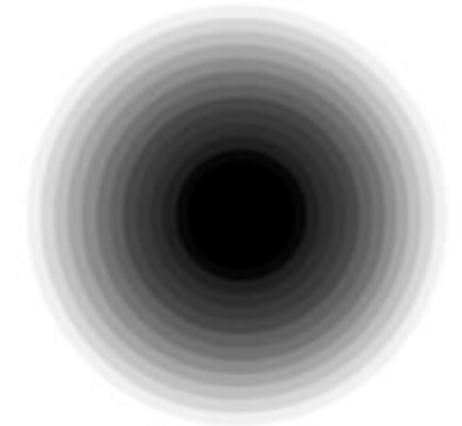
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electric ballroom  
camden town, london



with the distractions  
a certain ratio

7:30 pm  
£2.50 in advance

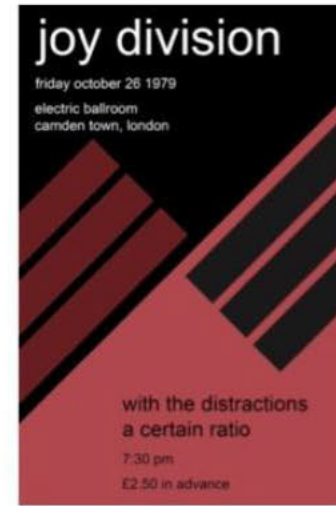
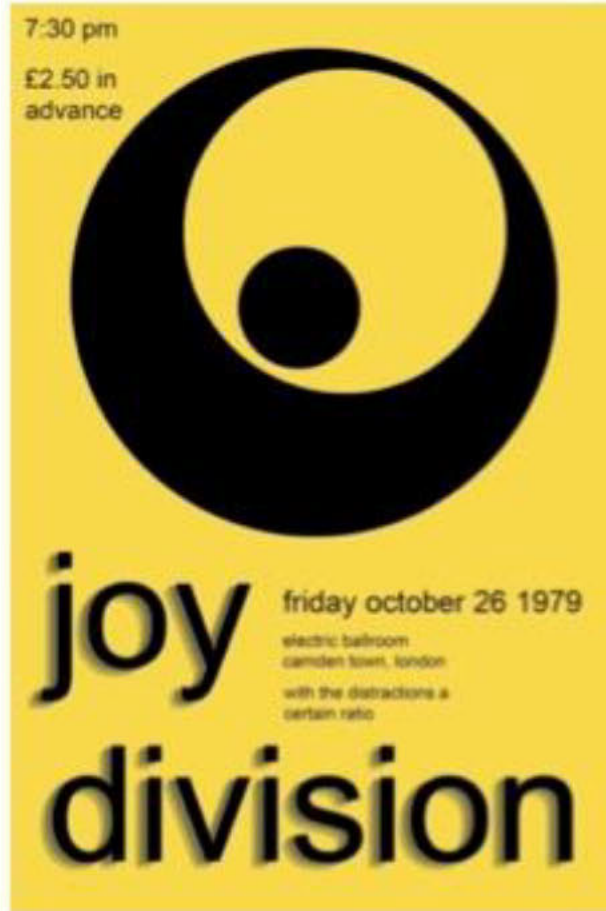
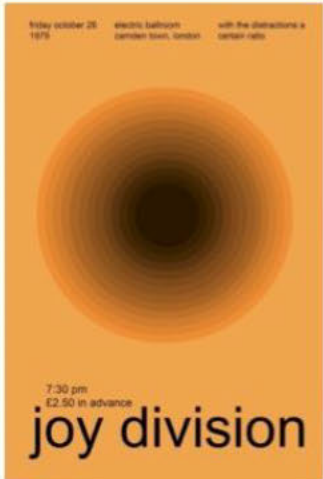
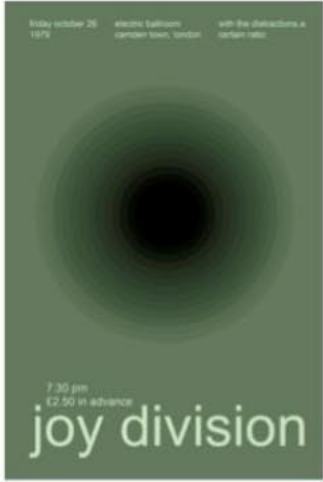
friday october 26 1979    electric ballroom camden town, london    with the distractions a certain ratio



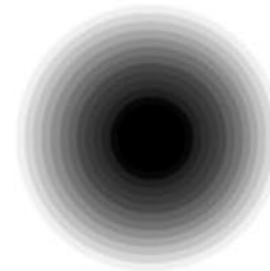
7:30 pm  
£2.50 in advance

joy division

## Final Designs



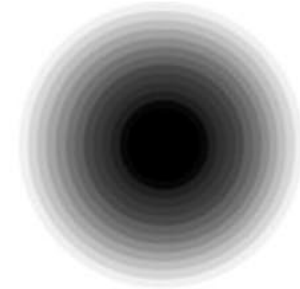
Friday October 26 1979 electric ballroom camden town, london with the distractions a certain ratio



7:30 pm  
£2.50 in advance  
joy division

## Final Outcome

Friday October 26 1979 electric ballroom camden town, london with the distractions a certain ratio



7:30 pm  
£2.50 in advance  
joy division

*For this piece I used a simple colour palette, black and white. I chose this as my final piece as it is visually interesting and uses negative space the most effectively out of the other two designs. Its a somewhat simpler design that doesn't use many shapes. I used circles to imitate a vinyl record and made the colour fade out so it blends well with the background, making the poster look 'softer'.*

Winter Olympic Stamps



63 marks, 9GC0, C1

Poster



Animated GIF





## Flaws Perfections Ideals and Compromises



### Brainstorming task

- *The flaws within the education system*
- *Make-up, disguises, masks, clothing, artificial fur, plastic surgery*
- *Flawed people that make great things*

Make-up, disguises, masks, clothing, artificial fur, plastic surgery



- How much money does the make up industry make each year?
- Can cosmetic surgery lead to death?
- How do unrealistic beauty standards affect peoples mental health?
- In 2019, the most recent year for which data is available, some 11.36 million plastic procedures were carried out around the world along with another 13.6 million non-surgical procedures.
- 40-54 year olds make up the majority of cosmetic procedures, 49% of the total in the world.

63 marks, 9GC0, C1

- Revenue in the Beauty & Personal Care market amounts to US \$15.92bn in 2023. The market is expected to grow annually by 2.17% (CAGR 2023-2027). The market's largest segment is the segment Personal Care with a market volume of US \$6.37bn in 2023.
- The survey asked members if they were aware of any BBL deaths, and from the answers estimated the mortality to be between 1/2351 and 1/6241, earning BBL notoriety as the deadliest procedure in plastic surgery.

Mood board using secondary sources







### Flawed people that make great things



- J.K. Rowling has been at the centre of transphobia accusations for many years, in a timeline that began with the 'liking' of a tweet that seemingly criticised the transgender rights movement to lengthy personal blogs on gender and feminism

- In 1993, the American pop singer Michael Jackson was accused of child sexual abuse by a 13-year-old boy, Jordan Chandler. The abuse allegedly took place at Jackson's Neverland Ranch home in Santa Barbara, California.
- Dali had a faintly perverse obsession with Hitler. While the vast majority of the Surrealist group professed far-Left political leanings, Dali kept curiously quiet during his early career, before being kicked out of the group for being a Nazi sympathiser, which he denied.

## Statement of Intent

I plan on exploring how the educational system fails to aid students in managing stress and how unhealthy behaviours such as sacrificing sleep for school are glorified. Burn-out is something many students have to struggle with but its rarely talked about. The fear of failing can become debilitating for some students, making it really hard for them to do well because of it.

Schools mostly teach through The Authority (teaching) Style. Its a questionable style of teaching as it involves little to no interactions between students and teachers. Furthermore it doesn't suit students with learning difficulties and fails to make students feel motivated to attend to lessons.

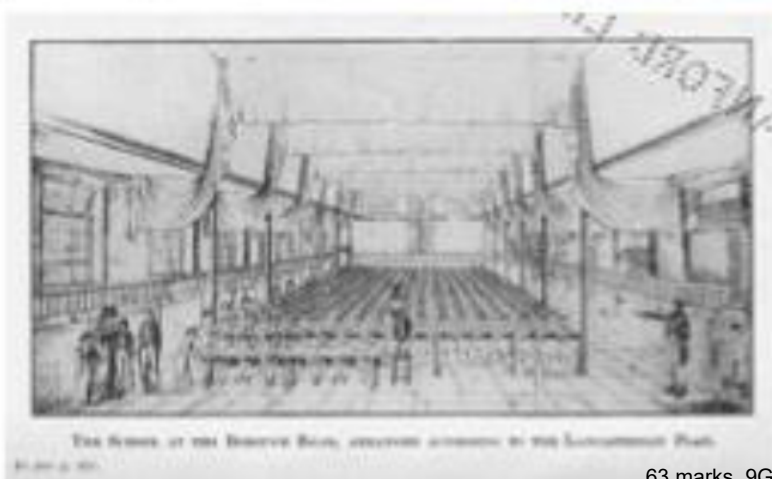
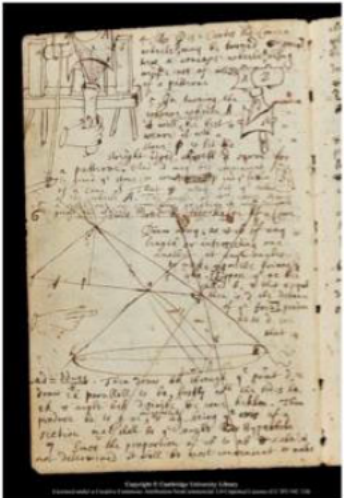
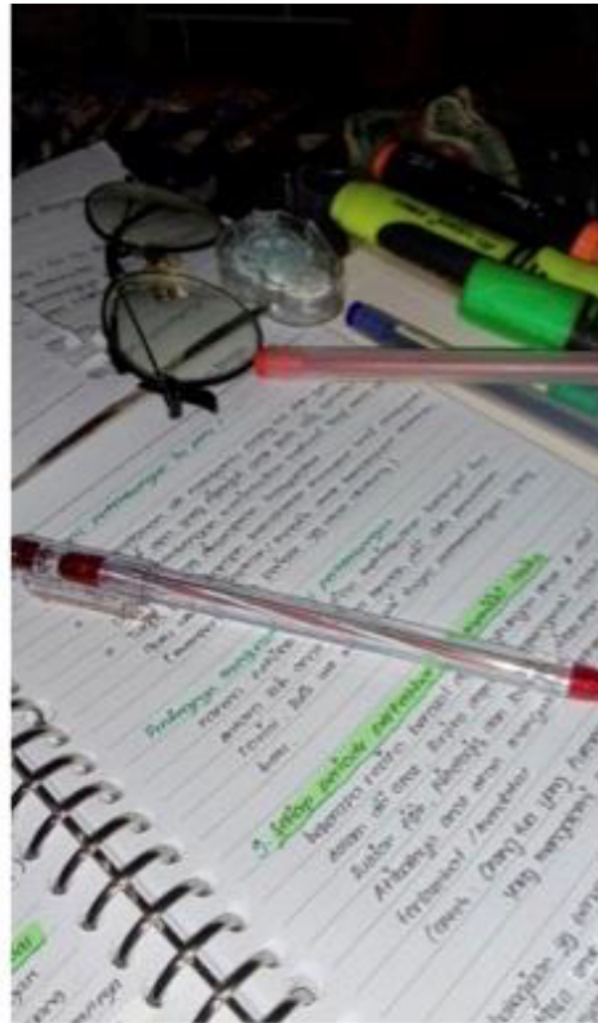
The grading system is also incredibly flawed. Its demeaning to some students and discourages them. Students are mostly graded through exams, however exams like this mostly tests the students ability to memorise and retain the information until the exam is over.

Teachers are stressed and severely under paid. Schools have gone on strike many times due to low wages, intense work load and long hours. Teachers pay has fallen by 24% since 2010 due to inflation.

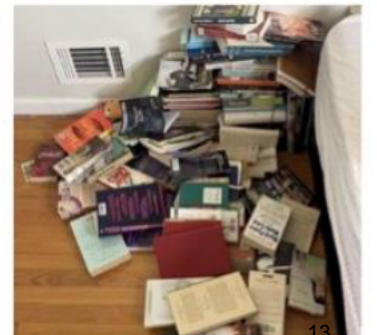
Mood board using secondary sources



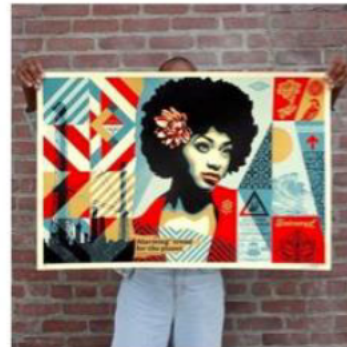




The Scheme of the Theatre Hall, architectural drawing by the Leaning Tower.



## Shepard Fairey



Shepard Fairey is a very famous Graphic artists and muralist. He was born on February 15, 1970 in Charleston, South Carolina in the United States. In 1988, the artist graduated from Idyllwild Arts Academy in Palm Springs, California. He earned his Bachelor of Fine Arts from the Rhode Island School of Design in Providence, Rhode Island in 1992. As a young adult he began to use his drawings in T-shirts and skateboards. While in school, Fairey held a part-time job in a skateboarding shop. Soon he became interested in the street art culture and graffiti movement.

I chose to look at the work of Shepard Fairey because I wanted to study an illustrator that would help me further understand the street art style. I like the way he uses bold colour palettes for three to four colours which stand out compared to the simple plain backgrounds. He also implements elements of mixed media within his work. For example, in the first image he uses a ripped up piece of newspaper. He has also used some patterns within this piece which also seems to be torn up

which. In the second piece, there seems to be paint dripping down for the corner of the. It also has an overall texture over the whole piece making it look old and worn out. This emphasises how Fairey draws inspiration from street art and graffiti movement.

Fairey uses simplified images, most often reproducing directly from a photographic source. He makes use of mixed-media, combining materials more commonly associated with 'graffiti' art such as spray paints and cut-out templates. He builds up layers within much of his work, using paper, glues, spray-paints. He makes use of templates, which are used to effectively mask areas when using spray-paint. Fairey works on many large-scale images, often utilising the ends of buildings to display his messages. Fairey advertises his work to a large audience, and he has become hugely popular in a short space of time.



Fairey's work is often political. He makes comment on world leaders, world events, and our place in society. Examples of this are his 'Hope' poster, where he showed Barack Obama in an encouraging and trusting light. He frequently uses symbols within his work, whether political or more general, to add fuel to the message. Commonly used symbols are the dove of peace; flags of countries or religious symbols; simple shapes such as arrows, designed to enforce or point out the message.

Fairey is hugely influenced by the 'skater' scene in the U.S; graffiti and casual, laid-back clothing lending to the colour schemes he is known for using. He also draws inspiration from the Russian Constructivist movement (early 20th century). Constructivism was an artistic and architectural theory that originated in Russia at the beginning of 1913 by Vladimir Tatlin. This was a rejection of the idea of autonomous art by constructing it. The movement supported art as a practice for social objectives.



## Dan Mountford

In Constructivism, the role of the artist was re-imagined, the artist "became an engineer wielding tools, instead of a painter holding a brush. For the Constructivists", artworks were part of a greater purpose, meant to raise awareness of class divisions, social inequalities, and revolution.

This shows clear links with what the style of Fairey is known for, as well as for the messages he is trying to send. He uses bold images, large typography and minimal colours frequently within his work.



Fairey is hugely influenced by the 'skater' scene, this style would appeal to the target audience of students between the ages of 14-21. Furthermore its a very recognisable style. it will also push me to use bright, limited colour palettes within my experiments.



Dan Mountford was born and raised in Milton Keynes but currently lives and works in Brighton. He studied Graphic Design at the University of Brighton. He is a freelance graphic designer and photographer. He works with a wide variety of disciplines like photography, illustrations, editorials and motion design. He is best known for his double exposure photography. He has worked commercially with notable brands and agencies such as The Economist, EMI Records, Urban Outfitters, The Barbican and The New Scientist Magazine and has held a solo exhibition in Paris.

I have decided to look at the work of Mountford as he focuses on photography, which is not something I do within my work often. I would like to learn how to implement double exposure within my work as he does. In his pieces the light tends to be posted to the middle of the photo, causing the edges to become more shadowed. These shadows add depth to the picture, making the outline of the figure in the centre (usually a person). His work tends to be in black and white. However, when he does use colour, the images seem to be quite desaturated.

Dan Mountford creates his images using digital SLR's, which has a double exposure mode, allowing the layering of two images in camera. In Mountford's photographs, he uses the analogue method to lay one image over another to create a blend of the two in a singular image. Surprisingly, he doesn't use any Photoshop to make these images. He uses a basic coloured background to make the outline clearer and sharper, keeping the image aesthetically pleasing and clean. He uses the same tone in each photograph so that the images don't contrast too much and they blend together better.

Mountford describes his own work as "a visual journey through our minds by calm and tidy means which the reality of everyday life does not show". This seems to imply that he comments on our mental state, whether is chaotic or relaxed. Regardless of which one of the two he is depicting, his work feels calm and comforting.

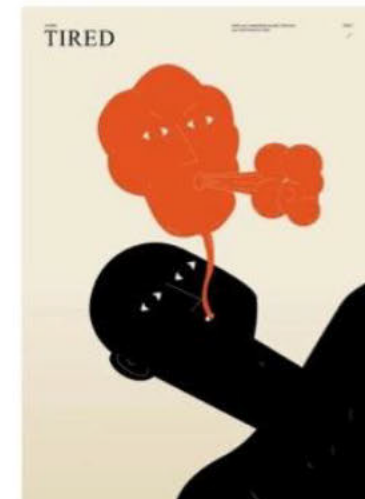
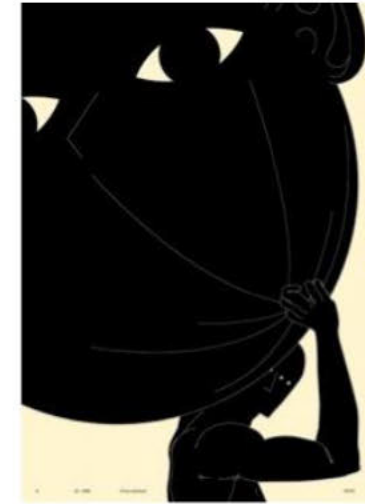
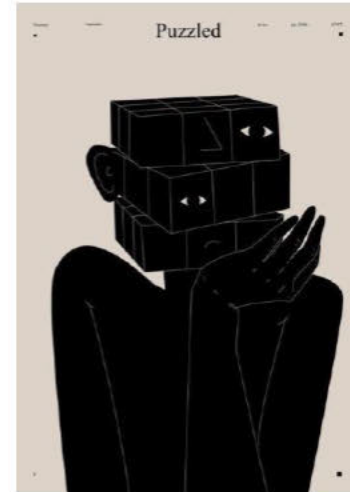
Mountford was inspired by double exposure photography. A double exposure is a combination of two images in one. One image is layered on top of another for a unique effect. In 1860s William H. Mumler pioneered what he referred to as spirit photography. He would use a previously exposed negative while taking a portrait, and the resulting photo would appear to have a spirit in it. To capture these now-vintage images, photographers would snap a picture of the subject in one position. Then, they'd have to move into another pose before the following photo was taken.



Rokas Aleliunas



Mountford's as I focus on how the current education system leads many students to experience some amount of stress. Mountford's description of his own work is fitting to the aim of my project and it will push me to create simpler experiments.







Rokas Aleiunas' work mostly focuses on creativity however he makes many pieces that focus on mood such as being burnt out or overwhelmed. These are things that I want to also explore within my work as well as pushing me to include more figures into my experiments.

## Client Brief



## Prince's Trust

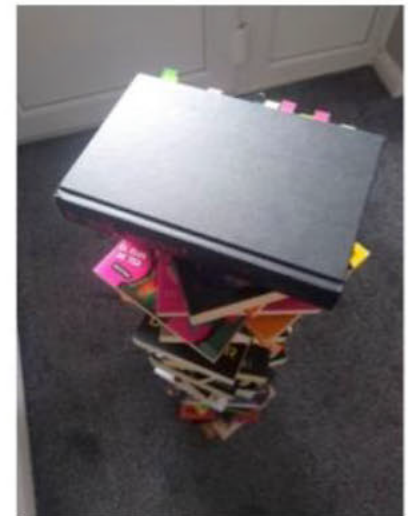
The Prince's Trust is a charity in the United Kingdom founded in 1976 by King Charles III to help vulnerable young people get their lives on track. It supports 11-to-30-year-olds who are unemployed or struggling at school and at risk of exclusion.

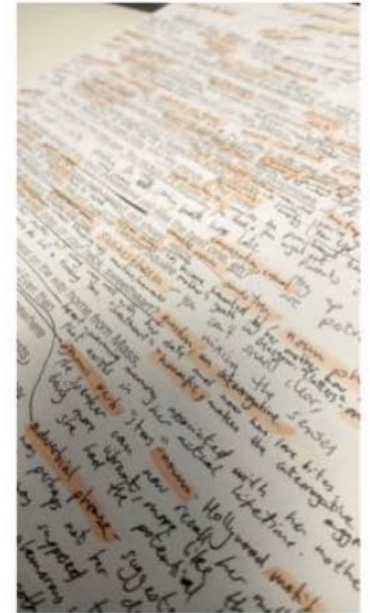
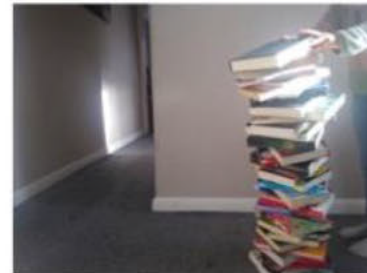
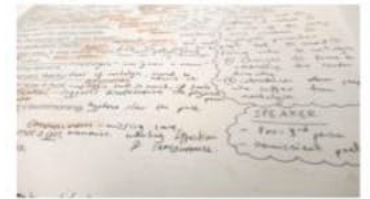
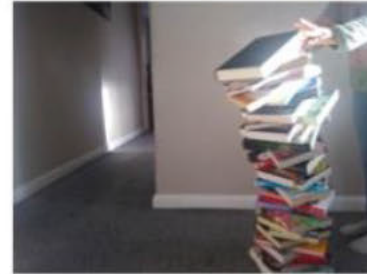
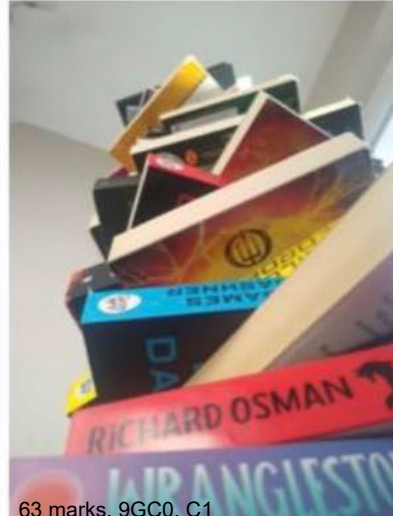
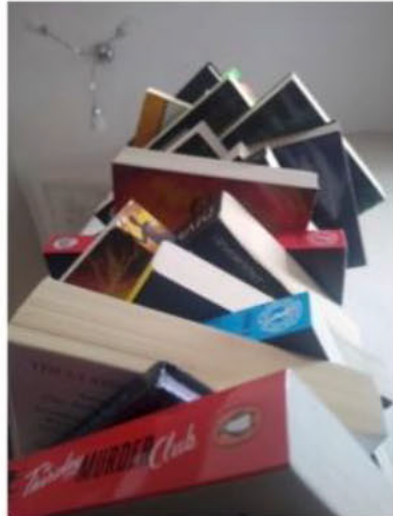
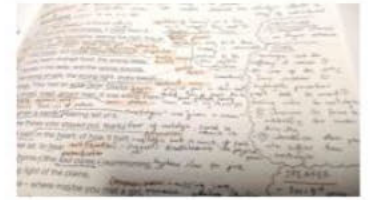
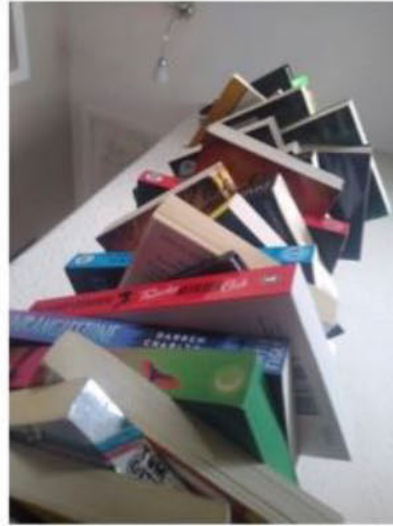
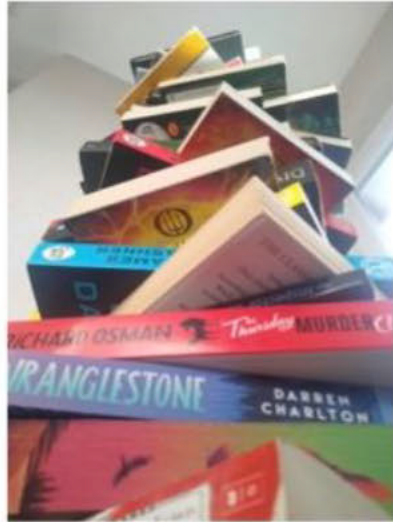
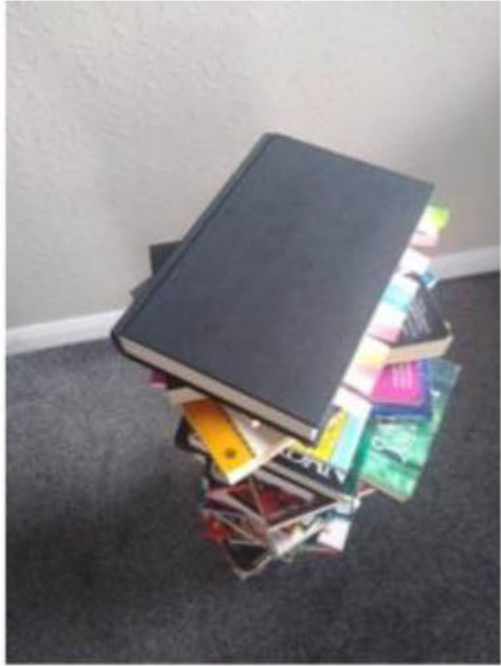
The Prince's Trust is holding an event where they will be activities for students between the ages of 14-21 to take part in. These activities and workshops will cover things such as:

- Dealing with exam stress
- Importance of self care
- Keeping thing in perspective
- Dealing with disappointing exam results

The Prince's Trust wants you to create a poster promoting this event. It will be happening in railway arches in Waterloo, Southwark on the 3rd July 2023. There is limited capacity of people allowed in at a time so tickets would need to be booked on their website , <https://www.princes-trust.org.uk/>.

## Primary sources





63 marks, 9GC0, C1



**Module 2: Section 2: Transport in Plants**

**Page 14.37: Transport in Plants**

1. *0/1 mark*

2. *1/1 mark*

Water travels in the xylem pathway from the roots through the stem to the leaves. Water travels in the phloem pathway from the leaves through the stem to the roots.

3. *2/2 mark*

Answer: (a) *transpiration* (b) *transpiration* (c) *transpiration* (d) *transpiration*

4. (a) *Water on the leaves would reduce the water potential gradient between inside the leaf and outside // mark.*

(b) *E.g. cut the shoot underwater - not the appearance of cutwater // mark.*

(c) *E.g. It is a transpiration of the rate of water uptake cells, of a water loss from the leaves // mark. This is because transpiration is higher // mark.*

(d) *At higher temperatures, water molecules have more kinetic energy so they evaporate more quickly from the cells inside the leaf // mark. This increases the water potential gradient between the inside and outside of the leaf // mark, so water diffuses out of the leaf faster and the rate of transpiration is faster // mark.*

5. (a) *Light intensity is higher at 12:00, so more stomata are open // mark, which increases the transpiration rate // mark. This draws water molecules up the xylem at a quicker rate, due to cohesion and tension // mark.*

(b) *At 12:00, it would be dark, whereas there is sunlight at 12:00.*

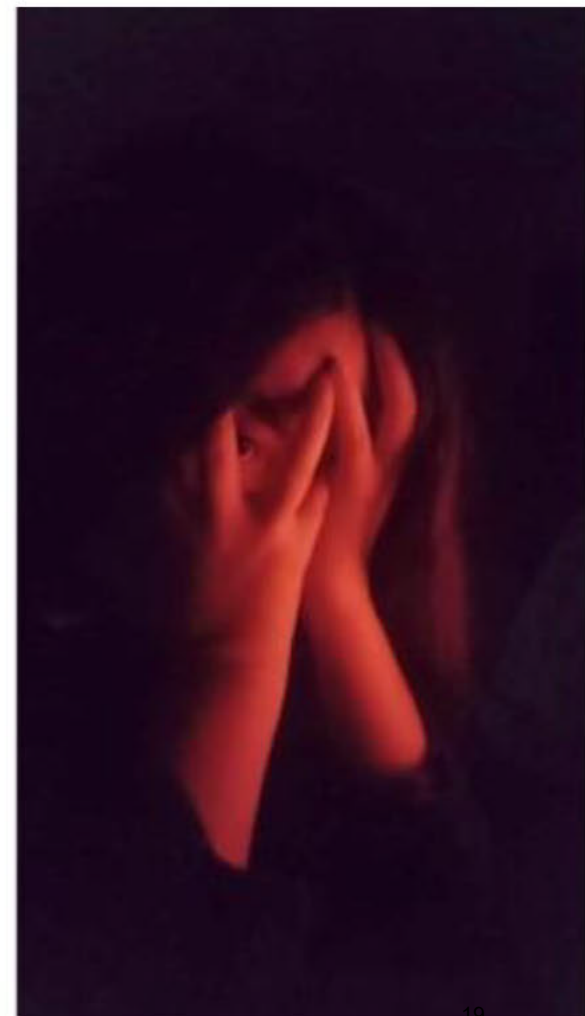
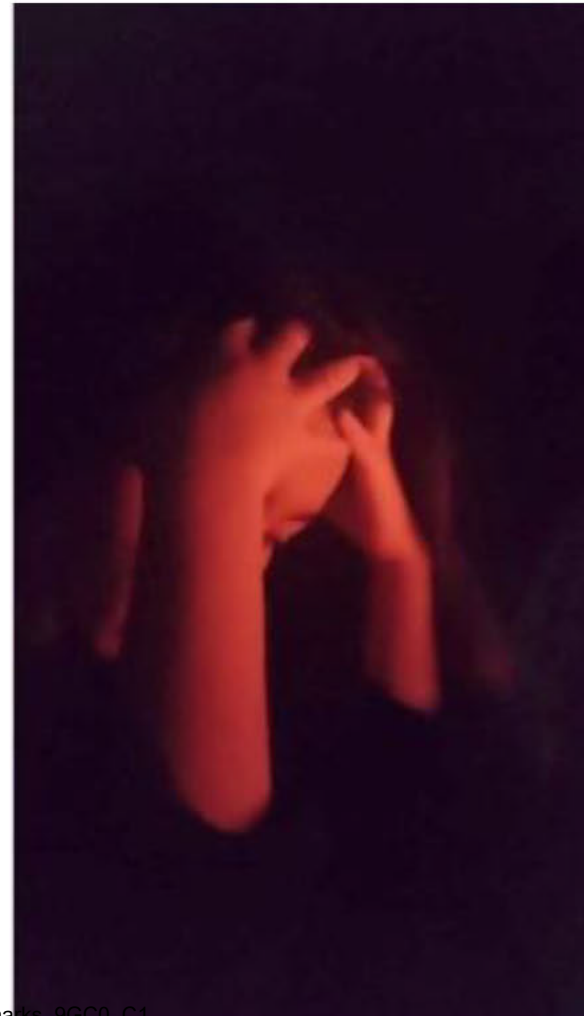
(c) *To prevent the plant tissue from drying out // mark.*

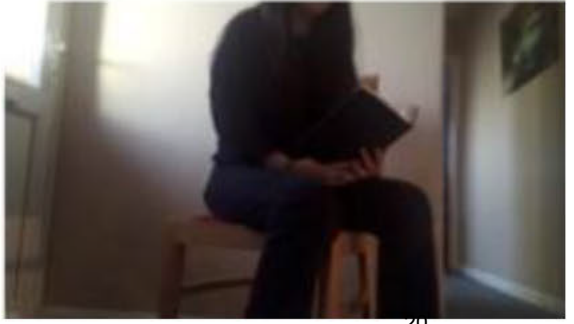
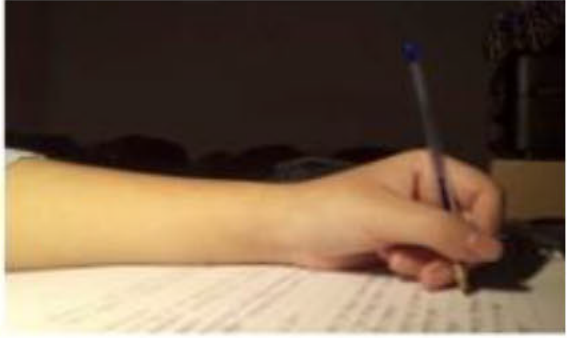
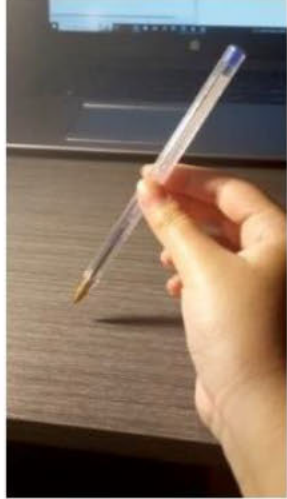
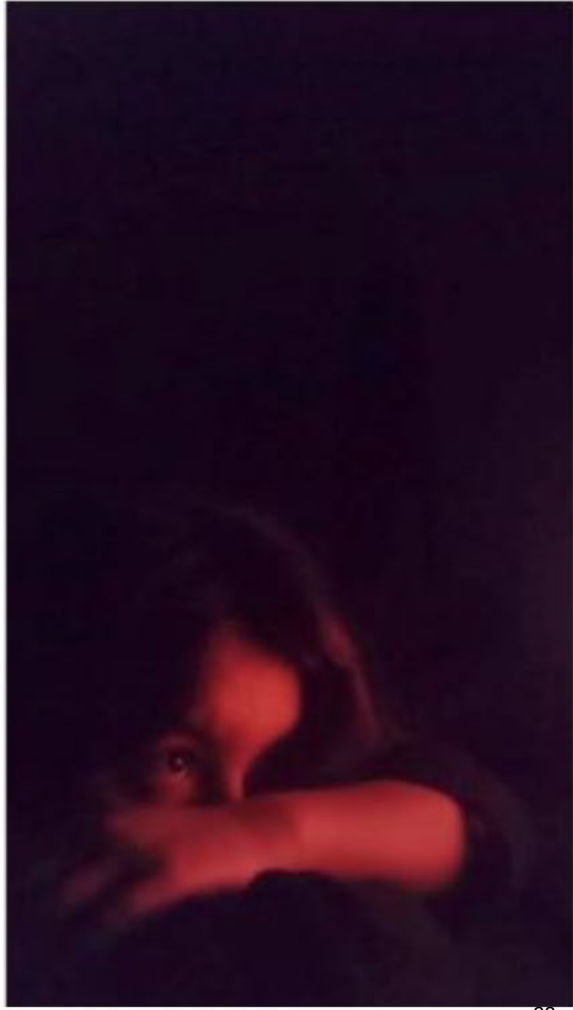
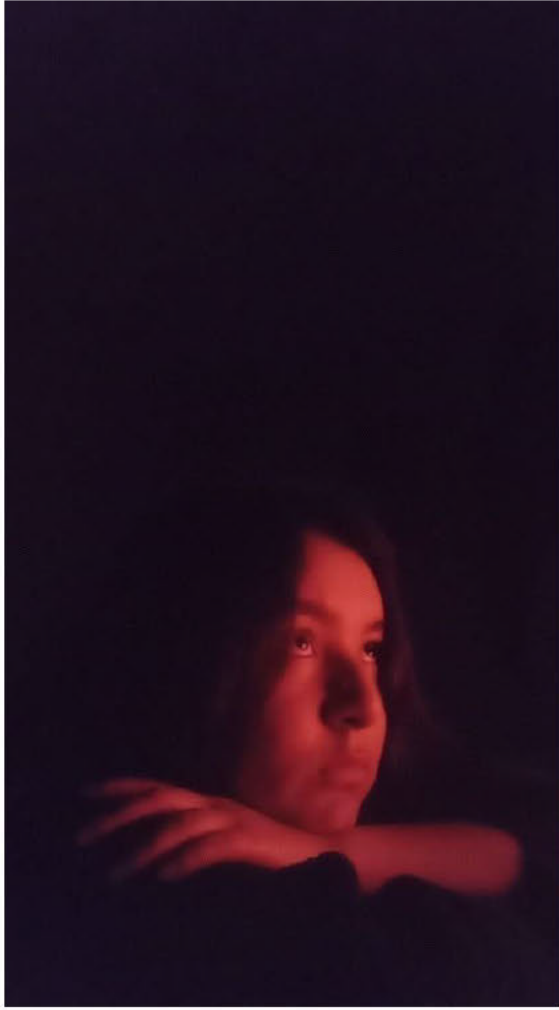
(d) *E.g. dyeing the tissue with a stain/dyed stain // mark.*

(e) *E.g. in a root, the xylem is arranged in the centre, whereas in a stem, the xylem is near the outside. In a root, the xylem is grouped together in a cross shape, whereas in a stem, it is arranged in individual bundles that form a ring around the stem. // mark.*

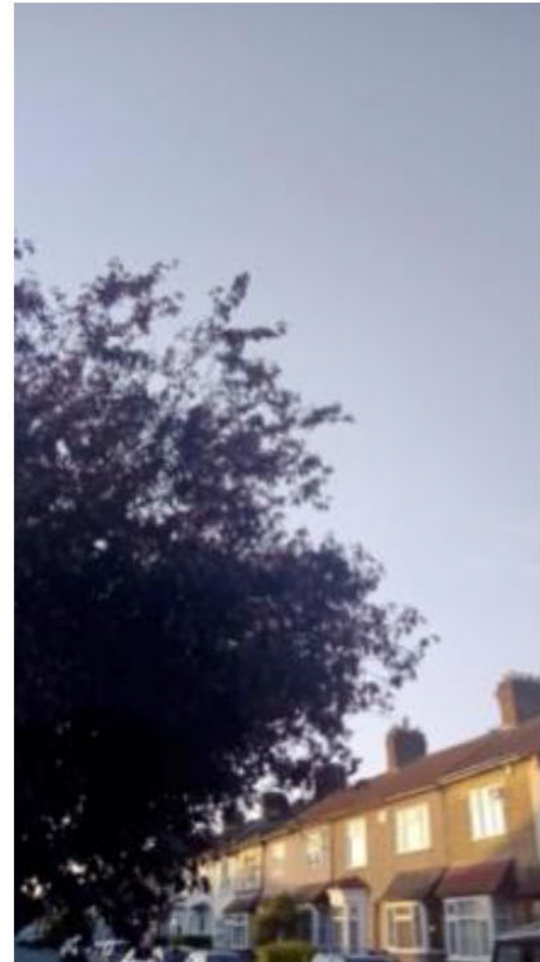
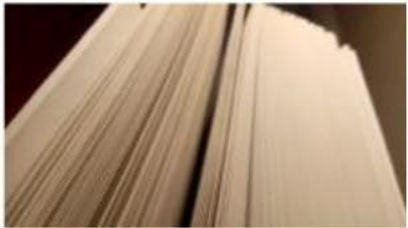
6. *Translocation requires energy/ATP // mark. If metabolism stops, respiration cannot occur so ATP is not produced / energy is not released // mark.*

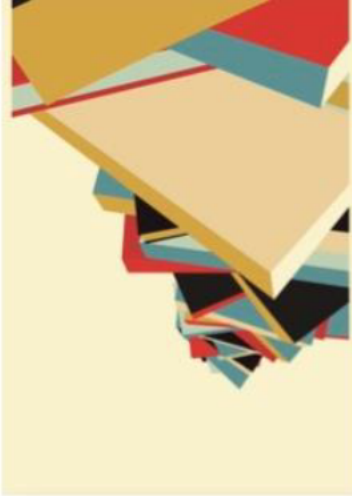
7. *E.g. at point A, the water potential is being lowered by solutes being actively loaded from the companion cell into the sieve tube // mark. This causes water to enter from the xylem and companion cell, and raises the pressure // mark. At point B, the pressure is lower because water is leaving the sieve tube by osmosis // mark. This is occurring because solutes are being removed from the sieve tube and so the water potential is higher // mark.*









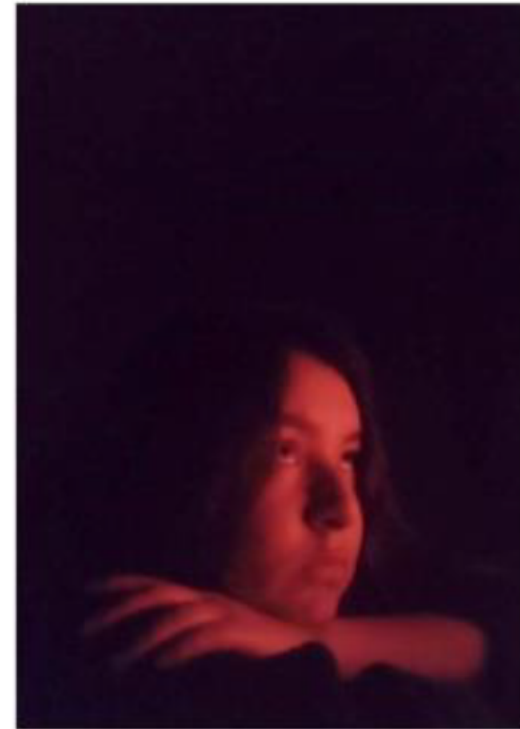


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*In this piece I started experimenting with limited colour pallets used with in Shepard Fairey's work. I worked on creating a clean illustration with Illustrator. Fairey uses textures within his work so I decided to also include this in my experiment. I took down the opacity of these textures it wouldn't draw attention away from the the illustration.*

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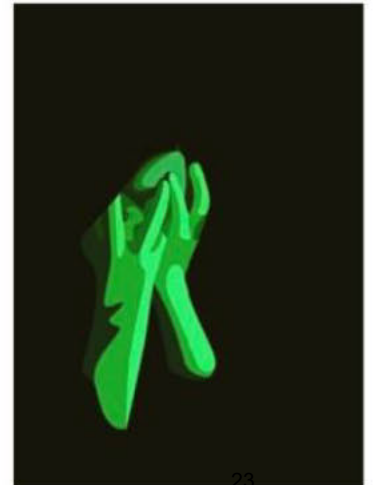
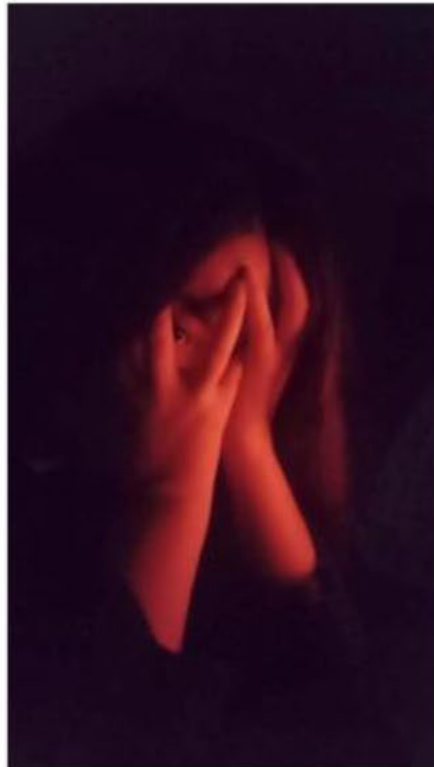
#### Experiment 2





*In this piece I started working with double exposure. Since this is a quite dark image I didn't want to cover up the areas that were light up so I took down the opacity and matched the colour to the lighting to make it "blend in". I think this experiment would have been more successful if there was a clearer figure.*

### Experiment 3

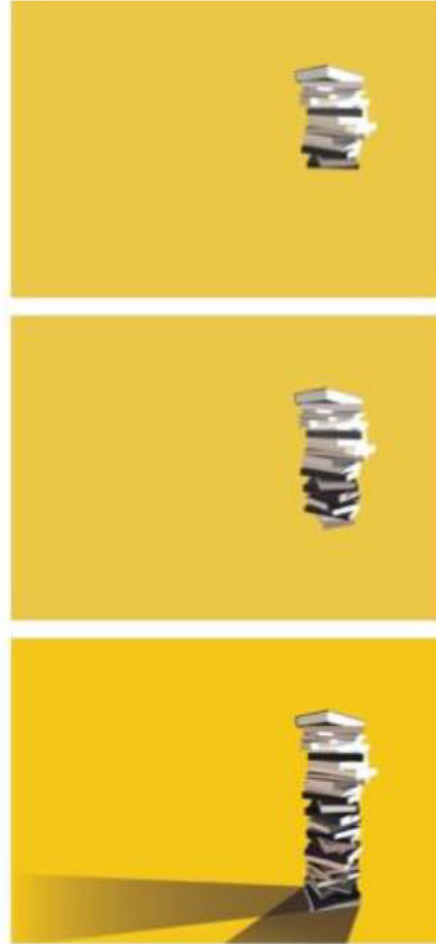
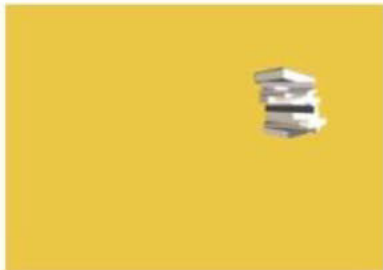






*In this experiment I further explore the style of Shepard Fairey. I used a limited colour palette and focused on a figure, which Fairey does regularly within his own work. I used illustrator to create a sharp image*

Experiment 4



*In this Piece I wanted to experiment with negative space to contrast with Fairey as his work tends to be quite detailed with many patterns and textures within one piece*

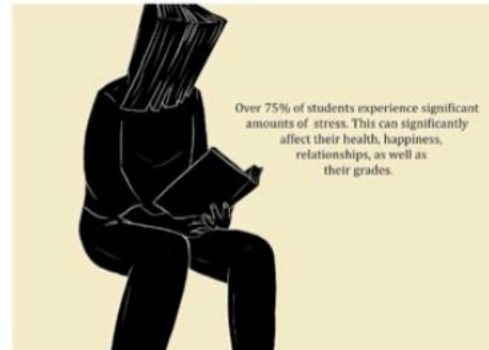
63 marks, 9GC0, C1

Experiment 5





Experiment 6



Experiment 7



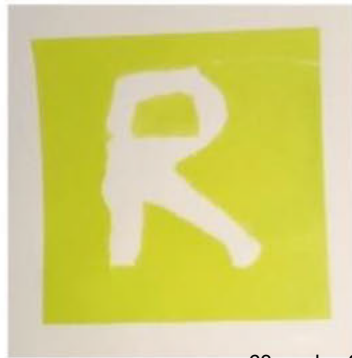
*In this experiment I started working in the style of Rokas Aleliunas. I used a limited colour pallet and drew the figure with a tablet instead of using illustrator to give it a more hand drawn look. I also placed the typography in similar places Aleliunas does within his own work*



*I did some more double exposure and this piece was more successful as there was a clear figure. I used a more interesting texture than I did for my previous experiment where I worked in the style of Dan Mountford and the style of this piece is closer to his style.*

Practical experiments

SCHOOL



STRESS

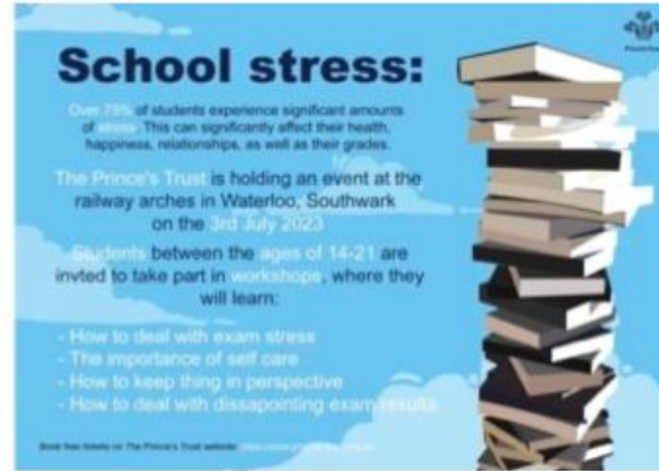
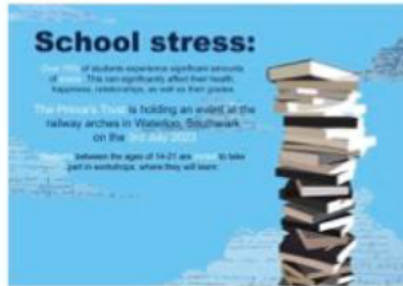
STRESS

STRESS

Poster 1





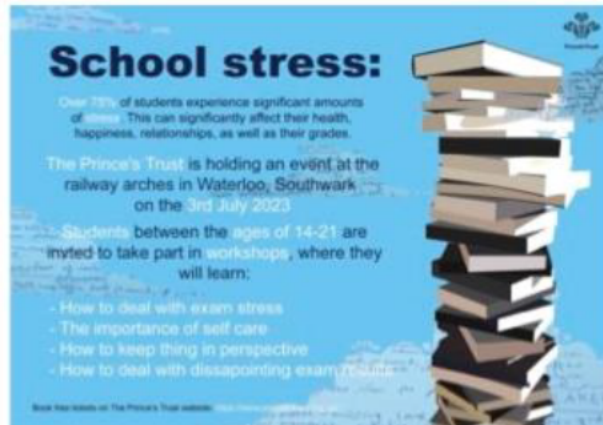


Poster 2



Mock up (done outside of exam time)

Finished piece



63 marks, 9GC0, C1





### School stress:

Over 75% of students experience significant amounts of stress. This can significantly affect their health, happiness, relationships, as well as their grades.

The Prince's Trust is holding an event at the railway arches in Waterloo, Southwark on the 3rd July 2023

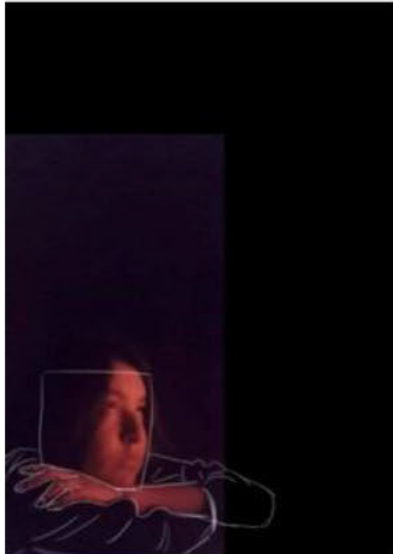
Students between the ages of 14-21 are invited to take part in workshops, where they will learn:

- How to deal with exam stress
- The importance of self care
- How to keep things in perspective
- How to deal with disappointing exam results



Prince's Trust

Book now online on The Prince's Trust website [www.princes-trust.org.uk](http://www.princes-trust.org.uk)



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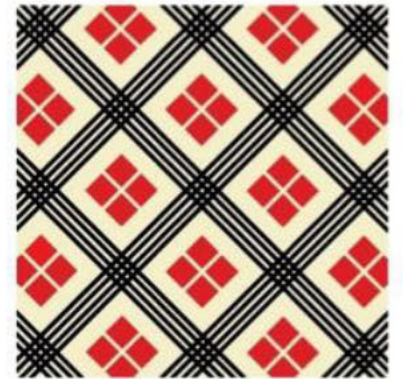
Prince's Trust



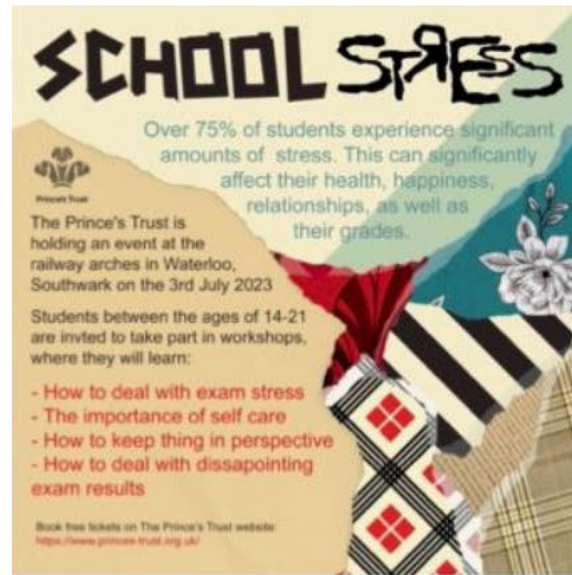
Alternate Final Piece (done outside of exam)



I - Colour Palette

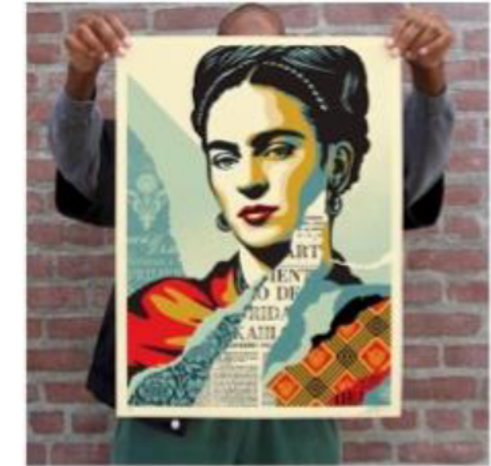






Mock up





2 - Shepard Fairey.

Mock up



Final evaluation

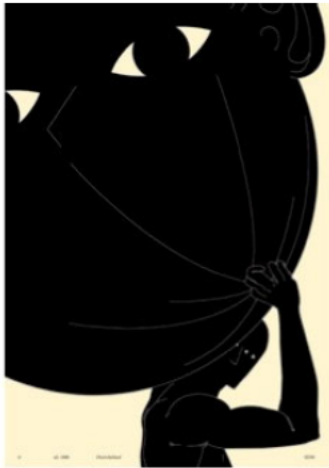
In the beginning of the project my teachers introduced me to the theme of "Flaws, Imperfections, Ideals and Compromises". I wanted to specifically focus on the idea of flaws within people or systems. I started researching some subjects that interested me. I looked at the make-up industry and how it exploited and profited from the present, unrealistic beauty standards. I also looked at problematic celebrities and artists who have made great impact and found great success despite these flaws. However, as much as I can relate to these topics and have strong opinions on both, they didn't feel personal enough for me to do a project I truly enjoyed. I decided to work on something that affected me more directly, it being the flaws with in the education system. At first, I wanted to explore how these flaws affected teachers and students, but I wanted to something more relatable to me, so I ultimately decided to focus on the impact the system has on students.

I studied two main artists for this project, the first being Shepard Fairey. His art mainly comments on world leaders, world events, and our place in society. Fairey is hugely influenced by the 'skater' scene in the U.S; graffiti and casual, laid-back clothing lending to the colour schemes he is known for using. I thought this style would appeal to the target audience of students between the ages of 14-21. The second artist I studied was Dan Mountford. Mountford describes his own work as "a visual journey through our minds". This relates to my topic as I focus on how the current education system leads many students to experience some amount of stress. I also briefly looked at Rokas Aleiunas. His work focuses on creativity however he makes many pieces that focus on mood such as being burnt out or overwhelmed. These are things that relate to my topic.



3 - Dan Mountford





4 - Rokas Aleiunas

I took a range of photos to use as primary sources for my experiments. I took a picture of a tall book stack and experimented with the angle and negative space. I took pictures of annotations and text as well as some patterns from clothing. I took pictures of these textures as Shepard Fairey uses many textures within his work and I wanted to experiment with this. Took pictures of figures and experimented with lighting. The focus point within the work of Dan Mountford and Rokas Aleiunas are figures so it was necessary for me to include this.

In my experiments, I explored the artists styles and used similar, limited colour pallets. I used my primary sources and traced over them on illustrator to create sharp and clean images. This process was complicated and time consuming. It required me to learn a few new skills to make this process a little easier. I also experimented with double exposure, but I did not feel like I did enough experiments for this, in turn, this feature not caring on to my final outcomes as strongly as it could have. I did a couple of experiments imitating Aleiunas' style, using limited colour pallets, and focusing on figure. I did some practical work and made some unique lettering. I carried this on into photoshop to give a cleaner look and overlay some interesting patterns.

I created three final outcomes. The first used the skills I learnt from working in the style of Fairey, using illustrator to create a clean sharp image with a limited colour palette. However, I think I should have added, more texture to make this piece more visually interesting, which I did for my alternative outcome. In my second outcome I imitated the style of Rokas to create an "abstract" figure. I also used some double exposure to add some more interesting texture to the figure. In my alternative outcome I leaned in more heavily on the Fairey style. I used many textures and incorporated a figure within this piece as the main focus point.

If I had more time with this project, I would spend more time taking pictures of figures to experiment with. The artists I studied made pieces with figures in them continuously. I would also like to experiment more with double exposure to further develop my skills and get a better understanding on how to include this into my final pieces. I would also like to study the work of Sigmar Polke. His work consists of layering many images. I like how it includes traditional art aspects. If I had more time, I would also like to do final outcome that had double exposure as its focus point.

## Final Essay

### How has the development of science influenced illustration?

Art and illustration have always been a form of communicating the reality or perceived reality of present culture, social and political issues. All these things have a significant impact on artist's chosen subject matter. In this essay I will be exploring how science has impacted this, and how the development of science has changed how and why scientific illustration is being used for science or to influence the public perception of science and medicine. In the 4th century, botanical illustrations started playing a big part in classifying plants, it's around this time that healers realised that medicine had no future without a proper body of knowledge about the medicinal properties of plants. The first known visual depictions of plants were often used to decorate the walls of tombs or temples as well as vases and wine vessels, but these were highly stylised. The romans would also use semi realistic depictions of flowers, herbs and trees to decorate coins, ceramics, and armour. The earliest instance of botanical art was in 1600 BC where the flowers were recognisable, and several manuscripts from the 1st century BC mentioned Krates, a Greek physician, who drew flowers and plants for scientific purposes. Botanical art and scientific illustration as a whole is used to communicate complex concepts and subjects in an engaging and easily comprehensible way. The first artists I will be looking at is Maria Sibylla Merian botanical artist, Erns Haeckel, a zoologist drawing inspiration from the theory of evolution, David Goodsell, professor of computational biology at the Scripps Research Institute. Merian was a botanical artist, respected scholar of the natural sciences and successful businesswoman who stepped away from the classic scientific illustration style and depicted her subject matter in a more naturalistic form. Second artist I chose is Erns Haeckel. He was a zoologist studying marine invertebrates. His research led to him creating classic scientific illustrations. He was also inspired by Darwin's Theory of evolution. The theory of evolution suggests that animals evolve due to natural selection. Those organisms that have the characteristics that will increase their chances of survival will go on to pass those characteristics to their offspring. Those who do not have the necessary adaptations to survive will die off. The last artist I have chosen to discuss is David Goodsell. Goodsell is a professor of computational biology at the Scripps Research Institute. He creates watercolour pieces of cells under a microscope, and he attempts to make sure that these images are proportionally accurate so all the molecules making up these cells are visible. All these artists have some relevant scientific background which influences their illustrations. All these artists are from separate times, and I wanted to explore how these differences in time have changed the way they depict their subject matter. All three artists use water colours to create detailed scientific illustrations which are fairly accurate to real life. Merian and Haeckel have similar styles and subject matter, however, in Merian's work, there is more energy and movement than is Haeckel's work.

Erns Haeckel



Erns Haeckel was born on February 16, 1834, and died on August 9, 1919. From his childhood, Haeckel showed great interest in botany and naturalism. He studied medicine in Berlin Wulzburg, later he became a professor of zoology for more than 40 years. He studied marine invertebrates and made colour drawings of these specimens, creating classic works of scientific illustration. He sent two volumes of his own Radiolarian illustrations to Charles Darwin which led to a relationship of mutual admiration between the two naturalists. He published *Morphology of Organisms* in 1866, this is considered his greatest work.

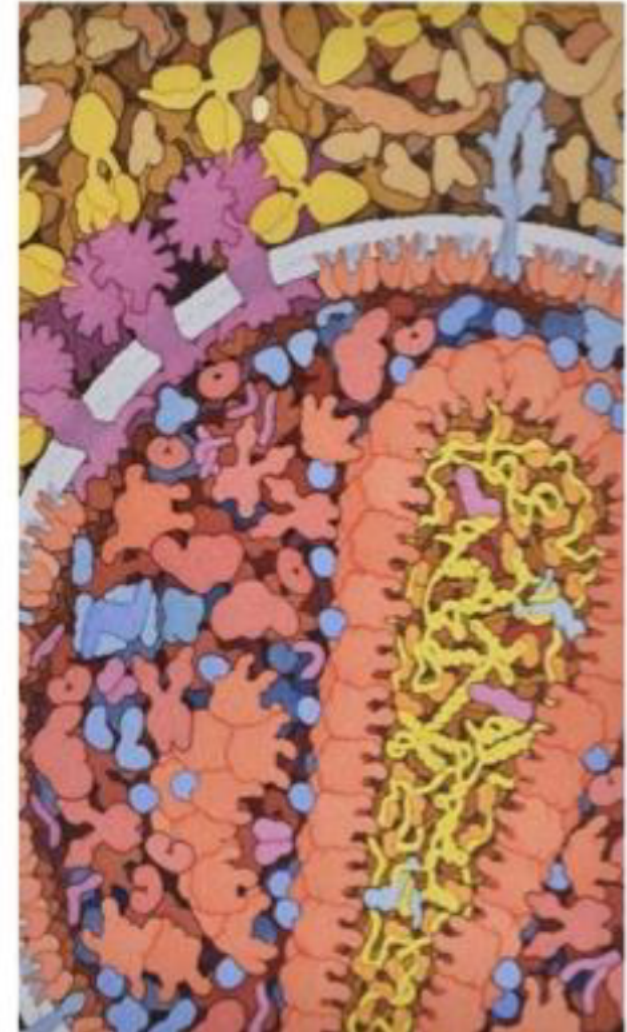
These pieces were done between the years 1899 and 1904. In this piece I can see specimens of plants and animals on a plain black or white background. This image does not feel empty or crowded. There is a good balance between the subject matter and negative space. Even though the subject matter has a large amount of detail, the negative space separates each plant/animal. Haeckel uses varied colour palettes. In some of his pieces, there is a wide range of colour and in others he has a monochromatic palette. There is a constant use of organic shapes and soft curves within his work, there is a lack of geometric shapes which further enhances this depiction of natural forms. There is an effective use of tone to emphasise light and shadow within his pieces, stopping his illustrations from looking flat. All his art was influenced by his work as a professor of zoology. At the same time, Darwinism and the theory of evolution was gaining popularity and Haeckel was an avid supporter of this theory. He used pencil and watercolour to create these detailed illustrations of organisms and specimens he collected. These are scientific illustrations, so they must be fully accurate to real life. The details in these pieces are accurate to real life. However, Haeckel was criticised for the freedom he took with the details of his art, to the point that he was accused of fraud, changing these details to support his theories. Haeckel inspired other artists such as Dutch architect Hendrik Petrus Berlage and French designer René Lalique.

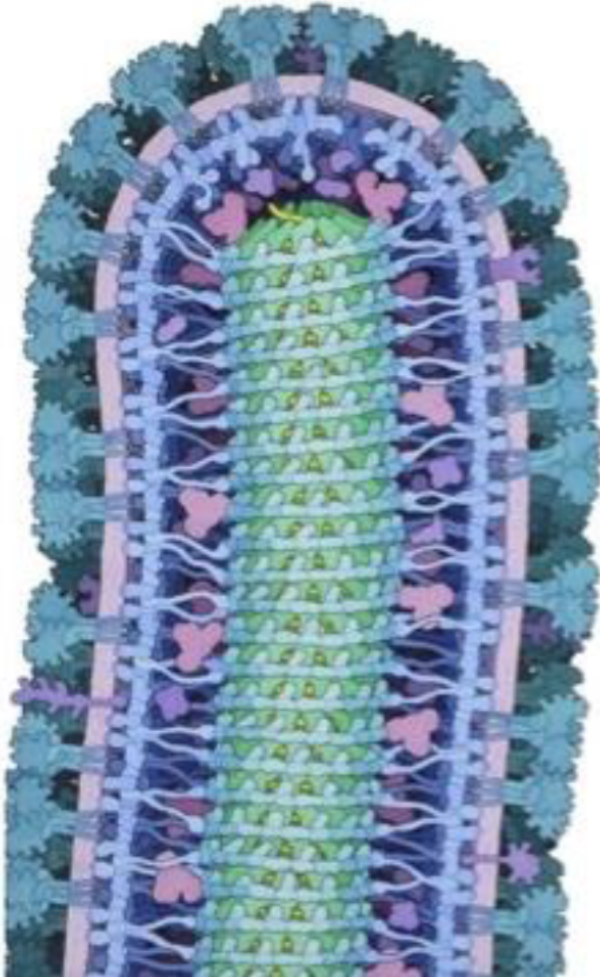




Erns Haeckel was not only influenced by Darwinism and the theory of evolution, but he was also influenced by Art Nouveau. This art style flourished between the 1890s and 1910s though out Europe. It is characterised by long flowing lines, organic shapes, undulating asymmetrical lines most used in interior design, jewellery, posters and illustration depicting flowers and plants. These influences are seen clearly in Haeckel's work though his line work and use of organic shapes. Art Nouveau was used for aesthetic purposes rather than informative illustrations, contrasting with the style of Erns Haeckel.

David Goodsell





David Goodsell, an American molecular biologist born on October 25th, 1961, discovered his passion for painting early in his childhood under the guidance of his grandfather. Despite not pursuing formal art education at the university level, he holds a Bachelor of Science in chemistry and biology, followed by a Doctor of Philosophy in biochemistry. Since completing his PhD, he has investigated symmetry in proteins and molecular structures, as well as computer aided drug design, his main research focus being HIV drug resistance and structure-function dynamics of bacteria. In graduate school, Goodsell became interested in scientific illustration while working on a program to visualise DNA.

In these pieces Goodsell provides viewers with a cross-section view of cells, or otherwise referred to as "cell landscapes". These pieces contain an intricate amount of detail and a limited use of negative space, the whole canvas is taken up by shapes and vibrant colours. What distinguishes Goodsell's approach is his dual method of creating these pieces. When depicting individual proteins, he uses a computer to generate an image that is cell shaded. However, when depicting cell interiors, he turns to the traditional medium of watercolours, imbuing his creations with a sense of simplicity that offers clarity without overwhelming detail. Even through, this art work is highly stylised, Goodsell makes sure that these pieces represent what cell interiors look like in real life, all his work is printed out at a consistent 1000000x magnification. Organic shapes and gentle curves dominate his compositions. There are no geometric shapes or sharp angles. He also uses vibrant colour palettes and coloured outlines, and there is clear use of colour theory. Harmonious and contrasting colours are usually

63 marks, 9GC0, C1

placed next to each other. Furthermore, the colours he uses aren't overly saturated. His work looks very flat and little use of complex shading.



Goodsell's style of illustration, leans into scientific illustration which is usually confused with hyper-realism. However, these two styles are not the same as there is no room for subjectivity; it must serve the purpose of communicating scientific fact, that is why its most important feature is its accuracy and objectivity. Different subjects like plants and animals compared to bacteria and viruses, require different tools and techniques to depict them accurately. Pencils, watercolours, and inks can be used when depicting bigger organisms, however digital software has recently been transformed scientific illustration, adding a new level of representation and special effects that were not possible before. Goodsell has shown to use both techniques when working. However, he does not completely follow this style of illustration as the colours he uses are not completely exact to real life. He also simplifies a lot of the forms in his work so there is not an overwhelming amount of detail.

The evolution of scientific knowledge has profoundly influenced the field illustration, and this is shown by the contrasting approaches of Ernst Haeckel and David Goodsell when it comes to scientific illustration. Both artists use the traditional medium of watercolour to produce pieces depicting natural forms, but their method and composition differs vastly. Haeckel has a more traditional approach of scientific illustration by incorporating negative space and allowing each individual element "room to breathe" and it allows them to stand out. However, Goodsell fills the entire composition with shapes and vibrant colours that deviate from realistic colouration of cell interiors. This departure from traditional methods suggests a shift influenced by the development of new scientific understanding and technologies which are incorporated into Goodsell's workflow. The contrast in style may be due to the development of the microscope, where Goodsell had the opportunity to focus and create artworks of molecular structures that Haeckel didn't have. Additionally, Haeckel was rumoured to be manipulating details in his illustrations so it would support theories pushed by Darwin, which highlights the complex relationship between scientific development and scientific illustration. These contrasting approaches exemplify how the development of science has not only influenced the techniques but also the intentions and interpretations within scientific illustration. As science evolves, artists adapt their methods to reflect new understandings, creating a dynamic interplay between scientific accuracy and artistic creativity in illustration.





Merian was born April 2nd, 1647, in Frankfurt into a family of engravers and topographical artists. They gained international fame through their lavishly illustrated books on voyages. Her father died when she was three years of age, but the business continued to flourish under her half-brother, an artist who specialised in portraits. This background of art and business, contributed to her ambitions. She was obsessed with the origins and development of insects from an early age; first-hand knowledge of this subject was an important foundation for the later development of entomology (study of insects). Later in life she went on to marry a flower painter and had two daughters. Her work was admired by natural scientists including the founder of the British museum, Sir Hans Sloane who acquired two large volumes of her drawings for the collection. She went on to publish three volumes of a pattern book containing flower engravings. Poor health towards the end of her life culminated in a stroke in 1715.

In this artwork I can see many natural forms, insects, flowering plants, and fruits on a blank background. These elements are interacting with each other sometimes. There is some strange placement of elements in these pieces. All elements interact with each other, like an insect climbing a plant or spiders sitting on a web, creating a busy scene with many events happening at once. These pieces are quite visually crowded as many things are happening at once and there is an extraordinary amount of detail placed on each element of this painting. However, the white background allows these details to stand out without being overwhelming to the viewer. Merian worked in the studio from spontaneous sketches, which then she turned into detailed compositions in bright watercolours on large sheets of vellum. Her popularity was based on her innovative depiction of insects in naturalistic contexts rather than a diagrammatic style, which was the prevailing fashion at the time. This has led to her work having energy and flow to it. Whereas other scientific illustration may be very static her work has more life in it and an ongoing story. It depicts animal behaviours like spiders building a web or hunting, frogs carrying tadpoles on their back, insects eating fruit and other plants. Her work is not completely realistic as the proportions of some animals is not completely right and some colours are slightly brighter than they would be in real life. However, there is a great attention

to detail and texture throughout her work. Because Merian was born into a family of illustrators and went on to marry a flower painter, there is a significant impact on her style when it comes to subject matter.



Merian was deeply influenced by the work of Jacob Marrel. Marrel's work tended to focus on still life of flowering plants and herbs, and he tends to include insects within his pieces as well, which clearly carried on into Merian's own work. Marrel also uses vibrant colour palettes and variety of tones to enhance the depth of the piece.

The development of science has profoundly influenced illustration, as evidenced by the distinct styles of Ernst Haeckel and Maria Sibylla Meria. Both artists use watercolours to depict different species of plants and animals, and they use classic scientific illustration techniques by making use of negative space, curved lines and organic shapes to depict organic subject matter. However, they slightly differ in style, Ernst uses more vibrant colour palettes and creates more sterile and diagrammatic composition, while Merian's work depicts natural scenes, where individual elements interact with their environment. There is also a great contrast with Maria Sibylla Merian and David

Goodsell's work. Both artists utilize water colours and employ organic shapes with smooth, curving lines. However, their subject matter and approaches differ greatly, Goodsell focuses on depicting intricate cell interiors, while Meria shows animals and plants within a naturalistic setting and co existing. Goodsell's work is characterised by its flatness, it lacks complex shading, and tends to fill the entire page, further pushing this idea of complexity and scientific precision. On the other hand, Merian's work, even is flattened by the absence of backgrounds, contains far more depth than Goodsell's work. In addition, while Goodsell uses computer programs to create his illustration, and Merian predates such technology, which further emphasises the evolving relationship between science and illustration.

### Conclusions

In conclusion, the evolution of science has left an indelible mark on the realm of illustration, shaping its styles, techniques, and purposes over time. From the early and loose depictions, shown by the works of Maria Sibylla Merian, to the attention to detail required for advancing scientific understanding, illustrated by Ernst Haeckel, and the use of new blossoming technology in the creative process like Goodsell, the relationship between science and illustration has undergone significant transformation. Illustrators like Merian, with her slightly exaggerated portrayals, reflected a time when scientific knowledge was less collective, and subjectivity was embraced. However, as science progressed and illustrations became crucial tools for communicating complex theories, artists like David Goodsell emerged, were in times like global pandemics, depictions of viruses and bacteria have become widely popularised and acknowledged by the wider public rather than just the scientific community. Figures like Haeckel also bridged the gap between scientific discovery and public understanding, utilizing illustration to share new ideas to wider audiences in ways that are easy to understand, and this had great importance due to the culture of the time, where, due to religion, new theories were likely not going to be accepted. Making these new ideas easier to digest would have been more effective to change public perception. Thus, as science continues to evolve, so too will the art of illustration, adapting to meet the demands of an ever-expanding body of knowledge while still retaining its capacity for creativity and expression. In my own work, I've approached subject matter like that of Goodsell's but approached it through an advertising lens. Unlike Haeckel, whose work is targeted at fellow scientists, my designs are made for public consumption, appealing to a broader audience that doesn't necessarily have a scientific background. My goal of my work is to raise awareness of the issue at hand.





## Sources

- <https://study.com/academy/lesson/ernst-haeckel-biography-facts-theory.html#:~:text=Ernst%20Haeckel%20was%20the%20author,talented%20artist%20of%20scientific%20illustration>
- <https://archive.org/details/KunstformenDerNaturErnstHaeckel/page/n79/mode/1up>
- [https://www.goodreads.com/author/quotes/243117.Ernst\\_Haeckel#:~:text=Where%20faith%20commences%252C%20science%20ends,the%20reasoning%20intelligence%20of%20man](https://www.goodreads.com/author/quotes/243117.Ernst_Haeckel#:~:text=Where%20faith%20commences%252C%20science%20ends,the%20reasoning%20intelligence%20of%20man)
- <https://www.promega.co.uk/corporate-responsibility-csr/community-touch/interview-with-david-goodsell/>
- [https://en.wikipedia.org/wiki/David\\_Goodsell](https://en.wikipedia.org/wiki/David_Goodsell)
- <https://mindthegraph.com/blog/the-key-visual-science-scientific-illustration/#:~:text=Scientific%20illustration%20is%20a%20method,often%20used%20to%20describe%20them>
- <https://www.thomsonec.com/news/scientific-illustration-when-art-meets-science/#:~:text=Scientific%20illustration%20could%20be%20mistaken,features%20are%20accuracy%20and%20objectivity>
- <https://education.nationalgeographic.org/resource/theory-of-evolution/>
- <https://www.britannica.com/art/Art-Nouveau>
- <https://ilandudnomuseum.co.uk/wp-content/uploads/2021/05/Botanical-Illustration-History.pdf>
- <https://www.britishmuseum.org/collection/animals/maria-sibylla-merion-pioneering-artist-flora-and-fauna>