

WHO AM I ONLINE?

ASKING BIG QUESTIONS THAT BRIDGE SCIENCE & OTHER DISCIPLINES

A portrait is an artwork created about a person or persons which tells us something about them. Is a selfie just another type of portrait? What impact does social media have on how we portray ourselves online - our digital portrait? What other information is being included with your selfie? This raises questions about the impact of technology on our identity and security of our "online selves".

WHAT'S IN A PORTRAIT?



Artists have represented people in portraits for hundreds of years, and not just famous people. Portraits make us ask questions about who these people are, and why they have been captured in paintings and photographs for others to see and consider. Sometimes a portrait doesn't seem to look like the person it is meant to represent, but it may still show us something about that person.

FROM PORTRAIT TO COLLAGE

A collage takes already existing, unrelated materials and puts them together to create a new image. A collage can be made with newspaper clippings, fabric, coloured paper, parts of other artwork, photographs and objects, glued to a piece of paper or canvas. The pieces are arranged purposefully to create different effects on the audience - it might be emotional, or intended to make us think about how all the unrelated images work as a new whole.



SELFIES, COLLAGES AND SELF-PORTRAITS

Creating a self-portrait is an introspective process, but the self-portrait itself becomes a representation of ourselves out in the world, and it will be viewed in many different ways. By creating a self-portrait, we can learn more about who we are, and how we want to represent ourselves.

Can a collage be a self-portrait? Can a selfie be a self-portrait? Is it always necessary to present a true image of the person, or are emotions, interests, goals, and dreams just as important? Is the selfie the only way to present yourself on social media?

OVER TO YOU

First, the photo... Take two photographs of yourself with the instant camera. For the first try to be as natural as possible, for the second you'll show how you feel or view yourself. Wait until the end of the session to take your second photo! Then just have fun!

Then, the collage... Use a combination of your 'Insta' photo, the magazines, and a sheet of A5 or A4 paper to create a collage self-portrait.

Not sure where to start? Choose images based on how makes you feel; look for words in the text which are meaningful or represent your interests; pick out patterns within the images or use whole pictures featuring items which interest you. The choice is yours; there is no right or wrong way to do this.

WHO ARE YOU ONLINE REALLY?

Think about your experiences of using technology creatively

- How has this influenced the way you think about the portraits of you on digital platforms and circulating in social media environments?
- How much of yourself do you share online?
- Is the selfie the only way to present yourself on social media?
- Is "who you are" the same online as offline? What about across different platforms (social media/Role Playing Games etc).
- What would your online identity look like if there weren't any camera phones?

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SESSION ACHIEVEMENTS:

- Engage with creative techniques to re-shape the way you represent yourself online.
- Exploring whether the self-portrait truly represents “image” in the modern digital age.
- Understand the difference between digital portrait and digital profile.
- Appreciate that scholars use many methods and some are more scientific than others.
- Art & Design – develop and refine ideas as you work and understand different graphic communication processes.
- English – Listen to and build on others’ contributions, and ask questions to clarify and inform.
- Computing - Understand how changes in technology affect safety and ways to protect your online privacy and identity.

CAREERS TO

GAMES WRITER

The story is an integral part of video gameplay experience. Games writers work with the design team moving from concept through to final delivery. They are integral to everything from world design to character development and universe story. Game writers tend to have a love of both English and video games, and are imaginative thinkers who often study creative or script writing at university.

EXHIBITION DESIGNER

Exhibition designers are creative thinkers with excellent design and communication skills. They may work on trade shows and public exhibitions for industry; or cultural exhibitions for museums, galleries and libraries. They are able to design their exhibition to reflect the needs of client and provide an engaging experience for customers and visitors.

SOCIAL MEDIA DEVELOPER:

Social media developers are analytical thinkers who specialise in the technical management of an organisation’s social media platforms. They design and create applications to engage their customers, and take their applications from idea to reality. Social Media Developers help to connect the world in ways that have never been done before.

THINK ABOUT

Susan O’Connor

Recognised as one of the most influential and original game writers in the industry working on project such as Far Cry 2, BioShock, and Gears of War. She is known for her innovative storytelling that pushes the boundaries of game content and bridges the line between video gaming and art.



Ioanna Gkritzani

Works at Natural History and Science Museums in London where she lets her “imagination go wild, transforming ideas, spaces and objects into installations that visitors can play with and learn from.



Evan Spiegel

The founder of Snapchat. While studying at Stanford University, he proposed Snapchat as a class project for project design subject. His net worth is still around \$4 billion, making him one of the youngest billionaires in the world.

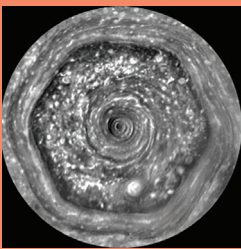


WHAT'S THE UNIVERSE REALLY MADE OF?

ASKING BIG QUESTIONS THAT BRIDGE SCIENCE & OTHER DISCIPLINES

Maths is a language it has vocabulary, grammar and rules for sentences. If we can understand maths as a language it can help us to understand how the world works and how objects in it are connected. This raises questions about how we can make sense of very big and very small parts of our universe, and patterns that appear to arise from chaos.

FROM CIRCLES AND LINES



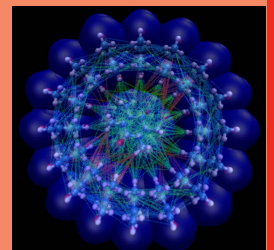
Although seemingly random, nature is full of patterns that follow mathematical rules. From how lightning forks to spiral of a snail shell and even the pattern of broccoli. In fact with just a circle and straight line you can recreate almost every shape in the universe

There is even a mysterious hexagonal cloud pattern at Saturn's North Pole. There are a variety of scientific descriptions of why the hexagon exists, but scientists need mathematics to show why it is a hexagon and not a circle, a star, or any other shape.

UNDERSTANDING NATURE'S BOOK

Maths gives us the tools to explain the fundamental behaviour of the universe from how molecules rotate and vibrate to whether a galaxy spirals clockwise or anti-clockwise. Algebra and equations work to explain complex ideas just like writing systems such as Japanese Kanji.

Kanji can express the difference between listening [聞<] and paying attention to what you're listening to [聴<] just like small variations in equations can explain and link very different concepts.



A SENSE OF SCALE

Some patterns in nature, like the spiral of a pine cone are clear to us, but others are too big or too small to be seen. Just because we can't see the order it doesn't mean it's not there. But can mathematics really describe the behaviour of things from DNA to galaxies? If everything in the universe is describable by mathematics does that mean everything (including us) is following a strict path or can maths describe "chaos"? The short answer is yes, there's a whole branch of mathematics dedicated to chaos theory (also called the butterfly effect). <https://tinyurl.com/chaos-theory-IM>

OVER TO YOU

For your GCSE you will have to create a perpendicular line and bisect an angle - this uses similar techniques to go beyond your exam

Constructing a Hexagon - Use a compass to draw a circle on the page (not too small or this will get tricky!). DO NOT adjust the compass, place the point on the edge of your circle and draw a small arc where the pencil crosses the circle. Now put your compass on this point and repeat to get a third point. Keep going until you have six points on your circle. Connect adjacent points using a ruler to create a hexagon. Can you build a honeycomb pattern?

Building a Fibonacci Spiral - The fibonacci sequence starts at 0 or 1 and increases by adding the previous two numbers together: 0, 1, 1, 2, 3, 5, 8, 13, 21... This pattern forms a spiral also known as the golden ratio which is found across nature and architecture. Use squared paper to build a grid using the fibonacci sequence, then either free hand or using the compass create a curve across each square until you have a spiral. How big can you make the spiral? Can you build a double spiral?

WHERE IS THE MATHEMATICS IN YOUR UNIVERSE?

Think about how you engage with maths without realising

- Find out just how big the minecraft world is or how small your chromosomes are at scaleofuniverse.com
- The maths behind CGI www.mathscareers.org.uk/video/advancing-the-digital-arts/
- Snowflakes, lightning patterns, the structure of shells and even broccoli are all examples of fractals in nature. www.maths.surrey.ac.uk/hosted-sites/R.Knott/Fibonacci/fibnat2.html
- If maths exists throughout the universe did we create it, or discover it?

Want to know more? Turn over for careers & curriculum links

SESSION ACHIEVEMENTS:

- Understanding maths as a language.
- Understand some questions are more amenable to scientific explanation than others.
- Exploring how scale helps us to talk about the full range of size of objects in the universe.
- Appreciating the ordered pattern present in nature from the very small (e.g. DNA) to the very large (e.g. galaxies).
- Maths – Apply ratios to real contexts and model situations mathematically.
- Science – Develop an understanding of the methods of science and understand physical laws/models are expressed mathematically.

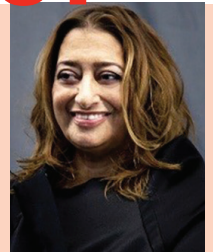
CAREERS TO THINK ABOUT

ARCHITECT

Architects have been using mathematical proportions to design buildings from the great pyramids in Egypt to the Gherkin in London. Architects are problem solvers who can think and design creatively and then communicate those ideas to a client. They have often studied Art & Design and Maths at school.

Zaha Hadid

Zaha Hadid was a multi award winning Iraqi-British architect, known as “Queen of the Curve”. Her buildings can be found from Beijing to Glasgow and she designed the London Aquatics centre for the 2012 Olympics. She was made a Dame for her service to architecture.



BIOPHYSICIST

Biophysicists explore issues where biology and physics meet, which means they're creative thinkers who want to know about relationship between physics and living organisms. They are at the forefront of major advancements in science and medicine, particularly with DNA. They can work for the government, in many industries or doing research in a university.

Candice Etson

Candice Etson trained as a ballet dancer gaining a degree in Fine Arts and Dance. After a few years she returned to university to study physics and gained her PhD at Harvard. She currently looks at how your DNA turns one cell into a muscle cell and another into a skin cell at the level of individual molecule.



ANIMATION SCIENTIST

CGI animations in films, computer games and scientific modelling are all built using models that are realistic, but can also be processed quickly enough by a computer. Animation scientists work in teams to create accurate models that help us tell better stories.

Tony DeRose

Tony DeRose is an animation scientist at PIXAR. With a degree in physics and a PhD in computer science, he translates arithmetic, geometry and algebra into clouds, smoke and bouncing hair.





DOES SIRI "JUST" LISTEN?

ASKING BIG QUESTIONS THAT BRIDGE SCIENCE & OTHER DISCIPLINES

The EU (European union) are debating how we regulate artificial intelligence (AI) including "electronic personhood". This raises the question how should we understand the advance of human-like robots – should it make us appreciate how very special we are and so, what a long way robots have to go? Or should it make us realise that we're not very special and everything we think is special, will one day be explained by science?

CAN YOU TELL A ROBOT FROM A HUMAN?



Alan Turing designed a method to test whether a machine can fool us into thinking it is human. In order to pass a machine must convince someone (who can't see it) they are talking to a person. In the test humans don't know if they are interacting with a robot or a person. Sometimes the humans on the other end "fail" the Turing test – people think that they are talking to a robot!

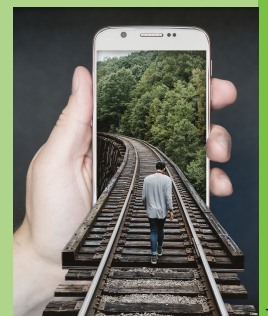
Understanding what, if anything, makes us different from machines can help us realise our criteria for saying another entity is a "person".

Source: pixabay

TECHNOLOGY AND LANGUAGE

We talk about "smart" phones, machine "learning", and Siri & Alexa "listening" to us. But what do we actually mean when we use these words? Is your phone smarter than you?

Can it provide information a place you've never heard of more quickly than you? Yes. Can it appreciate that a sunset can be beautiful? Did you answer differently? A similar comparison applies when we talk about the robot "hearing" us or simply responding to sound. Does the robot understand the command?



Source: pixabay

WHEN IS AI ABOUT MORE THAN PROGRAMMING?

We live in an increasingly technological world where everything from our sleep patterns to our regular commute can be recorded through technology. As technology becomes increasingly more integrated into our lives and habits the boundary between technology and other disciplines becomes increasingly blurred. Can (or should) the programmer be able to answer whether we should use androids in healthcare? Who is responsible when a robot reacts differently in the real world to the lab? Should a robot be granted citizenship and if so when? Can art created by technology have the same value as a work by a famous artist?

To be able to answer these questions (and many others) raised by the use of AI, robotics and technology we must seek to integrate the knowledge and thinking provided by a range of disciplines and understand the power and limitations of each to provide part of the answer.

OVER TO YOU

This is an opportunity to explore how we judge whether something is "human-like" and think about the language we use about technology.

Artificial "intelligence"? - Spend some time talking to Mitsuku - what questions is "she" able to answer easily? Where does "she" struggle to give a human response? <https://tinyurl.com/IM-mitsuku>

Loebner Prize - Have a conversation with "Millie" **about the Turing Test** - can you work out whether you are speaking to a robot or human? what happens when you ask about topics other than the Turing test? <https://tinyurl.com/IM-turing>

ROBOT OR "ELECTRONIC PERSON"?

Think about how you would make the distinction

- What's the difference between hearing, listening (which Siri & Alexa do a lot of apparently), and responding to sound?
- What are the real sticking points that cause challenges for designing robots that interact or "think" like humans?
- If we wait, will technology one day become so complex that consciousness appears? Will there be a "consciousness" chip that engineers can add if it's useful? Or is consciousness nothing like either of these?

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SESSION ACHIEVEMENTS:

- Critically examine the language we use to describe technology and the complexity of the AI debate.
- Understand that some questions are more metaphysically sensitive than others.
- RE & Citizenship – understand the role of justice in society and the place of moral responsibility.
- Science – understand the power and limitations of science at dealing with ethical issues.
- Computing - apply analytic, problem-solving, design, and computational thinking skills.

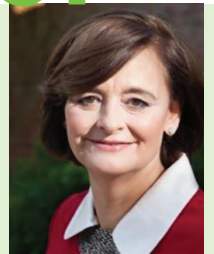
CAREERS TO THINK ABOUT

LAWYER

A lawyer provides legal protection for people, and does far more than keeping people out of gaol. Lawyers offer representation (in court) and legal advice to individuals and whole companies. Dealing with court proceedings or small disputes they are often interested in history and English. You can specialise in a whole variety of areas from property or family to the environment there will be something for you.

Cherie Blair

Known professionally as Cherie Booth QC, she is an English barrister. She is married to Tony Blair, the former British Prime Minister. She specialises in employment, discrimination and public law and has represented claimants taking cases against the UK government.



ROBOTICS ENGINEER

A robotics engineer is a creative problem solver, who design solutions to the world's problems. They create new applications for robots and continually find new ways to expand their uses. They work in any industry that can benefit from the technology they create. Engineers typically develop designs, create prototypes and experimental robots, and work on applications that can range from military to medical use.

Melonee Wise

The CEO (Chief Executive Officer) of Unbounded robotics. The company design robots like UBR-1 that can do household tasks such as bringing you drinks, and laying the table. The company is be the one making the first semi-humanoid multipurpose robots that people actually have at home.



MARKET RESEARCHER

Market researchers interview people to find out what they think about products, services or issues. Market research executives and managers usually work for consultancies or in-house marketing/research departments - this can be in practically any industry. The data you collect will normally revolve around what organisations or people buy, need, do or think and the reasons why.

Michelle Goddard

A graduate of the London School of Economics and Political Science, she received her Ph.D. in Law from Osgoode Hall Law School, York University, Canada in 2011 and has a wealth of experience in consumer market regulation and research.

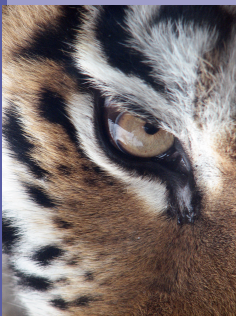


IS SEEING THE SAME AS BELIEVING?

ASKING BIG QUESTIONS THAT BRIDGE SCIENCE & OTHER DISCIPLINES

Science requires observable, objective data. We think reporting on what we see/measure is more accurate and repeatable than reporting on our feelings. But psychologists and neuroscientists point out our senses don't exactly reproduce the reality of the world around us. This raises questions about the difference between our perceptions and 'reality' including how we interpret the physical world.

PERCEPTION



Some optical illusions occur because of the structure of the eye. Imagine how your view of the world would be different if you had the same eye structure as a dog (the world is in shades of yellow, blue and grey)... a bee (very poor at detail, but very sensitive to motion)... a rabbit (you can see nearly 360° around you and far above your head, but you have no depth perception for objects close to you). Find out more: tinyurl.com/IM-animalsight

Source: Wikicommons

ASSUMPTION

The brain is a very powerful tool, but to process all the visual information we receive our brain would need to be bigger than a building, and then it still wouldn't be enough. In order to process all this information we (subconsciously) simplify the information we are processing in order to reach decisions at greater speed. It is thought these cognitive "shortcuts" or biases allow us to make decisions quickly, helping our ancestors survive dangerous or threatening situations.

The world you think you are seeing has been constructed in your mind based on your mental model of what's out there! Optical illusions help us study how our mind creates a mental model of reality.

SCIENTIFIC METHOD

Although we often talk of a logical path of "scientific method" scientific discovery is more like a detective story. New discoveries are made with hundreds of people working alone or in groups to share information. Sometimes discoveries happen through mistakes, luck, mathematical appeal or guesswork. A big part of scientific research is thinking creatively about problems, asking new questions that people haven't thought of and finding a way to answer them. It's about stepping outside the comfort zone of existing knowledge and trying something new.

OVER TO YOU

The Stroop Test... In pairs time each other on how long it takes to say the COLOUR of each word in two lists. Use your phone/a stopwatch to record and compare the time taken for each list. If the person does not say the correct colour they will have to repeat the word. What do you think it shows? Is the test useful?

Newton's Colour Wheel... Use a compass to draw a circle about the size of a DVD on the white card. Mark the centre point, and draw three lines through the centre so the circle is divided into six spaces. Colour or use coloured card to make the sections red, blue, green, red, blue, green.

Put a pencil through the centre of the disc and use it to spin the disc as fast as possible. What do you notice about the colours? You are trying to spin the disc faster than your eyes can process the colours.

CAN YOU TRUST WHAT YOU'RE SEEING?

Think about the issues of how our sensory data is interpreted

- If you were born and lived on Mars are there any optical illusions that we have on Earth that wouldn't work for you?
- What is the dividing line between perception of reality and hallucination – is it a clear line?
- Which is more important for a scientist – imagination, systematic thinking, or both?

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SESSION ACHIEVEMENTS:

- Be able to relate the idea of cognitive bias to an explanation of why optical illusions work.
- Develop an understanding of the complexity of science in relation to the “scientific method”.
- Challenge the claim that we can draw objectively on sensory data.
- Understand the power and limitations of science in dealing with observed data.
- Science – use scientific theories and explanations to develop hypotheses.
- Psychology – explain what causes optical illusions and the role of visual cues in perception.

CAREERS TO THINK ABOUT

VISUAL MERCHANDISER / DISPLAY DESIGNER

Display designers and visual merchandisers use their design skills and creativity to help promote an organisation's image, products and services. Display designers usually focus on displays for exhibitions and events. Visual merchandisers focus on window and in-store displays. People that enter these careers have excellent communication skills and an ability to turn an idea into reality.

Lucie Thomas and Thibault Zimmermann

(Known as Zim&Zou) are French artists who have made displays for companies like Hermes, IBM and Microsoft. They focus on handcrafted objects in a strict move away from computer design.

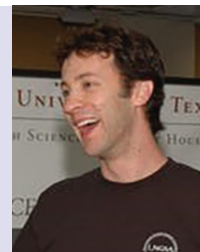


NEUROSCIENTIST

Neuroscientists study the development and function of the nervous system, which includes the brain, spinal cord, and nerve cells throughout the body. They could specialize in one part of the nervous system, or focus on specific behaviours. You might work directly with patients in hospitals and/or do research in a laboratory or office.

David Eagleman

Directs the laboratory for Perception and Action at Baylor College of Medicine and the Initiative on Neuroscience and Law. He is also a New York Times bestselling author.



PHOTOJOURNALIST

Photojournalists are experts at communication with a deep understanding of how the public will perceive the story through their images. Photojournalists will take images that are difficult to capture, and convey intense emotion. These will be used in magazines, websites and even books.

Lee Miller

Started as a model for vogue before moving in to photojournalism when she became their official war photographer for World War II. She documented the Blitz of London, the first use of Napalm, the Liberation of Paris and the Nazi concentration camps at Buchenwald and Dachau.



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