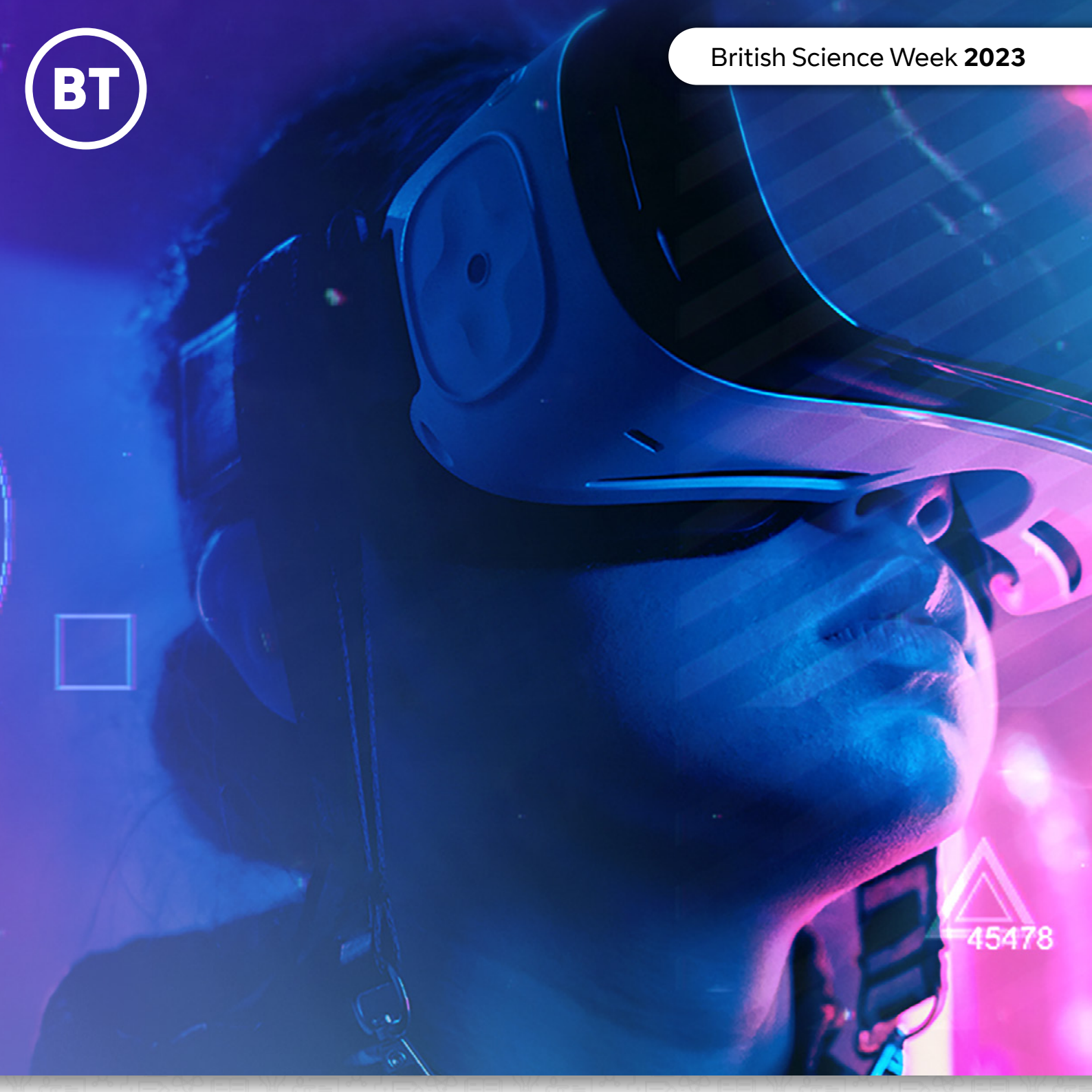
British Science Week **2023**



TEACHER'S PACK

This is our Teacher Briefing Pack which provides you with lots more information about our virtual British Science Week event, from Monday 13th – Friday 17th March. We're really looking forward to releasing our content for 2023!

Here's how it will work.

There will be five days of online content, each of which will be released at midnight, starting on Monday 13th March. Each day will be hosted by Abi J, Mo & Abi G who are current BT Research apprentices or graduates - they will be giving an overview of the topics being covered at the start of each day.

This year we're covering a broad range of topics. We'll take a look at how all of these subject areas require STEM-based skills, whilst also looking at the exciting technology involved and varied careers in each:

- Monday 13th March **Sustainability**
- Tuesday 14th March **Extended Reality**
- Wednesday 15th March **Digital Banking**
- Thursday 16th March **Space**
- Friday 17th March **Accessibility**

The content for each day will have a combination of videos, activities, and a live Q&A panel. The Q&A sessions will be a great opportunity for you and your students to pose questions to world leading experts and also meet some Gatsby measures. They can submit questions via a moderated chat and the host (Carol Fletcher, BT) will ask the panellists to answer. Those panellists are listed on page 3 of this pack.

A reminder that the kit list for the activity packs from all five days can be found on page 4.

We really hope you find the content useful. We'd love to see you all getting involved as well so please send any pictures of you, your students or class watching the videos, reading the content or getting stuck in with the activities. Email these to us at computerscience@bt.com or post on social media and mention @adastralpark with the hashtag #BSW23.

Don't forget that our content from previous events such as British Science Week 2022, 2021 and Norwich Science Festival 2021 is also still available for you to use:

- British Science Week 2022: BT Adastral Park - https://atadastral.co.uk/bsw/2022/
- British Science Week 2021: BT Adastral Park - https://atadastral.co.uk/bsw/2021/
- Norwich Science Festival @School 2021: BT Adastral Park - https://atadastral.co.uk/nsf/

If you have any questions about any of the content, please reach out and email us on computerscience@bt.com.

Thanks again, and we really hope you enjoy the content starting on Monday 13th March.

Answers

This year there is only one activity that requires answers and that is for Wednesday's topic of Digital Banking, more specifically Activity 1 within the activity pack.

If you would like to see what the answers are then please reach out to us at computerscience@bt.com and we will send them back to you – good luck!

Each day we'll be holding a live Q&A session hosted by Carol Fletcher (BT) between 2:00-2:30pm, with the subject experts who feature in our topics across the five days. These will be a brilliant opportunity for you and/or your students to ask the following experts your burning questions!

The Q&A webinars will be hosted on Zoom - click here to head over to the registration form. Once you have signed up, we will send you the specific dial-in details closer to the time.

Monday 13th March – Sustainability

- Dede – BT
- Janet - BT
- Matt - BT
- Mimi - N2S
- Michelle - Bioscope Technologies

Tuesday 14th March – Extended Reality

- Adam - BT
- Anasol - BT
- Roly - BT
- James - UrbanXR

Wednesday 15th March – Digital Banking

- James - BT
- Jacqui - BT
- Clark - Nationwide
- Becca - Nationwide
- Clair - Nationwide

Thursday 16th March – Space

- Steve - BT
- Mauro - BT
- Jon - BT
- Tony - Red Hat
- Pablo - OneWeb

Friday 17th March – Accessibility

- Ronise - BT
- Callum - BT
- Christian - BT
- John - BT
- Sam - University of Cambridge
- Anya – University of Cambridge

Monday 13th March - Sustainability

Activity 1

- Used paper
- Scissors
- Sellotape or hot glue gun (with glue sticks)
- Glue
- 8 Lollipop sticks / craft sticks / drink stirrers
- Mesh / sheer fabric
- Bowl (cereal bowl or small bowl)
- Larger bowl or a sink to stand over
- Water
- Blender
- Rolling pin
- Sponge
- Old newspaper

Activity 2

- Print Worksheet on page SU7
- Bag/Container for recycling

Tuesday 14th March - Extended Reality

Activity 1

- Cardboard (shoe box or box packaging)
- Printed Templates 1 - 5 (pages ER7-9)
- Scissors
- Printer
- Paper
- Velcro
- Pen or pencil
- Sellotape
- Glue
- Ruler

Activity 2

- Cardboard VR glasses (from Activity 1)
- Smartphone

Wednesday 15th March - Digital Banking

Activity 1

- Paper
- Pen or pencil
- Colouring pens or pencils

Activity 2

- Printed Worksheet (page DB12)
- Pen or pencil
- Colouring pens or pencils

Thursday 16th March - Space

Activity 1

- Cardboard (cereal box, shoe box or any thin card)
- Scissors
- Printed Template 1 (page SP6)
- Pen or pencil
- Colouring pens or pencils
- Paper fasteners
- Glue
- Sellotape

Activity 2

- Paper
- Colouring pens or pencils
- A device with internet

Friday 17th March - Accessibility

Activity 1

- A device with internet

Activity 2

- Print Worksheet on page AC8-9
- Paper
- Pen or pencil
- A device with internet

Activity 3

- A laptop or PC with internet

Activity 4

- Paper
- Pen or pencil
- A device with internet

Introduction

Our modern lives come with a huge environmental footprint. How can we reduce this? Could bacteria be part of the solution?

From the clothes we wear, the food we eat and the tech we use, everything has an impact on the world around us. We explore how BT is looking to build a sustainable future for all and how technology can accelerate that journey.

As the world becomes more and more digital and the number of electronic devices we use grows, we need to find better ways of recovering the materials used in them. Over 55m tonnes of 'e-waste' are created each year, but only 20% is formally recovered and recycled. We can all contribute to solving this problem, so N2S look at what you can do and what exciting innovations are taking place to protect the planet's resources.

How can we build a more sustainable future for all?

Activities

Activity 1 will get students making their own paper out of old, used paper from around the home or classroom. It aims to show how fun it can be to recycle, and why we should all be looking to recover, reuse or recycle more of our waste (be that electronic or general) going forward. Activity 1 can be done individually, in pairs or in a small group of 3 or 4.

Tips & advice for this activity:

- Adding more used paper at the beginning is better than less! If you don't use enough you won't be able to make a very strong piece of paper. Consider using ~10 pieces of old, used paper at the beginning.
- Don't be afraid to add a few layers of paper pulp when pouring it into your frame. This will help to make sure the new piece of paper is strong enough once it has dried. Otherwise, it can rip quite easily.
- If the mesh / sheer fabric gets clogged up, give it a rinse in a sink and you should be able to use it again.
- Consider ways to make your paper more colourful and exciting – you could add herbs, flowers, seeds, food colouring or even glitter into your pulp to see what results you end up with!

Activity 2 has been created by Recycle Your Electricals and sets the students on a Tech Treasure Hunt. They will be tasked with looking for items around the classroom or home that can be reused or recycled in order to show how much we all store around the place which could be put to better use. Activity 2 is best carried out in pairs or small groups.

Activity 1 can be done **individually, in pairs or in a small group of 3 or 4**.

Activity 2 is best carried out in **pairs or small groups**.

We have included the entire **Sustainability Activity Pack on pages SU1-8** so that you can start to plan how you may want to use them.

Introduction

Can you still tell the difference between the real and the virtual world? From Pokémon GO to Smart Cities, take a look at how Augmented Reality, Virtual Reality and Mixed Reality technologies are revolutionising our lives.

The difference between the real world and the digital world is narrowing and AR / VR technologies are becoming increasingly more prevalent and enabling a whole host of new opportunities and experiences. We take a look at some of the cutting-edge applications of this technology that are being developed by BT's research teams.

The virtual world of gaming and our real-world experiences are coming together in an explosion of immersive experiences. UrbanXR explore how things were, what is happening now, and what the future holds for AR & VR, whilst also looking at the massive influence creative technology careers will have in the future.

Activities

This activity will get the students making their own Virtual Reality headset out of cardboard, before virtually stepping onto the International Space Station!

This will require a smartphone with internet connectivity for the second part of the activity. The phone will be placed in the front of the cardboard headset and the video we have directed you to is the BBC's 360° VR Spacewalk Experience.

From that point, any other 360° video can be used on the device to provide a wide range of 'VR' experiences.

It would be worthwhile holding onto any cardboard you have such as shoe boxes or cardboard box packaging as that will come in very handy for making these DIY VR headsets.

This activity is best suited to **individual work or pairs**.

We have included the entire **Extended Reality Activity Pack on pages ER1-9** so that you can start to plan how you may want to use them.

WEDNESDAY

Introduction

In a world where cash is used less and more transactions are online, what will the banks of the future look like? And how do these banks stay safe and secure during a digital revolution?

At the moment you can walk into a bank; you can phone, email, or text them but BT explore what role new technology, such as that used in gaming or virtual concerts, could play in modern banks in the future.

In today's online world it is possible to buy almost anything using just a click of a button or face ID on your smartphone. But how do you know that your money is safe and secure? Nationwide Building Society look into what's being done in the background to keep you one step ahead of the game and help you look after your hard-earned cash!

Activities

As we do more of our banking online or anything where we're purchasing products or services, we've got to make sure we trust the communications we're getting from the banks or online retailers. Activity 1 puts you on the spot to work out if you can spot the fake... it centres around real-life digital scams on email, text or social media and shows you some tips and tricks for staying safe online.

Activity 2 is then focused around a careers questionnaire from TechSkills. Digital banking may not sound the most exciting of topics, but even if it does appeal to you, it's hard to know what it actually means. Therefore, it's difficult to know what type of roles exist for a career in this industry. Answer the questions in this activity to find out which type of role may suit you best and where that fits into the Digital Banking sector.

Activity 1 can be **done individually** but would be good in **pairs or a small group** so discussion can be had as to what may be wrong with the examples provided.

Activity 2 is best done **individually** as it is a personal careers-based questionnaire.

We have included the entire **Digital Banking Activity Pack on pages DB1-15** so that you can start to plan how you may want to use them.

Introduction

Did you know that space, rockets, and satellites aren't just the subject of science fiction like Star Wars and the Marvel Cinematic Universe? They are the subject of science fact affecting every part of our day to day lives and are set to become even more important in solving many of the global issues we face today.

Satellites have been launched into space on rockets for more than 60 years, orbiting the earth, broadcasting TV pictures such as sports events and even the moon landing to every part of the globe. When you share your location on your mobile phone such as through SnapMaps, you're connecting to satellites thousands of miles above the Earth. New types of satellites are being launched which orbit much closer to Earth that will help allow cars to drive themselves and connect people and things in really remote locations. What if we could build things in space that take advantage of low gravity and vacuums to do things that are impossible to build on the Earth? BT take a look at LEO (Low Earth Orbit), MEO (Mid Earth Orbit) & GEO (Geostationary Equatorial Orbit) satellites as well as drones to see how they can solve issues or open up new opportunities going forward.

Sending data from a location like the International Space Station to Earth still takes time and can cause delays in onboard experiments. So Red Hat explore what happens when you provide astronauts access to advanced computing capabilities in space.

Activities

Activity 1 will help to visualise how LEO, MEO and GEO satellites operate in relation to the Earth. You will get the chance to design, draw and colour in your own satellites before creating a moving satellite model. This will show how LEO satellites are closest to the Earth, with MEO further away and GEO even further still. But also importantly, how GEO satellites match the rotation of the Earth meaning they look as if they never move and are always in the same part of the sky.

For Activity 2, you'll need to bring your creativity and imagination! We know there are lots of passionate Space enthusiasts out there who may be part of a Space club; it might be your favourite thing to learn about at school or it might be your personal hobby. If so, you're part of the world Space community. However, wouldn't it be great to have a visual identity for the Space community? To have a badge that identifies you and makes everyone feel part of one big Space team? We've seen some amazing designs out there in real life by the likes of NASA, the US Space Command but also in movies too, such as the Star Trek Starfleet Command badge.

So we'd really love you to get creative and design a 'World Space Community' badge! Once you've created your badge, please share it with us by emailing it to computerscience@bt.com.

We'd also love for you to post your designs on social media by uploading a picture of your badge, mention @adastralpark and using the hashtag #BSW23.

We can't wait to see your designs!

Activity 1 can be done **individually, in pairs or in a small group of 3 or 4**.

Activity 2 is more of an **individual** exercise.

We have included the entire **Space Activity Pack on pages SP1-7** so that you can start to plan how you may want to use them.

FRIDAY

Introduction

Technology is awesome, but only if you can access it effectively... how we can we use design to ensure it can be enjoyed by all?

Every time you speak to Alexa or zoom in on your phone, you're using technology originally developed for people with disabilities or accessibility challenges. Great design and simple technology can make a big difference for those with disabilities – and it can also help everyone else too. Find out more about what BT are doing in digital accessibility to make it easier for people using BT's websites and apps.

The University of Cambridge then take you through some of their products such as their simulation gloves and glasses which provide insight into how limitations in hand movement and vision loss can affect how people use different items. The tools can be used to examine the accessibility of products and services and build empathy with users, helping to create better more inclusive designs.

Activities

There are a series of four activities that build on the digital accessibility information also provided in the activity pack. They are designed to help you identify what bad accessibility looks like, how to improve it with design principles, how to build your own websites with this in mind and then the challenge...

Looking at existing websites e.g., your school website (or pick a random one), can you now analyse the design, but also have the confidence to provide recommendations on how to improve it?

These activities will require access to a device with internet connectivity. See the kit list on page 4 for further information on what's required.

All of these activities are best done in **pairs or small groups** so that they can talk about the issues they see and the approach they are going to take on them.

We have included the entire **Accessibility Activity Pack on pages AC1-9** so that you can start to plan how you may want to use them.

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SUSTAINABILITY

Activity Pack

Sustainability is a hugely broad topic, but for British Science Week we are focusing on the sustainability of our environment on planet Earth. When something is sustainable in this way, it means it can be carried on for a long time and doesn't harm the environment. Unfortunately, quite a few things that humans currently do are unsustainable and are therefore causing damage to our planet through things like climate change.

Single-use plastics are a good example:

- An **unsustainable** thing to do would be to use a new plastic cup every time you get some water.
- A **sustainable** alternative would be to re-use a plastic water bottle, or better still, use one made from a recycled or recyclable material.

The same goes with plastic shopping bags. When you put those plastic cups or bags into the bin, they get taken to landfill sites where they are just buried and left, so it's much better to recycle or use recyclable products!

Sustainability around technology is also really important. One angle of it would be looking at how we can recover, reuse, or recycle components from old devices so that we reduce the amount of e-waste produced. E-waste is a term for any electronic appliances that are discarded such as mobiles, laptops, or games consoles.

On an individual basis, that may mean finding somebody else who could use your unwanted bit of tech, like a phone, tv or tablet. For businesses such as BT, it may mean using companies like N2S to recover old routers so they can be broken down properly and reused to create new bits of tech instead.

To be more sustainable, we have to all lower our carbon footprint. This is the amount of greenhouse gases released into the atmosphere as a result of what you do day-to-day, like driving a car or charging your phone. You have your own carbon footprint as an individual, as will your household and so do businesses. It is a simple measure of the impact of your activities on the CO_2 produced.

We can all make a difference. If we all change how we do things to be more sustainable then we can limit the damage we're doing to our planet.

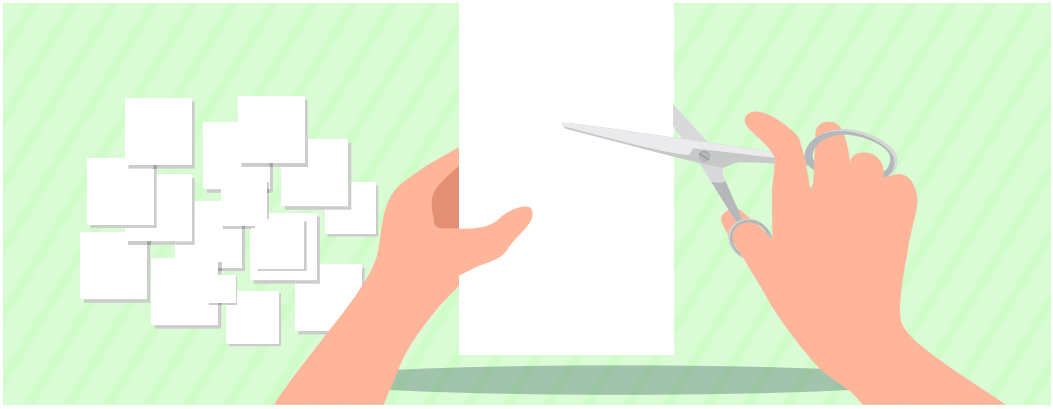
ACTIVITY 1

Kit List

- Used paper
- Scissors
- Sellotape or hot glue gun (with glue sticks)
- Glue
- 8 Lollipop sticks / craft sticks / drink stirrers
- Mesh / sheer fabric
- Bowl (cereal bowl or small bowl)
- Larger bowl or a sink to stand over
- Water
- Blender
- Rolling pin
- Sponge
- Old newspaper

Instructions:

1. Collect some used paper from around the classroom or your home.
2. Cut your used paper into small square pieces.

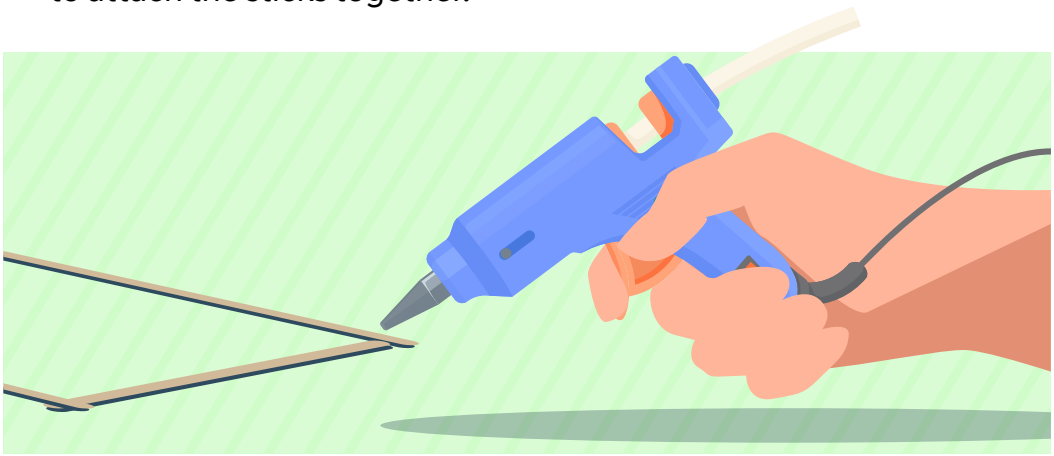


3. Put these small pieces of paper into a blender and fill it up with water.
4. Blend it all up until the paper is turned into a pulp.

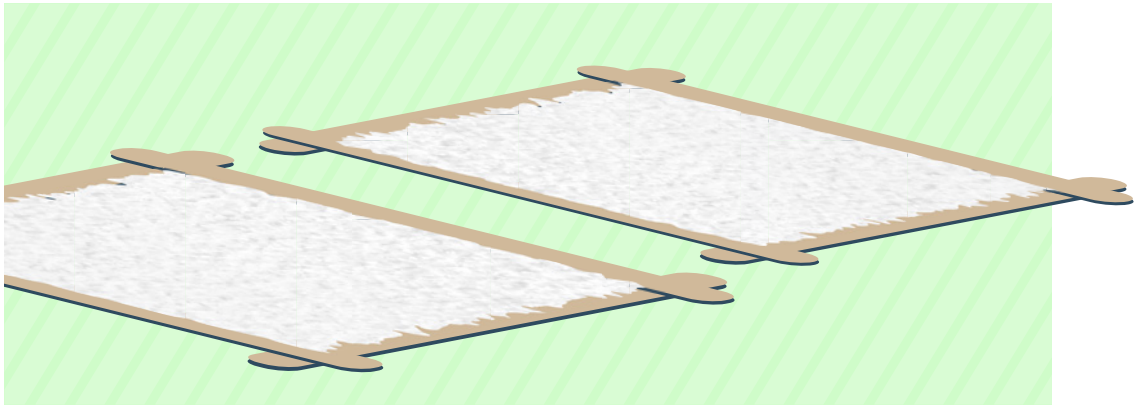
5. Put this paper pulp into a bowl and fill the bowl with water. Leave this to one side for 24 hours.

ACTIVITY 1

6. Now it's time to use your sticks to create a square or rectangular frame for your new piece of paper. Use Sellotape or a hot glue gun to attach the sticks together.



7. Cut your mesh / sheer fabric so that it is the same size as the frame you've just made.
8. Now attach the mesh / sheer fabric to the frame with glue or Sellotape.
9. Cut out a second piece of mesh / sheer fabric, but this time make it slightly larger than the frame and put it to one side for later on in the process.
10. Once the bowl of paper pulp has been left to soak for at least 24 hours, it should be ready to turn into a new sheet of paper...
11. Lay your frame down in a large bowl or on the sink draining board.
12. Pour some of the paper pulp into the frame, taking care to spread the pulp evenly across the frame.
13. Once finished, carefully pick up your frame, being sure to keep it flat, and lay it on a flat surface that you can leave it to dry on.



14. Time to get rid of the water! Place your bigger piece of mesh / sheer fabric on top of the frame and use your rolling pin to roll out as much water as you can. Use your sponge to absorb any excess water as you roll.
15. Repeat step 14 as many times as necessary in order to remove as much water as possible.
16. Take the top layer of mesh / sheer fabric off of the frame. If the flattened paper pulp sticks to the mesh / sheer fabric it is still too wet and you should return to step 14 to try and squeeze some more water out before continuing.
17. Lay out a few sheets of old newspaper on a flat, solid surface.
18. Carefully pick up your frame and flip it over, leaving the sheet of paper pulp to dry whilst on the newspaper.
19. Carefully separate the frame from the drying sheet of paper pulp.
20. Leave this to dry for approximately 24 hours.

Once it is completely dry, you've got yourself a completely new piece of paper – all made from your old, used paper!

This is a great example of how we can recover, recycle, and reuse materials.

ACTIVITY 1

We'd love to see pictures of you all getting involved with the activity. Show us your new pieces of paper or how much you were able to recycle!

Email these to us at computerscience@bt.com stating your school and key stage, or post on social media and mention @adastralpark with the hashtag #BSW23.

Links

Teacher Links:

- Micro:bit & the Global Goals <https://atadastral.co.uk/go/bswst01>
- Healthy Oceans <https://atadastral.co.uk/go/bswst02>
- Energy Awareness <https://atadastral.co.uk/go/bswst03>
- Helping Plants Grow <https://atadastral.co.uk/go/bswst04>
- Litter Hunt <https://atadastral.co.uk/go/bswst05>
- Protecting Animals on Land <https://atadastral.co.uk/go/bswst06>
- Saving Sea Creatures <https://atadastral.co.uk/go/bswst07>
- Climate Resources and Activities <https://atadastral.co.uk/go/bswst08>
- Power Savers <https://atadastral.co.uk/go/bswst09>

Find Out More:

- Hello World – Sustainability & Computing <https://atadastral.co.uk/go/bswsf01>
- Tackling Climate Change with Technology <https://atadastral.co.uk/go/bswsf02>
- You and the Planet <https://atadastral.co.uk/go/bswsf03>
- Climate Change Video Series <https://atadastral.co.uk/go/bswsf04>

Have A Go:

- Light-up Fishing Nets <https://atadastral.co.uk/go/bswsh01>
- Saving Sea Turtles <https://atadastral.co.uk/go/bswsh02>
- Animal Tracker <https://atadastral.co.uk/go/bswsh03>
- Great Object Hunt: Our Natural Environment <https://atadastral.co.uk/go/bswsh04>

ACTIVITY 2

1. Hunt

Embark on your very own Tech Treasure Hunt, from Recycle Your Electricals, and find the old electricals in your house or classroom!

Ask a grown-up if they have any old or unused electricals which may have been forgotten about in drawers or cupboards.
You'll need to print this page so you can start to fill out step 1.

Step 1: HUNT			Step 2: DECIDE		
Unwanted electrical item	How many?	Is it broken?	Fix it?	Pass it on?	Recycle it?
					
					
					
					
					
					
					
					
					
					
					
					
					
					
					

recycle your electricals

ACTIVITY 2

2. Decide

Now it's decision time! What are you going to do with all the electricals you have found? Are you going to Fix it, Pass it on or Recycle them?

Read more about each option below. Then complete step 2 on your printed worksheet.

Fix it!

Many organisations can repair and refurbish your small electricals.

Your grown-ups can ask the original manufacturer for a list of their authorised repair networks.

Pass it on!

If nobody wants it, pass it on. Charities can raise vital funds by selling your old electricals or giving them to people in need.

Electricals will need to be prepared (personal data cleared etc.) before they are passed on.
You can find out how to do this by visiting www.recycleyourelectricals.org.uk.

Recycle it!

If it has a plug, battery or cable, it can be recycled and turned into anything from life-saving equipment to children's playgrounds.

Find out more by visiting
www.recycleyourelectricals.org.uk.

3. Bag it

Place the electricals you are going to pass on in a bag. Put the electricals for recycling in another bag. Now you are ready to take them to their new home!

recycle your electricals

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EXTENDED REALITY

Activity Pack

Extended Reality, often shortened to XR, covers three different technologies which you may have already heard of: Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR). All of these technologies create immersive digital experiences and can provide some really exciting opportunities to interact with environments you haven't seen before!

Let's explore each technology:

Augmented Reality (AR)

Augmented Reality enhances the real world with digital information such as text or animations overlaid on a screen. To experience AR, you may have to wear a pair of AR glasses or use a smartphone or tablet. One of the most well-known examples of AR is the Pokémon GO game that overlays Pokémon onto the real world.

Another great example are Snapchat filters that allow you to make it look like you're wearing glasses, a beard, or silly hats. The great thing about AR is that you can still see what is going on around you in the real world and are less likely to bump into something (although you should still take care and be aware of your surroundings when experiencing AR). However, AR is reliant on your location and what your camera can see.

Virtual Reality (VR)

Virtual Reality puts you into a fully simulated, 360-degree, digital environment. This helps trick you into thinking you are really in that artificial world. For this experience, you have to wear a VR headset, which can come in many different shapes and sizes. When VR first burst onto the scene, it was used mostly for gaming.

But now there are lots of people using VR for training and many other applications across different industries such as construction, engineering, and healthcare! VR tends to be the most effective of the three technologies for putting people into an environment or location that they haven't been in before. This allows them to better prepare for an upcoming trip or practise a certain procedure before doing it in real life. However, when in VR you are mostly cut off from the real world which can be problematic at times.

Mixed Reality (MR)

Mixed Reality (MR) merges the real world and the virtual world together and is therefore a bit of AR and VR all mixed into one. It is where virtual objects can interact with real-life objects in your physical location.

The downside is that it does require a lot more processing power than VR or AR and is therefore the least well known/ used currently but could prove to be extremely exciting in the future!

EXTENDED REALITY

We'd love to see pictures of you all getting involved with the activities. Show us your new cardboard VR headsets! Did you find any other cool 360-degree videos?

Email these to us at computerscience@bt.com stating your school and key stage, or post on social media and mention @adastralpark with the hashtag #BSW23.

Links

Teacher Links:

- Introduction to Virtual, Augmented and Mixed Reality <https://atadastral.co.uk/go/bswxt01>

Find Out More:

- UrbanXR <https://atadastral.co.uk/go/bswxf01>
- Are Immersive Technologies the Future of Human Interactions <https://atadastral.co.uk/go/bswxf02>
- From Holograms To Augmented Reality <https://atadastral.co.uk/go/bswxf03>
- Creative Media <https://atadastral.co.uk/go/bswxf04>

Have A Go:

- Virtual School Trips <https://atadastral.co.uk/go/bswxh01>
- Google AR & VR <https://atadastral.co.uk/go/bswxh02>
- Roll-a-Ball <https://atadastral.co.uk/go/bswxh03>
- Google Earth VR <https://atadastral.co.uk/go/bswxh04>
- Learn Code & Start VR Projects <https://atadastral.co.uk/go/bswxh05>

ACTIVITY 1

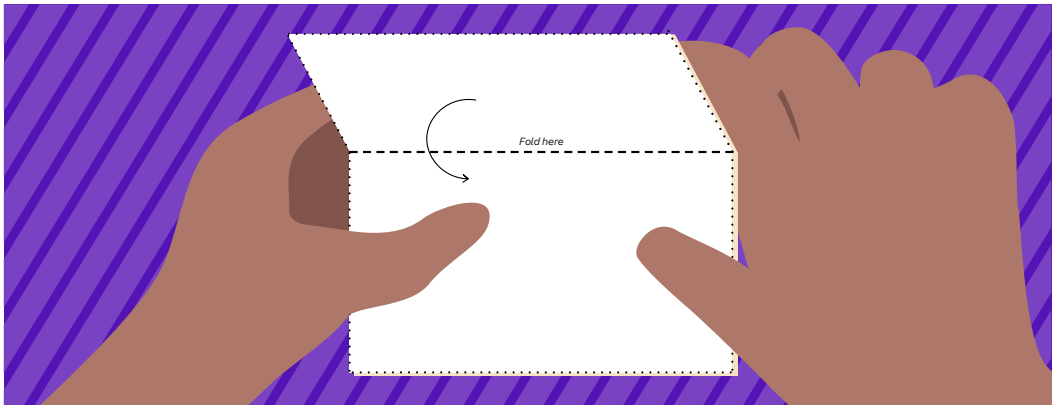
Kit List

- Cardboard (shoe box or box packaging)
- Printed Templates 1 - 5 (pages ER7-9)
- Scissors
- Printer
- Paper
- Velcro
- Pen or pencil
- Sellotape
- Glue

Instructions:

1. Print out Template 1 (on page ER7) onto some A4 paper.
2. Cut out Template 1 using scissors.
3. Attach Template 1 to some cardboard with glue or Sellotape so you can use it to cut around.

4. Place a ruler along the hashed line of Template 1 and bend the cardboard over it to create a crease.

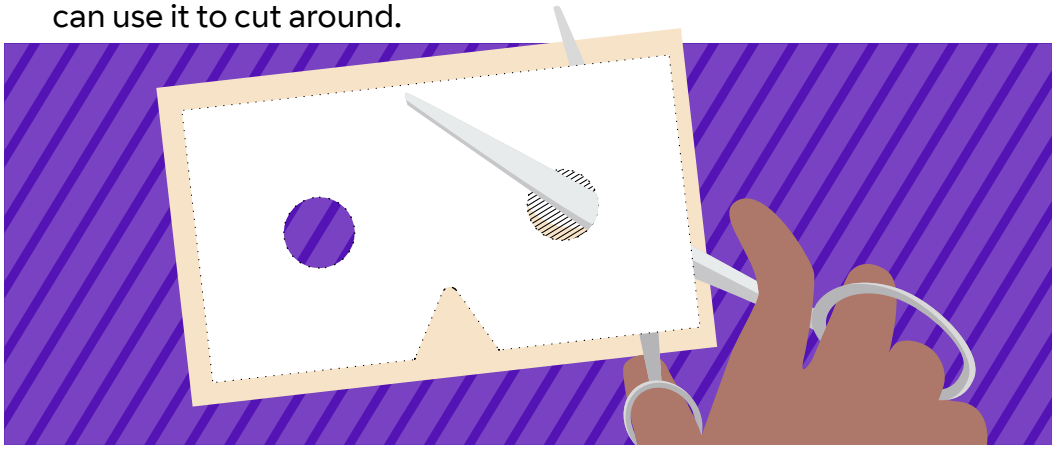


5. Print and cut out Template 2 (on page ER8) – there are three parts to this template.
6. Attach each part of Template 2 to some cardboard with glue or Sellotape so you can use them to cut around.
7. Print and cut out Template 3 (on page ER9).
8. Attach Template 3 to some cardboard with glue or Sellotape so you can use it to cut around.
9. Print and cut out Template 4 (on page ER9).
10. Attach Template 4 to some cardboard with glue or Sellotape so you can use it to cut around.

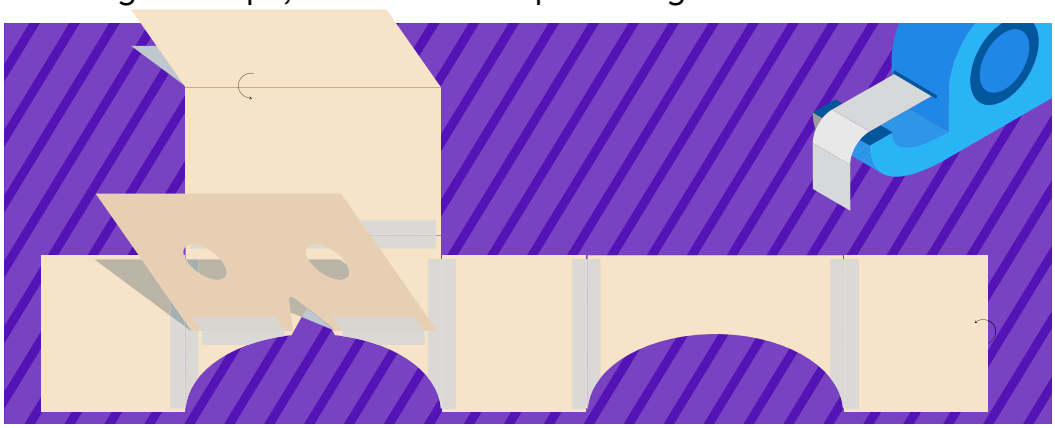
ACTIVITY 1

11. Print and cut out Template 5 (on page ER7).

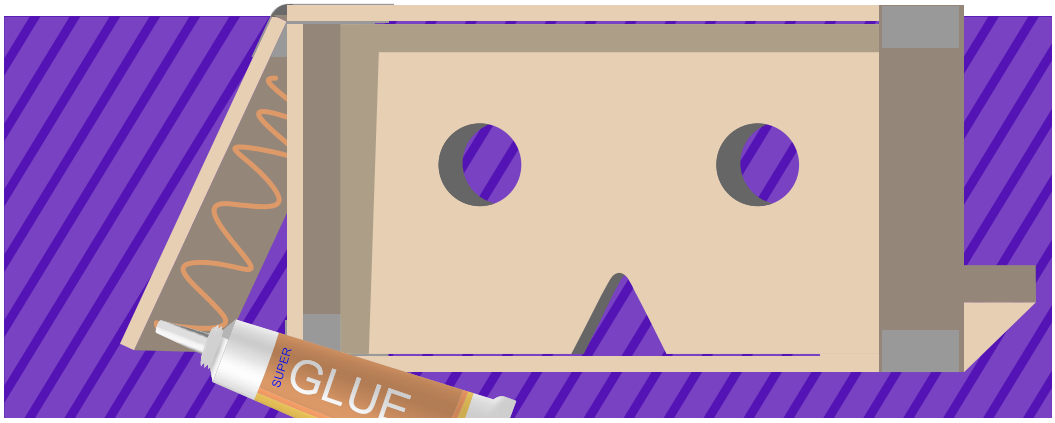
12. Attach Template 5 to some cardboard with glue or Sellotape so you can use it to cut around.



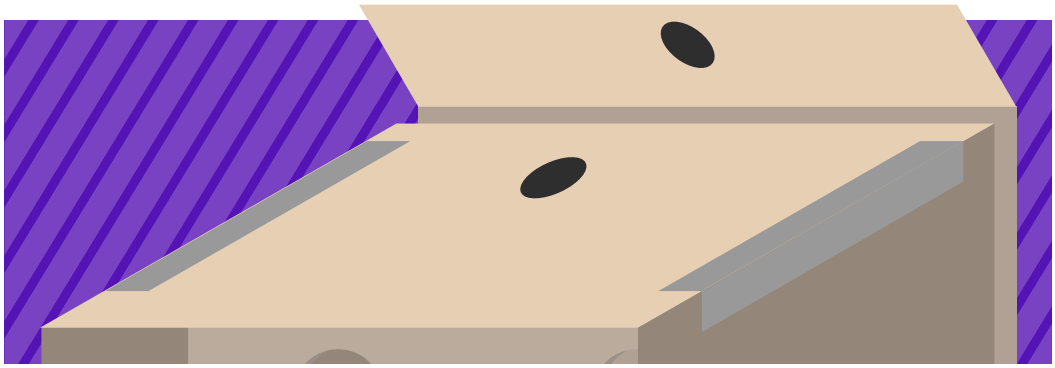
13. Using Sellotape, attach all of the pieces together like this:



14. Glue these two pieces of the cardboard together to give it the headset-like shape (you could alternatively use tape for this step):



15. Attach a small piece of Velcro to the top of the headset and the other side of the Velcro on the lid:



ACTIVITY 2

Kit List

- Cardboard VR glasses (from Activity 1)
- Smartphone

Instructions:

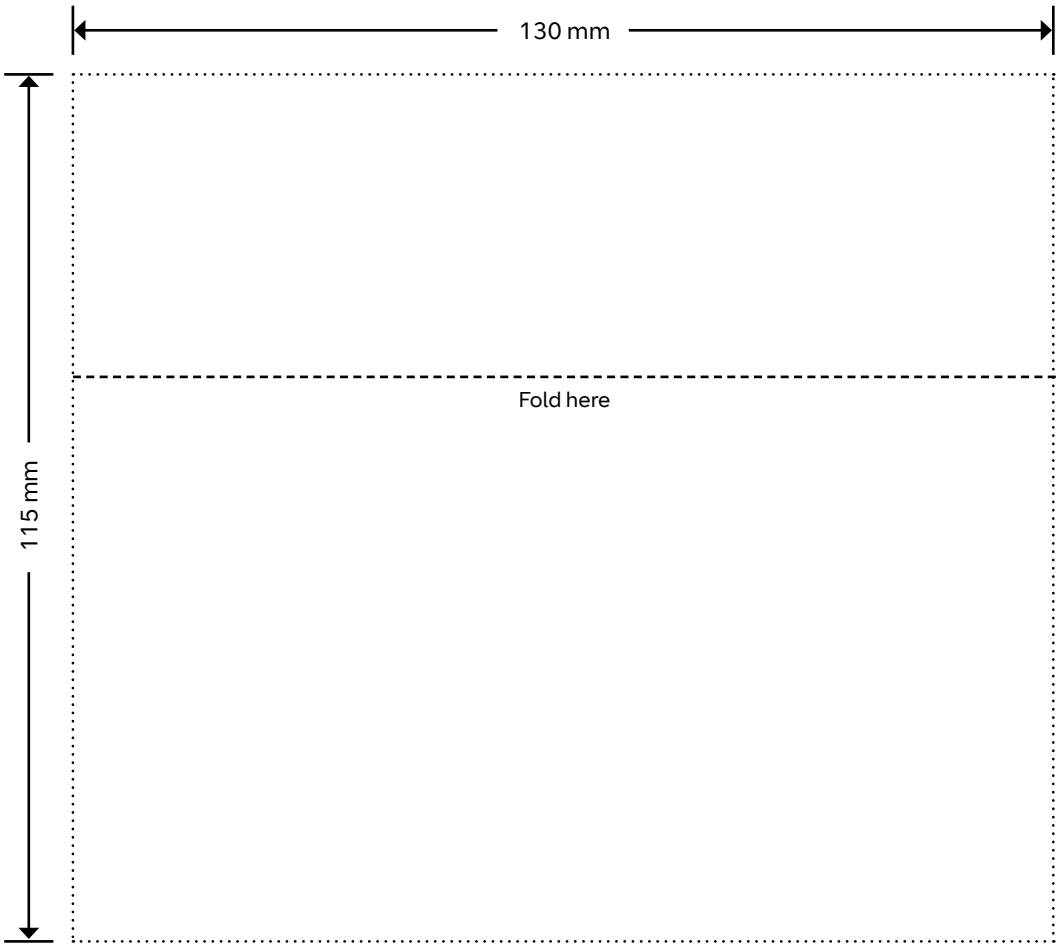
1. Make sure you have a smartphone that fits in your new cardboard VR headset.
2. Load up the 360° VR Spacewalk Experience on the smartphone.
3. Undo the Velcro on your VR headset and place your smartphone in the front of the cardboard VR glasses, with the screen facing the eyeholes.
4. Close the VR glasses by sticking the Velcro back together.
5. Hold the VR headset up to your eyes and immerse yourself in a VR Spacewalk experience – look around you, what can you see?

6. Try out some other 360-degree videos to explore more immersive, virtual worlds!

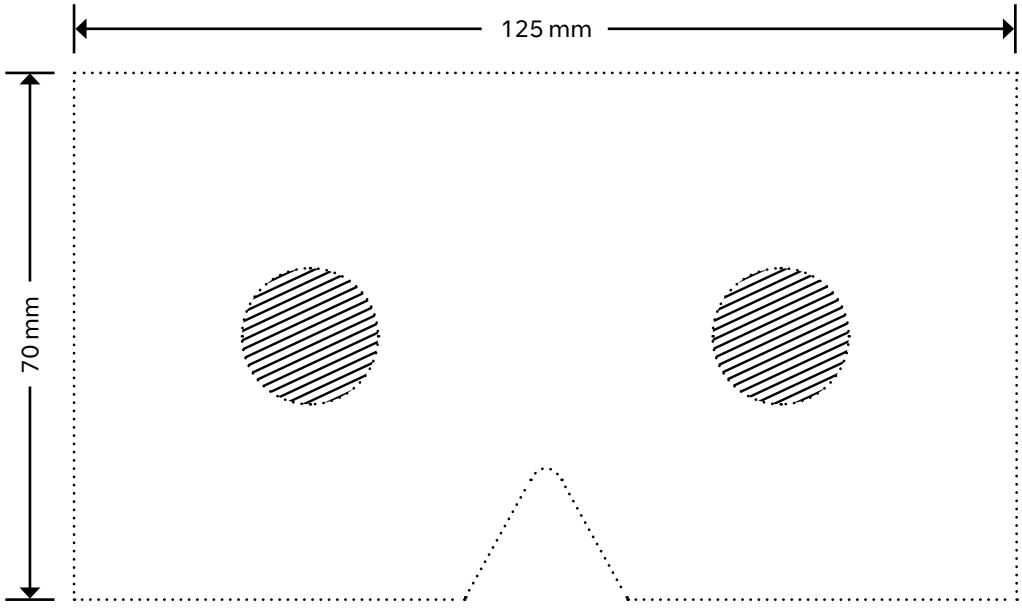
TEMPLATES

Cut along the dotted lines

Template 1



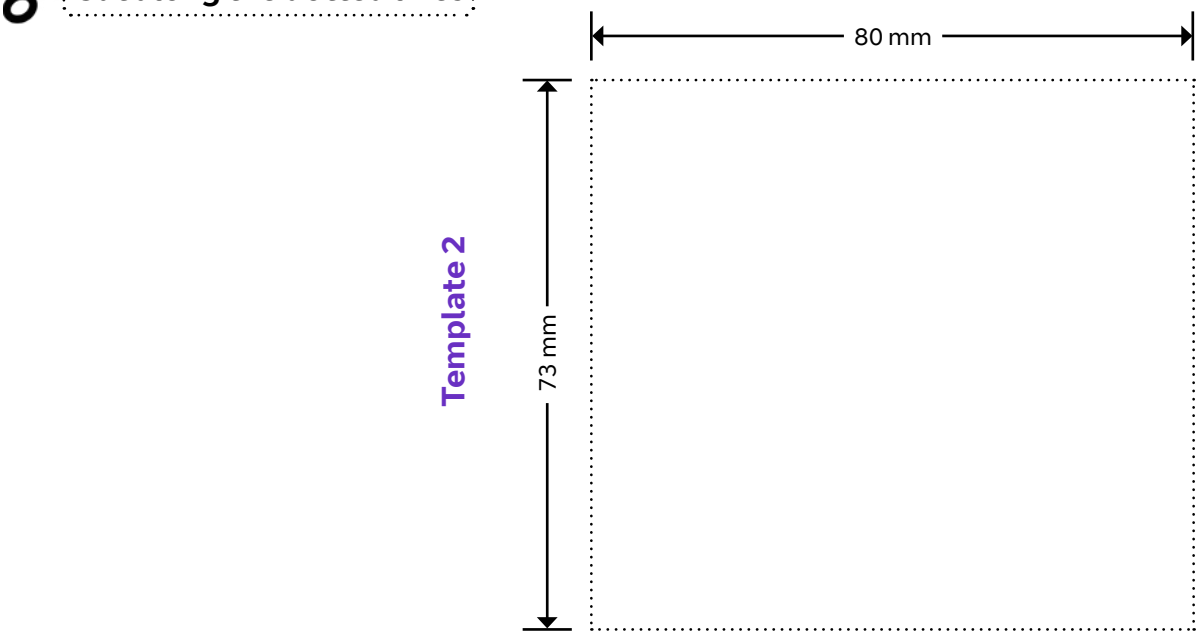
Template 5

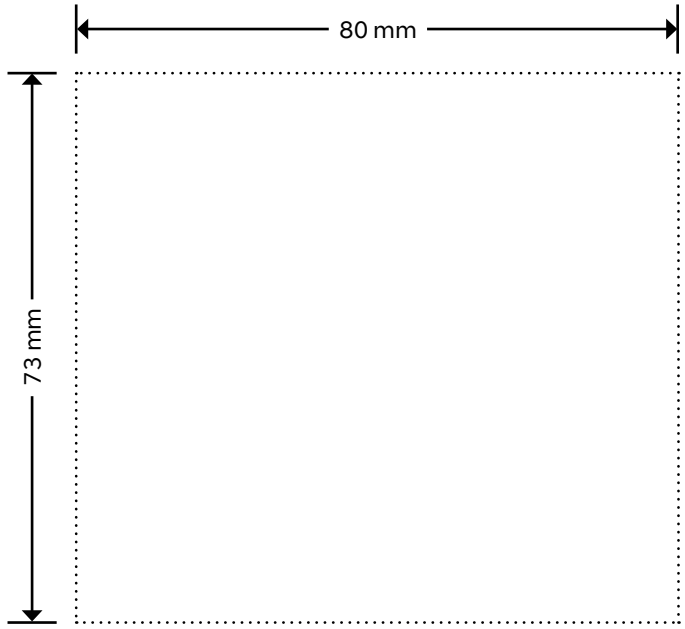


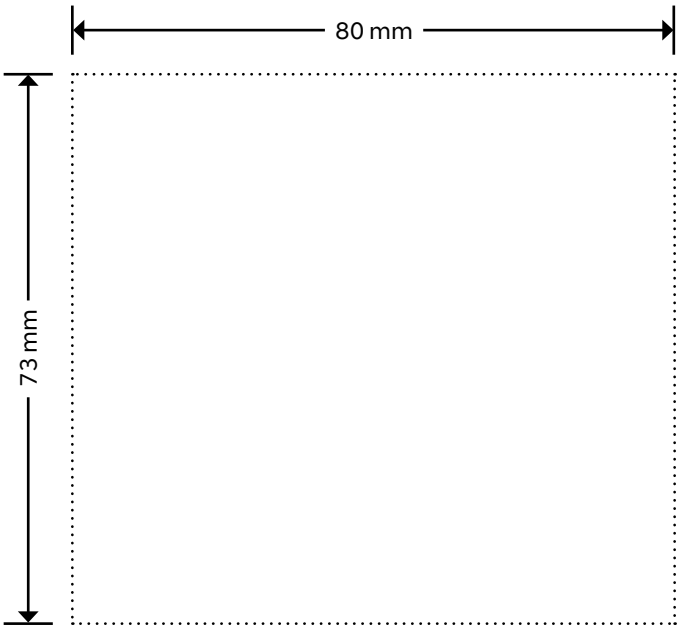
TEMPLATES

Cut along the dotted lines

Template 2



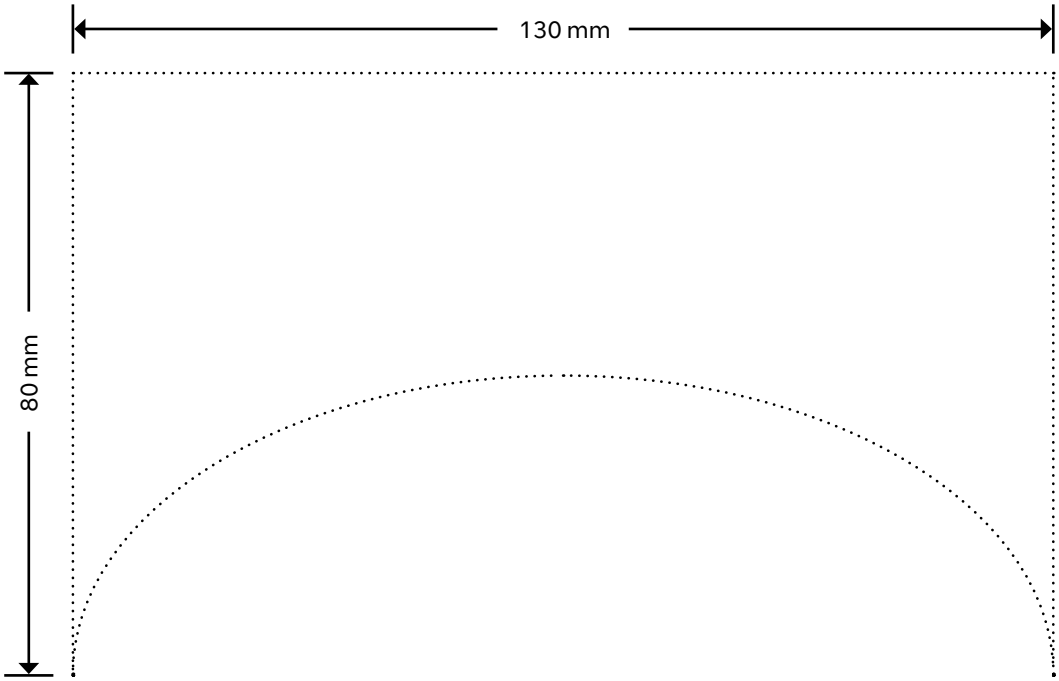




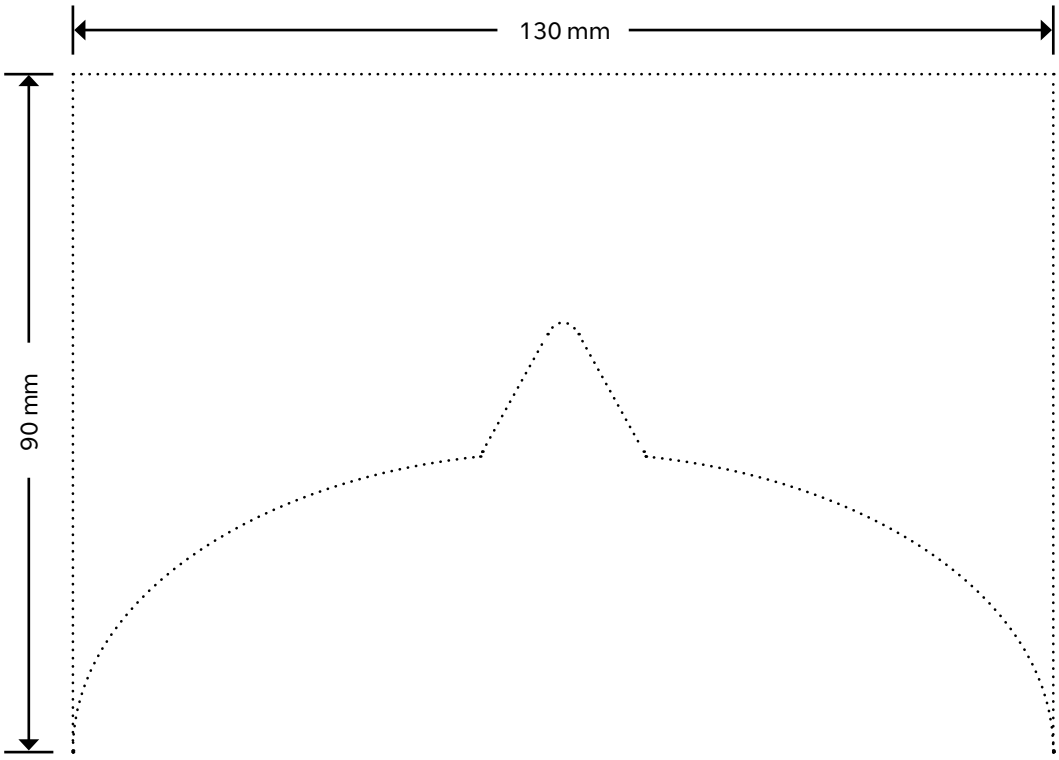
TEMPLATES

Cut along the dotted lines

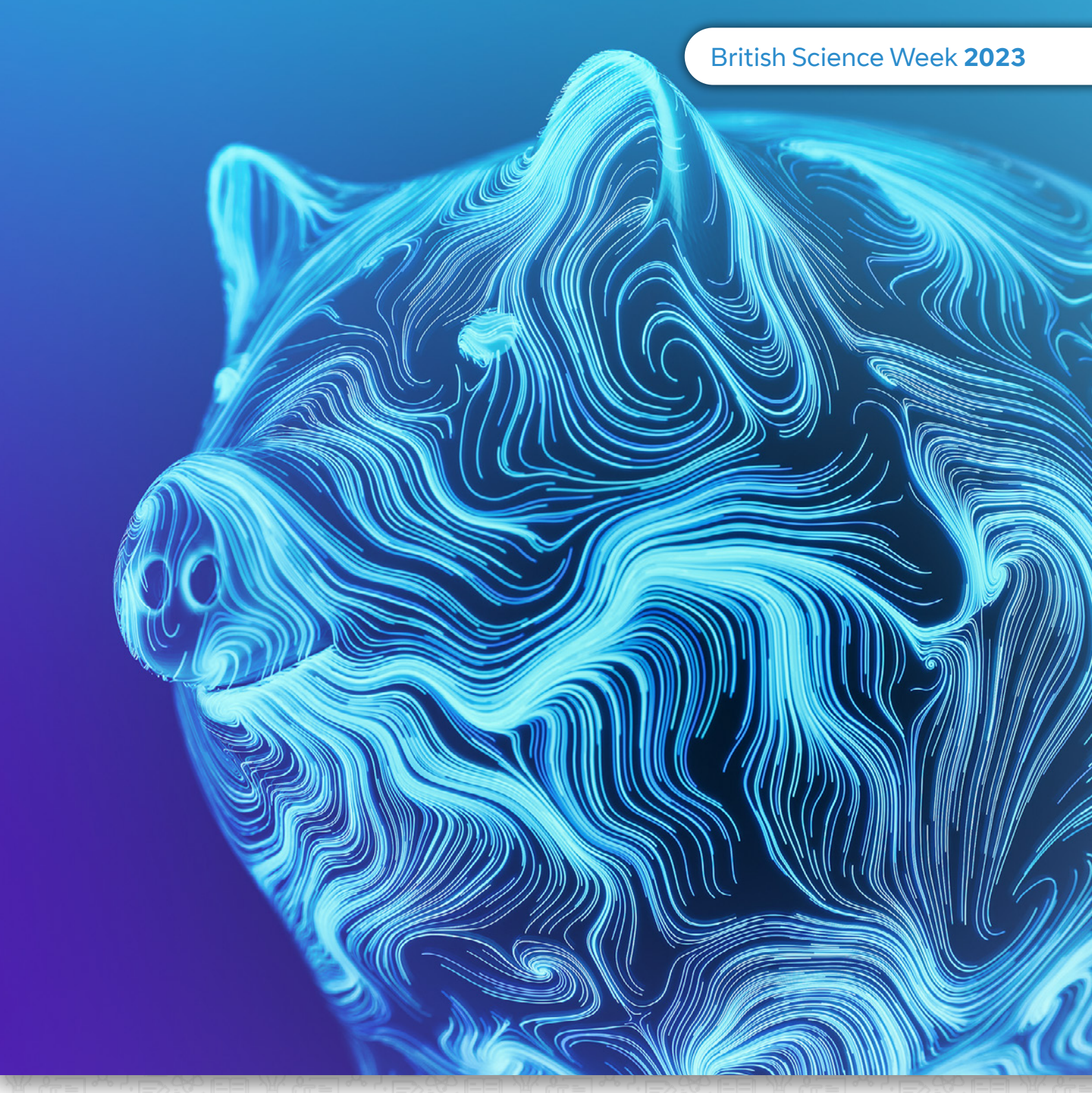
Template 3



Template 4



British Science Week **2023**



DIGITAL BANKING

Activity Pack

DIGITAL BANKING

In today's online world it is possible to buy almost anything using just a click of a button or using face ID on your mobile phone. Digital banking is a way to manage your money by using the internet, allowing us to do things digitally, rather than having to travel into bank branches in towns or cities. You can do things like check your account balance, transfer money between accounts, pay bills, and even deposit checks using just your device.

Digital banking is convenient because you can do it anytime and anywhere, as long as you have an internet connection. It certainly makes things more sustainable by removing some of the paperwork and the need to travel to a physical bank! Overall, digital banking is a modern and convenient way to manage your finances.

However, when it comes to such a crucial thing such as our money, how can we ensure that what we have in our bank accounts is safe and can't be stolen? Furthermore, how can we make sure that the communications we receive online asking for our personal details or payment are genuine?

Hackers are constantly at work, trying to find new ways to get around security measures. But the banks take security very seriously and invest lots of time and money, keeping one step ahead to help look after your hard-earned cash.

There are many cyber risks when banking digitally such as the threat of phishing attacks, man-in-the-middle attacks, or spoofing - all aimed at getting your money or personal data. These involve tricking you into giving away your account details or sending money to places you think are real but are actually a scam.

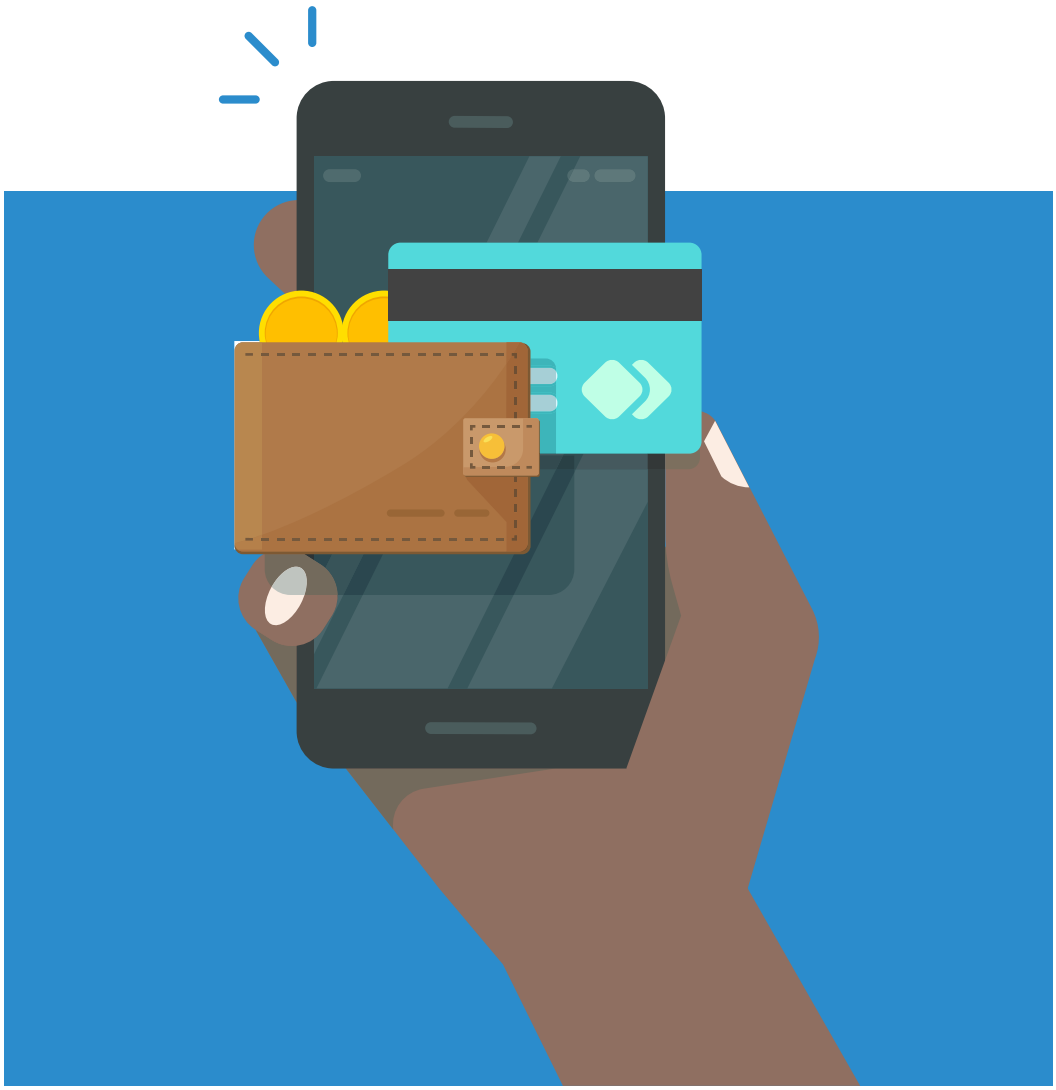
That is why banks use things like encryption and multi-factor authentication. As annoying as it may be to enter another code to login, it really is important, as it confirms to the bank that you are who you say you are!

If you would like the answers for Activity 1, please email computerscience@bt.com stating your school and key stage.

We'd also love to see pictures of you all getting involved with the activities. Tell us how many phishing / smishing clues you found, and what Digital Banking role did you end up with?

Email these to us at computerscience@bt.com or post on social media and mention @adastralpark with the hashtag #BSW23.

DIGITAL BANKING



Links

Teacher Links:

- KS3 / GCSE: Real Life Maths <https://atadastral.co.uk/go/bswbt01>
- Hello World: Maths & Computer Science <https://atadastral.co.uk/go/bswbt02>

Find Out More:

- Bank Card – The Secret Genius of Modern Life <https://atadastral.co.uk/go/bswbf01>
- Nationwide Building Society Educational Partnerships <https://atadastral.co.uk/go/bswbf02>
- Avoiding SPAM and Phishing <https://atadastral.co.uk/go/bswbf03>
- Phishing: Spot and Report Scams <https://atadastral.co.uk/go/bswbf04>
- My Data & Privacy Online: A Toolkit for Young People <https://atadastral.co.uk/go/bswbf05>
- Nationwide Building Society: Guide to Avoiding Scams <https://atadastral.co.uk/go/bswbf06>

Have A Go:

- Santander & Scuderia Ferrari Formula 1 Maths & Science <https://atadastral.co.uk/go/bswbh01>
- BBC Bitesize GCSE Maths <https://atadastral.co.uk/go/bswbh02>
- Online quiz: Can You Spot These Scams? <https://atadastral.co.uk/go/bswbh03>

ACTIVITY 1

Kit List

- Paper
- Pen or pencil
- Colouring pens or pencils

Keeping your bank details and data safe is super important. We know we shouldn't share our passwords, but when we receive messages from the bank, how can we tell if they're real or a scam?

If you were put on the spot, do you have what it takes to SPOT THE FAKE? Have a go at seeing if you would have noticed the clues in these REAL fakes!

Challenge 1: How many clues can you spot in these REAL phishing emails?

Phishing is when someone tries to steal your personal information by tricking you into clicking on links in emails. If you do click the link, then it might trigger your device to download some malicious software or take you to fake websites which may capture your login details.

Phishing scams don't just come from people pretending to be banks, they could be from other scam organisations or people pretending to be your friend or long-lost family member. But if someone can steal your login details, then they could try and use them on your accounts for other sites or take you to links which contain harmful content.

What could be wrong in these two examples?

Example1

From: Amazon Billing <amazon-refundz.com>
Sent: 15 August 2022 13:47
To: Scott Jason Scott.Jason@iclud.com
Subject: Refund – Valid Billing information needed.

amazon.co.uk prime

Your Orders | Your Account | Amazon.co.uk

Hello,

Thanks for your order. Due to a system error, you were double charged for your last order. A refund process was initiated, BUT could not be completed due to errors in your billing information.

REF CODE: 16490J

Your required to provide us with valid billing information to complete the refund process.

Update Billing information

After your information has been validated, your should received your refund withing 3 business days

Thanks Amazon

ACTIVITY 1

Example 2

You have been mentioned in a group

Teams <noreply@email-teams-micrsoft.com>
Sent: 18 January 2023 13:36
To: Mathew Connor
Subject: LM and S sent 2 messages to your chat

Hi,

Your teacher is trying to reach you in **Microsoft Teams**.

You have been mentioned in group "**late Maths homework**"

> Your late homework does not meet school standards.
> Please take a look...

Reply in Teams

Install Microsoft Teams now

iOS Android

This email was sent from an unmonitored mailbox. Update your email preferences in Teams. Activity > Settings (Gear Icon) > Notifications.

Microsoft

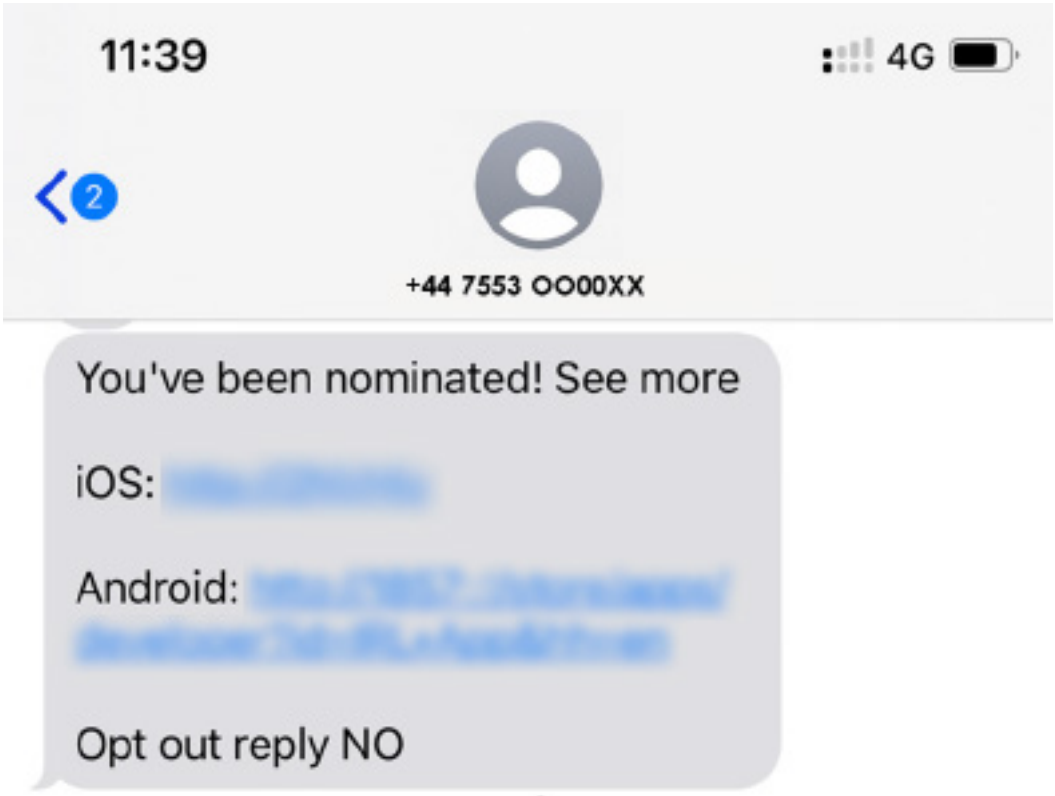
Challenge 2: **How many clues can you spot in these REAL smishing messages?**

Smishing is when cyber criminals send messages via text or on social media to trick you into sharing information or downloading malware onto your device. As with phishing emails, texts can also include malicious links or attachments to get you to do something bad.

Remember that, like email phishing, smishing is a crime of trickery. It is a form of social engineering and relies on the good nature of humans and our inherent trust for others. But this is all about fooling the victim into cooperating, by clicking a link or providing information as most people would just assume (wrongly) that it is ok to do so.

The simplest protection against these attacks is to do nothing at all. So long as you don't respond or click on the links, a malicious text or email can't do anything. If you're unsure… ask someone else about it, report it and delete it.

How many clues can you find as to why this text is actually a scam?

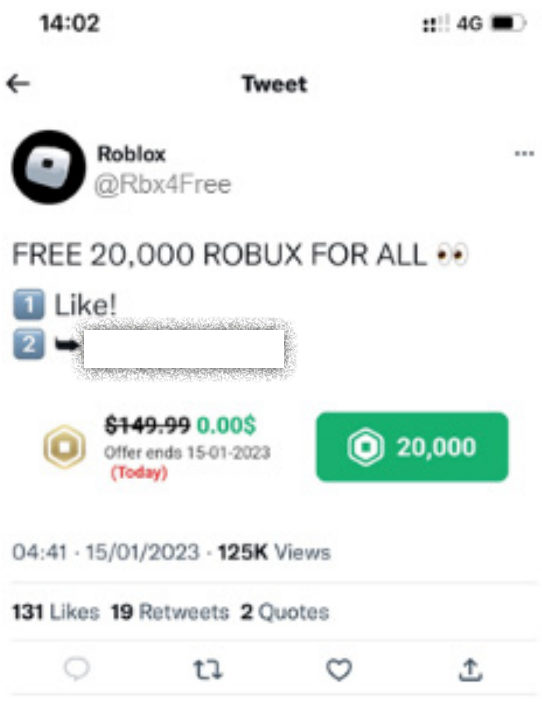


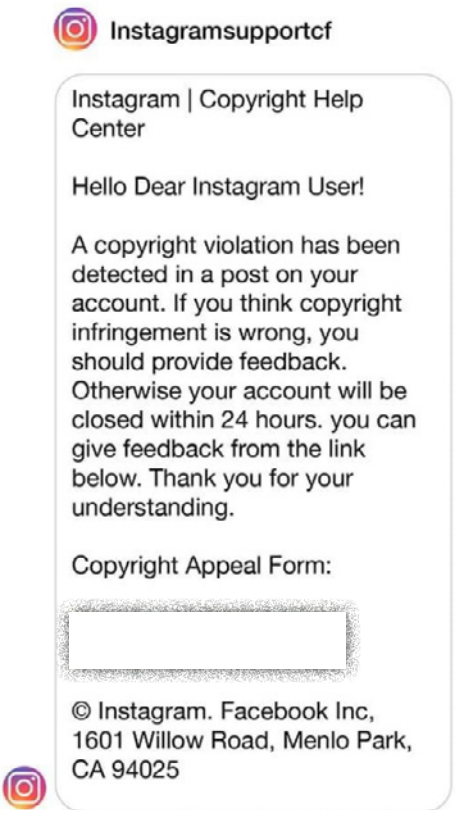
ACTIVITY 1

Caution: these are real scams.
Please do not type these links into a web browser.

Here are a couple of scams from social media below. These could be trying to get you to log into your accounts and steal your:

- Credentials
- Personal information
- In-game currency even, such as Robux!





ACTIVITY 1

Now it's your turn

How can you help make sure others don't fall for these tricks?

In your pairs or groups, create a campaign poster to raise awareness of these scams with some advice on how to stay safe online.

In the future, you could work in cybersecurity or fraud prevention within a bank, using technology to reduce scams and keep people safe. Try out Activity 2 to see if a career in Digital Banking is for you!

Tips & Advice

- Keep your online accounts secure and private.
- Watch out for suspicious emails, text messages or websites.
- Don't click on links if you don't trust them.
- Decline payments when prompted from people you don't know.
- Choose carefully where you shop online.
- Use a credit card for online payments.
- Only provide enough information to complete your purchase, and no more.
- If things go wrong, speak to an adult who can support you and help you to report it. <https://atadastral.co.uk/go/bswbfc>

ACTIVITY 2

Kit List

- Printed worksheet on page DB12
- Pen or pencil
- Colouring pens or pencils

Is Digital Banking for me?

Digital Banking opens a world of opportunities with roles in all sorts of areas. You could be designing how customers interact with the mobile app, answering questions to an e-chat, keeping customers safe or using the newest technology to design the future of banking!

Instructions:

1. Print out the worksheet on page DB12.
2. Answer the following 10 questions (adapted from www.techskills.org/careers/), to see what type of role you might take in technology.
3. Jot down your answer (A, B, C or D) to each question in the 'Your Answer' column of the table on your print-out.
4. For each question, colour in the letter of your answer wherever it appears along that row.
5. For each column, add up the number of coloured circles there are and make a note of this in the box at the bottom.
6. Answer these questions:
   a. Which column had the highest number of bubbles coloured in? (add the role code below)

      This is the role that seems to suit you the most!

      _____

   b. Which column has the second highest number of bubbles coloured in? (add the role code below)

      This is the next-best role that could suit you too!

      _____

What do these codes mean? Have a look at the table on pages DB13 - 15 to see the descriptions of each role. All of these roles exist within a potential Digital Banking career.

techskills
a techUK company

Is a career in Digital Banking for me?

ACTIVITY 2

Q1 Which of these statements do you agree with most?

I'm an artistic person - I love drawing or designing

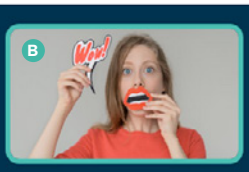
I'm a creative thinker and have an active imagination

I love coming up with new ideas for things

I'm a logical person – I love Maths & Science

Q2 When you see a cool new thing like a gadget or an app, do you think:

Amazing – whoever thought that up is a genius



Wow – I wonder how that works

Awesome – I'd love to create something like that

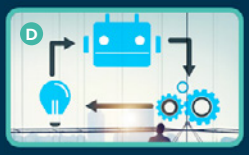
Clever, but I wouldn't give a moment's thought

Q3 What are you like at fixing or building things?

I can design things, but wouldn't have a clue how to build it

Brilliant - I'm always the go to person when something is broken

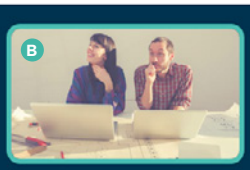
I only do it for fun - I liked Lego and The Sims as a kid



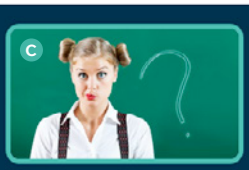
I'd rather build something than design it

Q4 Which of these statements best describes you during a group discussion?

I try and listen to everyone's opinion before I communicate my own



If I don't understand something I keep it to myself and find out later

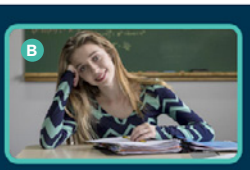


If I don't understand something I ask at the time

I tend to say what's on my mind and stick to my guns

Q5 Would you say you're good at maths?

Yes, it's my best subject



I'm quite good I but have to work hard

It's not my strongest subject but I get along ok

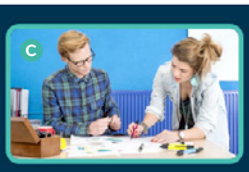
I prefer creative subjects like languages, English or art

ACTIVITY 2

Q6 Creating a new product as a team, would you...

Make sure the team have everything they need to develop it

Design the look of the product



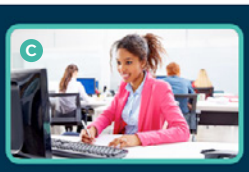
Build a working model of the product

Teach other team members how to make the product

Q7 What would your dream job look like?

I would like to do something different everyday

I'd like to solve problems



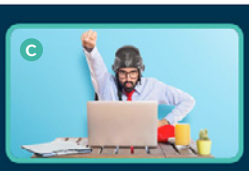
I'm happy to follow instructions - I like structure and routine

Whatever I'm working on, I want to be leading

Q8 What level of challenge do you like?

I perform best when under pressure

I'm at my best when I'm thinking creatively



If I can't solve it quickly, I get bored and move on to something new

I have an eagle eye and work on something until it's perfect

Q9 When invited to a party where you only know the host, do you?

Accept the invitation and look on it as an opportunity to make new friends

Accept - but I'd ask if I can bring a friend

Go to the party, but I tend not to mingle easily with people I don't know

Refuse - I wouldn't go to a party where I hardly know anyone

Q10 Organising a camping trip with your friends, what role would you take?

The leader - I'd take care of scheduling the travel and activities

Entertainer - keeping people's spirits up when it rains

Reading out the instructions for building the tent

I'd just pitch in wherever I was needed

ACTIVITY 2

Question	Your Answer											
1		D	B C	A B	D	D	C D	A B	B	D	C	D	B
2		A D	B	A D	B D	B	B C	C	C	B	B	B	A
3		B C	B D	A	B	A D	B C	A	C	B		B	A
4		A	A	C	B D	B	B C	C	C	C	C	C	C
5		A B	C D	C D	A	A	A	C	C	B	A	A	A
6		A	C D	B	A C	C	B	B	B	C	C	C	B D
7		B	B D	A	C	B	B	A	C	C	B	C	B
8		A	A B	B	D	D	A	A	D	D	A	D	D
9		A B	A	B	B	C	C	B	B	C	D	C	C
10		A C	B	D	A	A D	A D	D	C	D	D	D	D
Total of coloured boxes in each column													
Role code		BM	CR	M	BA	DS	DA	UX	WD	TE	CS	NE	SE

Don't forget to check out the online version of this activity from TechSkills at: www.techskills.org/careers/.

ACTIVITY 2

What are the different types of roles you could have?

Business Manager (BM)	A business manager is a person who manages people, resources and budgets to make projects a success. They need to build good working relationships with internal and external customers within organisations and will have excellent interpersonal, negotiation, motivation and presentation skills.
Sales and Client Relations (CR)	Job roles in Sales and client relations includes building and managing relationships with clients, helping customers solve their technical problems, or translating complex technical information into language that can easily be understood by non-technical people. The Sales team help to grow businesses and are responsible for increasing the number of customers and the number of services the organisation provides to a customer. Sales people are often out meeting new people every day, selling inventive digital solutions to help them solve their business problems.
Marketing (M)	Marketing roles are focused on raising the visibility of a company's brand and working with the Sales teams to increase business. They are usually involved in promoting a brand and raising its profile online using social media and digital marketing tools to help a new brand, product or service go viral.
Business Analyst (BA)	A business analyst is responsible for assessing the business impact of change, capturing, analysing and documenting requirements and supporting the communication and delivery of requirements with relevant stakeholders. They create detailed analysis of systems and make recommendations for improvement. They produce specifications of user requirements that enable software engineers to develop the right software solutions. They require a broad foundation of skills and knowledge to be able to be effective as their work incorporates all aspects of digital technology systems.
Data Analyst (DA)	The primary role of a data analyst is to collect, organise and study data to provide new business insight. They are responsible for providing up-to-date, accurate and relevant data analysis for the organisation. They are typically involved with managing, cleansing, abstracting and aggregating data across the network infrastructure. They have a good understanding of data structures, software development procedures and the range of analytical tools used to undertake a wide range of standard and custom analytical studies, providing data solutions to a range of business issues. They document and report the results of data analysis activities making recommendations to improve business performance. They need a broad grounding in technology solutions to be effective in their role.

ACTIVITY 2

Data Scientist (DS)	Data Scientists find information in diverse datasets to address complex problems and improve organisational processes. They are inquisitive, they explore and visualise data of all kinds, find and present 'stories' within the data in a meaningful way to a range of technical and non-technical audiences. They make recommendations to inform strategic and operational decision making through sourcing, accessing and manipulating data, and engineering data processes. They identify and address data bases and handle private data ethically and appropriately, complying with (inter)national privacy regulations.
UX Designer (UX)	The broad purpose of this occupation is to investigate, analyse and design the experience that people have with digital products and services, both current and emerging. They do this in order to find ways these interactions can be implemented, improved and optimised over time. Digital User Experience (UX) Professionals are responsible for the continuous improvement of the experiences that digital products and services offer to their users and for leading and advocating the use of user-centred design practices within multi-disciplinary teams.
Web Developer (WD)	A web developer will create reliable and high-performing web-based applications and services. Focusing solely on the underlying software and databases (known as the 'back end') is most common. However, some web developers work on the interface and visual design (the 'front end'), and others combine both ('full-stack development'). The job's purpose is to create products that meet clients' needs. The work can be varied and might mean several projects being run simultaneously. Web developers have regular meetings with clients to discuss their requirements and update them on progress.
Technical Engineer (TE)	A technical engineer is a person that is able to architect, install, service and repair the computer hardware and/or communication systems within or between organisations. From designing equipment such as routers, switches, multiplexers and other specialized computer/electronics equipment to maintaining computer networks and hardware, a technical engineer is the backbone of an organisation's technology systems.

ACTIVITY 2

Cyber Security Analyst (CS)	A cyber security analyst is responsible for the implementation, maintenance and support of the security controls that protect an organisation's systems and data assets from threats and hazards. They ensure that security technologies and practices are operating in accordance with the organisation's policies and standards to provide continued protection. They require a broad understanding of network infrastructure, software and data to identify where threat and hazard can occur. They are responsible for performing periodic vulnerability assessments to evaluate the organisation's ongoing security posture and will provide visibility to management of the main risks and control status on an ongoing basis. They respond to security incidents and implement resolution activities across the organisation.
Network Engineer (NE)	The primary role of a network engineer is to design, install, maintain and support communication networks within an organisation or between organisations. They need to maintain high levels of network performance and availability for their users, such as staff, clients, customers and suppliers. They will understand network configuration, cloud, network administration and monitoring tools, and be able to give technical advice and guidance. As part of their role, they need to be proficient in technology solutions as they will analyse system requirements to ensure the network and its services operate to desired levels. They will need to understand the data traffic and transmission across the network, and they have a major role to play in ensuring network security.
Software Engineer (SE)	The primary role of a software engineer is to be able to design, build and test high-quality software solutions. The software engineer role is broader, with higher levels of responsibility than a software developer as they need to apply engineering principles to all stages of the software development process, from requirements, analysis and design, development and data requirements whilst ensuring security robustness is built in. They will typically be working as part of a larger collaborative team and will have responsibility for significant elements of software projects.

British Science Week **2023**

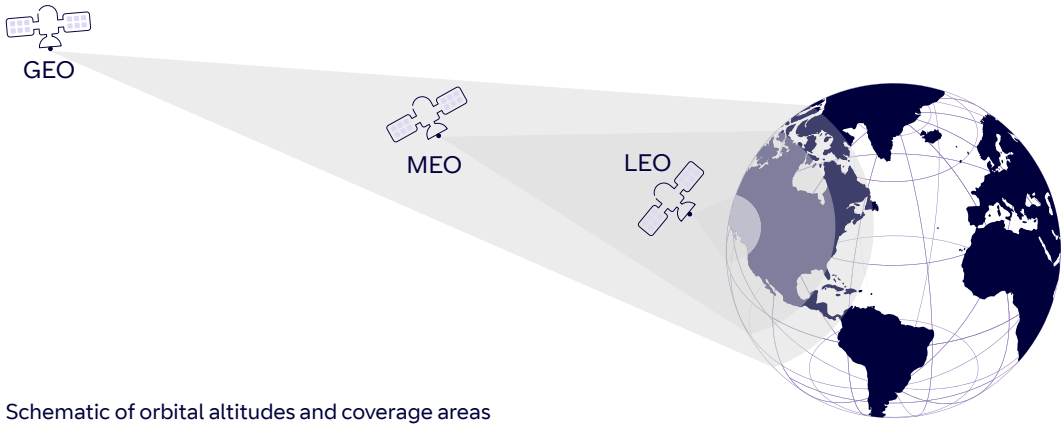
SPACE

Activity Pack

SPACE

Space is such a huge and exciting topic! When you think about space, you may think of planets, aliens, or rockets. However, for British Science Week we've focused on satellites that orbit in space and look at how they can be used to increase connectivity back down on Earth or provide helpful services for us humans.

Let's focus on three types of satellite in space. LEO, MEO & GEO starting with the ones furthest from Earth:

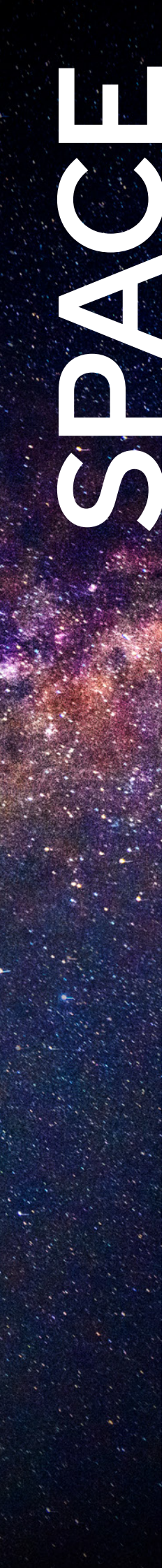


Schematic of orbital altitudes and coverage areas

GEO (Geostationary Equatorial Orbit) Altitude: 36,000km above Earth
GEO satellites stay above the same point on the ground because they follow the rotation of the Earth. They are used to help provide services like weather data or TV shows. They are quite far away though and therefore introduce latency into the network (latency is the time it takes for data to be sent from one machine to another, the smaller the better).

MEO (Medium Earth Orbit) Altitude: 5,000 - 20,000km above Earth
MEO satellites are sometimes referred to as the 'Goldilocks Orbit' because they're not too close and they're not too far away, they're just right! By being closer to Earth than GEO, MEO satellites have a lower latency and much better signal strength (more megabits per second). But by being a bit further away compared with LEO satellites, they can 'see' more of the globe, and therefore you don't need as many satellites to provide coverage to the entire planet. They've traditionally been used for things like GPS but are now starting to be used to supply internet connectivity to remote areas or places like cruise ships in the middle of the ocean!

LEO (Low Earth Orbit) Altitude: 500 - 2,000km above Earth
LEO satellites have the lowest latency, which is great, but because they orbit so much closer to Earth, they don't cover as much area and therefore you have to launch thousands of satellites into space to achieve full Earth coverage! By using these satellites in space, you can provide signal to rural areas where you otherwise wouldn't be able to connect to the internet, stream music or play your games console online!



We'd love to see pictures of you all getting involved with the activities. Show us your satellite models and definitely send in those Space badges you've designed!

Email these to us at computerscience@bt.com stating your school and key stage, or post on social media and mention @adastralpark with the hashtag #BSW23.

Links

Teacher Links:

- Royal Observatory Classroom Resources <https://atadastral.co.uk/go/bswspt01>
- National Space Centre Education: Free Downloadable Resources <https://atadastral.co.uk/go/bswspt02>
- UK Space Agency: Educational Resources <https://atadastral.co.uk/go/bswspt03>
- NASA STEM Engagement <https://atadastral.co.uk/go/bswspt04>
- The European Space Agency: Primary Classroom Resources <https://atadastral.co.uk/go/bswspt05>
- The European Space Agency: Secondary Classroom Resources <https://atadastral.co.uk/go/bswspt06>
- European Southern Observatory: Educational Material <https://atadastral.co.uk/go/bswspt07>
- The Royal Society: Teacher Resources <https://atadastral.co.uk/go/bswspt08>
- European Space Education Resource Office CPD & Resources <https://atadastral.co.uk/go/bswspt09>

Find Out More:

- Careers in Space <https://atadastral.co.uk/go/bswspf01>
- Tim Peake's Spacecraft <https://atadastral.co.uk/go/bswspf02>
- Drones <https://atadastral.co.uk/go/bswspf03>

Have A Go:

- Satellite Viewer <https://atadastral.co.uk/go/bswsph01>
- NASA Fun Activities To Do @Home <https://atadastral.co.uk/go/bswsph02>
- The Moon Adventure <https://atadastral.co.uk/go/bswsph03>
- No Pressure <https://atadastral.co.uk/go/bswsph04>
- Rugged Rovers <https://atadastral.co.uk/go/bswsph05>
- Institute of Physics Activity Packs <https://atadastral.co.uk/go/bswsph06>
- Astro Pi Challenge <https://atadastral.co.uk/go/bswsph07>

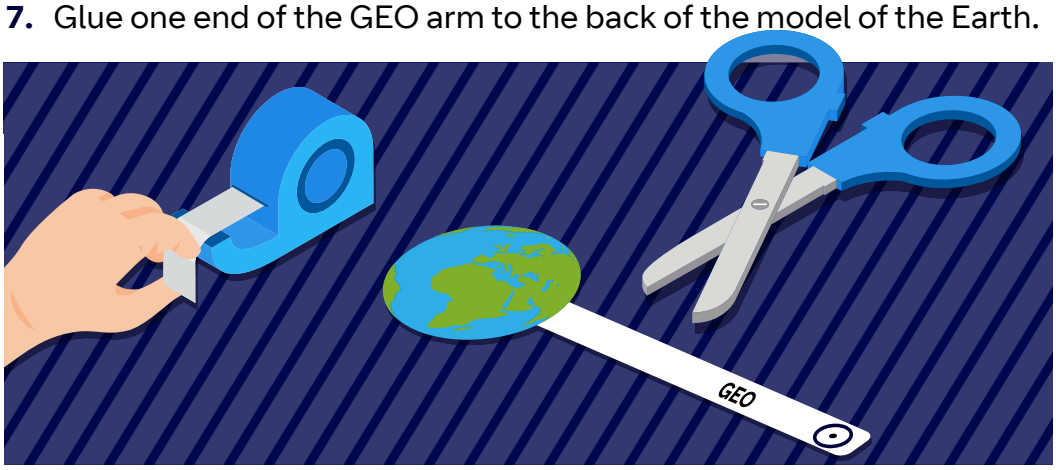
ACTIVITY 1

Kit List

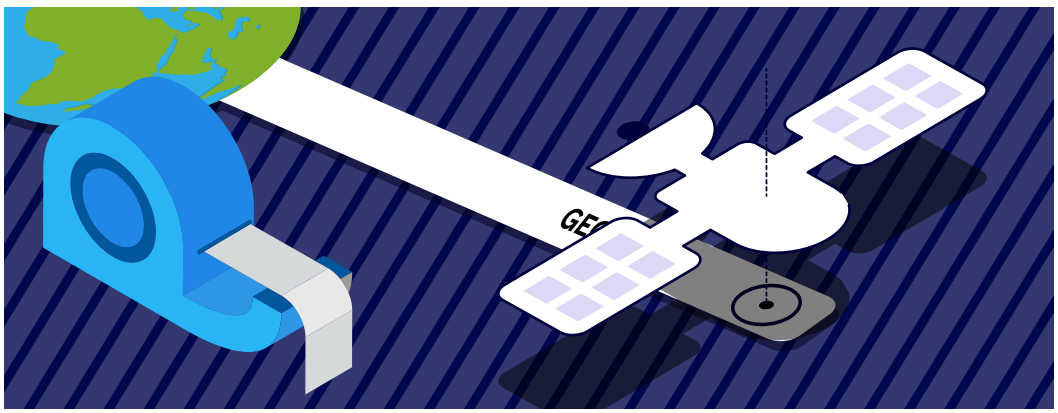
- Cardboard (cereal box, shoe box or any thin card)
- Scissors
- Printed Template 1 (page SP6)
- Pen or pencil
- Colouring pens or pencils
- Paper fasteners
- Glue
- Sellotape

Instructions:

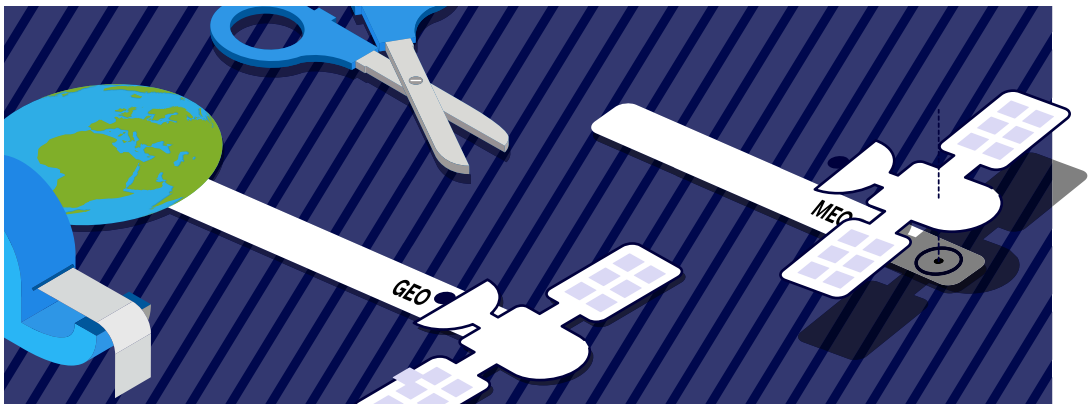
1. Cut out a piece of cardboard so it is the same size as a piece of A4 paper.
2. Print out the Template on page SP6 onto some A4 paper.
3. Stick this Template onto the piece of cardboard with some glue.
4. Using scissors, cut around the lines on the Template to give you the 7 parts needed to build this model.
5. On the three squares you have cut out, it's time to get creative! You need to design your own LEO, MEO & GEO satellites by drawing them in the correctly labelled square.
6. Once you've drawn them, colour them in and then cut them out.
7. Glue one end of the GEO arm to the back of the model of the Earth.



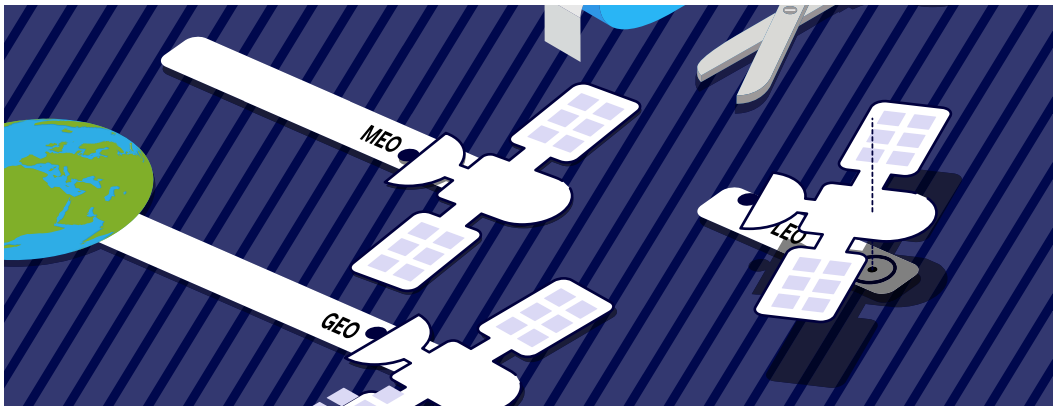
8. Glue or Sellotape one end of the GEO arm to the back of the Earth cut-out like this:



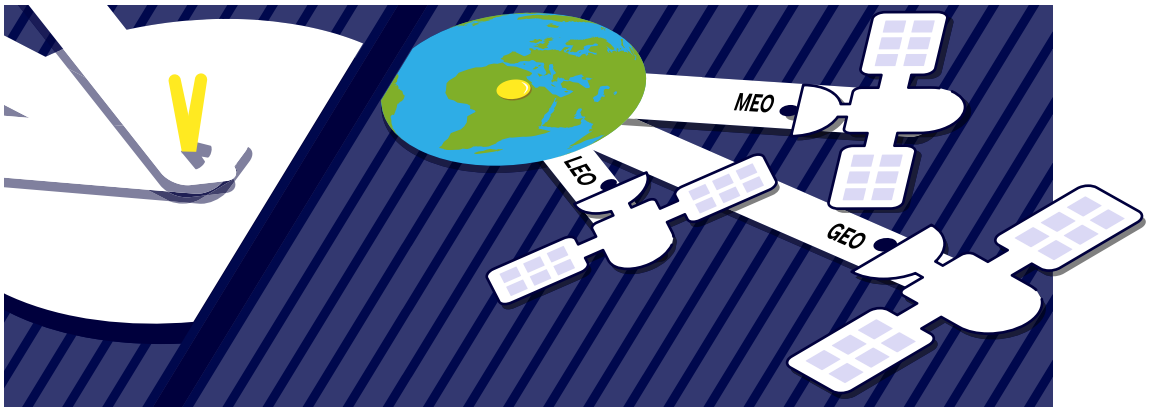
9. Using glue, Sellotape, or a paper fastener, attach the MEO satellite model you've designed to one end of the MEO arm:



10. Using glue, Sellotape, or a paper fastener, attach the LEO satellite model you've designed to one end of the LEO arm:



11. Using a paper fastener, attach the other ends of the MEO and LEO arms to the model of the Earth:



You can now move your LEO, MEO & GEO satellites around Earth to emulate how they orbit our planet in real life. Can you now see how the Geostationary equatorial satellites don't move position in relation to the Earth, as they follow the rotation of the globe? Can you also now visualise why so many more LEO satellites are needed in order to provide coverage to the entire planet?

Take a read about Starlink and OneWeb to see what cool things are being done right now with LEO satellites.

SPACE

Template 1

Cut along the dotted lines

Geostationary Equatorial Orbit (GEO)

Medium Earth Orbit (MEO)

Low Earth Orbit (LEO)

Design your own:
Medium Earth Orbit (MEO) satellite

Design your own:
Geostationary Equatorial Orbit (GEO) satellite

Design your own:
Low Earth Orbit (LEO) satellite

ACTIVITY 2

We know there are lots of passionate Space enthusiasts out there, it's such a vast, amazing topic… how can you not be interested? You may be part of a Space club; it might be your favourite thing to learn about at school or it might be your personal hobby. If so, you're part of the world Space community.

However, wouldn't it be great to have a visual identity for the Space community? To have a badge that identifies you and makes everyone feel part of one big Space team?

We've seen some amazing designs out there in real life by the likes of NASA, the US Space Command but also in movies too, such as the Star Trek Starfleet Command badge. So we'd really love you to create your own badge.

Get creative and design a 'World Space Community' badge! You can use pictures of rockets, satellites, antennas… anything space-related. Our only requirements are that it is:

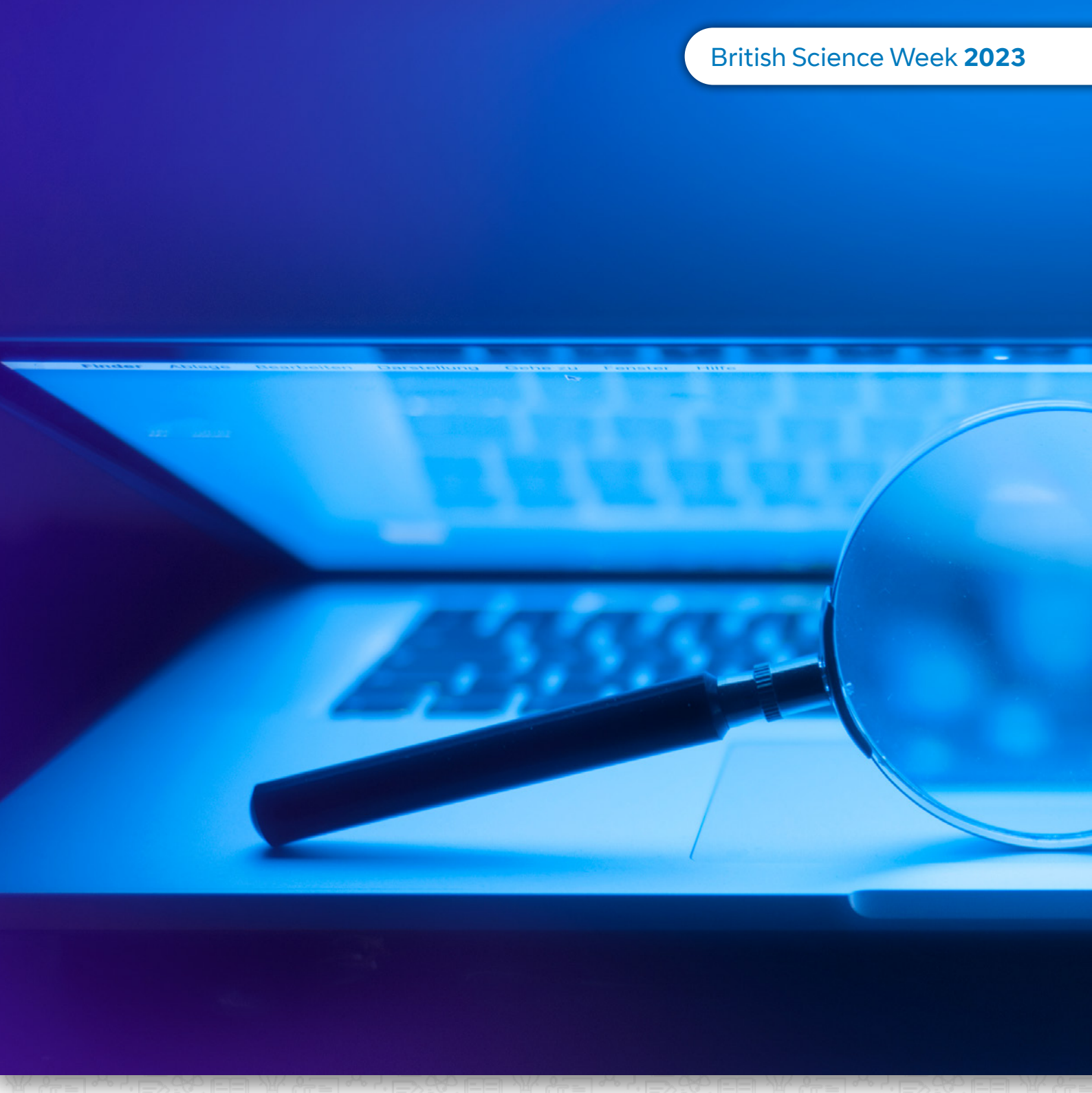
- Creative
- Includes 'World Space Community' somewhere
- Looks great

Once you've created your badge, please share it with us by emailing it to computerscience@bt.com.

We'd also love for you to post your designs on social media by posting a picture of your badge, mention @adastralpark and using the hashtag #BSW23.

We can't wait to see your designs!

British Science Week **2023**



ACCESSIBILITY

Activity Pack

ACCESSIBILITY

We are increasingly surrounded by a digital world, whether that is shopping online, digital banking or listening to music. Technology is awesome, but only if you can use it.

Digital accessibility is important for everyone. For example, subtitles make a video accessible to people who are hard of hearing, but also to those people watching the video in a noisy environment or who may find following the audio difficult.

Therefore, when we design something (a product, digital content, device, service, vehicle, or environment) we must think about digital accessibility by considering any barriers that will make using it harder or may exclude people from using it. When texting was first created it was great and opened up a whole new world for some but excluded others.

Every time you speak to Alexa or pinch to zoom in on your phone, you're using technology developed for people with disabilities. Great design and simple technology can make a big difference for those with disabilities – and it can also help everyone else too.

It is really important that we always design things inclusively so that everyone can use them. Discriminating people by creating products that cannot be used easily is unfair and means your product is ultimately not a very good one!

Unless you've had to use digital accessibility features before, would you know where to find them or how to use them? Would you even know what good or bad accessibility design looks like? Take a look through our activity pack to see if you can learn a thing or two that could help you or someone you know in the future.

The next few pages give you a few things to think about when you next create digital content, for example a PowerPoint presentation or a web page. Use this information to help you complete the following activities.

We'd love to see pictures of you all getting involved with the activities. Show us your websites, recommendations and tell us the best thing you've learned about accessibility!

Email these to us at computerscience@bt.com stating your school and key stage, or post on social media and mention @adastralpark with the hashtag #BSW23.

ACCESSIBILITY

Knowing where you are

What to check on a web page:

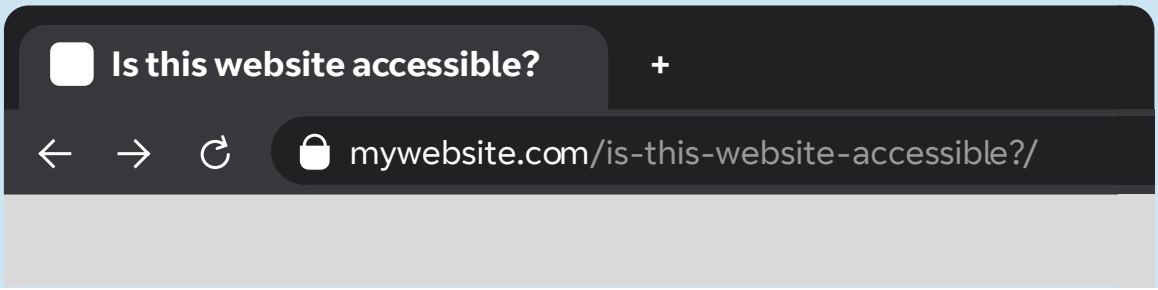
- Is there a Page Title?
- Does the Page Title describe the content of the web page in a way that is adequate, clear, and concise?

What is a Page Title and why is it important?

- Page Titles provide a short description of a web page and help blind people know where they are between different open tabs in their browser.
- They are the first thing screen readers will say when a blind user visits a web page.

How to check on a web page:

- The Page Title is found in the window title bar or in the browser's tabs where there are multiple web pages open.



Text size

What to check on a web page:

- Can you zoom in up to 200% and zoom out up to 25% on the text?
- Are the pages still usable after resizing the text?

Why is it important to be able to increase and decrease font size?

- People with visual impairments might need to enlarge or decrease the content on a web page to be able to read it.
- When web pages are not designed well, text, images and other content can overlap when zooming in or out.

How to check on a web page:

- In all web browsers, the ability to zoom in and zoom out can be found in the "View" menu.

You can also increase and decrease the font size by using keyboard shortcuts:

- On a Windows machine, click on 'Ctrl' and the '+' buttons to zoom in or the 'Ctrl' and '-' buttons to zoom out.
- On an Apple machine, click on 'Command' and the '+' buttons to zoom in or the 'Ctrl' and '-' buttons to zoom out.

ACCESSIBILITY

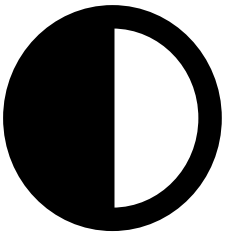
Colour contrast

What to check on a web page:

- Does the web page have sufficient colour contrast?

Why is colour contrast important?

- People with colour vision deficiency will find it hard to distinguish information when there is not enough contrast between the foreground and background colour. For example, text on a coloured background.



How to check on a web page:

- Use tools such as this one to check your web page.

The use of colour

What to check on a web page:

- Can you still read and understand all of the information on a web page if you remove all of the decorative colour?

Why is it important to ensure that information is not conveyed by colour alone?

- When colour alone is used to convey information, people with colour blindness will not be able to follow any instructions related to it.
- For example, information displayed in maps or chats will be inaccessible for people with colour blindness.

How to check on a web page:

- If you are using a Windows machine:
  - From the start menu, search for **Adjust Colour Filters**.
  - Toggle **'Turn on colour filters'** so that they are on.
  - Ensure that the **Greyscale filter** is selected.
  - Turn on colour filters.
- If you are using an Apple machine:
  - Go to **Settings** > **Accessibility Preferences** > **Display**.
  - Select Grayscale from the filter options and tick on **Enable Colour Filters**.

No mouse?

What to check on a web page:

- Can you navigate around a web page, fill in a field on a questionnaire/ form or select links by using keyboard commands alone?

Why is it important to be able to use keyboard only?

- Blind users typically use a keyboard for moving around a web page.
- Some people have mobility issues which don't allow for fine muscle control with a mouse or trackpad.

ACCESSIBILITY

How to check on a web page:

- Try navigating a web page by using the tab, space bar, arrows and enter keys.
  - Press the 'tab' key to navigate forward to the next option.
  - Press the 'tab' and 'Shift' keys together to navigate backwards to a previous option.

- Are links highlighted to indicate that they are active when you press the tab bar or arrows to select them?
- Can you clearly see where you are on the screen as you navigate using the tab key?
- Can you activate buttons and links by pressing the 'Enter' or 'Space bar' keys?
- Can you use drop-down lists/menus and radio buttons by using only the 'Space bar' and arrows keys?

Labelling images

Think carefully when adding images to your PowerPoint slides or web pages.

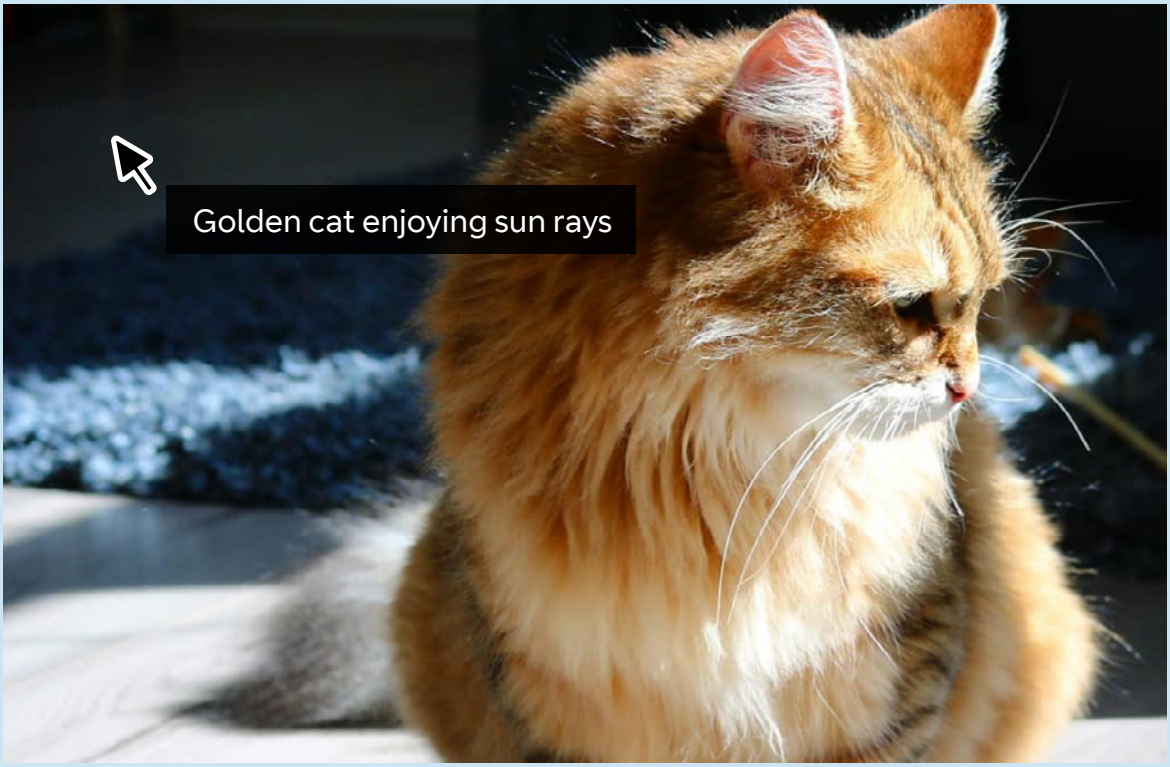
- Are they just decorative? If the images are removed, does the content of the web page still make sense?
- Or are they informative? Do the images represent information?
- There are lots of different types of images, check them all out here.

What is Alt-text and why is it important?

Alt-text, Alt Attribute or Alternative Text, is text that adds information to an image for screen reader users. Alt-text is read aloud by screen readers and help people with visual impairments to understand information conveyed by pictures or graphics.

- For decorative images you may add a simple descriptor e.g. "An image of a black cat on a brown sofa."
- For informative images it is important that the alt-text provides the detail being conveyed in the image.

Try it for yourself. Hover your mouse over an image on a web page - does it display any alt-text?



ACCESSIBILITY

Accessibility is built into Windows Operating Systems and MacOS as well as your mobile phone. They include functionality such as screen readers, voice control, text-to-speech and captioning as well as the ability to connect with other assistive technologies. You can have text read aloud for you, give voice commands, connect to a hearing aid through Bluetooth, change the display to accommodate your needs and much more.

Take your time to explore these capabilities and discover which ones will help you use your computer or mobile more efficiently and enjoyably, regardless of any differences you may or may not have:

- **Windows**

Search for Accessibility or Ease of Access and check for further details and guidance at: Microsoft Accessibility For Everyone.

- **Apple**

Go to System Preferences and select Accessibility and check for further details and guidance at: Apple Accessibility - Make It Yours.

- **Android**

You can customise your Android device with accessibility settings and apps. Check here for further details and guidance: Android Accessibility Overview.

Links

Teacher Links:

- KS2 Lesson Plan and Resources - Web Page Creation <https://atadastral.co.uk/go/bswat01>
- KS3 Lesson Plan and Resources - Developing for the Web <https://atadastral.co.uk/go/bswat02>
- Free Inclusion and Diversity Magazine <https://atadastral.co.uk/go/bswat04>
- Culturally relevant Pedagogy <https://atadastral.co.uk/go/bswat05>

Find Out More:

- How to Write HTML <https://atadastral.co.uk/go/bswaf01>
- Building Better Digital Lives <https://atadastral.co.uk/go/bswaf02>
- Simplifying Complexity: Handshake <https://atadastral.co.uk/go/bswaf03>

Have A Go:

- Sensory Classroom <https://atadastral.co.uk/go/bswah01>
- Contrast Calculator <https://atadastral.co.uk/go/bswah02>
- Project MakeAccessible <https://atadastral.co.uk/go/bswah03>

ACTIVITIES

Activity 1 – Compare Good Vs. Bad Accessibility Design

Take a look at this website and go through the demo which will show you various web pages.

The 'Before' and 'After' demonstration shows an inaccessible website and an improved version of this same website.

The aim of this is to show you what bad accessibility design looks like to help you with the following activities.

Activity 2 – Creating Accessible Presentations

With all the accessibility knowledge you now have from reading the information provided above, how many issues can you spot in the presentation on pages AC8 - 9?

- Make a list of things that you have chosen to edit and a reason why.
- Can you add a new slide that is designed with accessibility in mind?

Some apps can help you identify accessibility issues. For example, on PowerPoint, go to: Review > Check Accessibility for some advice and tips.

Activity 3 – Create Your Own Accessible Website

Using Trinket, follow these step-by-step instructions Raspberry Pi courses to create your own website:

- Website 1.0: Projects | Computer coding for kids and teens | Raspberry Pi.
- Website 2.0: Projects | Computer coding for kids and teens | Raspberry Pi.
- Website 3.0: Projects | Computer coding for kids and teens | Raspberry Pi.

Activity 4 – Review Your School's Website

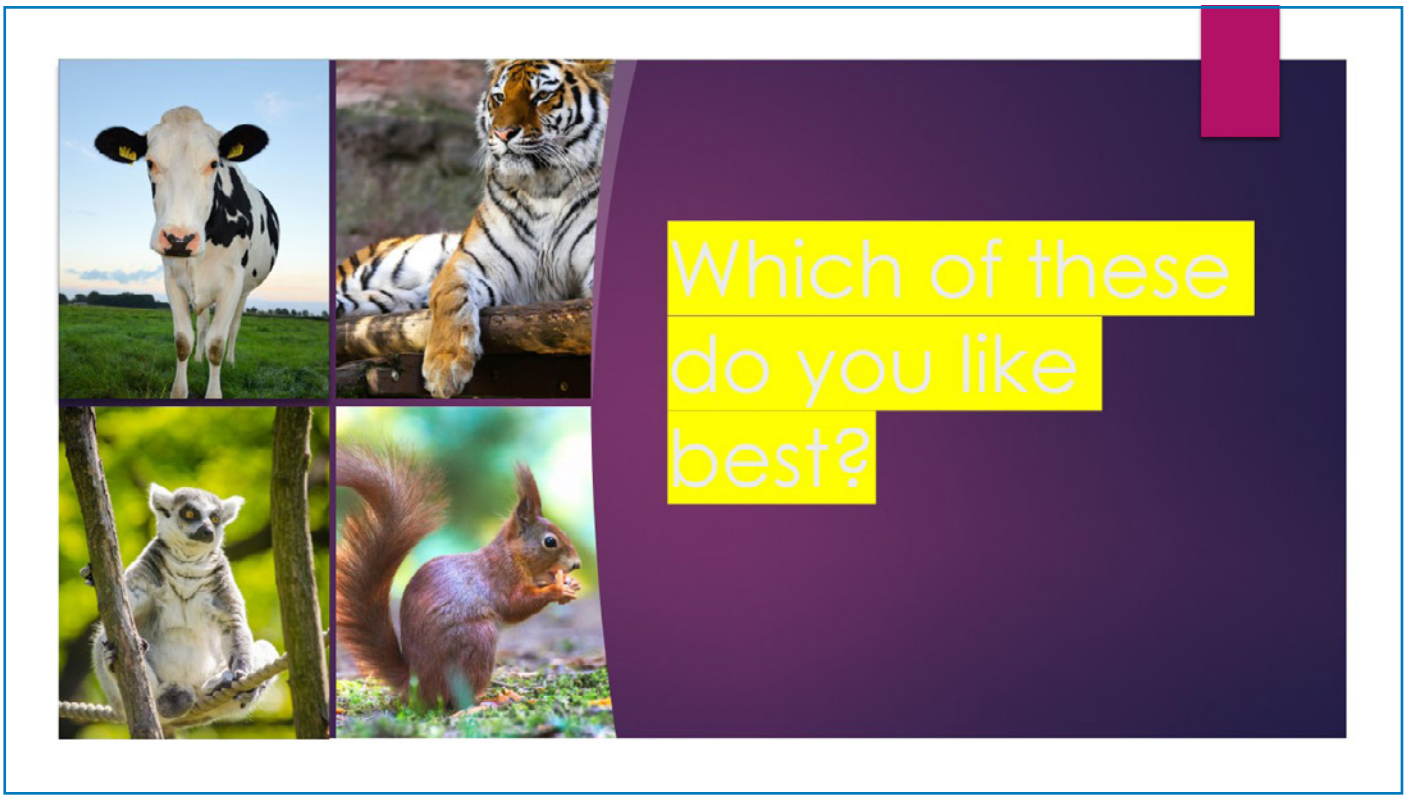
Now that you've completed the activities, with your newfound accessibility wisdom, go to your school's website and see how accessible it is.

Switch on the accessibility functionality and in your pairs have a go at using the website with your eyes shut, ear defenders on, only using your non-dominant hand or maybe try using it wearing gloves.

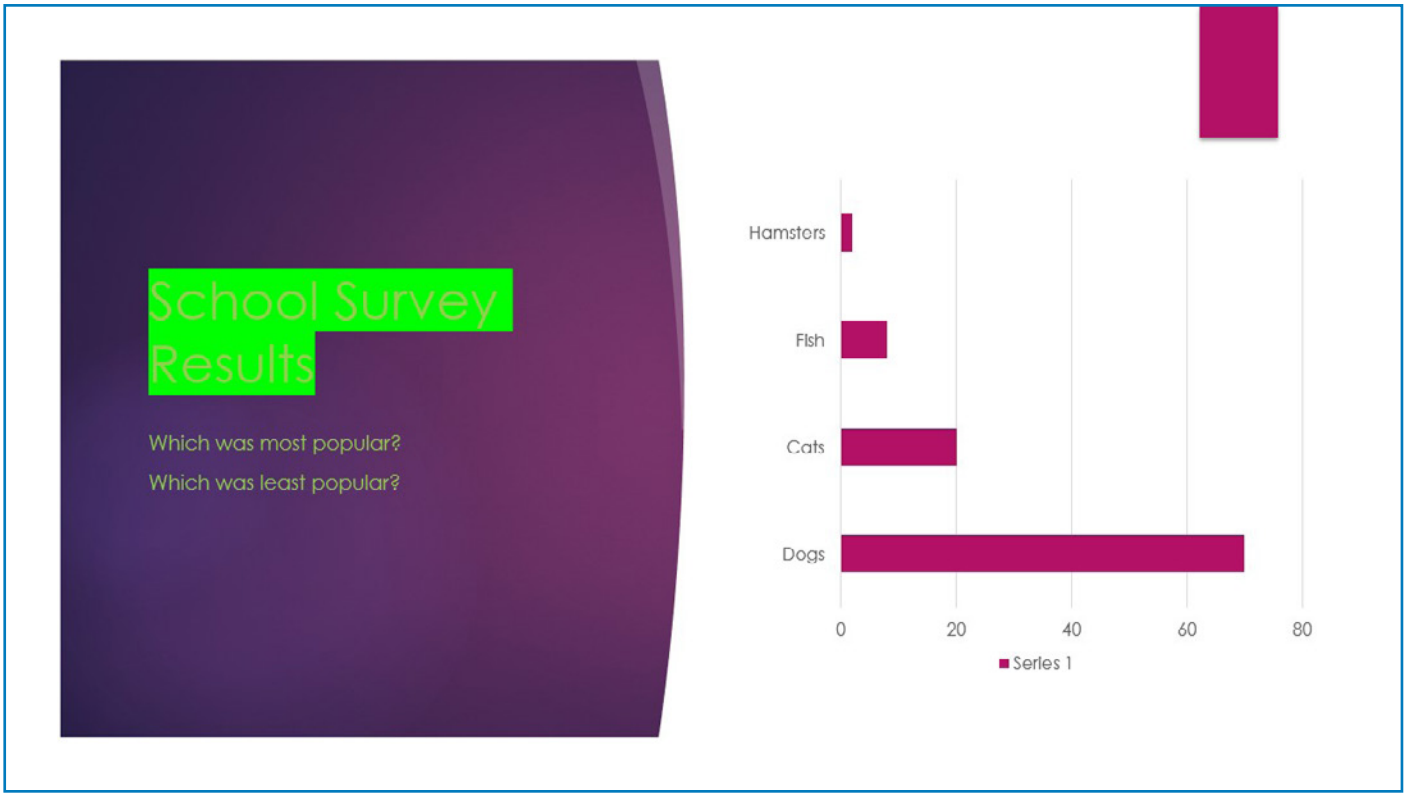
Can you make any recommendations to the people who manage the website in order to make it more accessible for everyone?

Slide 1

Slide 2



Slide 3



Slide 4