

The Spark

Magazine



OUR 25TH ANNIVERSARY ISSUE

ISSUE
No30

MEET THE SCIENTISTS WHO WORK AT GLASGOW SCIENCE CENTRE

**CREATE
CINEMA SOUND
IN YOUR LIVING
ROOM**

**EXPERIMENT
WITH SOME
KITCHEN
CHEMISTRY**



GLASGOW
**SCIENCE
CENTRE**
Registered Scottish charity SC030809

Inside

This issue

25
YEARS



#Tag Us!

If you try any of our activities, please show us how they turned out!



Hello!

This year, Glasgow Science Centre is turning 25! In this special birthday edition, you'll meet some of our brilliant scientists – both past and present – and learn about their favourite STEM topics.

Learn about 3D printers, travel Scotland, and go to the cinema! Plus, we've got puzzles, activities, and our Bright Sparks quiz too!

Let the celebrations begin!

Best wishes,
Glasgow Science Centre



MINI GAME

Find the words that say party

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

- BIRTHDAY
- CAKE
- BALLOONS
- CANDLES
- GIFTS
- PARTY
- MUSIC
- FRIENDS
- GAMES
- STREAMERS
- CONFETTI
- ICE CREAM



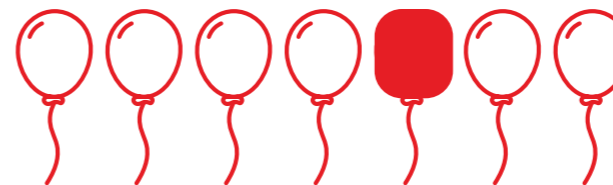
The Birthday Paradox

In a group of 23 people, there's a 50% chance that at least two of them will have the exact same birthday. In a group of 75 people, this rises to a 99.9% chance that they have the exact same birthday!

The Science of Design

You may not notice it, but graphic design is everywhere. From event flyers, product packaging, social media, and even the Spark Magazine! Steven, our very own Graphic Designer, has laid out some of his favourite design science below.

The Isolation Effect



Which balloon did you notice first? The "isolation effect" predicts that when you see many similar objects, you'll probably notice the different one first. Graphic designers use this effect to grab your attention quickly.

Seeing the Invisible

When an image is incomplete, our brain fills in the gaps. This helps you understand what you are looking at and make decisions quickly. Look at the images below. Can you see the 'invisible' shapes?



What did I read?

Try to say the colours of the words below out loud instead of reading the actual words.

RED GREEN YELLOW BLUE BLUE

ORANGE PURPLE YELLOW GREEN GREEN

PINK PURPLE BLUE RED

Pretty tricky, right? Because the word describes a different colour than the actual colour you see, your brain can get confused. This is called the "Stroop effect".

What does red mean to you?

Colours mean different things to different people, and they affect our feelings, moods, thoughts, and behaviours.

What does red mean to you? Ask your family and friends the same question.

Are their answers the same or different from yours? Why might this be?

Meet Scientist Steven Graphic Designer



What should people know?

You don't have to be good at drawing to be a graphic designer. It's about playing with colour and laying out the right elements and other skills.

Best part of your job?

Seeing the graphics I've made make exhibits cool, fun and easier to understand.

Fun Fact



I play drums in a band!

Kitchen Science

Working in the kitchen involves using a lot of STEM skills. You need to weigh and measure, understand temperatures, and watch out for chemical reactions happening everywhere! Our Chef De Partie, Diarmid, has whipped up some delicious science facts just for you!

Space Food



Some astronaut food is freeze dried. The food is cooked, then frozen and put in a vacuum chamber to remove water and air. This keeps the food fresh for long periods of time, like a mission to the Moon! To rehydrate the food, the astronauts inject water into the package with a water gun.

Luckily, astronauts on the International Space Station also have fresh fruit, an oven, and even the first espresso machine designed for use in space, the "ISSpresso".



Image © Copyright Nasa

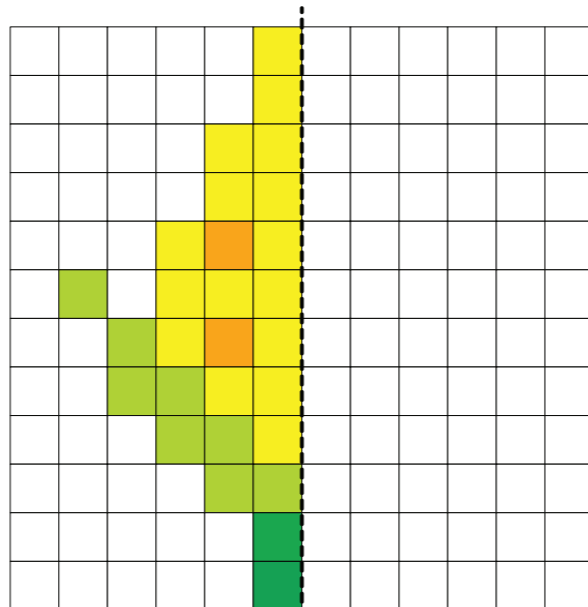
That Tastes Weird

Are you a picky eater? You might be a 'super-taster'. Super tasters have more taste buds than most people, which makes them more sensitive to bitter food. Don't worry, our taste buds change as we get older, so someday you might like Brussels sprouts!



What does it look like?

Colour in the boxes on the right to complete the image.



Solution on back page.

fun fact



I did some cooking on live TV and I loved it!



Meet Scientist Diarmid Chef De Partie

What should people know?

I didn't always want to be a chef. It wasn't until I was washing dishes for amazing chefs that I thought, "I could do that too."

Best part of your job?

There are so many delicious, unusual and interesting foods, the combinations are endless!

Bake Lab

Your kitchen is now a lab. You're the scientist, the microwave is your reaction chamber, and the ingredients are your chemicals. Combine these together to get delicious chemical reactions!



Mug Cake Chemistry

Chemicals

- 3 Tbsp plain flour
- 2 Tbsp granulated sugar
- 1 Tbsp unsweetened cocoa powder
- ¼ tsp baking powder
- Pinch of salt
- 3 Tbsp milk
- 1 Tbsp oil or melted butter
- 1/8 tsp vanilla extract

Scientific Method

- Step 1.** Lightly grease a microwave-safe mug with oil or butter.
- Step 2.** Add all the dry ingredients into your mug and stir together.
- Step 3.** Add the wet ingredients and stir until smooth. Be sure to scrape the bottom of the mug!
- Step 4.** Cook in microwave for 70-90 seconds until cake is just set, but still barely shiny on top. Allow to rest in microwave for 1-minute before eating.



What's Happening?

Proteins in Flour React with Water to Form Gluten

Gluten forms long, stretchy strands that stick together, which is why the batter thickens as you stir.



Sugar Reacts With Heat and Proteins to Create the Perfect Crust

This is called the Maillard reaction and it's also responsible for seared meats and toasted bread!



Baking Powder Reacts With Water & Heat to Make Bubbles

Baking powder is a mix of an acid and a base. When the powder gets wet the acid and base mix to create carbon dioxide bubbles. These bubbles expand, pushing the batter up and out.



Oil Coats the Flour Proteins to Create the Perfect Texture

This limits gluten development which means the cake doesn't get too fluffy.

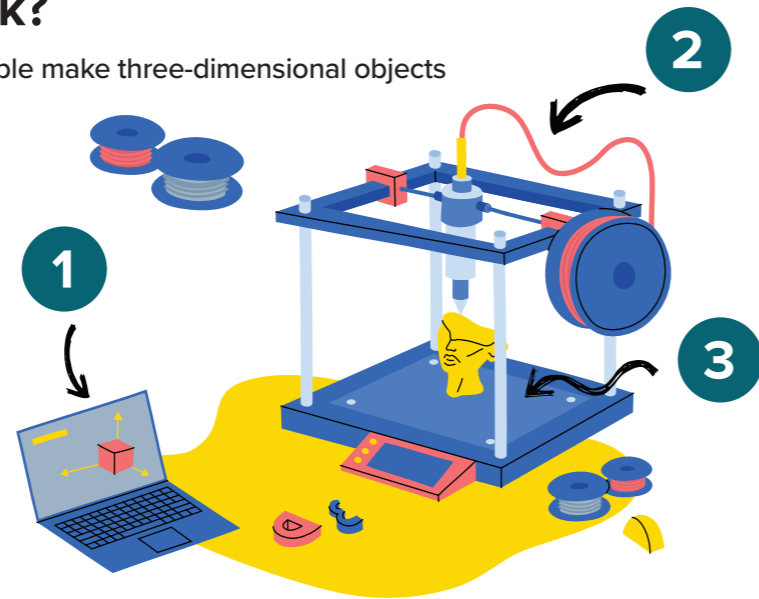


Designing Science

Glasgow Science Centre has lots of fun hands-on exhibits to explore. We have an amazing team who design, build, and repair our 300+ exhibits. This team needs to know how to use lots of different tools. Our Exhibition Designer, Ailsa, has some design secrets to share with you!

How does a 3D Printer Work?

“3D” stands for 3 dimensions. 3D printers let people make three-dimensional objects in almost any shape they want.



- 1 The object is designed on a computer. This design is digitally sliced into thousands of layers. The layers are then sent from the computer to the printer.
- 2 A plastic cord goes into the printer's nozzle. The nozzle heats up, melting the plastic and making it ready for printing.
- 3 The melted plastic is squeezed through the nozzle onto the base of the printer. The bottom layer is first, then more layers are added, one on top of the other until the 3D object is complete!

Match the pictures



Solution on back page.



Clever Critters

It's not just humans who use tools to make tasks easier, lots of animals do too!

Crows use twigs to pull tasty bugs out of holes.



Otters use rocks to crack open mollusc shells.



Elephants use tree branches to swat flies away.



Scottish Science

Our On Tour Team spend their days driving science exhibits and experiments all over the country. They get to see lots of cool places, so we asked Senior Science Communicator Aileen to share some of her favourite Scottish science facts.

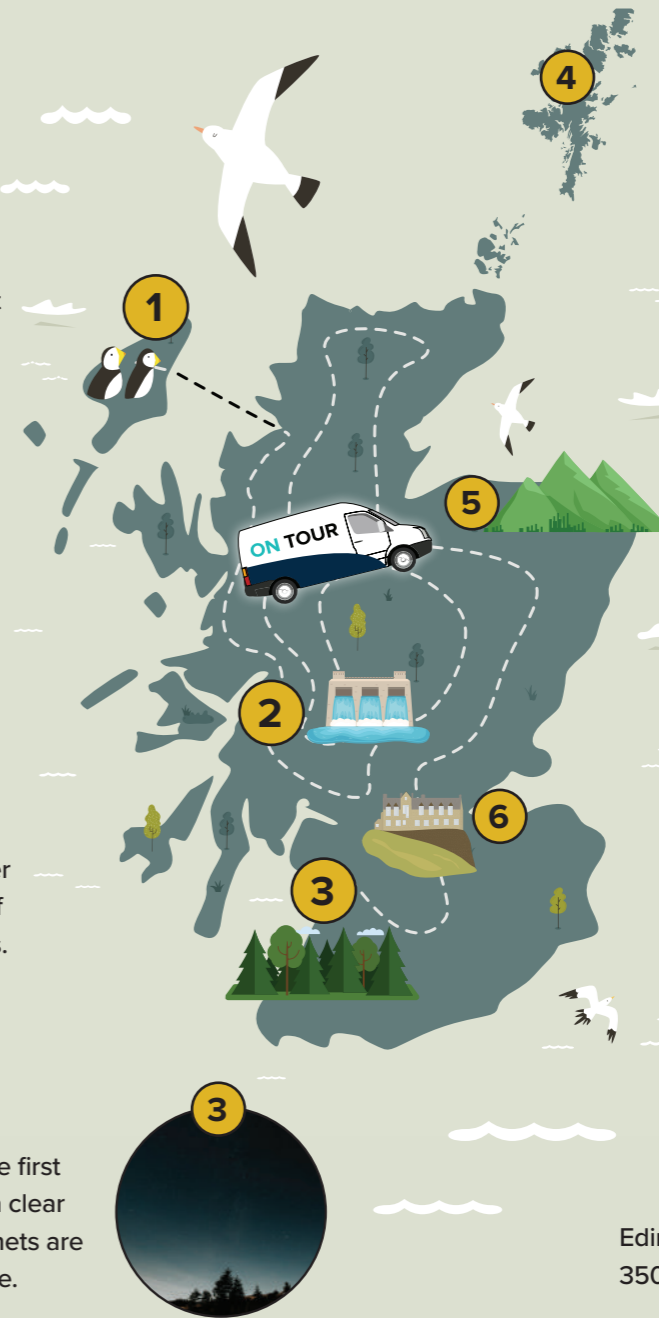


Scottish islands are the perfect nesting ground for puffins, with St. Kilda holding the UK's largest puffin colony of over 130,000 breeding pairs!



When emergency electricity is needed, Cruachan Power Station uses the power of water to generate 440 megawatts of electricity in under 30 seconds. That's enough to power 90,000 homes!

Galloway Forest Park was the first dark sky park in the UK. On a clear night over 7,000 stars and planets are visible with the naked eye.



Scientists hope to use SaxaVord Spaceport in Shetland to launch spacecraft into space! It's easier for rockets to get into a polar orbit if they are launched from further north.



Cairngorm quartz, Scotland's national gemstone, is a rare type of smoky quartz only found in the Cairngorms.



Edinburgh castle is built on a giant 350-million-year-old volcanic plug!



Meet Scientist Ailsa Exhibition Designer

What should people know?

My job is to take ideas and bring them to life by creating layouts, designs, lighting, and interactive elements (buttons, switches, and more!)

Best part of your job?

Every day is different! I can be brainstorming ideas, making models in the workshop, or creating 3D visualisations.

fun fact



I can do a head stand for a very long time!



Meet Scientist Aileen Senior Science Communicator

What should people know?

My degree is in Community Arts specialising in music and visual art, and now I work in STEM. Everyone's path is different.

Best part of your job?

When I was a kid, I wanted to be a teacher. Now I get to teach in a different school every day!

fun fact



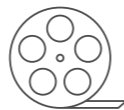
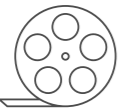
In my spare time I like going to wrestling shows!

Cinema Science

Lights, camera, action! Welcome to IMAX at Glasgow Science Centre, the LARGEST cinema screen in Scotland! Craig, one of our Visitor Experience Assistants, will teach you the scientifically correct way to enjoy a film!

Step 1 - The Film

The first films were just a set of pictures. Photographers would quickly take lots of photos of animals in motion and then project the photos onto a wall one after another. This made it look like the pictures were moving.



Step 2 - Snacks

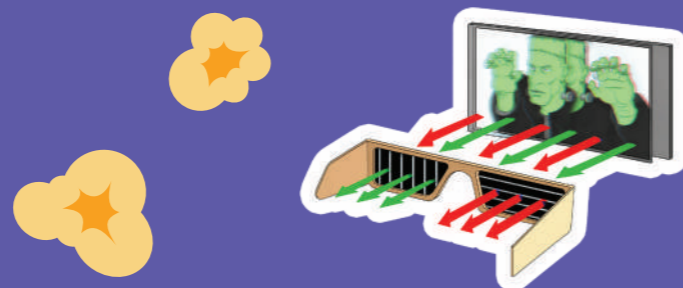
Of the four most common types of corn, only the popcorn variety pops! That's because popcorn's seed coat (or outer shell) has just the right thickness.

Each kernel contains a small drop of water and soft starch. As the kernel heats up, the water turns into vapour and expands which wets the starch turning it into goo. The pressure inside the kernel builds until...POP! The gooey starch explodes out of the kernel and immediately cools into the fluffy shape we know and love.



Step 3 - 3D Glasses

Without 3D glasses, 3D films look blurry. This is because the projector uses polarised light to project two images on top of each other. Polarised light waves move in one direction, horizontally or vertically. The lenses in 3D glasses are also polarised, with each lens only letting through one kind of polarised light. This means your brain gets two separate images, just like when you look at something in real life!



fun fact

When I was young, I wanted to be a stunt actor, so I learned karate!



Step 4 - Amazing Sound

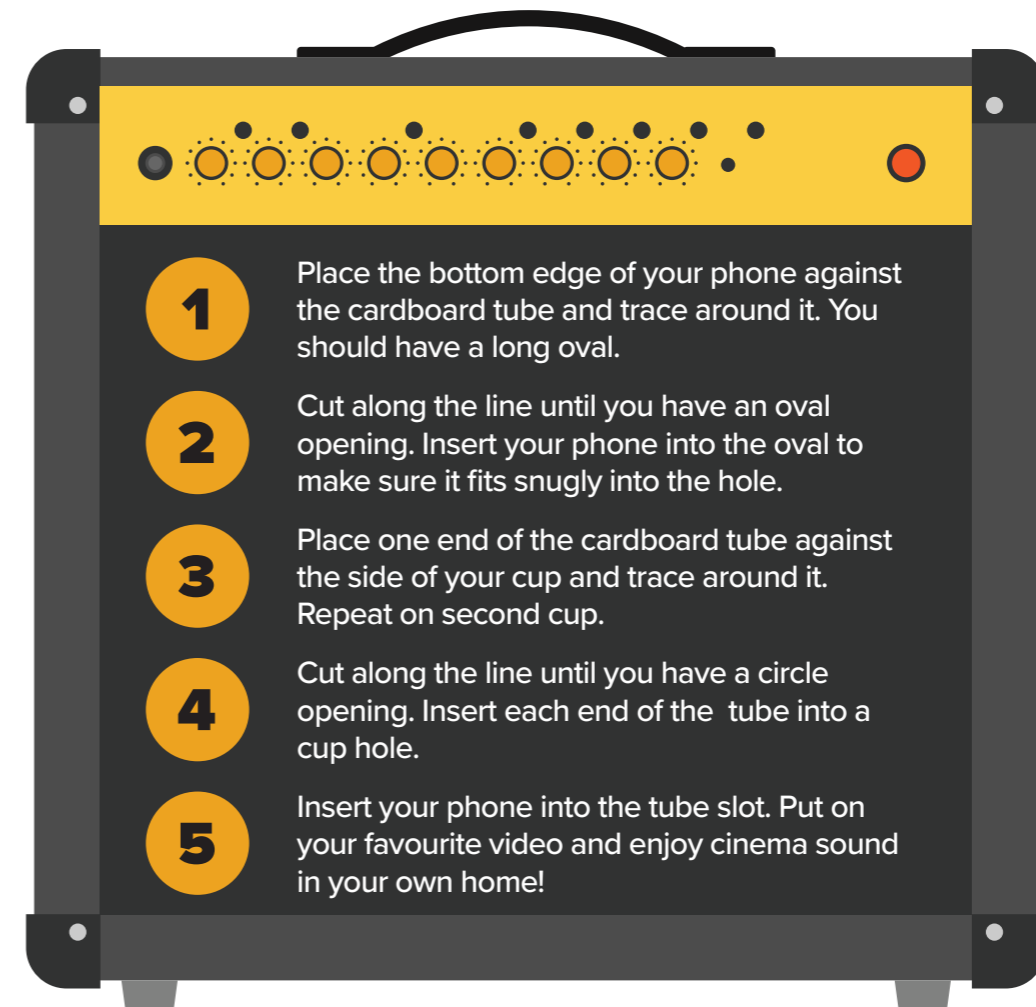
It rumbles your chest, it gives you a jump scare, it might even make you feel a bit sad. Sound has lots of different effects on our bodies and films use this to make you feel like you're part of the action.

Films have lots of sounds, like talking, music, and loud explosions. Making sure they all reach your ears is the job of a Sound Engineer. But don't take our word for it, why not become a Sound Engineer yourself?

DIY Sound Amplifier

You will need

- Help from an adult
- Cardboard tube from kitchen roll
- 2 disposable cups (paper or plastic)
- Scissors
- A pen
- A mobile phone
- A great video to watch!



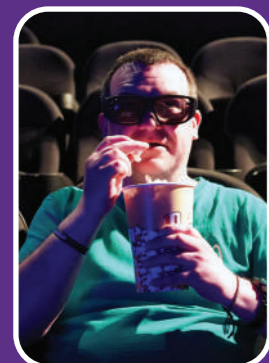
- 1 Place the bottom edge of your phone against the cardboard tube and trace around it. You should have a long oval.
- 2 Cut along the line until you have an oval opening. Insert your phone into the oval to make sure it fits snugly into the hole.
- 3 Place one end of the cardboard tube against the side of your cup and trace around it. Repeat on second cup.
- 4 Cut along the line until you have a circle opening. Insert each end of the tube into a cup hole.
- 5 Insert your phone into the tube slot. Put on your favourite video and enjoy cinema sound in your own home!



What's happening?

When the sound waves leave your phone's speaker they move in all different directions. The cups focus the waves so that more of them travel directly to your ears.

What would happen if you used bigger cups? A longer tube? More cups and more tubes? How does the sound change? Why might it change?



Meet Scientist Craig Visitor Experience Assistant

What should people know?

I wish people knew that science is for everyone, young and old, experts and beginners!

Best part of your job?

I love hearing people's excitement when they come to the IMAX for the first time.

MEET THE EXPERTS

You've met a handful of our amazing scientists, but what do people do when they leave? We asked a few previous staff members to tell us about their cool new STEM careers!



Shauna Culshaw

Job at GSC: Science Communicator

Current STEM Career: Professor of Periodontology & Immunology.

What does that mean? I treat patients, train student dentists, and research how the body's immune system works in the mouth.

What should people know? Dentistry isn't just about filling holes or making smiles look nice. Healthy mouths benefits everybody!

Favourite subjects in school: Biology, Chemistry & Physics.

Fun Fact: I help raise Guide Dog puppies in my spare time.



Liam Harquin

Job at GSC: Customer Service Assistant

Current STEM Career: Mechanical Engineer.

What does that mean? I design small spacecraft for Earth observation.

What should people know? Designing for space comes with unique challenges like launch vibrations or extreme temperatures, and we have to think of solutions that wouldn't work on Earth.

Favourite subjects in School: Maths and Physics, but I also enjoyed English for storytelling.

Fun Fact: I was a warrior on Raven!



Heather Sinclair

Job at GSC: Senior Science Communicator

Current STEM Career: Volunteer Search & Rescue / Trainee Search Dog Handler.

What does that mean? I am training my German Shepherd, Calluna, as an air scent dog to find lost and injured people in the wilderness.

What should people know? Volunteering in search & rescue takes a lot of commitment. We respond in any weather, any environment, 365 days a year, 24 hours a day!

Favourite subjects in school: Latin, the Classics, Maths, Biology, & Languages.

Fun Fact: I had a job shampooing camels!



Lisa Morrison

Job at GSC: Science Communicator

Current STEM Career: Wildlife Guide

What does that mean? I take folk on boat tours to spot wildlife on the West Coast of Scotland. I chat about animal history, biology, and conservation.

What should people know? Working in retail, hospitality and maintenance equipped me with things I didn't get during my degree, like communication skills and confidence.

Favourite subjects in school: Biology and Art.

Fun Fact: I can tell which bird I'm looking at from a distance by the way they fly!

BRIGHT SPARKS!

Are you a bright spark? Test your knowledge with our tricky questions! Check your answers on the back page.

1. What is the reaction that makes bread toast?

- A) Stroop
- B) Maillard
- C) Crumble

1

The first films were made from lots of pictures.

- True
- False

2

Edinburgh Castle is built on a giant what?

- A) Volcanic plug
- B) Beach
- C) Gold mine

3

What do otters use to crack open mollusc shells?

- A) Their tails
- B) Sticks
- C) Rocks

4

How many breeding pairs are in the UK's largest puffin colony?

- A) Over 50,000
- B) Over 95,000
- C) Over 130,000

5

True or False: Out of the 4 most common types of corn, popcorn is the only one that pops.

- True
- False

6

How many days a year do search & rescue volunteers have to be available?

- A) 210
- B) 365
- C) 430

7

The "isolation effect" is when we see invisible shapes.

- True
- False

8

The IMAX at Glasgow Science Centre has the largest what in Scotland?

- A) Popcorn box
- B) Cinema screen
- C) Speakers

9

In a group of 23 people, what chance is there that at least two people have the same birthday?

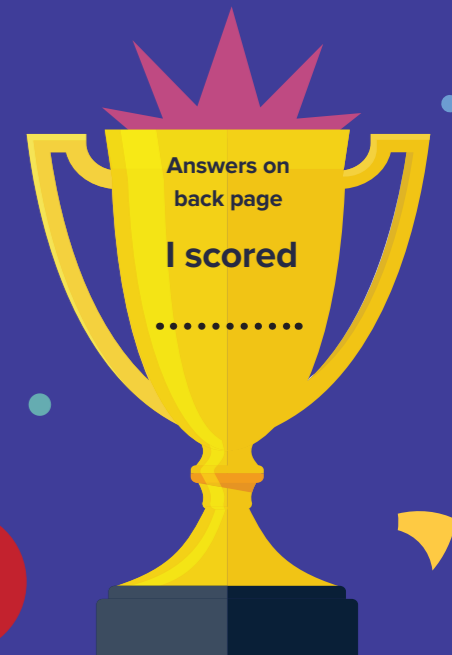
- A) 50%
- B) 75%
- C) 99.5%

10

Scientists want to use 3D printers to make what?

- A) Houses
- B) Food
- C) Human organs
- D) All the above

11



ABOUT US

Glasgow Science Centre is a 5-star visitor attraction located beside the River Clyde. We are home to hundreds of interactive exhibits where you can discover how the world works.

Glasgow Science Centre is a registered Scottish charity SC030809.

For more information and bookings, visit: glasgowsciencecentre.org

Bright Spark QUIZ ANSWERS



- Q1. B Maillard
- Q2. True
- Q3. A Volcanic Plug
- Q4. C Rocks
- Q5. C Over 130,000
- Q6. True
- Q7. B 365 days a year
- Q8. False
- Q9. B Cinema screen
- Q10. A. 50%
- Q11. D All of the above

WE WANT YOUR FEEDBACK



We would love to hear what you think!

We hope you liked this issue, but if you didn't, what could we change? What other things would you like to see? What topics are you most interested in?

You can send feedback to CLDteam@GSC.org.uk or message us on [@Bluesky @glasgowscience](https://www.instagram.com/bluesky)

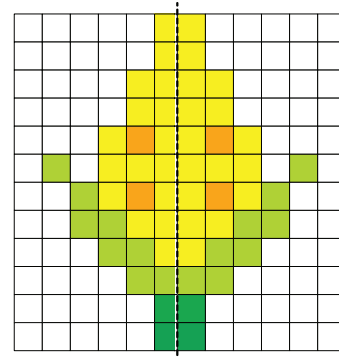
PUZZLE SOLUTIONS



Party Wordsearch

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

What does it look like?



Match the pictures

