



# EXPLORE EVENT GUIDE

Staffordshire University  
in association with Big Bang



We can't wait for you to Explore Staffordshire University in association with Big Bang. This event is all about having fun and finding out more about science, technology, engineering and maths (STEM). Check out below the 4 ways to get involved across the event and then have a look at the detailed programme for each day to **plan which STEM challenges and discover sessions you want to explore!**

[www.learnbydesign.co.uk/staffs-uni-explore-at-home](http://www.learnbydesign.co.uk/staffs-uni-explore-at-home)  
Password: StaffsUni2020

## 4 WAYS TO GET INVOLVED

1

### Get hands on with STEM challenges

Each day set science, technology, engineering and maths challenges will be released for you to take part in. Have a go, upload a picture of your creation and tune into the live curiosity slots.

2

### Join Discover Sessions

Q+A's, quizzes and workshops will take place at specific times. Follow the links to join.

3

### Take the Meet The Future You Challenge

Download the challenge sheet, take the quiz and then watch a few videos to find out about your possible future career options.

4

### Vote on the competition entries

Take a look at the amazing 'Explore at Home' entries and vote on your favourite.  
Voting is between 10am - 3pm on the 16 June  
Winners will be announced at 3pm on the 17 June

The programme is subject to change



# 16 JUNE - KS2 MORNING SESSION

Staffordshire University  
in association with Big Bang



## STEM Challenges

### 10.00 The STEM Challenges begin

#### Garden Volcano

Be ready for exploding fun with this quick chemistry challenge. Have your materials ready and be prepared to make a bit of mess! Will you be able to work out what's happening?

#### What you need

Washing up liquid - Cold water  
White vinegar - Bicarbonate of Soda  
Empty 2 litre bottle - Measuring jug  
Food colouring

#### Lego Furniture Factory

Are you up for a challenge? You are in charge of your own furniture factory: you can make small tables and chairs out of Lego. Work out the maximum pieces of furniture you can make for the minimum amount of money, and learn how to optimise the process using maths, science and operational research (OR). Will you be able to make the best use of your materials to maximise your profit?

#### What you need

6 rectangular Lego bricks (we use ones with 2x4 dots on)  
8 square Lego bricks (we'll be using ones with 2x2 dots)  
A pen or pencil  
Paper and Handout

#### Chromatography butterflies and bow ties

See the colours of your pens transformed into butterflies or bow ties that you can use to decorate your home.

#### What you need

Pipe cleaner - Coffee filter paper  
Non-permanent felt tip pens  
Water - Small pot

#### Home for Monty

Monty has lost his home! Put your creativity to the test by making him a new home from recycled materials. Watch the video to hear what Monty needs to survive.

#### What you need

Recycled plastic and cardboard from around the house

#### Shadow Theatre

Use materials from around the home to engineer your very own shadow puppet theatre.

#### What you need

Cardboard - Tissue Paper - Lollipop sticks or straws - Masking tape - Lamp or torch

### 11.15 STEM Challenge Explanation Videos

Discover why things reacted the way they did in your STEM Challenges.

## Discover Sessions

### 10.15 - 10.45 - LIVE session

#### Forensics Live

Can you use Forensic Science to Solve a Crime? In this activity you will be guided through a crime, you will need to collect and analyse evidence to try and solve this case.

### 10.30 - 11.00

#### Guess Who: Health Science

Are you ready to use your investigative skills? Can you guess the careers of our STEM superstars from a few clues? Tune in at 10.30 to have a go, and then join the Discover Who session live to find out their career identities.

#### What you need

Worksheet

### 11.00 - 11.30 - LIVE session

#### Discover Who: Health Science

Tune in to find out the answers to Guess Who challenge. Join Sarah Cosgriff as she reveals the STEM superstars' job titles and answers any burning questions you might have. Will you get them all right?



Discover who our STEM superstars are with  
**Sarah Cosgriff**

### 11.30 - 12.00 - LIVE session

Had a go at a STEM challenge? This is your chance to ask your burning questions to the brilliant Jon Chase as he shows off his favourite pictures from today's challenges along side his favourite science raps!



Get curious about STEM with  
**Jon Chase**

# 16 JUNE - KS3 AFTERNOON SESSION

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## STEM Challenges

### 1.00 The STEM Challenges begin

#### Lego Furniture Factory

Are you up for a challenge? You are in charge of your own furniture factory: you can make small tables and chairs out of Lego. Work out the maximum pieces of furniture you can make for the minimum amount of money, and learn how to optimise the process using maths, science and operational research (OR). Will you be able to make the best use of your materials to maximise your profit?

#### What you need

6 rectangular Lego bricks  
(we use ones with 2x4 dots on)  
8 square Lego bricks (we'll be using ones with 2x2 dots)  
A pen or pencil  
Paper and Handout

#### Bridge Builder

Put your creativity and engineering skills to the test with this building challenge.

#### What you need

10 Sheets of paper - 2 chairs  
- Rice - Sandwich bags  
- Sticky tape

#### Tower of Hanoi

Take on the mathematical game of the Tower of Hanoi!

#### What you need

Polystyrene or cardboard  
Pencils - Blue Tack -  
Compass

#### Bicycle Materials Challenge

Find out more about bikes and the materials they are made from.

#### What you need

A bicycle (optional)

#### Can we build an airplane out of seaweed?

Put your engineering brains to the test, as you think about the best materials use when building a plane and is it possible to build a plain from seaweed?

#### What you need

Worksheet

### 2.15 STEM Challenge Explanation Videos

Discover why things reacted the way they did in your STEM Challenges.

## Discover Sessions

### 1.15 - 2.15 - LIVE session

#### Explore the technology of Esports events

The small interactive workshops with explore the tech behind Esports events.

Numbers are limited for this session. Please book [here](#) or on the event page on the day.

### 1.30 - 2.00

#### Guess Who: Research Science

Are you ready to use your investigative skills? Can you guess the careers of our STEM superstars from a few clues? Tune in at 1.30 to have a go, and then join the Discover Who session live to find out their career identities.

**What you need:** Worksheet

### 1.45 - 2.00

#### Meet a Boat Captain fighting plastic pollution in the worlds oceans

Do you love the Ocean? Have you ever dreamed of being an Explorer? Are you interested in a career linked to the Environment? Join Rachael Miler Captain of the American Promise, the worlds most environmentally friendly research vessel, which was also used for a record solo circumnavigation of the planet, talking to Professor Claire Gwinnett about their research into plastic pollution in the Ocean.

### 2.00 - 2.30 - LIVE session

#### Discover Who: Research Science

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Discover who our STEM superstars are with  
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### 2.15 - 2.45 - LIVE session

#### Forensics Live

Can you use Forensic Science to Solve a Crime? In this activity you will be guided through a crime, you will need to collect and analyse evidence to try and solve this case.

### 2.30 - 3.00 - LIVE session

#### Curiosity Live

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# 17 JUNE - KS2 MORNING SESSION

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## STEM Challenges

### 10.00 The STEM Challenges begin

#### Make your own playdough

Ever wondered how to make the wonderful stuff that is playdough. Watch for step by step instruction then share a picture of your creations.

#### What you need

Water - Flour  
Cream of tartar - Salt  
Vegetable or sunflower oil  
Food colouring

#### Lava Lamps

The colourful chemistry experiment is a great way to discover more about density and chemical reactions.

#### What you need

Cup or bottle - Vegetable oil and Water  
Food colouring of any colour  
Fizzy tablets (such as heartburn tablets) but parental supervision is required

#### Could you bandage an injured animal?

Not only is this a fun activity, but it can actually help in an emergency! Our pets can get cut easily – especially on their paws – and it's surprising how much they bleed. Bandaging the wound correctly will make it easier for you and their pet get to the vets quickly and safely.

#### What you need

Guidance sheet  
Toy animal  
Bandages or toilet paper

#### Pollutants: Can you work out the biggest?

Air pollution is all around us, but do you know what's causing it? Try out this speedy challenge to test your knowledge.

#### What you need

Paper and pen

#### Pollution Catcher! Conduct your own experiment.

Ever wondered how clean the air you are breathing in is? This challenge will task you to set up your own experiment measuring air quality on your street.

#### What you need

Paper plate  
Vaseline  
String

#### Glitter germs

How much do you know about germs? The good and the bad? Have a go at this quick challenge to see how easy it is to pass on nasty germs and the importance of washing our hands.

#### What you need

Glitter  
Water

### 11.15 STEM Challenge Explanation Videos

Discover why things reacted the way they did in your STEM Challenges.

## Discover Sessions

10.30 - 11.00

### Guess Who:

#### Engineering, Design and Technology

Are you ready to use your investigative skills? Can you guess the careers of our STEM superstars from a few clues? Tune in at 10.30 to have a go, and then join the Discover Who session live to find out their career identities.

What you need - Worksheet

10.45 - 11.00

#### Amphibians and Reptiles of the Midlands: survey, identify, protect!

Join Phil to discover more about amphibians and reptiles near you whilst he shows you how they undertake local surveys and protect the wildlife.

11.00 - 11.30 - LIVE session

#### Discover Who: Engineering, Design and Technology

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**Curiosity Live**

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# 17 JUNE - KS3 AFTERNOON SESSION

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## STEM Challenges

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#### Design a Pet First Aid Kit

Can you design a portable First Aid Kit that can be taken with you when you are walking your dog? We will introduce you to all the essential tools a pet First Aid Kit should have. Your challenge is to create an inventive design that is easy to carry: one that could be made into a real product!

**What you need** - Paper - pencil

#### Paper City

Can you build a 3D mini version of your home? Learn how to design and make a net of your home.

**What you need** - Paper - Pencil - Ruler

#### Transfusion!!

An interactive blood transfusion simulation to explore how biomedical scientists use their knowledge of antibodies to save lives

**What you need** - Milk - Vinegar - Red food dye (gel type if possible) - 5 small liquid containers (for example glasses or small plastic drinks bottles) - Dropper (or teaspoon or a straw with your finger over one end) - Stirrer (ie cocktail stick) - A waterproof pen or crayon - A waterproof test plate (a white plate or a piece of flat plastic)

#### The science of personality

This activity will introduce you to the science of personality, exploring how and why psychologists measure it. You'll be challenged to take and review a personality test to find out how you score as well as complete a task exploring how personality is linked with social media.

#### Identify the organism

Test out your skills of identification with this organism quiz.

**What you need** - Paper - Pencil

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### 1.30 - 2.00 - Guess Who: Technical Science

Are you ready to use your investigative skills? Can you guess the careers of our STEM superstars from a few clues? Tune in at 1.30 to have a go, and then join the Discover Who session live to find out their career identities.

**What you need:** Worksheet

### 2.00 - 2.30 - LIVE session - Discover Who: Technical Science

Tune in to find out the answers to Guess Who challenge. Join Sarah Cosgriff as she reveals the STEM superstars' job titles and answers any burning questions you might have. Will you get them all right?



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### 2.15 - 2.45 - LIVE session - Are you ready to be a Cyber Defender

Join this live session to discover more about cyber security and watch a live cyber attach demo. Leave ready to secure your accounts against hacks!



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### 2.30 - 3.00 - LIVE session - Curiosity Live

Had a go at a STEM challenge? This is your chance to ask your burning questions to the brilliant Jon Chase as he shows off his favourite pictures from today's challenges along side his favourite science raps!

## For everyone to join

### 3.00 - 3.15 - LIVE - Competition Winners Revealed

Entered the 'Explore at Home' competition, or voted on your favourite? We will reveal the winner, runner up and people's vote at 3pm, so make sure you're ready!

