



SAMPLE STUDY GUIDE

**CAHOOTS**

## The University of Wonder & Imagination

The University of Wonder & Imagination is now enrolling students of all ages and magical abilities...and there's a place with your name on it!

Following its groundbreaking international 'Zoom' tour in 20-21, The University is back, this time in theaters, live and in-person! Assemble with your fellow students and journey to the most unusual of universities, where the mysterious Professor Bamberg will guide you through this interactive theater experience. The choices you, the audience, make will shape your unique course! Choose your subjects of study and enter themed rooms (such as Math, Space, and Art!) You will interact with the liveliest of lecturers and encounter all kinds of problems and puzzles, unlocking your magical powers as you go.

Cahoots combines magic and illusion with multi-media technology to create an innovative, engaging theatrical performance that's bound to boggle the mind and spark the imagination...Come join the class!

This production first premiered on Zoom in fall 2020 during the Covid-19 Pandemic. The live version of the performance will premiere in 2023, from Cahoots, the makers of Danny Carmo's Mathematical Mysteries, Lights! Camera! Math!, Penguins, Secrets of Space, Shh! We have a Plan and Egg.





*The University of Wonder & Imagination LIVE* offers a wide range of opportunities for school audiences to engage with curriculum subjects such as: Math, Science, Fine Arts, History and Language Arts.

**This sample study guide includes:**

- Additional activities that can be enjoyed before or after you attend the performance
- Suggested further resources

If you are a presenter in North America looking for more information on how to bring this production to your community, please contact Holden & Arts Associates at [sk@holdenarts.org](mailto:sk@holdenarts.org).

If you are teacher or school group, please contact your presenting venue.

If you are a presenter, teacher or school group outside of North America, for more information on how to bring this production to your community, please contact Cahoots on [info@cahootsni.com](mailto:info@cahootsni.com)



## Related Activities

### Math

#### X Marks the Spot

Professor Danny Carmo is head of the Math department in the University of Wonder & Imagination, and these are some of his favourite mathemagical tricks! You will need between 12-20 coins, preferably all the same type.

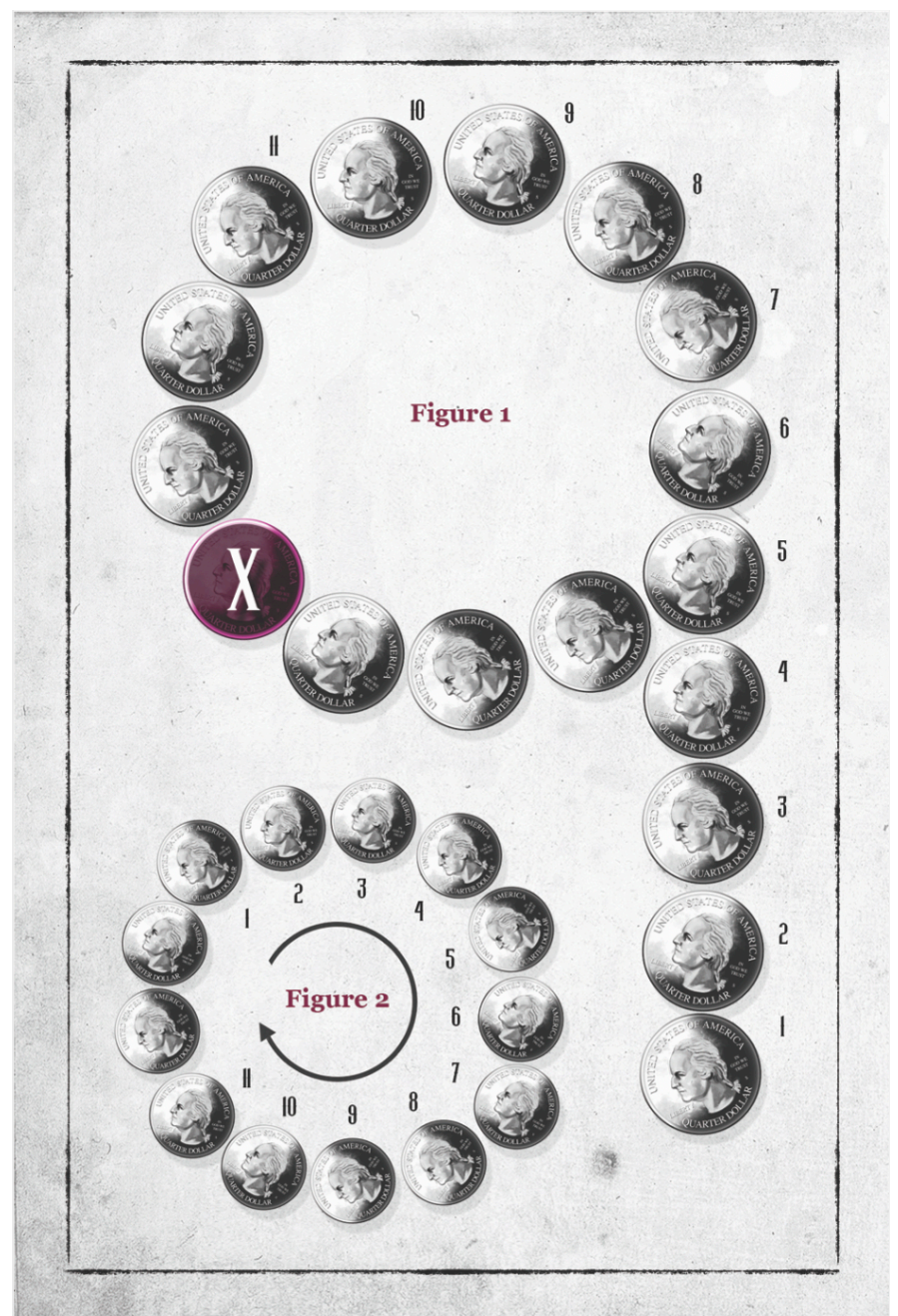
On one of these coins attach a small sticker to one side and mark it with an X. The coins must be laid out as shown in this picture (Figure 1), just like the number 9.

Take note of the position of the coin with the sticker underneath. Ask a friend to name a number between 5-25. Ask your friend to place their finger on the coin at the end of the tail and start counting to their selected number. They should continue counting in a counter-clockwise direction until they reach their chosen number.

Now ask them to count the number again in a clockwise direction but this time ignoring the tail of the 9 (Figure 2).

Have them turn over the coin they land on. It will be the marked coin! Quickly turn over all the other coins to show that they are all unmarked.

Magic!





## The Grid

Draw a grid with 4 rows and 4 columns and fill in the numbers as shown (Figure 1). You will also need a prediction which states 'I predict that your total will be 34'. It must always be 34!

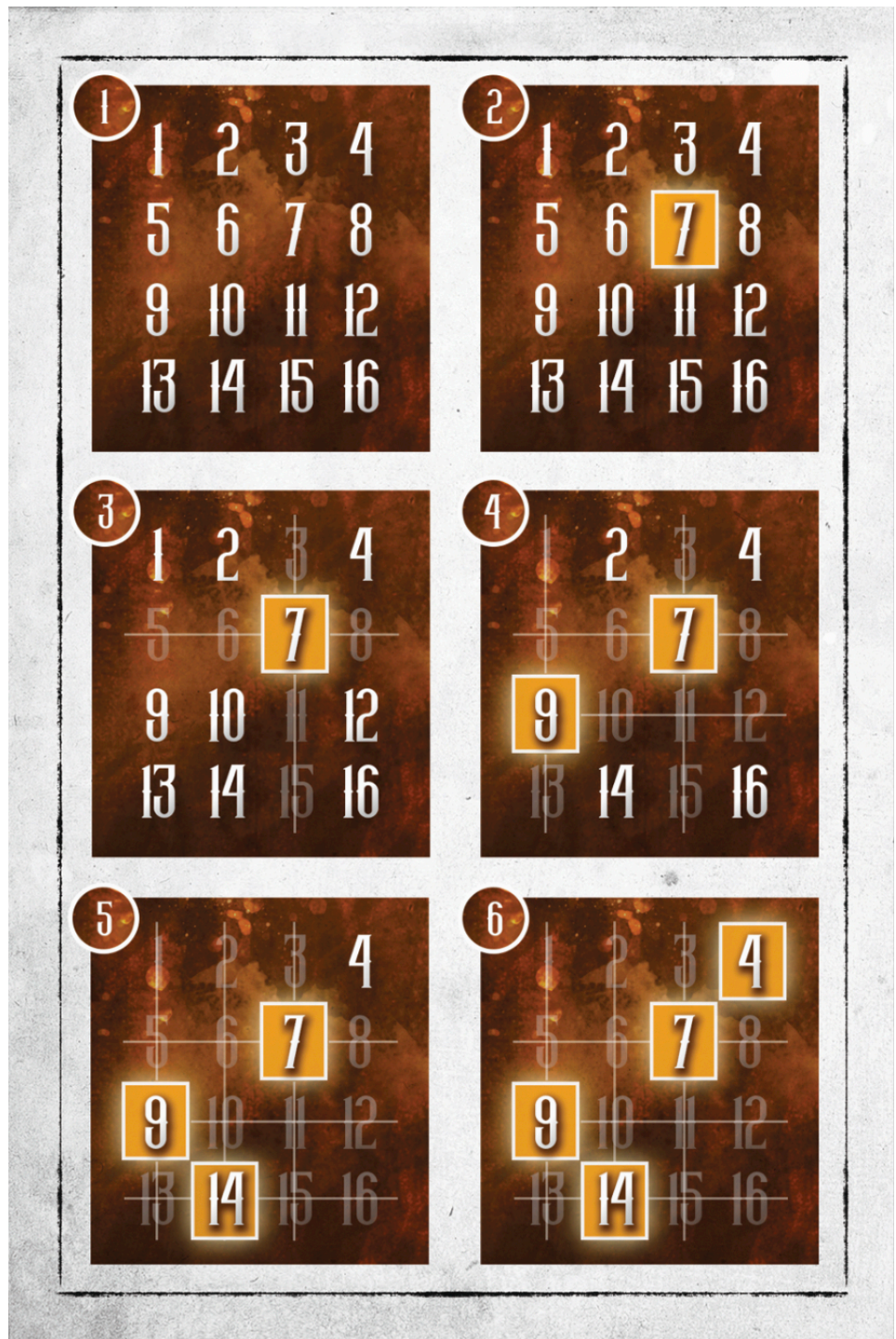
Ask someone to select a number from the grid. For example, they might pick the number 7. Circle the number selected (Figure 2). All the numbers in the same row and column as the selection are now eliminated. Draw a line through these numbers so they can no longer be selected (Figure 3).

Ask a second person to select another number from the grid. They might pick number 9, for example. All the numbers in the same row and column as the selection are now eliminated. Draw a line through these numbers so they can no longer be selected (Figure 4).

Ask a third person to select a number - they might choose number 14. Once more, Circle the number selected. All the numbers in the same row and column as the selection are now eliminated. Draw a line through these numbers so they can no longer be selected (Figure 5). Only 1 number remains. In our example it is the number 4. Circle this number (Figure 6).

Now the fun part - add the 4 circled numbers together and they will match your prediction...

it's the number 34!





## The Magic of 1089

Have a friend write down any 3 digit number. Ask them to reverse the order of the digits and subtract whichever 3 digit number is smaller from the larger number 3 digit number. Write down your answer.

Now ask them to reverse the answer. Add the reversed version of the answer to its unreversed version (see diagram.) The answer will always be 1089! If the answer to the first part of the calculation is 99, have your friend put a zero in front so that it becomes 099. This is the only exception.

It's interesting to know that if you look at the answer to the first part of the calculation, the centre digit will always be 9, and the first and last digits will always add up to 9! You can use the information to check quickly that your friend has done the subtraction correctly.

**STEP 1: PICK ANY 3-DIGIT NUMBER**

316

**STEP 2: REVERSE THIS NUMBER**

613

**STEP 3: SUBTRACT THE SMALLER NUMBER FROM THE LARGER**

$613 - 316 =$

297

**STEP 4: REVERSE THIS NUMBER AND ADD THEM BOTH TOGETHER**

$297 + 792 =$

1089



# Science

## Lunar Drawing

When Professor Hurst was a child, she loved to look out of her window with a telescope and look out into deep, dark Space! Try it yourself by keeping a moon diary for a month and watch the moon change shape. Take a look at the moon every night for a full lunar cycle, 28 days. Draw the shape you see and track the changes that happen. Analyse your results - why does this happen?

## Gravity

This experiment can get a very messy, so make sure you conduct it over a large basin or outside! Poke a hole near the bottom of a polystyrene cup. Fill the cup with water, keeping your finger over the hole.

Take your finger off the hole and observe what happens. The water should stream out.

Fill the cup again, holding your finger over the hole. This time, you are going to drop the cup and lift your finger off the hole at the same time. What do you think will happen? Make sure the cup falls into a large bucket or onto the grass - stand back, you might get splashed! You should notice that when you dropped the cup the water no longer sprayed out of the hole.

When you held the cup and lifted your finger off the hole the first time, the water was pulled out of the hole and towards the ground by gravity. When you let go of the cup completely, gravity didn't pull the water out of the cup, because both the water and the cup were moving at the same speed!



## Fine Arts

### Design a Brochure

Have a go at designing your own brochure to encourage students to register for a place at The University of Wonder & Imagination. What colors will you use and what aspects of the University will you show? Don't forget to include all the reasons a student might want to attend, the classes they can take and plenty of pictures!

### A Moment in Time

In the Art Department, Professor Hoffman talks a lot about the connection between photographs and memories and how “a picture is a poem without words.” Do you have a photograph or memory that means a lot to you? Try different ways of bringing that photo or memory to life! You could write a poem based on how that photo or memory makes you feel, try to recreate it with paint or pencils, or even create a short dramatic reenactment of it!

### “Portraitology”

Pair up with a partner and sit facing each other. Have a go at drawing a portrait of your partner. Pay close attention to their skin, eyes, smile, all the little details that make them unique, and try to capture them on paper. Do they have features that are similar to you? Do they have features that are different to you? Don't forget to sign your work of art! When you are both finished, reveal your portraits to each other and see what you think!





# History

## Women in Space

Professor Hurst, Head of the Space Department, loves teaching students all about women who work in the Space industry.

Why not create a research project all about the different women who played and continue to play various roles in the space industry - finding out things like - where they were born, did they go to space? When and why? Did they go alone?

This can be done as a group or individual project and presented to the class.

## Building History

During the University of Wonder & Imagination, Professor Bamberg shows us the history of the ancient building by showing us pictures and videos. The University building is actually a series of real life historical buildings in Armagh, a city in Northern Ireland. How old is your school building? Are there any really old buildings in your town or city? Take a field trip to see them, and take some pictures if you can. Compare and contrast the old buildings with newer, modern buildings.



# Language Arts

## Diary Entry

Write a diary entry from the perspective of a student after their first day at The University of Wonder & Imagination. Include what they may have seen and how they may have felt.

Use your imagination to consider :

Your journey to the University, the Professors, the other students, the classes on offer, (both normal and not so normal!), the food served at the University and your accommodation at the University.

## My Motto

At the University of Wonder & Imagination, Professor Bamberg tells us that the school motto is “In Imagination We Trust, and in Wonder, We Must!” If you were in charge of a school of your own, what would your motto be? Remember, it should be short and meaningful. What elements of your own personality can you include? What do you think is an important message for pupils at your school to connect with? Once you’ve decided on your motto, you could try designing a school crest and combining the two!

## Hot-seating

Take on the role of one of the Professors from The University of Wonder & Imagination - it can be a character you met in our show, or one you have made up entirely. Sitting in a seat in front of the class, pretend to be this person and answer questions asked to you by your classmates exactly how your character would! Take into account the way they may sit and the voice they might have.

The questions asked might include things like :

What is your name?

How old are you?

What subject do you teach and why should I enrol in your class?

Where do you live?

What’s your favourite color?

What is your favourite food?

What are your hobbies?



**Suggested further resources:**

**The Space Department**

NASA Image and Video Library : <https://images.nasa.gov/>

Live streams from Space : <https://www.youtube.com/NASA>

Sounds from Space : <https://archive.org/details/nasaaudiocollection>

National Geographic : <https://www.nationalgeographic.com/science/space>

Kennedy Space Center Educator Resources : [https:// www.kennedyspacecenter.com/camps-and-education/educator-resources](https://www.kennedyspacecenter.com/camps-and-education/educator-resources)

Hubble Telescope resources : <https://hubblesite.org/>

The Overview Effect : [https:// vimeo.com/55073825](https://vimeo.com/55073825)

**The Math Department**

Self-Working Number Magic by Karl Fulves

Mathematics, Magic and Mystery by Martin Gardner

Mathematical Wizardry by Martin Gardner

Mathemagic by Royal Vale Heath

Mathematical Magic by Bill Simon

Mathematical Magic Manual : <http://mathematicalmagic.com/index.html>

Illusioneering Handbook : <http://illusioneering.org/>

**The Art Department**

National Portrait Gallery, London Online Collections : <https://www.npg.org.uk/collections/>

Metropolitan Museum of Art Kids Video Library : <https://www.metmuseum.org/art/online-features/metkids/videos/channel/all>

Tate Modern Children's Art Activities : <https://www.tate.org.uk/kids>

BBC NI, How to Draw a Portrait : [https://www.bbc.co.uk/teach/class-clips-video/ how-to-draw-a-portrait/zk28qp3](https://www.bbc.co.uk/teach/class-clips-video/how-to-draw-a-portrait/zk28qp3)

National Museums Northern Ireland Online Collections : <https://www.nmni.com/collections/art>

**Cahoots NI**

Cahoots' website : [www.cahootsni.com](http://www.cahootsni.com)