

# • TEACHERS' GUIDE •

Welcome to Arithmetown! We're so glad that you've decided to join us on this mathemystery adventure and we hope that you and your team will be able to help us solve the crime. We recommend you work through the full activity yourself before using it with students. If you have any questions at all, please contact us at [sumsofanarchymaths@gmail.com](mailto:sumsofanarchymaths@gmail.com).

THIS ACTIVITY CAN BE COMPLETED WITH OR WITHOUT INTERNET ACCESS  
BUT THE INSTRUCTIONS ARE SLIGHTLY DIFFERENT SO KEEP READING TO FIND OUT MORE.

The activity consists of three puzzles, each of which has four parts so it's ideal to split the class into four groups, each group can solve their part and bring their answers together to complete each puzzle. If you're working with fewer students or would rather keep the class together, that's no problem. They'll just have to solve all four parts for each puzzle.





HERE'S A CHECKLIST OF ALL THE PAGES INCLUDED IN THE PDF.  
YOU'LL NEED TO PRINT OUT ONE SET PER GROUP.

- 1. Title Page
- 2. Number Day Poster
- 3. Comms 1
- 4. Intro to Puzzle 1
- 5. Suspects List
- 6. Geometrack Data (4 parts)
- 10. Arithmetown Map
- 11. Comms 2
- 12. Intro to Puzzle 2
- 13. Visitor Log
- 14. Ray's Code (4 parts)
- 18. Comms 3
- 19. Intro to Puzzle 3
- 20. Close up of ID (4 parts)
- 24. Arithmetown Company ID List
- 25. Finale





# INSTRUCTIONS FOR USE WITH INTERNET

Each puzzle eliminates one of the suspects. If you have internet access and the option of showing videos to the class, you can access additional content at [www.sumsofanarchy.com/nsfcc](http://www.sumsofanarchy.com/nsfcc). You'll need to enter the code `numberday2024` to enter the portal.

1. Start by watching the video. This is a fun introduction to the world of Arithmetown.
2. Let the students have a look at the Title Page and the Number Day Poster.
3. Read out the Comms 1. If you fancy putting your acting skills to the test, you can take on the role of Chief Inspector!
4. Read through the Intro to Puzzle 1.
5. Let students complete Puzzle 1.
6. When they have worked out which suspect can be eliminated, enter the name of the suspect into the portal as one word, all lower case e.g. `janedoe`
7. The correct answer will unlock the next page.
8. Repeat instructions 3-7 for Puzzle 2 and Puzzle 3.



# INSTRUCTIONS FOR USE WITHOUT INTERNET

Each puzzle eliminates one of the suspects. If you don't have internet access, you can print out the Verdict Pages included in this guide. Put each of these inside an envelope, write the suspect's name on the front and pin these up at the front of the class.

1. Read out the Comms 1. If you fancy putting your acting skills to the test, you can take on the role of Chief Inspector!
2. Read through the Intro to Puzzle 1.
3. Let students complete Puzzle 1.
4. When they have worked out which suspect can be eliminated, open the envelope with the suspect's name to verify. (Note: teachers should check their answer beforehand to ensure that they don't open the wrong envelope and get a spoiler!)
5. Repeat instructions 1-4 for Puzzle 2 and Puzzle 3.



# INSTRUCTIONS FOR SOLVING PUZZLES

SPOILER ALERT: The answers will be revealed in the following section so if you wanted to give the puzzles a go by yourself first, now is your chance!



# PUZZLE 1: GEOMETRACK

## SUSPECT LIST



## ARITHMETOWN MAP



## GEOMETRACK DATA



## THE MISSION

Each group will be tracking the movements of one suspect. If you're working with fewer groups, they'll need to track all of the suspects.

The Geometrack Data shows the movements of each suspect on the day of the theft but two of the numbers are missing. Use the Encryption Key and spot the pattern in each sequence to uncover the missing number.

Once you've found the missing numbers, grab the map and make a cross to mark the first location of your suspect on the map. Now you can use the completed movement data to mark out the movements of your suspect.

Group 3 will notice that TESSA LATE never visited the Arithmetown Hall. She is the suspect to be eliminated. All other groups will notice that their suspects visited the Arithmetown Hall and these suspects remain in the investigation. Open Tessa Late's envelope or enter tessalate into the portal.



# GEOMETRACK SOLUTIONS

15, 12, 9, G, 3: Sequence is subtracting 3 so  $G=6$

0, H, 4, 6, 8: Sequence is +2 so  $H=2$

1, 3, P, 10, 15: Sequence is +2, +3, +4 etc (or triangle numbers) so  $P=6$

Q, 9, 13, 17, 21: Sequence is adding 4 so  $Q=5$

1, V, 9, 16, 25: Sequence is square numbers so  $V=4$

1, 2, 4, W, 16: Sequence is multiplying by 2 so  $W=8$

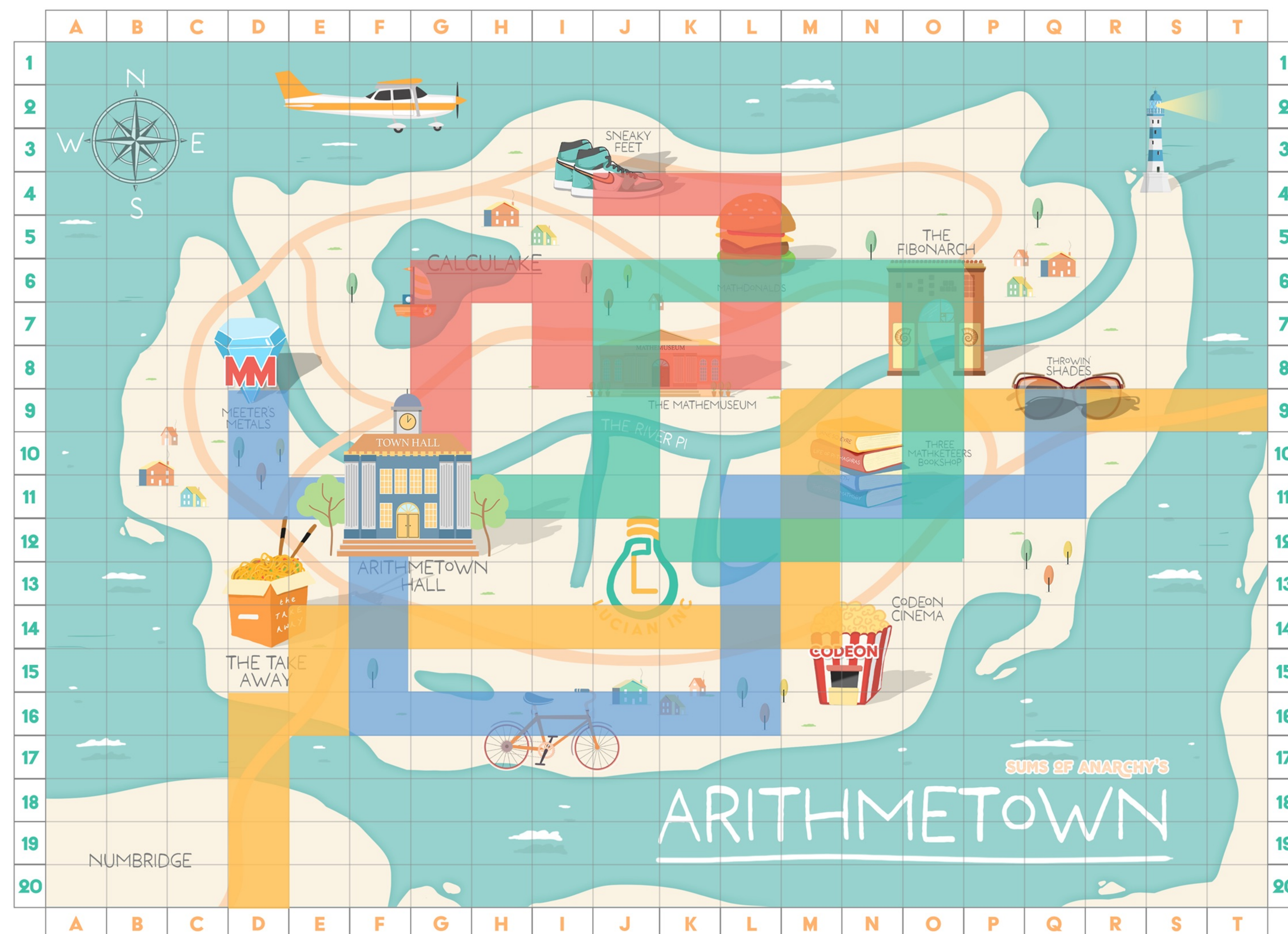
1, X, 9, 27, 81: Sequence is multiplying by 3 so  $X=3$

1, 3, Y, 7, 9: Sequence is +2 so  $Y=5$



# GEOMETRACK MAP

SOL: ■  
 DES: ■  
 MILLIE: ■  
 TESSA: ■



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Number Day 2024

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# PUZZLE 2: RAY'S CODE

## VISITOR LOG

VISITOR LOG						
VISITOR ID	VALUE	NAME	TIME IN	DURATION	TIME OUT	
1			19:25	90m		
2			20:15	45m		
3			20:20	32m		
4			20:25	50m		
5			20:39	30m		
6			20:44	35m		
7			20:58	14m		
8			21:01	6m		

## RAY'S CODE

• RAY'S CODE: A •

lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Quis ipsum

A

 +  = 8

 ×  = 36

 =

 =

## THE MISSION


Each group will be uncovering the identity of two visitors. If you're working with fewer groups, they'll need to uncover all of the visitor identities. The sweets in Ray's Code stand for numbers. Work out which numbers satisfy both equations in their section to reveal the value of each sweet.

### PART: A

 = 4

 = 9

### PART: B

 = 16

 = 8

### PART: C

 = 5

 = 12

### PART: D

 = 7

 = 3

Once they have the correct values, enter them into the 'Value' column on the Visitor Log. Students will need to share their answers with each other here so that they all have the 'Value' column completed. Now they can use Ray's cheat sheet to work out which visitor belongs to which visitor ID.



# RAY'S CODE SOLUTIONS

Julie: Even Square  $< 10 = 4$

Bob: Sides of A Pentagon = 5

Millie: Even Square  $> 10 = 16$

Roxy: Fourth Prime = 7

Sol: Even multiple of 3 = 12

Lou: First odd prime = 3

Des: Odd Square = 9

Sam: Vertices of a cube = 8

Next, they can use the 'Time In' and 'Duration' columns to work out the time each visitor left.

Julie: 21:19

Des: 21:12

Bob: 21:09

Sol: 21:00

Millie: 21:15

Sam: 20:52

Lou: 21:07

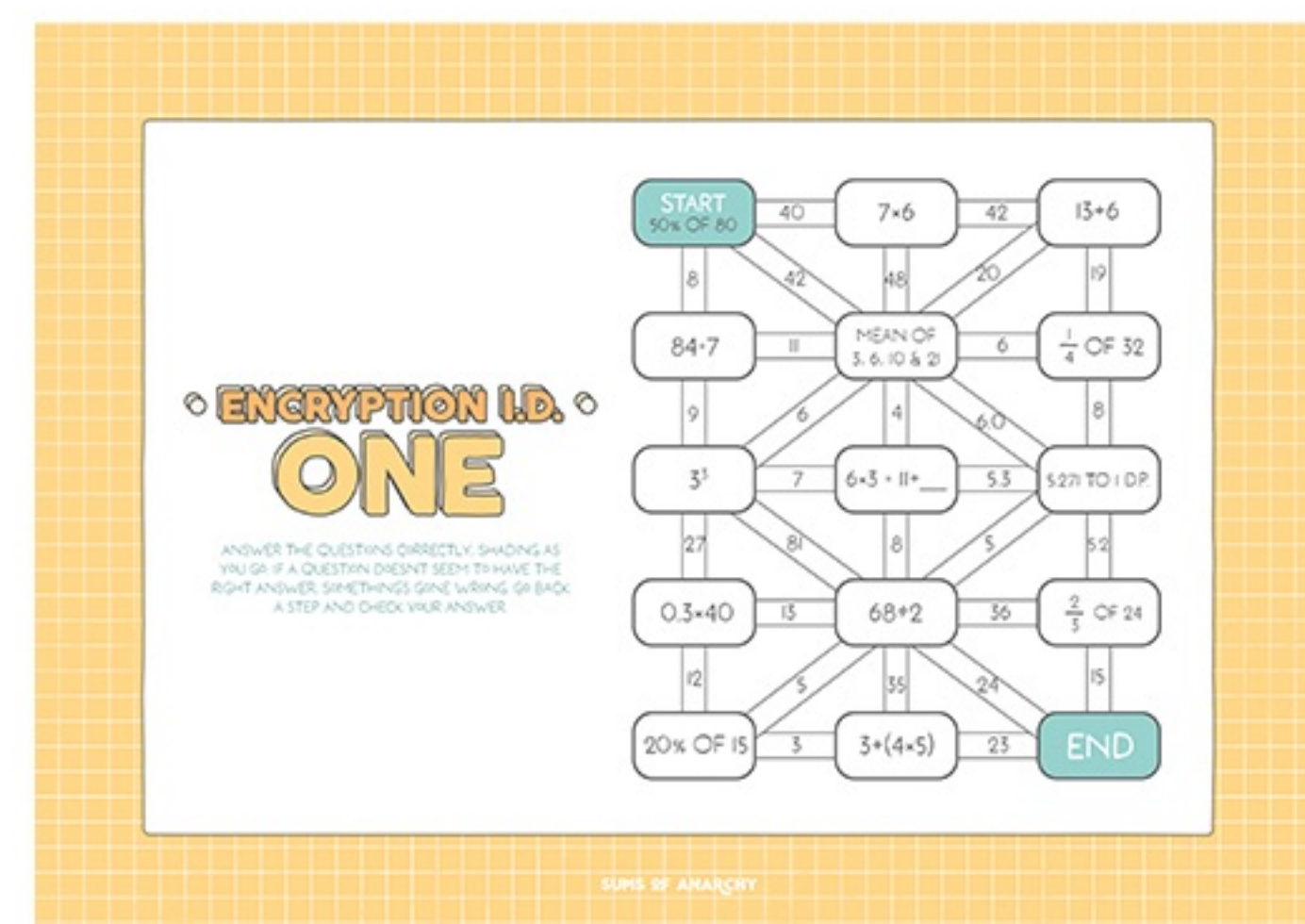
Roxy: 20:55

Students will notice that, out of our three remaining suspects, only Des Simmel and Millie Meeter were there during the crime window. SOL LUCIAN can be eliminated. Open Sol Lucian's envelope or enter sollucian into the portal.



# PUZZLE 3: COMPANY I.D

CLOSE UP OF I.D



ARITHMETOWN COMPANY ID LIST



ARITHMETOWN MAP



## THE MISSION

Each group will decrypt one part of the ID. If you're working with fewer groups, they'll need to decrypt all four parts.

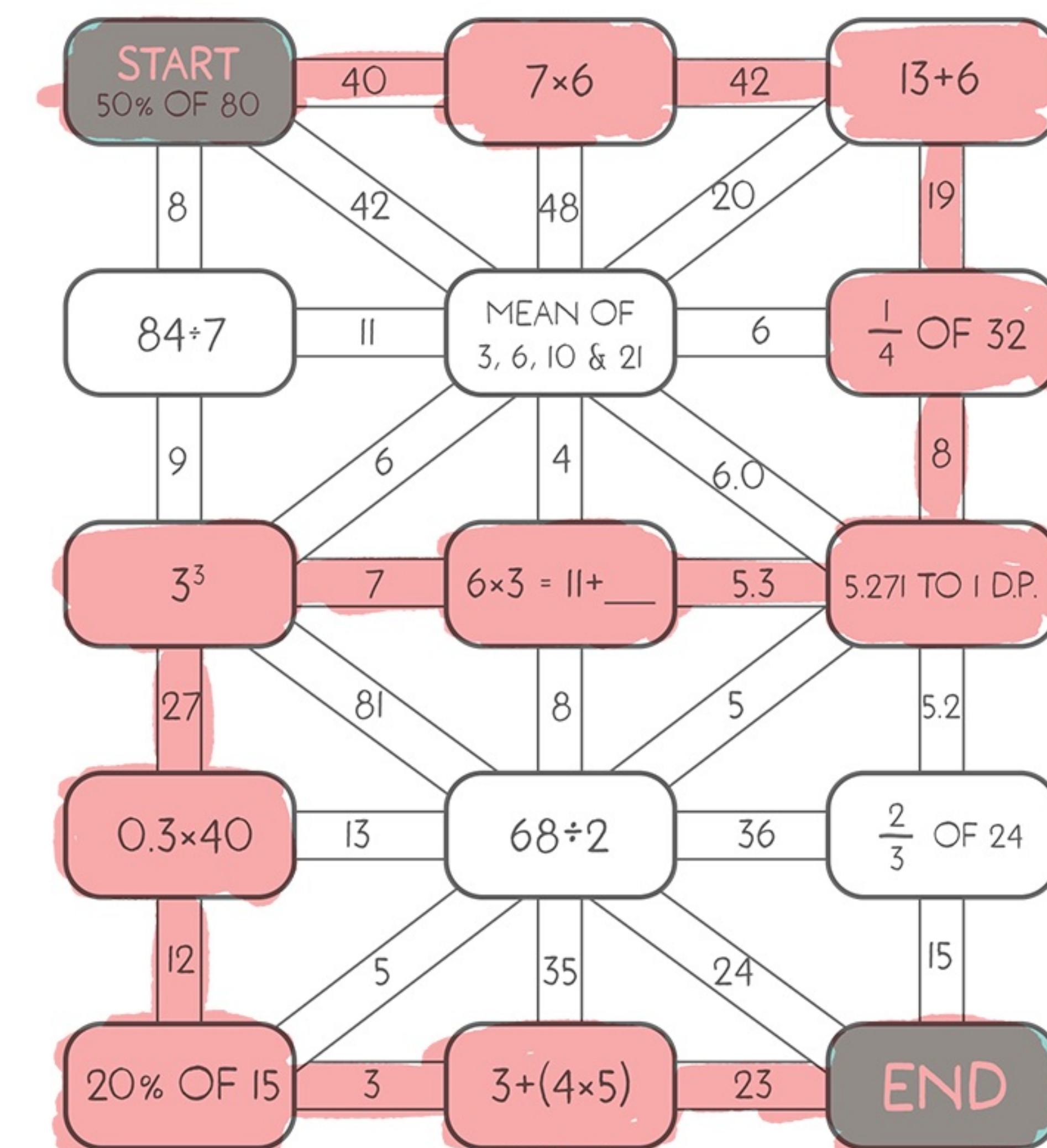
Locate the 'Start' square, answer the question and shade the route with the correct answer. Keep going until you reach the 'End' square. If a question doesn't seem to have a correct answer, something has gone wrong. Go back a step and check your answer.

When they've reached the end, they should notice that the path they've shaded resembles a number.

Once all groups have their numbers, they'll put them together (in group order) to reveal the company ID: 2579

When they check the Arithmetown Company ID List they'll see this is the company ID for **Throwin' Shades**. Now they know where the purchase was made.

They'll have to check the movements that they marked on the Arithmetown map from the Geometrack Puzzle. Group 4 will notice that **MILLIE MEETER** visited **Throwin' Shades** so she is the thief! The case has been cracked. Open Millie Meeter's envelope or enter **milliemeeter** into the portal.







# CERTIFICATE

OF CRIME SOLVING

PROUDLY PRESENTED TO

For solving the Arithmetown Trophy Thief Mystery,  
apprehending the thief and recovering the Golden Numeral  
Trophy in time for Number Day.

- DATE -

DM JP

-DOMINIQUE & JACK-  
CHIEF ANARCHISTS



# NOT GUILTY

I was in Arithmetown on the day of the theft  
but, as the Geome-track data shows, I never  
went to the Arithmetown Hall!

• TESSA LATE •



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# NOT GUILTY

I was at the Arithmetown Hall but, as Ray's Code shows, I had left before the crime occurred!

SOL LUCIAN.



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# NOT GUILTY

I was at the Arithmetown Hall at the time of  
the crime but, as the Geome-track data shows,  
I never went to Throwin' Shades!

•DES SIMMEL•



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Number Day 2024



# GUILTY

It was me! I took the Golden Numeral trophy, and if that piece of receipt had never fallen out of my pocket, I'd have gotten away with it too! I could have melted down that trophy so that no-one would ever have been able to identify it, and once I'd got my hands on that solid gold, I'd be long gone. A new life in the Seychelles! But now, the closest I'm going to get to precious metals is the stainless steel in these handcuffs. Thanks for nothing SUMS team.

•MILLIE MEETER•

