



# Lucy & Rebekah



First released for Outbox 2020

## Starters 15 mins

Snack, Cackle & Pop..... 2 mins

Snack: Before we begin, grab a snack!

Cackle:

**Why do plants hate mathematics?**



**Because it gives them square roots!**



Pop: Stemillions playlist on Spotify:

[bit.ly/stemillionsplaylist](https://bit.ly/stemillionsplaylist)

Meet Her..... 5 mins

Rebekah and Lucy are both analyst developers who work in the Serious Crime team at GCHQ. GCHQ stands for Government Communications Headquarters.

Discuss:

★ Have you heard about GCHQ before?

## Desserts 5 mins

Share with us ..... 1 min

Upload photos on [Twitter](#) or [Instagram](#) and tag @Stemettes and #Stemillions.

Ask Away..... 2 mins

Got a question? Ask Away! [bit.ly/Ask-Away](https://bit.ly/Ask-Away)

Digest..... 2 mins

Digest this Meal Plan - fill out the feedback form.

## Mains 40 mins

ACTIVITY..... 40 mins

**You will need: 3 pieces of paper, ruler, pen/pencil.**

Julius Caesar used a simple substitution cipher to send messages to his troops. He substituted each letter by the letter that was 3 places further along in the alphabet so "A" was replaced with "D" and "B" with "E" and so on.

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

1. Along the long edge of the pieces of paper mark every centimeter for 26 cm.
2. Draw another line 26 cm long under the marks. This will make a grid.
3. Fill each of the grids with the alphabet using capital letters - A,B,C etc.
4. You should have 3 pieces of paper with grids on.
5. Julius Caesar used a shift of 3, we'll do the same. Take one of your grids - this is your plaintext. Now take one of the other grids and line up the "D" with "A" of the first grid.
6. You will see you have three letters at the end with no letters underneath - this is what the other piece of paper is for. Line up the other grid next to the lower grid to fill in the last three letters.
7. To encode a message find the letter you want to encode on the top line, then write down the letter below.
8. Let's try encoding "HELLO": First find "H" then write down the letter below which is "K".
9. What is "SECRET MESSAGE" encoded? Can you encode your name?
10. In the Caesar cipher the letters have been shifted by 3. The person encoding and the person decoding the messages both need to know this number. This is known as the **key**. Keeping the key private is very important - Why?

Try changing the key to 7 what letter is now under "A"?