#### ENIGMA





## 1. Message Formatting

First, determine the hidden message. This can be a word or a series of numbers that have narrative significance.

If it's a word, it should be easily discernible and comprehensible to laymen. It is recommended that the message be around 3 - 6 characters in length.

\*It is very important that the message be chosen carefully, as changing it later will require an almost complete redesign of the puzzle from scratch.

As an example, let us take the word "CODE," which consists of the four letters: C, O, D, and E.

First, copy the modular cell in the provided Illustrator file by the corresponding number of characters in the message. Make sure they are directly adjacent to one another.

\*In outstanding circumstances (such as the Coventry puzzle), one may change the grid density for the cell as seen fit.



### 2. Path Composition

Now, using the four colours (red, orange, blue, and green) of the two mathematicians and the two linguists, trace over the characters as seen fit to compose a legible message.



While you are doing it, here are some things you should consider:

1) Some characters (letters or numbers) can be drawn a single, linear stroke. These are best drawn this way.



2) Others, such as the letters "B" and "P", require a combination of multiple lines to complete. Letters that require more than 3 different strokes, such as the letter "R", are difficult to draw, and should be used sparingly.



### 2. Path Composition

3) Try to avoid shared start and end points (the "inlet" and the "outlet"), as they may confuse some players.



4) Avoid overlapping lines as much as possible. This runs the risk of giving away the message without the players having solved the puzzle!



5) The "transfer" lines should be always justified to the bottom (much like an underline) to maximize visual clarity.



### 2. Path Composition

6) While referring to the stroke patterns on the Appendix templates is a good starting point, every set of characters is a unique problem. Hence, the patterns may vary from case to case.

7) The length of each line should be fairly balanced. For example, as seen in the illustration below, the linguist A's line should not be dominating the drawing space.



8) Simplicity is key. Try to minimize the number of turns for each line, and focus more on the bigger gestures.

#### Letters

First, count the number of grid intersections where character can be written on, noting the "gaps" where multiple lines overlap, and the "turns" where the line changes direction.



Now, fill in the grid intersections with the characters that make up the intended hidden message. Leave the "gaps" as blank spaces. Once finished, repeat the procedure for the other linguist's path as well. In general, it is much easier to recognize a pattern when the sequence reads from left to right, top to bottom.



Here are some things to consider while you're doing it:

1) Never start a word right before a gap / turn in the line. It is highly likely that players will be confused and lost.



2) Actively use grammatical rules to have the message "flow" and guide the players to look for certain words. For example, if the current word is a noun, it is highly likely that the next word should be a verb.

3) Use simple, familiar vocabulary. This is not a test for literature majors.

4) Try to avoid short connectors such as "a" or "is", as it may be difficult for the players to distinguish from the other words.



5) Pay attention to the possibility of words that may be subset of the original message. This may lead the players to formulate a new message with an entirely different meaning. For example, the word "subset" can be interpreted in two parts "sub" and "set."

#### Numbers

Fortunately, mathematicians' lines are much easier to design that the linguists'. Since there is no inherent grammatical constraint, the logical constraint can be constructed from scratch.

First, count the number of grid intersections along the path, also noting the "gaps" and the "turns" mentioned before.



Now, think of a simple mathematical pattern, where the underlying operations are recognizable. For example, this could be a simple constant addition operation, a Fibonacci operation, or even switching back and forth between different operations, such addition and subtraction.



Use mod 10 to avoid having multiple digit numbers. This eliminates the possibility of ballooning numbers, which may make it too easy to visually predict the correct path. This keeps the visual homogeneity of the characters on the grid. Once finished, repeat the procedure for the other mathematician's path as well.



Here are some things to consider:

1) Try not to incorporate more than 3 mathematical rules at play at a given time.

$$1^{+2} 3^{+2} 5^{+2} 7^{+2} 9^{+2} 11^{+2} 13^{+2} 15^{+2} 17^{+2} 19$$
 YES  
$$1^{+2} 3^{+2} 5^{-3} 2^{+2} 4^{+2} 6^{-3} 3^{+2} 5^{+2} 7^{-3} 4$$
 MAYBE...  
$$1^{+2} 3^{\times 2} 6^{-3} 3^{+2} 5^{\times 2} 10^{-3} 7^{+2} 9^{\times 2} 18^{-3} 15$$
 NO !!!

2) Be wary of patterns that may be easily mistaken for an another mathematical logic.

$$2^{+2} 4^{+2} 6^{+2} 8^{+2} 10$$
$$2^{\times 2} 4^{\times 2} 8^{\times 2} 16^{\times 2} 32$$

3) Avoid operations that requires the players to remember more than 3 numbers in sequence.



## 4. Hiding the Message

Now that the message has been designed, it is now time to camoflouge it in a field of random letters and numbers.



First, populate the empty grid with a letter or number of your choosing. In this case, it is "A".



#### 4. Hiding the Message

Then, spanning the letters from A to Z and the numbers from 0 to 9, randomly distribute the characters, making sure that no character is a duplicate of its adjacent pair.



This means the value (ex. 0 vs 0), or the type (ex. O vs 0) of a character in relation to its neighbours must be distinct.



It is recommended that no more than 5 characters of the same type be consecutively adjacent.



#### 4. Hiding the Message

As a final check, see if there are possible alternative paths along the original four paths as a result of the new jumble of characters. For example, for the sentence "This is…", there may be two options, both offering the possible route of "…just a…".



This runs the risk of confusing the players. Hence, follow and troubleshoot these branching paths, changing the characters as seen fit to make the paths airtight.



**But!** One can also take advantage of misdirection to enhance engagement and difficulty of the puzzle. If these intentional branching paths are properly managed - if they quickly lead to an obvious deadends within one or two words - they can throw in an element of surprise to the players. However, optional paths to an optional path should be avoided - as they may entrap the players in the chaos of misleading paths.

# 5. Appendix

LETTERS

![](_page_12_Figure_2.jpeg)