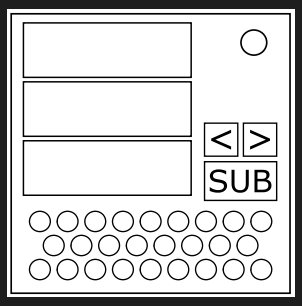
On the Subject of the Sudoku Cipher



The gift that keeps on giving.

On the module, you will see three screens, a keyboard, two arrows, and a **submit** button that displays the current page you're on.

Pressing the right arrow takes you to the next page. Pressing the left arrow takes you to the previous page. The number of pages may vary.

This module comes preloaded with a single **Regular Sudoku Cipher** but subsequent stages may be added.

If there is no coloured sudoku module on the bomb, refer to the page for **Regular Sudoku Cipher** and disregard the remainder of this manual.

When a coloured sudoku module is present on the bomb, solving the initial cipher will not solve the module. Instead, with each coloured sudoku solved, a new cipher will be queued onto the module.

Ciphers will always be queued in the same order that the sudokus are solved. For the first cipher, the module's background will change colour. When a new cipher is generated, the module will change colour to match the solved sudoku.

All ciphers require a word to be input using the keyboard. Some ciphers will have an alternative mode that can be entered using the **S** key. To submit your word from this state, first press the **submit** button.

Creating Alphabet Keys

Unless otherwise specified, when asked to create an alphabet key, take the given keyword, remove any duplicate letters, and append the entire alphabet A-Z with any letters from the keyword removed.

When asked to form a letter grid, three keywords will be provided as well as a three-letter string where each letter corresponds to one of the keywords. Form three alphabet keys using the keywords. Then, for each key, take the corresponding letter three-letter string, replace that letter in the alphabet key with # and move the letter to the end of the alphabet key. Finally, concatenate the three keys and split into rows of 9 to form a 9x9 grid of letters.

On the Subject of Regular Sudoku Cipher

Did someone order a regular?

	Page 1	Page 2	Page 3+
Screen 1	Coordinates	Keyword 1	Clues
Screen 2		Keyword 2	
Screen 3	3 Letter Key String	Keyword 3	

Using the clues from page 3 onwards, form and solve the 9x9 sudoku grid. The clues give the coordinate followed by the value at the coordinate.

Then, form a letter grid using the keywords from page 2 and the three-letter key string from page 1. The coordinates on page 1 refer to six positions within the letter grid which form an encrypted word.

To decrypt the word, apply a forwards caesar shift to the letters equal to the value of the same cell in the sudoku grid.

#	7	#	#	#	5	(8)	#	#
#	#	#	#	#	4	3	#	5
8	#	#	#	#	#	#	#	#
#	#	#	9	#	#	#	#	#
1	(6)	#	#	4	#	9	2	#
3	9	#	#	8	#	7	#	#
#	#	6	2	#	7	#	#	#
#	5	4	6	#	#	#	#	2
(2)	#	#	#	1	#	5	#	#

Example

For given clues: B17, F15, F24, G23, I25, A38, D49, A51, E54, G59, H52, A63 B69, E68, G67, C76, D72, F77, B85, C84, D86, I82, E91, G95, Take the first two characters as a coordinate using column first, then row.

B17 means there is a 7, at B1.

Keywords: CIPHER, PUZZLE, SUFFER
Three-Letter Key String: FML
Coordinates: G1, B5, B1, A3, G1, A9
Sudoku Values: 8, 6, 7, 8, 8, 2
Letter Values: A, G, I, S, A, P

A + 8 = I
G + 6 = M
I + 7 = P
S + 8 = A
A + 8 = I
P + 2 = R

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

On the Subject of Red Sudoku Cipher

Oh no look, it's all broken and on the floor.

	Page 1	Page 2
Screen 1	3 Letter Key String	Keyword 3
Screen 2	Keyword 1	
Screen 3	Keyword 2	

Form a letter grid using the keywords from pages 1 and 2, and the three-letter key string from page 1.

Then, press the **S** key to enter movement mode. In this mode, a grid of words can be navigated using the **L** and **R** keys. The middle screen will display the word in your current position.

The grid of words consists of an outer grid which is shown when first entering movement mode, and an inner grid which can be accessed by Pressing the **D** key on the only valid word from the outer grid.

A word is considered valid if the sum of the alphabetic positions (A=1 Z=26) of the letters between the first and last letter of the word modulo 10 is equal to the cell in the same position in the sudoku grid. For the outer grid, use compare validity using the centers of each 3x3 box in the sudoku grid. Upon entering the inner grid, compare to each cell in reading order from the same box you entered.

Next, find six valid words from the inner grid. The first letter of each word, combined with its position in the grid (first being 1, last being 9), forms a coordinate. Use this coordinate in the letter grid to find a letter. Repeat for all six valid words to obtain a scrambled word.

Example

word: FEATHER

E + A + T + H + E = 5 + 1 + 20 + 8 + 5 = 39

If the sudoku grid has 39 % 9 = 9 in the same position, the word is valid.

On the Subject of Orange Sudoku Cipher

Like discolored squares but with more squares and less effort.

	Page 1	Page 2
Screen 1	Encrypted Word	Keyword 2
Screen 2	3 Letter Key String	Keyword 3
Screen 3	Keyword 1	

Form a letter grid using the keywords from pages 1 and 2, and the three-letter key string from page 1.

Next, find each letter in the encrypted word in the letter grid (always three occurrences). If the number in the same position in the sudoku grid falls on a palindrome line, use the position on the other side of the palindrome line.

Look for the letter in the letter grid given by this position's column as the row and row as the column. Each letter in the final word can be any of the three letters found. The word to sumbit is the only valid word that can be formed using some combination of these letters.

1	6	8	9	2	7	4	5	3
3	7	5	1	4	8	9	6	2
2	4	9	5	3	6	7	8	1
4	5	3	7	6	1	2	9	8
9	8	1	4	5	2	3	7	6
6	2	7	3	8	9	1	4	5
8	9	6	2	7	3	5	1	4
7	3	4	6	1	5	8	2	9
5	1	2	8	9	4	6	3	7

Keywords: CIPHER, PUZZLE, SUFFER
Three-Letter Key String: FML

Y = G3 G9 H6 > F1 G9 H6 > A6 I7 F8 = Q **D** #
H = B8 C5 D1 > D6 C5 D1 > F4 E3 A4 = **A** W P
X = F3 F9 G6 > F3 F9 G6 > C6 I6 F7 = S **M** A
D = I1 I4 I7 > I1 I4 I7 > A9 D9 G9 = **P** V Y
F = A5 C7 I3 > A5 C7 I3 > E1 G3 C9 = **E** Y T
K = D2 E8 F5 > D2 E8 G4 > B4 H5 E6 = U **N** V

Example

Lines at:
[E5-F6-G7] [B2-C3-D4] [D6-B7-B8]
[G3-G2-F1] [F5-F4-G4]

Encrypted word: YHXDFK

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

On the Subject of Yellow Sudoku Cipher

Putting the pieces back together.

	Page 1	Page 2	Page 3
Screen 1	Coordinates	3 Letter Key String	Keyword 3
Screen 2		Keyword 1	
Screen 3	Initial Offset	Keyword 2	

Form a letter grid using the keywords from pages 2 and 3, and the three-letter key string from page 2.

A hidden grid is generated and caesar shifted to form a navigable grid. Each letter is caesar shifted by three factors: the initial offset (bottom screen, page 1), the sudoku value at that spot, and the letter's position in your letter grid.

Press **S** to enter movement mode. Navigate the 9x9 letter grid from the center with **U**, **R**, **D**, and **L** to the six given coordinates. The middle screen shows your current letter. Crossing a jigsaw box wall will caesar shift the whole grid forward by the sudoku value of the square you move into.

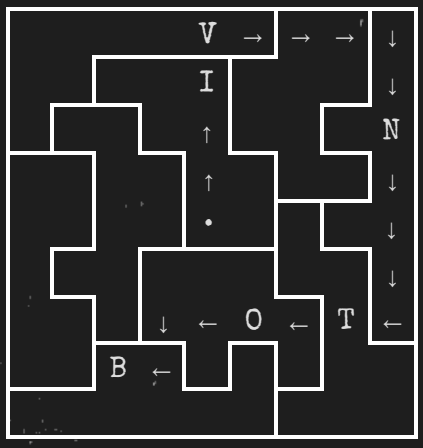
9	6	2	1	3	5	7	4	8
4	8	7	3	5	1	6	9	2
7	2	5	6	9	8	3	1	4
1	3	9	7	8	4	2	5	6
6	7	8	4	1	2	5	3	9
8	1	6	9	2	3	4	7	5
2	9	3	5	4	6	1	8	7
5	4	1	2	7	9	8	6	3
3	5	4	8	6	7	9	2	1

Example

⇐ Sudoku Grid
Letter Grid ⇒

Keywords: CIPHER PUZZLE SUFFER
Three-Letter Key String: FML
Coordinates: I3 F7 H7 C8 E2 E1

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



⇐ Path Taken
Initial Offset: 6
9 (I) = (? + 6 + 5 + 12) % 26 ⇒ L
22 (V) = (? + 6 + 3 + 5 + 3) % 26 ⇒ E
14 (N) = (? + 6 + 4 + 6 + 18) % 26 ⇒ F
20 (T) = (? + 6 + 8 + 3 + 26) % 26 ⇒ C
15 (O) = (? + 6 + 6 + 1 + 27) % 26 ⇒ A
2 (B) = (? + 6 + 1 + 9 + 29) % 26 ⇒ I
In Order: FACILE

On the Subject of Green Sudoku Cipher

You don't have the cards.

	Page 1
Screen 1	Player 1 Name
Screen 3	Player 2 Name

Two players are engaged in a first to five, match of nine card poker. Input the winner's name followed by the letter at the alphabetic position given by the number of games that were played before they won.

The match consists of nine games, each given by a row of the sudoku grid. The deck has nine cards with three ranks and three suits.

1 = Ar 2 = 2r 3 = 3r 4 = Ag 5 = 2g 6 = 3g 7 = Ab 8 = 2b 9 = 3b

The first two numbers in the row represent the first player's cards, the next two represent the second player's cards, the next three represent the flop, and the final two represent the turn and the river cards respectively. Hands are formed using five cards with at least one card from the player's cards. The hands below, are in order from lowest to highest value.

Set	Two Pair	Three of a Kind	Straight Flush	Full House
Xr Yg Zb	X x2 Y x2	Xx Xy Xz	X x3	X x2 Y x3

Each game has three stages. After the flop and turn, if a player has a hand two or more ranks lower than the other player, they fold.

If neither player's highest ranked hands are the same higher after the river, the player with the highest valued card (1-9) wins.

Example Game - 982541673

Player 1 Cards	Player 2 Cards	Flop	Turn	River
3b 2b	2r 2g	Ag Ar 3g	Ab	3r

Player 1 ⇒ Flop: 3b Ag Ar 3g ⇒ Fold

Player 2 ⇒ Flop: Ag 2g 3g ⇒ Turn: Ag Ar Ab 2g 2r

Player 2 wins.

On the Subject of Cyan Sudoku Cipher

I'm feeling very attacked right now.

	Page 1	Page 2
Screen 1	Coordinates [1+ Screens]	Keyword 1
Screen 2	Letter Order	Keyword 2
Screen 3	3 Letter Key String	Keyword 3

Form a letter grid using the keywords from page 3, and the three-letter key string from page 2.

The coordinates on the top screen(s) of page 1 are the coordinates of chess pieces to be placed onto the letter grid. To find which piece should be placed, refer to the chess piece table and use the value of the same position in the sudoku grid.

Once all pieces are placed, six squares will be attacked by more than one piece. The letters in the same position in the letter grid are a scrambled word. Taking the positions that the letters were found in reading order, the final order of the letters is given by the string of numbers on the middle screen of page 1.

8	5	2	1	6	7	9	3	4
4	3	1	9	5	2	8	6	7
6	7	9	4	3	8	1	5	2
2	6	7	3	8	1	4	9	5
3	8	5	2	9	4	6	7	1
1	9	4	5	7	6	3	2	8
5	4	6	7	1	3	2	8	9
7	2	8	6	4	9	5	1	3
9	1	3	8	2	5	7	4	6

Example

Coordinates: B7, D7, F4, H1
B7 ⇒ 4 ⇒ ♗
D7 ⇒ 7 ⇒ ♘
F4 ⇒ 1 ⇒ ♔
H1 ⇒ 3 ⇒ ♗

Value	Piece
1	King ♔
2-4	Bishop ♗
5-6	Rook ♖
7-9	Knight ♘

8	5	2	1	6	7	9	♗	4
4	3	1	9	5	2	L1	6	♗
6	7	9	4	♔	L2	♔	5	2
2	6	7	3	L3	♔	♔	9	5
3	8	♘	L4	L5	♔	♔	7	1
♗	♘	L6	5	7	♘	3	2	8
5	♗	6	♘	1	3	2	8	9
♗	♘	♗	6	4	♘	5	1	3
9	1	♘	♗	♘	5	7	4	6

Multi-Attacked Squares:
G2, F3, E4, D5, E5, C6

Letter Grid ⇒
CIPHER PUZZLE SUFFER FML
Letter Order: 5 4 1 2 3 6

Final Letters: NXEIJS
Unscrambled: JINXES

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

On the Subject of Blue Sudoku Cipher

Woah! Where did that come from?

	Page 1	Page 2
Screen 1	Row Shifts	Keyword 1
Screen 2	Column Shifts	Keyword 2
Screen 3	3 Letter Key String	Keyword 3

Form a letter grid using the keywords from page 3, and the three-letter key string from page 2.

Using the string of digits from the top screen of page 1, for each row of the letter grid, take the corresponding digit from the string. Look at that position in the row of the Sudoku grid and use its value to shift the row of the letter grid to the right.

Using the string of digits from the middle screen of page 2, for each column of the letter grid, take the corresponding digit from the string. Look at that position in the column of the Sudoku grid and use its value to shift the column of the letter grid down. The final word will appear somewhere in the grid.

6	1	8	4	2	3	5	7	9
7	5	4	1	9	6	3	2	8
2	3	9	5	8	7	1	4	6
3	8	7	2	1	5	9	6	4
1	9	6	3	7	4	8	5	2
4	2	5	8	6	9	7	3	1
8	6	1	7	5	2	4	9	3
9	7	3	6	4	8	2	1	5
5	4	2	9	3	1	6	8	7

Example

⇐ Sudoku Grid
Letter Grid ⇒ >
CIPHER PUZZLE SUFFER FML

Row Clues: 955622815
Col Clues: 885389718

Row Shifts: 008502003
Col Shifts: 076541475

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

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

⇐ After Row Shifts
After Col Shifts ⇒

Final Word: CUBIST

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

On the Subject of Purple Sudoku Cipher

I can see the world from up here!

	Page 1	Page 2
Screen 1	Coordinate Clues	Keyword 1
Screen 2		Keyword 2
Screen 3	3 Letter Key String	Keyword 3

Form a letter grid using the keywords from page 3, and the three-letter key string from page 2.

Each coordinate clue is made up of a grid coordinate followed by a letter indicating a direction (U, R, D, L). Go to each coordinate in the sudoku grid and move in the direction given until a building which is higher than the building at the given coordinate is reached (the value of the cell is higher). Take the position of this new building and look at the letter in the same position in the letter grid to obtain a decrypted letter.

Repeat for all clues to decrypt the word.

6	7	2	5	8	9	4	1	←3
8	9	3	1	2	4→	7	5	6
1	4	5	6	3	7↓	2	8	9
7	2	1	4	6	5	3	9	←8
5	8	6	9	7	3	1	4	2
4	3	9	8	1	2	6	7	5
3	1	7→	2→	5	8	9	6	4
2	5	4	7	9	6	8	3	1
9	6	8	3	4	1	5	2	7

Example

⇐ Sudoku Grid
Letter Grid ⇒ >
CIPHER PUZZLE SUFFER FML
Clues: F3D D7R I4L C7R F2R I1L
F3 = 7 next tallest D = 8 F7 ⇒ A
D7 = 2 next tallest R = 5 E7 ⇒ R
I4 = 8 next tallest L = 9 H4 ⇒ C
C7 = 7 next tallest R = 8 F7 ⇒ A
F2 = 4 next tallest R = 7 G2 ⇒ N
I1 = 3 next tallest L = 4 G1 ⇒ A

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

On the Subject of Pink Sudoku Cipher

- .... . / .-- --- .-. .-.. -.. / -. . . -.. . -.. / .- -. --- - .... . .-. / -- --- .-. ... . / -- --- -.. ..- .-.. .

	Page 1
Screen 1	Encrypted Word
Screen 2	Start Coordinate
Screen 3	Clue

Treating odd numbers (circles) as dots and even numbers (squares) as dashes, go to the start coordinate on the middle screen of page 1 in the sudoku grid. Convert the numbers to as many dots and dashes as given in the number part of the bottom screen clue on page 1.

Find a way of splitting the dots and dashes to form a word in morse code. To help, the word will always begin with the letter given in the bottom screen clue on page 1.

The final word to submit is the word obtained from the morse code caesar shifted to the left by the alphabetic positions of the letters in the encrypted words on the top screen of page 1.

Example

	A	B	C	D	E	F	G	H	I
1	4	2	7	8	9	3	6	1	5
2	8	6	1	7	5	4	2	3	9
3	5	9	3	6	1	2	7	8	4
4	2	5	8	1	7	9	4	6	3
5	9	3	4	2	6	5	1	7	8
6	1	7	6	4	3	8	9	5	2
7	6	8	9	3	2	7	5	4	1
8	7	4	2	5	8	1	3	9	6
9	3	1	5	9	4	6	8	2	7

⇐ Sudoku Grid
Encrypted Word: KGOUYY
Starting Coordinate: G7
Clue: 13E
Morse: .-..--.-...-.
Split: . / -..- / -.-. / .. / - / .
Final: EXCITE

On the Subject of White Sudoku Cipher

In memory of Joseph Kruskal

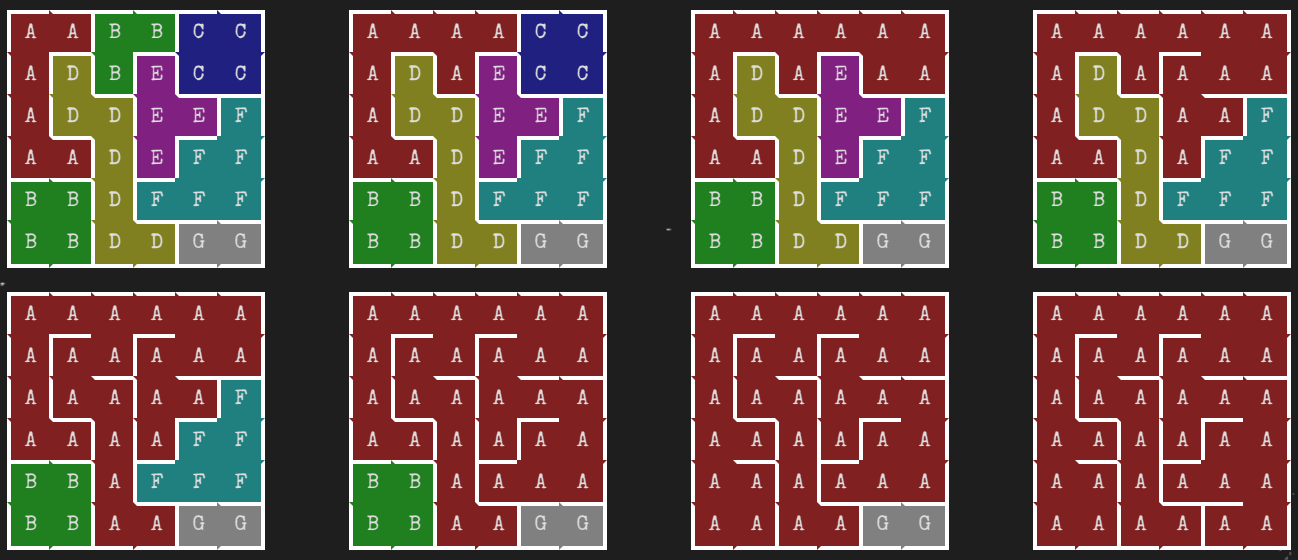
	Page 1
Screen 1	Coordinates
Screen 2	

The coordinates on the module are positions in a hidden letter grid maze that can be navigated in movement mode. Hitting any wall in the maze will cost a life, and you have a limited number of lives. Losing all lives will cause a strike and generate a new grid.

The maze can be determined prior to entering movement mode using the cages in the sudoku grid. Start from the top left cell moving right. For each cell, consider the next cell you would move to. If there is a wall between the cells, and they are not part of the same region, remove the wall, otherwise ignore the cell and continue moving. Once you hit the end of the row, move down once and continue moving to the left. Continue snaking back and forth until all cells are part of one connected region.

Press the S key to enter movement mode. In this mode, the maze can be navigated using the U, R, D, and L keys. The middle screen will display the letter in your current position. Your starting location in the grid is random. Your current life count will be displayed on the top screen. Hitting a wall will reduce your lives by 1.

Maze Generation Example



On the Subject of Black Sudoku Cipher

Snake! What happened? Snake!? SNAAAAAKE!?

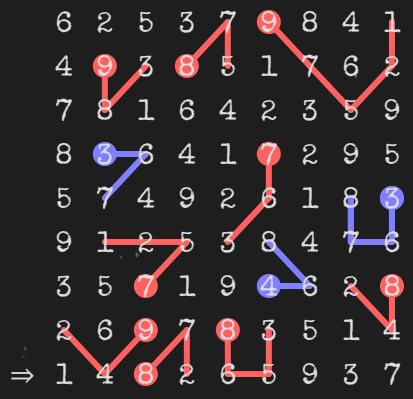
	Page 1	Page 2	Page 3
Screen 1	Moves	3 Letter Key String	Keyword 3
Screen 2		Keyword 1	
Screen 3	Ignored Values	Keyword 2	

Form a letter grid using the keywords from pages 2 and 3, and the three-letter key string from page 2.

Treat the sudoku grid as a Snakes and Ladders board with your initial starting position being in the bottom left (not yet on the board). Moves progress to the right until the end of a row is reached, then moves progress upwards once before moving back to the left. This snaking continues up to the square in the top right of the board.

Each number in the top two screens on page 1 refers to a movement, one through nine, along the board. When landing on a square, if that square is the tip of a red thermometer or the bulb of a blue thermometer, move to the other end of the thermometer and continue movements from that point.
Otherwise, if the square you land on has a value in the sudoku grid equal to one of the ignored values on the bottom screen of page 1, do nothing.
Otherwise, if the square you land on has a # in the letter grid, do nothing.
Otherwise, note down the letter in the same position in the letter grid.

Once all movements have concluded, submit the word formed by the found letters.



Example

⇐ Sudoku Grid
Letter Grid ⇒ >
CIPHER PUZZLE SUFFER FML
Moves: 455755427649257
Ignored Values: 3
4 ⇒ D9 ⇒ Snake ⇒ C9
5 ⇒ H9 ⇒ Ignore (3)
5 ⇒ F8 ⇒ Snake ⇒ E8
7 ⇒ C7 ⇒ F (first letter)
...
Final Word: FICKLE

C	I	P	H	E	R	A	B	D
#	G	J	K	L	M	N	O	Q
S	T	U	V	W	X	Y	Z	F
P	U	Z	5L	6E	A	B	3C	D
F	G	H	2I	J	4K	#	N	O
Q	R	S	T	V	W	X	Y	M
S	U	1F	E	R	A	B	C	D
G	H	I	J	K	#	M	N	O
P	Q	T	V	W	X	Y	Z	L