

# Scratch Encryption

- This week we will cover the Caesar Cipher

Plaintext:	Ciphertext:
a	D
b	E
c	F
d	G
e	H
f	I
g	J
h	K
i	L
j	M
k	N
l	O
m	P
n	Q
o	R
p	S
q	T
r	U
s	V
t	W
u	X
v	Y
w	Z
x	A
y	B
z	C

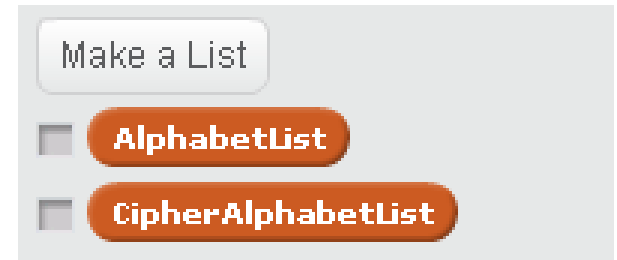
# Scratch Encryption

- Step 1 Create a new sprite



# Scratch Encryption

- Step 2 Create Two List Variables
- The list variable “~~Alphabet~~List” will contain each letter of the alphabet.
- The variable “~~Cipher~~AlphabetList” will contain each letter of the alphabet with the position of the letters changed according to the offset.



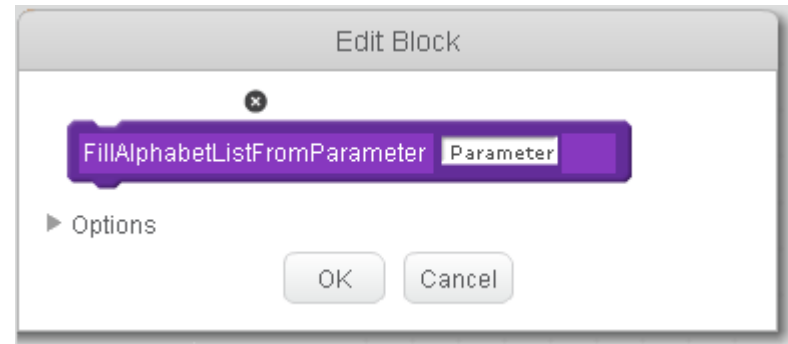
# Scratch Encryption

- Step 3 Create Alphabet Variable
- Create a Variable to store the Alphabet “a, b, c, d, e, ...w, x, y, z”



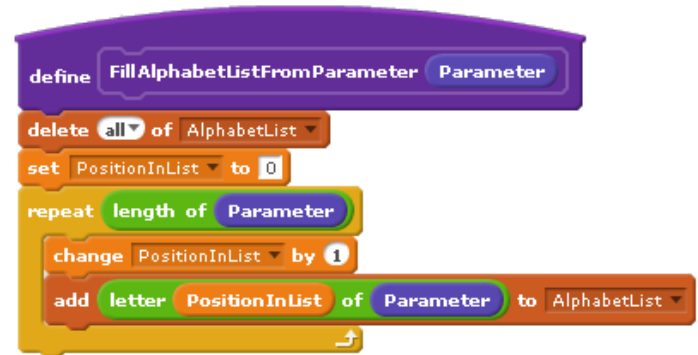
# Scratch Encryption

- **Step 4 Create new Block**
- In Scratch 2.0 we can create new Code Blocks and pass a parameter to these blocks.
- The new Code Block is called **“FillAlphabetListFromParameter”**.
- The new parameter is called **“Parameter”**.



# Scratch Encryption

- Step 5
- Delete contents of “AlphabetList”
- Set the variable “PositionInList” equal to “0”.
- Repeat the length of “Parameter”
  - Change the variable “PositionInList” equal by “1”.
  - Add the letter “AlphabetList”.



```
define FillAlphabetListFromParameter Parameter
  delete all of AlphabetList
  set PositionInList to 0
  repeat length of Parameter
    change PositionInList by 1
    add letter PositionInList of Parameter to AlphabetList
```

# Scratch Encryption

- Step 6
- The contents of “AlphabetList” looks like



# Scratch Encryption

- Step 7 Create new Block
- In Scratch 2.0 we can create new Code Blocks and pass a parameter to these blocks.
- The new Code Block is called “FillCipherAlphabetListFromParameter”.
- The new parameter is called “Parameter”.





# Scratch Encryption

- Step 8
- Delete contents of “CipherAlphabetList”
- Set the variable “PositionInList” equal to the “Offset”.
- Repeat the length of “Parameter”.
  - Add the letter at the variable “PositionInList” to the “CipherList”.
  - If the variable “PositionInList” is equal to the length of the “Parameter” reset the variable “PositionInList” to “0”.

```
define FillCipherAlphabetListFromParameter Parameter Offset
  delete all of CipherAlphabetList
  set PositionInList to Offset
  repeat length of Parameter
    change PositionInList by 1
    add letter PositionInList of Parameter to CipherAlphabetList
  if PositionInList = length of Parameter then
    set PositionInList to 0
```

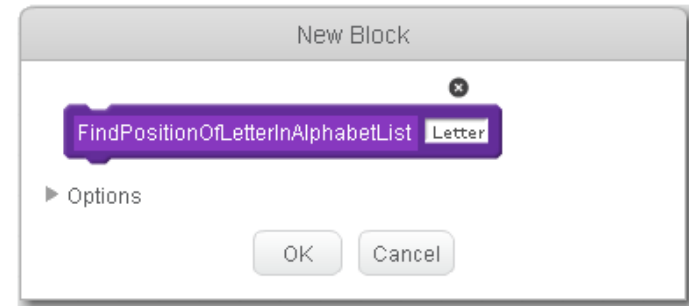
# Scratch Encryption

- Step 9
- This is what the “CypherAlphabetList” looks like.
- The letters of the alphabet are shifted by the number in the “Offset”. The letters at the start of the alphabet appear at the end of the list.



# Scratch Encryption

- Step 10 Create new Block
- Call the new Data Block  
“FindPositionOfLetterInAlphabetList”
- Pass in the variable “Letter” to the new Data Block.



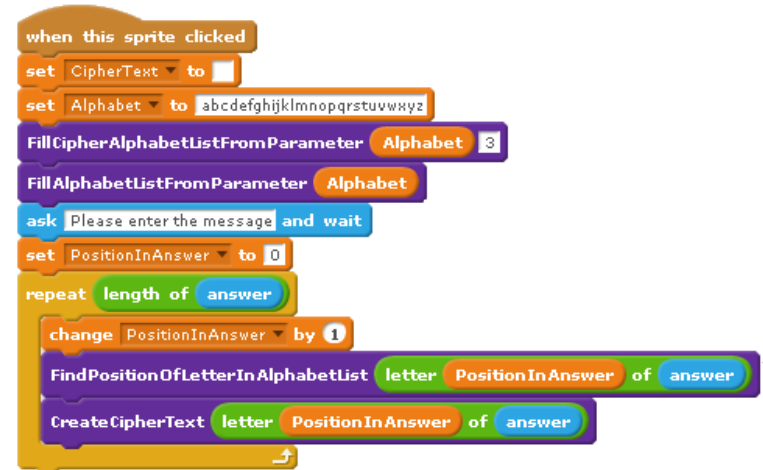
# Scratch Encryption

- **Step 11**
- Set the variable “**PositionInList**” equal to “**0**”.
- Set the variable “**LetterFound**” equal to “**False**”.
- Repeat the length of “**AlphabetList**”
  - If the “**Letter**” is found in the “**AlphabetList**”.
  - Set the variable “**LetterFound**” to “**True**”
  - Stop the script.

```
define FindPositionOfLetterInAlphabetList Letter
set PositionInList to 0
set LetterFound to False
repeat length of AlphabetList
  change PositionInList by 1
  if item PositionInList of AlphabetList = Letter then
    set LetterFound to True
    stop this script
```

# Scratch Encryption

- Step 12
- Create the script to ask for the message and Encrypt it.



```
when this sprite clicked
set CipherText to 
set Alphabet to abcdefghijklmnopqrstuvwxyz
FillCipherAlphabetListFromParameter Alphabet 3
FillAlphabetListFromParameter Alphabet
ask Please enter the message and wait
set PositionInAnswer to 0
repeat length of answer
change PositionInAnswer by 1
FindPositionOfLetterInAlphabetList letter PositionInAnswer of answer
CreateCipherText letter PositionInAnswer of answer
```

The image shows a Scratch script for encryption. It starts with a 'when this sprite clicked' event block. The script then sets 'CipherText' to an empty string, 'Alphabet' to 'abcdefghijklmnopqrstuvwxyz', and fills two lists: 'CipherAlphabetListFromParameter' (with 'Alphabet' and '3') and 'AlphabetListFromParameter' (with 'Alphabet'). It then asks the user 'Please enter the message and wait'. A 'set PositionInAnswer to 0' block is followed by a 'repeat length of answer' loop. Inside the loop, 'PositionInAnswer' is incremented by 1, and two blocks are executed: 'FindPositionOfLetterInAlphabetList' (with 'letter', 'PositionInAnswer', and 'of answer') and 'CreateCipherText' (with 'letter', 'PositionInAnswer', and 'of answer').

# Scratch Encryption

- Step 13
- Encrypting the message “the quick brown fox jumps over the lazy dog”
- Results in

