



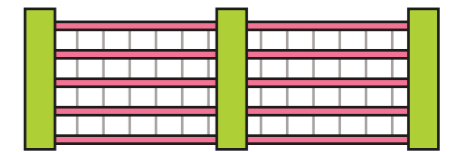
CIPHERS

Have you ever wanted to drop your closest friend a note that no one else could understand? By using ciphers, you can pass a message along to a friend in a secret language!

There are two types of ciphers: (1) Rail Fence ciphers and (2) Caesar ciphers.

(1) Rail Fence Ciphers

In a rail fence cipher, the letters of the message are jumbled. The message is written in a zigzag pattern which resembles a rail fence. Learn how to construct a rail fence cipher below, using the message: MEET ME AT THE LIBRARY AT SIX.



Step 1: Decide on the number of rails. We'll be using four rails in this example. Draw five lines to create four empty rows between the lines.

Step 2: Write your message in a zigzag manner starting in the first rail, as shown in the example.

Row 1	M				A					I					A			
Row 2		E			E			T		L			B		Y		T	
Row 3			E		M			T		E			R		R		S	X
Row 4				T					H					A				I

Step 3: Write your secret message by writing letters in each row as one word. In this example, the secret message would read: MAIA EETLBYT EMTERRSX THAI.

(2) Caesar Ciphers

The Caesar cipher was used by the Roman dictator, Julius Caesar (100–44 BCE), and is one of the earliest known ciphers. In a Caesar cipher, letters of the message are replaced, either by different letters or by other symbols. Each letter of the alphabet is replaced by another letter three, four, or whatever places down the alphabet. Take a look at the example below:



Step 1: Write the alphabet in one line.

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

Step 2: Write the alphabet again below the first line, but this time, start three places down.

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

Step 3: Write your secret message by using the corresponding letters of the bottom line. For example, B-O-O-K will be Y-L-L-H after using this Caesar Cipher.

B O O K
↓ ↓ ↓ ↓
Y L L H

Note: You can shift the second line of alphabets down as many places as you like.



Save Our Ship (SOS)



Another famous type of cipher is the Morse code. The Morse code distress signal, Save Our Ship (SOS), was first transmitted at sea from the Titanic 65 minutes after she hit the iceberg, and 95 minutes before she sank.

Sources:

Adams, S. (2021). *Code Breakers: Riveting Reads for Curious Kids*. Dorling Kindersley Limited.
Codes and Ciphers (2022). *Scholastic GO!*. go-scholastic-com.proxy.lib.sg/content/schgo/D/article/a20/059/a2005930-h.html

Decipher This!



ACTIVITY

Your phone has been hacked and you may be in danger. You need help and send your friends an encrypted message using Rail Fence Ciphers and Caesar Ciphers.

Rail Fence Ciphers


Caesar Ciphers

Fill in the table and use it as a guide:

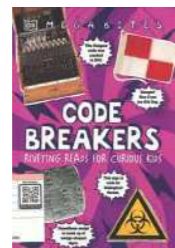
A	B	C	D	E	F	G	H	I	J	K	L	M
N	O	P	Q	R	S	T	U	V	W	X	Y	Z

Encrypt the message using the above ciphers.

Recommended Reads



The Explorer's Code
 Author: Allison K. Hymas
 Call No.: J HYM
 Publisher: Imprint, 2020
 Available as an eBook on the NLB catalogue at www.nlb.gov.sg



Code Breakers: Riveting Reads for Curious Kids
 Author: Simon Adams
 Call No.: J 652.8 ADA
 Publisher: Dorling Kindersley, 2021



Create Your Own Secret Language: Invent Codes, Ciphers, Hidden Messages, and More
 Author: David J. Peterson
 Call No.: J 652 PET
 Publisher: Odd Dot, 2020

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Paper Prototype

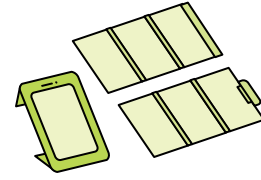
POP OUT!



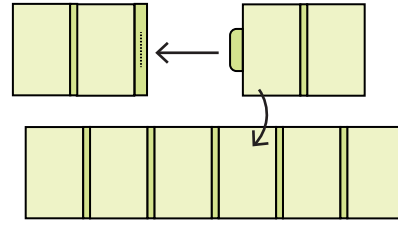
In paper prototyping, app designers sketch their ideas on paper to imagine the user's experience. Wouldn't it be cool to have an app that can decipher messages between you and your friend? What would your app look like? Try designing it below!

Instructions:

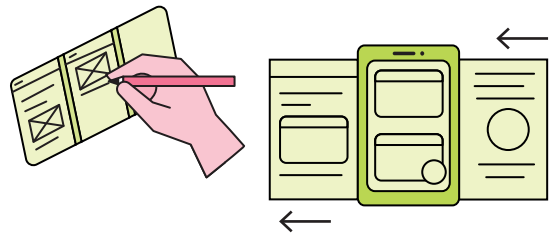
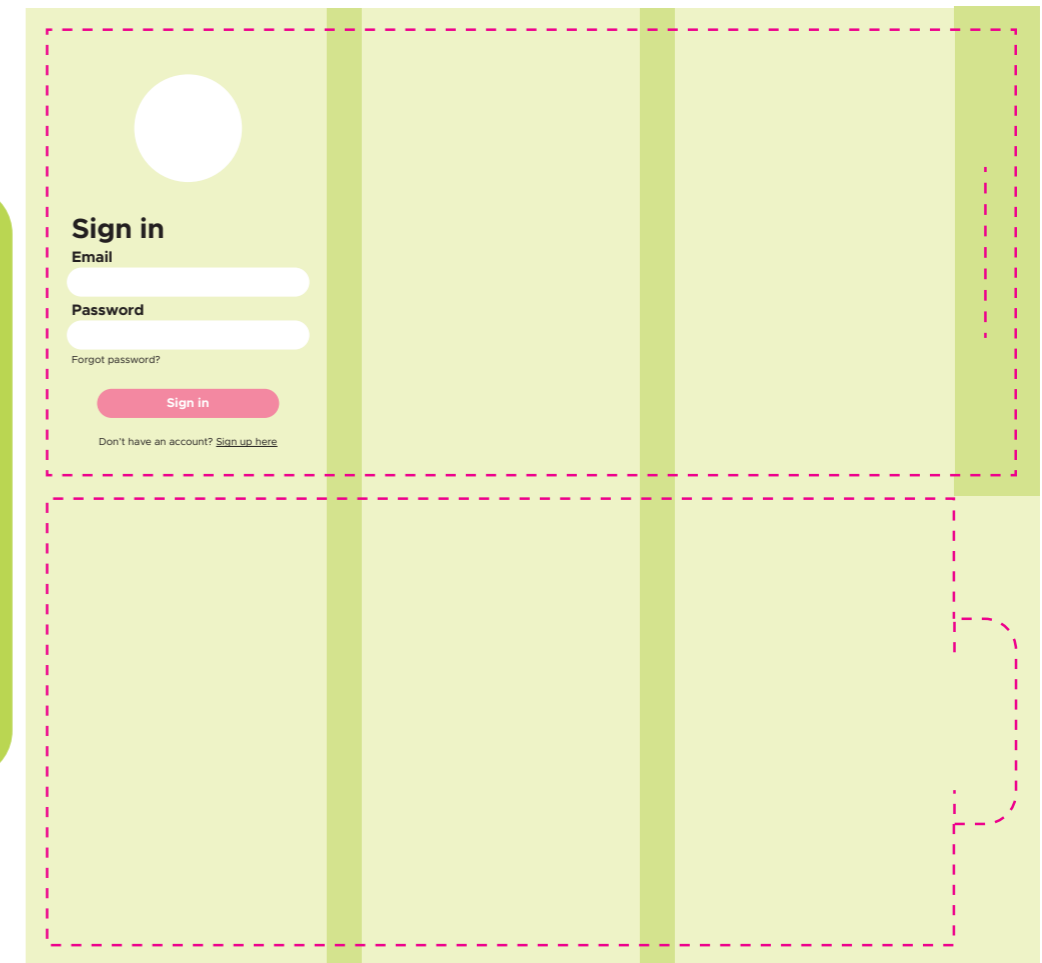
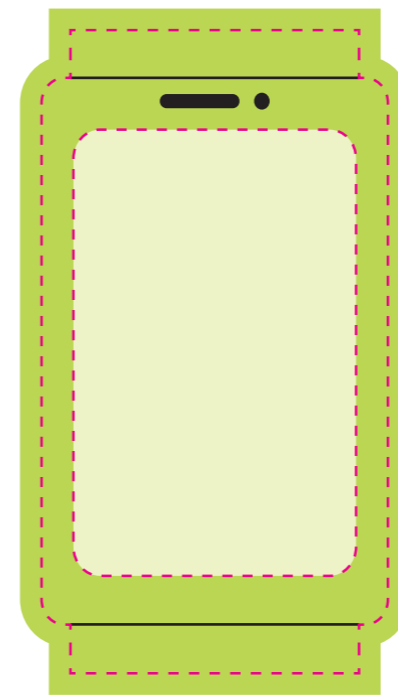
1 Pop out the phone frame and the panels.



2 Place the tab in the slit to create one long reel.



3 Design the user interface for your app! A sample has been done for you. Slide the panels through the phone frame to view your paper prototype!

Sources:

Cook, E. (2015). *Prototyping*. Cherry Lake Publishing.
 Paper prototyping: The 10-Minute practical guide. (n.d.). *Studio by UXPin*. Retrieved June 23, 2022, from <https://www.uxpin.com/studio/blog/paper-prototyping-the-practical-beginners-guide/>
 Woodhull, A. (2022). *Computer Security*. Retrieved April 18, 2022, from Scholastic GO!, <https://go-scholastic-com.proxy.lib.sg/content/schgo/C/article/006/927/0069272-0.html>
 Schwartz, E., & Williams, L. (2019). *Can You Crack the Code?: A Fascinating History of Ciphers and Cryptography*. Bloomsbury Children's Books.