

# Codes and Ciphers

## Cryptography and Cybersecurity

One way to protect a private message is to use a cipher. Here are three ciphers you can use with your friends. Give them a try—you'll learn how encryption works, an important way to keep information safe.

### 1. Caesar (Shift) Cipher

Use the wheel to the right with the letters shifted to align C = I .  
The cipher text is on the inside wheel. Decode the substitution cipher.




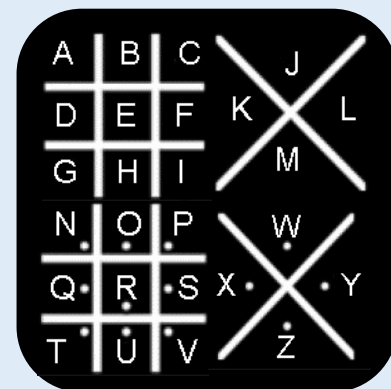
I o v n k x y X l a t

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### 2. Pigpen Cipher (where pen is a holding place for animals)

This looks hard but it only takes a key, one you can draw!

Each letter is represented by the unique line shapes and dots that surround it. For example  = S. Decode the pigpen cipher. To draw the key:



1. Draw two tic-tac-toe grids. Then draw two Xs.
2. Draw dots in each of the second tic-tac-toe boxes and the second X. Add the letters of the alphabet as shown.

⌌ 7 0 ^ 0 0 L > 6

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### 3. Binary Encoding / ASCII Chart

Computers can only “talk” in 0’s and 1’s. One way computers *encode* letters is to use ASCII encoding.

ASCII is used to store our alphabet in binary form (a series of 0’s and 1’s).

Use the ASCII chart (right) to decode the message below.

L	0100000	I	1001001	R	1010010
A	1000001	J	1001010	S	1010011
B	1000010	K	1001011	T	1010100
C	1000011	L	1001100	U	1010101
D	1000100	M	1001101	V	1010110
E	1000101	N	1001110	W	1010111
F	1000110	O	1001111	X	1011000
G	1000111	P	1010000	Y	1011001
H	1001000	Q	1010001	Z	1011010

1000011 1010010 1011001 1010000 1010100 1001111

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# Codes and Ciphers

## Cryptography and Cybersecurity

### Cryptography

The practice and study of secure communications. It helps keep computer messages secret and secure!

#### **Cryptography Uses**

- ◆ Secret Message Transmission
- ◆ Secure Credit Card Transactions
- ◆ Securing apps and websites (grades, banking, healthcare data)
- ◆ Emails and Text Messages

Cryptocurrencies are tokens that can be traded for money

Currency = different types of money!

**Cryptocurrency** is a digital form of currency that uses cryptography to exchange money safely. It is an encrypted data file that hold a value of currency. Examples include Bitcoin, Ethereum, and Dogecoin.

**Cybersecurity** is the practice of protecting networks, devices, and data from unauthorized access or criminal use. With all of the digital data and devices connected online, this is a challenging and rewarding field to work in with many job opportunities!

Training can include a college major in computer science or cybersecurity, such as the programs at the United States Air Force Academy. Visit <https://usafa.edu> for more information.

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