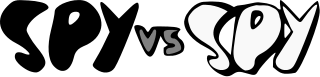
**Created by:** Elizar Navarro, Aaron Berman

**Date:** 2/13/20

**Caesar’s Ciphers**

So you want to be a spy? You gotta start somewhere.

How to send a coded message to your friend.



Challenge 1

1. What are you going to say? Keep it short, it's easier.

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1. Change every letter to its corresponding number. (a=1, b=2, ... , z=26)

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Choose a number between 2 - 26.

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1. Add the number you chose to every number from step 2.if you have a number higher than 26 subtract 26

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1. Change the numbers from step 4 to letters. (1 = a, 2=b, …, 16=z)

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Now your message is secure!

Challenge 2

1. Now lets decode a message.
2. Message: zlorefrphevgl vf sha
3. Number: 13.
4. First convert the message into numbers

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1. Then add the Number. If the answer is higher than 26 subtract 26

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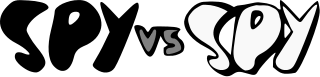
6. Convert the numbers to letters.

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You have now decrypted the message!!!

**Cryptograms**

Time to learn some more spy tricks!

2

Finding Common Patterns

Unlike our last sets of codes, not all messages have a key to solve it. Substitution ciphers, where one letter is used in place of another is pretty random, with no real key to use. In most cases, we rely on using our brains to find some sort of pattern.

Challenge 3

1. What are 5 of the most common letters used in the English Alphabet (not counting vowels)?

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1. How about some common two-letter words? Name at least 3.

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Now taking this info, lets see if you can solve this cryptogram, a sort of puzzle that uses Substitution cipher. Make sure you update your coded section, don’t want to use the same letter twice!

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Normal | 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 |
| Coded | I | N |  | H |  |  |  |  |  | B |  |  |  |  |  |  |  |  |  |  | M |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Message | Y | O | U |  | C | A | N |  | R | E | A | D |  | I | T | , |  | G | O | O | D |  | J | O | B |
| Code | Z | W | M |  | L | I | E |  | D | P | I | H |  | R | X | , |  | U | W | W | H |  | B | W | N |

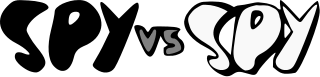
I think the last message speaks for itself. Knowing a lot of words will help in the long run. Now let's try a harder one:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Normal | 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 |
| Coded |  |  |  |  | S |  |  |  |  |  | O |  |  |  |  | E |  |  | G |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Message | E | V | E | R | Y | O | N | E |  | L | I | K | E | S |  | P | U | Z | Z | L | E | S |
| Code | S | J | S | N | B | K | I | S |  | D | W | V | S | G |  | E | T | P | P | D | S | G |

**Putting it Together**

It’s time to test your spy skills for real!

Ultra

Using Multiple Ciphers

There are a bunch of different ways to code and decode messages, but now it's time for today’s true challenge: using multiple of them! This last challenge will use what you’ve learned so show your work and ace the test!

Challenge 4

1. Solve this cryptogram for your first number!

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Normal | 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 |
| Coded | X |  |  | V |  |  | Y |  |  |  |  |  |  |  |  |  |  | C |  | W |  |  | K |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Message | S | T | O | P | , |  | H | O | W |  | M | A | N | Y |
| Code | Z | W | N | G | , |  | U | O | K |  | S | X | T | J |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| S | I | D | E | S |  | D | O | E | S |  | T | H | I | S |
| Z | A | V | B | Z |  | D | N | B | Z |  | W | U | A | Z |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| S | T | R | E | E | T |  | S | I | G | N |  | H | A | V | E | ? |
| Z | W | C | B | B | W |  | Z | A | Y | T |  | U | X | P | B | ? |

1. Use the answer of the last message to decode this Caesar Message:

bism bpm nqzab vcujmz, ivl ill bpm aqlma wn i aycizm nwz bpm nqvit xchhtm!

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1. One more message! Decode and do what the message says to finish:

az ftq rdazf, pdmi m tmf iuft ftq iadp ebk az uf, mzp dmueq kagd dustf tmzp!

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Answer Key

Answer key for challenge 2

C y b e r s e c u r i t y i s f u n - final answer

3 25 2 5 18 19 5 3 21 18 9 20 25 9 19 6 21 14 - numbers of final answer

26 38 15 18 31 32 18 16 34 31 22 33 38 22 32 19 34 27 - numbers shifted by 13

Â26 12 15 18 5 6 18 16 8 5 22 7 12 22 6 19 8 1 - numbers of encrypted message

z l o r e f r p h e v g l v f s h a - encrypted message

Answer Key for Challenge 3:

Question 1 Possible Answers: t, s, w, c, b, p, h, f, m, and d

Question 2 Possible Answers: at, it, to, an, me, we, he, be, on, no

Message 1: you can read it, good job

Message 2: everyone likes puzzles

Answer Key for Challenge 4:

Message 1: stop, how many sides does this street sign have?

Message 2: take the first number, and add the sides of a square for the final puzzle!

Message 3: on the front, draw a hat with the word spy on it, and raise your right hand!