Substitution Cipher Activity Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Encrypt the following message with the given key. Each letter of the alphabet has been swapped with another letter.

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

“Appear weak when you are strong, and strong when you are weak.” – Sun Tzu

Decrypt the following message with the given key.

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

“Wu wa z ufouc ohwrsfazllx zykhpvlsbnsb, uczu z awhnls tzh wh epaasaawph pi z nppb ipfuohs, toau ds wh vzhu pi z vwis.” – Gzhs Zoaush

The key for the following message is partially unknown, see if you can determine the key and decrypt the message.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *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* |
|  |  |  |  |  | **U** |  |  |  |  |  |  |  |  |  | **Q** |  |  |  |  |  |  |  |  |  |  |

VHRX HX F QGY VPCQ: UJGG QFJJCYV, JGFBO YC RC - XC QGJAPGV XGAGVVFJO.

**Keyword cipher**

Remembering a random permutation of the alphabet is a difficult task. To make the substitution cipher easier to use, we will instead start with a keyword and fill in the rest of the alphabet. To create a unique permutation based on a word or phrase.

**Keyword: apples**

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

Notice that the keyword **apples** begins the cipher alphabet, ignoring the duplicate letters. The remaining letters are placed alphabetically.

Encrypt the following message:

[Many of life's failures are people who did not realize how close they were to success when they gave up.](https://www.brainyquote.com/quotes/quotes/t/thomasaed109004.html) - [**Thomas A. Edison**](https://www.brainyquote.com/quotes/authors/t/thomas_a_edison.html)

Keyword: Lightbulb

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *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* |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Create your own keyword and encrypt a message of your choosing. Swap with someone else and decrypt their message.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *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* |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Keyword:

Encrypted Message: