CURIOSITY AT HOME

DECRYPTION DETECTIVE

Encryption is a way of changing information into a coded form, or ciphertext, so that it cannot be understood if intercepted. When done properly, the person you want to be able to read the message should have a method for decrypting (decoding) it, but no one else can easily figure out what type of encryption you used. Can you uncover the secret message encrypted below?

MATERIALS

- Something to write with
- Science notebook or paper

PROCEDURE

- Either print this page, or copy the ciphertexts into your science notebook or on a piece of paper.
- To decode the ciphertexts, find the matching letter in the table below for each number, and copy the letter into the blank above the number. For example, where you see the number 1, you would write the letter A in the blank above it.
- Once you've found all the letters, read them in order to find out the secret message.

Letter	Number
A	1
B	2
C	3
D	4
E	5
F	6
G	7
H	8
I	9
J	10
K	11
L	12
M	13
N	14
O	15
P	16
Q	17
R	18
S	19
T	20
U	21
V	22
W	23
X	24
Y	25
Z	26

___ ___ ___   ___ ___ ___   ___ ___ ___   ___ ___ ___ ___ ___ ___ ___ ___   ___ ___   ___ ___

23 8 25   4 9 4   20 8 5   3 15 13 16 21 20 5 18   7 15   20 15

___ ___ ___   ___ ___ ___ ___ ___ ___ ?

20 8 5   4 15 3 20 15 18

___ ___ ___ ___ ___ ___ ___   ___ ___   ___ ___ ___   ___   ___ ___ ___ ___ ___

2 5 3 1 21 19 5   9 20   8 1 4   1   22 9 18 21 19

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DECRYPTION DETECTIVE

EXPLORE MORE

- Now, you're going to try and encrypt your own secret messages!
- First, write out your word, phrase, or sentence on a scrap piece of paper. Some suggestions include your name, a favorite animal, or a short sentence about what you did last weekend.
- Go through and replace the letters with their respective numbers to encode your message.
- Lastly, copy the ciphertext onto a fresh sheet of paper, leaving space above each number for someone to write in the right letter.
- Hand your ciphertext off to a friend or family member with the letter/number decryption table. Can they decrypt your secret message?

WHAT'S GOING ON?

In this activity, you were able to decipher the ciphertexts above using the decryption key provided. In this case, the "key" is a table that pairs each letter to a number, but that's not always the case. When you encrypt information, one number or symbol can replace a whole word or phrase. This can make the ciphertext much shorter.

The idea of shortening a word or phrase to a single symbol isn't new: think about ancient Egyptian hieroglyphs or cartouches. Each hieroglyph (character/symbol) represented a word or phrase. Some modern examples of this way of writing include: Chinese hanzi, Japanese kanji, Korean hanja, and Vietnamese Hán tự.

CURIOSITY AT HOME

DECRYPTION DETECTIVE

K–2 GRADE EXPLORATION

- Describe to someone the steps you used to encrypt secret messages.
- Write another message to send to a friend or family member. This time, try replacing a letter with a different letter. For example, you could take each letter and replace it with the next letter in the alphabet. So, A would encode to B, and B would encode to C. Make sure to provide a new decryption key for your buddy.
- Can you come up with another way to encrypt messages? Come up with your own secret code and teach it to a friend.
- Computers use encryption to send private information to each other. Why might somebody want their data encrypted?