

## Activity description: Encryption using the Caesar Cipher

Age level: 8+ (older kids should be able to work through this sheet on their own)

Time frame: varying

Imagine that you're passing a note in class and the teacher intercepts it. Do you want him/her to read it? Of course not! How embarrassing would THAT be! So why not *encrypt* it?

One of the first ways people used to hide their messages from other people who might read them was called the Caesar Cipher. As you might have guessed, it was used in the time of Julius Caesar, so it has been around a while. For activities like online banking that you really need to keep private newer, more complicated techniques are generally used.

Here's how it works:

1. Pick a number. To make applying the cipher easier, make it a fairly small number, less than 26. We'll call your number  $n$ .
2. Take each letter in your message and replace it with the letter that is  $n$  letters along in the alphabet.

Here's an example. Let's say that my number is 6, and here's my message:

COMPUTER SCIENCE RULES!

I've typed out the alphabet below to make it easier to count 6 letters along. So the first letter in my message is a C; 6 letters down from that is an I. Then we have an O; 6 letters down from that is a U, and so on. What do we do if we run off the end of our alphabet? Just go back to A and keep on counting. So if we have a U, then 6 letters down from that is the A; we just wrapped around back to the beginning.

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

Here's my encoded message: IUSVAZKX YIOKTIK XARKY!

As you can see, it doesn't make any sense. Cool, huh?

So what do you need for passing encrypted notes? Well, you need a key – that's the number that you picked, and your friend needs to know that key as well.

I bet you can figure out how to decrypt the message – just count back in the alphabet! So 6 letters back from the I is a C, and 6 letters back from the U is an O.

***Your mission: send an encrypted message to someone at the other side of the room.***