



CLASSIFIED FILE 3

SHIFT CIPHERS—STRAIGHT LINE DECODER

Shift codes are one of the oldest ways to disguise a message. In a Caesar Shift, you replace each letter of the alphabet with another letter. In a Keyword Shift, you build in an extra trick to make the code even more secure.

Below are instructions for making a straight-line decoder to create and decipher messages disguised with a shift code.

For messages disguised using a Caesar Shift, you can also use a code wheel. See Classified File 1 for instructions.

CAESAR SHIFT CIPHER

1. Create a straight-line decoder by drawing a table with two rows and 26 columns.
2. Write the alphabet in uppercase (big) letters along the top row.
3. Starting from 'A' and moving to the right, count the number of shifts you will need to code or decode a message. With a shift of '3' for example, you need to count 3 letters to the right, 'D'.
4. Directly under this letter, write a second alphabet in lowercase starting with 'a'. When you reach the end of the table, return to 'A' and continue writing from there.



Example: 3-letter Caesar Shift

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |
| x | y | z | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | r | s | t | u | v | w |

KEYWORD SHIFT CIPHER

1. Create a straight-line decoder by drawing a table with two rows and 26 columns.
2. On the top line, start by writing the keyword in uppercase letters, with one letter in each box. Let's use WINTER as our keyword. Write out the remaining letters of the alphabet in order, with one letter in each box. Don't repeat any of the letters you've already used in your keyword.

IMPORTANT: Keywords work best when they include at least one letter that occurs late in the alphabet. Also, you need to make sure the same letter doesn't appear more than once in your keyword.

3. Write the alphabet in lowercase letters on the bottom line.

Example: WINTER Keyword Shift

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

ENCODING

1. Decide how many letters to shift your message, or choose a keyword.
2. Create a straight-line decoder.
3. Find the letters for your message on the bottom row of lowercase letters and read the letters they line up with on the top row of uppercase letters.

