

UNIT 1 *Substitution Ciphers*

Teacher Resource Material

Key Stage: 3

Target: *Mainstream Year 7 or high-achieving Year 5/6*

Teaching Notes

Starting with fairly simple Caesar ciphers, this section extends to general substitution. Students are encouraged to think about how many Caesar/substitution ciphers are possible. They are also given a (gentle!) introduction to frequency analysis.

In *Exercise 6*, the concept of the number of permutations is introduced, starting with some straightforward examples students can work out 'by hand'.

For *Exercise 7*, students will hopefully be guided to the correct answer, which is 5 times the previous answer. This introduces the concept of factorial numbers.

In the *Activity*, students work through the processes step by step until they have enough information to finish.

Solutions and Notes

Exercise 1 GONE TO WATCH HARLEQUINS. BACK AT SEVEN.

Exercise 2 26 different ways

Exercise 3 THIS HAS BEEN SHIFTED BY EIGHT

Exercise 4 T might represent letter E; shift of 15; GIVE ME CHEESE PLEASE

Exercise 5 JANUARY BRINGS THE SNOW

Exercise 6 6 different substitution ciphers

Exercise 7 (a) 24 different substitution ciphers
 (b) 120 different substitution ciphers

Activity Substitution table:

<i>Plain</i>	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
<i>Cipher</i>	U	P	T	B	Z	O	K	F	V			A	G	M	J		Y	C	H	N	W	I		D		

Deciphered message:

LAST NIGHT I DREAMT I WENT TO MANDERLEY AGAIN. IT SEEMED TO ME I STOOD BY THE IRON GATE LEADING TO THE DRIVE AND FOR A WHILE I COULD NOT ENTER FOR THE WAY WAS BARRED TO ME.

Some letters are missing from the table.

Words including letters missing from the table are needed for the table to be completed.

Detailed Lesson Plans are provided to help teachers in their delivery of interactive whole-class teaching.