

UNIT 1 *Substitution Ciphers*

Overhead Slides

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OS 1.2

Vigenere Square

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

OS 1.4*Letter Frequency in English Text*

The alphabet in descending order of frequency for a typical passage of text in the English language:

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

OS 1.5

Message to Decode

AUHC MVKFC V BYZUGC V

IZMC CJ GUMBZYAZD UKUVM.

VC HZZGZB CJ GZ V HCJJB

PD CFZ VYJM KUCZ AZUBVMK

CJ CFZ BYVWZ UMB OJY U

IFVAZ V TJNAB MJC ZMCZY

OJY CFZ IUD IUH PUYYZB

CJ GZ.

OS 1.6*Hints 1 to 3*

Hint 1: The three most frequently occurring letters in the passage above concur with the list above (although this is not always the case in short English passages). Find the three most commonly occurring letters in the cipher and substitute the letters you think they could represent.

Hint 2: Note that there are some one-letter words; one of these you should already have found. What would the other one be? Use this information to find a fourth letter.

Hint 3: The next most frequently occurring letter in the cipher can now be assigned its real letter. So you now have a fifth letter.

OS 1.7*Hints 4 to 6*

Hint 4: If you have done everything correctly, you should have a couple of words that look like T?E, where ? is an unknown letter. What common three-letter word starts with T and ends with E? Use this information to find the fifth letter.

Hint 5: Look at the word ?ATE. There are a few possibilities for this – DATE, FATE, GATE, LATE, MATE, RATE, SATE. Note that whatever the letter K stands for, it stands for the same thing in the second word – ?I?HT. Which letter would make this look like an English word?

Hint 6: What word could this be? Note that M is a fairly common letter, and that it occurs in word 20, which (if you've got everything right so far!) has a very common ending.

By now you should have enough to work out/guess (both are very important skills in cipher analysis) to decipher the whole message!
