

Theta's Code Busters Test

Scoring

Question Score / 4450 _____

Time for Timed Question _____

Timing Bonus _____

Final Score _____

Team Info

Participants _____

School _____

Resources

Alphabet

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
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

Frequency of English Letters

E 12.51% S 6.54% C 3.06% G 1.96% K 0.67%
T 9.25% R 6.12% U 2.71% W 1.92% X 0.19%
A 8.04% H 5.49% M 2.53% Y 1.73% J 0.16%
O 7.60% L 4.14% F 2.30% B 1.54% Q 0.11%
I 7.26% D 3.99% P 2.00% V 0.99% Z 0.09%
N 7.09%

Frequency of Spanish Letters

E 14.08% I 5.98% M 3.08% Y 1.09% Z 0.47%
A 12.16% L 5.24% P 2.89% V 1.05% Ñ 0.17%
O 9.20% D 4.67% B 1.49% G 1.00% X 0.14%
S 7.20% T 4.60% H 1.18% F 0.69% K 0.11%
N 6.83% U 4.69% Q 1.11% J 0.52% W 0.04%
R 6.41% C 3.87%

Vigenère 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
A 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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

Bacon's 24-Letter Alphabet

A aaaaa N abbaa
B aaaab O abbab
C aaaba P abbbba
D aaabb Q abbbbb
E aabab R baaaa
F aabba S baaab
G aabbb T baaba
H aabbb U,V baabb
I,J abaaa W babaa
K abaab X babab
L ababa Y babba
M ababb Z babbb

Opening lines of *Walden*

When I wrote the following pages, or rather the bulk of them, I lived alone, in the woods, a mile from any neighbor, in a house which I had built myself, on the shore of Walden Pond, in Concord, Massachusetts, and earned my living by the labor of my hands only. I lived there two years and two months. At present I am a sojourner in civilized life again.

[Timed Question] [200 points] Solve the following Aristocrat where N corresponds with B.

L	K	Z	R

H	K

N	Z	N	N	Z	D	M

S	A

R	U	I

L	I	V

S	O	V	U

V	J	M

H	Z	W	J	S	O	M

C	K	U	O	D

A	S	D	I	K	M	Q

C	S	P	P

V	J	M

K	S	D	J	V

Z	O	Q	C	M	K	Q

W	U	H	M

U	I	V

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
2	0	3	4	0	0	0	3	4	4	6	2	7	3	4	2	3	2	6	0	5	6	2	0	0	5
													B												

1) [250 points] Decode the following text from a famous play which has been encoded using the Vigenère cipher with the key "BIT."

U	W

U	F

W	K

O	W	M

U	W

U	F

B	A	B	B

B	T

B	A	F

Y	N	F	A	M	J	W	G

2) [200 points] The following text has been encrypted using the Caesar cipher. What did it originally say?

R	O	R	L	J

W	C	M	J	W

L	N	M	D	A

R	W	P	H	X

D	A	A	N	E

X	U	D	C	R

X	W	R	F	J

W	C	W	X	Y

J	A	C	R	W

R	C	

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
4	0	5	3	1	1	0	1	0	4	0	2	2	2	1	1	0	7	0	0	1	0	7	4	1	0

3) [350 points] Solve the following Pastiocrat where the last word is "stick."

J	R	M	Q	F

M	S	F	C	M

E	H	M	Z	M

T	Q	O	Z	M

E	U	M	Q	Z

D	E	A	U	T

B	V	U	R	M

D	E	H	M	Q

S	U	G	L	B

R	R	E	F	F

T	M	H	T	K

T	U	T	A	B

E	C	C	M	X

U	R	M	F	M

S	F	C	M	A

A	U	T	B	V

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
4	4	4	2	6	6	1	3	0	1	1	1	14	0	1	0	4	5	3	7	7	2	0	1	0	3
S	C																		I	T	K				

4) [200 points] Decode the following text which has been encoded using the Affine cipher where $a = 5$ and $b = 2$.

Q	K	C	G	J

W	C	T	H	W

F	Q	W	D	W

J	T	L	C	T

C	P	S	T	L

Q	P	G	P	U

T	W	N	Z	J

W	O	O	F	S

B	U	J	H	Q

R	R	W	P	Q

O	W	N	Z	F

Q	M	Q	T	F

S	C	F	F	U

I	W	R	

5) [200 points] Solve the following Aristocrat which is a quote from *1984*.

O	N

R	I	U	N

I	Z	O	I	S	K

X	N	N	A

I	B

O	I	Y

O	F	B	R

N	I	K	B	I	K	F	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
1	3	0	0	0	2	0	0	8	0	3	0	0	5	4	0	0	2	1	0	1	0	0	1	1	1

6) [300 points] Encode the given text using the Hill cipher with the following matrix:

$$\begin{bmatrix} 3 & 7 \\ 9 & 10 \end{bmatrix}$$

I	F

T	H

E	W

I	N

D	W

I	L

L	N

O	T

S	E

R	V

E	T

A	K

E	T

O	T

H	E

O	A

R	S

7) [400 points] Decrypt the following text which has been encrypted using the Affine cipher where $a = 3$ and b is not known.

T	A	F	K

J	D	S	O

V	U

H	T	V	E	O

U	V	M	O	H

D	S

A	F	M	U

8) [200 points] Solve the following Aristocrat which is a quote from Arthur Schopenhauer.

Z	X	M	E	P	K

M	B	U	E	K

R	W

K	T	R	O	E	M	B

H	K	O	H	K	T	N	M	B

R	S	U	O	T	M	B

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
0	4	0	0	3	0	0	2	0	0	5	0	5	1	3	1	0	3	1	3	2	0	1	1	0	1

9) [200 points] Encode the following text using the Affine cipher where $a = 5$ and $b = 4$.

I	T	S	O	V

E	R	A	N	A

K	I	N	I	H

A	V	E	T	H

E	H	I	G	H

G	R	O	U	N

D				

10) [300 points] Solve the following Pastiocrat where the last word is "woman."

C	H	X	Q	Z

H	C	R	S	C

D	H	S	O	R

D	U	R	J	X

D	S	X	F	C

L	X	Z	U	P

C	L	U	H	

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
0	0	5	3	0	1	0	4	0	1	0	2	0	0	1	1	1	3	3	0	3	0	0	4	0	2
		O					N				M				W					A					

11) [250 points] The following text has been encrypted using the Running-Key cipher with the opening lines of *Walden*. What did the message originally say?

S	L	H	B	V

P	Z	B	A	I

K	P	X	Y	V

P	P	O	N	B

U	L	G	O	S

S	M	F	R	E

C	X	Z	X	F

K	Z	A	F	V

Z	B	F	T	P

P	X	R	Z	Z

U	J	Y	U	C

S	W	Y	H	Z

R	G	

12) [200 points] Solve the following Aristocrat where the first word is "Nobody."

R	E	S	E	T	N

I	C	A	X	Z	F	C	L

V	Q	A	V

L	E	D	C

B	C	E	B	X	C

C	G	B	C	R	T

V	I	C	D	C	R	T	E	Y	L

C	R	C	I	W	N

D	C	I	C	X	N

V	E

S	C

R	E	I	D	A	X

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
3	3	14	4	7	1	1	0	5	0	0	3	0	3	0	0	1	5	2	3	0	4	1	4	1	1
				O									Y				N	B	D						

13) [300 points] Encode the following statement from the show Sweet Genius using the Vigenère cipher with the key "SWEET."

K	N	O	W	L

E	D	G	E	J

U	S	T	K	N

O	W	I	N	G

E	V	E	R	Y

T	H	I	N	G

A	N	D	I	F

E	E	L	L	I

K	E	I	P	O

S	S	E	S	S

T	H	A	T	

14) [250 points] The following text has been encrypted using Bacon's cipher with a 24-letter alphabet. What did it originally say?

- -		- - -	- - -	-

-	- - -	- - -	-	-

-	- - -	- - -	- - -	

- -	- -	-	- -	- - -

- - -	- -	- - -	-	-

- - -	-	-	- - - -	-

- -				

15) [200 points] Solve the following Xenocrypt, which is a Spanish phrase beginning with "Todos."

Q	J	Ñ	J	T

C	J	T

X	F	M	J	T

X	V	B	I	X

V	Y	Q	F	T	Q	V	T

A	B	C	D	E	F	G	H	I	J	K	L	M	N	Ñ	O	P	Q	R	S	T	U	V	W	X	Y	Z
0	1	1	0	0	2	0	0	1	4	0	0	1	0	1	0	0	3	0	0	5	0	3	0	3	1	0
									O					D			T			S						

16) [200 points] The following text has been encoded using the Caesar cipher. What did the message originally say?

X	L	I	Q	M

R	H	M	W	I

Z	I	V	C	X

L	M	R	K	A

L	E	X	C	S

Y	X	L	M	R

O	C	S	Y	F

I	G	S	Q	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
1	0	3	0	1	1	1	1	5	0	1	4	4	0	1	0	2	3	3	0	0	1	1	4	2	1

17) [250 points] Solve the following Xenocrypt which is a Spanish phrase ending with "provocarlos."

V	R	B	F	V	B	F	I	V	K	V	I	P	A	V	K	V	N	G	K	G	

R	T	N	Q	V	Y	G	N	A	I	V	P	V	B	F	V

Z	K	T	C	T	Ñ	G	K	R	T	N

A	B	C	D	E	F	G	H	I	J	K	L	M	N	Ñ	O	P	Q	R	S	T	U	V	W	X	Y	Z
2	3	1	0	0	3	4	0	3	0	5	0	0	4	1	0	2	1	3	0	4	0	10	0	0	1	1
		V				A				R			S	C				L		O						P