

Science Olympiad — KingDJ777's Code Busters Test

Exam Preparation

You will need:

1. Folders for each of the teams to hold the tests
2. Sufficient copies of the test for all teams. They don't need to be stapled.
3. Multiple timers which have a lap function on them - ideally one per volunteer. The timer app on an iPhone or Android Phone that has a stopwatch function with lap function is sufficient.

Before the event begins:

1. Practice starting the timers and using the lap function to record the times. Make sure volunteers understand how to use the lap function and are not accidentally stopping the timer completely.
2. Memorize the answer to the timed question.
3. Check to make sure that this key matches the test you are proctoring.
4. Place one copy of the test for each team in the provided folders with the first page outside the folder.
5. Adjust desks and chairs – teams may have up to 3 students for this event.

Running the Event

1. When the students enter the room, instruct them to sit down, DO NOT OPEN THE FOLDER, and put their names, school name and school number on the first page.
2. Encourage them to write their team number on all the other pages AFTER they begin the test. This way if their papers gets separated from each other we can make sure to give them credit.
3. **CRITICAL:** Check to see that students have ONLY brought
 - i. Something to write with (pencils, pens, erasers)
 - ii. Five function calculators (addition, subtraction, multiplication, division, and usually square root). The calculator can have a simple memory store/recall function but must not have a modulus or other scientific and programmable functions. If their calculator doesn't meet these requirements, they may not use it.
 - iii. If there are spare calculators in the kit, you may loan up to one per team to use for the test.
 - iv. If the student has a smart watch (Apple watch, Samsung Gear, etc.) they will need to put it away.
4. Instruct the students that if they answer the timed question within 10 minutes, they can be awarded a bonus if they solve the timed question with no more than 2 letters incorrect.
 - i. When they have a solution for the cryptogram they should raise their hand.
 - ii. Let them know that you will announce when the 10-minute time is up. After the first 10 minutes, no additional bonus points will be awarded.
 - iii. When you see a team raise their hand, hit the LAP function and head to the team.
 - iv. Determine if their answer is correct (see next page for grading), If so, write the time on their score sheet.
 - v. If their score is incorrect (more than 2 letters incorrect), tell the team that the answer is wrong, but DO NOT tell them what is wrong. They can continue to work on the question and raise their hand again to be checked. A team has an unlimited number of attempts during the 10-minute bonus.
5. Tell the teams that they do not have to fill in the frequency table. It is simply there as an aid to them solving the cryptogram. It will not be graded.
6. Some students may never have used a non-scientific calculator. You should have them enter a simple formula on their calculator: $1 / 26 = * 26 = ..$ Most will be surprised to see that the answer is not rounded to 1 as they expected but .9999999999

7. When the timers hit the 10-minute point, announce that no bonus points will be awarded and put away the timers. The students may continue to work on the question, but they may not receive any extra points.
8. A team is not restricted to only the timed question during the 10 minutes. They can move on or split up the work if they would like, but it is in their best interest to try for the bonus.
9. When time is up, have the students put writing instruments down and put their answer pages back into the folder in the correct order.

How to grade

1. Teams can have up to two incorrect letters total on their cryptogram and still be correct. The frequency of the incorrect letter is irrelevant. See the example below.

If the cryptogram was as shown:

KZBAOF KFXMFXYP
SAMPLE SENTENCE

and the students answered (underlined letters indicate mistakes)

SAMPLE SENTENCE

then it counts as four mistakes (even though the mistake was only in the letter E) and the answer DOES NOT count. However, if they put

SAMPUL SENTENCE

It is considered correct with two letter mistakes.

2. For questions which have a numeric answer (such as determining the a= and b= values), no mistakes are allowed.
3. Teams do NOT have to fill in the frequency table. It is simply there as an aid to them solving the cryptogram. It WILL NOT be graded. It is included in the answer key as an aid to the grader.
4. When scoring the Baconian ciphers (with strange text or symbols), they can write the answer under the Baconian symbols or on the line provided. Note that you will see lots of As and Bs, but they are not graded as the answer, only what they put on the answer line.
5. As you score each question, if correct, put the number of incorrect letters (0, 1, or 2) next to the question number on the scoring page. Also, put the value for the question into the score column. If they get more than 2 letters wrong, subtract 100 points from the score until it would be zero. If a question is worth 240 points and they get 4 letters wrong, you would start with 240 points (for up to 2 letters wrong) and then subtract 100 points for the next two letters wrong ending up with a final score of 40 points for that question. If they had gotten 5 or more letters wrong on a 240 point question, they would receive 0 points for that question. With a 650 point question, they could get 8 letters wrong and receive 50 points (2 free letters then $6 \times 100 = 600$ points off). Just put the incorrect cost deduction on the score sheet and subtract it from the value for the question. Under no circumstance should the score for any question be less than zero. Note that while the timed question must have 2 or fewer letters incorrect in order to get the timing bonus, a team solving the timed question after the 10 minutes passed would be accepted as correct with 3 incorrect letters receiving 100 points for the timed question.
6. If they correctly answered the timed question in 10-minutes or less with 2 or fewer letters incorrect, you need to compute the bonus time. Take the value for the minute from this first table below

0:xx	2,160	1:xx	1,920	2:xx	1,680	3:xx	1,440	4:xx	1,200
5:xx	960	6:xx	720	7:xx	480	8:xx	240	9:xx	0

and then add the seconds value from this table:

X:00	240	X:01	236	X:02	232	X:03	228	X:04	224	X:05	220
X:06	216	X:07	212	X:08	208	X:09	204	X:10	200	X:11	196
X:12	192	X:13	188	X:14	184	X:15	180	X:16	176	X:17	172
X:18	168	X:19	164	X:20	160	X:21	156	X:22	152	X:23	148

X:24	144
X:30	120
X:36	96
X:42	72
X:48	48
X:54	24

X:25	140
X:31	116
X:37	92
X:43	68
X:49	44
X:55	20

X:26	136
X:32	112
X:38	88
X:44	64
X:50	40
X:56	16

X:27	132
X:33	108
X:39	84
X:45	60
X:51	36
X:57	12

X:28	128
X:34	104
X:40	80
X:46	56
X:52	32
X:58	8

X:29	124
X:35	100
X:41	76
X:47	52
X:53	28
X:59	4

For example if they solved the time question at the 6:46 mark, you would add 720 (from the 6:xx entry in the first table) to 56 (from the X:46 entry in the second table) to get a bonus of 776. If they had solved it in exactly 4:00 minutes, you would add 1200 and 240 to get a bonus of 1440.

7. Add up all the scores and put the total on the bottom of score sheet.
8. You must break all ties. Indicate the tie breaker by adding .1 to the score of the team ahead. With multiple teams tied, you will add more. I.e. if five teams all scored 200 points, the final scores that you would enter on the score sheet would be 200.4, 200.3, 200.2, 200.1 and 200.
9. To determine how to break the tie, you need to look at the correctly answered questions in the order from the table below. If both teams answered the same (i.e. they answered the question with zero mistakes) then you go on to the next question. If one team had no mistakes and the other team had one mistake, then the team with no mistakes is ahead. For example, if one team answered question #8 (which is the highest value question) and another team didn't, the first team will be ahead.

Tie Breaker Order	Question #
1	17
2	3
3	19
4	10
5	7
6	16
7	15
8	6
9	20
10	18
11	11
12	14
13	12
14	8
15	2
16	13
17	9
18	5
19	4
20	Timed
21	1

0. If there is still a tie (typically when you have teams which answered either zero, one or two questions) then you will need to look at the tie breaker questions again and count the number of correctly answered letters. The team with the most correctly matched letters is to be ahead.

Timed Question [200 points] Solve this quote by Jackie Chan for the movie Karate Kid. When you have solved it, raise your hand so that the time can be recorded and the solution checked.

RMT WXZV OXTDWO CV X ZVUR PCAMUOXSO JVFFMS. JPKV
YOU HAVE TAUGHT ME A VERY IMPORTANT LESSON. LIFE

QPJJ GSMEG TF HMQS, ITO QV EXS EWMMFV QWVOWVU MU SMO
WILL KNOCK US DOWN, BUT WE CAN CHOOSE WHETHER OR NOT

OM FOXSH IXEG TA.
TO STAND BACK UP.

	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
Frequency	2		2	1	4	5	3	2	2	4	1		10		9	3	4	2	7	5	4	9	5	7		2
Replacement	P	Z	M	G	C	S	K	D	B	L	F	Q	O	J	T	I	W	Y	N	U	R	E	H	A	X	V

1) [110 points] Solve this quote from the movie Moana which has been encoded with the Caesar cipher.

T	F	F	U	I	B	U	M	J	O	F	X	I	F	S	F	U	I	F	T	L	Z	N	F	F	U	T	U	I	F
S	E	E	T	H	A	T	L	I	N	E	W	H	E	R	E	T	H	E	S	K	Y	M	E	E	T	S	T	H	E

T	F	B	J	U	D	B	M	M	T	N	F	B	O	E	O	P	P	O	F	L	O	P	X	T	I	P	X
S	E	A	I	T	C	A	L	L	S	M	E	A	N	D	N	O	O	N	E	K	N	O	W	S	H	O	W

G	B	S	J	U	H	P	F	T
F	A	R	I	T	G	O	E	S

2) [250 points] A quote by Robert Jordan has been encoded using the Morbit Cipher for you to decode. You are told that 4=-●, 9=xx, 5=--, 8=x-, 3=●x, 6=-x

4 5 8 5 7 2 9 4 3 5 6 4 9 6 8 1 7 4 8 5 7 5 8 3 8 1 3
 -●--x---x●●-xx-●●x---x-●xx-xx-●●x-●x---x●--x-●xx-●●●x
 Y O U / D O N / T / D R O W N / B

4 5 9 1 4 7 6 2 1 7 4 3 1 8 3 5 3 7 3 4 9 6 1 1 7
 -●--xx●●-●x-●-●●x-●●x●●x-●x--●xx●●x-●xx-x●●●●x●
 Y / F A L L I N G / I N / T H E

9 2 6 2 8 7 7 4 9 4 5 8 5 7 2 9 4 3 2 3 5 6 2 6 4
 xx●--x-●-x-x●x-●●xx-●--x---x●●-xx-●●x-●x---x●--x-●
 / W A T E R / Y O U / D R O W N

9 4 1 8 2 6 7 1 8 7 6 4 5 7 3 4 8 4 9 6 1 1 7 7 4
 xx-●●●x-●--xx●●●x-x-●-x-●--x●●x-●x--●xx-x●●●●x●x-●
 / B Y / S T A Y I N G / T H E R

7
 x●
 E

3) [500 points] A famous phrase from Ralph Waldo Emerson has been encoded as a Patristocrat using a K1 alphabet about making one's own path in life. What did he say?

FQPQV IQYJG TGVJG RCVJO CANGC FIQKP UVGCF YJGTG
 DONOT GOWHE RETHE PATHM AYLEA DGOIN STEAD WHERE

VJGTG KUPQR CVJCP FNGCX GCVTC KN
 THERE ISNOP ATHAN DLEAV EATRA IL

Do not go where the path may lead, go instead where there is no path and leave a trail.

K1	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
Frequency	1		9			4	11		2	6	3			3	1	4	5	2		4	2	7		1	2	
Replacement	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

4) [200 points] A quote has been encoded using the Pollux Cipher for you to decode. You are told that the quote ends with **NONE**.

805594002551025778868206675617286716859108199188828676
 ●-●●x---x●●●-x●xx●●-●x---x●-●xx●-x●-●●x●-●●xx●●●●x●-x-
 L O V E F O R A L L H A T

7545212618795541706691089745204420598
 x●-●x●x-●●xx●●-●x---x●-●xx-●x---x-●x●
 R E D F O R N O N E

5) **[200 points]** The following quote has been encoded with the Vigenère Cipher using a very common word for the key. The deciphered text starts with **DREAM**.

W	A	N	T	W	A	N	T	W	A	N	T	W	A	N	T	W	A	N	T	W	A	N	T	W	A	N	T	W	A
Z	R	R	T	I	A	F	B	B	Y	B	N	H	L	Y	B	R	E	S	H	N	E	I	X	N	L	V	O	A	A
D	R	E	A	M	A	S	I	F	Y	O	U	L	L	L	I	V	E	F	O	R	E	V	E	R	L	I	V	E	A

N	T	W	A	N	T	W	A	N	T	W	A	N	T	W	A
F	B	B	Y	B	N	H	L	Q	B	A	T	B	W	W	Y
S	I	F	Y	O	U	L	L	D	I	E	T	O	D	A	Y

6) **[350 points]** Using a key of BUZZ, which is an encryption matrix, decode this quote by Robert Schiuller using the Hill Cipher with a 26- character alphabet.

$$\begin{pmatrix} B & U \\ Z & Z \end{pmatrix} \equiv \begin{pmatrix} 1 & 20 \\ 25 & 25 \end{pmatrix}$$

H	T	D	W	I	F	A	E	A	F	S	H	E	J	Z	F	O	Z	Q	O
H	A	P	P	I	N	E	S	S	D	E	P	E	N	D	S	O	N	U	S

7) [400 points] Alexa severely misheard a quote from Thanos in the movie Avengers: Infinity Wars and then encoded it as an aristocrat using a K1 alphabet. What did it come out as?

**FXF ZPV DPVME LOPU MJWF XJUI ZPV'SF PXO GBJMVSF.
EWE YOU COULD KNOT LIVE WITH YOU'RE OWN FAILURE.**

**XFBS EJE UIBU CSJOH FXF? CBDL UXP NF.
WEAR DID THAT BRING EWE? BACK TWO ME.**

K1	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
Frequency		4	2	2	3	9	1	1	2	5		2	3	1	3	6			4		5	4	1	6		2
Replacement	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

8) [250 points] The following quote by Neil Tyson needs to be decoded with the Vigenère Cipher with a keyword of DEARTH.

D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D

H	Z	E	I	R	V	Q	I	O	W	N	Z	L	W	,	I	E	M	O	H	G	O	J	F	P	F
E	V	E	R	Y	O	N	E	O	F	U	S	I	S	,	I	N	T	H	E	C	O	S	M	I	C

E A R T H D E A R T H , D E A R T H D E . A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D

T	E	I	L	W	H	G	T	Z	O	L	,	S	V	E	T	B	V	X	W	.	I	W	T	O	X	Q	A	E
P	E	R	S	P	E	C	T	I	V	E	,	P	R	E	C	I	O	U	S	.	I	F	A	H	U	M	A	N

T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D

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

R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D

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

H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D E A R T H D

M	L	R	D	R	G	V	W	L	E	I	.
F	I	N	D	A	N	O	T	H	E	R	.

9) [200 points] The following quote needs to be encoded with the Affine Cipher using $a=19$ and $b=9$.

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

10) [450 points] Solve this Xenocrypt, which is a quote by Christobal Colon.

ODOKB CNFBC KBXBH PN KFDHBF NS GKNBOG LBCQB TDN
 NUNCA SERAS CAPAZ DE CRUZAR EL OCEANO HASTA QUE

XJNFPBC PN EJCQB SB KGCQB.
 PIERDAS DE VISTA LA COSTA.

	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
Frequency		12	6	3	1	4	3	2		2	5	1		7		3	3	3		2	1				2		
Replacement	B	A	S	U	V	R	O	Z	Ñ	I	C	H	F	E	K	N	D	T	Y	L	Q	W	G	M	P	X	J

Translation: *You can never cross the ocean until you have the courage to lose sight of the shore.*

11) [300 points] A quote has been encoded using the Morbit Cipher for you to decode. You are told that the quote ends with LOVE.

4 3 8 6 7 3 6 7 4 9 6 2 3 4 6 3 7 8 7 4 3 3 5 9 2
 ●●●x---xx●●x-xx●●●xx-x●-●x●●-x●xx●--x●●●●xx-x●xx●-
 S O /I T /S / T R U E /W H E N / A

7 5 3 2 4 9 4 7 4 9 4 3 2 7 3 5 3 7 6 5 1 4 9 5 3
 x●-●●x●-●●xx●●x●●●xx●●●x●-x●●x-●●xx●-x-●x-●●xx-●●x
 L L / I S / S A I D / A N D / D

8 6 5 7 9 8 3 2 3 4 7 7 2 3 7 3 4 3 1 7 4 3 3 7 8 3
 ---x-●x●xx--●x●-●x●●x●x●●-●xx●●x●●●xx-x●●●●x●xx●--●x
 O N E / G R I E F / I S / T H E / P

2 3 4 1 2 3 3 7 8 7 9 2 5 7 6 5 8 9 4 5 1 8 7 5 9 2 4
 ●-●x●●x-●-●x●xx●--x●xx●--●x●-x-●--xx●●-●x---x●-●xx●-●●
 R I C E / W E / P A Y / F O R / L

1 8 7 4 6 3
 x---x●●●-x●x
 O V E

12) [250 points] Using a key of BETH, encode the given phrase using the Hill Cipher with a 26-character alphabet.

$$\begin{pmatrix} B & E \\ T & H \end{pmatrix} \equiv \begin{pmatrix} 1 & 4 \\ 19 & 7 \end{pmatrix}$$

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

13) [200 points] Solve this quote from the movie Mulan.

VXO MJCIOT VXSV KJCCLD RQ SZUOTDRVH RD VXO LCDV TSTO
THE FLOWER THAT BLOOMS IN ADVERSITY IS THE MOST RARE

SQZ KOSYVRMYJ CM SJJ.
AND BEAUTIFUL OF ALL.

	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
Frequency			5	4				1	1	5	2	2	3		6		2	4	6	4	1	7		3	2	2
Replacement	X	P	O	S	K	Q	C	Y	W	L	B	M	F	G	E	Z	N	I	A	R	V	T	J	H	U	D

14) [250 points] Solve this aristocrat which is a quote by Dante Alighieri talking about "sorrow."

WNHGH VT RP FGHLWHG TPGGPA WNLR WP GHSLMM VR EVTHGK
THERE IS NO GREATER SORROW THAN TO RECALL IN MISERY

WNH WVEH ANHR AH AHGH NLYYK.
THE TIME WHEN WE WERE HAPPY.

	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
Frequency	4				2	1	8	12			2	4	2	5		4		4	1	3		4	6		2	
Replacement	W	J	V	F	M	G	R	E	U	Z	Y	A	L	H	X	O	D	N	C	S	Q	I	T	K	P	B

15) [350 points] The following quote has been encoded using the Affine Cipher. You are told that **z** decodes to be **F** and **q** decodes to be **E**.

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

16) [350 points] Decode this Baconian Cipher, a quote by Veronica Roth, that ends in the work YOU.

AM TWO BACK A A BOOK ACRES A SHOT A BOOK BACON ABBEY
 AABBA BAAAA ABAAA AABAA AABAB ABAAA BAAAB ABBA
 G R I/J E F I/J S N

A PLAN BE ITS A CASE BACON EARTH ACRES A CASE BE OLD
 ABBAB BAABA AAAAA BAAAB AABBB AABAA AAAAA BAABB
 O T A S H E A U/V

BADLY A CASE BACON AM TWO BE OLD A BOOK A BABY BE ITS
 BABBA AAAAA BAAAB AABBA BAABB ABAAA ABABA BAABA
 Y A S G U/V I/J L T

A GOOD BE OLD BE ITS A BOOK BE ITS BE ITS A CASE
 AAAAB BAABB BAABA ABAAA BAABA BAABA AAAAA
 B U/V T I/J T T A

A BEAT ACRES BACON A HAND A PLAN BACK A ACRES A CASE
 ABAAB AABAA BAAAB ABABB ABBAB BAAAA AABAA AAAAA
 K E S M O R E A

BABES A CASE BADLY A SHOT BACK A A PLAN A HAND BADLY
 BABAA AAAAA BABBA AABAB BAAAA ABBAB ABABB BABBA
 W A Y F R O M Y

A PLAN BE OLD
 ABBAB BAABB
 O U/V

Grief is not as heavy as guilt but it takes more away from you.

17) [500 points] Special Agent, Alexia, has the following RSA public key:

$$n = 12559051 \quad e = 3215365$$

Unfortunately for them, A quantum computer has successfully factored their n

$$12559051 = 1733 * 7247$$

Compute the value of their private key:

Enter the computed private key:

7715045

18) [300 points] Solve this Aristocrat which is a quote by R. Brault.

**LAX LNSX OXUFJFE MW IJWX JH LM CIUFL LNXXH, SFZXN
THE TRUE MEANING OF LIFE IS TO PLANT TREES, UNDER**

**PAMHX HAUZX QMS ZM FML XBCXVL LM HJL.
WHOSE SHADE YOU DO NOT EXPECT TO SIT.**

	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
Frequency	3	1	2		1	5		5	2	4		9	7	3	1	1	1		3		3	1	2	11		3
Replacement	H	X	P	B	G	N	V	S	L	I	Q	T	O	R	M	W	Y	Z	U	K	A	C	F	E	J	D

19) [450 points] A famous phrase from William Shakespeare has been encoded as a Patristocrat using a K1 alphabet. What did he say?

PMODF WXLDE FZDWQ FODXS EFVIW XLDWL SVDWS ISSYV
 LIKEA STHEW AVESM AKETO WARDS THESH ORESO DOOUR

QMRYX DWLFW XDRXS XLDMV DRI
 MINUT ESHAS TENTO THEIR END

Like as the waves make towards the shore, so do our minutes, hasten to their end.

K1	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
Frequency				10	2	5			3			5	3		2	1	2	3	6			4	7	7	2	1
Replacement	X	Y	Z	E	W	A	B	C	D	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V

20) [300 points] Solve this Aristocrat which is a quote by Jack Handey.

WOSZLO DZC JLVFVJVPO MZXOZHO, DZC MRZCNA EUNG U XVNO
 BEFORE YOU CRITICIZE SOMEONE, YOU SHOULD WALK A MILE

VH FROVL MRZOM. FRUF EUD EROH DZC JLVFVJVPO FROX,
 IN THEIR SHOES. THAT WAY WHEN YOU CRITICIZE THEM,

DZC ULO U XVNO UEUD SLZX FROX UHA DZC RUQO FROVL
 YOU ARE A MILE AWAY FROM THEM AND YOU HAVE THEIR

MRZOM.
 SHOES.

	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
Frequency	2		6	7	4	8	1	4		4		7	6	4	17	2	1	10	2		10	11	1	6		12
Replacement	D	X	U	Y	W	T	K	N	P	C	J	R	S	L	E	Z	V	H	F	Q	A	I	B	M	G	O