



# INVESTIGATION



## Codes

LJVHXLJVITF IF QZV BCFV OHJV IF IQ ZCN  
VXPVWZZMF WCV IF JRR JNZCQS CF IQ VHX NXJR  
OZNRS. IA OX BCFV VHIQM JXZCV ZCN WZSIXF AZN J  
LZLXQV OHU JNX ZCN MQXXF HJRA OJU CD ZCN  
RXKF? HZO TZCRS OX OJRM IA ZCN MQXXF OXNE  
VHNXX YCJNVXNF ZA VHX OJU CD ZCN RXKF HZO  
TZCRS OX XJV IA ZCN XRWZOF OXNE VHNXX  
YCJNVXNF ZA VHX OJU SZOQ ZCN JNLF? OHU JNX  
ZCN XUXWJRRF NZCQS? JLS OHU JNX ZCN WNJIQF  
VHX FIEX VHXU JNX?

# MathSphere

## Codes

Look in a reading book and choose a section of about 150 words.  
Count how many times each letter of the alphabet is used.  
Record your answers in a table like this:

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

Notice that the vowels and consonants have been counted separately.

Which was the most popular vowel?

Which was the least popular vowel?

Which was the most popular consonant?

Which was the least popular consonant?

Put the letters in order of popularity.

Do the vowels and consonants separately.

How would you use this information to help you decode a message if each letter in the message was replaced by the same letter of the code?

Eg **F** was always replaced by **V**.

Try out your ideas by decoding this message.

LJVHXLJVITF IF QZV BCFV OHJV IF IQ ZCN VXPVWZZMF WCV IF JRR  
JNZCQS CF IQ VHX NXJR OZNR. IA OX BCFV VHIQM JXZCV ZCN  
WZSIXF AZN J LZLXQV OHU JNX ZCN MQXXF HJRA OJU CD ZCN  
RXKF? HZO TZCRS OX OJRM IA ZCN MQXXF OXNE VHNXX  
YCJNVXNF ZA VHX OJU CD ZCN RXKF HZO TZCRS OX XJV IA ZCN  
XRWZOF OXNE VHNXX YCJNVXNF ZA VHX OJU SZOQ ZCN JNLF?  
OHU JNX ZCN XUXWJRRF NZCQS? JLS OHU JNX ZCN WNJIQF VHX  
FIEX VHXU JNX?

Now you can code a message of your own!

## **Answer Guide**

The methods to be used in this investigation are quite obvious, but it is a good example for children to see how statistics and probability combine to solve a problem.

They will also gain some insight into the relative use of the different letters of the alphabet.

In practice, of course, no-one trying to keep information secret would use such a simple code as that given here, but a similar technique, this time analysing the frequency of the use of words and phrases, is used to determine who wrote a particular piece of writing, especially if that person is now dead. Did Shakespeare really write all the Shakespearean plays?

The message says:

"Mathematics is not just what is in our textbooks, but is all around us in the real world. If we just think about our bodies for a moment, why are our knees half way up our legs? How could we walk if our knees were three quarters of the way up our legs? How could we eat if our elbows were three quarters of the way down our arms? Why are our eyeballs round? And why are our brains the size they are?"

Message

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

Code