Solution for Challenge 1:

The underlying cipher for Challenge 1 was the simple mono-alphabetic substitution cipher:

Plaintext:	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
Ciphertext:	o	a	n	e	m	d	h	q	i	g	r	u	t	x	b	w	p	l	c	k	v	f	j	z	y	s

In order to make this cipher a little less susceptible to frequency analysis, some of the more common letters (e, t, and a) were sometimes encrypted with a second symbol: some occurrences of plaintext “e” were replaced with “&”, “t” with “?”, and “a” with “#”. Even though word spacing was mostly preserved in the ciphertext, some short words were padded with the “null” character “v” in order to increase their apparent length.

Even with these additional precautions, a standard frequency analysis approach provided many students with enough of the plaintext to decipher the message.

Original Plaintext:

I am writing to inform you of the need to change our current cipher system. It has come to my attention that some learned individuals can break such secrecy schemes simply by tabulating certain occurrences of letters, whether they are enciphered or not. However, I have some ideas that will allow us to continue to exchange information without anyone being aware of its meaning or importance. Let us meet at the end of the week at the fountain. I will describe the newly developed cipher which they say is completely unbreakable. Until then, do not trust this cipher with any incriminating evidence. The King has eyes and ears everywhere.