**Level 1: Simple substitution Cypher**

**Use this resource to answer the following questions.**

[**http://practicalcryptography.com/ciphers/simple-substitution-cipher/**](http://practicalcryptography.com/ciphers/simple-substitution-cipher/)

**Substitution consist of every plan text character for a different text character.**

**a. How does it work?**

**It changes the input into any key and then translate into cypher text.**

**b. What is a “key”?**

**A key is used for the substitution cypher which is 26 letters**

**2. Provide an example of encoding a message using a substitution cypher key.**

**hi my name is Faheem key: wfdojzxhbsrpequgiavktcymnl**

**3. Provide an example of decoding a message using a substitution cypher key.**

**hb en qwej bv auhwq**

**4. Summarize and explain the concepts related how “cryptanalysis” can be used to “break” a code.**

**a. How does the “frequency analysis of letters” work?**

**b. How does the “frequency analysis of words” work?**

**Level 2: Morse Code**

**Use this resource to answer the following questions.**

**http://www.newworldencyclopedia.org/entry/Morse\_Code**

**1. Summarize and explain the concept of Morse code**

**a. What does it do?**

**It is used to send coded information**

**b. How does it work?**

**Information is encoded into a scheme used in telecommunication that encodes text as character in a sequence**

**c. What does it use instead of a “key”?**

**It sends coded information and the receiver on the other side has to know how to decode the Morse code. If they don’t know they won’t be able to get the information.**

**2. Compare the Morse code table to the “frequency of letters” analysis in Level 1 above.**

**a. What is the shortest code and how does it correspond to the frequency of letters?**

**The shortest code is E a dot because it’s the most used letter in the alphabet.**

**b. What is the longest code and how does it correspond to the frequency of letters?**

**The longest code is J and Q they have 3 dashes and a dot they are the least used letters in the alphabet.**

**c. What is the benefit of having a variable length code for letters?**

**By the sound you can tell what letter it is and they all have a different sound from each other**

**3. Provide an example of encoding a message using Morse code.**

**… .. -- -.-- -. .- -- . .. … .-. --- …. .- -.**