MODULE 4

Intro to Cryptography

@cybervalkyries

What Is Cryptography?

Cryptography is the science of secret codes. It's how people hide messages so only the right person can read them. From ancient times to today's internet, cryptography has been a powerful tool to protect information.

Whenever you send a message online, cryptography works behind the scenes to keep it safe. It scrambles information into a secret form called encryption. Only someone with the key can unscramble it back into the original message.

Cryptography keeps secrets safe from hackers, spies, and anyone who shouldn't see them.

Why Has Cryptography Always Mattered?

For thousands of years, people have used codes to protect secrets in war, politics, and business. Imagine if your enemy knew your battle plans or private letters. Codes made sure only trusted people could understand messages.

Throughout history, breaking a code has changed the course of wars and history itself.

The Caesar Cipher

One of the earliest and simplest codes is the Caesar cipher. Julius Caesar shifted letters in his messages by a fixed number. For example, shifting each letter by 3 turns “HELLO” into “KHOOR.”

If you know the shift number, you can decode the message. If you don’t, it looks like nonsense! That’s how this works.

Decode This Caesar Cipher

Here is a secret message using a Caesar cipher with a shift of 2:
“JGNNQ YQTNF”

Try to decode it by shifting each letter back by 2. Write down the original message. Maybe write down the answer at the end like you did for the other one.

(Hint: If “J” shifted back by 2 is “H,” try the same for each letter.)

Cryptography in World War II

During World War II, cryptography was more important than ever. The Allies and Axis powers used complex machines like the Enigma to send secret messages.

Breaking the Enigma code was a huge victory. It helped end the war sooner and saved countless lives. The team behind this was led by brilliant women and men at Bletchley Park in the UK.

Women Who Changed History

Women played a vital role in cracking codes during the war. At Bletchley Park, women like Joan Clarke and many others used logic, math, and persistence to break enemy ciphers.

They worked in secret, often without recognition. Their work proved that girls and women have always been essential in cryptography and cybersecurity..

How Modern Cryptography Works

Today, cryptography uses complex math and computers. Instead of simple shifts, modern encryption uses keys.. long strings of numbers that lock and unlock data.

This protects everything from your text messages to online banking. Even governments rely on cryptography to keep secrets safe.

Create Your Own Cipher

Try creating a simple substitution cipher. Pick a rule, like replacing each letter with another letter or symbol. Write a secret message using your rule.

Then, swap messages with a friend and try to decode each other's messages. This shows how encrypting and decrypting works in practice.

Why Is Cryptography Important Today?

With so much of our lives online, cryptography is everywhere. It protects your passwords, messages, and payments. Without it, anyone could steal or change your information.

Understanding cryptography means understanding how your privacy is protected.

The Balance Between Privacy and Security

Cryptography protects privacy, but it can also cause problems. Some governments want access to encrypted data for security reasons, but that can threaten privacy.

This creates debates about where to draw the line between protecting people and spying on them. It’s a complex issue with no easy answers.

Decode This!

“Uifsf jt b tfdsfu dpef”

The decoded version is at page 16.

What Is a Key in Cryptography?

A key is a secret code used to encrypt or decrypt a message. Without the right key, the message stays scrambled. Keys can be short or very long, depending on the system.

Think of a key like a password, but for unlocking secret messages.

How Cryptography Protects You Every Day

When you send a message on apps like WhatsApp, cryptography scrambles it so no one else can read it. This is called end-to-end encryption.

It means only you and the person you're talking to can see the message. Even the app makers can't read it.

Cryptography Is a Skill Anyone Can Learn

You don’t need to be a math genius to understand the basics of cryptography. With curiosity and practice, anyone can learn how codes work and why they matter.

Learning cryptography is a step toward becoming a digital protector. It’s a skill that strengthens your ability to stay safe online.

Your Turn as a Cyber Valkyrie!

Your task is to create a secret message using a cipher. Write it down and share it with a friend or family member. Then, try to decode a message they create for you.

Answer for page 12: “Meet me at 8pm”