**Exploring Computer Science**

**Cyber Security**

Protecting your information online is crucial. The Internet was originally designed to connect large computers at universities, businesses, and governments. It grew exponentially once personal computers became common in the 1980s. Connecting to the Internet leaves computers vulnerable. People can use computers to delete data, spread viruses, or even steal someone’s identity. However, there are several ways to stay safe online by protecting information with coding, password cracking, & spotting email scam.

Answer the following Discussion Questions:

1. Why was the Internet originally designed?
2. What are some objects besides computers that can be connected to the Internet?
3. What can happen if you don’t protect your computer?
4. Why haven’t people developed a perfectly safe Internet?

**Cyber Codes**

Encryption keeps online information private. Your messages are coded by email programs and websites to prevent others from reading them. Codes have been used in messages for centuries. Caesar sent coded messages to his military in ancient Rome. In the 1940s, the Allied forces cracked the German Enigma Code, saving lives during World War II. Today, emails are protected through public-key cryptography, which uses numbers from both the sending and receiving email servers to create a key. However, not all online activity is encrypted and in some cases your browsing history, text messages, and data from apps can be intercepted.

Answer the following Discussion Questions:

1. What happens if your information is not encrypted online?
2. How have codes been used in the past to send messages?
3. How does public-key cryptography work?
4. What types of online information are encrypted and which data is still vulnerable?

**The Secret Lives of Hackers**

There are many different types of hackers. Hacking is solving problems in creative or unexpected ways. Hacks have been used for everything from Galileo’s telescope to Apollo 13. Similarly, there are many reasons that people hack computers. Some are just curious about how systems work, others hack to find and fix security flaws before they are exploited by criminals. Some hackers have bad intentions fueled by greed, attention, or rebellion. There are some hackers who have good intentions, but use questionable methods of getting information. “Hacking” isn’t good or bad – it depends on how and why people hack.

Answer the following Discussion Questions:

1. What is hacking?
2. Name some examples of hacks outside of computing.
3. What are some reasons that people hack computers?
4. How can hackers protect people from exposing personal information?