Outline:

Use selected on-line articles to explore current issues related to crypto currencies such as BitCoin. A focus for learning is: the underlying technologies, impacts on society, and impacts on the environment.

Objectives:

* C1.4 describe how electronic access to information influences our everyday lives.
* C2.1 describe the negative effects of computers and computer use on the environment.
* C3.1 describe legal and ethical issues related to the use of computers.

**Level 1: Cryptocurrencies & Blockchains**

Read the following resources before answering the questions below:

* <https://www.investopedia.com/tech/most-important-cryptocurrencies-other-than-bitcoin/>
* <https://www.investopedia.com/terms/b/blockchain.asp>
* <https://www.cryptoandgamers.com/>

1. What is a “cryptocurrency” and how are “cryptocurrencies” different from traditional currencies (money)?

Cryptocurrency is virtual or digital money which takes the form of tokens or “coins”. It is different from traditional currencies as it is generated, stored, and transferred securely and usually anonymously. They are also designed most of the time to be free from government manipulation and control.

1. BitCoin is the leading cryptocurrency that most people know. What are some other cryptocurrencies and what are their unique features?

Some other cryptocurrencies than BitCoin are Litecoin(LTC), Ethereum(ETH), Zcash(ZEC), Dash(DASH), Ripple(XRP), Monero(XMR), Neo(NEO), Cardano(ADA), and EOS(EOS). Litecoin has a faster block generation rate that results in a faster transaction conformation. Ethereum has been built to and run without any downtime, fraud, control, or interference from a third party.

1. “Blockchains” are the basic technology behind cryptocurrencies and other emerging technologies. Explain blockchains work with respect to:
   1. What they store
   2. How they work
   3. How they are secure and private
   4. How they use public and private encryption keys

Blockchains store information about transactions made, the date and time it was made, and the amount of dollars of your most recent purchase. They also store who participated in the transaction. They also store info that distinguish them from other blocks. They work by first getting verified. Then it is stored into a block, which is given a hash of the most recent block added to the blockchain. When it is added, it is public to everyone. Unfortunately, transactions are not private. Any hacker can multiply the blocks. But it is secure.

1. How does BitCoin use blockchains?

When a person pays another for goods, computers on BitCoin network race to verify the transaction. But in order to do so, the users need to solve a mathematical problem, which is called “hash”. When completed, the algorithmic is also verified. It is completely publicly stored on the block when it becomes unalterable.

1. What are some other real-world applications of blockchains?

Some other real-world applications of blockchains are banks, cryptocurrency, healthcare, property records, smart contracts, supply chains, and voting.

1. What are some advantages and disadvantages of blockchains?

Some advantages of blockchains are accuracy, cost, decentralization, efficiency, privacy, and security. Some disadvantages are cost, again, inefficiency, privacy. Security, and susceptibility.

1. Blockchain based games are the latest development in the gaming industry. Research the topic “Crypto Games” (google) to answer the following questions.
   1. What are some interesting Crypto Games available for Android or iPhone?

Some games available on mobile are Crypto Baseball, Cropbytes, Everdragons, Blockchain Cuties, and War Field.

* 1. How are they different from conventional games?

They are different from conventional games as you earn you can earn from these games. Instead of normal games in which you earn nothing, these games can get you different cryptocurrencies.

**Level 2: Bitcoin & Society**

Read the following resources before answering the questions below:

* <https://www.cnet.com/how-to/what-is-bitcoin/>
* <https://www.independent.co.uk/life-style/gadgets-and-tech/news/bitcoin-price-fall-criminals-blockchain-anonymous-cryptocurrency-zcash-monero-dash-a8174716.html>
* <https://coincenter.org/link/why-ransomware-criminals-use-bitcoin-and-why-that-could-be-their-undoing>

1. Who created BitCoin and who owns BitCoin now?  
   A person named Satoshi Nakamoto had created BitCoin. His goal was to create a “new electronic cash system”. But he had turned over the source code and domains to others in the bitcoin community and vanished in 2011.
2. How is BitCoin created and what is "BitCoin Mining"?  
   Bitcoin is created by mining. BitCoin Mining is the generation of BitCoin. A person, group, or company mines bitcoin by doing a combination of advanced math and record-keeping. When someone sends a bitcoin to someone else, the network records the transaction and all the others made over a certain period of time in a “block”. Computers running special software’s inscribe these transactions in a gigantic digital ledger accessible record. Miners convert these blocks into sequences of code, known as a “Hash”. When a new hash is generated, it’s placed at the end of the blockchain. It is then publicly updated and propagated.
3. Can you buy BitCoin and what does it cost?  
   You can buy a BitCoin. 1 BitCoin costs $5,147.93! (Google was used)
4. Why would you want to buy BitCoin and what can you use it for?  
   With BitCoin, you can buy things from more than 100,000 merchants, sell it, or just keep it. Transactions like Coinbase usually charge a fee, but inherent transaction fees do not exist.
5. What are the risks of using BitCoin?  
   Some risks of BitCoin are that the financial value of BitCoin can change, you don’t know who is selling or buying BitCoin to you or from you, theft of BitCoin, and since BitCoin is new, there are many unknowns.
6. How much of BitCoin business is related to criminal activity?  
   25% of all users and 44% of bitcoin transactions were related to criminal activity.
7. What are some of the reasons why criminals use BitCoin?  
   Some reasons why criminals use BitCoin are that cryptocurrency allow users to hide or conceal activity, and BitCoin is fast, reliable, and verified. In BitCoin, you don’t have to tell your real identity, so if illegal activity is made, it is hard to find the people related to it. Also, illegal activity can happen fast. For example, if a drug deal is happening, the money is sent fast and the person can get more drugs.
8. What are some of the disadvantages of BitCoin when used for criminal activity?  
   The name of the person isn’t a real name. It is a created up name which doesn’t help anyone to figure out who it is.
9. Many people dislike Bitcoin because they think it is only good for criminal activity.   
   Is this true? Write a supported opinion paragraph (SOP) to explain your position.

Many people believe that BitCoin is a good place for criminal activity. But it is only for people with more money. The fact that people use it to buy illegal stuff, hack other accounts, or other things. But if you are using BitCoin for legal purposes, or not doing illegal stuff, and keep little BitCoin in your account, you are safe to use it. If you keep thousands of BitCoins in your account, then there is a bigger chance that your account will be hacked, and you will lose a lot of money. If money is taken out very fast, then there would be less chances of any criminal activity.

Guidelines for writing a supported opinion paragraph (SOP)

* <http://schools.peelschools.org/sec/fletchersmeadow/studentlife/OSSLTprep/Documents/Sample_%20Writing%20a%20Supported%20opinion%20paragraph.pdf>

**Level 3: Bitcoin & The Environment**

Read the following resources before answering the questions below:

* <https://www.cbc.ca/news/business/bitcoin-electricity-1.4668768>
* <https://www.cbc.ca/news/business/hut8-medicine-hat-bitcoin-mining-1.4834027>

1. What is a BitCoin “miner” and why are people concerned about BitCoin mining?  
   A BitCoin “miner” is a computer hashing for BitCoins. People are concerned about BitCoin mining because it uses too much electricity.
2. Why does BitCoin mining use so much energy?  
   BitCoin uses so much energy because computers crunch 26 quintillion, or 26,000,000,000,000,000,000, hashes every second of every day. That is a lot. It does take quite a bit of computational power to pull that off.
3. Why has Hut-8 decided to locate its facility in Alberta when its head office is in Toronto? What does the city of Medicine Hat provide that is required for mining BitCoin?  
   Hut-8 has decided to locate its facility in Alberta because it takes too much energy and on summer heat waves, it can stop electricity to it so that there are no blackouts for residents.
4. What benefits does the city of Medicine Hat expect to see from this BitCoin facility?  
   The city of Medicine Hat expects to see a significant financial boost from the new project.
5. What concern does the city of Medicine Hat have about from this Bitcoin facility?  
   A concern about the Bitcoin facility in Medicine Hat is that it consumes too much energy in a place where energy is mostly produced by fossil fuels.
6. What concern do environmentalists have about the Medicine Hat facility and about BitCion mining in general? E.g. how does BitCoin mining harm the environment?  
   There will be too much fossil fuels being used in the future as it consumes too much. Too much use of fossil fuels will cause more pollution in the city.
7. If Hut-8 wanted to build a facility in Brampton, would be in favor of this proposal. Write a SOP to justify your position.

Hut-8 is a BitCoin mining process in Medicine Hat. If it were to build a facility in Brampton, I would only be in favor if it were only to use energy from Dams or Wind Turbines, etc. Those electricity producing plants usually create an environment-safe production which use water, wind, etc. It doesn’t create any harm to the environment such as how fossil fuels create pollution. If the facility were to use fossil fuels, then I would be against this proposal as it isn’t really a benefit to anyone. I would rather have it be built somewhere else.