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 a virtual or digital currency which takes the form of tokens or coins. Cryptocurrencies are different from normal money as it is not physical money, are not stored in banks and are 100% government free.

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

* Litecoin (LTC) - “Litecoin is based on an open source global payment network that is not controlled by any central authority and uses "scrypt" as a proof of work, which can be decoded with the help of CPUs of consumer grade.”

### Ethereum (ETH) - “Ethereum is a decentralized software platform that enables Smart Contracts and Distributed Applications (DApps) to be built and run without any downtime, fraud, control or interference from a third party.”

* Zcash (ZEC)- “Zcash, a decentralized and open-source cryptocurrency launched in the latter part of 2016, looks promising. “If bitcoin is like http for money, zcash is https," is one analogy zcash uses to define itself. Zcash offers privacy and selective transparency of transactions.”
* DASH (DASH) - “Dash (originally known as darkcoin) is a more secretive version of bitcoin. Dash offers more anonymity as it works on a decentralized master code network that makes transactions almost untraceable.”

1. “Blockchains” are the basic technology behind cryptocurrencies and other emerging technologies. Explain blockchains work with respect to:
   1. What they store

Blockchains store information about transactions, who is participating in the transaction and information that makes them different from other blocks.

* 1. How they work

Blockchains work by a transaction happening, the transaction has to be verified and it must be put in a block.

* 1. How they are secure and private

Anyone can access blockchain but you can choose to connect your computer to a blockchain and you get updated every time a new block is added.

* 1. How they use public and private encryption keys

1. How does BitCoin use blockchains?

Blockchains put regulations and stores information for BitCoin.

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

It can be used to store other transactions and data. It can also store data of property exchanges and, vote for a politician.

1. What are some advantages and disadvantages of blockchains?

Advantages are that it has great privacy and security, low fees and has a few errors.

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?

A few Crypto games that are available for iPhone and Android are MLB Crypto baseball, unchained, cryptobytes, eyedragons and more.

* 1. How are they different from conventional games?

They are different as you make real money off of them rather than fake.

**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?  
    Bitcoin was created by a person named Satoshi Nakamoto in 2009 and still owns the company.
2. How is BitCoin created and what is "BitCoin Mining"?  
   Bitcoin is created by mining and mining Bitcoin is achieved by doing series of advanced math and record keeping.
3. Can you buy BitCoin and what does it cost?  
   There are a number of cryptocurrency exchanges and the price of BitCoin constantly changes.
4. Why would you want to buy BitCoin and what can you use it for?  
   You can buy BitCoin as it can be a good investment especially with the popularities with cryptocurrencies. With Bitcoin, you can use it to buy things, sell them or just hold on to them.
5. What are the risks of using BitCoin?  
   The value of BitCoin can rise or drop at any time and there is a tax if you own $20,000 and more worth of BitCoin.
6. How much of BitCoin business is related to criminal activity?  
   44% of Bitcoin transactions and 25% of Bitcoin users are related to criminal activity.
7. What are some of the reasons why criminals use BitCoin?  
   People use BitCoin to buy illegal firearms, drugs; money launder and much more.
8. What are some of the disadvantages of BitCoin when used for criminal activity?  
   Disadvantages are that authorities have found ways to identify criminals that use BitCoins for illegal activity.
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.

It is true that many people dislike BitCoin as they think it is only useful for criminal activity since there is no government control over BitCoin and it is not like traditional money. Starting off, governments do not have control over cryptocurrencies and cannot make laws and regulations over it. According to Justin Jaffe from Cnet.com “

Without a government or central authority at the helm, controlling supply, "value" is totally open to interpretation.” Another reason why people may think that BitCoin is only good for bad reasons is that it is something the world has never seen before and is not like traditional money with cash or banks. People may believe that BitCoin can be easily earned, stolen and manipulated but that is not the case at all. To conclude, people dislike BitCoin as they believe that is only good for illegal matters and is something the world has never seen before.

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?  
   According to what is.techtarget.com a Bitcoin miner is someone who processes transactions and in return get paid with BitCoin. The public is concerned about Bitcoin mining because it uses too much energy.
2. Why does BitCoin mining use so much energy? Mining uses so much energy since takes up 2.5 gigs watts of energy and 200,000 transactions take place everyday.
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 locates it’s facility in the city of Medicine Hat because there is a power plant built next to it since mining bitcoins can take up a lot of energy.
4. What benefits does the city of Medicine Hat expect to see from this BitCoin facility?  
   Medicine Hat benefits from it as the facility employed 40 full time workers, and adds to the city’s local economy.
5. What concern does the city of Medicine Hat have about from this Bitcoin facility?  
   It concerns the city as the facility uses a lot of fossil fuel powered energy.
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?  
   The energy that Hut-8’s facility is using is powered by fossil fuel energy and causes pollution and other environmental problems.
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.

If Hut-8 were to build a facility in Brampton, I would not be in favour of it as the facility would create pollution, use too much energy and use the only power plant Brampton has. To start off, building a BitCoin mining facility would create a lot of pollution due to the amount of energy BitCoin mining takes and how the only power plant in Brampton is run by gas (a non-renewable energy source). This will burn fossil fuels and can create electricity pollution adding to the growing problem of climate change. Furthermore, BitCoin mining uses and takes up a lot of energy. According to economist Alex de Vries, a single transaction of bitcoin uses as much as the average Canadian home does in a month while adding that there are as much 200,000 transactions that take place each day. The facility In Medicine Hat, Alberta uses 60 megawatts of power. One megawatt equals to 1,000,000 watts. In last, in order for Hut-8 to build a facility in Brampton, the company will need to use Brampton’s only power plant located on Goreway Dr. The power plant provides energy to more than 500,000 people in Brampton and will not be able to support such a facility that uses a ridiculous amount of energy. In conclusion, the city of Brampton should not allow Hut-8 to build a BitCoin mining facility as it would cause pollution, take up much energy and use Brampton’s only power plant.