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 & Block chains**

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)?

It is units of currency that is a form of a digital currency (online money). Cryptocurrency uses strong cryptography to secure financial transactions, control the creation of additional units, and verify the transfer of assets. It’s different because it is digital/virtual and it is not controlled by any central authority (like a bank).

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

Litecoin-it has a faster block generation rate and hence offers a faster transaction confirmation

Zcash-offers privacy and selective transparency of transactions

### Ripple-Enables banks to settle cross-border payments in real time, with end-to-end transparency, and at lower costs. It is also unique in that it doesn’t require mining. Which e sets itself apart from bitcoin and many other altcoins.

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

Blocks store information about transactions, say the date, time, and dollar amount of your most recent purchase from for example Amazon. (amazon does not really work on a block chain just for illustrative purposes). Blocks store information about who is participating in transactions. A purchase from Amazon would record your name along with Amazon.com, Inc. Instead of using your actual name, your purchase is recorded without any identifying information using a unique “digital signature,” sort of like a username. Lastly, each block stores a unique code called a “hash” that allows us to tell it apart from every other block

* 1. How they work

When we say the words “block” and “chain” in this context, we are actually talking about digital information (the “block”) stored in a public database (the “chain”). The way they work is by a transaction that needs to occur. Then the transaction must be verified. When you purchase something, it verifies your transaction. When verified, the transaction gets stored in a block. When the block is added to the block chain, it becomes publicly available for anyone to view.

* 1. How they are secure and private

**Private:**

Anyone can view the contents of the block chain, but users can also opt to connect their computers to the block chain network. You do not have access to identifying information about the users making transactions. Although transactions on block chain are not completely anonymous, personal information about users is limited to their digital signature, or username.

**Secure:**

After a block has been added to the end of the block chain, it is very difficult to go back and alter the contents of the block. That’s because each block contains its own hash, along with the hash of the block before it. Hash codes are created by a math function that turns digital information into a string of numbers and letters. For example, if someone is trying to hack you and they attempt to edit the dollar amount on your transaction, the blocks hash will change.

* 1. How they use public and private encryption keys

Public keys are keys that can be accessed through anyone if found in the central data. Meaning, a public key has data on how to open it (if you lose the key, it’s not the end of the world). Whereas a private key is a key that there is no central data. Meaning it does not keep data on how to open it, so if you lose it, it is gone forever.

1. How does Bitcoin use block chains?

Bitcoin uses block chain technology to jointly manage the database that records Bitcoin transactions.

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

**Smart Contracts-**several industries and are reducing the dependency on standard legal contracts

**Money Transfers across Borders-**this would help to increase the resiliency of the internet.

**Digital IDs-**These Digital IDs would serve to empower refugees, impoverished people and bring them into the formal financial sector.

1. What are some advantages and disadvantages of block chains?

Advantages: decentralization, immutability, security, and transparency, and also allows for verification without having to be dependent on third-parties.

Disadvantages: cannot undo a transaction, allows transactions to happen between parties who don’t trust each other, require nodes to run, each transaction increase the size of database meaning the computing requirements for each use will increase.

1. Block chain 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?

Games like crypto trillionaire, and bitcoin billionaire.

* 1. How are they different from conventional games?

They turned a real-life investment/thing into a video game. They are telling you to mine coins and to invest and make money.

**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 invented in 2009 by a person (or group) who called himself Satoshi Nakamoto. He turned over the source code and domains to others in the bitcoin community.
2. How is BitCoin created and what is "BitCoin Mining"?  
     
   Bitcoin is an online currency, bitcoin is "mined" by powerful computers connected to the internet. Basically, bitcoin mining is when someone sends a bitcoin to someone else, the network records that transaction, and all of the others made over a certain period of time, in a "block." Computers running special software -- the "miners" -- inscribe these transactions in a gigantic digital ledger.

**Jaffe, Justin. “Bitcoin: The Newcomer's Guide to Cryptocurrency.” *CNET*, CNET, 13 Feb. 2018,** [**www.cnet.com/how-to/what-is-bitcoin/**](http://www.cnet.com/how-to/what-is-bitcoin/)**.**

1. Can you buy BitCoin and what does it cost?

To get a bitcoin, it is as similar as setting up a PayPal account. With Coin base, for example, you can use your bank (or PayPal account) to make a deposit into a virtual wallet, of which there are many to choose from. Once your account is funded, which usually takes a few days, you can then exchange traditional currency for bitcoin. Bit coin is your money that you exchange for online currency like bitcoin. So, all you need is for your account to be funded, and then you can make the exchange.

1. Why would you want to buy BitCoin and what can you use it for?

Getting started is about as complicated as setting up a PayPal account. With Coin base, for example, you can use your bank (or PayPal account) to make a deposit into a virtual wallet, of which there are many to choose from. Once your account is funded, which usually takes a few days, you can then exchange traditional currency for bitcoin.

1. What are the risks of using BitCoin?

The risk of bitcoin is value change (the value of bitcoin can change day to day or even by the hour), cannot be traced (You can never be certain who is selling you bitcoin or buying them from you), and theft (hackers can steal your bit coins).

1. How much of BitCoin business is related to criminal activity?  
     
   There are criminals in the world, so the criminal activity is going to continue to take place. To have Bitcoin currency is like taking some sort of a risk. Hackers are out there trying to steal individual’s money. Since it is so new, technical rules are still being put into place, and in fact still involving. So yes, the bitcoin business is related to criminal activity. It is another place for criminals to steal.
2. What are some of the reasons why criminals use BitCoin?  
     
   Some criminals use bitcoin because users can open a wallet to send and receive bitcoin without giving a name or identity. There is no bank or central authority, like a government, to control this information.
3. What are some of the disadvantages of BitCoin when used for criminal activity?

Bitcoin is not completely anonymous and transactions can be traced by police through bitcoin trading websites.

1. 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.  
     
   Guidelines for writing a supported opinion paragraph (SOP)

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

No, I do not believe that bitcoin is only good for criminal activity. Individuals should not be stopped by criminal activities from using bitcoin. Bitcoin does have a lot of perks, it can help many people around the world when moving countries/assets, in the future it will eventually be one of the main currencies used as people say, and people can make a great investment of bitcoin. Even if one bitcoin user is a criminal, they eventually make a transaction with their wallet, and their identity could be found. So it is nothing to be afraid of, since it can be really beneficial in the future.

**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 the process by which transactions are verified and added to the public ledger, known as the block chain, and also the means through which new bitcoin are released.

2.       Why does BitCoin mining use so much energy?

As more miners compete for bitcoins, facilities will have to use more electricity compared to the amount of the crypto currency they collect. The bitcoin algorithm is designed to waste as much electricity as possible. And the more popular bitcoin becomes, the more electricity it wastes.

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 is located in Alberta because of the number of blackouts in Alberta due to how many miners there are in Alberta. There are some bit coin buyers in Alberta which requires them to have more energy.

4.       What benefits does the city of Medicine Hat expect to see from this BitCoin facility?

Some benefits for the city of Medicine Hat is they now have their own natural gas, four wind turbines, electricity generations and distribution centers. With this 40 new full time jobs are created in the city. The economy of Medicine Hat is also expected to increase due to the jobs increase.

5.       What concern does the city of Medicine Hat have about from this Bitcoin facility?

The concern for the city of Medicine Hat is that fossil fuels are used to run the facilities and not clean energy. This means the air of Medicine Hat is going to be polluted due to the facilities.

6.       What concern do environmentalists have about the Medicine Hat facility and about BitCoin mining in general? E.g. how does BitCoin mining harm the environment?

Bitcoin mining is harming the environment as it takes a lot of energy to mine. Bitcoin mining causes a lot of blackouts which is a lot of trouble for the city people. Also, a lot of fossil fuels are being used to run the facility which affect the air.

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 a Hut-8 facility was built in Brampton, it would be a great economy boost for the city as it will create a lot jobs. If a Hut-8 facility comes to Brampton then the economy will boost and more jobs will be created. Moreover, Brampton economy can be on a rise if its own facility is built. Brampton will have its own natural gas, electricity generators and distribution centers. With all this it will create a lot of money and more population for the city of Brampton. Furthermore, Brampton’s unemployment rate will go down as more jobs will be created. With the natural gas facility, electricity generators and distribution centers this will for sure create a lot of jobs for Brampton. In conclusion, a Hut-8 facility will increase Brampton’s economy in a lot of ways.