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.

**BitCoin & Crypto currencies**

Use the following resources  to answer the questions below:

·      <https://www.investopedia.com/tech/most-important-cryptocurrencies-other-than-bitcoin/>

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

A cryptocurrency, broadly defined, is virtual or digital money which takes the form of tokens or “coins.” Cryptocurrencyexchange is somewhat the same as the  global online payment system, PayPal, except the currency being exchanged is not traditionalmoney.

2.      BitCoin is the leading crypto currency that most people know. What are some other crypto currencies and what are their unique features?

Some other crypto currencies are and their unique features is

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. Although Litecoin is like bitcoin in many ways, it has a faster block generation rate and hence offers a faster transaction confirmation.

Ethereum (ETH): Ethereum is a decentralized software platform that enables Smart Contracts and Distributed Applications to be built and run without any downtime, fraud, control or interference from a third party. The applications on ethereum are run on its platform-specific cryptographic token, ether.

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 its users the choice of “shielded” transactions, which allow for content to be encrypted using an advanced cryptographic technique or zero-knowledge proof construction called a zk-SNARK developed by its

**Block Chains Explained**

Use the following resource to answer the questions below:

·      <https://www.investopedia.com/terms/b/blockchain.asp>

1.      “Block chains” are the basic technology behind crypto currencies and other emerging technologies. Explain block chains work with respect to:

a.      What they store

Blocks store information about transactions like the date, time, and dollar amount of your most recent purchase from Amazon. Store information about who is participating in transactions. Lastly it also store information that distinguishes them from other blocks.

b.      How they work

In order for a block to be added to a blockchain 4 things must happen: A transaction must occur, That transaction must be verified, That transaction must be stored in a block and That block must be given a hash. When that new block is added to the blockchain, it becomes publicly available for anyone to view even you.

c.      How they are secure and private

Anyone can view the contents of the blockchain, but users can also opt to connect their computers to the blockchain network. Yes, blockchain is innately secure private keys are even more secure as they are considerably longer.

d.      How they use public and private encryption keys

Every single time you make a transaction on the blockchain, that transaction is sent out to many nodes in the Bitcoin network the blockchain is a shared public ledger on which the entire Bitcoin network relies.

2.      How does BitCoin use block chains?

 The [blockchain](https://www.investopedia.com/terms/b/blockchain.asp)​ has since evolved into a separate concept, and thousands of blockchains have been created using similar cryptographic techniques. This history can make the nomenclature confusing. Blockchain sometimes refers to the original, bitcoin blockchain. At other times it refers to blockchain technology in general, or to any other specific blockchain, such as the one that powers [Ethereum](https://www.investopedia.com/terms/e/ethereum.asp)​.

The basics of blockchain technology are mercifully straightforward. Any given blockchain consists of a single chain of discrete [blocks](https://www.investopedia.com/terms/b/block-bitcoin-block.asp) of information, arranged chronologically. In principle this information can be any string of 1s and 0s, meaning it could include emails, contracts, land titles, marriage certificates, or bond trades. This versatility has caught the eye of governments and private corporations.

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

Pros

* Improved accuracy by removing human involvement in verification
* Cost reductions by eliminating third-party verification
* Decentralization makes it harder to tamper with
* Transactions are secure, private and efficient
* Transparent technology

Cons

* Significant technology cost associated with mining bitcoin
* Low transactions per second
* History of use in illicit activities
* Susceptibility to being hacked

**Crypto-Games & Other Applications**

Use the following resource to answer the questions below:

·      <https://egamers.io/beginners-guide-to-crypto-games/>

1.      What are some interesting Crypto Games (i.e. games that use Block Chain technology) available for Android or iPhone?

* Cryptokitties – Tradable **Crypto** Assets.
* Spells of Genesis – Playable **Crypto** Assets.
* Beyond **the** Void – In-**game** Cryptocurrency Economy.
* Privateers Life – Closer to a Real Economy.
* Worldopoly – Augmented Reality **Game** Based on Blockchain/DAG.

2.      How are Crypto Games different from conventional games?

 The main difference between the two is that a blockchain game has every process in the game recorded on the blockchain as a transaction. No one can change, delete or influence the result of a game, whereas a crypto game has only a token used within the game. Even more, crypto games don't even use their own blockchain

3.      What are some other real-world applications of block chains besides games and crypto currencies?

 Payment processing and money transfers. ...

* Monitor supply chains. ...
* Retail loyalty rewards programs. ...
* Digital IDs. ...
* Data sharing. ...
* Copyright and royalty protection. ...
* Digital voting. ...
* Real estate, land, and auto title transfers

**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.      How is BitCoin created and what is "BitCoin Mining"?

Each Bitcoin is basically a computer file which is stored in a 'digital wallet' app on a smartphone or computer. People can send Bitcoins (or part of one) to your digital wallet, and you can send Bitcoins to other people. Every single transaction is recorded in a public list called the blockchain.

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

Yes you can buy BitCoin and 1 BitCoin cost $10382.99 canadian dollars

3.      What can you use BitCoin for?

You can use bitcoin to buy things from [more than 100,000 merchants](https://www.cnet.com/pictures/25-things-you-didnt-know-you-could-buy-with-bitcoins/), though still [few major ones](https://www.cnet.com/news/you-cant-really-shop-much-online-with-bitcoin-says-report/). You can sell it. Or you can just hang on to it. Note that there are no inherent transaction fees with bitcoin, although exchanges like Coinbase typically charge a fee when you buy or sell.

4.      What are the risks of using BitCoin?

Investors should know that buying and using digital currency such as Bitcoin carry risks. Speculative trading in bitcoins carries significant risk. There is also the risk of fraud related to companies claiming to offer Bitcoin payment platforms and other Bitcoin-related products and services

5.      How much of BitCoin business is related to criminal activity?

As blockchain is constantly being reviewed by bitcoin users, hacks are unlikely. On the other hand, though, the fact that bitcoin itself is difficult to hack does not mean that it's necessarily a safe investment. There does exist the potential for security risks at various stages of the trading process

6.      What are some of the reasons why criminals use BitCoin?

 One of the main reasons bitcoin is so popular with criminals is that the cryptocurrency allows users to conceal their identities.

7.      What are some of the disadvantages of BitCoin when used for criminal activity?

**Disadvantages of Using Bitcoin**

* Exposure to Bitcoin-Specific Scams and Fraud. ...
* Black Market Activity May Damage Reputation and Usefulness. ...
* Susceptible to High Price Volatility. ...
* No Chargebacks or Refunds. ...
* Potential to Be Replaced by Superior Cryptocurrency. ...
* Environmental Ills of Bitcoin Mining

**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?

Bitcoin miners achieve the same effect without these institutions by clumping transactions together in “blocks” and adding them to a public record called the “blockchain.” When bitcoin miners add a new block of transactions to the blockchain, part of their job is to make sure that those transactions are accurate

2.  Why does BitCoin mining use so much energy?

Miners use their computing power to add blocks of transaction data to the bitcoin blockchain; miners that do so are rewarded with more bitcoins.

3.  Why has Hut-8 decided to locate its facility in Alberta when its head office is in Toronto?

The company said it has already mined more than 3,300 bitcoins in Alberta, including at its much smaller site in Drumheller. On average, the Medicine Hat facility mines about 20 bitcoins per day. The value of bitcoin can fluctuate daily, but has sold recently for around $9,000.

 What does the city of Medicine Hat provide that is required for mining BitCoin?

Environmental groups are concerned by the sheer amount of energy consumed by bitcoin mining, especially in places like Medicine Hat where most of the electricity is produced by fossil fuels.The bitcoin system is designed, so only a limited number of the cryptocurrency can be mined everyday. Over time, as more miners compete for a decreasing number of available bitcoins, facilities will have to use more electricity compared to the amount of the cryptocurrency they collect.

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

The vast amount of electricity needed for bitcoin mining is why the city of Medicine Hat has championed the economic benefits of the project, while environmentalists say they are wary of the significant energy use.

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

That's why, in the event of a summer heat wave, the city has provisions in place to pull the plug on the electricity it provides to Hut 8, so there won't be any blackouts for residents, according to the mayor.

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

Mining has the potential to have severely adverse effects on the environment including loss of biodiversity, erosion, contamination of surface water, ground water, and soil. The formation of sinkholes is also possible

7.  If Hut-8 wanted to build a facility in Brampton, would you be in favor of this proposal? Explain why and why not.

If HUt-8 wanted to build a facility in Brampton I wouldn’t be in favor of this proposal because Hut 8 is a cryptocurrency mining company that is not doing so well in their stock prices, with this stock doing poorly it would affect Canada’s economy negatively. Hut 8 has its Toronto and would not do so well as most of its business is because Brampton is not really good for cryptocurrency the same way Toronto is. Toronto also has more business than Brampton, causing more profit to Hut 8 in Toronto than Brampton.