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 resource 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 is a digital tool designed to work as a medium of exchange that uses strong

cryptography to secure financial transactions, control the creation of additional units, and verify the

transfer of assets.

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

Traditional notes or coins are not that flexible you cannot use them worldwide to use them first you

need to convert them and they are provided by the government and controlled by the government

whereas Cryptocurrencies are not controlled by anyone

**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:
   1. What they store

record transactions between two parties efficiently and in a verifiable and permanent way”. For use as a distributed ledger, a block chain is typically managed by a peer-to-peer network collectively adhering to a protocol for inter-node communication and validating new

blocks.

* 1. How they work

**A block in a block chain is a collection of data. Block chain is a distributed ledger, which simply**

**means that a ledger is spread across the network among all peers in the network, and each peer holds a copy of the complete ledger.**

* 1. How they are secure and private

block chain is designed to be immutable, tamper-proof and democratic. It achieves this,

more or less, through three defining characteristics: 1. Decentralization 2.

* 1. How they use public and private encryption keys

Public key cryptography uses a pair of a public key and a private key to perform different tasks.

Public keys are widely distributed, while private keys are kept secret. Using a person&#39;s public key, it is possible to encrypt a message so that only the person with the private key can decrypt and read it.

1. How does BitCoin use block chains?

**transactions made in Bitcoin are verified by**

**a network of computers. When one person pays another for goods using Bitcoin, computers on the Bitcoin network race to verify the transaction**.

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

**-Advantages.**

**Distributed. Since block chain data is often stored in thousands of devices on a distributed network of nodes, the system and the data are highly resistant to technical failures and malicious attacks.**

**Stability. ...**

**Trustless system. ...**

**-Disadvantages.**

**51% Attacks. ...**

**Data modification. ...**

**Private keys.**

**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?  
   -Eos Knight

-Ox Universe

-Mega crypto polis

1. How are Crypto Games different from conventional games?

**main difference between the two is that a block chain game has every process in the game**

**recorded on the block chain 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. c**

1. 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.**

**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"?  
   **bitcoins are generated by a competitive and decentralized process called “mining” Bitcoin miners are processing transactions and securing the network using specialized hardware and are collecting new bitcoins in exchange. The Bitcoin**

**protocol is designed in such a way that new bitcoins are created at a fixed rate.**

1. Can you buy BitCoin and what does it cost?  
   **Once you have a Bitcoin wallet, you can use a traditional payment method such as a credit**

**card, bank transfer (ACH), or debit card to buy Bitcoins on a Bitcoin exchange. While**

**exchanges offer wallet capabilities to users, it is not their primary business. Bitcoin is worth**

**$10,413.**

1. What can you use BitCoin for?
2. –OK Cupid (dating site)

-Cheap Air (travel/hotel booking agency)

-PizzaForCoins (pizza delivery)

-Zynga (Mobile apps/games)

-Etsy (e-commerce, some Etsy sellers accept bitcoin as payment)

1. What are the risks of using BitCoin?

-Young Technology. Cryptocurrency is still a very young technology.

-Currency Or Investment Opportunity? ...

-Financial Loss. ...

-Limited Use. ...

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

Since 2009, estimates suggest criminals have used the hyper-connected cryptocurrency

ecosystem to launder well over $2.5 billion worth of dirty Bitcoin. Contrary to popular

opinion, it’s actually quite easy to link Bitcoin transactions together in order to identify you.

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

Criminals use bitcoin because it is anonymous.

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

-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 mining is the process of adding transaction records to Bitcoin’s public ledger of past

transactions or block chain. ... Bitcoin nodes use the block chain to distinguish legitimate

Bitcoin transactions from attempts to re-spend coins that have already been spent

elsewhere.

1. Why does BitCoin mining use so much energy?

Mining is a very energy-intensive process; by one estimate, bitcoin requires 215 kilowatt-hours

of energy for each transaction. According to Morgan Stanley data, the total energy

consumption of the bitcoin network consumes as much electricity as 2 million U.S. homes.

1. 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?

**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.**

**Toronto-based Hut 8 has spent more than $100 million to develop the 4½-hectare site**

**on the northern edge of the city. It has 56 shipping containers, each filled with 180**

**computer servers that digitally mine for bitcoin around the clock.**

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

**bitcoin mining facility is located right beside the city of Medicine Hat’s new natural**

**gas-fired power plant and four wind turbines are a short distance away. The bitcoin**

**plant can consume more than 60 megawatts of power, more than 10 times more**

**electricity used by any other facility in the city, according to the mayor.**

1. What concern does the city of Medicine Hat have about from this Bitcoin facility?  
   **a huge magnitude when you talk about the carbon emissions” said Saeed**

**Adour, an analyst with the Pembina Institute, an environmental think-tank.**

**“Moving forward, there needs to be some consideration on what the environmental**

**impact of this is.”**

1. 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?

**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.**

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

Yes, because fossil fuels are the second most important source of electricity in Canada. About

9.5 percent of electricity supply comes from coal, 8.5 per cent from natural gas and 1.3 per cent

from petroleum. About 16 percent of electricity supply is generated in nuclear power plants

using the Canadian-developed CANDU reactor.