bitcoin
PROFIT SECRETS

GUIDE 4:

Everything you need to know about
Bitcoin Mining

Bitcoin Mining – Everything You Need To Know About Bitcoin Mining

In this guide, we'll cover everything there is to know about Bitcoin mining so you can find out if this is something that you would like to do so you can get your fair share of bitcoins.

Bitcoin has been in the news a lot nowadays, and its current price is a source of interest to a lot of people around the world. A few years ago, many people labeled Bitcoin as a scam, but now it is seen, along with other cryptocurrencies, as the future of money.

> *Cryptocurrencies, as virtual or digital currencies, have no physical properties and need to be 'mined' electronically.*

Before we go into details, we'd like to define first the most common terms used in Bitcoin mining so you can easily understand how this highly technical process works.

Bitcoin Mining Terms You Should Get To Know

Block: The data related to transactions is stored on a page known as a block.

Bitcoins Per Block: This is the number of bitcoins rewarded to miners for every block mined and added to the blockchain. The initial reward per block was 50 bitcoins but every 210,000 blocks, the reward is divided by 2. Currently, the reward sits at 12.5 bitcoins per block.

Bitcoin Difficulty: With an increasing number of miners, Bitcoin mining also increases in difficulty. The ideal average mining time defined by the network is 10 minutes per block.

Electricity Rate: To calculate how much you're earning, you need to check your electric bill. This can help you judge how much electricity is consumed by your mining computer in return for your bitcoin earnings. Are you making

a profit, breaking even or losing? These are important questions all miners need to ask themselves.

Hash: In Bitcoin mining, a hash can be seen as a problem related to mathematics. The mining machine needs to solve it to earn rewards.

Hash Rate: The time it takes to solve these hash problems is called Hash Rate. Hash rate increases with the number of miners on the Bitcoin network. MH/s (Mega hash per second), GH/s (Giga hash per second), TH/s (Terra hash per second) and PH/s (Peta hash per second) are some of the units that are used in measuring hash rates.

Pool Fees: Miners join a pool for mining known as a 'mining pool.' Like natural mining, miners here mine together as it helps them solve those complex hash problems faster. You have to pay fees to the pool so it can continue its operations. When bitcoins are finally mined, they are distributed to miners with respect to their hash rates.

Power Consumption: Not every mining machine consumes the same amount of electricity. So before buying yourself an expensive machine, you must check first how much power it will consume.

Time Frame: This is a duration that you need to define yourself to see how much you're mining. For example, you define a time frame of 45 days. This means that after 45 days, you'll calculate how many bitcoins you've mined during this period. Defining a time frame can help you see if you are producing more or less than your fellow miners.

Bitcoin Mining Hardware Commonly Used By Miners

CPU (Computer Processing Unit):

In the beginning, bitcoin mining was incredibly easy and could be easily mined on regular desktop CPUs. However, as the number of miners increased, bitcoin mining on CPU became more difficult and caused computer hard drives to fail.

GPU (Graphical Processing Unit):

With a surge in the number of miners on the network, the use of GPUs started to gain popularity when people realized they were more efficient for bitcoin mining.

Some advanced GPUs even allowed miners to increase their mining productivity 50-100 times better in comparison to CPU mining. People also started altering their BIOS settings to maximize their rewards. Nvidia and ATI's cards shot to popularity as a result.

FPGA (Field-Programmable Gate Array):

FPGA is an integrated circuit created with the objective of performing bitcoin mining. GPU mining was turning out to be not so profitable for everyone because of rising electricity costs. FPGA was designed to consume less power, and so miners moved from GPUs to FPGAs.

ASIC (Application-Specific Integrated Circuit):

With the arrival of ASIC technology, FPGA was overtaken as the primary hardware used in bitcoin mining. ASIC is a computer chip that is used solely for mining of cryptocurrencies like bitcoins or other coins that use the SHA-256 algorithm.

Unlike other mining hardware, ASICs cannot be used to do tasks other than mining. Right now, this is the gold standard which miners swear by as these powerful chips solve more problems in less time while consuming less electricity as well.

The Role Of Mining In The Creation Of New Bitcoins

You can own bitcoins using a few methods. The easiest way is to buy some bitcoins on a Bitcoin exchange platform though, of course, bitcoin prices are so high now that you'll need to make a sizeable investment. The other method is not to use any money and instead simply mine bitcoins using computer hardware.

It's important to note here that the main and integral purpose of mining is the creation or release of new bitcoins which can be then available on the

network. Currently, about 16 million bitcoins have already been mined out of the possible 21 million bitcoins that can ever be created.
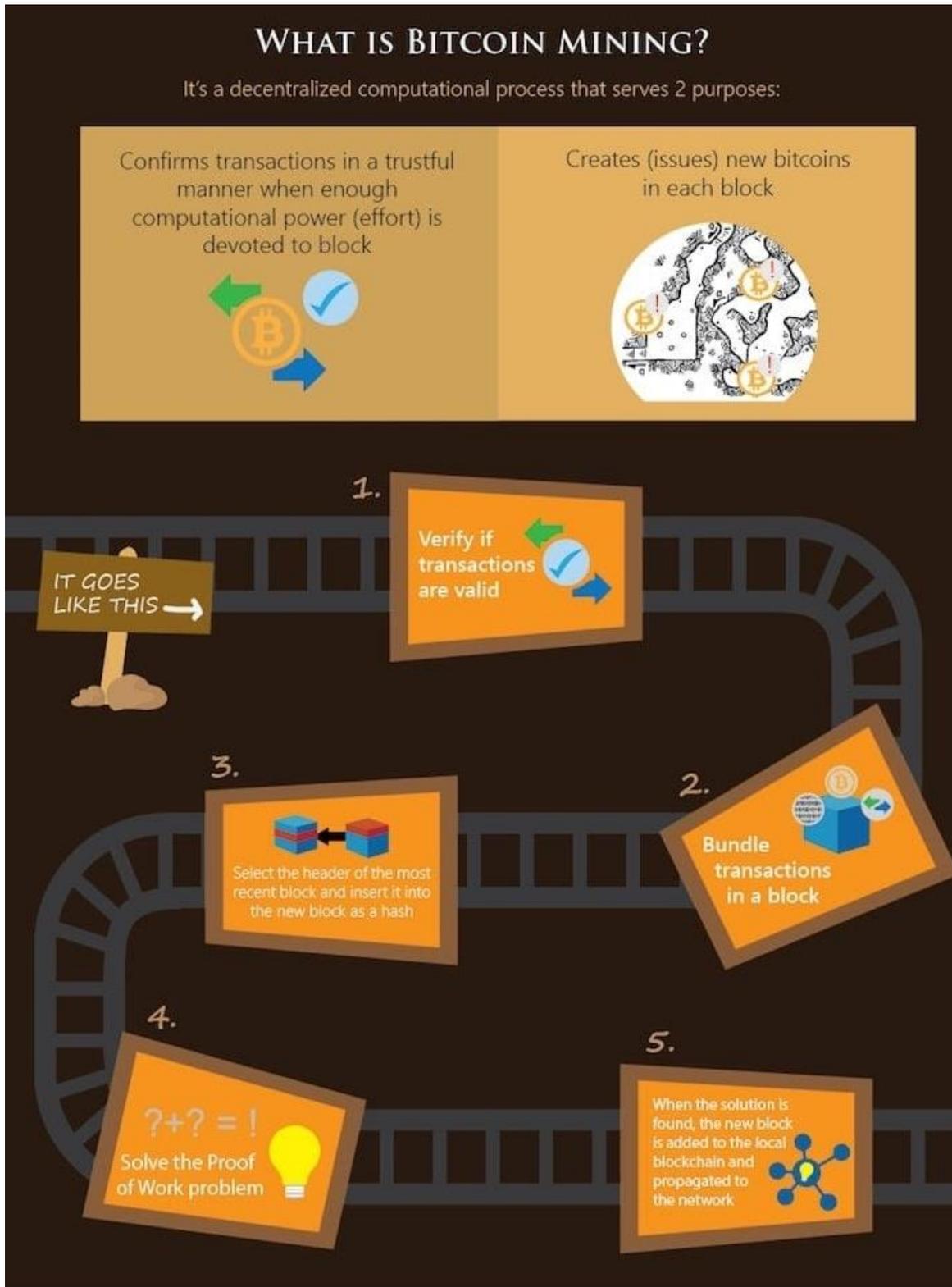
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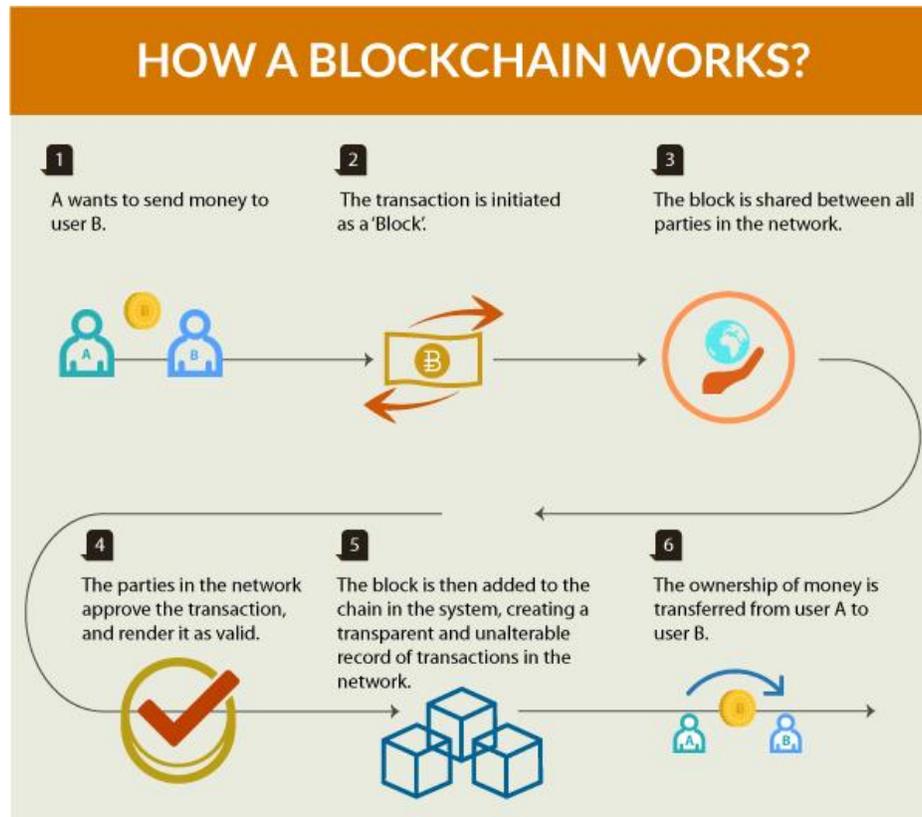
(Image Source: Biz2Credit)

Unlike normal currency transactions being confirmed and regulated through banks, cryptocurrencies' transactional data appears a public ledger known as the 'blockchain'. Each block can be said as a page that contains the data of transactions. That is why it is called as blockchain. Mining helps to confirm these transactions on a blockchain.

Miners also run cryptographic hash on blocks. A hash requires complex computations. These hashes are important because they make a block secure. Once a block has been accepted in the blockchain then it can't be altered. Miners anonymously validate these transactions. For their help, miners are rewarded bitcoins. 'Proof of work' is the term coined for the assistance of miners in validating transactions.

What Exactly Is Bitcoin Mining?

WHAT IS BITCOIN MINING?

It's a decentralized computational process that serves 2 purposes:

Confirms transactions in a trustful manner when enough computational power (effort) is devoted to block

Creates (issues) new bitcoins in each block

IT GOES LIKE THIS →

1. Verify if transactions are valid

2. Bundle transactions in a block

3. Select the header of the most recent block and insert it into the new block as a hash

4. ?+? = ! Solve the Proof of Work problem

5. When the solution is found, the new block is added to the local blockchain and propagated to the network

(Image Source: BitcoinMining.com)

The term 'mining' is often used with natural resources like gold, silver, and other minerals. These resources are limited in supply and are therefore very valuable commodities, much like Bitcoin. Similarly, 'mining' is the term used by Bitcoin founder, Satoshi Nakamoto, because miners will essentially be going deep into the Bitcoin network to mine those precious coins.

Bitcoin miners may not get dirty on their hands and knees to mine bitcoins, but with the increasing difficulty of solving complex cryptographic hash functions, they might as well be!

The Bitcoin mining process creates these 2 results: the first is it secures and verifies transactions that are happening on the Bitcoin network, and the second is it creates new bitcoins.

Bitcoin mining involves using the SHA-256 algorithm. SHA stands for Secure Hashing Algorithm which is a computational algorithm that is used for encryption. Since Bitcoin is a decentralized type of currency, meaning no central body or authority gives permissions to miners, anyone with access to electricity and a mining machine can mine bitcoin.

However, these mining machines are themselves very costly as you need specialized computer chips to mine bitcoin efficiently, as those complex hash functions miners need to solve become more complicated over time.
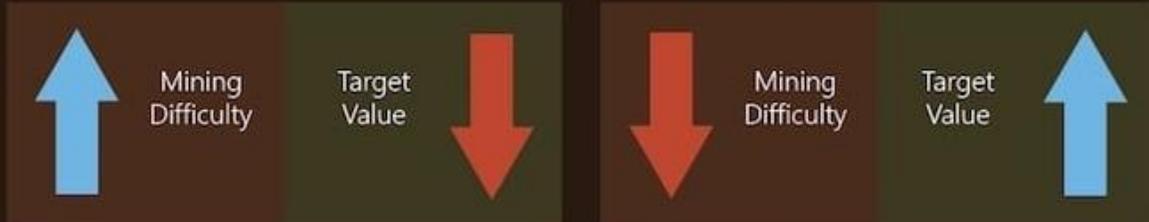
In the early days, you could use your computer's CPU (computer processing unit) and GPU (graphics processing unit) to solve hash problems, but today the problems are so complicated, miners are setting up expensive rigs and forming mining groups to pool their computer resources!

Individual miners are left with no choice but to join mining groups because their individual machines just cannot handle the difficult workload.
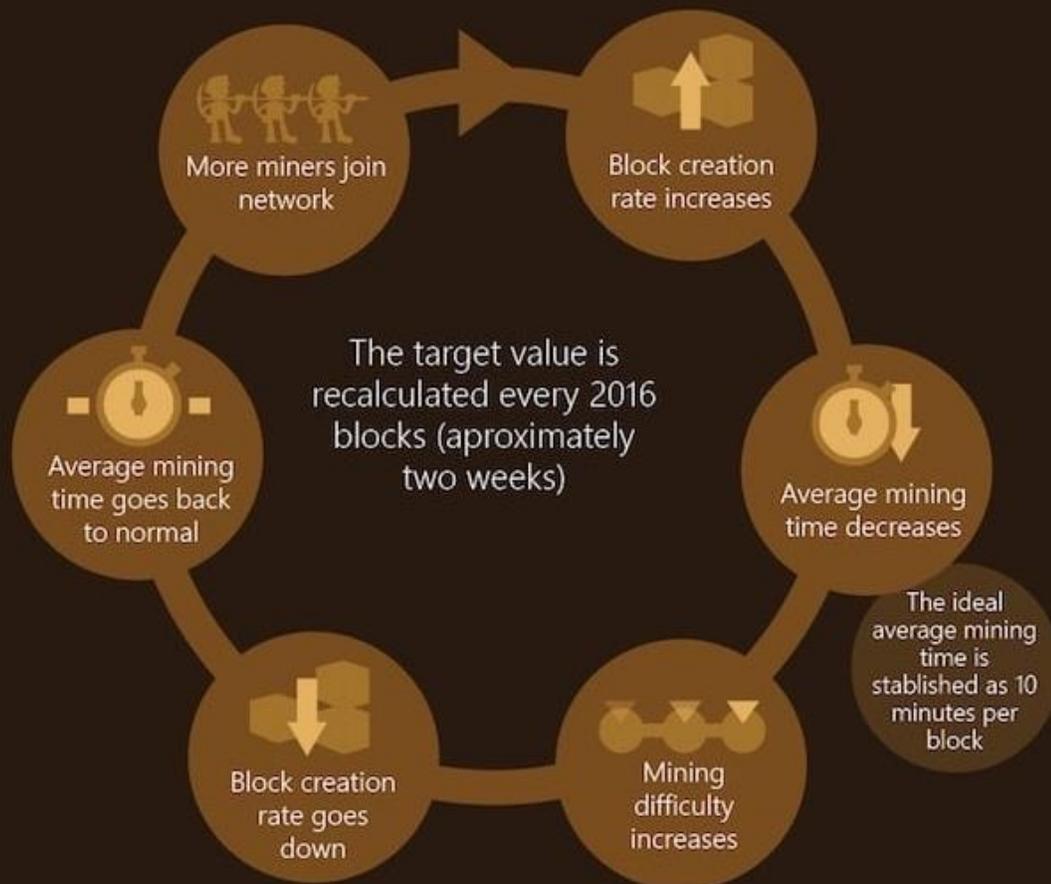
Bitcoin Mining And Mining Difficulty

WHAT IS MINING DIFFICULTY?

It's a measure of how difficult it is to find a hash below the target value (a 256-bit number) during the Proof of Work

Mining Difficulty ↑   Target Value ↓

Mining Difficulty ↓   Target Value ↑

HOW DOES IT WORK?

More miners join network

Block creation rate increases

The target value is recalculated every 2016 blocks (aproximately two weeks)

Average mining time decreases

The ideal average mining time is stablished as 10 minutes per block

Average mining time goes back to normal

Block creation rate goes down

Mining difficulty increases

(Image Source: BitcoinMining.com)

Computers involved in bitcoin mining try to solve complex mathematical problems that are near impossible for a human being to solve. Not only are these problems becoming increasingly difficult, but they are also time-

consuming for computers as these take a lot of time, and electric power, to solve. In fact, expert miners estimate that approximately $150,000 worth of electricity is used each day by Bitcoin miners all over the world!

On average, it takes about 10 minutes for Bitcoin miners to find a new block with each block containing about 2,000 transactions. These 10 minutes is the time needed for bitcoin transactions to be validated by the network and to form a new block.

Hence, a new block is created every time these complex problems get solved. This process is more commonly known as 'Proof Of Work,' and this eliminates the possibility of having only a few miners mine all the remaining bitcoins for themselves.

Since Bitcoin's network is decentralized without a central body verifying the transactions, this self-governed system means each miner is an integral part of the system. Without miners, there would be no bitcoins, plain and simple. Due to the important role miners' play in the Bitcoin network, they are rewarded in a few ways.

First, the transaction fees that users pay for each bitcoin transaction is sent to the miners. Secondly, the network rewards each winning miner a set number of bitcoins; the second reward is important because this is the only way that new bitcoins are created. Thus, miners have to continue mining so that more bitcoins are created and released into the network.

In 2009, when the first Bitcoin block was mined by Satoshi Nakamoto himself, the reward was 50 bitcoins for each block. However, the reward is reduced by half every 210,000 blocks or approximately 4 years. This means that 210,000 blocks after the genesis (or first ever) block was mined, the miner who successfully mined the 210,001st block was only rewarded 25 bitcoins; this occurred on 28th November 2012.

Then another 210,000 blocks later, on 9th July 2016, the reward was again halved, this time into 12.5 bitcoins. It is expected that sometime in the year 2021, the next 210,000 blocks will be completed and the reward will drop down to 6.25 bitcoins.

Another interesting thing to note is that while the rewards are getting smaller and smaller, the mining difficulty is increasing. There's far more competition now, and solo miners find it near to impossible to find a single block by themselves. Joining mining groups allow several miners to pool their resources, but this also means they are sharing the bitcoin reward among themselves.

Bitcoin Cloud Mining – An Alternative To Joining Mining Pools?

Beware! Bitcoin cloud mining platforms are full of Ponzi-style scamming operations. While some see this as a great alternative to mining pools, there are only a few legitimate cloud mining operations.

In theory, cloud mining is the perfect solution to people who want to mine bitcoins without buying their own mining computers and joining a pool. They don't need to worry about electricity and all the other problems that real miners have to deal with. In short, all you have to do is pay up the subscription fee and wait for your bitcoin earnings to be sent to your wallet. Sounds great, right?

Many people are attracted to this model, and of course, scammers and thieves are ready to lend them a hand and relieve them of their money.

Is Bitcoin Mining Profitable?

This million dollar question will get you many different answers. Some would encourage you to go ahead and mine, while others will tell you the time to mine bitcoins has passed. With Bitcoin prices continuously breaking records and reaching all-time highs, the investment may be worth it.

But Bitcoin is such a volatile cryptocurrency, and we can never predict the direction its price is going to take, so it's a huge risk for miners as well when the price drops. When this happens, the best thing for miners to do is to hold on to their bitcoins and wait for the price to go back up again before selling their bitcoins to eager buyers.