Why web3?

Context

Before exploring the technical concepts involved with web3 and blockchain, let's take a really quick look at the broader and more general themes that make it alluring. That way, even if you have trouble understanding every aspect of how the technology works, you will still understand why it is important. That said, we're here with you and will do everything we can to support your understanding of both how and why!

There is an endless amount of information about blockchain technology on the internet. We acknowledge that free knowledge is not, in fact, free. It costs time – our most valuable resource – and so we have tried to make it more accessible by curating it in a way that will give you a base knowledge + precise focus on how and why blockchain technology can help you as a musician.

Here are some words you're going to hear a lot

- **Decentralized** - decision-making is done by a distributed network rather than a centralized entity (such as an individual person or business).
- **Immutable** - information and data is irreversible and cannot be manipulated or replaced by anyone.
- **Trustless** - participants in a transaction do not need to trust each other or a third party in order for the transaction to correctly execute.
- **Transparent** - most blockchain code and transactions are open source and viewable by anyone to review and audit.
- **Composability** - think Lego blocks. Ability for anyone to combine, link and build on any existing protocols or platform code within the network.
- **Interoperability** - ability for data to be accessed and used across the blockchain.
- **Portability** - ability to move data from one protocol to another within a network.
- **Ownership** - ownership is immutable unless the owner verifies the change. Third parties have no decision-making power over individual ownership rights.

Web3, blockchains and Ethereum

We are going to link to a fair amount of external resources here.

Please keep in mind that some of these linked resources are kind of long. If it's your first time learning about this material it may take you some time to work through it. The links are meant to be read in sequential order, before moving on to the next one. Links that are meant to be clicked are in blue text.

What is web3?

Tokens, fungible and non-fungible, as a record of ownership are especially important to keep in mind. We'll be working with them a lot.

What is a blockchain?

Often blockchains are associated with money (as cryptocurrencies, like Bitcoin), but their use cases extend far beyond one that is simply financial. There are networks, such as Ethereum,

which use blockchain technology as a tool of distributed consensus for a variety of applications, but which also have an asset inside the network, such as Ether (ETH) in Ethereum's case.
If you have heard about web3 and NFTs, it's most likely that they were made possible with using the Ethereum 1 blockchain – and because of its popularity and most widespread adoption, it will be our main focus when considering the web3 tools that will work best for your project.

In fact, in order to really understand the potential use cases that can be achieved with Ethereum, think of it not as money, but as a giant (decentralized) programmable computer that exists across the internet that no one owns but that everyone can use. This computer, which is called the "Ethereum Virtual Machine" (EVM), can "create '[smart] contracts' that can be used to encode arbitrary state transition functions."

In other words, smart contracts are code (primarily in a programming language called Solidity) that run on the blockchain that can be programmed to do all sorts of stuff that otherwise would have traditionally needed a middleman to manage and execute. Taking it a step further, there are decentralized apps (dApps) which on the frontend UI look and feel like the apps and platforms on the internet we know and love today, but on the backend are powered by smart contract.

Thinking about this in the context of music, it is no secret that the traditional industry has the reliance and need for middlemen built into its infrastructure at every turn. Especially as blockchains are built to eliminate the need for trust and at the same time heighten transparency and accountability, it becomes easy to see how useful and effective smart contracts may be in updating new practices that may eliminate some of the previous issues that have been prevalent in the business of being a musician. We'll dive a lot deeper into this soon.

Other blockchains

In addition to Bitcoin and Ethereum, there are hundreds of other blockchains. To put it in perspective, as of February 2022, by volume, 88% of all NFT sales occurred on Ethereum. While Ethereum has a huge lead, the appeal for other chains is generally focused on the fact that the cost to process transactions is less expensive and faster. There are, however, tradeoffs with this, such as losing decentralization or security. As mentioned in the link above on blockchains 1, this is called the Blockchain Trilema.

Some other chains that are gaining adoption for use cases with art and music are Solana (SOL), Algorand (ALGO), and Tezos (XTZ). All three of these networks, along with Ethereum, are considered Layer 1 (L1) blockchains.

To mitigate congestion, developers have created secondary blockchains that work in conjunction with the main blockchain. This technology is known as Layer 2 (L2). They have virtually no capacity limits, increase transaction speeds, lower fees, and make Layer 1 blockchains more efficient. The benefit of using an L2 is that it helps with scalability of transactions that occur directly on L1 by processing them off-chain and then bundling them and sending them to the L1. This can help with the speed and cost of transactions.

Because blockchains have blocks that are limited in size, it means they can only process a certain amount of transactions per block. When a lot of people try to use them at the same time, things can get congested. And as the use of blockchains grows in popularity, the need to scale them becomes ever more important. The processing of transactions quickly and cheaply is known as scaling. The important thing to remember is that they all accomplish the same goal; increase transaction speeds and lower fees for Layer 1's.

Another scaling solution to reduce issues with transaction speed and cost is called a side chain. Where an L2 relies on the security mechanism of its respective L1 blockchain, a side chain has its own consensus mechanism separate from an L1, but is also compatible with the L1. To complicate things even further, there can also be Layer 2 side chains, of which the most popular is called Polygon (MATIC). If you've explored the world of blockchain and music at all you've probably come across some platforms that use Polygon, such as Mint Songs, Royal – and even Facebook has recently announced they will be using Polygon.

Gas & how transactions are processed
What is gas? Gas is really important to consider for our projects and it can drastically impact both the cost to us personally as well as the experience that fans and collectors will have when they interact with your project.

Exchanges
You've probably at least heard about the most well known crypto exchange, Coinbase. There are many different types of exchanges but their primary use is to buy and sell cryptocurrencies. There is always a level of risk when using exchanges but Coinbase is often a good choice when needing to use one because it is a publicly traded company on the New York Stock Exchange and is subject to a high degree of regulatory scrutiny (compare to the disaster and collapse of an early popular crypto exchange, Mt. Gox).
Often, the cheapest way to get crypto (ie Ethereum) into your Meta Mask wallet is to purchase it on Coinbase and then transfer it to your wallet.

Security & scams
Once you get your Coinbase and Meta Mask set up, it's a good idea to also get a Cold Wallet. Because of the nature of most crypto having a financial element to it, there are many, many scams on the internet. If you've browsed Twitter you've likely come across a heartbreaking story of someone who has had everything that was in their wallet stolen.
Here are some security tips and good practices 1. Be very careful about what links you click and always make sure you are going to the official website when you are going to use your wallet to sign a transaction. It is not uncommon for scammers to replace common letters to trick you into going to websites like c0inbase.com instead of coinbase.com.