

NFTs Explained: What They Are & How to Make One

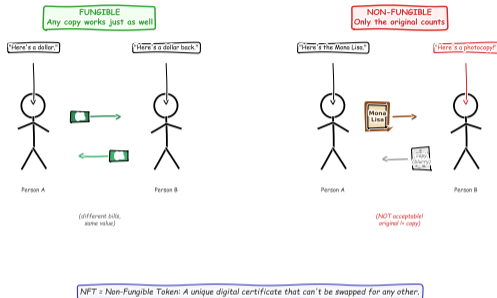
A Beginner's Guide to Digital Ownership

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Can You Lend Me a Dollar?



Fungible vs. Non-Fungible

A dollar bill is **fungible** – any dollar works. The Mona Lisa is **non-fungible** – only the original counts.

An NFT makes your digital creation non-fungible:

- **Unique** – one-of-a-kind record
- **Traceable** – full ownership history on-chain
- **Yours** – cryptographically provable

Fungibility is the key concept behind NFTs – it is what makes each token unique.

What is an NFT?

Definition:

A **Non-Fungible Token (NFT)** is a unique digital certificate stored on a blockchain. It proves you own a specific digital item – like a deed for a house, but for the internet.

What it is NOT:

- Not the digital file itself
- Not a copyright (unless explicitly transferred)
- Not stored on the blockchain (the file is off-chain)

Fungible vs. Non-Fungible:

Item	Fungible?
Dollar bill	Yes – any dollar works
Bitcoin	Yes – 1 BTC = 1 BTC
Concert ticket	No – seat A7 \neq seat B3
Your drawing	No – it is unique

Key insight: the NFT is not the file itself – it is the blockchain record that points to the file.

How NFTs Work: From Creation to Trading



Simplified flow — actual process may vary by platform

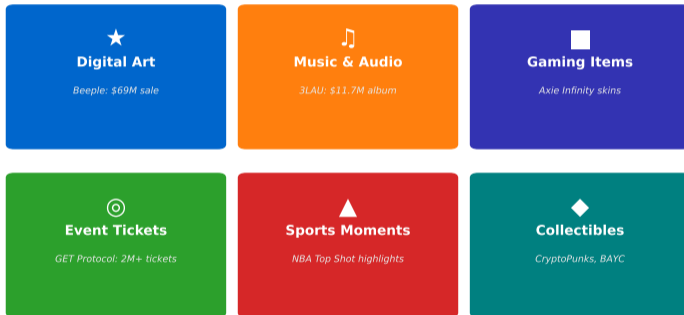
An artist creates a digital file, uploads it to decentralized storage (IPFS), then mints a token on the blockchain. The token is a permanent, public record of ownership that anyone can verify.

The file itself lives off-chain (on IPFS or Arweave). The blockchain only stores the pointer and ownership record.

What Can Be an NFT?

Almost anything unique can become an NFT:

What Can Be an NFT?



NFTs can represent ownership of virtually any unique digital or physical asset

The fastest-growing categories in 2024-2025 are gaming items, event tickets, and real-world asset certificates.

Where Are NFTs Traded?

Top Marketplaces:

- **OpenSea** – largest, multi-chain (Ethereum, Polygon, Solana)
- **Blur** – fastest-growing, lower fees
- **Foundation** – curated art focus
- **Magic Eden** – Solana & Bitcoin Ordinals

What to Look For:

- Trading fees: typically 0.5–2.5%
- Creator royalties: 0–10% (optional since 2023)
- Supported blockchains
- Wallet compatibility

The marketplace landscape changes rapidly – always research current options before trading.

Step 1: Set Up a Crypto Wallet

What is a Wallet?

Think of it as a digital keychain. It does not store your NFTs – it stores the **private key** that proves they are yours.

Popular Options:

- MetaMask (browser + mobile)
- Coinbase Wallet
- Rainbow (mobile, beginner-friendly)

Quick Setup (3 minutes):

1. Install MetaMask (browser extension or mobile app)
2. Create a new wallet – write down your seed phrase!
3. Get free test ETH from a faucet (for practice)

Warning: Never share your seed phrase with anyone.

Never share your seed phrase. Anyone who has it controls your wallet.

Step 2: Create Your Digital File

Supported Formats:

- **Images:** PNG, JPG, SVG, GIF
- **Video:** MP4, WEBM
- **Audio:** MP3, WAV
- **3D:** GLB, GLTF

Tips for Your First NFT:

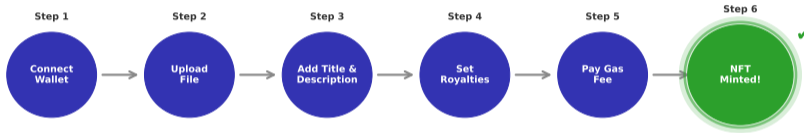
- Start simple – a drawing, photo, or short clip
- Max file size: typically 50–100 MB
- Make it original – your own creation
- Quality matters more than complexity

You do not need to be a professional artist. Some of the most valuable NFTs are intentionally simple.

Step 3: Mint Your NFT

Minting = writing your NFT to the blockchain. Here is the process:

How to Mint Your NFT: 6 Simple Steps



Process shown for OpenSea — other platforms follow similar steps

On Layer-2 networks like Polygon, minting can cost under \$1. On Ethereum mainnet, gas fees vary with network congestion.

Step 4: List, Price & Sell

Pricing Strategies:

- **Fixed price:** set a “buy now” price
- **English auction:** bidding starts low, goes up
- **Dutch auction:** price starts high, drops over time

Cost Breakdown:

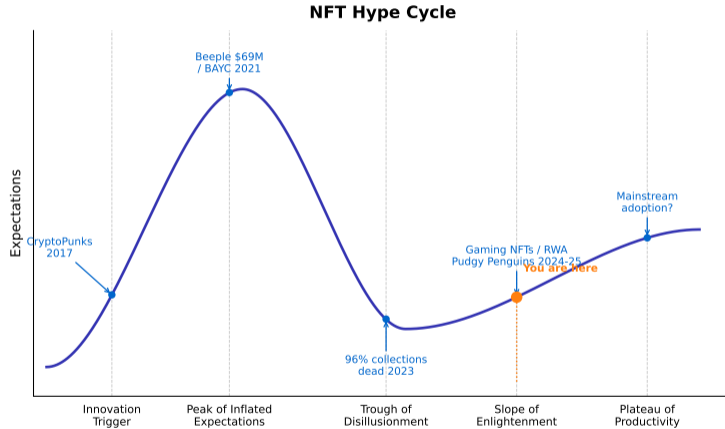
- Gas fee: \$0.01–\$5 (varies by network)
- Marketplace fee: 0.5–2.5%
- Creator royalties: you set 0–10%

Note: Many platforms now offer gasless listing.

Pricing is more art than science. Research comparable NFTs before setting your price.

The NFT Hype Cycle

Like most breakthrough technologies, NFTs follow a predictable hype cycle:

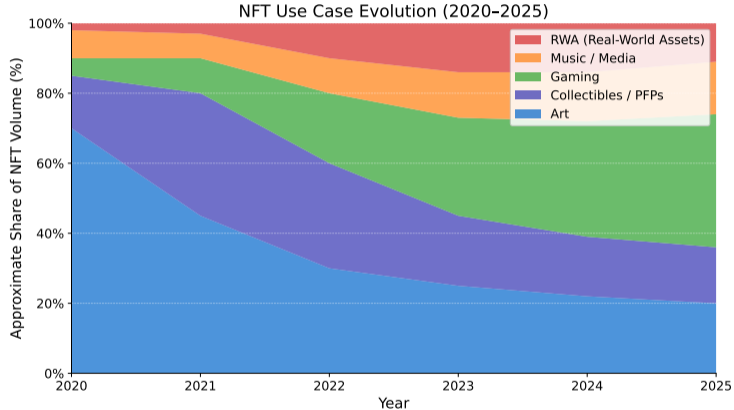


Stylized illustration — not based on formal Gartner data

We are likely in the “Slope of Enlightenment” phase where genuine utility (gaming, RWA, tickets) replaces speculation.

How NFT Use Cases Are Evolving

In 2021, NFTs were mostly digital art and collectibles. By 2025, utility-driven categories dominate:

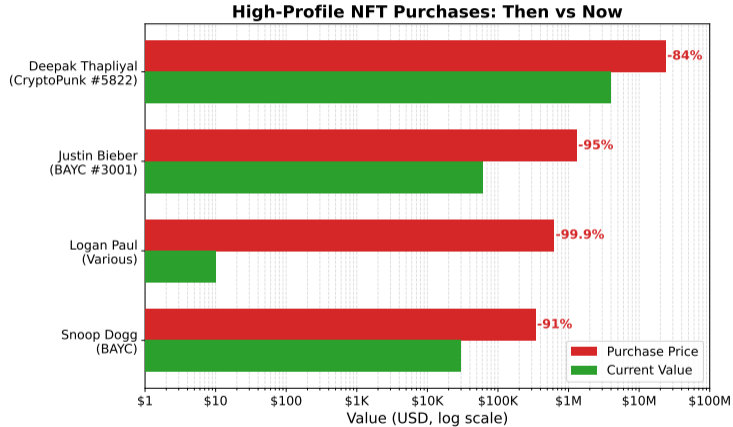


Approximate percentages based on DappRadar Q3 2025 and CoinTelegraph H1 2025 reports

Gaming (38%), music (15%), and real-world assets (11%) have overtaken art and collectibles. Source: DappRadar Q3 2025.

Cautionary Tale: Celebrity NFT Losses

Not every NFT holds its value. These high-profile purchases illustrate the risk of speculative buying:



Values approximate, as of early 2025. Sources: BeInCrypto, BitPinas

NFT value depends on utility, community, and sustained demand — not celebrity endorsement or hype alone.

Key Takeaways

1. **Unique:** An NFT is a one-of-a-kind blockchain certificate, not the file itself
2. **Accessible:** Anyone can create and mint an NFT in minutes with free tools
3. **Valuable:** Value comes from scarcity, demand, and provenance – not just the art
4. **Experiment:** Start small on a test network, learn the process, then go live

You now know everything you need to create your first NFT. The best way to learn is by doing.

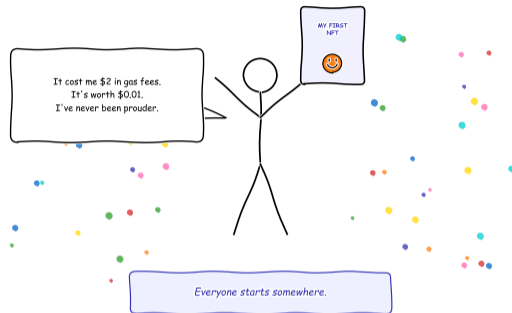
Congratulations!

You now understand what NFTs are and how to create one.

Start with a testnet, experiment freely, and remember – every expert was once a beginner.

Your next steps:

- Set up MetaMask on a testnet
- Create a simple image or clip
- Mint your first NFT for free



Next steps: try the full NFTs & Digital Assets lecture for deep dives into ERC standards, metadata storage, and marketplaces.

Appendix: Create Your First NFT

Step-by-Step Guide Using Remix IDE

Follow along on your laptop — takes about 20 minutes

For the full 60-minute guided version, see Workshop W03.

A1: Install MetaMask

Installation Steps:

1. Go to <https://metamask.io/download/>
2. Click “Install MetaMask for Chrome” (or your browser)
3. Add the extension to your browser
4. Click the fox icon in your toolbar

Important Notes:

- Free and open-source
- Works on Chrome, Firefox, Edge, Brave
- Mobile app available (iOS/Android)

Warning: Only download from the official site — phishing clones exist!

MetaMask is the most widely used Ethereum wallet. It is the gateway to all Ethereum dApps.

Create Your Wallet:

1. Click “Create a new wallet”
2. Set a strong password (min. 8 characters)
3. Write your 12-word Recovery Phrase **on paper**
4. Confirm the phrase by selecting words in order

Never share your seed phrase with anyone — not even “support.”

Switch to Sepolia & Get Free ETH:

1. Click the network dropdown in MetaMask
2. Enable test networks (Settings → Advanced)
3. Select “Sepolia test network”
4. Get free test ETH from a faucet:
 - Google: cloud.google.com/application/web3/faucet/ethereum/sepolia
 - Alchemy: sepoliafaucet.com
 - Chainlink: faucets.chain.link/sepolia

Wait 15–30 sec — a small amount of SepoliaETH appears.

Always practice on a testnet first. Testnet ETH is free and mistakes cost nothing. If a faucet is down, try another.

Create Your Digital File:

- Use any tool: phone camera, Canva, MS Paint
- Recommended: simple PNG or JPG image
- Resolution: at least 1000×1000 pixels
- Keep it original and under 50 MB

*This is about the **process**, not the art!*

NFT Metadata (What Your Token Knows):

For this tutorial, use the ready-made URL:

```
https://digital-ai-finance.github.io/  
Cryptoeconomics-Blockchain/ workshops/w03-example-metadata.json
```

This JSON file contains: name, description, and an image URL.

For custom metadata, upload your own JSON to IPFS — see Workshop W03.

Metadata links your on-chain token to off-chain content. The pre-hosted URL works instantly — no IPFS setup needed.

A4: Open Remix IDE & Paste the Contract

Set Up Remix:

1. Go to <https://remix.ethereum.org>
2. Create new file: MyFirstNFT.sol
3. Paste the contract code (right)
4. Click Solidity compiler tab (left sidebar)
5. Click "Compile MyFirstNFT.sol"

OpenZeppelin handles all the complex ERC-721 logic — you only write ~25 lines.

The Complete Contract:

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.20;

import "@openzeppelin/contracts/
token/ERC721/ERC721.sol";
import "@openzeppelin/contracts/
token/ERC721/extensions/
ERC721URIStorage.sol";

contract MyFirstNFT
  is ERC721URIStorage {
    uint256 private _nextTokenId;

    constructor()
      ERC721("MyFirstNFT", "MNFT") {}

    function mintNFT(
      string memory tokenURI)
      public returns (uint256) {
        uint256 tokenId = _nextTokenId;
        _nextTokenId++;
        _safeMint(msg.sender, tokenId);
        _setTokenURI(tokenId, tokenURI);
        return tokenId;
    }
}
```

This is the complete contract. OpenZeppelin provides audited building blocks — never write token standards from scratch.

A5: Deploy & Mint Your NFT

Deploy the Contract:

1. Click “Deploy & Run” tab in Remix
2. Set Environment to **Injected Provider — MetaMask**
3. Verify you are on **Sepolia** network
4. Click “Deploy” — confirm in MetaMask
5. Wait 10–20 sec — contract appears below

Mint Your NFT:

1. Expand your deployed contract
2. Find the `mintNFT` function
3. Paste the metadata URL into `tokenURI`
4. Click “transact” — confirm in MetaMask
5. Success! Your NFT is on Sepolia

Copy the contract address from Remix — you will need it next.

You just deployed a smart contract and minted an NFT — the same process used by every NFT collection on Ethereum.

Find Your NFT:

1. Go to <https://testnets.opensea.io/>
2. Connect your MetaMask wallet
3. Click your profile — your NFT should appear
4. If not visible, use this URL pattern:

`testnets.opensea.io/assets/sepolia/ [your-contract-address]/0`

Going Live (When You Are Ready):

- Repeat the process on Ethereum mainnet
- Consider Layer-2 for lower gas fees:
 - Polygon: gas < \$0.01
 - Base: gas < \$0.05
- Explore: royalties, collections, unlockable content
- **Start small** — your first real mint should be inexpensive

OpenSea automatically indexes NFTs on supported chains. No “upload” button needed — your contract does the work.

A7: Quick Reference Card

You Need:

- MetaMask wallet
- Sepolia test ETH
- A digital file (PNG/JPG)
- Remix IDE

`remix.ethereum.org`

You Do:

1. Create wallet & get test ETH
2. Paste contract in Remix
3. Compile & deploy to Sepolia
4. Call `mintNFT` with metadata URL

You Get:

- An ERC-721 token on Sepolia
- Viewable on OpenSea testnet
- Full ownership proof on-chain
- Skills to go live on mainnet

Full 60-minute guide: Workshop W03 · Questions? Ask the instructor or visit the course GitHub page.

You have completed the full cycle: create → mint → view. To go live, repeat on mainnet with real ETH.