# Web3 and Blockchain Basics: Setup Wallet and Explore DApps

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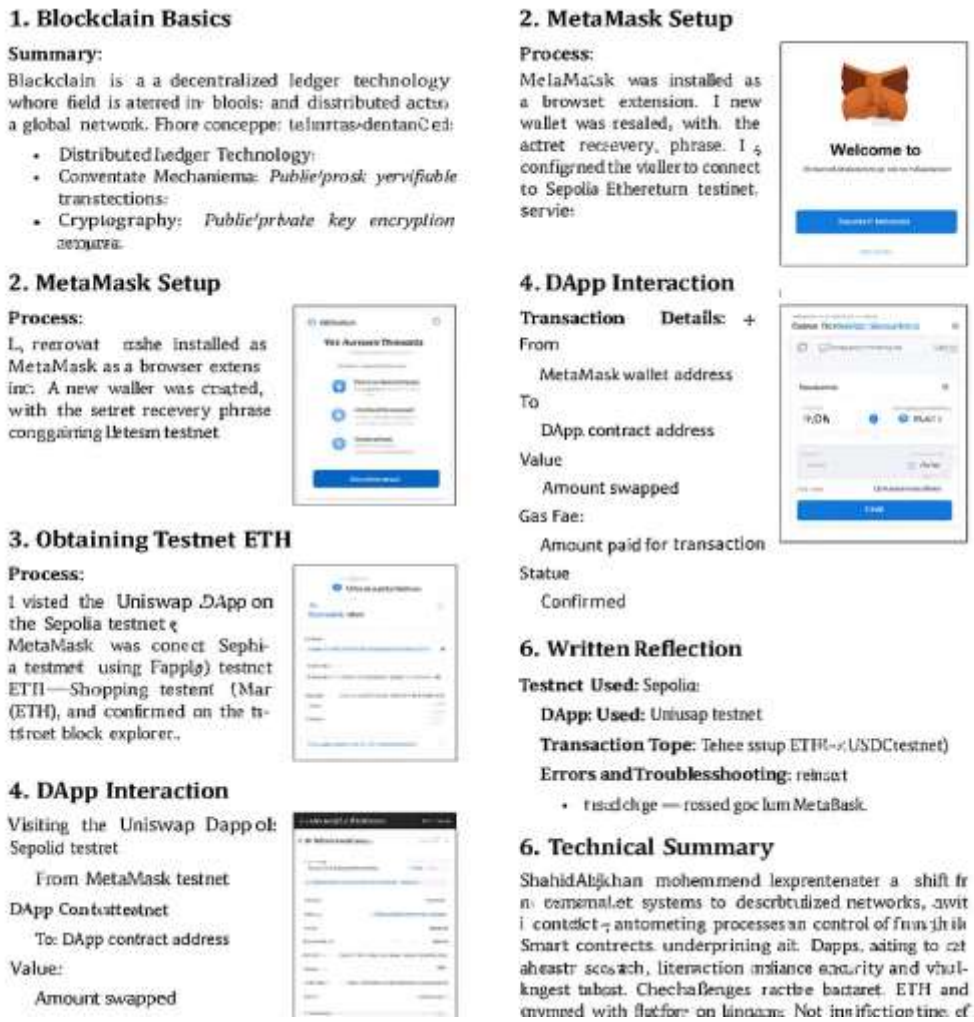
## 1. Blockchain Basics

Blockchain is a decentralized ledger technology where data is stored in blocks and distributed across a network of computers. Each block is cryptographically linked to the previous one, ensuring immutability and transparency. Key concepts include: **Distributed Ledger Technology:** Data is shared across multiple nodes, removing the need for a central authority. **Consensus Mechanisms:** Proof of Work (PoW) uses computation to validate transactions, while Proof of Stake (PoS) selects validators based on their token holdings. **Cryptography:** Public and private keys secure user identities and enable verifiable transactions.



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Amount swapped

2. MetaMask Setup

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4. DApp Interaction

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MetaMask wallet address

To

DApp contract address

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6. Written Reflection

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6. Technical Summary

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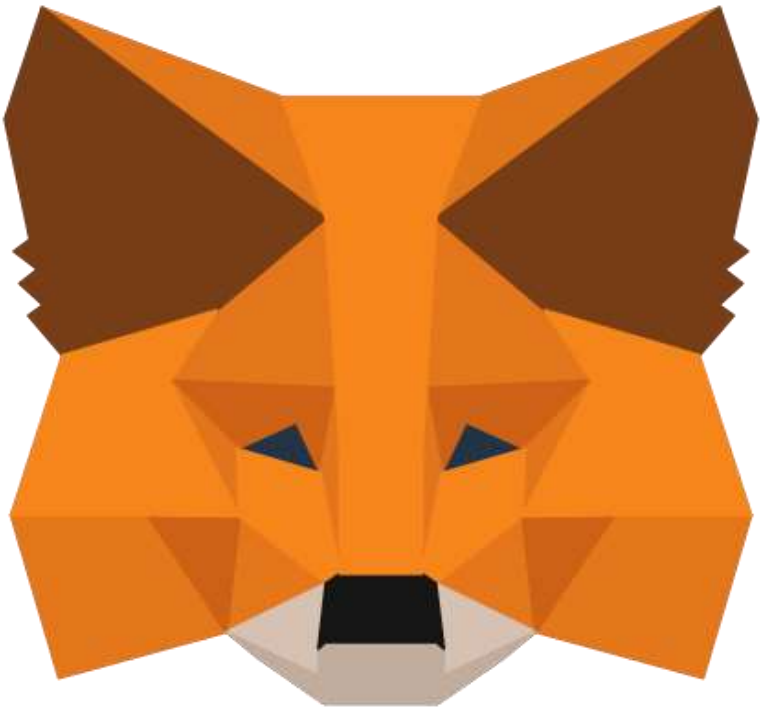
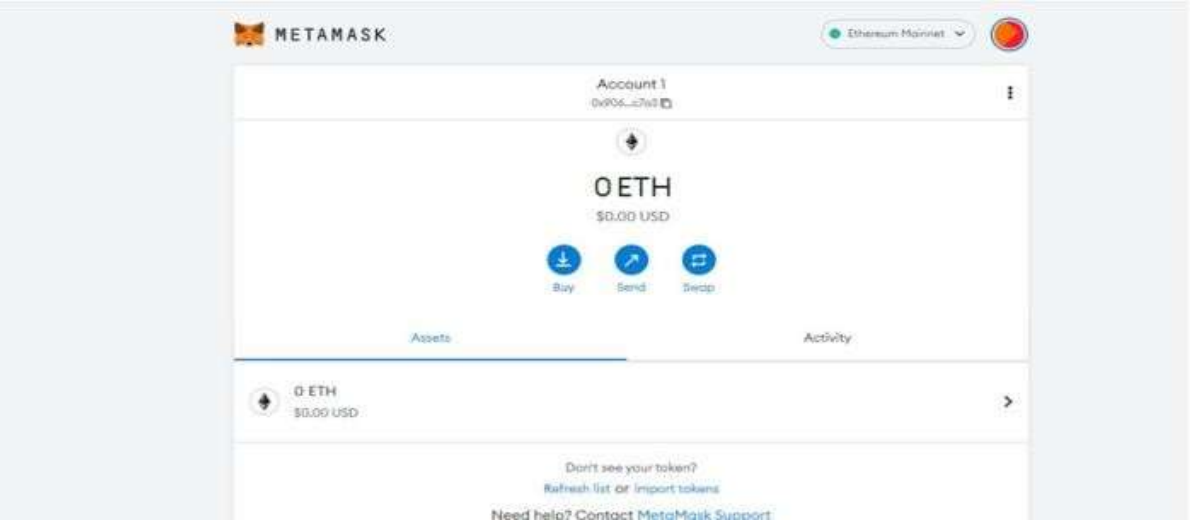
## 2. MetaMask Setup

MetaMask was installed as a browser extension and a new wallet was created. The Secret Recovery Phrase (12 words) was securely stored offline. The wallet was configured to connect to the Ethereum Sepolia Testnet via network settings. Wallet security practices were strictly followed — URLs verified, seed phrase kept private, and phishing awareness maintained.



## 3. Obtaining Testnet ETH

Testnet ETH was obtained from the **Alchemy Sepolia Faucet**. After entering the wallet address, ETH was credited to the testnet account and verified on the **Sepolia Etherscan Explorer** with a visible transaction hash. This demonstrated how blockchain transactions are transparent and verifiable by anyone.

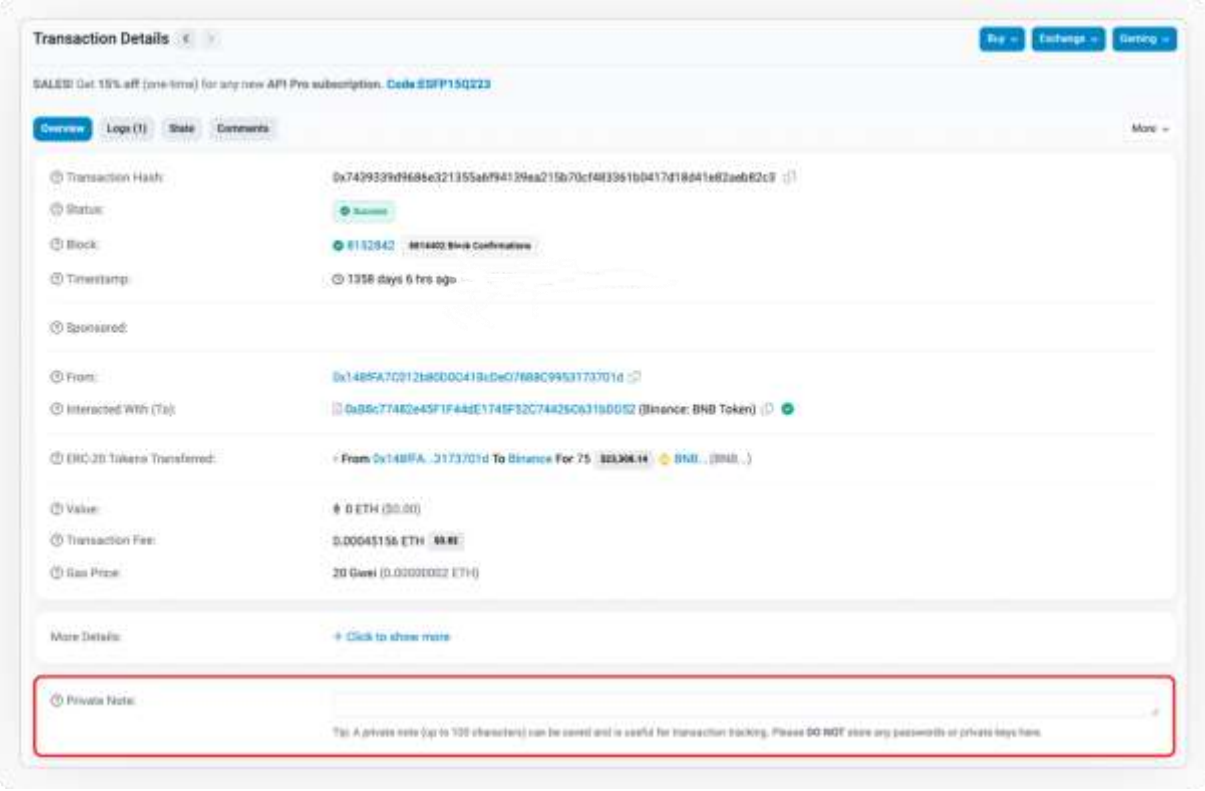



## 4. DApp Interaction

The Uniswap Testnet DApp was accessed using the Sepolia network. The MetaMask wallet was connected, and a test transaction was performed — swapping Sepolia testnet ETH for testnet USDC. MetaMask prompted for transaction approval and gas estimation. Once approved, the transaction was confirmed and recorded on the Sepolia Etherscan with a unique hash.

## 5. Etherscan Transaction Verification

The transaction details viewed on Etherscan included: **From:** Wallet address **To:** Uniswap smart contract **Value:** Swapped testnet ETH **Gas Fee:** Amount paid for transaction processing **Status:** Confirmed successfully This visual confirmation strengthened understanding of how public ledgers track and validate transactions across the network.



## 6. Written Reflection

This project deepened my understanding of blockchain, smart contracts, and Web3 ecosystems. I learned that decentralized systems eliminate single points of failure and empower users with ownership of assets and identities. Smart contracts act as self-executing agreements, forming the backbone of DApps. The primary difference between centralized and decentralized applications lies in control and transparency — while Web2 apps depend on central servers, Web3 enables direct peer-to-peer interaction through blockchain networks. Setting up MetaMask gave me first-hand experience of secure key management and transaction validation. Challenges included faucet delays and gas errors, which were resolved by increasing gas limits. Overall, the hands-on approach provided me with a clear understanding of Web3 fundamentals, preparing me for more advanced blockchain projects.

## 7. Technical Summary

**Testnet Used:** Ethereum Sepolia **DApp Used:** Uniswap Testnet **Transaction Type:** Token Swap (ETH → USDC) **Errors Encountered:** Faucet delays and gas estimation errors **Troubleshooting:** Retried faucet requests and adjusted gas values in MetaMask