

Web3 and Blockchain Basics: Setup Wallet and Explore DApps

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Task: Mandatory Task – Web3 and Blockchain Basics

Network Used: Sepolia Testnet

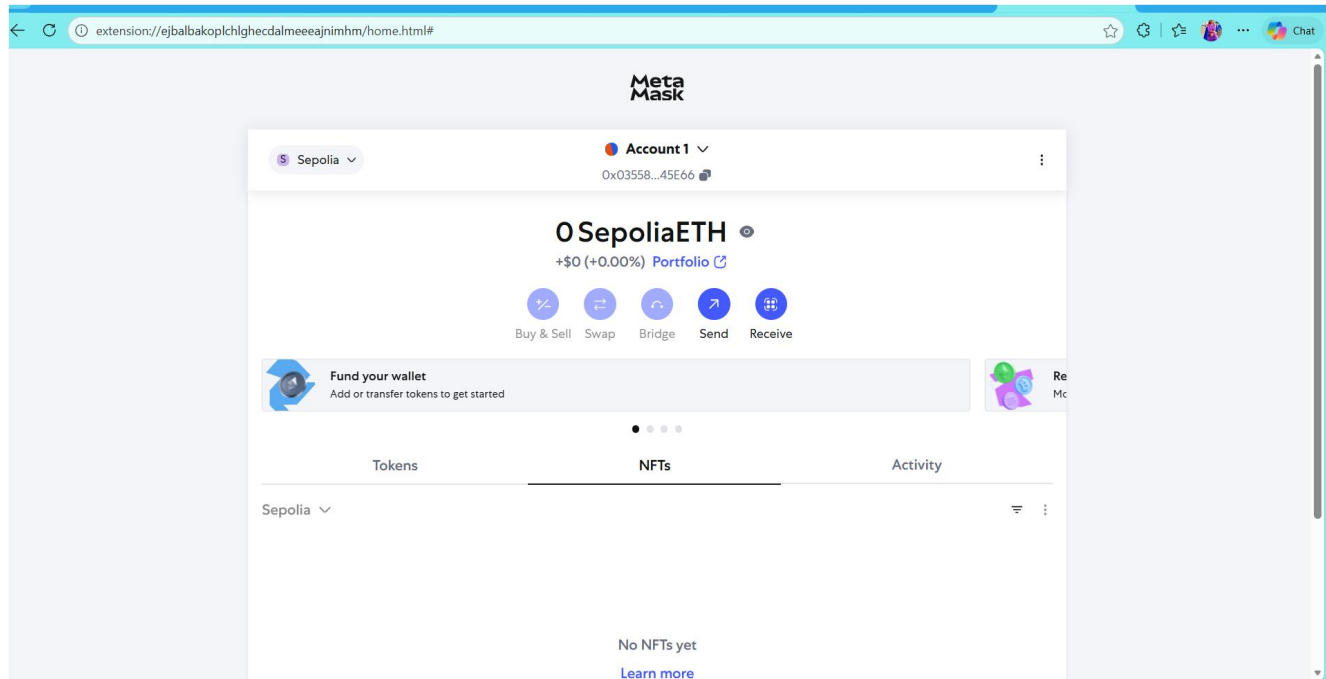
Step 1: Understanding Blockchain & Web3 Concepts

Blockchain Basics:

- Blockchain is a **distributed ledger** storing data in blocks linked cryptographically.
 - Consensus mechanisms:
 - ◆ **Proof of Work (PoW):** Miners validate transactions by solving complex puzzles.
 - ◆ **Proof of Stake (PoS):** Validators stake coins to validate blocks.
- **Smart Contracts:**
 - Self-executing code running on the blockchain.
 - Require **gas fees** to execute transactions.
 - Immutable once deployed.
- **Web3 vs Web2:**
 - **Web2:** Centralized; data controlled by companies.
 - **Web3:** Decentralized; users control data via wallets.
 - Wallets store **private/public keys**, enabling ownership of digital assets and interaction with DApps.

Step 2: Setting Up MetaMask Wallet

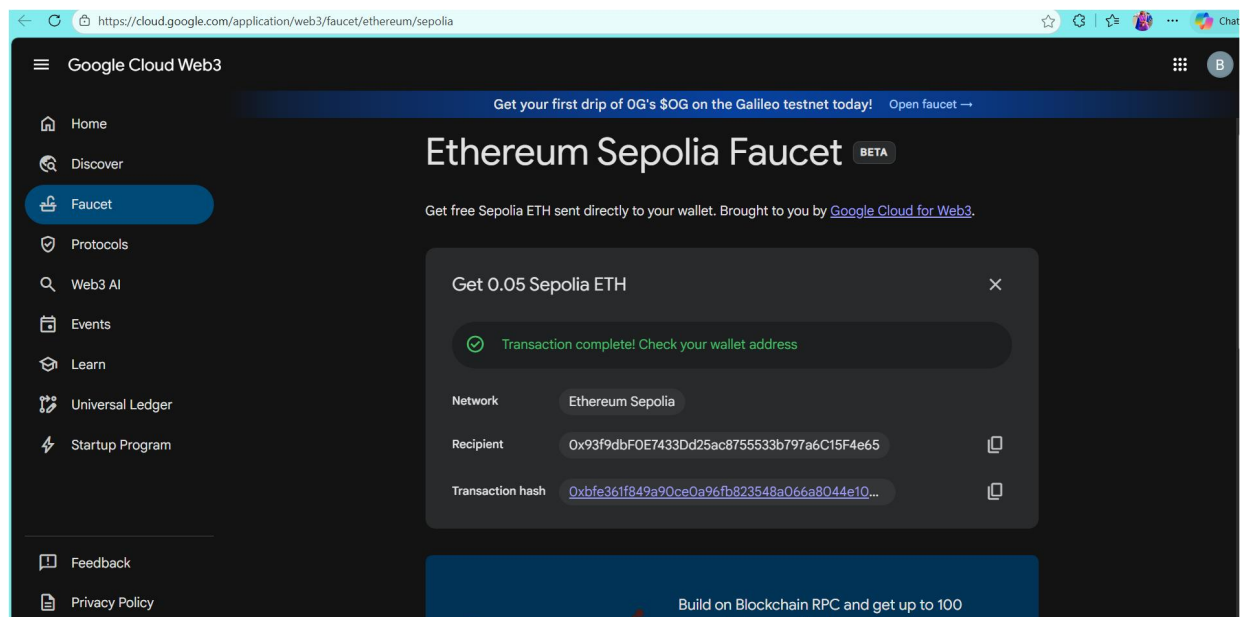
- Installed MetaMask from the official website: <https://metamask.io>.
- Created a new wallet with a strong password.
- Backed up the **seed phrase securely offline**.
- Add Sepolia: Network details - Name: Sepolia, RPC: <https://rpc.sepolia.org>, Chain ID: 11155111, Symbol: ETH, Explorer: <https://sepolia.etherscan.io>.

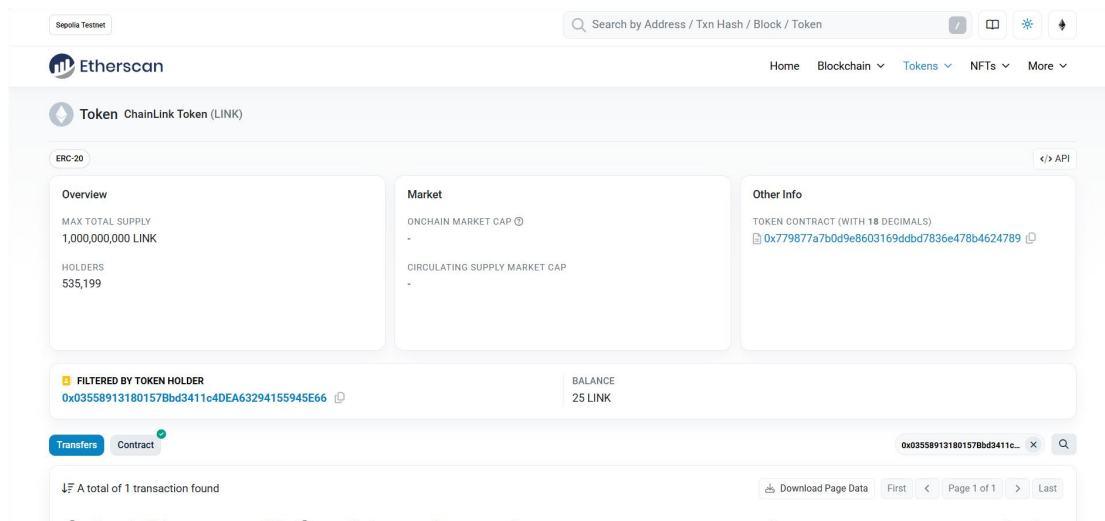


Step 3: Acquire Sepolia Testnet ETH

- Copied my **MetaMask** public address.
- Visited a **Sepolia faucet**.
- Entered my wallet address and requested testnet ETH.
- Waited a few minutes until ETH appeared in MetaMask.
- Verified the transaction on **Sepolia Etherscan**: <https://sepolia.etherscan.io>

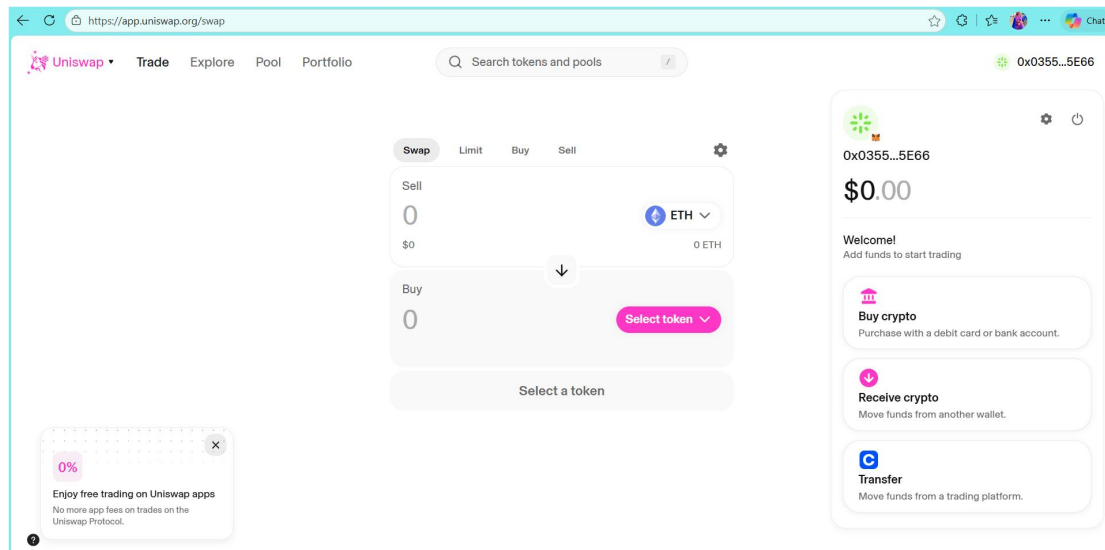
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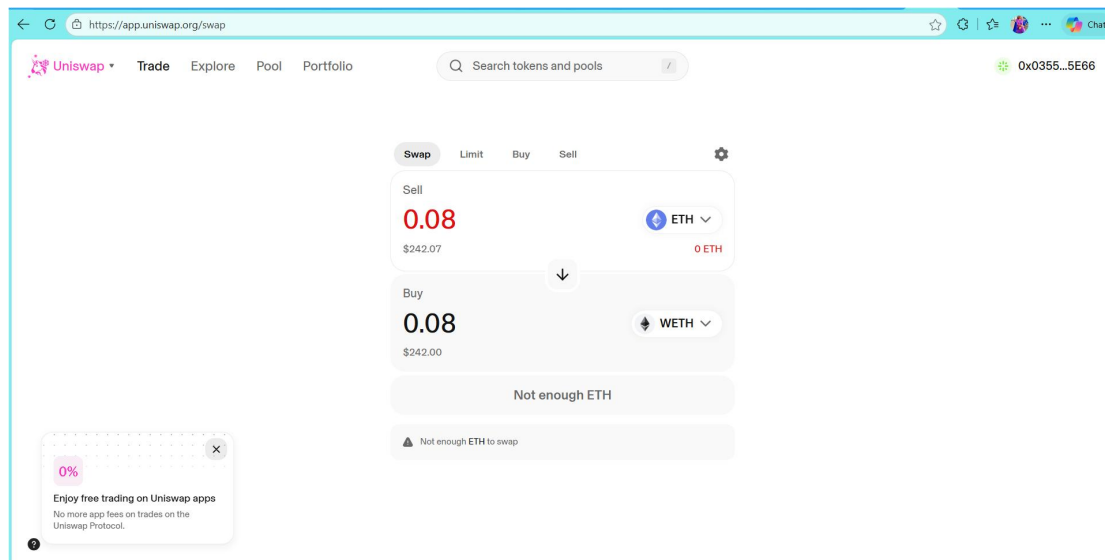




Step 4: Interacting with a DApp (Uniswap Testnet)

- Visited **Uniswap Testnet**: <https://app.uniswap.org/#/swap>.
- Connected MetaMask wallet to the DApp.
- Swapped a small amount of **ETH** → **WETH** (Sepolia test tokens).
- Confirmed the transaction in MetaMask (observed gas fee and estimated time).
- Monitored transaction status on **Sepolia Etherscan**.





Step 5: Learning Reflection

During this task, I gained **hands-on experience** with blockchain, Web3 wallets, and decentralized applications (DApps). Unlike traditional Web2 systems, where data is stored and controlled by centralized servers, blockchain ensures that all transactions are **transparent, verifiable, and immutable**. This distributed nature removes the need for intermediaries and gives users full control over their assets.

Setting up MetaMask reinforced the importance of **wallet security**. Backing up the seed phrase and never sharing private keys are critical to prevent loss of funds. I also learned that test networks like **Sepolia** allow experimentation in a safe, risk-free environment, making it ideal for beginners.

Interacting with Uniswap highlighted the lifecycle of a blockchain transaction. Approving the wallet, estimating gas fees, submitting the transaction, and waiting for confirmation helped me understand **on-chain activity** and transaction latency. I observed that even testnet transactions require gas fees (though minimal), illustrating how blockchain ensures network security and prevents spam.

Smart contracts on the DApp performed automatic execution without intermediaries, emphasizing their potential for automating trust in decentralized systems. This experience clarified why smart contracts are considered the backbone of Web3.

Overall, the task helped me **demystify blockchain operations**, wallet setup, and DApp interactions. It provided a clear understanding of how users interact with decentralized systems and prepared me to explore advanced concepts like NFT creation, token swaps, and DeFi protocols in the future.