

## Lab 1: Blockchain and Transaction

### Objectives:

- To know about different types of blockchain and how their transaction is managed using a crypto wallet. Also, we will discuss some blockchain explorers

### Submission:

- Three checkpoints.

### Introduction:

In this lab, we will discuss different types of blockchain, and how their transactions can be managed from a user perspective using a crypto wallet. In addition, we will discuss some blockchain explorers of ethereum and bitcoin so that the students can get a real-life idea of what really happens when a transaction is completed.

We know there are primarily two types of blockchain. To interact with a blockchain, a user needs an account which is identified by an address. To use and manage the accounts we need a crypto wallet. This wallet basically holds the account information, and balance, and also helps users to maintain multiple accounts easily and efficiently. To clear your imagination about the crypto wallet and account you can assume this with a physical wallet( crypto wallet ) where you store multiple credit/atm card accounts).

There are primarily two types of crypto wallets such as custodial and non-custodial wallets. In this lab we will use a non-custodial wallet called metamask which can be used as a browser extension.

### Section-1 : Setting up metamask

To install MetaMask,

1. First, open Google Chrome. Click the extension icon at the top-right corner of the browser and then click manage extensions(Figure 1.a). This will bring the existing extension of your browser. Click the hamburger menu button( menu button with three lines ) at the top-left corner of your browser and click open chrome web store(Figure 1.b & 1.c). The steps are mentioned below:

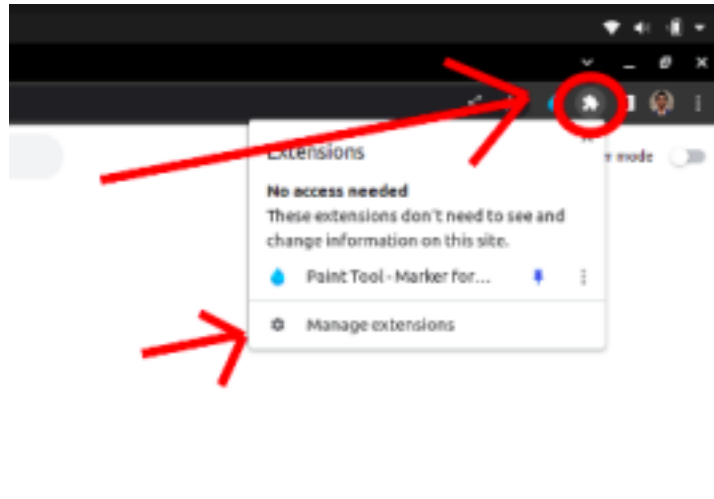


Fig: 1.a

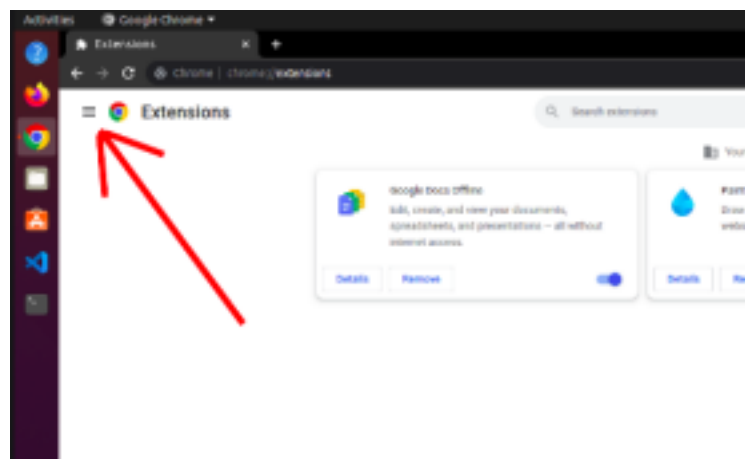
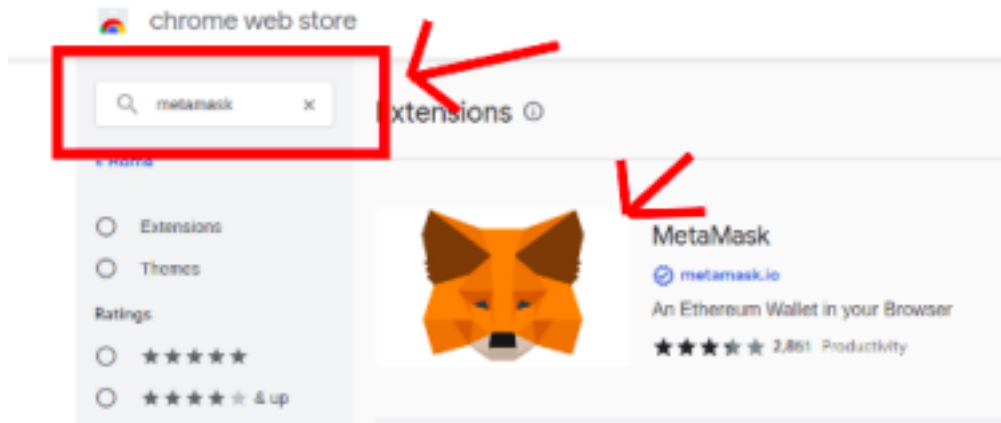


Fig: 1.b

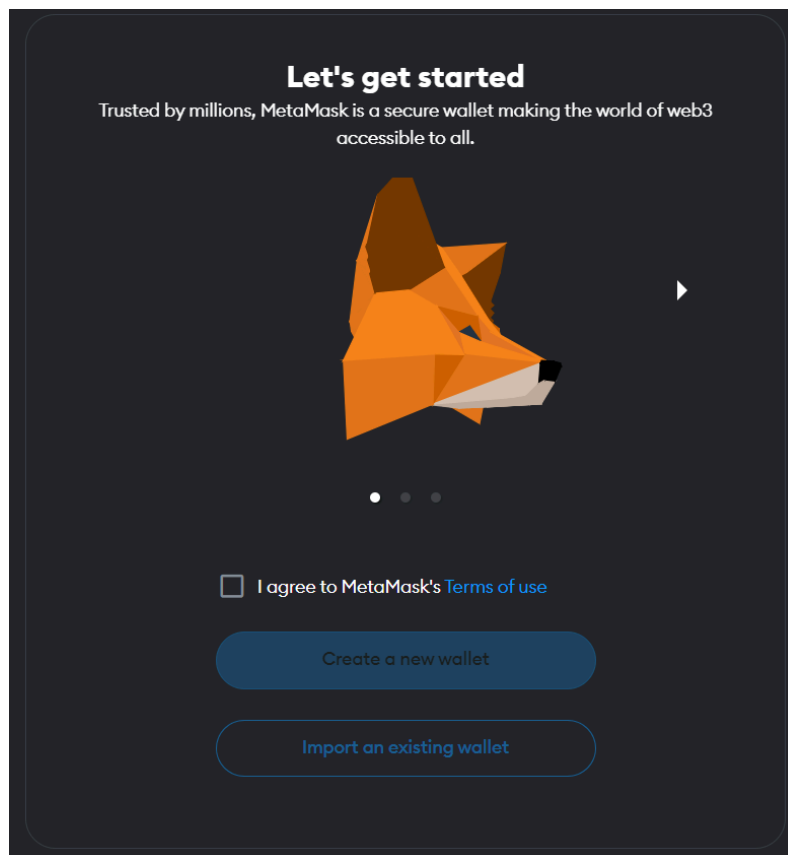


Fig: 1.c

2. Now, search metamask and click the metamask wallet shown below:



3. Next click **Add to Chrome** and this will start downloading and install the file. After installation, you will see an image like below. We are assuming that you do not have any wallet. Therefore click the **Create New Wallet** button.



4. A new page will appear. Where you have to provide your credential and after writing them, click **create a new wallet**.
5. A new page will appear. Press **I agree**.

## Help us improve MetaMask

MetaMask would like to gather usage data to better understand how our users interact with MetaMask. This data will be used to provide the service, which includes improving the service based on your use.

MetaMask will...

- ✓ Always allow you to opt-out via Settings
- ✓ Send anonymized click and pageview events
- ✗ **Never** collect information we don't need to provide the service (such as keys, addresses, transaction hashes, or balances)
- ✗ **Never** collect your full IP address\*
- ✗ **Never** sell data. Ever!

This data is aggregated and is therefore anonymous for the purposes of General Data Protection Regulation (EU) 2016/679.

\* When you use Infura as your default RPC provider in MetaMask, Infura will collect your IP address and your Ethereum wallet address when you send a transaction. We don't store this information in a way that allows our systems to associate those two pieces of data. For more information on how MetaMask and Infura interact from a data collection perspective, see our update [here](#). For more information on our privacy practices in general, see our [Privacy Policy here](#).

I agree

No thanks

6. Now set the password to unlock metamask and remember it.

**Note:** in case you forget this password, you can not recover this one.

1

2

3

Create passwordSecure walletConfirm secret recovery phrase

## Create password

This password will unlock your MetaMask wallet only on this device. MetaMask can not recover this password.

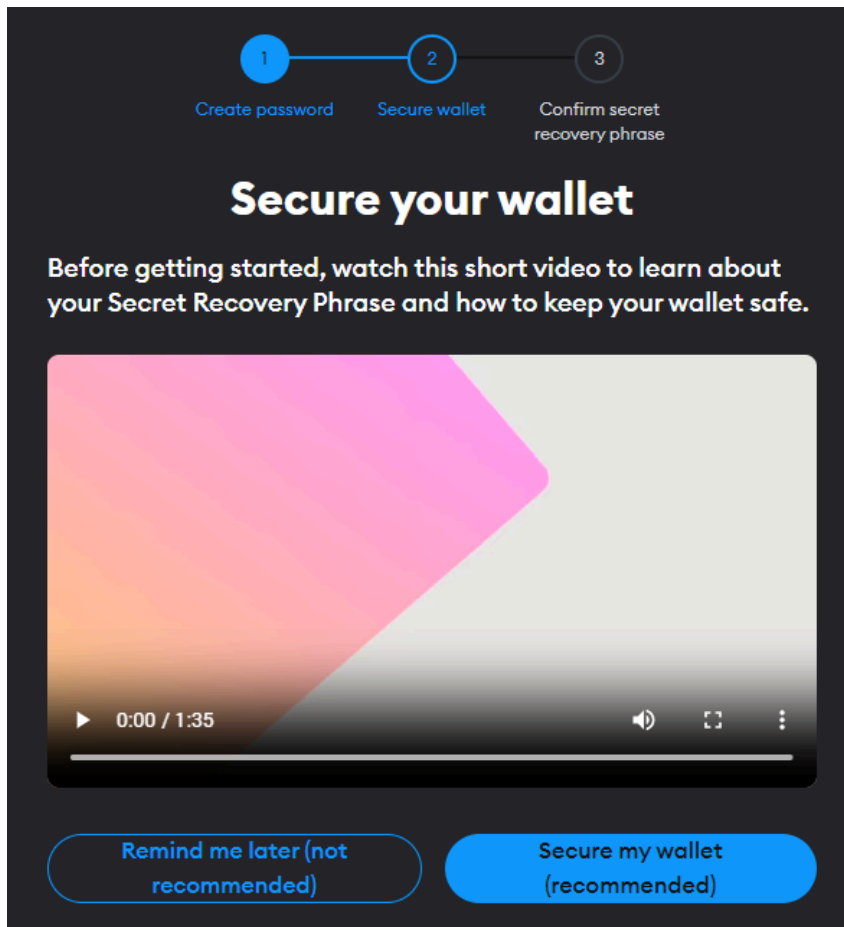
New password (8 characters min) [Show](#)

Confirm password

☐ I understand that MetaMask cannot recover this password for me. [Learn more](#)

Create a new wallet

7. Afterwards, this new page “**Secure your wallet**” will pop up.



8. Click **Secure my wallet(recommended)** and you will find a page with some secret phrase (also known as **mnemonic phrase / seed phrase / master key**) containing 12 words mentioned in the picture below. This secret phrase is very important for **non custodial wallets** like metamask. You must copy and store this phrase in a safe place. If you lose it, you will not be able to retrieve your wallet again. Also, Make sure that you store this secret phrase in a safe place because if someone gets this phrase he/she can access your account and do whatever they want.

5.1. Press **Reveal Secret Recovery Phrase**. Take a screenshot of that page.

1 Create password 2 Secure wallet 3 Confirm secret recovery phrase

## Write down your Secret Recovery Phrase

Write down this 12-word Secret Recovery Phrase and save it in a place that you trust and only you can access.

**Tips:**

- Save in a password manager
- Store in a safe deposit box
- Write down and store in multiple secret places

Make sure nobody is looking

Reveal Secret Recovery Phrase

6. On the next page, confirm your secret phrase only then the **confirm** button will automatically be active. (You must type the phrases). Press the confirm button to go to the next page.

1 Create password 2 Secure wallet 3 Confirm secret recovery phrase

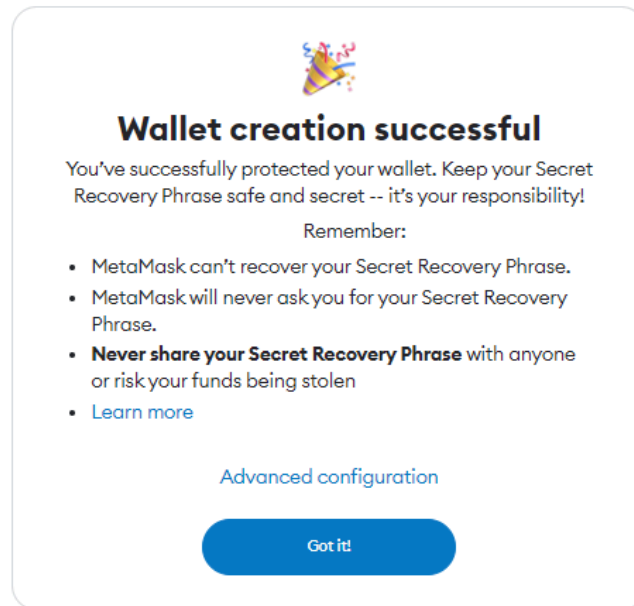
## Confirm Secret Recovery Phrase

Confirm Secret Recovery Phrase

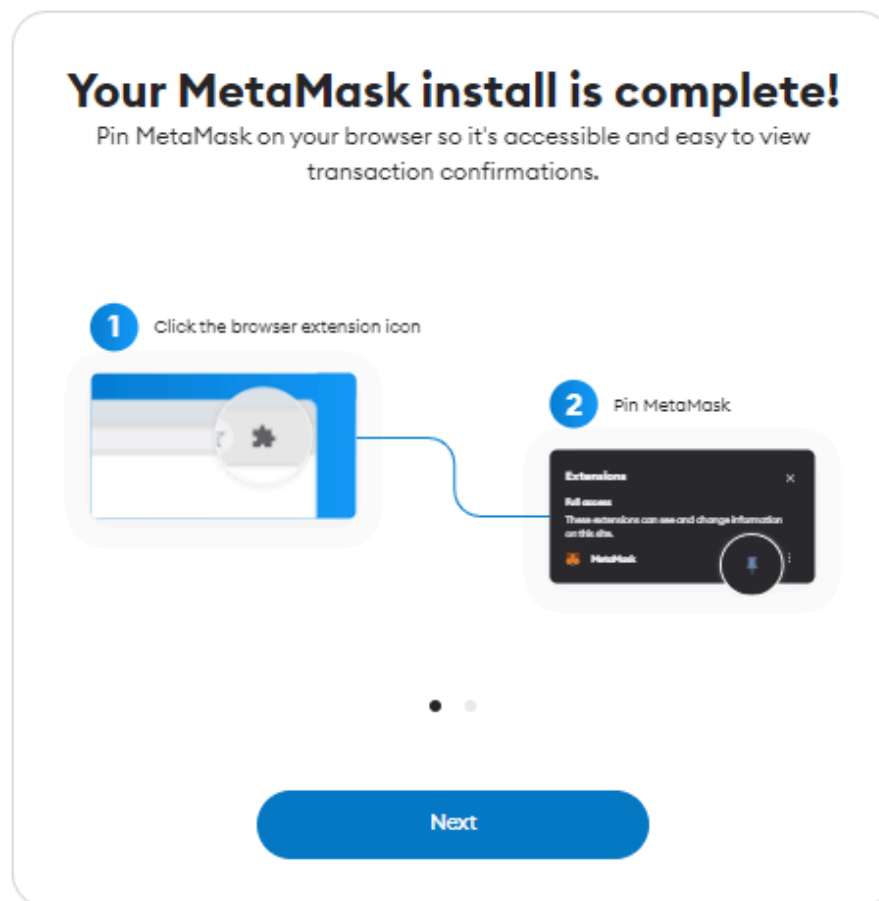
1. love	2. ordinary	3. <input type="text"/>
4. <input type="text"/>	5. only	6. scene
7. gorilla	8. <input type="text"/>	9. term
10. bracket	11. you	12. bullet

Confirm

7. Our wallet has been created.

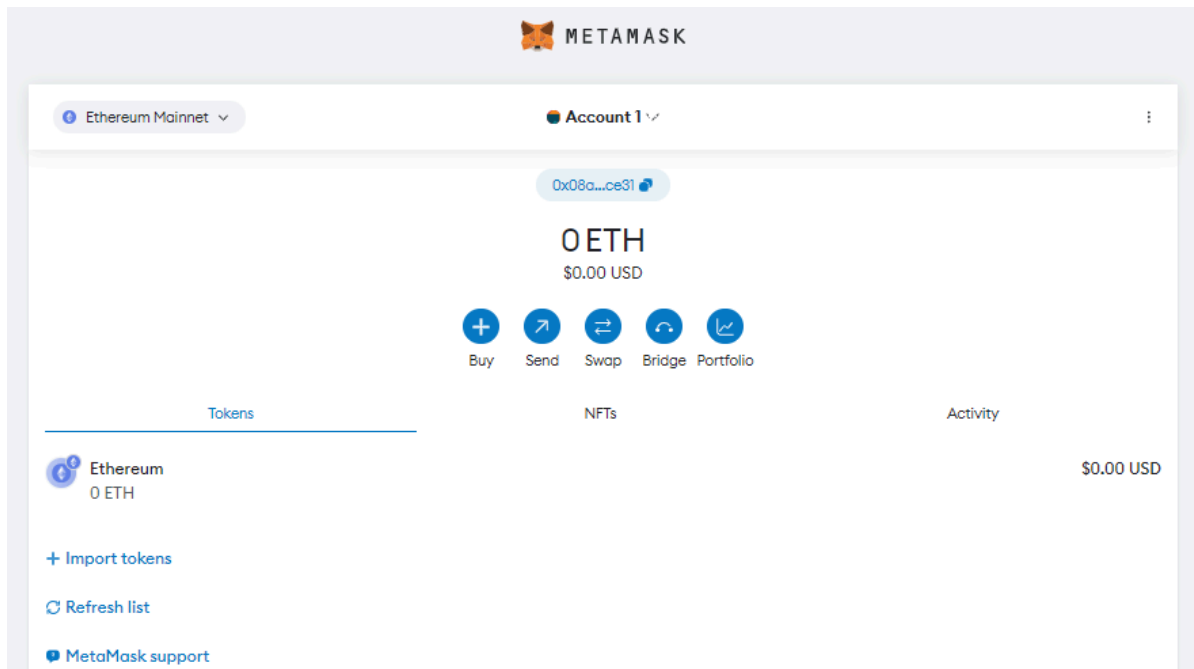


8. Finally, pin the extension from the existing browser extension list similarly mentioned in the picture below(Optional but recommended for this lab):

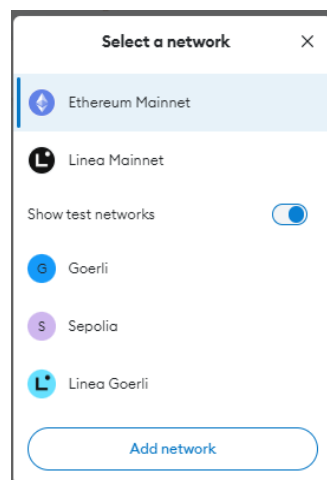


## Section-2 : Using the test network

1. After successfully setting up the wallet, you will see a panel like the image below. Initially you will have two networks to interact with which is ethereum mainnet and Linea mainnet. However, we will interact with a test network. Therefore, click the option “**Ethereum Mainnet**” at the top-left corner.

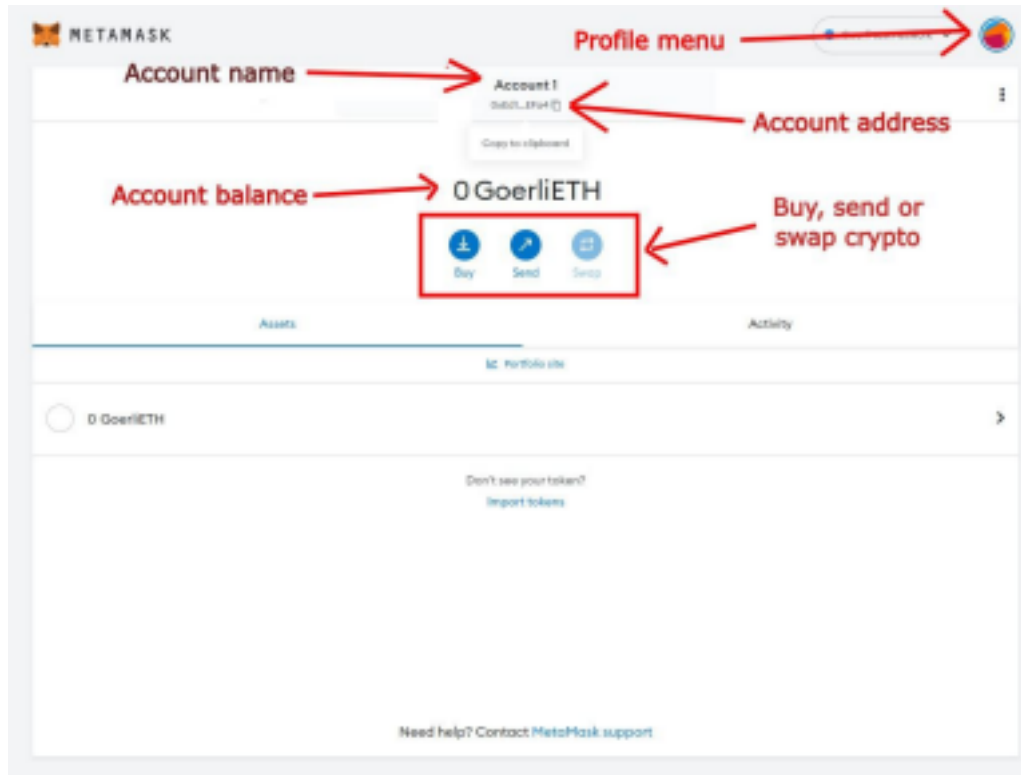


2. You will find a toggle button and you should click “**show test networks**”. This will bring you some test networks in the wallet like the image below. You can add more networks in the wallet. However, in this lab, we will try to interact with the Sepolia or Linea Goerli test network. First, click “Sepolia” option.





3. These are the basic options of the metamask wallet. We will interact with these options. However, the swap feature is not available in the test network, therefore we will interact with other available options here.



### Section-3 : Interaction with the wallet.

In this section, we will fetch/buy some dummy cryptocurrency from the faucet and try to use the balance by sending it to another person/account.

In the crypto world, faucets are some applications or websites that provide users a small amount of crypto reward/currency/balance. In ethereum, the currency they use is called ether or ETH. For bitcoin, the currency name is bitcoin of btc. Similar to that, the sepolia test network uses the currency called SepoliaETH. Now, let's get some balance/cryptocurrency or to be more specific SepoliaETH since we are using sepolia test network.

1. Now visit <https://cloud.google.com/application/web3/faucet/ethereum/sepolia>

# Ethereum Sepolia Faucet BETA

Get free Sepolia ETH sent directly to your wallet. Brought to you by [Google Cloud for Web3](#).

Select network\*  
Sepolia

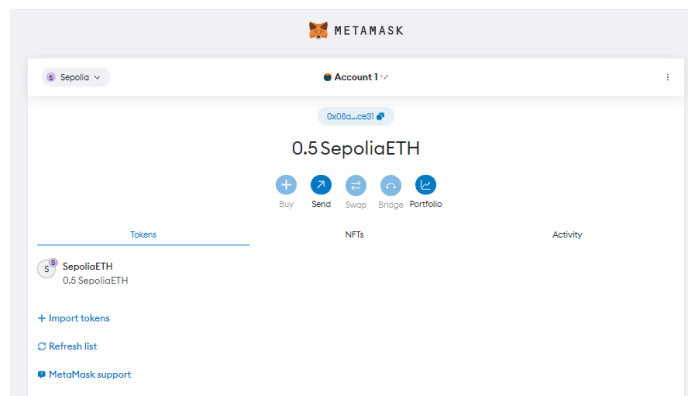
\*required

Wallet address\*

Tokens will be sent to this Ethereum address

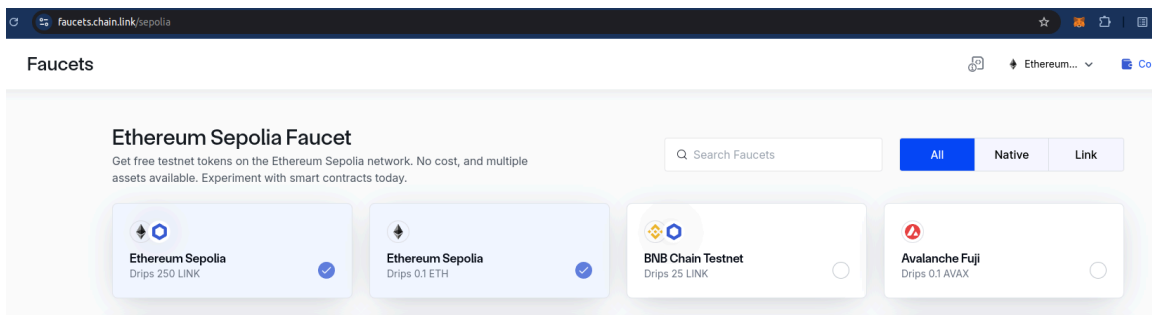
Receive 0.05 Sepolia ETH

2. Paste your account address and press “Receive ...”
3. Now, visit metamask you should be able to see 0.05 sepoliaETH into your account. Make sure you are in the **Sepolia testnet**. (It may take some time)



## Another Faucet



- A. If the faucet before doesn't work you can also try out this website:  
<https://faucets.chain.link/sepolia> and **JUST CLICK CONTINUE**



- B. The prerequisite of this faucet is that you must have a **GitHub account** and you need to authorize this faucet there to give some free rewards (Currently, most faucets require you to have actual ETH and a few give you free rewards if you do some prerequisites).
- C. Now Click on **Continue with GitHub** fill in your credentials and authorize this faucet service. After that, it will bring you back to this page paste your wallet address in the two fields then Click on **Get Tokens**.

### Add wallet addresses





Where are you sending the testnet tokens?

 <b>Ethereum Sepolia</b> Drips 0.1 ETH	→	Enter wallet address	Remove
 <b>Ethereum Sepolia</b> Drips 250 LINK	→	Enter wallet address	Remove

- D. Wait for a bit and you should see the transactions to be Successful.

### Finished

Check to see if the tokens have arrived.

 <b>Ethereum Sepolia</b> Drips 0.1 ETH	✓	Transaction Hash <a href="#">0x18bd...847e</a> 	Success
 <b>Ethereum Sepolia</b> Drips 250 LINK	✓	Transaction Hash <a href="#">0xf787...22d2</a> 	Success

- E. Go back to your wallet and you should see 0.1 SepoliaETH was received.

### ANOTHER FAUCET

- A. If the faucet above doesn't work either you can try out this faucet link.  
<https://faucet.trade/sepolia-eth-faucet> (You have to have a Twitter account for this)
- B. Put your wallet address in the first box and like Step: 2 (before that login to your Twitter) Follow @faucet\_trade on Twitter and also Tweet what they requested by clicking the 2nd link.

Available tokens

OG Newton Testnet AOGI

SaharaAI Testnet SAH

Soneium Minato Sepolia ETH

Holesky ETH

Morph Holesky ETH

**Sepolia ETH**

Berachain BERA

Tabi Chain V2 Carnival TABI

Blast Sepolia ETH

Polygon Amoy MATIC

BSC Testnet BNB

Avalanche Fuji AVAX

archived ▾

Buy testnet tokens

fast reliable deal without headache

Sepolia ETH Faucet

// obtain testnet tokens in just one minute

Step 1. Put your wallet address \*

Step 2. Follow and tweet \*


Follow @faucet\_trade

Tweet

Step 3. Put your tweet URL \*

Step 4. Solve captcha \*

☐ I am human

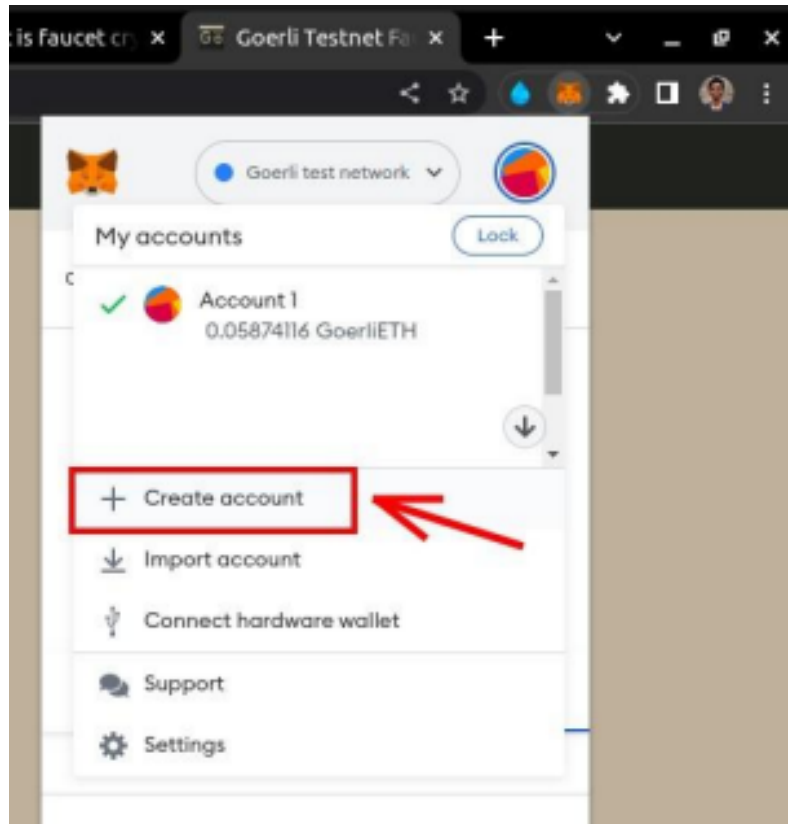


hCaptcha

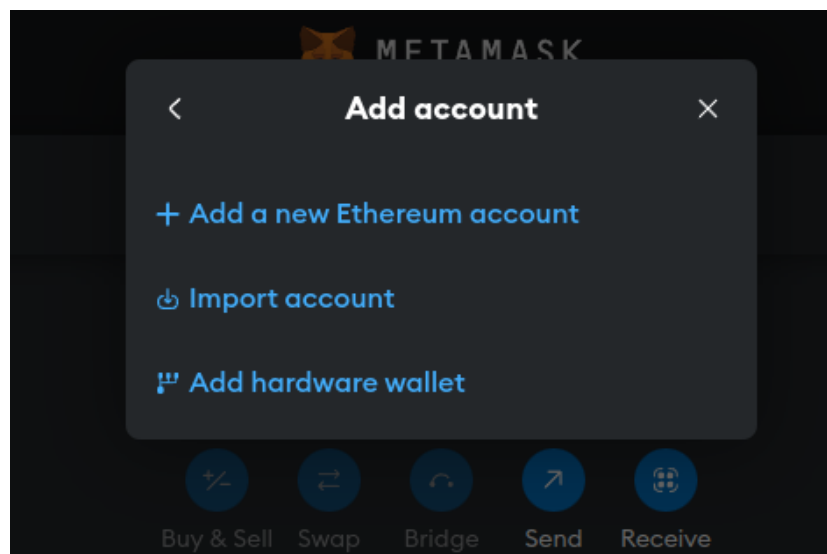
Privacy - Terms

Receive tokens

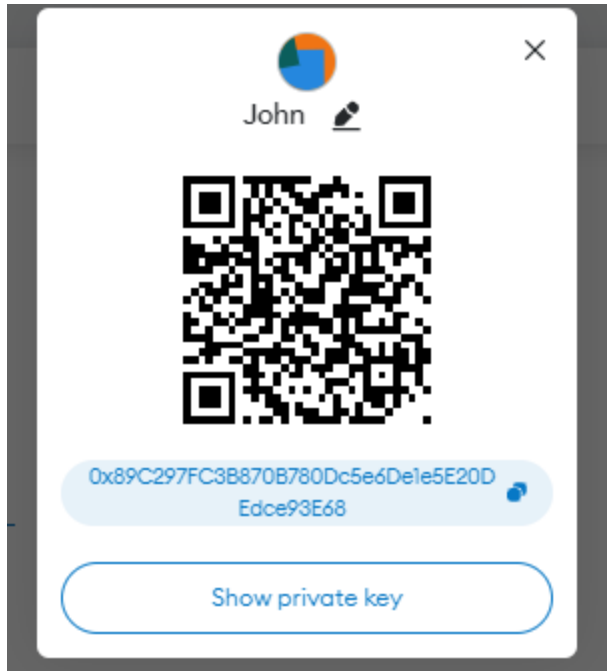
- C. Now take your Tweet link and put the URL in the Step 3 box.
  - D. Finally, finishing the captcha click on the **Recieve tokens** button and after a while you will receive only 0.005 SepoliaETH.
5. Now, we will send some cryptocurrency. But to whom ? Who is the receiver ? Users use their account address to send/receive the cryptocurrency in blockchain. This can be considered as their identity like we use email addresses for sending/receiving email. Therefore, now we will create another account from the same wallet and send crypto from one account to another. You can create and manage multiple accounts from one wallet. Therefore, to create a new account, click the profile icon in metamask and then click create new account. You can set the account name as you want. For this lab, I named it as “**John**”.



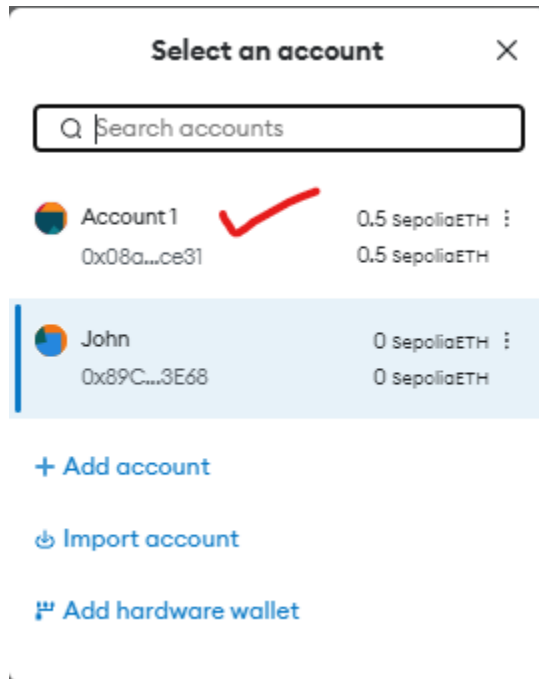
Or,



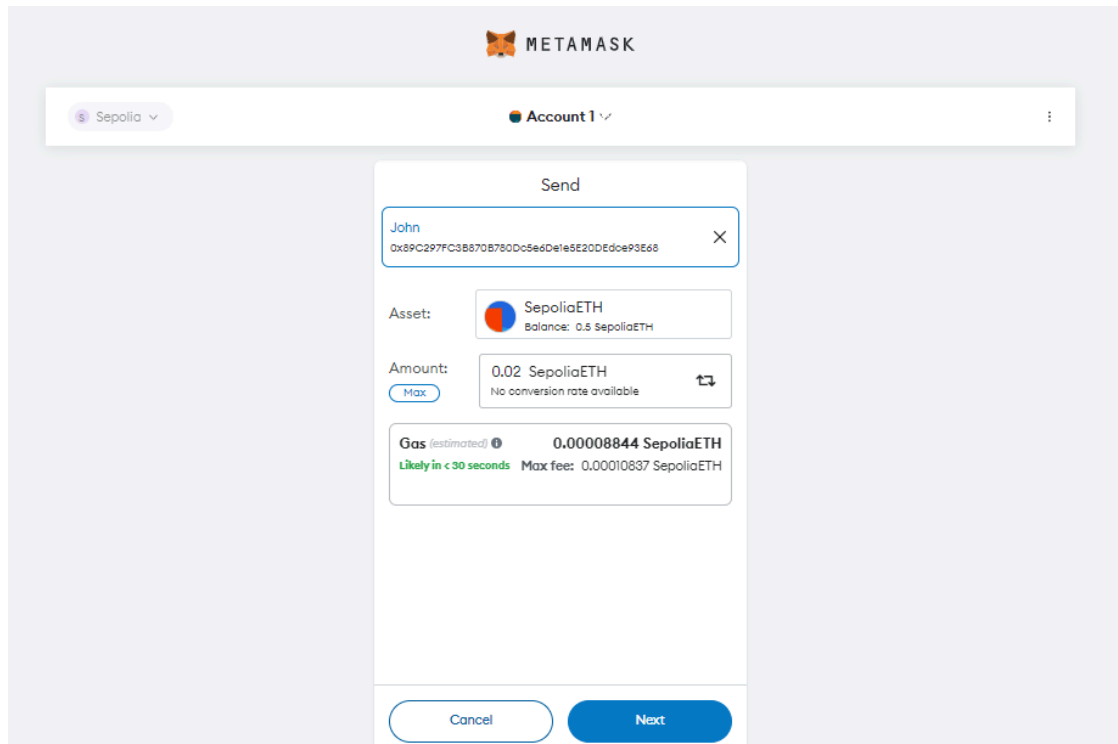
5. After creating a new account, you will see the initial balance of that new account is zero. Now, we will send some crypto to this new account from Account 1. To do this, first copy the address of the newly created account.



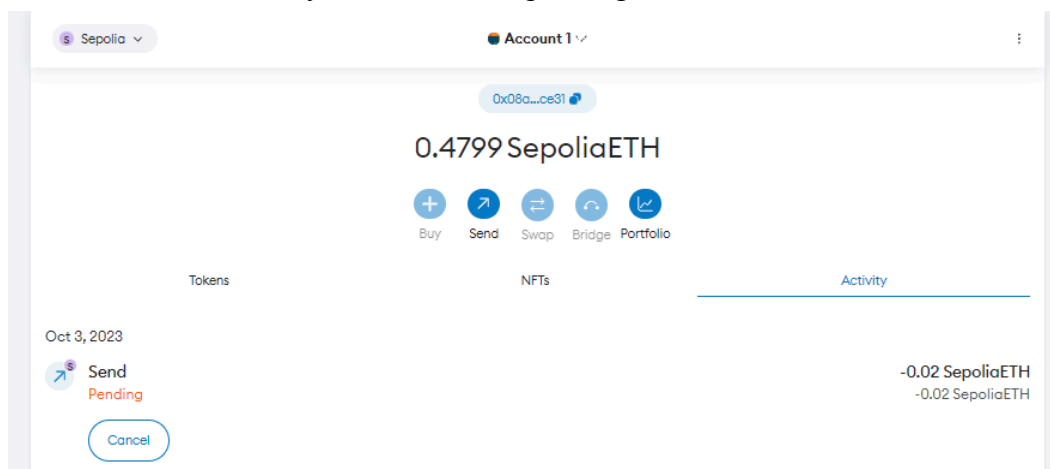
6. Next, switch to Account 1 from the profile menu by clicking the account 1 option.



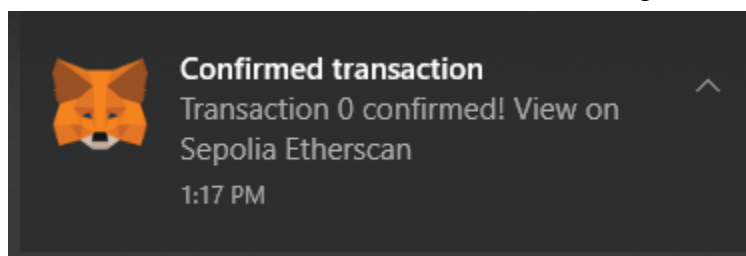
7. Now, click the **send** button, and then paste the account address, set an amount to transfer, and click next. Here, I am sending **0.02 GoETH** to Jhon(account 2).



8. After clicking next, You will see a prompt to confirm transactions with related fees. This fee will be deducted from your account in addition to the **0.02 SepoliaETH**, that you are going to send Jhon. In ethereum, we pay some transaction fees( gas ) for transactions. After confirmation, you should see a pending transaction in the wallet.



9. After a few seconds, the transaction will be completed and you will get a notification.



10. . Now check the balance of both of your accounts. You should see Account 1 has some less balance than before and Jhon( account 2 ) has balance **0.02 SepoliaETH**.

**Checkpoint 1:** Now, you have to send some amount of cryptocurrency to your friends. For this, get the account address of your group member/friend and then send some crypto to that account. After that, tell your friend/group member to send you some crypto. After completing it, show the result to your teacher.

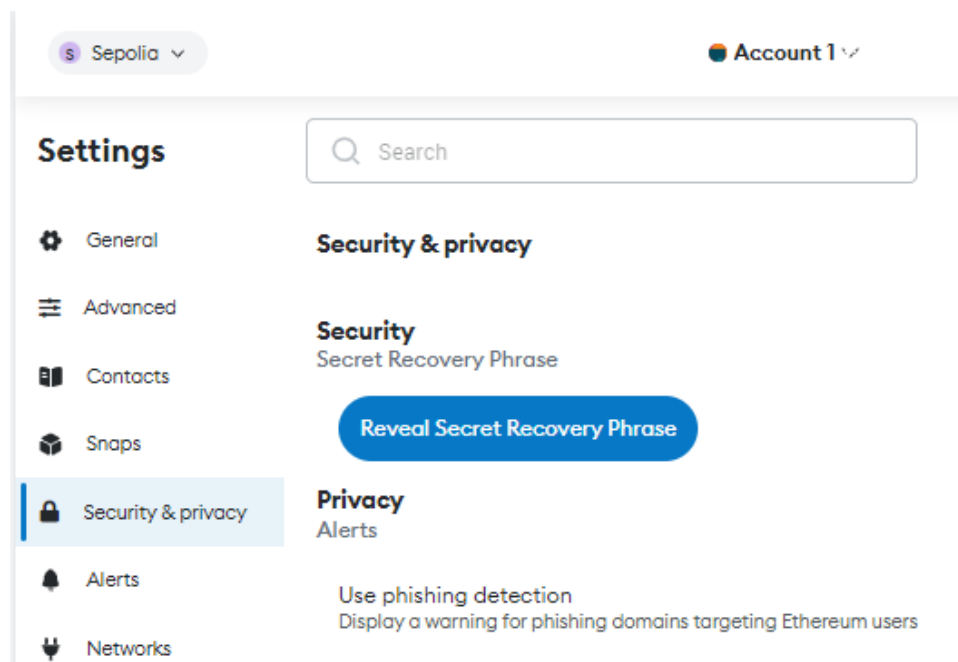
## Section-4 : Backup and Retrieve Wallet and Accounts

In this section, we will discuss how we can backup our wallets and accounts so that we can access them in future.

In metamask, we already have seen the secret phrase. We know this secret phrase is essential to retrieve our wallet if we somehow lost the wallet. In addition, Each account in a wallet contains a public key and a private key. In section 3, we sent and received some crypto using an address. This address is basically the public key of that respective account. Therefore we will see how we can export these secret keys/phrases and use it in future to retrieve wallet/account.

### 4.1 Export Secret Phrase / seed phrase / master key of wallet

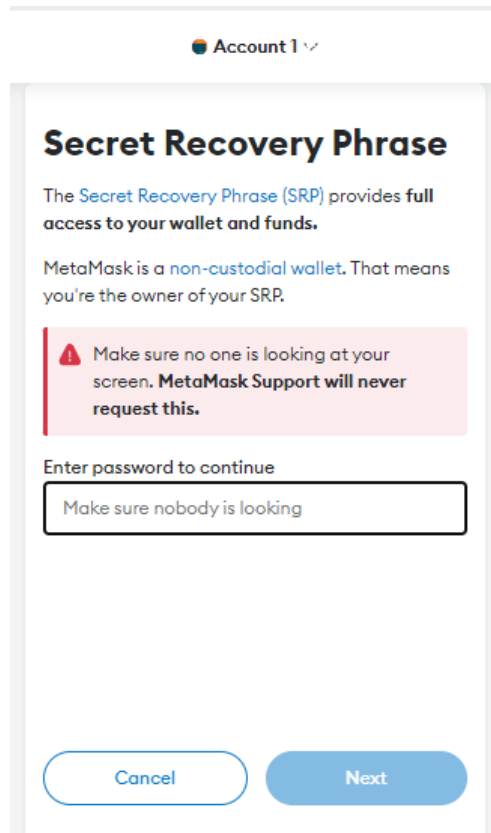
1. To export your wallet secret phrase, go to the “**settings > security and privacy**” under the metamask profile menu. You will see an option to recover the secret phrase key.



2. Click it and it will ask you two basic questions which we already covered, Now answer



them first. Then metamask will prompt you to enter your password.



Account 1 ✓

## Secret Recovery Phrase

The [Secret Recovery Phrase \(SRP\)](#) provides full access to your wallet and funds.

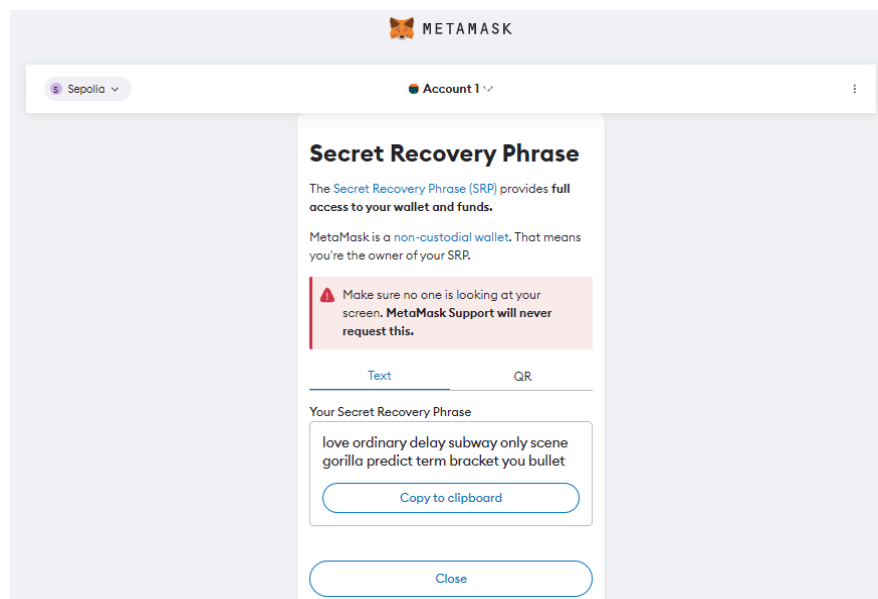
MetaMask is a [non-custodial wallet](#). That means you're the owner of your SRP.

⚠ Make sure no one is looking at your screen. **MetaMask Support will never request this.**

Enter password to continue

Cancel Next

3. Once you enter your password, you will see your secret phrase like below:



METAMASK

Sepolia Account 1 ✓

## Secret Recovery Phrase

The [Secret Recovery Phrase \(SRP\)](#) provides full access to your wallet and funds.

MetaMask is a [non-custodial wallet](#). That means you're the owner of your SRP.

⚠ Make sure no one is looking at your screen. **MetaMask Support will never request this.**

Text QR

Your Secret Recovery Phrase

love ordinary delay subway only scene  
gorilla predict term bracket you bullet

Copy to clipboard

Close

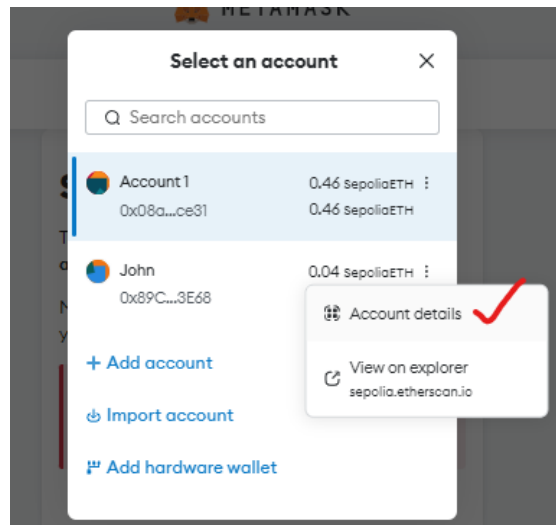
2. Click the “**Copy To Clipboard**” and paste the value also if you want. Now you can store

this secret phrase in a secure storage.

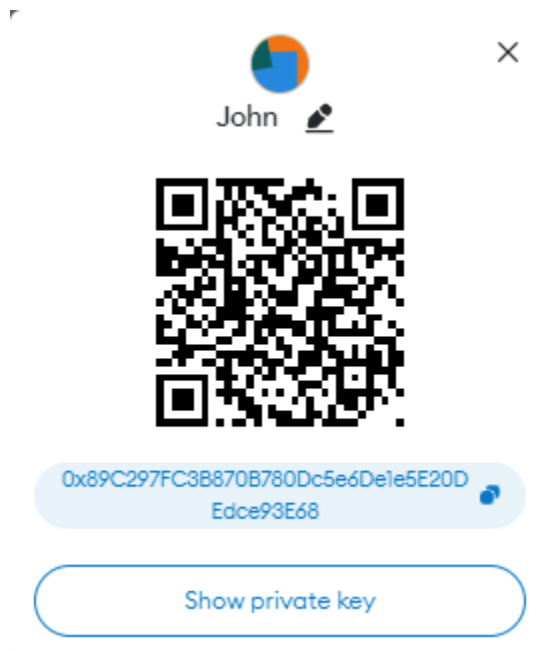
## 4.2 Export private key of account

In a metamask wallet, we can hold multiple accounts. You may want to back up your account so that you can access it from another wallet. To backup the account:

1. open metamask and click the menu button with three dots. This will bring some options and Select “**Account Details**”



2. Then click “**Show private key**” . This will prompt you to enter your password. After entering a password, you will see your private key for that respective account.



3. Copy this private key and store it in a safe place. If you lost this private key and somehow lost access to your wallet also, you will not be able to retrieve this account anymore.

**Checkpoint 2:** Now, remove metamask and try to install it again. But this time try using import your wallet from the phrase that you stored in the previous section. Show this to your teacher.

**Checkpoint 3:** What did you see when you imported the wallet ? Only one account is there right ? What happens to others ? Are those deleted forever ? The answer is no. You can retrieve the accounts using its private key as we mentioned earlier. Therefore, now try to retrieve the account by importing instead of creating one from the metamask. Give it a try. If you can do it successfully, please show this to your teacher.

## Section-4 : Exploring transactions

In this section, you will learn about public blockchain explorers such as [etherscan.io](https://etherscan.io) and [bitaps.com](https://bitaps.com). Your teacher will discuss these during the lab.