

Create a Blockchain Currency

*Before this assignment, make sure you have completed **Deploying a Smart Contract**

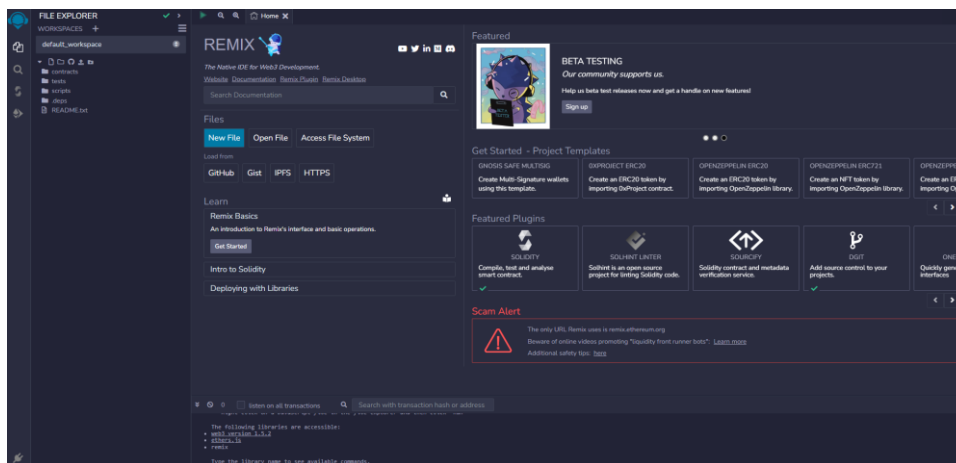
**We recommend using Google Chrome for this exercise. However, if the processes yield a mistake try a different internet browser

INITIAL NOTE

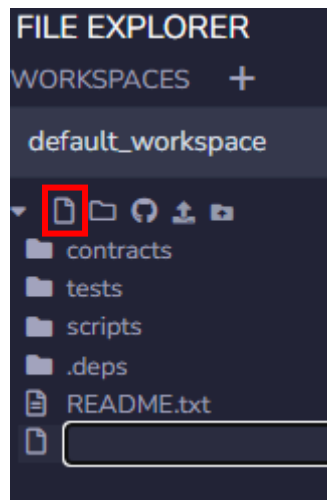
The digital environment is a very dynamic and agile environment where updates and changes occur on a constant basis. In this program, we will use web resources and external software in order to carry out the practical activities and provide a real vision of the tools available in the market. This means that, although we strive to keep the guides updated, sometimes some of the environments we will be showing you in the activities may suffer some small differences from the images reflected in these guides. Normally it is possible to follow the development of the activity by easily interpreting the differences between the guide and the real environment, if any. In case this is not possible, please let your facilitator know by sending a message through the program's platform inbox.

1. Creating a currency

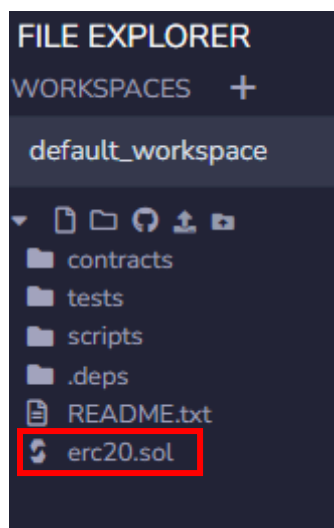
Go to remix.ethereum.org in your browser. Remember, if this is your first time visiting the editor, close all the pop-ups. Then, open the contracts folder.



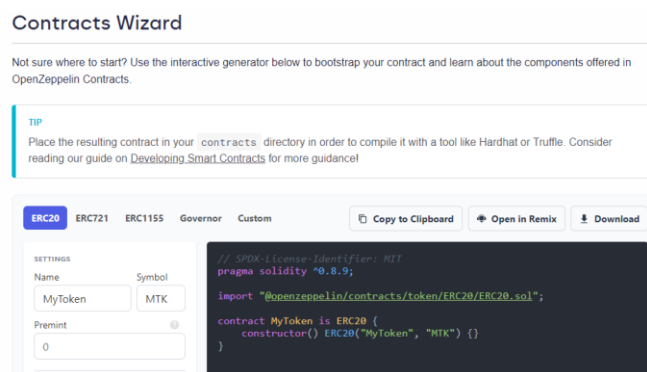
Click on the “Create New File” icon.



Name it “erc20.sol”, then click “enter.”



Go to OpenZeppelin Wizard: <https://wizard.openzeppelin.com/>



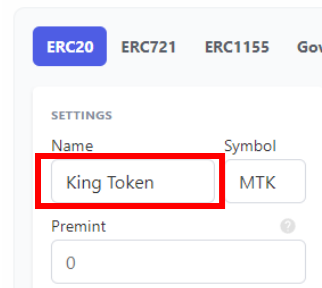
1) Change the name of your token

Contracts Wizard

Not sure where to start? Use the interactive OpenZeppelin Contracts.

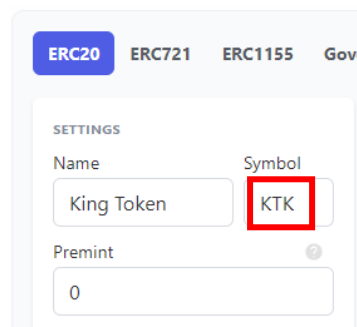
TIP

Place the resulting contract in your project by following our guide on [Developing Smart Contracts](#).



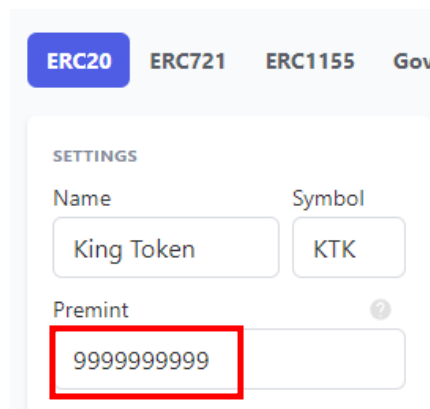
The screenshot shows the 'Contracts Wizard' interface. At the top, there are tabs for 'ERC20', 'ERC721', 'ERC1155', and 'Gov'. The 'ERC20' tab is selected. Below the tabs, there is a 'SETTINGS' section. It contains three input fields: 'Name' (containing 'King Token'), 'Symbol' (containing 'MTK'), and 'Premint' (containing '0'). The 'Name' field is highlighted with a red rectangular box.

2) Add a symbol



The screenshot shows the 'Contracts Wizard' interface. At the top, there are tabs for 'ERC20', 'ERC721', 'ERC1155', and 'Gov'. The 'ERC20' tab is selected. Below the tabs, there is a 'SETTINGS' section. It contains three input fields: 'Name' (containing 'King Token'), 'Symbol' (containing 'KTK'), and 'Premint' (containing '0'). The 'Symbol' field is highlighted with a red rectangular box.

3) Choose a premint amount. Note: Do not add commas or periods.



The screenshot shows the 'Contracts Wizard' interface. At the top, there are tabs for 'ERC20', 'ERC721', 'ERC1155', and 'Gov'. The 'ERC20' tab is selected. Below the tabs, there is a 'SETTINGS' section. It contains three input fields: 'Name' (containing 'King Token'), 'Symbol' (containing 'KTK'), and 'Premint' (containing '999999999'). The 'Premint' field is highlighted with a red rectangular box.

4) Make sure none of the "Features" are selected

SETTINGS

| Name | Symbol |
|------------|--------|
| King Token | KTN |

Premint ?

99999999

FEATURES

- ☐ Mintable ?
- ☐ Burnable ?
- ☐ Pausable ?
- ☐ Permit ?
- ☐ Votes ?
- ☐ Flash Minting ?

5) Copy the code

ERC20 ERC721 ERC1155 Governor Custom

Copy to Clipboard Open in Remix Download

SETTINGS

| Name | Symbol |
|------------|--------|
| King Token | KTK |

Premint ?

99999999999

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

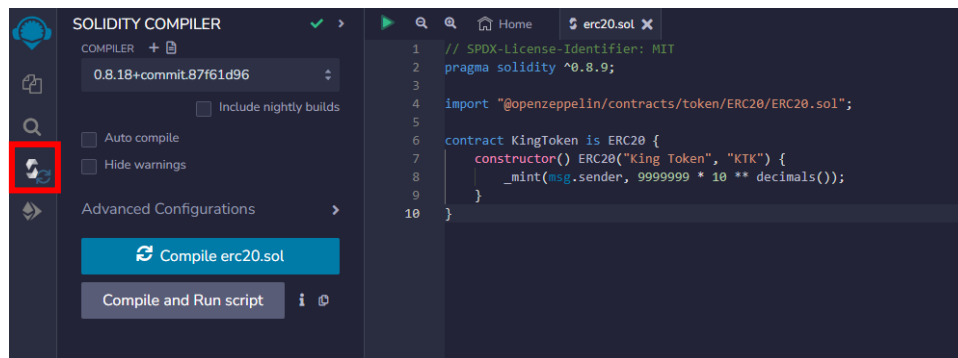
import "@openzeppelin/contracts/token/ERC20/ERC20.sol";

contract KingToken is ERC20 {
    constructor() ERC20("King Token", "KTK") {
        _mint(msg.sender, 99999999999 * 10 ** decimals());
    }
}
```

Paste this ERC20 code to Remix. Your code should look like this:

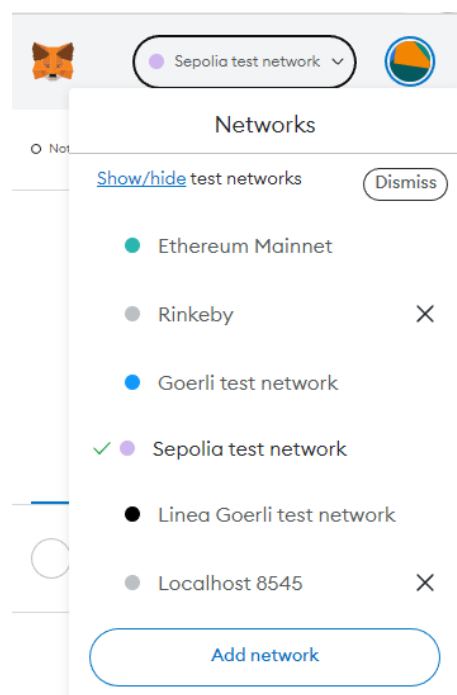
```
erc20.sol x
1 // SPDX-License-Identifier: MIT
2 pragma solidity ^0.8.9;
3
4 import "@openzeppelin/contracts/token/ERC20/ERC20.sol";
5
6 contract KingToken is ERC20 {
7     constructor() ERC20("King Token", "KTK") {
8         _mint(msg.sender, 9999999 * 10 ** decimals());
9     }
10 }
```

Now, click on the “Solidity Compiler” icon.

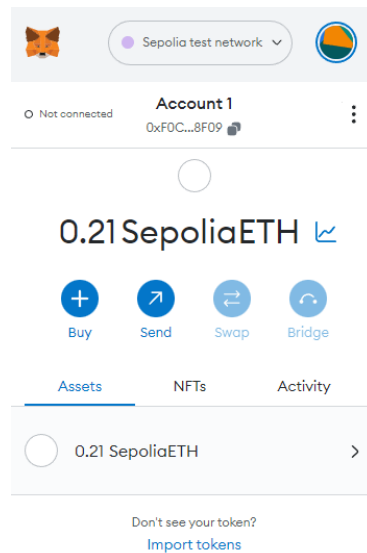


NOTE: Before proceeding, make sure of the following:

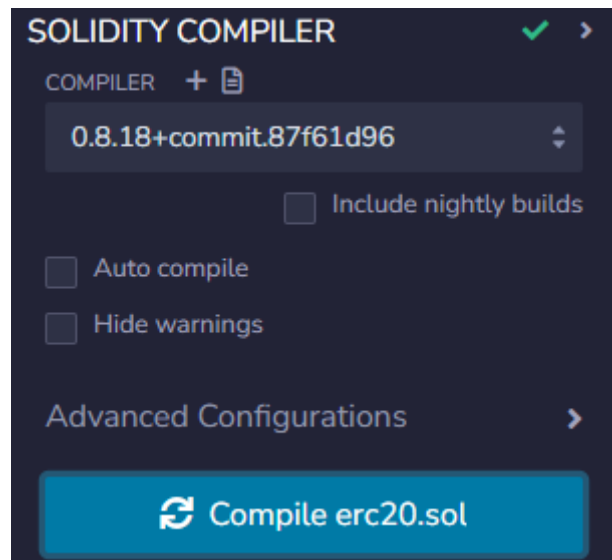
- A) You’ve selected the Sepolia test network in your MetaMask.



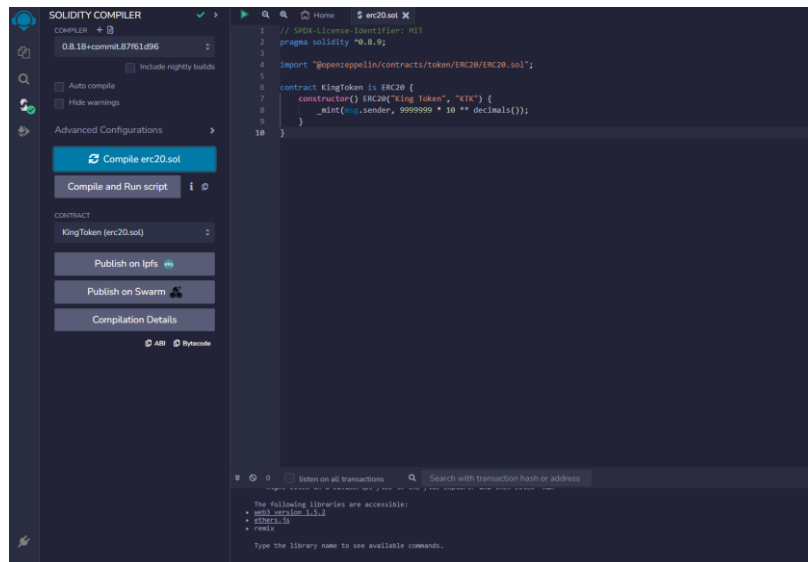
- B) You have at least 0.02 SepoliaETH (otherwise go to the Sepolia faucet at <https://sepoliafaucet.com/> or ask your learning facilitator to send you 0.02 SepoliaETH).



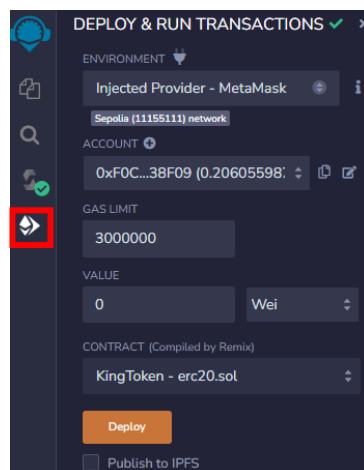
Click “Compile erc20.sol.”



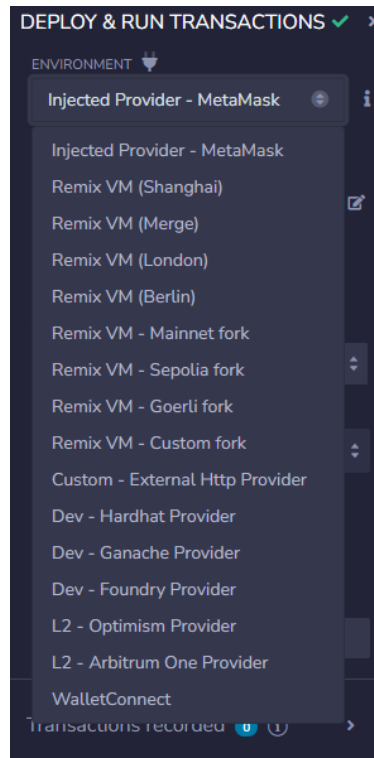
Your screen should look like this:



Now, go back to the "Deploy & Run Transaction" icon.

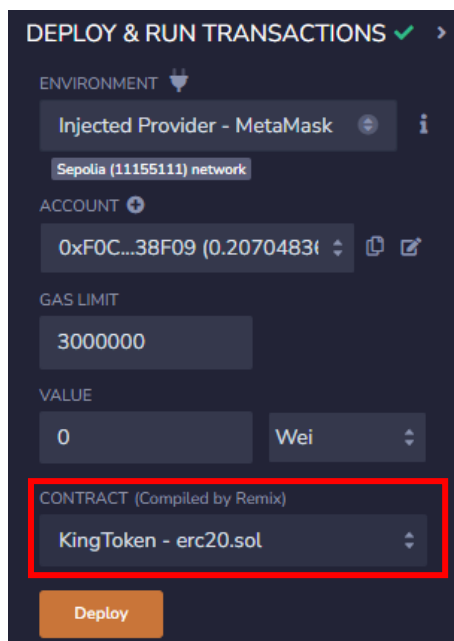


Make sure the environment is set to "Injected Provider - Metamask."

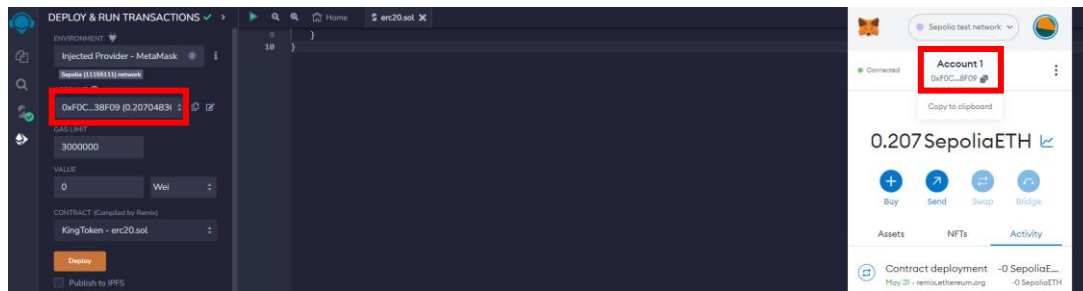


(Note, if MetaMask prompts you to connect, click “Next” and then “Connect.”)

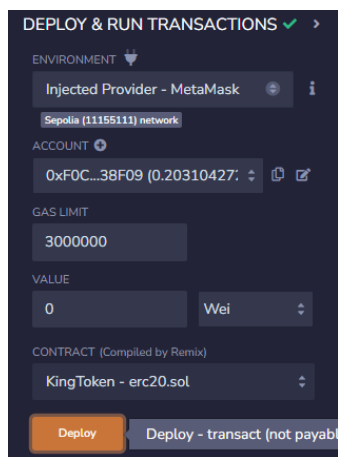
In the “contract” drop-down menu, make sure that the name of your token and erc20.sol file are selected.



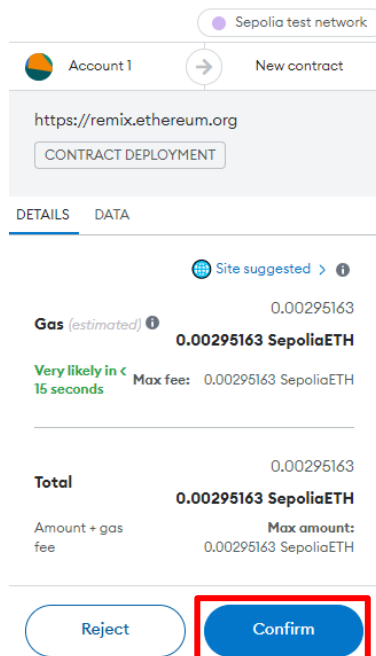
Also, check the account number matches your MetaMask account.



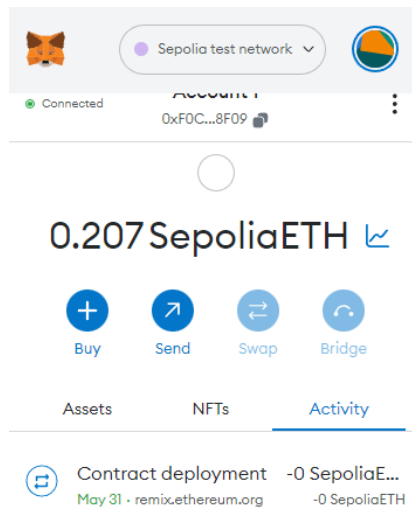
Click “Deploy.”



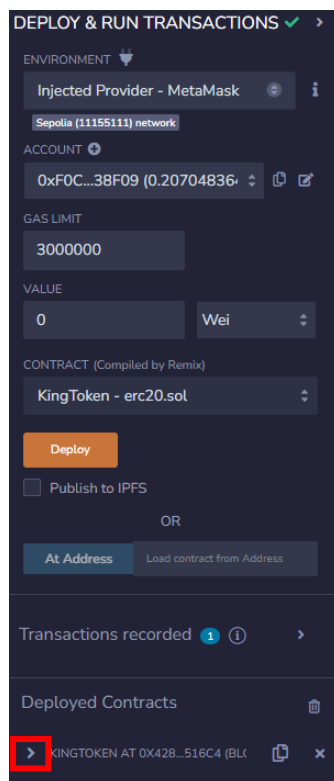
Your MetaMask should appear. Click “Confirm.”



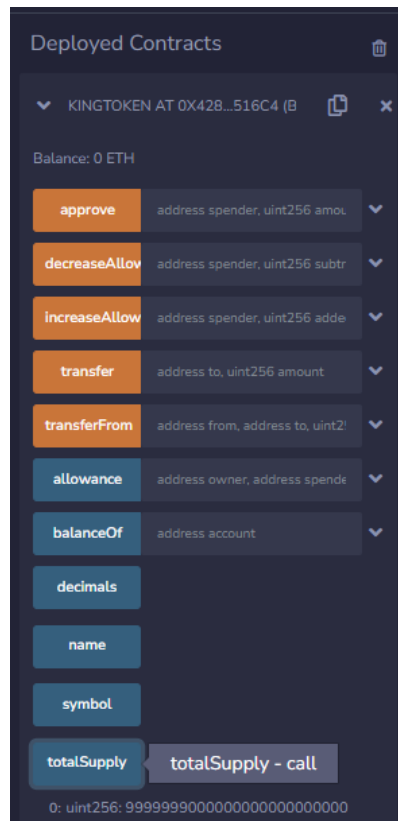
Your screen should look like the image below.



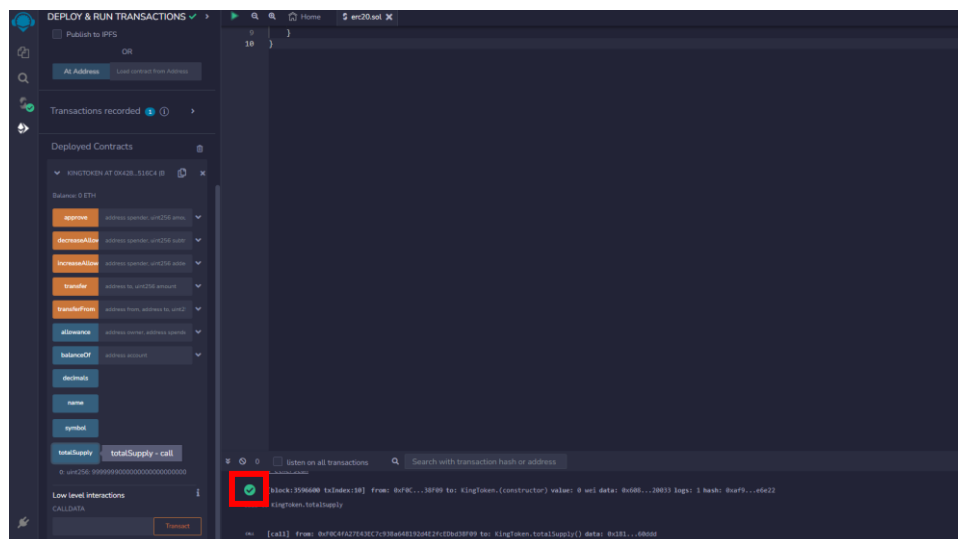
Click on the arrow next to “Deployed Contracts.”



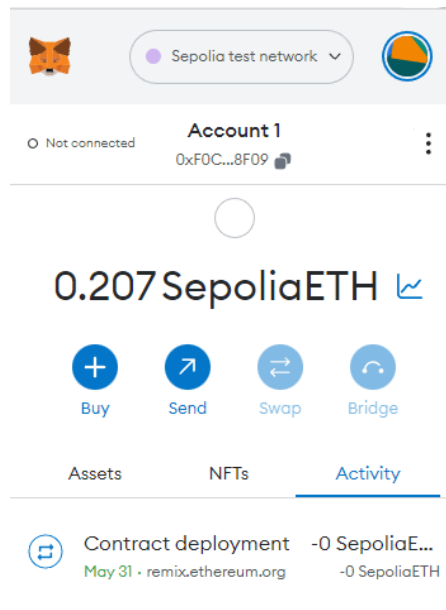
Click on “totalSupply” at the bottom.



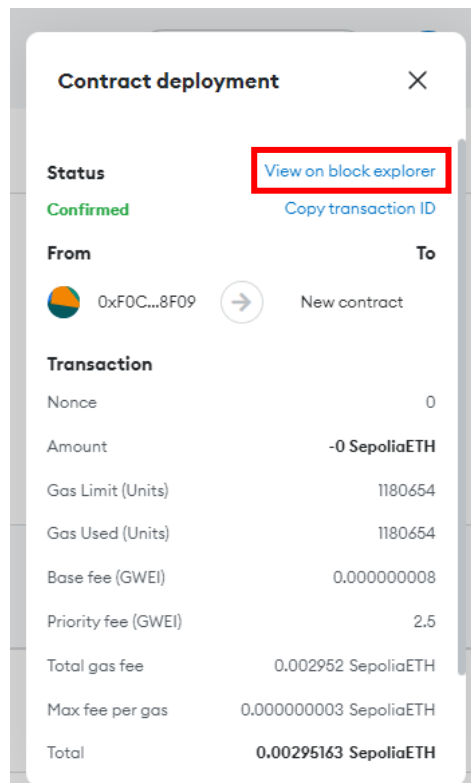
This will give you a big number. It's given in a fractional representation of Ether which is why there are so many zeros.



Go back to MetaMask to check if the transaction has been successful. Under “Activity,” select the first transaction (“Contract deployment”).



Select “View on block explorer” which will take you to Etherscan.



In Etherscan, you can also check the status of your transaction.

The screenshot shows the 'Transaction Details' page on Etherscan for a Sepolia Testnet transaction. The transaction is successful, with 27 block confirmations. It shows the transaction hash, status, block number, timestamp, from address, and the token transferred (King Token - KTK).

Transaction Details

[This is a Sepolia Testnet transaction only]

- Transaction Hash: 0x27c3bdc6145302da91c409e70e5ac58d727093f32c21c1bcf620ae681d369bc
- Status: Success
- Block: 3596600 (27 Block Confirmations)
- Timestamp: 7 mins ago (May-31-2023 03:28:36 PM +UTC)
- From: 0xF0C4FA27E43EC7c938a648192d4E2fcEDbd38F09
- Interacted With (To): 0x428cecf603d28ea138806d1eef6f49594ad516c4 Created
- ERC-20 Tokens Transferred: From 0x000000...00000000 To 0xF0C4FA...Dbd38F09 For 9,999,999 King Token... (KTK...)
- Value: 0 ETH (\$0.00)
- Transaction Fee: 0.002951635009445232 ETH (\$0.00)
- Gas Price: 2.500000008 Gwei (0.000000002500000008 ETH)

To find out more information about the transaction, click on the contract in the line “Interacted With (to)”:

The screenshot shows the 'Contract' page on Etherscan for the address 0x428cecf603d28ea138806d1eef6f49594ad516c4. It displays the contract creator, token tracker (King Token - KTK), and a list of transactions.

Contract 0x428cecf603d28ea138806d1eef6f49594ad516c4

Overview

- ETH BALANCE: 0 ETH

More Info

- CONTRACT CREATOR: 0xF0C4FA...Dbd38F09 at txn 0x27c3bdc6145302d...
- TOKEN TRACKER: King Token (KTK)

Multi Chain

- MULTICHAIN ADDRESSES: 2 addresses found via Blockscan

Transactions

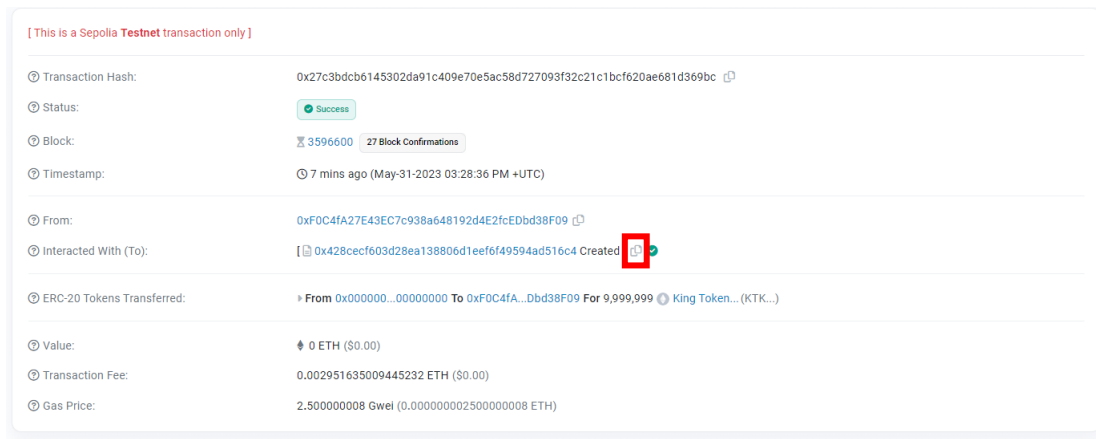
Latest 1 from a total of 1 transactions

| Transaction Hash | Method | Block | Age | From | To | Value | Txn Fee |
|----------------------|------------|---------|------------|---------------------|-------------------|-------|------------|
| 0x27c3bdc6145302d... | 0x60806040 | 3596600 | 8 mins ago | 0xF0C4FA...Dbd38F09 | Contract Creation | 0 ETH | 0.00295163 |

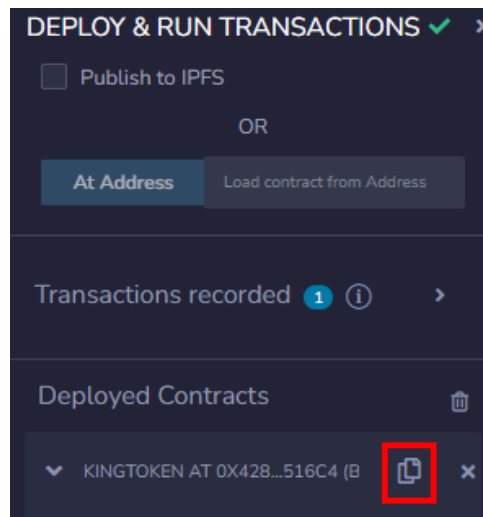
[Download CSV Export]

To obtain the address of your contract you can do one of the following two options:

- 1) Click on the ‘copy’ symbol in the “Interacted With” line next to “Contract 0x... Created”



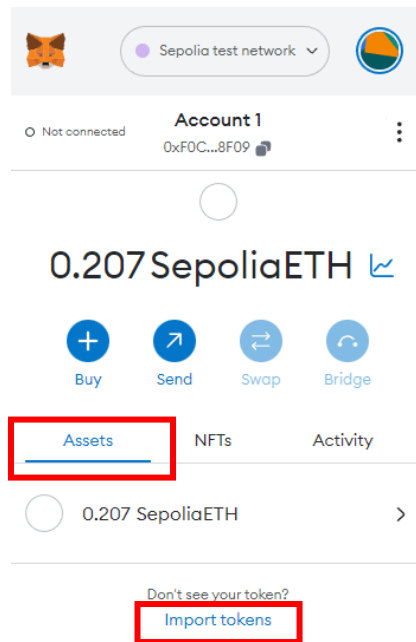
2) Go back to Remix and click on the 'copy' icon below the Deployed Contracts header:



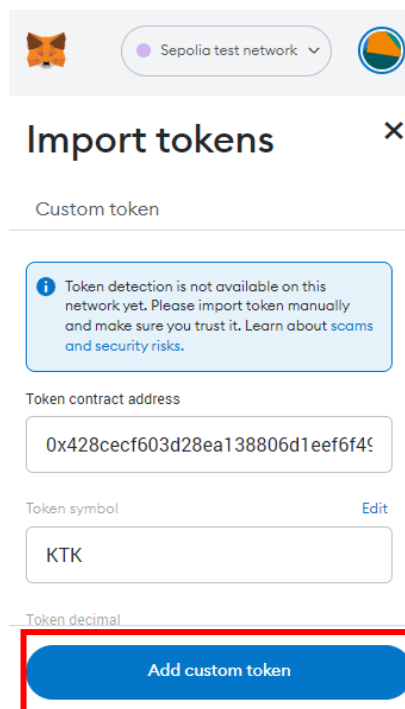
Additional Information

Once you have created your cryptocurrency, you can now transfer tokens to other accounts.

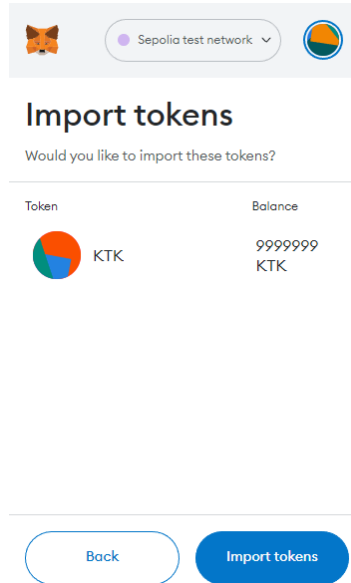
Open the MetaMask plug-in, click the "Assets" tab, and then click "Import tokens."



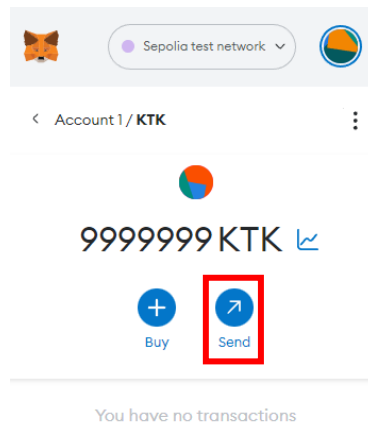
Next, paste the contract address in the “Token Contract Address” in MetaMask. When you add the contract address, the token symbol and token decimal fields will be filled in automatically. Click “Add Custom Token.”



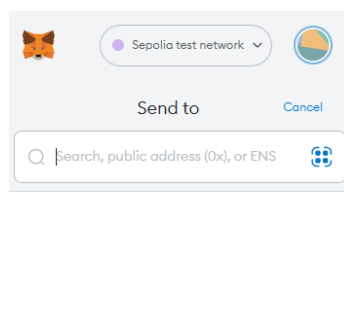
Click “Import Tokens.”



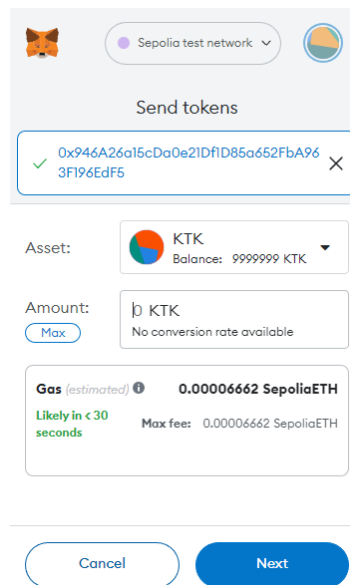
Now, your token should appear! To make a transfer, click on your token under “Assets.” Now, click “Send.”



Add the account address you want to send your token to in the “Send to” box.



Check the address is correct and fill in the “Amount” with how many tokens you would like to send. Click “Next.”



The "Send tokens" screen shows the Sepolia test network selected. The destination address is 0x946A26a15cDa0e21Df1D85a652FbA963F196EdF5, marked with a green checkmark. The asset is KTK with a balance of 9999999. The amount field is set to 10 KTK. Gas is estimated at 0.00006662 SepoliaETH, with a max fee of the same amount. The screen includes "Cancel" and "Next" buttons.

Send tokens

0x946A26a15cDa0e21Df1D85a652FbA963F196EdF5

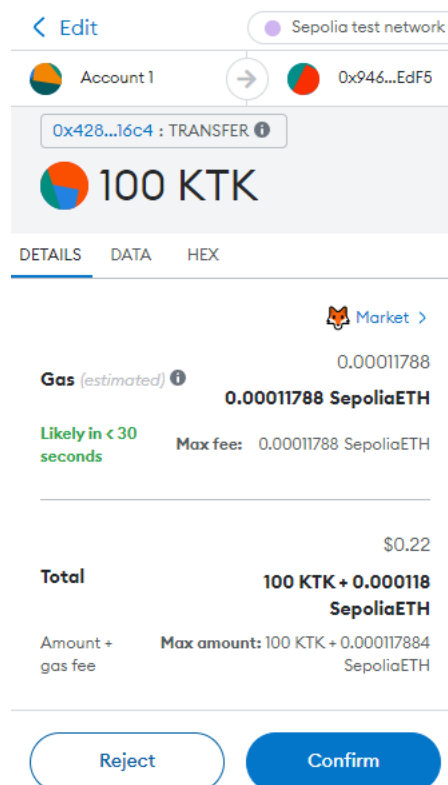
Asset: KTK Balance: 9999999 KTK

Amount: 10 KTK No conversion rate available

Gas (estimated) 0.00006662 SepoliaETH
Likely in < 30 seconds Max fee: 0.00006662 SepoliaETH

Cancel Next

Double-check the information is correct and click “Confirm.”



The confirmation screen shows a transfer of 100 KTK from Account 1 to 0x946...EdF5. It displays gas details: 0.00011788 SepoliaETH, likely in < 30 seconds, with a max fee of 0.00011788 SepoliaETH. The total cost is \$0.22 (100 KTK + 0.000118 SepoliaETH). The screen includes "Reject" and "Confirm" buttons.

< Edit Sepolia test network

Account 1 → 0x946...EdF5

0x428...16c4 : TRANSFER

100 KTK

DETAILS DATA HEX

Market >

Gas (estimated) 0.00011788
0.00011788 SepoliaETH
Likely in < 30 seconds Max fee: 0.00011788 SepoliaETH

\$0.22

Total 100 KTK + 0.000118 SepoliaETH

Amount + gas fee Max amount: 100 KTK + 0.000117884 SepoliaETH

Reject Confirm

A successful transaction should look like this. Click “View on block explorer” to view the transaction on Etherscan.

Send KTK



Status

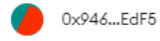
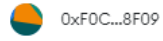
[View on block explorer](#)

Confirmed

[Copy transaction ID](#)

From

To



Transaction

| | |
|---------------------|------------------------|
| Nonce | 1 |
| Amount | -100 KTK |
| Gas Limit (Units) | 78589 |
| Gas Used (Units) | 52393 |
| Base fee (GWEI) | 0.000000008 |
| Priority fee (GWEI) | 1.5 |
| Total gas fee | 0.000079 SepoliaETH |
| Max fee per gas | 0.000000002 SepoliaETH |
| Total | 0.00007859 SepoliaETH |