

Mine It – Basic Proof-of-Work Simulation



**Objective/Aim:**  
  
 To simulate the Proof-of-Work (PoW) process by mining blocks and understand how nonce and difficulty affect block validation.

**Apparatus/Software Used:**

* Laptop/PC
* Blockchain Demo website → [Proof of Work Simulator - Blockchain Academy](https://blockchain-academy.hs-mittweida.de/2021/05/proof-of-work-simulator/)
* Browser

**Theory/Concept:**

* Proof-of-Work (PoW): A consensus algorithm requiring miners to solve computational puzzles.
* Nonce: A number adjusted until the block’s hash meets difficulty conditions.
* Difficulty: Defines how many leading zeros a valid hash must have.
* Mining: The process of finding this valid hash.



**Procedure:**

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* Open the Blockchain Demo website.
* Enter some data into the block and observe the hash.
* Change nonce manually and check how the hash changes.
* Click Mine → system adjusts nonce until hash meets difficulty.
* Increase difficulty level and observe mining time.

**Observation:**

* Changing data or nonce changes the block hash.
* Mining finds a nonce that produces hash with required leading zeros.
* Valid hash satisfies current difficulty setting.
* Higher difficulty increases mining time.
* Modifying block data invalidates the block (chain breaks).

