

Three Dice Decentralized Consensus Algorithm

Step1. Independent verification of each transaction

Verify each transaction

After the validating transactions, a bitcoin node will propagate the new transactions and add them to the memory pool (transaction pool), where transactions await until they can be aggregated (mined) into a candidate block by a mining node.

Step2. Independent aggregation of transaction into candidate blocks

Aggregate (mine) transactions into new candidate blocks

Step3. Independent verification of each block

Verify new candidate blocks

Assembly into a blockchain

Step4. Independent selection of blockchain

Select the blockchain

Item	Three dices
Encoding	Dice 1 + Dice 2 + Dice 3
Objective	Throwing two dices whose summation is less than a specified number (= target = difficult target).
All possibilities	3 (both dices are 1) – 18 (both dices are 6)
Related to mining	One can estimate the amount of work it takes to succeed from the difficulty imposed by the target. For example, If the target of the dice game is 3, if someone has succeeded in casting a winning throw it can be assumed that they attempted, on average, 216 throws.
Total possible outcomes	$216 = 6 * 6 * 6 = 6^3$ Each die has 6 outcomes
Easy Target	Target is 12 The player must throw $11 = 12 - 1$ or less to win. The sum of win's combinations is $(1 + 3 + 6 + 10 + 15 + 21 + 25 + 27 + 27) = 135$ The probability of win is $135/216 = 5/8$
Difficult Target	Target is 5 The probability of the sum is less than 5. The player must throw $4 = 5 - 1$ or less to win. The probability of the player will lose is $4/216 = 1/54$