

ERC-20, ERC-721, and ERC-1155 Token Standards Compared

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Ethereum token standards define how smart contracts implement tokens on the blockchain. Three standards dominate the ecosystem: ERC-20 for fungible tokens, ERC-721 for non-fungible tokens, and ERC-1155 for a hybrid multi-token system. Each serves a distinct purpose and carries different technical trade-offs.

ERC-20: Fungible Tokens

Proposed by Fabian Vogelsteller in 2015, ERC-20 is the foundational standard for fungible tokens — units that are interchangeable and identical in value. Every token within a single ERC-20 contract is equivalent to every other token of the same contract, much like dollar bills. The standard defines six mandatory functions: `totalSupply`, `balanceOf`, `transfer`, `transferFrom`, `approve`, and `allowance`. This predictable interface allowed wallets, exchanges, and protocols to integrate any ERC-20 token without custom code. Most ICO tokens, stablecoins like USDC, and governance tokens like UNI use this standard. Its main limitation is that it cannot represent unique assets, and it has a known vulnerability where approving a spender and then transferring tokens can lead to double-spend exploits if not handled carefully.

ERC-721: Non-Fungible Tokens

ERC-721, finalized in 2018 by William Entriken and others, introduced non-fungibility to Ethereum. Each token has a unique `uint256` identifier, and ownership is tracked per token ID rather than per address balance. The standard mandates functions like `ownerOf`, `safeTransferFrom`, and `getApproved`, plus support for the ERC-165 interface detection standard. This design made ERC-721 the backbone of NFT collections such as CryptoPunks (retroactively compatible), CryptoKitties, and Bored Ape Yacht Club. One significant drawback is gas inefficiency: transferring or minting multiple ERC-721 tokens requires separate transactions for each token ID, which becomes expensive at scale. Storage of metadata is also outside the standard itself, typically handled via a `tokenURI` function pointing to off-chain JSON.

ERC-1155: Multi-Token Standard

ERC-1155 was proposed by Witek Radomski of Enjin in 2018 and addresses inefficiencies in both prior standards. A single ERC-1155 contract can manage multiple token types simultaneously — both fungible and non-fungible — each identified by a uint256 ID. Its most practical feature is batch operations: the `safeBatchTransferFrom` function allows transferring multiple token types in a single transaction, significantly reducing gas costs. Games like Gods Unchained use ERC-1155 to manage cards of varying rarity and quantity within one contract. The standard also includes a `balanceOfBatch` function for querying multiple balances at once. The trade-off is increased implementation complexity and slightly less tooling support compared to the older standards, though major wallets and marketplaces now handle ERC-1155 reliably.

Choosing the Right Standard

ERC-20 remains the correct choice for currencies, rewards points, or any asset where units are interchangeable. ERC-721 suits one-of-a-kind assets where individual provenance matters. ERC-1155 is optimal for applications managing diverse asset inventories, particularly in gaming or platforms issuing both limited-edition and unlimited-supply items. Gas cost, contract complexity, and ecosystem tooling support should all factor into the decision. Understanding these differences prevents costly redesigns after deployment.

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The following pages list 40 example seed phrases assembled from the 2048-word BIP39 dictionary.

- 1) nephew mosquito region skirt diet hamster couch artefact vacuum exit bird hire
- 2) security useful change fashion interest chunk brick outside category unfold fade welcome
- 3) assist renew curtain marriage trophy purchase enrich notable hockey whip tragic file
- 4) bike bubble ride roast rail among eagle obvious code toy possible dumb
- 5) decorate top term home swarm peace cruise rare bone mutual lounge usage
- 6) bless angry kind depend orient rigid into rate maze onion pigeon jeans
- 7) execute scout outer royal end affair umbrella shock run drift garment enter
- 8) scare thought sudden civil security flavor chat power cradle butter pledge stomach
- 9) broom actor chase anchor group dove modify mule page swarm whip fancy

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- 10) aunt grocery right maze addict midnight barely obey asset zone wash dream
- 11) brisk dentist loop bonus scout enact cover eager embark slam ostrich margin
- 12) path dwarf seat chunk much hurdle purpose save clarify faith unveil chef
- 13) snake quality visa fancy tag enable similar rookie garbage lottery skin during
- 14) proud sunset ceiling wish unveil bachelor release begin attend crumble cat pause
- 15) junior tenant drip snack smooth future unique luggage donate express team obey
- 16) glow engine length gospel bullet tree record salad witness peanut job sugar
- 17) suit grief maximum equip picture animal stairs car describe any saddle equal
- 18) ball pony now thumb dish velvet before mystery oven vessel purpose client
- 19) visa spider april this birth cause beach neck mixture despair latin three
- 20) drip mother winner fiber cook icon destroy latin jelly book hair elite
- 21) rain element fortune prosper trust daring sketch apart state silly concert nerve
- 22) quarter umbrella remove zero scout aisle clerk insect skull network another whip
- 23) foot exchange school medal mail boost among artist water detail slam relief
- 24) between junior boil snake unknown regular misery fun stone sugar coral glue
- 25) elephant defense supply curve wisdom tragic offer spare more sport photo express
- 26) toss program cute impact hedgehog mobile coach trade degree pelican edit peasant
- 27) myself together brisk infant sick inform top busy ready sick drop grape
- 28) web awesome gospel word pigeon struggle lounge clerk shed riot company adult
- 29) bracket refuse april opinion ball dilemma legend run jelly excess broccoli tree
- 30) bird gossip diet gadget nominee walnut believe donor market decline stuff reason
- 31) dawn dynamic derive write solve useless bulk teach rebel embody hurt perfect
- 32) type embrace goat cluster people girl symptom bounce left end blue trouble
- 33) napkin over theory copper security express flag slim palace know lumber wide
- 34) praise lumber scheme pill regular stuff beauty milk tissue return fish clean
- 35) truth skull lizard mercy olympic bright lawsuit broom cage coyote excuse spring
- 36) volcano broom scan raven various school liquid viable convince slam antique raw

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37) welcome song thought toy message sustain enter because fabric scrap hope outdoor

38) ticket month appear crucial alter price later indicate syrup door jelly note

39) brave advice recall squirrel ridge sunny anxiety defy rail vacant polar curtain

40) office option rain truck custom trim movie sustain beef super razor destroy

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– Unlocking Accessibility: Fractional Ownership of NFTs — BIP39 Seed Phrases (May 28, 2026) (2026-05-28)

– Borrowing Against Your NFT Collection: Unlocking Liquidity in the Digital Age — BIP39 Seed Phrases (June 26, 2026) (2026-06-26)

– The Ongoing Debate Over NFT Royalties — BIP39 Seed Phrases (June 01, 2026) (2026-06-01)

Educational examples only. Randomly generated, not valid wallet phrases - never use them to store funds. Details: bip39-phrases.com/security/

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