SECTION 2 REVIEW: BLOCKCHAIN FOUNDATIONS

A Prison Professors Self-Directed Course

Estimated time: 60–90 minutes

Educational Boundary:

> *This review provides general education about technology and preparation. It does not provide individualized financial, investment, legal, or tax advice. It does not recommend any network, company, product, or digital asset. You do not need internet access, an account, a wallet, or a digital asset to complete this review.*

REVIEW PURPOSE

You have completed Lessons 5 through 8 of Understanding Web3. This review gives you a place to pause, strengthen your vocabulary, and connect the components of a blockchain before moving into the next section.

I encourage you to treat the review as part of the learning process rather than as a test of whether you remembered every sentence. Attempt each question first. When you find a gap, return to the lesson, study the relevant passage, and revise your response. That cycle can help you develop the habits of a self-directed learner.

THE REVIEW COVERS:

- The purpose, structure, possible benefits, and limitations of a blockchain.
- The path from a proposed transaction to a recorded block, including the role of cryptographic hashes.
- Nodes, consensus mechanisms, proof of work, proof of stake, finality, and the limits of technical agreement.
- How to distinguish a blockchain network from its native asset and compare Layer 1, Layer 2, and application-layer designs.

HOW TO COMPLETE THE REVIEW

- Write your responses on separate paper or in an approved institutional messaging system.
- Number each response so that another person can follow your work.

» Complete the knowledge questions and vocabulary matching before reading the scenario.
» Explain your reasoning in your own words when a question asks why or asks you to compare alternatives.
» Use the printed lessons when you need to check a definition or reconsider an answer. You do not need the internet.
» Do not include passwords, private keys, seed phrases, authentication codes, account numbers, or other sensitive information.

The learner-facing review does not include answers. Correct responses, brief rationales, and sample responses will appear in the consolidated appendix after all lessons are complete.

PART 1: KNOWLEDGE QUESTIONS

MULTIPLE CHOICE

1. Which statement best describes a blockchain?
   a. A system that guarantees every recorded statement is true
   b. A shared digital ledger in which records are grouped into blocks, linked in order, and maintained according to a network's rules
   c. A private password that authorizes every type of online transaction
   d. A label that applies to every conventional database
2. Which sequence best describes the general path of a blockchain transaction?
   a. Proposal, basic checking, selection into a proposed block, network agreement, and recording
   b. Recording, deletion, advertising, and automatic proof of truth
   c. Payment, bank approval, password recovery, and printing
   d. Hashing, encryption, guaranteed acceptance, and permanent secrecy
3. Which statement best describes a cryptographic hash?
   a. A reversible container that hides a message until a key opens it
   b. A fixed-length result used to represent input data and help detect change
   c. A guarantee that the input came from an honest and authorized person
   d. A timestamp that independently proves when an outside event occurred
4. Which statement accurately distinguishes a node from a miner or validator?
   a. Every node must propose a block.

b. A node may receive, relay, store, or check data without serving as a miner or validator.
c. A miner or validator cannot run network software.
d. The terms node, miner, and validator always describe the same role.

5. What problem is a consensus mechanism designed to address?
   a. How distributed participants can agree on an accepted blockchain history
   b. How to prove that every statement about the outside world is true
   c. How to eliminate all costs, delays, and concentration risks
   d. How to make every network use the same rules
6. Which statement most accurately compares proof of work and proof of stake?
   a. Proof of work uses computational work, while proof of stake uses committed value and possible penalties; both involve tradeoffs.
   b. Proof of work guarantees decentralization, while proof of stake guarantees speed.
   c. Proof of stake gives every person one equal vote, while proof of work has no participation rules.
   d. The two terms describe identical systems with different names.
7. Which question is most useful when evaluating a system described as a Layer 2?
   a. Does its name include the number two?
   b. Is its related asset increasing in price?
   c. Which Layer 1 does it depend on, what information does it post there, and what new dependencies does it introduce?
   d. Does an advertisement describe it as the fastest network?

TRUE OR FALSE

1. A network may reach consensus that a transaction belongs in its record without proving that every outside claim in the transaction is true.
2. The term Layer 3 has one universal definition that every blockchain project uses in the same way.

SHORT EXPLANATION

» In three to five sentences, explain why neither a matching hash nor network consensus proves that the information entering a blockchain was truthful and properly authorized. Identify one type of outside evidence or process that could help establish accuracy.

PART 2: VOCABULARY MATCHING

Match each term with the definition that best fits it. Write the letter of the term beside the correct numbered definition. Use each letter once.

TERMS

a. Blockchain
b. Ledger
c. Transaction
d. Hash
e. Tamper-evident
f. Node
g. Consensus mechanism
h. Proof of work
i. Proof of stake
j. Native asset
k. Layer 1
l. Layer 2

DEFINITIONS

1. A proposed action or change that a system may verify and add to its record; it does not have to involve money.
2. A base blockchain network that maintains its own ledger, consensus rules, and transaction history.
3. An organized record of transactions, events, balances, or other changes.
4. A method in which validators commit value and may face rewards or penalties as they propose or check blocks.
5. A shared digital ledger in which records are grouped into blocks, linked in order, and maintained according to a network's rules.
6. A fixed-length result produced when a hash function processes data and designed to make changes to the input detectable.
7. A computer running software that connects to a blockchain network and performs one or more network functions.
8. A digital asset built into a blockchain protocol and commonly used for functions such as paying network fees or supporting network security.

9. Designed so that an unauthorized or unexpected change leaves evidence that can be detected.
10. A method in which miners perform computational work to compete for the opportunity to propose blocks.
11. The collection of rules, processes, and incentives that helps distributed participants agree on an accepted blockchain history.
12. A system built on or connected to a Layer 1 that processes or organizes activity and relies on that base network in a defined way.

PART 3: APPLIED SCENARIO — A SHARED LEARNING RECORD

Five community organizations offer educational programs. They want to create a shared record of course completions while keeping sensitive learner information outside the shared system. A technology provider proposes the following design:

- An authorized organization submits a digitally signed completion record. The proposal is treated as a transaction.
- Software checks the transaction's format and signature. Accepted transactions are grouped into blocks.
- Each new block contains a hash-based reference to the previous block.
- Each organization operates a node that keeps a copy of the record and checks blocks against shared rules.
- Selected validators commit value under the system's rules, propose or vote on blocks, and may face penalties for provably conflicting conduct.
- The provider calls the system a Layer 2, but its proposal does not identify the Layer 1, explain what information will be posted to that base network, or describe what happens if the connection fails.

The provider's promotional materials state: "Our blockchain is immutable. Consensus proves every completion record is genuine. Because the system is fast and its native asset has a high price, it is the best design for educational credentials."

SCENARIO QUESTIONS

1. Identify the transaction, block, hash reference, nodes, and validators described in the proposal. Explain the function of each.
2. What could the hash-based reference help the organizations detect? What could it not prove about a learner's course completion?
3. What could consensus establish about the shared record? What outside facts would still require evidence, authorization, or review?

4. Which details suggest that the proposal uses a proof-of-stake approach? What additional information would you request before evaluating its security and concentration risks?
5. What information would the provider need to supply before the organizations could evaluate the Layer 2 label and its dependencies?
6. Compare the proposed blockchain with the alternative of one trusted organization maintaining a conventional database. Identify one possible benefit and one limitation of each design. Then recommend the next step the organizations should take before choosing, and explain your reasoning.

COMPLETION CHECK

Before moving to Section 3, ask yourself whether you can:

- Explain a blockchain using the ideas of a ledger, transactions, blocks, links, and a network.
- Describe how a hash can help reveal a change without proving that the original information was true.
- Distinguish a node from a miner or validator and explain the purpose of consensus.
- Compare proof of work and proof of stake without assuming that either method removes every risk.
- Distinguish a network from its native asset and evaluate Layer 1 and Layer 2 claims by examining evidence and dependencies.

If one statement remains difficult, return to the relevant lesson and write a brief explanation in your own words. That review is evidence that you are monitoring your understanding and directing your learning.

SUBMISSION REMINDER

You may submit your completed review as a dated Profile journal entry, subject to your facility's rules. Include your name or approved Profile identifier, Understanding Web3 — Section 2 Review, and the date you completed the work.

Use one of the established Prison Professors Profile methods:

- Send it by institutional email to Playbook@PrisonProfessors.org. Suggested subject: Web3 Section 2 Review — [date completed].
- Send it by postal mail to: Prison Professors, 1205 BMC Drive, Suite 706, Cedar Park, TX 78613.

» Send it to an approved family member or supporter who can enter it in your Profile at PrisonProfessors.org.

Keep a copy when circumstances permit. Never include passwords, private keys, seed phrases, authentication codes, account numbers, or other sensitive credentials.