

Voting Lab: Hands-On Governance

Practical Exercise P01

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Prerequisite: Lesson 9 (Voting Systems)

Today's exercises:

- 1 Set up MetaMask wallet (15 min)
- 2 Receive VOTE tokens via airdrop
- 3 Cast votes on Snapshot.org (20 min)
- 4 Analyze voting results (25 min)

Learning outcomes:

- Experience blockchain voting firsthand
- Understand wallet security basics
- Analyze governance data critically

All exercises use Polygon network (low cost, real blockchain). Allow 60–90 min total.

Exercise 1: Wallet Setup

Step 1: Install MetaMask

- Go to <https://metamask.io/download/>
- Install browser extension

Step 2: Create wallet

- Create strong password
- **CRITICAL:** Write down 12-word recovery phrase on paper
- Never share recovery phrase with anyone!

Step 3: Connect to Polygon

- Network dropdown → Add Network → Polygon Mainnet

Step 4: Share your address

- Copy wallet address (0x...)
- Submit to instructor for airdrop

Estimated time: 15 minutes

NEVER share your recovery phrase!

Safe practices:

- Write recovery phrase on paper (not digital)
- Store in secure location
- Never enter phrase on any website
- Only connect to trusted dApps

Your wallet address (0x...) is safe to share—it's like an email address, not a password.

Real crypto: same security practices apply to real assets

Exercise 2: Voting on Snapshot

Step 1: Connect wallet

- Go to <https://snapshot.org/>
- Click “Connect wallet” → MetaMask

Step 2: Find course space

- Search for space name (provided by instructor)
- Click “Join” to follow

Step 3: Cast vote

- Find active proposal
- Select your choice
- Sign message (free, no gas!)

Step 4: Verify

- Confirm vote recorded
- Note your voting power

Estimated time: 20 minutes

Why off-chain voting?

- Free to vote (no gas fees)
- Fast results
- Still verifiable via signatures

Voting strategies we may use:

- **Single choice:** Pick one option
- **Weighted:** Distribute 100% across options
- **Quadratic:** Cost = votes²

What happens after?

- Results are advisory (Snapshot)
- Or executable via Governor contract (Tally)

Over 20,000 spaces use Snapshot for governance

Exercise 3: Analyze Results

Data to collect:

- Total voters and voting power
- Vote distribution by option
- Top 5 voters by VP

Analysis tasks:

- 1 Calculate Gini coefficient (inequality measure)
- 2 Counterfactual: What if quadratic voting?
- 3 Counterfactual: What if 1-person-1-vote?
- 4 Remove top 3 voters: Does outcome change?

Written analysis (200-300 words):

- Is the current system fair?
- What alternative would you recommend?

Estimated time: 25 minutes

Calculating Gini Coefficient

Gini coefficient: 0 = equal, 1 = one person has everything

Formula:

$$G = \frac{2 \sum_{i=1}^n i \cdot VP_i}{n \sum_{i=1}^n VP_i} - \frac{n+1}{n}$$

Where VP_i is voting power sorted ascending, i is rank

Example:

- 4 voters with VP: [10, 20, 30, 40]

- $G = \frac{2(1 \cdot 10 + 2 \cdot 20 + 3 \cdot 30 + 4 \cdot 40)}{4 \cdot 100} - \frac{5}{4}$

- $G = \frac{2 \cdot 300}{400} - 1.25 = 0.25$

Gini $\hat{=}$ 0.6 suggests high inequality

Submit by end of session:

- 1 Screenshot of successful vote
- 2 Data collection table (voters, VP, distribution)
- 3 Gini coefficient calculation with work shown
- 4 Counterfactual analysis (3 scenarios)
- 5 Written analysis (200-300 words)

	Component	Points
Grading:	Data accuracy (correct values, no errors)	20
	Gini calculation	20
	Counterfactual analysis	30
	Written analysis	30
	Total	100

Submit via course LMS

Exercise files:

- `exercises/01_wallet_setup.md`
- `exercises/02_snapshot_voting.md`
- `exercises/03_analyze_results.md`
- `exercises/smart_contract.sol`

External resources:

- MetaMask: <https://metamask.io/>
- Snapshot: <https://snapshot.org/>
- Polygon: <https://polygon.technology/>

Need help?

- Raise hand for instructor assistance
- Check FAQ in course materials

Good luck with the exercises!