

Lightning Relay Race

This is a hands-on exercise where students send and receive real sats using the Lightning Network. Explain to students the Lightning wallet download and setup process. The instructions for installing a wallet are in the Lightning chapter. Reassure them you will guide them through the installation prompts, like creating a new wallet versus restoring an existing one. Once everyone has a wallet, you will start to send sats to each other! The goal is for each student to both receive and send sats. For large classes, divide students into groups. They will send sats to everyone within their group.

 ACTIVITY TYPE Experiential learning · Discussion	 DURATION 45 min	 PARTICIPATION Whole class · Small groups
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MATERIALS

- Students will need access to a Lightning wallet, ideally their own. If they do not have phones, find assistants willing to use their phones in class.
- Internet access.
- Sats loaded on a Lightning wallet for you to start the relay.

PREPARATION NOTES

Allow 20 minutes of preparation time.

Research which Lightning wallet you are going to recommend to your students. Verify it is working correctly in your region. It will be frustrating for your students and embarrassing for you if there is an issue.

Research and decided upon a backup Lightning wallet. Verify it is also working in your region. Lastly, verify how current on-chain bitcoin transaction fees impact the wallets you are planning to use.

Allow 45 minutes of class time.

The technical skill level of your students will impact how long it takes to conduct the Lightning Relay. Consider teaming more technical students with the less technical so they can help them.

Plan on spending half your activity time assisting students in setting up their Lightning wallets.

SETUP

There is nothing to set up other than having your Lightning wallet ready to go with some sats to start the relay.

PROCEDURE

Step 1: The First Payment

As the teacher, you will start off each group by sending the first payment.

Ask one student in the first group to generate a Lightning invoice, address, or QR code to receive bitcoin.

Then send them 21 sats.

Once they verify they received the sats, tell them to relay those sats to the next person in their group. Remind them the goal is for everyone to both receive and send sats.

Move to the other groups to get them started as well.

If the amount of sats available to send is less than 21, use the opportunity to discuss payment routing fees. Tell them to max out how much of the 21 they can send.

Step 2: Route More Payments

Walk from group to group to ensure the Lightning relay is going smoothly.

Verify all students are participating. Remember the goal is for every student to receive and send.

Step 3: Discussion Time

Once everyone in the class has successfully sent and received a Lightning payment, the last person in the relay sends the sats back to the teacher.

Then lead an open discussion about their experience.

KEY POINTS

1. Using a Lightning wallet will build your confidence to receive and send real sats.
2. Pay attention to units. Some wallets allow users to send bitcoin OR sats (1/100,000,000 of a bitcoin).
3. Lightning payments can sometimes get hung up in routing, especially for larger payments. Although possible, this kind of user experience is becoming less common as the network matures.

DISCUSSION QUESTIONS

- Were there any difficulties setting up your wallet?
- Was sending a payment easy?
- How fast were payments?
- Did you notice how expensive / inexpensive payments were to route?
- What is hard to understand about the Lightning Network? What is easy?

NOTES

Verify with your instructor if/how current on-chain Bitcoin transaction fees will impact the specific Lightning wallet you use.

ADDITIONAL RESOURCES

- [Video](https://youtu.be/yKdK-7AtAMQ)
<https://youtu.be/yKdK-7AtAMQ>
“Bitcoin Lightning Network Explained: How it Actually Works” by CuriousInvestor on YouTube uses animation and analogies to explain Lightning. <https://youtu.be/yKdK-7AtAMQ>
- [Book](https://www.lynalden.com/lightning-network)
<https://www.lynalden.com/lightning-network>
“A Look at the Lightning Network” by Lyn Alden goes deep into how Lightning is helping Bitcoin move from a store of value to a medium of exchange. <https://www.lynalden.com/lightning-network>
- [A • Activity sheet \(designed handout\)](https://qr.myfirstbitcoin.org/lightning.pdf)
<https://qr.myfirstbitcoin.org/lightning.pdf>