# The Need for Addressing

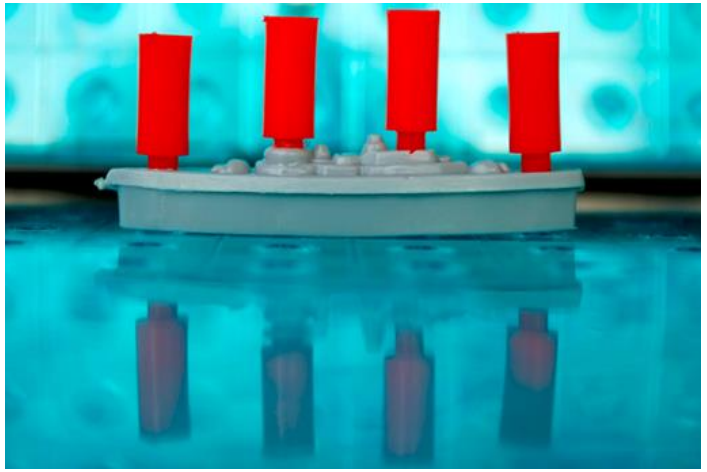
Unit 1 Lesson 9 (U1L9)

# Unit 1 Lesson 9 (U1L9a)
# The Need for Addressing

So far we have only solved Internet problems when you are connected to one other person (so-called "point-to-point" communication). Obviously, the Internet is bigger than that, and today we're going to look at problems that involve multiple people.

Today we’re going to be playing a game that simulates some issues that arise when constructing the internet.

How many people have played the following game?  Can anyone explain the rules to us?



# Unit 1 Lesson 9 (U1L9a)
# The Need for Addressing

# Unit 1 Lesson 9 (U1L9a)
# The Need for Addressing

Let's play a quick game of Battleship.  You probably won't finish, but will get the general idea of how the game is played.


**Broadcast Battleship**

We will play a crazy game of Battleship where instead of playing against one other person you will play multiple games against multiple other people simultaneously.

We call this "Broadcast Battleship“

In our version today, you will play in groups of 4.

To make it easier to track, we've also simplified the playing board to just a 3x3 grid.

**You do NOT want people to see where you place your ships!**

**Place your ships in DIFFERENT positions for each board.**

# Unit 1 Lesson 9 (U1L9a)
# The Need for Addressing

Play demo game with 3 groups???

## Activity Guide - Broadcast Battleship Game Board

**Battleship Directions:**

1. Write in the names of your partners on the lines below.
2. Shade in boxes for your ships' locations in the "My board" sections. Ships are 2 units long and are either horizontal/vertical, no diagonals.
3. You can have a different ship placement for each opponent.
4. Don't show your board to your opponents! Record each hit with an "X" and miss with an "O."

Partner #1:_____

My board

| | A | B | C |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |

Their board

| | A | B | C |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |

Partner #2:_____

My board

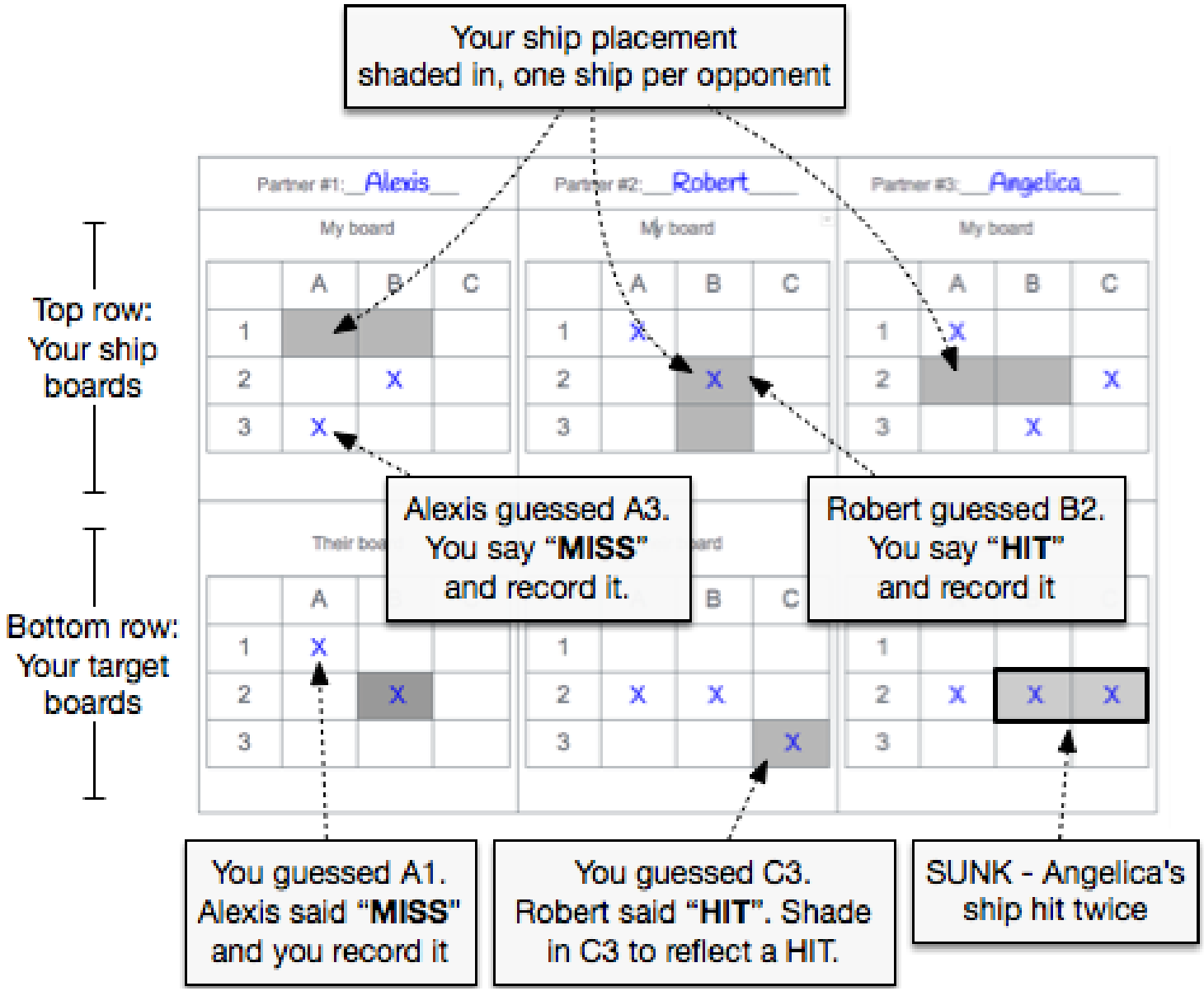
| | A | B | C |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |

Their board

| | A | B | C |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |

If you are in a group of 3, you do not need this column!

# Unit 1 Lesson 9 (U1L9a)
# The Need for Addressing



**Broadcast Battleship**

Any clarifying questions?

You and your team have 5 minutes to play your first game.

Remember, don’t let anyone see your board.

**If you finish early, do NOT start a second game.**

**Broadcast Battleship**

It seems that most of you have figured out a way to play battleship with your group.

You will start a NEW game in a few minutes.

We are going to add a **new challenge**:

Your team is going to have to play Battleship **without talking**.

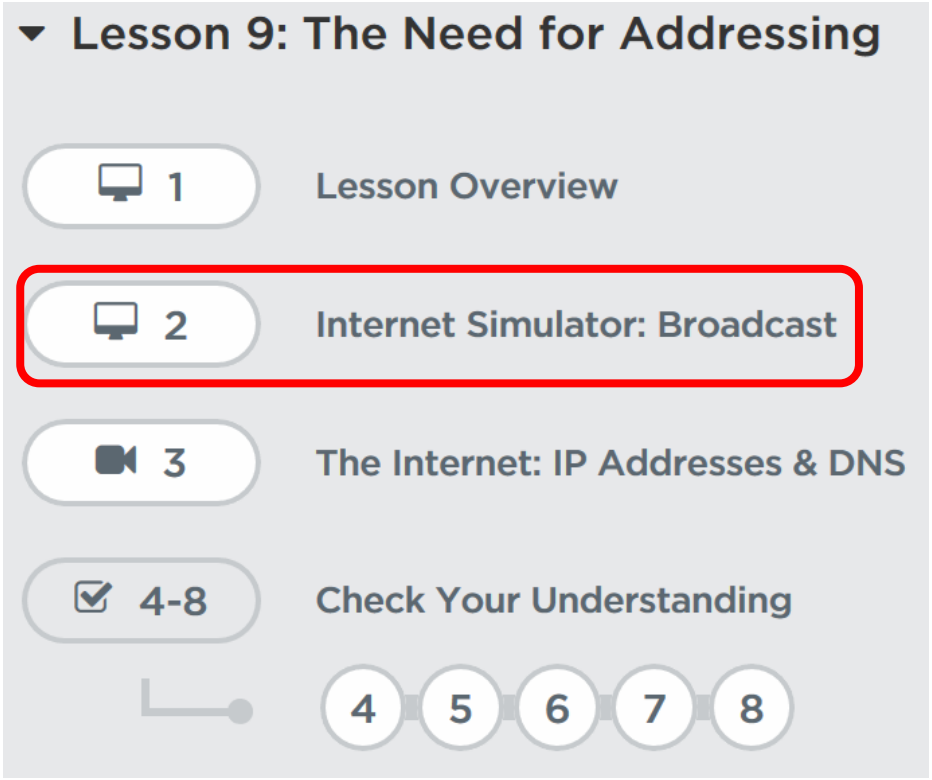
You will only be able to use the Internet Simulator to communicate.

# Unit 1 Lesson 9 (U1L9a)
# The Need for Addressing

Spend 3 minutes exploring what is new in the Internet Simulator.

What are some of the differences in this new version?

1. You connect to a “Room” with other people, instead of an individual partner
2. Every message that is sent gets broadcast to everyone in the “room,” including you.

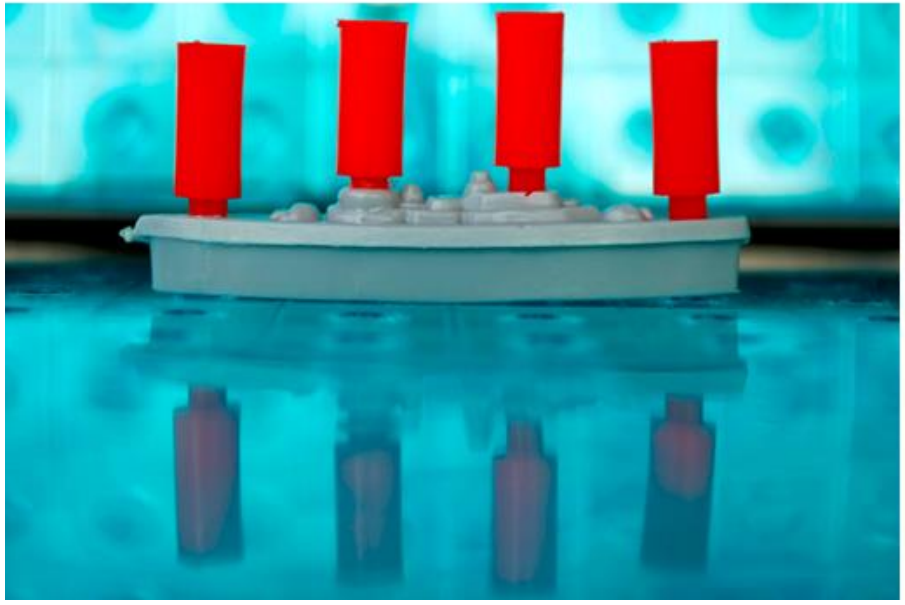


# Unit 1 Lesson 9 (U1L9a)
# The Need for Addressing

Start a new game on the other other side of your paper.

Remember, don’t let them see where you place your ship.

Remember **ABSOLUTELY NO TALKING!**

**Refine and Reflect**.

What protocol have you been using? Do you have a protocol at all?

How can you standardize your communication?

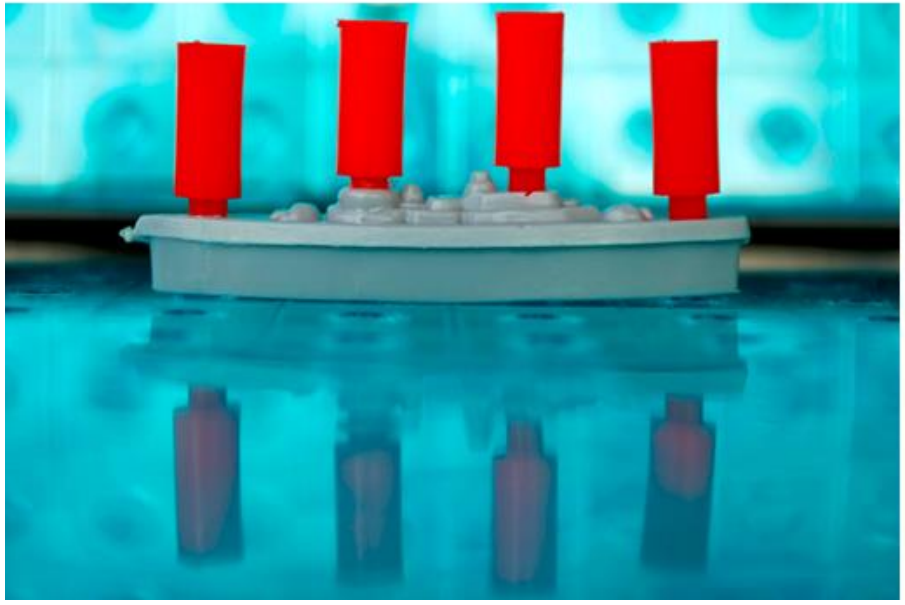
How can you make your message as clear as possible?

How can you make message as efficient (short/easy to interpret) as possible?

# Unit 1 Lesson 9 (U1L9a)
# The Need for Addressing

With your new protocol, play another game with your group.

Remember **ABSOLUTELY NO TALKING!**

**Wrap-Up**

In your notes:

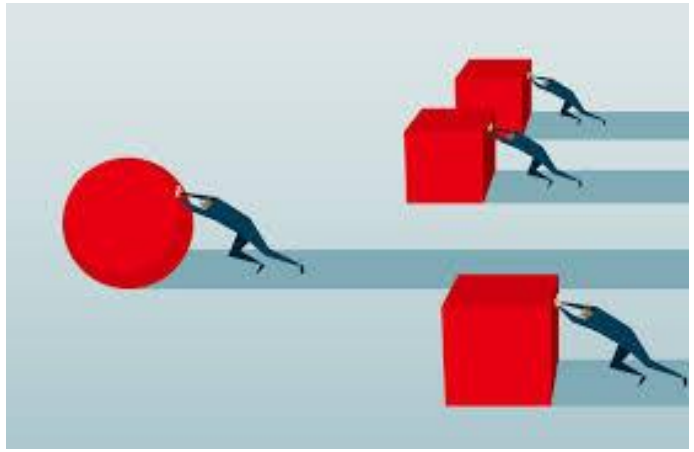
- What issues made this game difficult?
- How did you improve your protocol after your first online game?
- What would be the “best” protocol to use?

# Unit 1 Lesson 9 (U1L9b)
# The Need for Addressing

Previously you came up with a method for exchanging messages on an open broadcast channel to play multiple games of Battleship at once.

Now that you've played Battleship this way, today you are going to create an **efficient binary protocol** for playing a 3-person game of Battleship (using the same size board as yesterday) that can be played accurately over the Internet Simulator.

Let "efficient" mean that your protocol uses the **smallest** reasonable **number of bits** (0s and 1s) to make messages for Battleship that still contain **all** of the necessary information for playing the game.



# Unit 1 Lesson 9 (U1L9b)
# The Need for Addressing

Things to consider:

- How will you standardize the recipient and sender addresses?
- Should you encode people's names or (hint) use a number?
- How would a recipient of your message know where one address ends and the other begins?
- What other information do you need to include?

**Assignment (in your notes):**

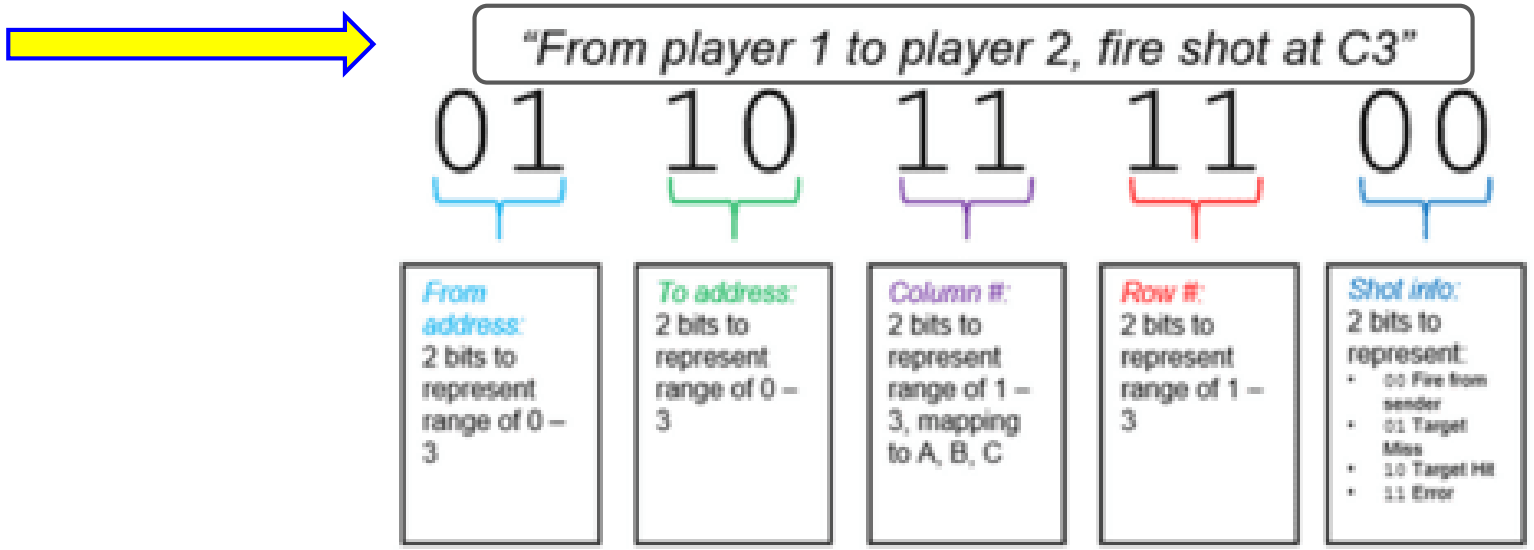
1st: clearly explain all aspects of your **BINARY PROTOCOL**, and what the different bits in a message mean/represent

2nd: write the following messages **in BINARY**, using your protocol

Message 1: From player 1 to player 2, fire a shot at B3
Message 2: From player 2 to player 1, B3 is a miss

Next slide contains a sample answer.

# Unit 1 Lesson 9 (U1L9b)
# The Need for Addressing



# Unit 1 Lesson 9 (U1L9b)
# The Need for Addressing

Did any other group do something similar? or something completely different?

What pieces of information were common across all of the protocols?

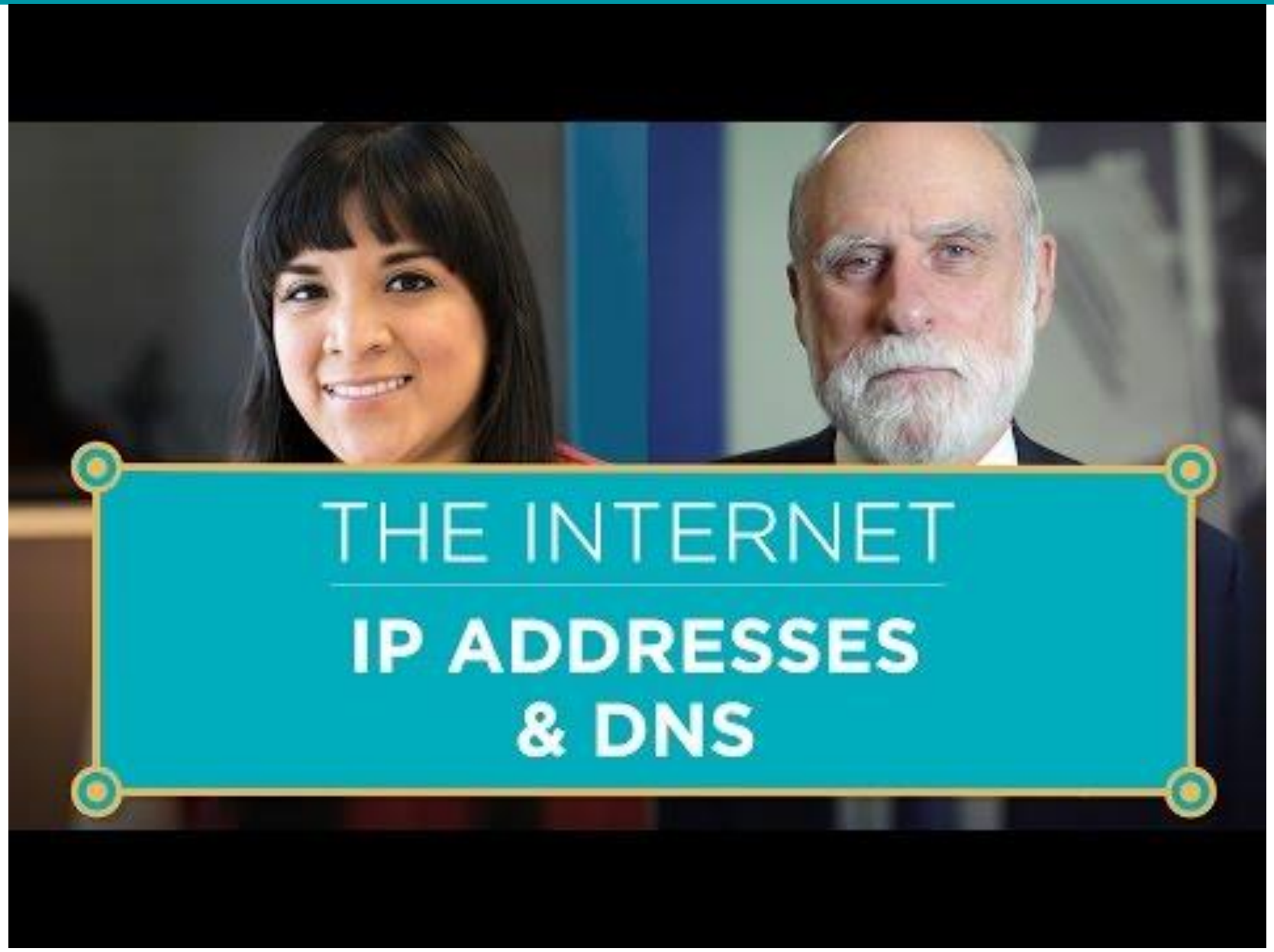
If we were to play a different game, what data would stay the same? What would change?

(Q): How does this activity have anything to do with the Internet?

(A): It turns out computers on the Internet are addressed in a similar way to phones for many of the same reasons. The real addresses used on the Internet are called “Internet Protocol Addresses” or IP Addresses for short.

# Unit 1 Lesson 9 (U1L9b)
# The Need for Addressing

The Internet: IP Addresses & DNS (6:44)




You can watch the video on your own in code.org.

While watching the following video, fill in your answers on the worksheet or digital template.

# Unit 1 Lesson 9 (U1L9b)
# The Need for Addressing