Write the name of each group member below,

Name _____

Name _____

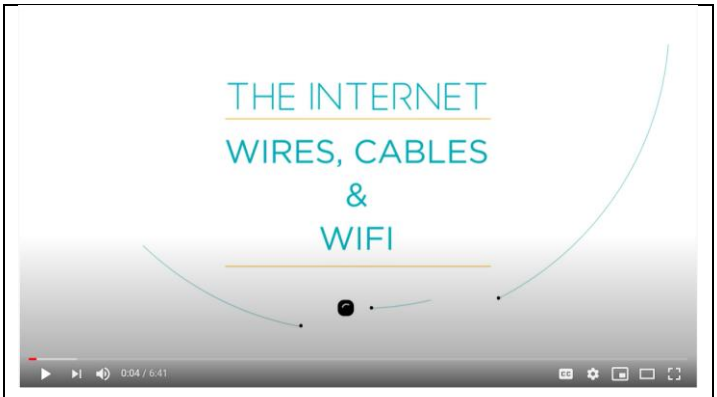
Sending Binary Messages

Your Tasks (Mark these off as you go)

- ☐ Watch the video: Wires, Cables, & WiFi
- ☐ Decode the flashlight binary signal test
- ☐ Assign group roles
- ☐ Join the Internet simulator and connect with your partner
- ☐ Develop a protocol for sending a 2-bit message back and forth
- ☐ Develop a protocol for sending an 8-bit message back and forth
- ☐ Calculate your bit rate
- ☐ Complete the reflection questions
- ☐ Receive credit for the group portion of this lab

☐ Watch the video: Wires, Cables, & WiFi

Following the link below to watch the video: Wires, Cables, and WiFi



https://www.youtube.com/watch?v=ZhEf7e4kopM

☐ Decode the flashlight binary signal test

The flashlight binary signal test simulates a flashlight turning on and off. Let the letter B represents the off position and the letter A represents the on position. Watch the first test, then decide on the message being sent,

Test 1	

Now watch the second test and decide on the message being sent,

Test 2	

After seeing Test 2, how might you revise test 1? Indicate your revised version below,

Test 1 Revised	

☐ Assign group roles

Before you continue. record your group number, then collaborate with your group and assign each person a role. Each role and a description is provided below.

Project manager (PM)	Leads the team discussion and keeps the team on task and on schedule. Make sure the final lab is submitted. Considers how the team is working and ensures all voices are hear.
Recorder (R)	Records answers for the team or ensures that all members have correct answers. Presents answers (or questions) to the class, instructor or other teams.

Group Number:	
Name	**Role**

☐ Join the Internet simulator and connect with your partner

Watch the video on how to join and use the Internet simulator.

https://youtu.be/Kn6Fd5uwZno

Navigate to https://studio.code.org/s/csp1-2018/stage/3/puzzle/2 to join the Internet Simulator and connect with your partner

Explore the tool with your partner – click all the buttons, type in the text areas what you can. You cannot break it, so do not worry!

☐ Develop a protocol for sending a 2-bit message back and forth

You and your partner will need to send a 2-bit message back and forth on the Internet Simulator. One partner will have a secret 2-bit message (for example BA).

When the partner sending the message says "Go", that partner will send the message using the Internet Simulator.

The second partner will then send the same message back. At the end, the first partner will check that the correct secret message was successfully sent back. You will need to agree on rules, or a "protocol" to make this message exchange work. Develop your protocol in the space below. Make sure you consider:

- How will you know when the exchange is supposed to begin and end?
- How will you know whose turn it is to send or receive the message?
- How will you coordinate your actions?

□ Develop a protocol for sending an 8 bit message back and forth

Does the protocol you developed above work for an 8 bit message (for example AAABBBAA? If so great! If not, revise your protocol to account for a longer sequence. Write your new protocol below,

□ Calculate your bit rate

A **bit rate** is a measure of how fast a system transmits bits. You can calculate your protocol's bit rate by dividing the number of bits sent by the amount of time it takes. Note, if you send 4 bits back and forth, you've actually transmitted 8 bits (4 bits to your partner + 4 bits back to you equals 8 bits)

Try sending an 8 bit signal to your partner and have them send it back for a total of 16 bits. How long does this take? Record the bits, the time, and the bit rate for your best run.

Bits Transmitted: _____ Time in Seconds: _____ Bit rate: _____ bits/sec

□ Complete the reflection questions

Now that you have completed the lesson, in your group discuss what you think is meant by each term. Write definitions to these terms below,

Protocol	

Bit	
Bandwidth	
Bit Rate	
Latency	

Why is it important to communicate a timing protocol prior to sending a message?

Refer to the video that we watched earlier in the lesson. Indicate the pros and cons of each of the following for transmitting data over the Internet.

	Pros	**Cons**
Electricity		
Light		
Radio waves		

Refer to the video that we watched earlier in the lesson. Where is copper wire most commonly used? Why don't we use it everywhere?

Refer to the video that we watched earlier in the lesson. Where is fiber-optic cable most commonly used? Why don't we use it everywhere?

Refer to the video that we watched earlier in the lesson. Where are radio waves most commonly used? Why don't we use them everywhere?

☐ Receive Credit for the group portion of this lab

Make sure indicate the names of all group members on this lab, the Project Manager is charge of submitting this lab