APH Coding Symposium
Code Jumper Lesson Plan (Unplugged)

Audience:	Beginning coding concepts
Duration:	**Getting Started: (2-5 mins)** ● What are computer networks? ● Kindness Counts **Activity: (20-30 mins)** ● <u>Facilitate and support students to complete the tutorial</u> **Wrap-up: (5-10 mins)** ● <u>Debrief and close</u> **Assessment/Extended Learning: (2-5 mins)** ● <u>Optional</u>

Learning targets (what do I want the students to learn?)

In this lesson, learners explore networks in a hands-on unplugged experience using typical materials found in a classroom. The theme for this lesson is around messages of kindness to others.

Objective #1	Understand what a network is and how data is transmitted over a network.
Objective #2	Create a kindness card with a caring message to a classmate.

Vocabulary terms for this lesson:

Network: A group of computers or electronic devices connected together by cables or Wi-Fi to share data and resources.

Network pathway: The information travels either wirelessly through the air, or through a cable

Packet: A unit of data sent from one computer or device to another over a network.

Hub: A physical networking device which is used to connect multiple devices in a network.

Switch: A switch is a networking device the connects devices in a network and uses packet switching to send and receive data over the network.

Router: router is a physical or virtual appliance that passes information between two or more packet-switched computer networks.

Materials needed (What I need to teach the lesson?)
● Large spool of string or yarn

- Tape
- Network Address Cards (three index card per students, should have student name and network address)
- Message Cards (three index card per student with a different network address on each one)
- Envelope with single hole punched in teh corner (one per students)
- Large paper clips (one per students)

Lesson procedure: (how am I going to teach this lesson?)

Setup

Arrange the room with enough desks in a circle around one chair in the center of the room. Attach a piece of string with tape to each desk so that the length of the string is long enough to reach the chair in the center of the room.

Create a table to identify the student's name with their assigned Network Address Card.

Network Address numbers should be easily identifiable by the students. (For example: 10, 12, 14, 16)

This should include the student's preferred media such as Braille, as well as print.

Make sure that each desk has the following:
- One large envelope with a single hole punched in the corner
- One paper clip
- One network address card with student's name and Network Address
- Three message cards with a different Network Address on each one

Getting Started (2-5 mins)

Introduce the activity (2-5 minutes)

As students enter the classroom, welcome them to their computer class network, verbalize that changes have been made to the room and instruct students where they will need to go.

Introduce the idea of why Kindness Counts. Ask students to come up with a definition of kindness, why it is important and then name an act of kindness that they have seen or done this week.

Direct students to the activity (1 minute)

When students reach their assigned desk, identify the supplies on their desks:
- 2 network pathways: string
- 2 sets of data packets: envelopes, message cards, and address cards with the student's name up.
- 2 links to the network pathway: Paperclips
- Writing utensil and/or Braillewriter

Ensure that all materials have been adapted to the needs of each student in the classroom. For large print users, ensure there is a larger card and larger envelope

Activity (20 mins)

Facilitate and support students to complete the tutorial, alone or in groups

1. Direct students to find the desk with their name. Assist students as needed.

2. Ask students how they think an email sent from one computer gets to another computer. Explain that data and information travel over a huge network of virtual wires that cover the world until it reaches the target computer. If using a visual for this, ensure there is a tactile graphic version available as well. This can be done with string glued to paper, or wax sticks.
3. Review that a network is a group of devices connected together to share data and resources, just like their classroom is now. Each desk represents a computer in the network that is connected by the string to a central location, which is the teacher at the center of the room.
   There are different types of these central locations:
   - Hub
   - Switch
   - Router
4. Explain to students that each of the desks in this activity has a unique network address found on the cards and that each desk is part of the network.
5. The class is going to simulate a network that will transmit data over a network. A unit of data sent from one computer or device to another over a network is called a packet. Tell students to think of a packet like an envelope and explain that they are going to transmit a unit of data over the network pathway.

Hub:
1. The first type of delivery system is the **Hub**: in this method, students will try and find the correct recipient by walking around the room and looking for the correct person.
2. Have students write a message of kindness on one of the cards. If a student is using Braille, have the student ask their table partner to write it in print on the card as well.
3. Have two table groups go at a time to try and find the correct person. For students with a visual impairment that might need assistance in a different room setup, have the table pairs use sighted guide to move around the room, or instruct to use their white cane.
4. Regroup and ask students if this was an efficient way to get your message to the correct person.

Switch:
1. The second method is using a **Switch**: in this method, students send their messages down the string to the teacher who then sends it on to the correct person. Verbally explain the entire set up to ensure a student with a visual impairment can understand the concept and layout.
2. Ask the students to write a message of kindness on the second message card.
3. Students then put the message card in one envelope and attach the paperclip to the envelope by using the hole in the corner of the envelope. Then, ask students to attach the paper clip to the string and wait for further instructions.
4. Choose a student to send the first message. Ask the student to push the packet down the string to the teacher in the center of the room. Lower the string to have gravity assist the packet along or ask the student to trail along the string to push it to the teacher. The teacher in the center opens the data packet and then sends it down the correct string to intended recipient. Use the table to easily determine who is which number.
   For a student with a visual impairment, have them walk through the entire process. Walk the packet down the teacher, then transfer to the new string and walk it down the correct student.
5. Repeat this process for each student, verbalizing what packets are being sent and received.
6. As students receive their data packets, instruct them to open the envelopes, take out the message card, read it and then place it on their desk.

Router:
1. The third message will be going through a **Router,** a router will send the information to a computer outside of the current network, in this instance the classroom.

2. This message of kindness will be for someone outside of the classroom, this can be another classroom or even the office staff!
3. Have students send the third message down to the string to the teacher, who will then gather them up, put then in a large envelope and deliver them to the appropriate network (room).

Wrap-Up (5-10 mins)

Debrief & Close
Discuss as a group what they observed and the differences between the types of network delivery systems they participated in this activity to help them understand computer networks. Have students think about the impact of receiving a message of kindness either from a stranger or someone you know.

Other ideas
During remote learning, students can create a kindness card and send it through the mail. Students can mail their messages of kindness to the teacher at school who can then send it on to the intended recipients, showing how messages can be forwarded on.

Assessment/Extended Learning (2-5 mins)

Optional
Time permitting, challenge your students to reflect on the day's activities and continue their learning. Consider:
- **Send more data packets.** Ask students to create an additional message to send to a different recipient.
- **Writing prompt.** Journal about the impact of sending a message of kindness, and all the different ways the message can be sent.