Lesson 2: Data packets

Year 6 – Computing systems and networks – Communication and collaboration

National Centre for Computing Education

Raspberry Pi

Lesson 2: Data packets

To recognise how data is transferred across the internet

- I can identify and explain the main parts of a data packet
- I can explain that data is transferred over networks in packets
- I can explain that all data transferred over the internet is in packets

Sending data

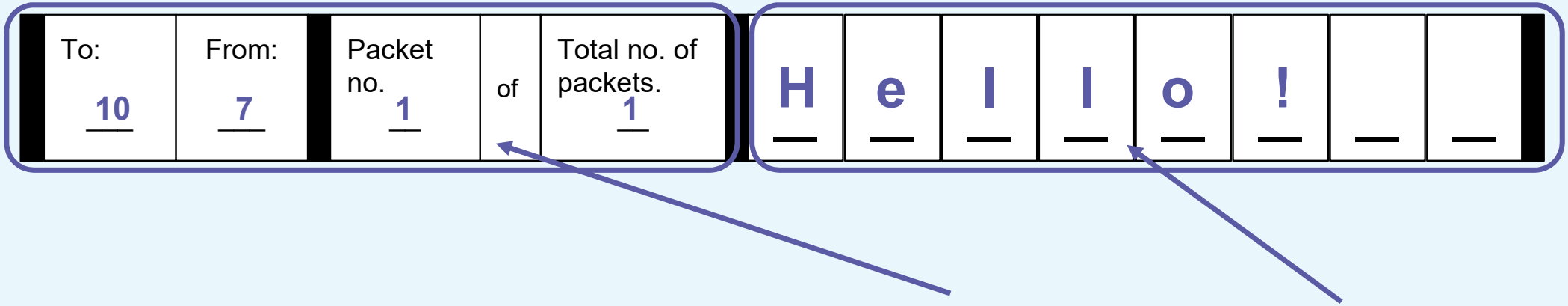
Think about what you learned in the last lesson as you watch this video.

Packets

To:	From:	Packet no.	of	Total no. of packets.								
___	___	__		__								

Computers send **data** across the internet in **packets**. This is a example.

Parts of a packet



There are two main parts to a packet: the **header** and the **data payload**.

Data packets are similar to letters

The envelope is like the **header**. It contains the address. The header also contains other key information, including the sender's address.

The letter inside is similar to the **data payload**.

Packets of a message

To:	From:	Packet no.	of	Total no. of packets.								
192.168.1.10	192.168.1.4	1		2	H	i	,	_	h	o	w	_

To:	From:	Packet no.	of	Total no. of packets.								
192.168.1.10	192.168.1.4	2		2	a	r	e	_	y	o	u	?

Data you send or receive cannot fit in a single packet, so it is split into multiple packets, like this example of a message. The packet number and total number of packets is contained in the header.

Use the information in the **header** and the **data payload** to arrange the packets on your activity sheet into the correct order.

Sending messages

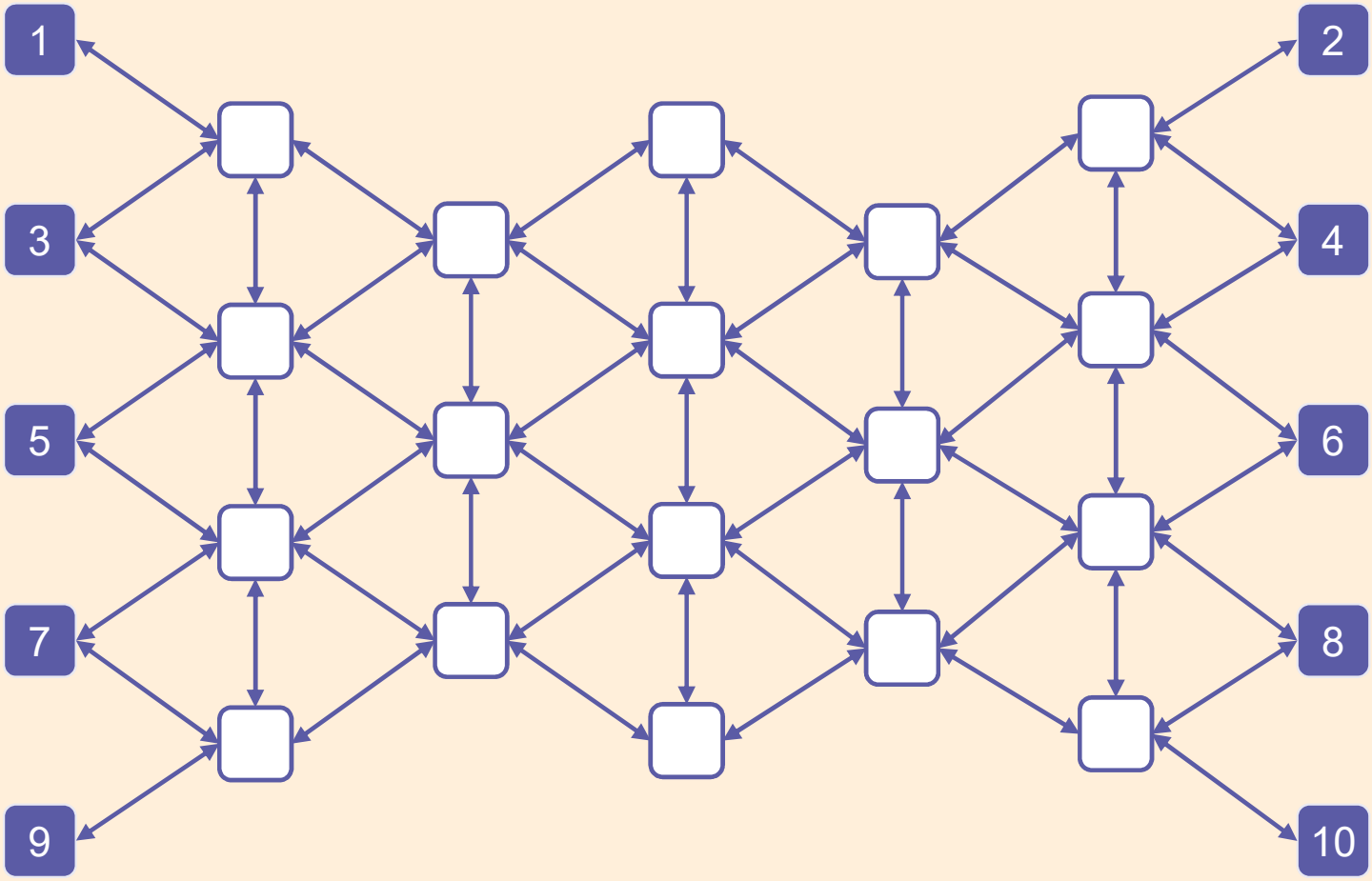
You're going to try to send messages across the classroom in packets.

In groups of **three**, you need to break your message into packets and write it on these strips:

To:	From:	Packet no.	of	Total no. of Packets	_	_	_	_	_	_	_	_	_	_	_	_

Then add the packet number and total number of packets to every strip.

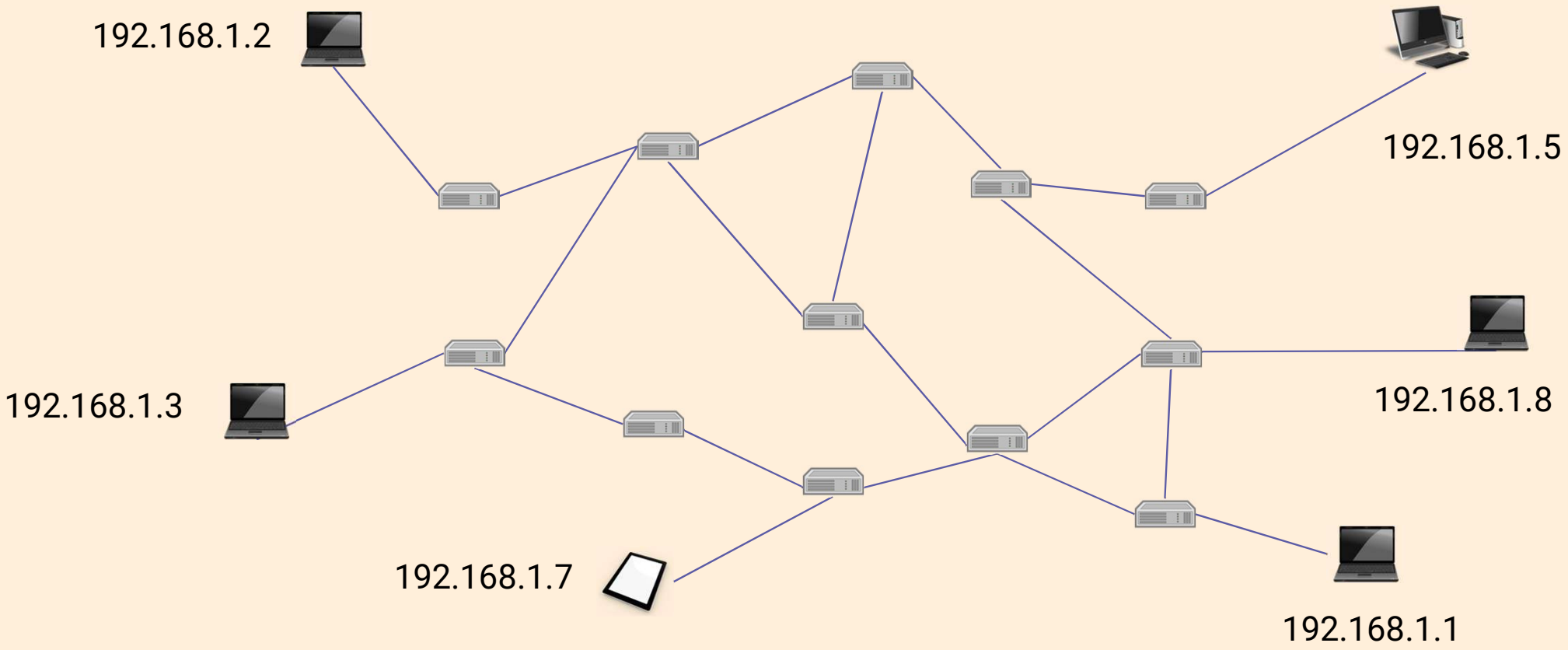
Sending messages



Sending messages

- Did the system work?
- Did all message packets travel to their destination along the same route?
- If the packet was not written correctly, would it get to its destination?

Sending data across a network



Transferring media

So far you have seen how messages can be transferred as data in packets.

Everything that is transferred through the internet is transferred in packets.

What else is transferred on the internet?

Audio

Video

Images

Transferring media

You will now simulate a picture being transferred over the internet between devices in different places.

Packet headers

How do you know the devices in your simulation are in different places?

To:	From:		Packet no.		Total no. of packets
192.168.1.3	103.244.1.1		1	of	5

The first two parts of the IP addresses in the header relate to the location of networks. If they are different, the devices are not on the same network.

Why are packets numbered?

They tell the receiving computer the total number of packets it should expect to receive. If the message is incomplete, the receiving computer can send a notification back to the sending computer.

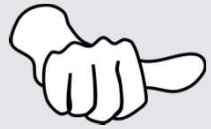
To:	From:		Packet no.	of	Total no. of packets
192.168.1.3	103.244.1.1		1		5

How confident are you? (1–3)

- I can identify and explain the main parts of a data packet
- I can explain that data is transferred over networks in packets
- I can explain that all data transferred over the internet is in packets

3 – Very confident

2 – Unsure



1 – Not confident

Next lesson

In this lesson, you…

Acted out the process of transferring packets on the internet

Found out the breadth of data that is transferred on the internet

Learnt about how computers find websites

Next lesson, you will…

Collaborate online to work on a presentation with another learner