

Networks & the Internet: Network Communication & Organization Grade Band: 3-5

Grade	Standards: NI.NCO.01
3	Recognize how information is sent and received over physical and wireless pathways.
4	Summarize how information is sent and received over physical and wireless pathways (e.g., information is deconstructed in smaller pieces called packets , transmitted to final destination, and reassembled).
5	Model how information is deconstructed into packets (smaller pieces), transmitted through multiple computing devices over the internet and networks , and reassembled at the final destination.

Grade	Essential Skills
3	Explain that information moves over the internet along physical wires and wireless connections.
4	Examine the reasons for deconstructing information into packets . Describe the role of packets in transmitting information efficiently over the internet.
5	Illustrate (in words, pictures, dramatization and/or animation) how the transmission of packets occurs through multiple devices over the Internet.

Explanation
Transmission of information over the internet occurs over a series of interconnected wired and wireless paths. To send and receive information quickly and efficiently. Most information (e.g., a photo, an email or a website) is broken into smaller pieces called packets . In addition to the original information, packets contain information about where they come from, where they are going, and how many packets total there are and their sequence. These packets may take different routes since there are usually many paths between any two points on the internet. All the packets end up at the final destination where they are reassembled into the original email, photo or website. Students should be able to model this process in a drawing, an animation, or by acting out the process.

Think of this as similar to....
Imagine that you want to send a jigsaw puzzle to a friend who is far away., but you don't want to send all of the pieces in one package. Some of the pieces you send in the mail, some you send with another friend who is going to visit and the rest you put on a train that is going to the friend's town.

Essential Questions
How is information transmitted over the Internet?
Why are packets used to help transmit information over the Internet?

Implementation Examples—What would this look like in the classroom?

Grade(s)	Title	Description	Link	Content Connection & Notes
3	Introduction to Seeing the Internet	Grade 3 --Students draw their concept of the internet and then locate physical evidence of the internet in photos and in their community. They identify wired and wireless connections along which information flows.	Introduction to Seeing the Internet	Some physical supplies needed for this lesson.
3-5	Let's Build the Internet	Grade 3 --Students build physical models of the internet and identify which objects can communicate with which other objects. Students trace information as it travels along the model network. Grade 4 --Students trace different routes that different packets might take over their model internet to get to the same destination. Grade 5 --Students model the transmission of packets over their model internet."	Let's Build the Internet Directions for the construction of a network modeling kit are included in the lesson or you can create a drawing instead.	Some physical supplies needed for this lesson.
4-5	Packet Switching Relay	Grade 4 --Students learn what packets are, why they are used, and then act out how packets are moved around the internet. Grade 5 -- Students review what packets are and why they are used and include packet movers when they act out how packets are moved around the internet."	Packet Switching Relay	Some physical supplies needed for this lesson.

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These annotations are a collaboration between [Maryland Center for Computing Education](#) and the [Maryland State Department of Education](#).