

# How the Internet Works: Routing & DNS

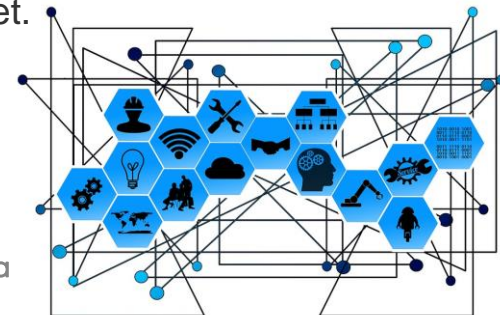
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## Journal:

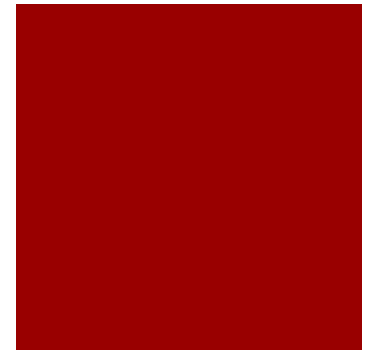
- When you type the name of a website (URL) into your browser, how does the browser know how to find that website?
- How does data get from one point to another on the Internet?

## Objectives:

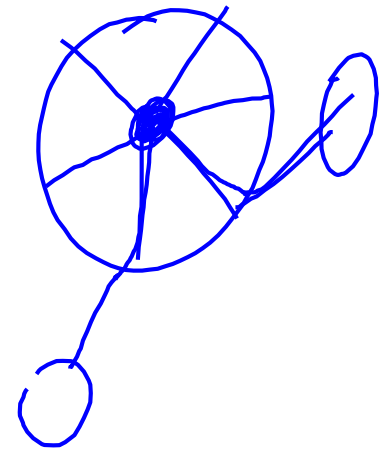
- Students will explain how routers move data from one place to another.
- Students will understand how data is encoded on the Internet.
- Students will explain how large amounts of data are managed on the Internet.



# 6 Degrees of Kevin Bacon



hubs  
+  
spokes



# A Packet's Tale



# Packet Transfer Activity A



- Protocol: “Recipient IP: \_\_, part # of total. Sender IP: \_\_”
  - IP Addresses: made up of three numbers, often correlate to your geographical location. Today, you IP address with have 3 letters.
- TCP/IP: (Transmission Control Protocol/Internet Protocol)
- Goal: send a letter from me to the correct IP address. Problem – not every computer knows every IP address, but are given the IP address of those connected to them.



# Map



<b>A.A.A</b>	<b>A.B.A</b>	<b>B.B.A</b>	<b>C.B.D</b>	<b>D.B.A</b>
<b>A.A.B</b>	<del><b>A.B.B</b></del>	<b>B.B.B</b>	<del><b>C.B.B</b></del>	<b>D.B.B</b>
<b>A.A.C</b>	<b>A.B.C</b>	<b>B.B.C</b>	<b>C.B.C</b>	<b>D.B.C</b>
<b>B.A.C</b>	<b>B.A.D</b>	<b>B.B.D</b>	<b>B.C.D</b>	<b>B.D.D</b>

*Special capabilities*

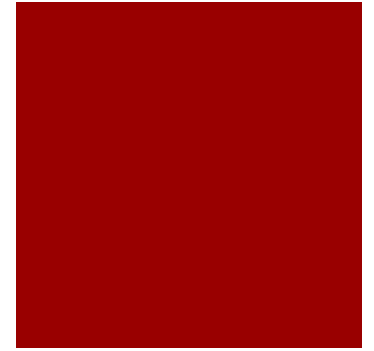
# Packet Transfer Activity A – Practice



- We are going to attempt to transmit a package from B.B.A to C.B.D. Student B.B.A - ask neighbors if they are C.B.D, or can get there.
- This request should propagate through students until someone has found C.B.D.
- C.B.D responds to their neighbor, who tells the neighbor who asked. This repetition should continue until the news has reached the original sender. B.B.A gives their message to the neighbor with the connection, and records on their paper who they went through to make the connection.
- The message is passed on to C.B.D, who opens it, and reads it.



# Problems?



# Packet Transfer Activity B

Ask a question?

2 lines = 10 words

- Our simulation of the protocol system on the Internet has been relatively tame. In reality, it doesn't always work this nicely. Sometimes packets are lost; not all the information you want to transmit fits in one packet; or some routers are unable to keep working. Fortunately, the Internet is full of redundancy that allows it to keep working even if some parts fail to work, and we can send large data sets through multiple packets. We're going to run our simulation again, but this time living in the "real world."
  - Send messages to one another, but this time, some will be mixed up a bit to simulate lost packets or unreadable data.
  - You give them a character for each packet that might require you to use multiple requests to send the information.
  - Give IP cards some identifiable characteristic with a particular characteristic that they are unable to connect to the network. The remainder of the class should to try to send messages without them.



# Stand Up, Hand Up, Pair Up

- What is the role of the IP address for each device on the Internet?
- How does redundancy of routers contribute to the Internet's ability to scale to more connections?
- In the activity, what happened when you tried to send out packets of information?
- What worked in the activity and what did not work?
- Make comparisons between what happened in the activity and what actually happens as data moves on the Internet.



# DNS



# DNS Activity

- Google Classroom

