

Understanding High Speed Internet

Evergreen Version

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Part I: Web Literacy Introduction (5 Minutes)

Introduction:

- We know that there are varying backgrounds here and different comfort levels with technology and with the Web.
- Before we dive into what high-speed networks are and the benefits they can have, we want to set make sure we have a common basis of understanding about what the internet is and a common vocabulary to work from for the rest of the day. Sound good?

Show A Packets Tale Video (linked):

- <https://thimbleprojects.org/chadsansing/125881/web-lit-basics-one/session02-ping-kong.html#step-2>

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Part II: Perform the Web (25 Minutes)

- <https://thimbleprojects.org/chadsansing/125881/web-lit-basics-one/session02-ping-kong.html#step-3>
- Form small improv groups of 4-5 actors.
- Give teams 8 minutes together to brainstorm and prepare a way to perform how the Internet works.
 - Think about how to use your space - you can perform anywhere there's room in the space around you and spread out and move around as much as you'd like.
 - Think about the materials around you and grab any props that might help you show the Net at work.
- Perform your skits for one another. Applaud your heart out for the other groups. Laugh and cheer at especially great moments of Performing the Net history!

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Part III: Sticky Note Art (15 Minutes)

Introduction:

- Now that we know how the internet works, let's explore the difference of high-speed internet networks.
- In the video we learned that the internet is about passing packets of information back and forth around the globe. In this activity, our packets were represented by post-it notes.

Instructions:

- The room divides into two groups (or more, depending on size).
- Each group is given 30 post-it notes
- Give them 5 minutes to create a sticky note art masterpiece.
- The group then forms a line from the back wall up to the front wall (or sticky note pad and easel).
- Round 1: Each group is allowed to pass 1 sticky note at a time up to the front and recreate their masterpiece.
 - Time them
- Round 2: Each group can pass 5 sticky notes at a time up to the front and recreate their masterpiece.
 - Time them

Reflection

What did you learn? What stood out to you about this? Was it any it new?

Facilitation tips:

- **The group that was only allowed to pass one post it note at a time is like traditional internet, sending one packet at a time. The other group was like a gigabit network and was able to send many more packets of information in the same amount of time.**
- But gigabit internet isn't just five times faster than traditional networks - it's 18 times faster to download and 52 times faster to upload than the average connection in an American home.
- In fact, gigabit internet allows for upload and download speeds of 1000 Mbps. That means you can download an entire two hour movie in a little under two minutes, or simultaneously watch five high-definition cat videos and still have enough bandwidth to check email and browse the web at the same time.
- Library metaphor - using a library card to check out a book one page at a time compared to a card being able check out the entire book at once.
- Before we do that, we're going to play a game to form a shared vocabulary. It's important that everyone have a voice in shaping the future of high speed technologies and the internet.

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Part IV: Speed Match (20 minutes)

Introduction (2 min)

This activity will help us understand gigabit terminology and create a common language about technology and components related to gigabit internet connectivity. Having a shared language will allow us to better understand high-speed internet and its potential impact on things like education, workforce development, and the future of the web.

You should each have one name or definition card. Please take a minute to read it. In a minute, we will ask you to find your partner - either the word that your definition describes or vice versa. Through this activity, we will teach one another terms as we introduce ourselves to one another.

The goal of the next 20 minutes is to help everyone learn some of the language typically used with high-speed networks, and to begin to feel comfortable discussing gigabit components.

Once the activity begins, you will have 5 minutes to find your match.

Facilitation note: Make sure you double up somewhere to offset an odd number of participants.

Activity (15 min)

Have participants introduce themselves to each other to figure out if they've made a match. Keep walking around the room until everyone has found their partner. (5 minutes)

Once everyone has found their match, ask each team to read their word + definition. (10 minutes)

Reflection (3 min)

After the activity is over gather everyone in a circle and ask them to discuss the activity. Ask them to describe any challenges, funny moments or interesting things they learned.

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Definitions

Packets: I am a unit of data that moves between an origin and a destination on the internet. When any file (e-mail message, HTML file, graphic, etc.) is sent from one place to another on the internet, protocols divide the files to create me to be an efficient size for routing. Typically I am made up of 1,000 or 1,500 bytes.

Latency: I am a way of explaining how much time it takes to transmit or receive packets on a network. I am affected by how far packets need to travel, how many networks packets need to travel over, and the quality of the networks the packets travel over. Gigabit internet networks typically have very low latency, meaning data travels faster.

Gigabit: I am a unit of information equal to one billion (10^9) bits. Gigabits are pretty much only ever used to describe download and upload speeds for internet connections. Gigabit Internet Connections can transfer data at a rate of 1 billion bits per second.

Byte: I am a unit of data that is usually equivalent to 8 bits. I am often used to describe file sizes and computational memory.

Bit: I am a basic unit of information in computing and digital communications, usually represented as a 1 or 0. I am the smallest unit of data in most computers.

Buffering: I am the process of storing data while it is being processed or transferred. The higher bandwidth and lower latency of gigabit internet connections reduces delays caused by buffering.

Bandwidth: I am an electronic byway that connects the internet to your computer. Increasing me allows a faster internet connection.

Fiber Optic: I am a technology that uses glass (or plastic) threads (fibers) to transmit data. Gigabit internet networks rely on me because of my capability to transmit data with high speed and low latency.

Upload: I enable a user to send data to a remote system such as a server so that the remote system can store a copy. On a gigabit network, I am usually symmetrical with download speeds, meaning users can upload and download data at the same speed.

Download: I allow a user to copy data from one computer system to another, typically over the Internet. On a gigabit network, I am usually symmetrical with upload speeds, meaning users can upload and download data at the same speed.

4K: I am the resolution of an electronic display, usually 3,840 pixels along the horizontal line of the display, and 2,160 pixels vertically. I am an example of a technology that works seamlessly on gigabit internet connections.

Internet of Things (IoT): I am a physical device - vehicle, building, or other item - that is connected to the internet, and contains electronics, software, sensors that enable me to collect and exchange data. I am an example of a technology that works seamlessly on gigabit internet connections.

Augmented reality: I am a live direct or indirect view of a physical, real-world environment whose elements are *augmented* (or supplemented) by computer-generated sensory input such as sound, video, graphics or GPS data (like on Pokemon Go!). I am an example of a technology that works seamlessly on gigabit internet connections.

Name Cards for printing -

<https://drive.google.com/file/d/0B1Tu07mQk89LQkJhRm5TQ251T00/view?usp=sharing>

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Activity Preparation *(to do ahead of time)*

Make name cards: Create name/definition cards for each of the gigabit traits listed above.

Note: You can either make the note cards on your own before the activity starts or ask your participants to help make the cards.

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Note: this is a remix of the [speed dating](#) activity

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Part V: Dreaming About the Possibilities (15 minutes)

Set context: What do gigabit speeds make possible?

- We're going to show you what the world thinks possible with gigabit technologies...but we know not every school or every community currently has equal opportunity to access or to build this future vision which is futuristic and lofty. However, we hope it raises questions about what resources and supports are needed to make this kind of technology future possible.
- As you're watching, please feel free to jot down notes, ideas, or questions on the notecards provided in your packets about opportunities, resources, learning resources, and supports that are needed to make this possible.
- We'll come back to those notes later in the workshop.

Show Sprint's day in the life video

- Video can be found here:
<https://drive.google.com/open?id=0B1Tu07mQk89LeHIMbkJjbzEwUnM>
- As noted, that video shows a pretty futuristic vision of what high-speed networks could offer - a future where communication feels life-like and immersive no matter how far apart you are and where lagging and buffering are distant memories.

Show Mozilla Community Fund [video](#)

Provide Project Examples

- It's fun to imagine those potentials, but we also want to talk about a few more tangible gigabit projects taking place right now.

- Here are a few examples:
 - For example, in Chattanooga, TN, students are able to remotely control a 4K microscope located in Southern California. They're able to move this ultra powerful microscope and watch the ultra high-definition image change instantaneously - without having to wait through download times or buffering - thanks to a high-speed network.
 - Virtual Realities in Culture - The V Form Alliance is working with students in Kansas City to create virtual field trips to landmarks in KS and MO that are important to black history.
 - Gigabots is a project that is bringing real-time internet connectivity and IoT technology to LEGO education robots.
- While these are a few examples of projects we've been working with, gigabit technologies like virtual reality, sensors that stream lots of data in real time, and artificial intelligence are changing the way people interact, work, and learn all over the world. For more info on Gigabit Community Fund projects:
<https://learning.mozilla.org/en-US/gigabit/portfolio>.

Conclude:

- So, now that we've shared a little bit about what high-speed gigabit networks can make possible, we want to spend the rest of our time together dreaming about what high-speed networks could mean in your classroom or community.

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Help us improve this activity! Contact [the Gigabit Team](#) at Mozilla.