

BANDWIDTH, DATA, RESOLUTION

There can be confusion around these terms, but in this new age of massively increased reliance on technology for program delivery (and other activities) it is worth taking a bit of time to clarify these definitions, and to explain their relevance when it comes to viewing and presenting in Zoom.

Bandwidth

Bandwidth comes up frequently in discussions about internet speed.

- Bandwidth measures the rate at which data is transferred
- Usually reported as **upload** and **download** speed
- Measured in Megabits per second (Mbps)
- In Zoom:
 - **Upload** refers to you broadcasting your video stream (ie. you presenting your video and/or sharing your screen)
 - **Download** refers to you streaming what you see (ie. viewing presenter and participant video)

Example: A Zoom group call in 720 p (standard) when using gallery view:

1.5 – 2.5 Mbps upload speed

1.5 – 3.0 Mbps download speed

You can check what your internet package offers:

- Check your plan details
- You can also check your actual upload and download speeds

<https://speedtest.shaw.ca/>

<https://www.rogers.com/customer/support/article/internet-speedtest>

<https://support.bell.ca/internet/internet-speed-test>

Example:

- A Shaw 300 plan is stated to supply 200 Mbps upload and 300 Mbps download speed
- After conducting a test on actual speeds:
 - 13.2 upload
 - 139.7 download

***although much lower than what is stated, it is still more than sufficient for the Zoom meeting listed above*

Tips to give you access to the best speeds:

- Close any applications that are open in the background on your computer (ie. e-mail etc.)
- If possible move closer to your router
- Turn off your video when it's not necessary to have it on
- Turn off any WiFi devices that are accessing the same router
- Connect your computer directly to your modem
- Turn off HD video and 'Touch up my appearance' options in zoom

Data

Data refers to the total volume of information being transferred. Most internet plans provide information on the data that you have access to on a monthly basis. Many are unlimited, but it is best to check.

- Total amount of data transferred
 - Measured in MB (Megabytes) or GB (Gigabytes)

Example:

- Zoom Group Call (at 720p) - 1.00 GB per hr to 2.5 GB per hour (upload and download)
- Screen Sharing: 22.5 MB per hour
 - with thumbnail – 67.5 MB per hour

NOTE:

Megabits per second (Mbps) – used to measure speed

Megabytes (MB) – used to measure size

Resolution

Resolution refers to visual quality. The higher the resolution, the better the image quality – sharper, more clear.

Resolution is measured using dots or pixels. It is represented as the width of horizontal bands (in pixels – how many pixels across) x the number of horizontal lines (how many pixels vertically).

1280 x 720

1280 pixels wide x 710 pixels high

$$\text{Total pixels} = 1280 \times 720 = 921,600$$

This can easily be converted to megapixels (commonly used to describe camera resolution)

$$4,500 \times 3,000 = 13,500,000 \text{ or } 13.5 \text{ megapixels}$$

These numbers don't change, regardless of the size of the image when it is shown. What changes is the density – how many pixels are found in a given amount of space.

The higher these numbers the bigger screen it can be shown on and still be crisp and clear.

Resolution	Pixel Size	Aspect ratio	Other Names
SD = standard definition	640 x 480	4:3	480p
HD = high definition	1280 x 720	16:9	720p
Full HD	1920 x 1080	16:9	1080p
2K	2560 x 1440 2048 x 1080	16:9 1.90:	1440p
UHD = ultra high definition	3840 x 2160	16:9	2160p
4K - UHD (ultra high def)	4096 x 2160	1:1.9	4K

- 4K takes up significantly more memory, requires faster computers and more storage
 - Only worth making recordings at this resolution if they are being viewed on a 4K screen or TV
- Recording in 1080p is likely best
- Most laptops have 720p cameras
- Can use 1080 HD display in Zoom but it will use up more bandwidth
 - This is an option in Zoom settings