

# Fear not the alphabet soup of TV features unveiled at CES (Update)

January 8 2018, by Ryan Nakashima

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In this Thursday, Jan. 5, 2017, file photo, attendees take pictures in an exhibit of LG OLED 4K TVs at the LG booth during CES International in Las Vegas. TV manufacturers are showcasing new models at the 2018 CES gadget show in Las Vegas, all with acronyms to set their sets apart and get consumers to spend more. (AP Photo/John Locher, File)

New TVs are coming with an alphabet soup of features designed to get you to spend more.

There's OLED and 4K, with a dash of HDR. How about QLED and QDEF? Samsung, LG and other TV manufacturers are showcasing new models at the CES gadget show in Las Vegas this week—all with acronyms to set their sets apart.

Fear not. Here's how to translate the tangle of great-sounding upgrades into plain English.

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HD, 4K, 8K

Translation: High definition has 1,920 pixels across and 1,080 vertically. UltraHD, or 4K, has twice as many in both directions—3,840 across and 2,160 vertically, which gives you four times as many pixels. 8K, primarily promoted by Sharp, offers 7,680 pixels across and 4,320 down.

8K sets are mostly for show for now—with video limited to the occasional experimental broadcast.

The choice between 4K and HD is still a real debate. It all depends on how far away you'll sit from your TV and how big it is, which we explain with this handy tool at [interactives.ap.org/2015/tv-buying-guide](http://interactives.ap.org/2015/tv-buying-guide) .

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OLED

Unpacking the acronym: Organic [light-emitting diodes](#).

Translation: Diodes are circuit elements that can emit light under certain conditions; OLEDs do so using a layer of material based on carbon,

which in a technical sense makes them organic. Sets using OLEDs, primarily made by LG, tend to be pricey because these screens are difficult to produce.

Pixels, the individual points that form an image, are self-illuminating and can thus be shut off individually. That means images can have truly black areas—rather than just very dark. Sets also cut down on light spillage in scenes where bright and dark colors are side by side; you see sharper contrast. OLED sets also have a wider viewing angle than regular sets.

But OLEDs aren't as bright as other displays and can suffer "burn-in" if a static image is left on screen for too long.

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## MicroLED

Unpacking the acronym: Micro light-emitting diodes.

Translation: Just as with OLEDs, sets with MicroLEDs have self-illuminating pixels, but the material used is slightly different and isn't organic. Samsung says MicroLEDs are brighter than OLEDs and offer the same benefits of high contrast and deep blacks, without burn-in.

Samsung is unveiling a 146-inch MicroLED set this year. Questions surround their ease of manufacturing and ultimately, their price. Don't expect to see mass-market availability of this kind of set any time soon.

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In this Friday, Jan. 6, 2017, file photo, attendees stand in front of a QLED TV at the Samsung booth during CES International in Las Vegas. TV manufacturers are showcasing new models at the 2018 CES gadget show in Las Vegas, all with acronyms to set their sets apart and get consumers to spend more. (AP Photo/John Locher, File)

## LCD

Unpacking the acronym: Liquid crystal displays.

Translation: In an LCD screen, the most common form of display, a thin panel of electrically controlled liquid crystals selectively blocks light or lets it through. The light that makes it through passes through red, blue or green filters to form a full spectrum of colors.

The knock on LCDs is that they must be "backlit" by a light source.

Don't be fooled by what are labeled "LED" TVs. These are still LCDs, backlit by LEDs. Because there aren't as many LED sources behind the pixels as there are pixels, there is still some wash of brightness where bright and dark meet and less than complete darkness in dark shots. Still, many manufacturers tout "local dimming" or special control of the backlights to reduce light spillage.

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## HDR and HDR10

Unpacking the acronym: High dynamic range using 10 "bits" to represent color gradations.

Translation: Everyone who's ever used a camera has seen what happens when you under- or over-expose a photo. Either the bright parts wash out the dark parts or everything is too dark. HDR aims to include both the brightest bright parts and the darkest dark parts without letting either dominate the image.

An industry group calls for HDR TVs to display about 1 billion variations of color and brightest brights that are 20,000 times brighter than the darkest parts of the screen image.

Video needs to be streamed in HDR format for you to see the improvements. Some online services are offering new Hollywood hits and their own TV series in HDR, but a lot of video hasn't been adapted yet.

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## Dolby Vision and HDR10+

Translation: Dolby pushes the color envelope further using 12 bits of color depth to offer 69 billion color variations. Video also comes with hidden instructions for compatible TV sets to calibrate HDR frame by frame. By contrast, standard HDR and HDR10 offer one setting for the entire video, which may not reflect what's best for each scene.

There's no TV set yet able to handle the 12-bit range, just some that use a 10-bit version of Dolby Vision. Sets that incorporate Dolby Vision pay a royalty to Dolby for the technology. Not wanting to go there, Samsung developed something called HDR10+ that offers frame-by-frame HDR but sticks to 10 bits. It's an open standard, one supported by such major brands as Amazon, Panasonic and 20th Century Fox.

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Quantum dots, QLED, QDEF and Q-whatever

Unpacking the acronym: It's complicated

Translation: Quantum dots are tiny particles that emit sharp colors based on their particular size. Because the size can be finely tuned, the colors can be very accurate. Also, because they give off color, there's no more need for filters—at least that's the promise. Today's quantum dot sets still do use filters, though because of fine-tuning, they represent reds and greens better than other sets and reduce the amount of power wasted when light gets filtered out.

Beware of the stuff that comes after the Q. While Samsung calls its version QLED, it doesn't mean it uses OLED screens. Rather, Samsung's QLED sets are backlit by standard LEDs and have the same problems with light spillage that other LEDs have. QDEF is Hisense's version, also with light spillage. Quantum dots that actually function like OLEDs, eliminating the need for backlighting, is still a ways off. We'll get filter-

less quantum dot technology before then.

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