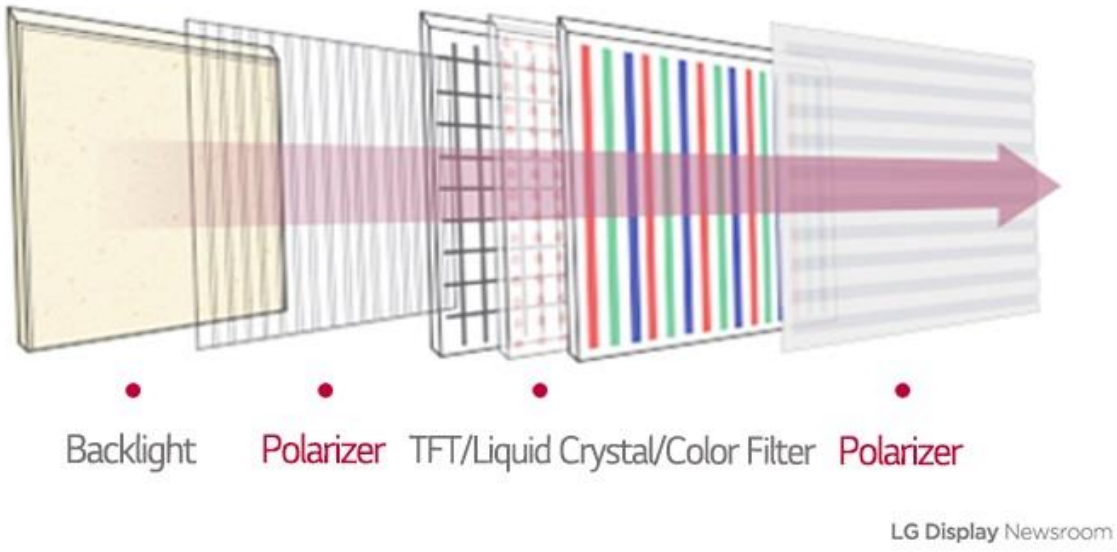
Today's Topics

Understanding flat-panel displays
What to look for in a new monitor
What's coming to over-the-air 4K television …

Microsoft Windows 10/11 upgrade paths

Anatomy of an LCD panel



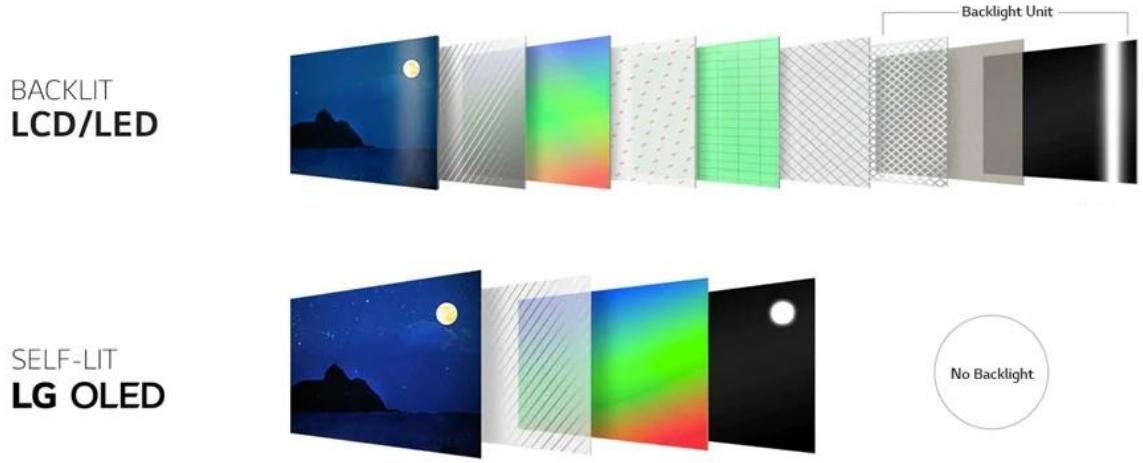
TFT: Twisted Film Transistor – found in TVs, monitors, and laptops

TN: Twisted Nematic – high refresh rates, low prices, weak color, limited viewing angle

IPS: In-Plane Switching – good viewing angle, vibrant color, lower refresh rates

VA: Vertical Alignment – strong contrast, generally cheaper than IPS

Anatomy of LCD, LED, and OLED panels



All LEDs are also LCDs, but not all LCDs are LEDs.

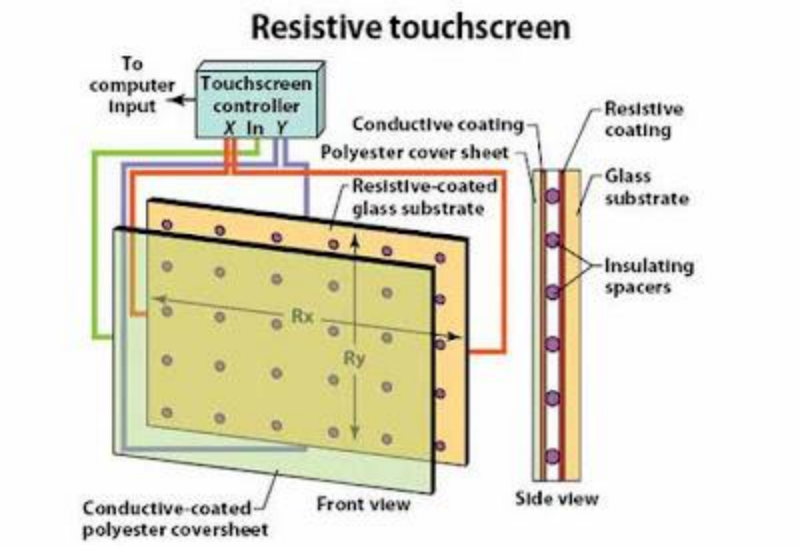
The main difference is that LED displays use tiny light-bulb-like semiconductors, called light-emitting diodes for the backlight. More LEDs means the more “light zones”, and better contrast. Cheaper LEDs might have 32 light zones; expensive LEDs may have anywhere from 384 – 1,152 light zones.

OLED “organic light-emitting diode” displays do not have liquid crystals. In an OLED display, every pixel has its own light source, so has the best image quality.

OLED create perfect black levels and contrast, superior color and picture quality, but are more expensive than LED and somewhat dimmer than LED.

For more information on panel types read this article.

Touchscreens add one more layer on the front of the glass to detect finger/stylus/pen movements. Read about that technology here.



Aspect Ratios: 4:3, 16:9, 21:9

Aspect Ratio		Uses	TVs
4:3	1.33:1	SD Channels	Old TVs
16:9	1.77:1	HD Channels	The majority of HDTVs
21:9	2.37:1	Most movies	Most theaters
14:10	1.4:1	IMAX Film	Very few theaters
19:10	1.9:1	IMAX Digital	Most IMAX theaters

The most common aspect ratios in the video industry.

Remember that the size of a monitor is measured from diagonal corners. If you are replacing an old 4:3 monitor with a wide-screen, you need to take aspect ratio into account.

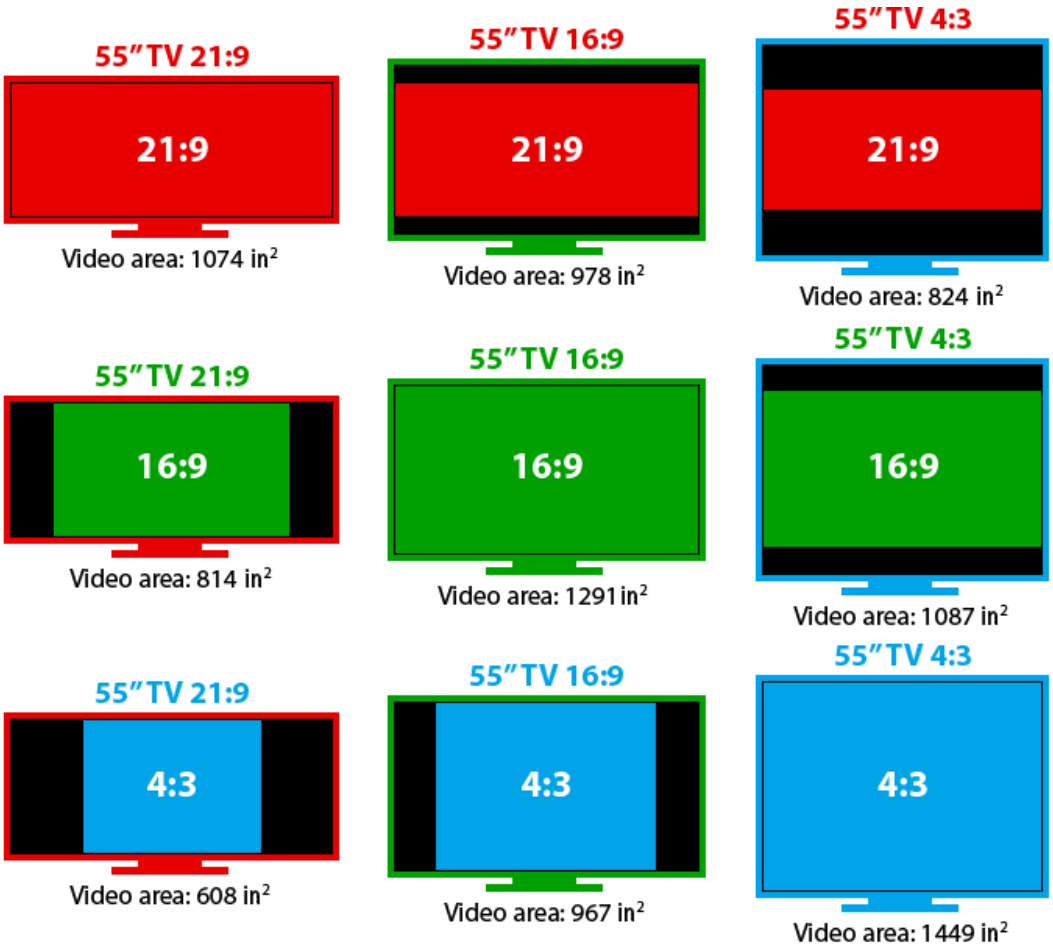
Most people want the vertical height of the new monitor to match what they are used to. For example, if your old monitor screen is 15” tall, you should get a 19” widescreen to match that height.

Old 15” tall get a 19” widescreen
Old 17” tall get a 22” widescreen
Old 19” tall get a 24” widescreen
Old 21” tall get a 27” widescreen

You also need to consider whether the new widescreen monitor will fit in the space where the old monitor was. If it’s in a cabinet, plan accordingly.

What does it look like when you watch it?

What you see on the screen depends on the aspect ratio of your monitor as well as the aspect ratio of the video material you are watching. If they are not the same, black bars will appear.



Monitor vs. TV vs. Laptop

Monitor

- LED or LCD panel technology
- Supports multiple screen resolutions 640, 1024, 1080, etc.
- Supports multiple screen refresh rates – important for gaming
- Supports VGA, HDMI and DisplayPort connections
- Widescreen monitors have a 16:9 aspect ratio
- May or may not have multi-point touchscreen
- May or may not have speakers
- May or may not have USB extension ports

TV

- LED or OLED panel technology
- HDMI connections for multiple video inputs
- Some TVs have VGA ports for connection to a computer
- 16:9 or 21:9 aspect ratio (rare)
- Screen resolution 720, 1080, 4K
- Built-in speakers, digital audio out (TOSLINK)
- TV station tuner – ATSC 3.0 “Nextgen TV”

Laptops (and “All in One” computers)

- LED panel technology
- HDMI port for external source connection
- Multi-point touchscreen on face of panel
- 16:9 aspect ratio

Supplemental Reading

How to Watch 4K Broadcast TV: A Guide to ATSC 3.0

When Will TV Stations Broadcast in 4K?

What is the Aspect Ratio? (4:3, 16:9, 21:9)