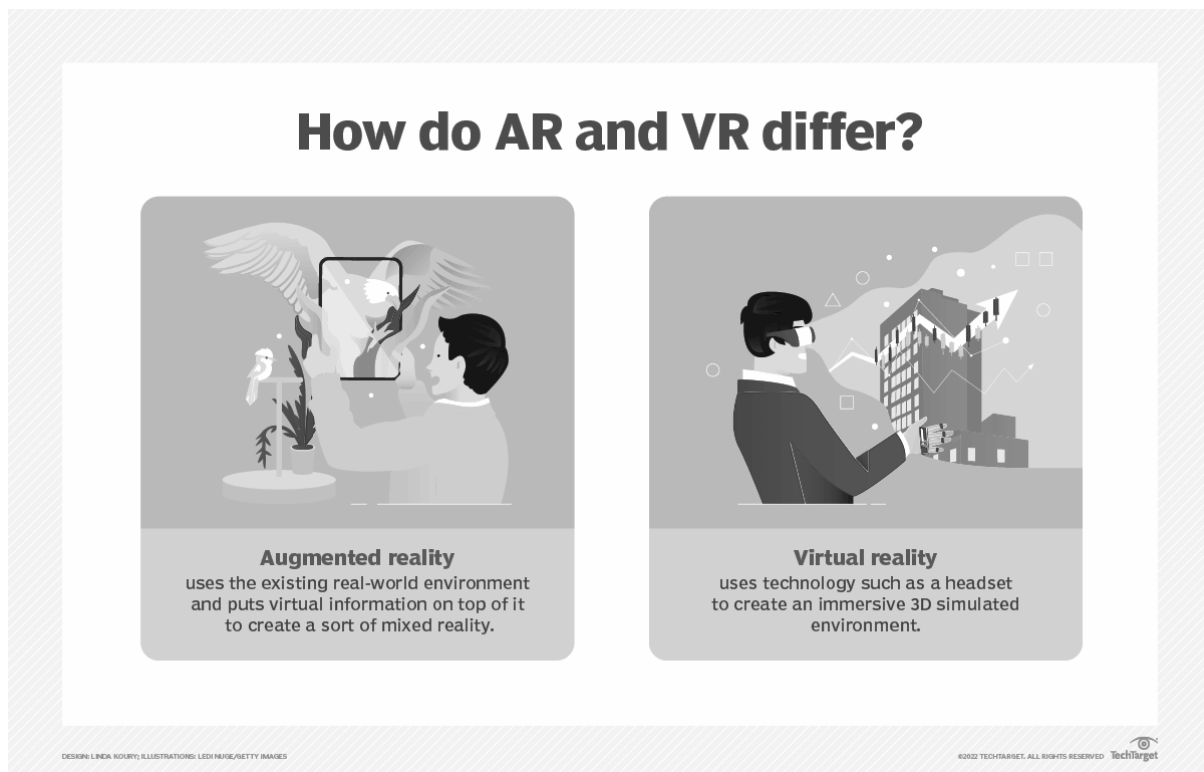**Differences between AR and VR**

VR is a virtual environment created with software and presented to users in such a way that their brain suspends belief long enough to accept a virtual world as a real environment. Virtual reality is primarily experienced through a headset with sight and sound.

The biggest difference between AR and VR is that augmented reality uses the existing real-world environment and puts virtual information on top of it, whereas VR completely immerses users in a virtually rendered environment. While VR puts the user in a new, simulated environment, AR places the user in a sort of mixed reality.

The devices used to accomplish this are different, too. VR uses VR headsets that fit over the user's head and present them with simulated visual and audio information. AR devices are less restrictive and typically include devices like phones, glasses, projections and HUDs in cars.

In VR, people are placed inside a 3D environment in which they can move around and interact with the generated environment. AR, however, keeps users grounded in the real-world environment, overlaying virtual data as a visual layer within the environment.

How do AR and VR differ?

Augmented reality
uses the existing real-world environment and puts virtual information on top of it to create a sort of mixed reality.

Virtual reality
uses technology such as a headset to create an immersive 3D simulated environment.

Top AR use cases

AR can be used in the following ways:

- **Retail.** Consumers can use a store's online app to see how products, such as furniture, will look in their own homes before buying.

- **Entertainment and gaming.** AR can be used to overlay a virtual game in the real world or enable users to animate their faces in different and creative ways on social media.

- **Navigation.** AR can be used to overlay a route to the user's destination over a live view of a road. AR used for navigation can also display information about local businesses in the user's immediate surroundings.

- **Tools and measurement.** Mobile devices can use AR to measure different 3D points in the user's environment.

- **Architecture.** AR can help architects visualize a building project.

- **Military.** Data can be displayed on a vehicle's windshield that indicates destination directions, distances, weather and road conditions.

- **Archaeology.** AR has aided archaeological research by helping archeologists reconstruct sites. 3D models help museum visitors and future archeologists experience an excavation site as if they were there.

Examples of AR

Examples of AR include the following:

- **Target app.** The Target retail app feature called <u>See it in Your Space</u> enables users to take a photo of a space in their home and digitally view an object, like a picture on the wall or a chair, to see how it will look there.

- **Apple Measure app.** The Measure app on Apple iOS acts like a tape measure by enabling users to select two or more points in their environment and measure the distance between them.

- **Snapchat.** Snapchat filters use AR to overlay a filter or mask over the user's Snap or picture.

- **Pokemon Go.** Pokemon Go is a popular mobile AR game that uses the player's GPS to detect where Pokemon creatures appear in the user's surrounding environment for them to catch.

- **Google Glass.** Google Glass is Google's first commercial attempt at a glasses-based AR system. This small wearable computer enables users to work hands-free. Companies such as DHL and DB Schenker use Google Glass and third-party software to enable frontline workers to be more efficient when it comes to global supply chain logistics and customized shipping. Google is also working on another pair of glasses in 2022 that's designed to overlay a live transcription or translation of what another person says in text.

- **U.S. Army.** The U.S. Army uses AR in an eyepiece called Tactical Augmented Reality (TAR). TAR mounts onto the soldier's helmet and aids in locating another soldier's position.

Future of AR technology

AR technology continues to grow as the popularity and familiarization of apps and games like Pokemon Go or retail store AR apps increase. The expansion of 5G networks may make it easier to support cloud-based augmented reality experiences, for example, by providing AR applications with higher data speeds and lower latency.