

Technology definitions

Technology	Definition	Examples
Extended reality and future internet	Technologies that enhance or replace our view of the world.	Augmented Reality (AR) – overlaying vision with computer-generated information. Virtual Reality (VR) – immerses a user within a computer-generated virtual environment. Virtual worlds – digital environments including digital twins and simulations. The ‘metaverse’ – a persistent, synchronous, functioning virtual experience spanning digital and physical worlds and the Internet.
Artificial intelligence (AI) and data	Technologies that leverage computers and data to solve problems and make decisions.	Speech recognition – processing of human speech into written text. Virtual agents – providing customised information and assisting decision making, including in response to conversational requests. Computer vision – processing and identification of features, objects and text from images and videos. Autonomous vehicles – integrating multisensory inputs with large data sets to enable self-driving.
Sensors	Technologies that detect or measure physical properties.	Acoustic sensors – sensors that detect and/or measure acoustic waves Biosensors – sensors that detect and/or measure biological structures, molecules, and organisms. Quantum sensors – systems that use quantum properties or phenomena to measure physical quantities.
Advanced computing	Technologies that support advanced applications of computers.	Internet of Things – system of internet-connected physical objects including everyday devices, machines, and sensors. Cybersecurity – hardware, software, processes, and practices for protecting networks, devices, and data from digital threats. Blockchain – distributed, unanimous and immutable digital ledgers for recording information. Edge computing – distributed computing that bring computation and data storage closer to the sources of data and users. Quantum computing – systems that use quantum properties or phenomena to perform computation. Semiconductors – semiconductor devices are electronic components, either discrete devices or integrated circuits, critical to the functioning of almost all technology applications.
Robotics	Technologies that enable machines to perform physical tasks.	Drones – unmanned aerial vehicles that are remotely piloted or can fly autonomously through embedded sensors and systems. Automated construction – the application of automated robotic systems for construction of buildings and infrastructure. Automated mining – the application of automated robotic systems for mining. Robotic surgery – the application of human-controlled or automated robotic systems for medical procedures.

Biotech	Technologies that use biological organisms, systems, or processes.	Synthetic biology – redesigning organisms for useful purposes by engineering them to have new abilities. Gene technologies – understanding, making, or adapting genetic material. Biomining – using microorganisms for mineral processing. Biomass – biological material used for energy or other applications.
Energy	Technologies that store, transport, manage, convert and use energy.	Energy systems – systems to optimise energy generation, transmission, storage, and consumption. Electrification – power from electricity replacing other power sources, especially fossil fuels. Biofuels – fuels produced from biomass. Smart- and micro-grids – future electricity grids, especially decentralised grids with advanced controls, automation, and other digital technologies.
Chemistry	Technologies that use chemical properties and interactions.	Synthetic foods – the chemical synthesis of substances into edible products. Pharmaceuticals – compounds manufactured for medicinal purposes. Vaccines – substances used to stimulate antibody production and provide active acquired immunity against disease. Carbon capture and utilisation – capturing carbon dioxide to be recycled for further use.
Materials	Technologies to develop, process and use materials.	Smart materials – designed materials that can controllably and reversibly modify their properties in response to stimuli. Nanotechnology – materials with unit sizes at nanoscale dimensions or produced with nanotechnology. Low carbon materials – materials with low carbon emissions and energy use in their production, assembly and transport. Circular materials – renewable, recyclable materials that enable regenerative supply chains.
Advanced processes	Advanced technologies for processing and production.	Additive manufacturing – also known as 3D printing, producing objects by precision layering of materials. Advanced joining and forming – advanced processes for joining and forming materials into objects. Nanomanufacturing – the production of nanoscale materials, structures, devices and systems. Bio manufacturing – use of biological systems to produce biomaterials and biomolecules.