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IBM Challenge Introduction Script

What do automobiles, cell phones, microwave ovens and implantable pet tracking devices all have in common? All of these contain one or more small semiconductor-based devices called integrated circuits or microchips. Each microchip can hold billions of electronic components in just a few square centimeters! The conducting lines that form the circuits on these chips may be as thin as a few tens of nanometers- that's less than one thousandth the diameter of a human hair!

How can such tiny and complex devices be manufactured? Microchips are made in semiconductor fabrication facilities called "fabs" - ultra clean, highly automated factories where even the smallest particle of dust can contaminate the process. Workers in the fab wear cleanroom suits that cover all but part of their faces so that skin, hair and cosmetic particles don't cause defects in the finished product.

Microchip production uses a process called photolithography. First, chemicals are applied to a highly polished thin platter of silicon or other semiconductor material to make it sensitive to light. The material is then exposed to high-energy ultraviolet light through a patterned mask. The exposed surfaces harden, and the unexposed parts are etched away using hot gases. Additional chemicals may be used to change the electrical properties of some parts of the chip. The process is repeated, layer-by-layer, until the complex circuitry is complete.

Since their invention in the 1950s, microchips have revolutionized daily life. From programmable home appliances to medical devices, computers to copy machines, integrated circuits are found in nearly every modern electronic device.