Moore's Law asserts that the number of transistors on a microchip doubles every two years, though the cost of computers is halved. In other words, we can expect that the speed and capability of our computers will increase every couple of years, and we will pay less for them.
Another tenet of Moore's Law is that this growth in the microprocessor industry is exponential meaning that it will expand steadily and rapidly over time.

Experts agree that computers should reach the physical limits of Moore's Law at some point in the 2020s. The high temperatures of transistors eventually would make it impossible to create smaller circuits. This is because cooling down the transistors takes more energy than the amount of energy that already passes through the transistors. In a 2005 interview, Moore himself admitted that his law "can't continue forever. It is the nature of exponential functions, they eventually hit a wall."

Shrinking transistors have powered advances in computing for more than half a century, but soon engineers and scientists must find other ways to make computers more capable. Instead of physical processes, applications and software may help improve the speed and efficiency of computers. Cloud computing, wireless communication, the Internet of Things, and quantum physics all may play a role in the future of computer tech innovation.

The vision of an endlessly empowered and interconnected future brings both challenges and benefits. Privacy and security threats are growing concerns. In the long run, however, the advantages of ever smarter computing technology ultimately can help keep us healthier, safer and productive.

Moore's Law:
An observation made by Gordon Moore, the co-founder of Intel.
"The number of transistors per square inch on integrated circuits had doubled every year since the integrated circuit was invented".
Moore predicted this trend would continue for the future. Moore's Law to hold true until 2020-2025.
About every 18 months, a transistor would be half the size of the current transistor so that more transistors could be packed into a chip (droves exponential growth of computing power).
Temperature Increases as power increases:
Gordon Moore observed that the number of transistors in a dense integrated circuit doubles approximately every two years, which means a doubling of computer processing power. More processing power increases the temperature threshold of the tranistors.
- Transistors consume power when they switch
- High power leads to high temperature

Power increases as transistor density increases.
Prof Moore observed that transistor density (quantity) increases to assemble on to a circuit board. However this causes more power to be consumed.
– Small transistors use less power, but density scaling is faster Voltage scaling reduces (dynamic) power consumption.
Dennard observed that voltage and current should be proportional to the linear dimensions of a transistor.
as transistors shrank, so voltage and current also reduces, circuits could operate at higher frequenices at the same power.
Power = alpha * CFV2
Voltage scaling cannot prevent leakage power loss.
Dennard scaling ignores the leakage current and threshold voltage - a baseline of power per transistor
Voltage scaling cannot prevent leakage power loss.
Voltage scaling cannot prevent leakage power loss.