

# Intel® Pentium® Silver and Celeron® Processors

Unmatched value for Education, Collaboration and Playing - to accomplish more



Intel's Entry level PCs can help users collaborate, create, learn and play like never before. Users can enjoy the great experiences they have wanted from their Notebook, Chromebook, Convertible, or Desktop PC, with the security and connectivity options for a protected modern lifestyle. The newest Intel® Pentium® Silver and Celeron® processors offer amazing video conferencing abilities, faster wireless connectivity, improved overall application and graphics performance, and long battery life. Whether you're a Windows, Chrome or Linux OS user, the Intel Pentium Silver and Celeron processor family delivers unmatched balance of performance, experience and value for education and entry level computing. The platform includes ultra-fast Intel® Wi-Fi 6 (Gig+), IPU & MIPI-CSI Cameras, 4K media support, next-gen Intel UHD Graphics and improvements in security in your choice of platform and OS at a price point for users who want rich experiences at a great value.

Now more than ever, it is important that students stay connected. It's the intangible and tangible feeling of connectedness that can help students do anything they want. The new Intel Pentium Silver and Celeron processors make distance learning a breeze for educators and next generation of students by providing seamless collaboration with best Wi-Fi technology for video conferencing<sup>9</sup>, faster photo & video editing and all school-day battery life<sup>8</sup>.

## Entry Level PC gives more people access to affordable computing

Intel is innovating with dedicated processors for the entry level PC market to help make computing accessible to more people by lowering overall platform cost. Intel Pentium Silver and Celeron processors continue to bring novel features like integrated Gigabit Wi-Fi, integrated IPU, 4K display and media support and long battery life to entry level PC.

## Entry PC for Primary and Secondary Education

With technology rapidly changing the workplace, more jobs will require computer skills. Incorporating PCs in primary and secondary education prepares students for future as more and more jobs require programming skills, understanding artificial intelligence, machine learning and operating robots. Connected PCs bring a wealth of information to classrooms and access to a variety of online open courses for self-paced learning.



- Innovative digital curriculum to make students creative problem solvers
- Curated and personalized learning through a performance evaluation feedback loop
- Collaborate with other students in class locally and globally
- Classroom PC to Cloud based Learning Management Solution connectivity makes student and school performance tracking instantaneous and seamless
- Continued access to digital content anywhere, anytime from any device



Intel Pentium Silver and Celeron processors empower educators and students to finish day-to-day tasks quickly and save valuable time. As compared to last generation of Intel Pentium Silver and Celeron processors,

- Students can experience up to 24% faster collaboratively working on STEM projects<sup>4</sup>
- Teachers and students can experience up to 43% faster web browsing<sup>5</sup>
- Students can collaborate and load coding projects up to 36% faster<sup>2</sup>
- Students can play Rocket League Education with up to 22% more FPS<sup>6</sup>
- Teachers and students can experience up to 78% better graphics performance<sup>7</sup>
- Gigabit Wi-Fi enables faster downloads in highly dense network area like a classroom.
- Seamless sharing and collaborating among students and classroom's monitor.

## Performance in Entry Level PC Segment

With up to 3.3GHz burst frequency, the all new Intel Pentium Silver and Celeron processors provide up to 35% better overall system performance<sup>1</sup> compared to last generation-based processors and give the computing power and visual experience users have wanted. With Intel Pentium Silver and Celeron processor platforms, users can enjoy:

- A new level of CPU & Graphics performance along with great battery life for longer active use.
- Gigabit Wi-Fi PC capability for extremely fast networking performance – faster than a wired Gigabit Ethernet connection<sup>4</sup>
- Integrated IPU and support for high quality MIPI-CSI cameras.
- Improved I/O and memory options for faster data transfer.
- Watch up to 10 hours of HD local playback.
- Boost your display visibility outdoors in bright sunlight with LACE\* technology (Local Adaptive Contrast Enhancement)
- Enjoy 4K HDR content on external 4K display or HDTVs
- Appreciate your favorite movies and videos in UHD (Ultra High Definition) from premier content providers like Netflix and YouTube
- Capturing and uploading 1080p video for Google Hangouts and YouTube is much easier with VP9 and HEVC 10-bit built in CODECs

## A device that suits your lifestyle

Intel Pentium Silver and Celeron processors power more devices, from notebooks to convertibles to desktops and mini PCs— Supports Windows, Chrome and Linux OS—giving you flexibility to choose the best device for your needs, while knowing it will give you the performance, experiences, and security features you deserve.

You can now select the device that matches your lifestyle – on the go or on the desk – with a wide range of new form factors and styles to choose - with quiet, fanless designs, and lighter-weight materials and devices.

Intel® Pentium® Silver and Celeron® Processors (6W TDP) Features at a Glance

FEATURE	INTEL® PENTIUM® SILVER PROCESSOR N6000 	INTEL® CELERON® PROCESSOR N5100 	INTEL® CELERON® PROCESSOR N4500 
Max Processor Frequency	Up to 3.3GHz	Up to 2.8GHz	Up to 2.8GHz
Number of Processors Core/Thread	4/4	4/4	2/2
Cache Size (MB)	1.5MB L2 + 4MB L3	1.5MB L2 + 4MB L3	1.5MB L2 + 4MB L3
Number of Memory Channels	2	2	2
Memory Type	DDR4-2933, LPDDR4x-2933	DDR4-2933, LPDDR4x-2933	DDR4-2933, LPDDR4x-2933
Graphics Dynamic Frequency (GHz)	Up to 850MHz	Up to 800MHz	Up to 750MHz
Intel UHD Graphics	Intel® UHD Graphics	Intel® UHD Graphics	Intel® UHD Graphics



Intel® Pentium® Silver and Celeron® Processors (10W TDP) Features at a Glance

FEATURE	INTEL® PENTIUM® SILVER PROCESSOR N6005 	INTEL® CELERON® PROCESSOR N5105 	INTEL® CELERON® PROCESSOR N4505 
Max Processor Frequency	Up to 3.3GHz	Up to 2.9GHz	Up to 2.9GHz
Number of Processors Core/Thread	4/4	4/4	2/2
Cache Size (MB)	1.5MB L2 + 4MB L3	1.5MB L2 + 4MB L3	1.5MB L2 + 4MB L3
Number of Memory Channels	2	2	2
Memory Type	DDR4-2933, LPDDR4x-2933	DDR4-2933, LPDDR4x-2933	DDR4-2933, LPDDR4x-2933
Graphics Dynamic Frequency (GHz)	Up to 900MHz	Up to 800MHz	Up to 750MHz
Intel UHD Graphics	Intel® UHD Graphics	Intel® UHD Graphics	Intel® UHD Graphics





## Legal Notices and Disclosures

Performance varies by use, configuration and other factors. Learn more at [www.intel.com/PerformanceIndex](http://www.intel.com/PerformanceIndex). Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. See Performance Index for configuration details. No product or component can be absolutely secure. Your costs and results may vary. Intel technologies may require enabled hardware, software or service activation. Functionality of certain applications may be OS-Dependent.

\*LACE is not supported on Chrome.

1. As measured by SYSmark 25<sup>A</sup> overall score <sup>^</sup>
2. As measured by Code.Org<sup>B</sup> workloadCollaborate <sup>^</sup>
3. 802.11ac 160MHz provides 1.73Gbps maximum throughput, 2X faster than standard 802.11ac 2x2 80MHz (867Mbps) and nearly 12x faster than baseline 1x1 BGN (150Mbps) Wi-Fi used in today's PCs. To achieve Gigabit wireless speeds the network requires a wireless router/access point that supports 160MHz channel
4. As measured by Education Collaboration<sup>C</sup> : STEM Workflow <sup>^</sup>
5. As measured by WebXPRT 3<sup>D</sup> overall score <sup>^</sup>
6. As measured by Rocket League (1080p Low) patch v1.89 <sup>^</sup>
7. As measured by 3DMark Fire Strike<sup>E</sup> graphics score <sup>^</sup>
8. As measured by CrXPRT 2<sup>F</sup> Battery – full rundown Score. All School Day is defined as a student spending 8 hours at school with their notebook working or web browsing or playing video at 1080P resolution or in idle state during that 8-hour duration
9. Summary of tests: Zoom video call and collaboration with heavy TCP network congestion (simulating multiple users doing file downloads). Wi-Fi 6 shows a significant reduction (>50%) in latency and jitter vs. Wi-Fi 5. 7 other clients congesting the network with TCP file download/upload ~500 Mbps

### Disclaimer

Intel over the air Wi-Fi testing shows PC platforms with Intel® Wi-Fi 6 (Gig+) can deliver >50% lower latency and jitter vs. Wi-Fi 5 in Zoom videoconferencing & screen sharing scenarios with several similarly configured additional clients simultaneously consuming network capacity

Test network: (7) clients maximizing network capacity with Wi-Fi traffic (ixChariot traffic simulator) while (1) client conducted a 5 min Zoom video conference session with a (1) client connected via 10/100/1000 Ethernet to a local server.

(1) Test Platform : Dell Latitude 5410 (10th Gen), Intel® Wi-Fi 6 AX201, Driver 21.110.1.1; OS: Windows 10 19H1 64-bit

(7) NB Wi-Fi network clients: Dell XPS 13 (10th Gen), Killer AX1650, Driver 21.110.1.1; OS: Win 10 19H1 64-bit

(1) wired NB Callee client: Dell G7 15 7588, Killer E2400, Driver: 9.0.0.42, OS: Win 10 19H1 64-bit

Wi-Fi routers: Wi-Fi 6 = ASUS RT-AX88U, FW: 3.0.0.4.384\_6436; Wi-Fi 5 = ASUS RT-AC66U, FW: 3.0.0.4.382.51641

Wi-Fi 6 performance benefits require use of a Wi-Fi 6 router which supports 160 MHz channels and is based on the IEEE 802.11ax wireless standard specification

Test data represents best case results in a controlled local network to show relative Wi-Fi 6 vs. Wi-Fi 5 technology differences. Actual real-world results may vary

## Workload and Benchmark information

- A. SYSmark 25** is a benchmark from the BAPCO\* consortium that measures the performance of Windows\* platforms. SYSmark 25 tests three usage scenarios: Productivity, Creativity and Responsiveness. SYSmark contains real applications from Independent Software Vendors such as Microsoft\* and Adobe\*
- B. Code.Org workload** – With DOGONews and Google Meet as background tasks. This workload measures the time to load Code. Org in the browser and to render the Universal Archimedes Spiral using the code that is pre-written as a part of the project
- C. Education Collaboration:** Stem projects Session - The performance of a project session is based on the working run times of individually measured operations. This Session replicates the real-world scenario of a student working collaboratively on various STEM projects. The Session begins with the user launching DOGONews and Google Meet. These will keep running as background tasks as the user collaboratively works on the various STEM projects. The User works on projects through various educational applications like GeoGebra, Code.org & finally TinkerCAD. The various projects are run sequentially and there is time lapse between the projects (which is not counted in the total time of Session) similar to kids taking breaks between work, though the collaboration continues.
- D. WebXPRT 3** is a benchmark from Principled Technologies that measures JavaScript/HTML5 performance using web applications based on real world usages, like Photo Enhancement, Organize Album Using AI, Stock Option Pricing, Encrypt Notes and OCR Scan, Sales Graphs, and Online Homework. It produces results for each of the test scenarios plus an overall score.
- E. 3DMark Fire Strike** measures Direct X 11 gaming performance for PCs, and includes two graphics tests, a physics test and a combined test that stresses the CPU and GPU.
- F. CrXPRT 2** is published by Principled Technologies (PT), an open-source community and host of the BenchmarkXPRT\* development forum. CrXPRT tests Chromebook Performance using real-world scenarios: Photo Effects, Face Detection (JavaScript), Offline Notes, Stocks Dashboard, DNA Sequence Analysis, and 3D Shapes with WebGL. Each scenario produces individual metrics that roll up to an overall score.

### Configurations Estimated on:

<sup>^</sup>Windows OS Configuration:

Intel® Pentium® Silver N6000 Processor, PL1=6W TDP, PL2 = 20W 4C4T, Burst up to 3.3GHz, Motherboard: JSL RVP, Graphics: Intel® UHD Graphics, Memory: 2x4GB DDR4-2933, Storage: 512GB Intel SSD 660P, OS: Windows\* 10 20 H1, OS Version 19041.546, BIOS : 2385.02\_140 vs.

Intel® Pentium® Silver N5030 Processor, PL1=6W TDP, PL2 = 15W 4C4T, Burst up to 3.1GHz, Motherboard: GLK RVP, Graphics: Intel® UHD Graphics 605, Memory: 2x4GB DDR4 -2400, Storage: 256GB Intel® SSD 540s Series, OS: Windows\* 10 19H1, OS Version: 10.0.19041.630 BIOS : 0064\_42

<sup>^^</sup>Chrome OS Configuration:

Intel® Pentium® Silver N6000 Processor, PL1=6W TDP, PL2 =20W, 4C4T, Burst up to 3.3GHz, Memory: 2x4GB LPDDR4x-2933, OS: ChromeOSv87.0.4280.79 measured on OEM pre-production system vs.

Intel® Pentium® Silver N5030 Processor, PL1=10W TDP, PL2 = 15W, 4C4T, Burst up to 3.1GHz, Memory: 2X4GB DDR3L-1866, OS: ChromeOS v87.0.4280.88 measured on an Acer Chromebook 314

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