K-12 BLUEPRINT

Powering the Modern Classroom	Commissioned by Intel®
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Chromebooks in the Classroom: Every Second Counts

How Processor Choice Affects Instructional Time

Executive Summary

In side-by-side testing of two widely deployed education Chromebooks, the Intel® Processor N150 outperformed the MediaTek Kompanio 540 on every tested classroom workflow, representing approximately $456 in instructional time value per educator across just three tasks: AI-generated video production, AI-assisted research and design, and processor-intensive math modeling. That equals 98% of the purchase price of the ASUS Chromebook CR11 (MSRP $459.99). Modern, AI-enhanced learning makes new demands on student devices. Multitasking across research tools, media creation, and complex data models require processing power that not every Chromebook delivers equally. The right Chromebook demonstrates its value across four priorities that we believe matter most to administrators and educators:

1. **Security**: Provides built-in protections like sandboxing and verified boot that run without slowing students down. Devices need the processing headroom to keep those protections active under real classroom load.

2. **Opportunity and Accessibility**: Ensures every student can fully participate in modern learning, with the tools and responsiveness needed to stay engaged and on task.

3. **Career Readiness**: Develops the digital fluency colleges and employers expect. When hardware underperforms, instructional time is lost and students miss opportunities to build future-ready skills.

4. **Partnership and Support**: Intel's long-standing commitment to K-12 education ensures sustained support and resources for learning initiatives.

A Classroom Lens on Chromebooks

This report presents an independent analysis of performance across two education-focused Chromebooks: the ASUS Chromebook CR11 (Intel® Processor N150, 8 GB LPDDR5) and the ASUS Chromebook CZ11 (MediaTek Kompanio 540, 8 GB LPDDR4x). Testing measured task completion speed across three authentic K-12 learning scenarios spanning 4th, 6th, and 8th grade, simulating real classroom multitasking conditions.

The processor must handle the platform's full application breadth, which seamlessly runs web, ChromeOS, and apps.

SPEEDOMETER 3.1 RESULTS

57%

Chromebooks with Intel® Processor N150 delivered 57% better web app responsiveness than Chromebooks with the MediaTek Kompanio 540 in Speedometer 3.1 testing.

Similar but Not Equal

The Intel® Processor N150 device showed a consistent performance advantage across every tested workflow, translating directly to recovered instructional time:

4th Grade Video Production:The ASUS Chromebook CR11 with Intel® Processor N150 completed the AI-generated video export workflow 37% faster than the ASUS Chromebook CZ11 with MediaTek Kompanio 540.

6th Grade Research and Design:The ASUS Chromebook CR11 with Intel® Processor N150 outpaced the ASUS Chromebook CZ11 with MediaTek Kompanio 540 by 16% between source indexing and design rendering.

8th Grade Math Modeling: The ASUS Chromebook CR11 with Intel® Processor N150 completed each processor-intensive simulation 9.65 seconds faster than the ASUS Chromebook CZ11 with MediaTek Kompanio 540.

The value of instructional time saved using a Chromebook with Intel® Processor N150 versus a Chromebook with MediaTek Kompanio 540 **equals approximately $456 per educator, recovering 98% of the purchase price** of the ASUS Chromebook CR11. These figures reflect modeled usage across classroom workflows over a four-year device lifecycle. See Appendix B for assumptions and methodology.

Schools expect devices that prove their value.
The data in this report makes the right choice clear.

Key Takeaways

Cost Recovery

98% of device cost recovered

Across three tasks over four years, the value of instructional time saved on a Chromebook with Intel® Processor N150 versus a Chromebook with MediaTek Kompanio 540 equals approximately $456 per educator, recovering 98% of the purchase price of the ASUS Chromebook CR11. Every additional use multiplies that return.

Web Responsiveness

57% better web responsiveness

Testing via Speedometer 3.1 confirmed Chromebooks with Intel® processors deliver 57% better web app responsiveness than Chromebooks with the MediaTek Kompanio 540, a gap that grows across every web-based tool students use throughout the school day.

Video Production

37% faster production

The ASUS Chromebook CR11 with Intel® Processor N150 completed the AI-generated video export workflow 37% faster than the ASUS Chromebook CZ11 with MediaTek Kompanio 540. When students are waiting on a render, creative momentum stalls and revision time shrinks before the period ends.

Math Modeling

9.65 seconds 180 times a year

The performance gap between the ASUS Chromebook CR11 with Intel® Processor N150 and the ASUS Chromebook CZ11 with MediaTek Kompanio 540 costs each student nearly 29 minutes of instructional time annually on this task alone. In a middle school math class, that compounds quickly.

Research and Design

Nearly 4.5 hours saved from a single workflow

Across source indexing and design rendering, the Intel® Processor N150 device outpaced a Chromebook with MediaTek Kompanio 540 by 16%, returning 260 minutes of instructional time per educator over the device lifespan.

Processing Power

80% higher clock speed

The Intel® Processor N150 device runs at 3.6 GHz versus 2.0 GHz on a Chromebook with MediaTek Kompanio 540, an 80% higher clock speed that gives students the processing headroom to handle AI-enhanced workflows without lag or interruption.

Choosing the Right Chromebook

Devices that support multiple digital tools and demanding workloads are now a baseline expectation in K-12. The conversation has shifted from whether students have devices to what those devices can actually do. As classrooms rely more heavily on AI-powered tools and collaborative platforms, device capability has become the real differentiator. Research shows that a frustrating device experience undermines engagement and learning. Administrators must evaluate whether a device can perform under real classroom conditions, not just meet a budget threshold.

Chromebooks remain a popular choice because they deliver strong value relative to comparable laptops. With automatic file saving, web-based management, built-in security, and centralized ChromeOS administration, they reduce IT burden and lower total cost of ownership. Now well-established in education since their introduction in 2011, Chromebooks have matured considerably. Schools have learned that not all Chromebooks deliver the same results despite surface-level similarities in cost and management.

Today, schools expect more. Devices must earn their place by delivering consistent, positive experiences that support meaningful learning from the first bell to the last. That means handling the multitasking, AI-enhanced workflows, and creative tools students use every day, without lag, interruption, or frustration. The right Chromebook demonstrates its value across four priorities that matter most to administrators and educators:

- **Security**: ChromeOS provides automatic updates, sandboxing, and verified boot as built-in protections against the ransomware and data threats increasingly targeting K-12 institutions. Devices need the processing headroom to keep those protections running without slowing students down.
- **Opportunity and Accessibility**: A device that performs reliably ensures every student can fully participate in modern learning, with the tools and responsiveness needed to stay engaged and on task.
- **Career Readiness**: Students who work on capable, responsive devices develop the digital fluency that colleges and employers expect. When hardware underperforms, instructional time is lost and students miss opportunities to build the future-ready skills they need.
- **Partnership and Support**: Intel's long-standing commitment to K-12 education ensures sustained support and resources for learning initiatives.

Chromebook Plus for Educators

For schools with educators managing AI-intensive workflows or content creation tasks, Intel-powered Chromebook Plus devices extend the platform advantage documented in this report. The tested ASUS Chromebook CR11 with Intel® Processor N150 outperformed the MediaTek-based alternative on every classroom workflow. Chromebook Plus devices with Intel® Core™ processors extend that advantage for heavier professional workloads. Device-specific performance data is available at intel.com/education.

Methodology of this Study

This report provides an independent evaluation of performance benchmarks across two education-focused devices: the ASUS Chromebook CR11 (featuring the Intel® Processor N150) and the ASUS Chromebook CZ11 (powered by the MediaTek Kompanio 540). This report prioritizes task completion efficiency during three authentic classroom workflows, alongside industry-standard benchmarking via Speedometer 3.1.

Task Speed Testing

To ensure reliable data, every test followed a rigorous, standardized protocol:

1. Initiate a full restart of the Chromebook.
2. Monitor system activity until CPU usage remains below 10% for five consecutive seconds.
3. Begin the CPU test tool and the stopwatch timer simultaneously.
4. Execute the specific scenario task.
5. Stop timing and record the elapsed duration in seconds.
6. Switch to the other device to allow a full system cool-down and resource reset, preventing residual process load or thermal throttling from affecting the subsequent test.

Scenarios were repeated four times: an initial practice run to stabilize the environment, followed by three timed trials. The results presented reflect the average of these three timed tests.

CPU Diagnostic

A CPU diagnostic ran alongside each task to simulate a typical school day. Students often manage multiple tabs and background apps at once. Since many ChromeOS tasks are cloud-based, this diagnostic ensured we measured local processor performance instead of network speed.

Browser Responsiveness

Web application responsiveness was assessed using Speedometer 3.1. This standard benchmark simulates the dynamic UI rendering and interactive demands of the tools students and teachers rely on daily. Speedometer 3.1 isolates core components of the modern web rendering pipeline, including JavaScript framework execution, DOM manipulation, and CSS parsing. Higher scores indicate greater capability to execute complex web interactions with lower latency. Each device completed three timed trials following an initial practice run; the results reflect the average of those three trials.

Instructional Return on Investment

(Seconds Saved per Occurrence) × (Occurrences per Year) ÷ 3,600 × ($50.36/hr) = Annual Cost Recovered per Educator

Using data from the NEA Rankings & Estimates report, an hourly wage of $50.36 was calculated based on a projected average educator salary of $76,552. Educator time is used as the fiscal proxy because device performance gaps affect the instructional environment the educator manages: when students wait on a slow render or recalculation, the educator loses productive instructional time across the full class. The resulting $455.96 recovered over a four-year period represents the impact of hardware performance on just three basic tasks; these savings multiply significantly as more workflows are considered.

Note: Results may vary depending on device configuration, network health, and specific user behavior.

Learning Scenarios and Effective Cost

The following scenarios reflect authentic K-12 classroom workflows tested across both devices. Each scenario was designed to capture the kind of AI-enhanced, multitasking-heavy work that defines modern student learning. These aren't benchmarks for their own sake, but tasks students and teachers actually do. The results reveal a consistent pattern: processor performance gaps that feel small in a spec sheet compound into significant instructional time lost across a school year.

Scenario	Workload	Intel Advantage	Minutes Saved (4 year)	LIfespan ROI
1. The Hometown Broadcast (4th Grade)	Google Slides + Google Vids: AI-generated video production and export	37% faster	167	$140.28
2. The Independent Research Hub (6th Grade)	NotebookLM source indexing + Photoshop Generative Fill	16% faster	260	$218.48
3. The Compound Interest Power-Lab (8th Grade)	Google Sheets: 5,000 trial market simulation, triggered 180 times per year	9.65 seconds per recalculation	116	$97.20
Total			543	$455.96

Minutes saved and lifespan ROI reflect modeled usage across classroom workflows over a four-year device lifecycle. See Appendix B for assumptions and methodology.

The performance gap between processors costs each student nearly **29 minutes per year on this task alone**. Multiplied across a classroom, that represents a significant block of instructional time the educator cannot recover.

Three tasks recover nearly the full cost of the device in time saved on the Intel® Processor N150 device versus a Chromebook with MediaTek Kompanio 540. Imagine the return across every class, every day.

The Hometown Broadcast: 4th Grade Social Studies

At a Glance

Grade Level
4th grade

Subject
Social Studies

Topic
Local Heritage and Community

Learning Skills

- Research and synthesis
- Digital storytelling
- AI-assisted media production

Tools Used

- Google Slides
- Google Vids

Intel Advantage

37% faster video production and export

Time Saved

167 minutes over device lifespan

Lifespan ROI

$140.28 per educator

37% Faster

The ASUS Chromebook CR11 with Intel® Processor N150 completed the video export workflow **37% faster** than the ASUS Chromebook CZ11 with MediaTek Kompanio 540. When students are waiting on a render, creative momentum stalls and revision time shrinks before the period ends.

The 37% faster video export event in this workflow alone equals $140.28 of the device's purchase price in instructional time value over four years.

In this local heritage project, fourth graders research regional figures and landmarks to create a five-slide Google Slides deck. Using the "Convert Slides" capability in Google Vids, they transform their research into an AI-narrated production, eventually exporting a high-definition video for sharing with audiences beyond the classroom.

In this workflow, students:

- Manage multiple research tabs and image libraries simultaneously while drafting their presentation
- Generate AI-generated narration and adjust media transition timing in Google Vids
- Export a final high-definition video for sharing with audiences beyond the classroom

The Independent Research Hub: 6th Grade Earth Science

At a Glance

Grade Level
6th grade

Subject
Earth Science

Topic
Urban Heat Island Effect and Local Climate Impact

Learning Skills

- Research and source evaluation
- Data synthesis and analysis
- AI-assisted design and creation

Tools Used

- Google NotebookLM
- Photoshop on the Web

Intel Advantage

16% faster source indexing and design rendering

Time Saved

260 minutes over device lifespan

Lifespan ROI

$218.48 per educator

260 Minutes Saved

Across source indexing and design rendering, the ASUS Chromebook CR11 with Intel® Processor N150 outperformed the ASUS Chromebook CZ11 with MediaTek Kompanio 540 by 16%. Over a four-year device lifespan, that advantage returns 260 minutes of recovered instructional time per educator.

The efficiency gains in this research and design workflow alone recover $218.48 of the device's purchase price over a typical four-year lifespan.

In this environmental science project, sixth graders act as lead researchers investigating local climate impacts such as the urban heat island effect. They build a digital research hub in NotebookLM by indexing ten or more diverse sources, including NASA datasets, EPA records, and municipal reports, creating an accurate, cited workspace for student inquiry.

In this workflow, students:

- Index multiple scientific sources in NotebookLM to build a grounded, AI-organized research hub
- Generate an initial infographic layout using NotebookLM Studio, then transition to Photoshop on the Web for high-fidelity design refinements
- Apply Photoshop's Generative Fill to transform raw data visuals into polished, publication-ready graphics for sharing with audiences beyond the classroom

The Compound Interest Power-Lab: 8th Grade Math

At a Glance

Grade Level
8th grade

Subject
Math

Topic
Personal Finance and Probability

Learning Skills

- Mathematical modeling and reasoning
- Data analysis and visualization
- AI-assisted financial literacy

Applications and Tools

- Google Sheets
- Gemini AI

Intel Advantage

9.65 seconds faster per recalculation

Time Saved

115.80 minutes over device lifespan

Lifespan ROI

$97.20 per educator

In this personal finance project, eighth graders model long-term wealth building by simulating 5,000 unique market scenarios for different starting ages. Using a Monte Carlo calculation engine built in Google Sheets, a method that runs thousands of randomized simulations to model a range of possible financial outcomes, they visualize the impact of market booms and busts on retirement security and the probability of financial success.

In this workflow, students:

- Receive a LAMBDA-based simulation engine in Google Sheets and run a test that independently models 600 months of market activity across 5,000 unique trials
- Toggle "Chaos Mode" to trigger a full recalculation of 3 million data points across five starting age cohorts, stress-testing both their financial model and their device
- Use a Gemini AI panel in Chrome Split View to translate complex financial concepts like sequence of returns risk while their live Sheets model stays active

180 Times a Year Adds Up

9.65 seconds per recalculation does not sound like much. But when students run the test 180 times across a school year, the performance gap between processors **costs each student nearly 29 minutes of instructional time annually**. In a middle school math class, that compounds quickly.

The efficiency gains in this math modeling workflow alone recover $97.20 of the device's purchase price over a four-year lifespan.

Conclusion

The scenarios in this report represent just three moments in a student's day. But those three moments tell a clear story: when a device can't keep up, students wait. When students wait, teachers lose the room. And when that happens across every task, every period, every day, those lost seconds add up to something measurable and recoverable.

Processor choice is the difference. The data in this report shows that the right Chromebook doesn't just run the same apps as another Chromebook. It runs them faster, more reliably, and with enough headroom to handle whatever comes next in the school day.

The ASUS Chromebook CR11 with Intel® Processor N150 outperformed the ASUS Chromebook CZ11 with MediaTek Kompanio 540 across every tested workflow:

Chromebooks with processors from Intel and MediaTek

Key Criteria	Proven winner	The contender
4th Grade Video Production: Completed the AI-generated video export workflow **37% faster** than the MediaTek Kompanio 540	 Intel® Processor N150	 MediaTek Kompanio 540
6th Grade Research and Design: Outpaced the MediaTek Kompanio 540 by **16% across source indexing and design rendering**	 Intel® Processor N150	 MediaTek Kompanio 540
8th Grade Math Modeling: Completed each processor-intensive simulation **9.65 seconds faster,** costing each student nearly 29 minutes of instructional time annually	 Intel® Processor N150	 MediaTek Kompanio 540

Measured across the full device lifespan, the instructional time saved on a Chromebook with Intel® Processor N150 versus a Chromebook with MediaTek Kompanio 540 equals 98% of the purchase price of the ASUS Chromebook CR11 per educator from just three tasks. Every additional workflow compounds that return.

As learning continues to grow more AI-enhanced and multitasking-heavy, the demands placed on student devices will increase. Schools that invest in devices with the processing headroom to meet those demands today are investing in the quality of learning experiences their students will have for years to come.

The right Chromebook does not just check a procurement box. It proves its value by enabling consistent, high-quality learning for students every period, every day, across the full life of the device.

Devices with Intel® processors are backed by Intel's long-standing investment in K-12 education and its partnership with Google and ChromeOS, giving schools confidence in long-term platform support.

Three tasks recover nearly the full cost of the device in time saved on a Chromebook with Intel® Processor N150 versus a Chromebook with MediaTek Kompanio 540.

Imagine the return across every class, every day.

This report was produced by K-12 Blueprint, an independent education technology research and consulting practice owned by Clarity Innovations, Inc. Testing was conducted using standardized protocols on commercially available devices. Results reflect observed performance under the specific conditions described in this report and may vary based on device configuration, network conditions, and individual usage patterns.

Appendices

Appendix A: Test Devices

Feature	ASUS Chromebook CR11	ASUS Chromebook CZ11
Operating System	ChromeOS	ChromeOS
Processor	Intel® Processor N150	MediaTek Kompanio 540 (MT8196)
Processor Frequency	3.6 GHz (Turbo)	2.0 GHz
Storage	64 GB	64 GB
Memory	8 GB LPDDR5	8 GB LPDDR4x
Battery Capacity	50 Wh	47 Wh
Display Size	11.6 in (1366 X 768)	11.6 in (1366 X 768)
Graphics	Intel® UHD Graphics	ARM Mali-G52
Networking	Intel® Wi-Fi 6E AX211	Wi-Fi 6
Connectivity	2 USB-C 2x USB-A	1x USB-C 1x USB-A
Price at Time of Purchase	$464.99	$429.99
Weight	2.8 lbs	2.7 lbs

Appendix B: Instructional ROI Calculations

Calculations reflect the fiscal impact of hardware performance gaps across three authentic classroom workflows. Results are based on an educator employing similar learning scenarios as those outlined in this report. Total time saved is based on the performance advantage of the ASUS Chromebook CR11 (Intel® Processor N150) over the ASUS Chromebook CZ11 (MediaTek Kompanio 540).

Scenario 1: The Hometown Broadcast (4th Grade Social Studies)

Video production projects are iterative by nature. Students typically revisit, revise, and re-export their work multiple times across a project cycle, making the render and export step one of the most frequently repeated processor-intensive actions in an elementary classroom.

	Per Occurence	Per Year	4-Year Lifespan
Time Saved (Intel® Processor N150 vs. MediaTek Kompanio 540)	52.20 seconds	41.76 minutes	167.04 minutes
Instructional Time Value	$0.73	$35.07	$140.28

Frequency assumption: 48 occurrences per year (4 projects x 4 iterations per project x 3 class periods per workload). Project and iteration counts reflect standard project-based learning cycles as observed in tested classroom scenarios.

Scenario 2: The Independent Research Hub (6th Grade Earth Science)

Research workflows in NotebookLM and design refinements in Photoshop on the Web happen continuously throughout a project, not just at key milestones. Students return to their research hub and design canvas across multiple sessions, indexing new sources and applying generative edits each time.

	Per Occurence	Per Year	4-Year Lifespan
Time Saved (Intel® Processor N150 vs. MediaTek Kompanio 540)	32.52 seconds	65.04 minutes	260.16 minutes
Instructional Time Value	$0.46	$54.62	$218.48

Frequency assumption: 120 occurrences per year (8 projects x 3 sessions per project x 5 class periods per workload). Project and session counts reflect typical research and design workflows as observed in tested classroom scenarios.

Scenario 3: The Compound Interest Power-Lab (8th Grade Math)

Recalculations trigger every time a student adjusts a variable or toggles Chaos Mode. In an active modeling session, this happens repeatedly as students test assumptions, compare outcomes, and refine their financial models across a unit.

	Per Occurence	Per Year	4-Year Lifespan
Time Saved (Intel® Processor N150 vs. MediaTek Kompanio 540)	9.65 seconds	28.95 minutes	115.80 minutes
Instructional Time Value	$0.13	$24.30	$97.20

Frequency assumption: 180 occurrences per year (6 units x 6 recalculations per session x 5 class periods per workload). Recalculation frequency reflects active modeling behavior as observed in tested classroom scenarios.

Combined Total

	Per Year	4-Year Lifespan
Total Time Saved	135.75 minutes	543 minutes
Total Value Recovered	$114.00	$455.96

Appendix C: Speedometer 3.1 Benchmark Results

Speedometer 3.1 measures a device's web application responsiveness by automating a dense sequence of simulated student interactions—such as rendering graphics, editing text, and manipulating lists—across a variety of popular modern JavaScript frameworks inside the browser. Unlike traditional benchmarks that measure task execution time in seconds (where a lower number is desired), Speedometer calculates an execution throughput where a higher score is better. A higher number indicates that the processor can execute more web actions per minute, translating directly to a fluid, lag-free experience when students are interacting with modern web-based learning tools. The table below reflects the three timed trial scores and trial average (T1–T3) for each device. The initial practice run is excluded from the average per the testing protocol.

	Trial 1	Trial 2	Trial3	Average (T1-T3)
ASUS Chromebook CZ11 (MediaTek Kompanio 540)	4.79	4.77	4.26	4.61
ASUS Chromebook CR11 (Intel® Processor N150)	8.15	7.66	5.89	7.23
Performance Delta (CR11 vs. CZ11)	+70.01%	+60.8%	+38.3%	+56.83%

Appendix D: Salary Table

According to the NEA Rankings of the States 2025 and Estimates of School Statistics 2026, the average classroom educator salary in the United States is projected at $76,552 for the 2025-26 school year. This study uses the following data table to calculate the fiscal impact of instructional time lost to hardware performance gaps.

Category	Days	Hours
Instructional Work Days	180	1,440
Non-Instructional Work Days	10	80
Total Contracted Days	190	1,520

Combined Total

Average Salary	Daily Salary	Hourly Wage
$76,552	$402.91	$50.36

Note: Results may vary depending on device configuration, network health, and individual usage patterns. Frequency assumptions reflect realistic task repetition across class periods, project cycles, and within-session iterations.