



The science behind the report:

Choose a more responsive Microsoft Windows device for Intel® Skills for Innovation applications to help boost academic performance

This document describes what we tested, how we tested, and what we found. To learn how these facts translate into real-world benefits, read the report [Choose a more responsive Microsoft Windows device for Intel® Skills for Innovation applications to help boost academic performance](#).

We concluded our hands-on testing on December 7, 2022. During testing, we determined the appropriate hardware and software configurations and applied updates as they became available. The results in this report reflect configurations that we finalized on December 7, 2022 or earlier. Unavoidably, these configurations may not represent the latest versions available when this report appears.

Our results

To learn more about how we have calculated the wins in this report, go to <http://facts.pt/calculating-and-highlighting-wins>. Unless we state otherwise, we have followed the rules and principles we outline in that document.

Table 1: Results of our testing in seconds. Less time is better.

	Intel® Core™ i3-1215U processor-powered Windows device	Intel® Celeron™ N5100 processor-powered Windows device	Percentage win
CoSpaces Edu			
Loading Pirate Roller Coaster CoSpace	5.5	6.7	17%
Loading End of Dinosaurs CoSpace	1.7	3.5	51%
Loading At the Airport CoSpace	8.0	10.0	20%
Loading Reserve Animal World CoSpace	10.4	19.2	45%
Blender			
Launching application	4.2	7.6	44%
Baking data for a fire simulation	2.6	5.4	51%
Baking data for a fluid simulation	10.1	29.4	65%
Baking mesh for a mesh simulation	16.5	40.4	59%
Randering a 3D animation	455.3	2,046.2	77%
Rendering a 2D animation	349.1	1,028.8	66%

	Intel® Core™ i3-1215U processor- powered Windows device	Intel® Celeron™ N5100 processor-powered Windows device	Percentage win
Labster			
Loading the plate tectonic module	26.0	59.6	56%
Loading the impact on climate change module	35.2	88.2	60%
Loading the cell division module	29.9	61.6	51%
Unity			
Playing the Ragdoll test	2.5	4.8	47%
Adding a New Script Component	4.3	9.8	56%
Building and running a project	10.4	16.2	35%
Fusion 360			
Launching the application	18.0	34.2	47%
Exporting a model as .STL (zipper)	1.6	2.2	27%
Exporting a model as .obj (bevel gear)	1.7	2.3	26%

System configuration information

Table 2: Detailed information on the systems we tested.

System configuration information	Lenovo Flex 5i IdeaPad laptop	Lenovo 500w Gen 3 laptop
Processor		
Vendor	Intel®	Intel®
Name	Core™ i5-1235U	Celeron® N5100
Core frequency (GHz)	1.3 – 4.4	1.1 – 2.8
Number of cores	10	4
Cache	12MB Intel Smart Cache	4MB L3 Cache
Memory		
Amount (GB)	8	4
Type	DDR4 Dual Channel	DDR4 Single Channel
Speed (MHz)	4,266	2,933
Graphics		
Vendor	Intel®	Intel®
Model number	Iris Xe Graphics	UHD Graphics
Storage		
Amount (GB)	512	64
Type	PCIe SSD Gen4	eMMC
Connectivity/expansion		
Wireless internet	Intel® Wi-Fi 6 AX201	Intel® Wi-Fi 6 AX201
Bluetooth	5.2	5.2
USB	1x USB 3.2 Gen 2 Type-C 2x USB 3.2 Gen 1 Type-A	1x USB 3.2 Gen 1 Type-C 2x USB 3.2 Gen 1 Type-A
Thunderbolt	1x Thunderbolt 4	N/A
Video	1x HDMI 1.4b	1x HDMI 2.0
Battery		
Type	Lithium Polymer	Lithium Polymer
Size	3 Cell	3 Cell
Rated capacity (Wh)	52.5	47
Display		
Size (in.)	14	11.6
Type	LED IPS	LED IPS
Resolution	1920 x 1200	1366 x 768
Touchscreen	Yes	Yes

System configuration information	Lenovo Flex 5i IdeaPad laptop	Lenovo 500w Gen 3 laptop
Operating system		
Vendor	Microsoft	Microsoft
Name	Windows 11	Windows 11
Build number or version	10.0.22000	10.0.19043
BIOS		
BIOS name and version	Lenovo J7CN34WW	Lenovo G6CN34WW
Dimensions		
Height (in)	0.74	0.78
Width (in)	12.32	11.40
Depth (in)	8.85	7.97
Weight (lbs.)	3.52	2.90

How we tested

Completing the CoSpaces Edu tasks

Loading the Pirate Roller Coaster CoSpace

1. Power on the device, and log in.
2. Open the Microsoft Edge browser, and navigate to edu.cospaces.io/Universe.
3. Navigate to the Pirate Roller Coaster CoSpace.
4. Simultaneously start the timer and click the Pirate Roller Coaster CoSpace.
5. Once the animation fully loads and the Play button appears, stop the timer.
6. Clear the cache in the Edge browser.

Loading the End of Dinosaurs CoSpace

1. Power on the device, and log in.
2. Open the Edge browser, and navigate to edu.cospaces.io/Universe.
3. Navigate to the End of Dinosaurs CoSpace.
4. Simultaneously start the timer and click the End of Dinosaurs CoSpace.
5. Once the animation fully loads and the Play button appears, stop the timer.
6. Clear the cache in the Edge browser.

Loading the At the Airport CoSpace

1. Power on the device, and log in.
2. Open the Edge browser, and navigate to edu.cospaces.io/Universe.
3. Navigate to the At the Airport CoSpace.
4. Simultaneously start the timer and click the At the Airport CoSpace.
5. Once the interactive environment fully loads and the Play button appears, stop the timer.
6. Clear the cache in the Edge browser.

Loading the Reserve Animal World CoSpace

1. Power on the device, and log in.
2. Open the Edge browser, and navigate to edu.cospaces.io/Universe.
3. Navigate to the Reserve Animal World CoSpace.
4. Simultaneously start the timer and click the Reserve Animal World CoSpace.
5. Once the interactive environment fully loads and the Play button appears, stop the timer.
6. Clear the cache in the Edge browser.

Completing the Blender tasks

To use Blender on Windows devices, we downloaded and installed the Blender application on each device before running each test.

Launching the Blender application

1. Power on the device, and log in.
2. Simultaneously start the timer and launch Blender.
3. Once Blender fully loads and the splash screen appears, stop the timer.

Baking data for a fire simulation

1. Open the Blender test file `fire_simulation.blend`.
2. On the right panel, click Physics Properties.
3. Verify that the Frame Start time in the Cache drop down menu is set to 1 and the End time is set to 300.
4. In the Settings drop down menu, simultaneously start the timer and click Bake Data.
5. Once the bake data process completes, stop the timer.

Baking data for a fluid simulation

1. Power on the device, and log in.
2. Open the Blender test file `saucy_viscosity.blend`.
3. On the right panel, click Physics Properties.
4. Verify that the Frame Start time in the Cache drop down menu is set to 1 and the End time is set to 300.
5. In the Settings drop down menu, simultaneously start the timer and click Bake Data.
6. Once the bake data process completes, stop the timer.

Baking a mesh for a fluid simulation

1. With the saucy viscosity Blender test file open after running the bake data process, expand the Mesh drop down menu in Physics Properties.
2. Simultaneously start the timer and click Bake Mesh.
3. When the bake mesh process is complete, stop the timer.

Rendering a 3D image

1. Power on the device, and log in.
2. Open a browser, and navigate to <https://www.blender.org/download/demo-files/>.
3. Download the test file `Car Demo`.
4. Open the test file `bmw27_cpu.blend`.
5. To open the render drop-down menu, click Render.
6. Simultaneously start the timer and click Render Image.
7. Once the render process completes, stop the timer.

Rendering a 2D animation

1. Power on the device, and log in.
2. Open a browser, and navigate to <https://www.blender.org/download/demo-files/>.
3. Download the test file `For You`.
4. Open the test file `(Anim) ForYou 2014.blend`.
5. To open the render drop-down menu, click Render.
6. Simultaneously start the timer and click Render Animation.
7. Once the render process completes, stop the timer.

Completing the Labster tasks

Loading the Plate Tectonics module

1. Power on the device, and log in.
2. Open the Edge browser, and navigate to <https://www.labster.com/>.
3. Click Login, and log into your account.
4. Click Catalog.
5. Click Simulations.
6. Navigate to the module `Plate Tectonics: Boundaries and crustal features`.
7. Simultaneously start the timer and click Play.
8. Once the module fully loads, stop the timer.

Loading the Impact on Climate Change module

1. Power on the device, and log in.
2. Open the Edge browser, and navigate to <https://www.labster.com/>.
3. Click Login, and log into your account.
4. Click Catalog.
5. Click Simulations.
6. Navigate to the module, `Human Impact on Climate Change: Balance human emissions and a growing population`.
7. Simultaneously start the timer and click Play.
8. Once the module fully loads, stop the timer.

Loading the Cell Division module

1. Power on the device, and log in.
2. Open the Edge browser and navigate to <https://www.labster.com/>.
3. Click Login, and log into your account.
4. Click Catalog.
5. Click Simulations.
6. Navigate to the module, Cell Division (Principleds): Mitosis and Meiosis.
7. Simultaneously start the timer and click Play.
8. Once the module fully loads, stop the timer.

Completing the Unity tasks

Playing Ragdoll test

1. Power on the device, and log in.
2. Open the Unity test project.
3. Simultaneously start the timer and click the play button on the top of the window.
4. Once the animation fully loads and starts to play, stop the timer.

Adding a new script component

1. Power on the device, and log in.
2. Open the Unity test project.
3. Under Hierarchy, click Cube.
4. Under Inspector, click Add Component.
5. Click New script.
6. Simultaneously start the timer and click Create and Add.
7. Once the script fully compiles and loads, stop the timer.

Building and running the project

1. Power on the device, and log in.
2. Open the Unity test project.
3. Simultaneously start the timer and click File → Build And Run.
4. Once the project loads and starts to play, stop the timer.

Completing the Autodesk® Fusion 360® tasks

Launching Autodesk® Fusion 360®

1. Power on the device, and log in.
2. Simultaneously start the timer and launch Fusion 360.
3. Once Fusion 360 fully loads, stop the timer.

Exporting model as .STL (zipper)

1. Power on the device, and log in.
2. Open the Fusion 360 test file 3Drepairzippersample.
3. Click File → Export.
4. Name your file, and under Type, select STL Files (*.stl).
5. Simultaneously start the timer and click Export.
6. Once the model exports, stop the timer.

Exporting model as .obj (bevel gear)

1. Power on the device, and log in.
2. Open the Fusion 360 test file `bevelgearsample`.
3. Click File → Export.
4. Name your file, and under Type, select OBJ Files (*.obj).
5. Simultaneously start the timer and click Export.
6. Once the model exports, stop the timer.

Read the report at <https://facts.pt/VPTLe9w> ▶

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