External Audience Protocol (EAP) - Computers - Laptops

Introduction

The following document presents the protocol for testing and evaluating laptops at Consumer Reports. The purpose of this test process is to expose the performance strengths and weaknesses for laptops, and to make a final assessment of its overall performance.

A high level description of our test process can be summarized by the following list of attributes:

1. Inventory of features (Versatility)
2. Ease of Use (Ergonomics)
3. Computing performance
4. Portability
5. Display quality

Description of Test Process

These tests are done in-house in our standard computer laboratory environment. The lab is equipped with multiple Wi-Fi networks on both 2.4GHz and 5GHz frequency bands and all test benches have wired Ethernet connections.

Each attribute’s test process is a tabulation of subscores that include, but are not limited to, the below examples.

1. Inventory of features (Versatility)
   - Features such as memory-card slots, connectivity ports and AV connections
   - Supported speed of WiFi, USB, and ethernet
   - Tech support and warranty provisions
2. Ease of Use (Ergonomics)
   - Represents the quality of the keyboard, touchpad, and touchscreen, and accessibility of features.
   - Keyboard and touchpad size are measured
   - Placement and legibility of keys, and fingerprint resistance on touchscreens are evaluated
3. Computing performance
   - Computer set-up: Before running performance benchmarks we remove any programs that might interfere or interrupt the benchmark testing. We remove any third-party anti-virus, and disable remote assistance and system restore. We also disable any pop-ups and other programs that are set to run on boot-up, and defragment the disk.
   - Results are based on performance scores while running industry standards including PCMark, Unigine, and GeekBench benchmarks. When a benchmark test is incompatible, then real-world tasks are performed and timed, such as compressing and decompressing files, and encoding video and music files.
4. Portability
Portability is a combination of battery life and carrying weight of the laptop.

Battery life
- Battery life is based on the average of multiple runs where we deplete a fully charged battery.
- Computer set-up: Before running our test we adjust the power plan to keep the display on for as long as possible, and the screen is set to 200 nits brightness using a luminance meter.
- The web browsing test is an example of workload under a light task. It is an internally developed script that loops through a sequence of saved web pages over Wi-Fi. We use a pre-installed browser (macOS: Safari; Windows: Microsoft Edge) to run our test script and browser caching is disabled through the website.
- The video playback test is an example of workload under a heavy task. It loops through a local 4K video until the battery depletes. We use a pre-installed browser to log time against our lab server (macOS: Safari; Windows: Microsoft Edge).

Weight
- Subscore is based on a calculation of the laptop weight relative to its screen size.
- Includes the weight of a keyboard dock for detachable models, and does not include the weight of the power adapter or power cable.

5. Display quality
- Covers items such as display size and resolution.
- We use a jury to judge color and viewing angle by comparing them to reference models.
- Measurements are taken for brightness, reflectivity, contrast, color range and shift.