

## The CPU - Central Processing Unit

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#### What is the CPU?

The CPU is the “brain” of the computer. ([See here for other parts of the computer](#)) [2] It does the thinking, the “processing” of information and is one of the 3 critical components that relate to the speed of the computer. The main CPU makers today are Intel and AMD. At least one of these is in every computer sold today, most of the time you can find a sticker on the machine indicating which it has.

CPU's have several factors that are worth considering. It's not critical for this to all sink in, but still interesting to point out.

Multi-core CPU's are standard these days. That that means generally is instead of having “one brain”, it has 2 or more. Older computers were single-core, one brain. Modern processors have between 2 and 8 cores... almost like having 2-8 CPU's, just on a single chip. This has been one of the main factors in CPU speed increase over the past decade.

Gigahertz (GHz) is the “clock speed”. Think of it like RPM (rotations per minute) of a car engine. It is a factor, not as important as most people think. Just like car engines produce different power at different RPM's, the same is true for CPU's. Some are actually more powerful at lower Ghz than others.

CACHE is the amount of “memory” built onto the CPU. Having memory built into the CPU speeds things up tremendously over using the system's normal RAM.

#### Budget vs Standard Processors

We receive a number of calls about “slow computers”. We roll out, and do what we can, but sometimes the issue is simply “your CPU is not powerful enough”.

Most processors are powerful enough these days that they'll handle normal (web browsing, email, office documents) without issue. However people sometimes make the mistake of getting the “budget low end” processors without realizing what they are purchasing.

[You get what you pay for!](#) [3] We've said that over and over in tech tips and this is another example in that vein.

Low-end CPU's are produced by AMD and Intel in order to not lose customers who might otherwise purchase another computer/processor because it's cheaper.

For example if Intel did not offer its “Celeron” CPU's, and you went to purchase a computer – you might see an AMD Sempron for less and go with that. It's for this reason, both CPU makers offer these low-end CPU's.

What isn't known by most people is that these low-end cheap CPU's are crippled in a number of ways and perform significantly worse than the "flag-ship" main processors offered at the time. The key word being significantly!

You might save \$100 over the cost of the cheaper processor compared to the flag-ship processor, purchasing a product that will likely not last as long and you may be unhappy with not long after purchase.

Unfortunately when we run across these computers, there isn't a lot we can do to make the system run as the user expects, and this is because the CPU is maxed out.

In the chart below, we compare an i3 (an Intel "standard") vs a Celeron. Both processors are "dual-core", but the Celeron is actually running at 2.16Ghz (faster) than the i3 running at 1.8Ghz.

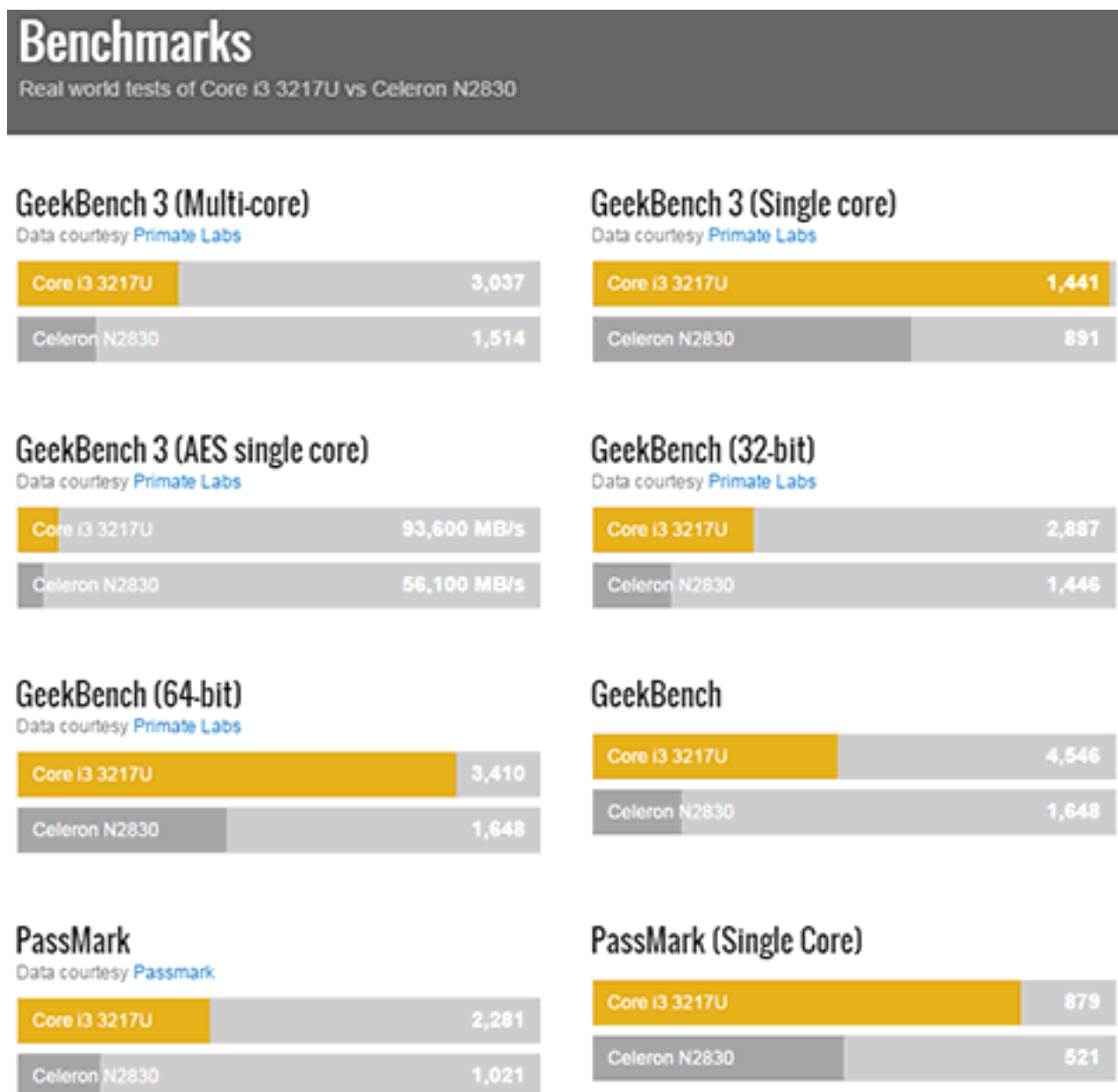


Chart courtesy of CPUBoss.com (<http://cpuboss.com/cpus/Intel-Core-i5-3427U-vs-Intel-Celeron-847> [4])

Notice that even though the Celeron has a faster clock-speed, the i3 still out-performs in every test, sometimes by a lot! [This is why on our recommendations for new computers \[5\] we advise an Intel](#)

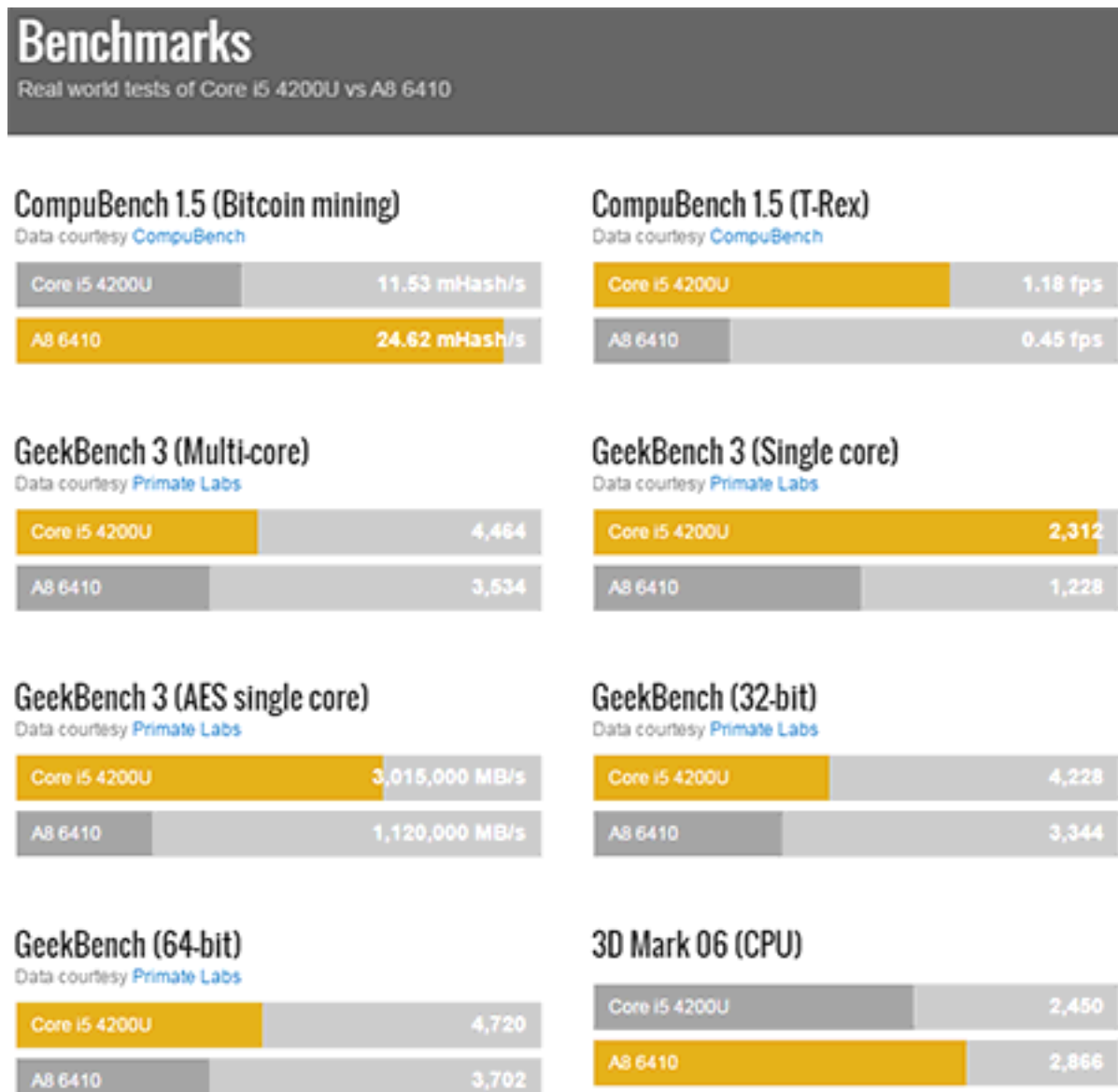
i3, i5 or i7 processor.

## AMD vs. Intel

We love rooting for the underdog. In the CPU world, that's AMD. However the truth of the matter is that in most situations, the Intel processors demolish the AMD processors.

The AMD Processors generate more heat, and are far less efficient than the Intel Processors. Generally it takes twice as many AMD cores to do the same as a single Intel core.

The chart below compares a similar AMD and Intel CPU in terms of Clock Speed (Ghz), but the Intel has only 2 cores (2 brains) vs AMD's quad-core (twice as many brains).



\*Chart courtesy of CPUBoss.com (<http://cpuboss.com/cpus/Intel-Core-i5-4200U-vs-AMD-A8-6410> [6])

Notice despite having half the core's, the Intel still beats the AMD in most tests, and sometimes by a lot! Because of this, we recommend the Intel processors instead of AMD processors.

## Conclusion

In conclusion - you get what you pay for. The CPU is the brain of the computer, so spend a little more on it! We recommend sticking with Intel processors, specifically the i3, i5 or i7 processors. Each of

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those have many variations and subsets, but as long as it has that label in front of it you'll be good for general use. Each number up is more power; think of it as "good, better, best".



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