Break Free of Your Calculator!

Today, using a calculator is a critical part of doing work in math and science. There's a greater possibility for making mistakes when working out complicated problems by hand, and using a calculator is faster. On the other hand, some calculations are so simple that a calculator shouldn't be necessary. If you have to add 3 + 4, you shouldn't need to reach for your calculator. As we get into more complex problems in math and science, we rely on the calculator more and more, and soon it just becomes easier to let the calculator do the work for us. We start to get lazy about arithmetic. This worksheet will describe some of the dangers of relying on your calculator for every calculation, and it will show you some tricks to help boost your mental math skills.

WHY NOT LET THE CALCULATOR DO IT ALL?

Calculators are fast and accurate, but there are two flaws with using the calculator for everything: it does exactly what you tell it to do, and it allows you to stop thinking.

While calculators never make mistakes, people still do, and you have to tell the calculator what to do. No matter how skilled you become at math, you will still do crazy things like write 15 + 15 = 20 and then go on with the rest of your problem. If you have an error, you'll still get an answer, but it won't be right. Math is like this.

If you type something and you have manny tpying mistakes, you will noticwe then assoon as you raad them, becuase they stikc out. You probably understand the last sentence, but it was painful to read because of all the errors. It is useful to develop the same sense of "wrongness" when we look over a math problem. This ties in to the other danger of letting the calculator do it all: it lets us stop thinking.

"Not thinking" sounds good, doesn't it? Chemistry, physics and calculus are hard enough without having to worry about doing arithmetic too! I passed Grade 3 a long time ago! Why should I need to do math in my head? Why should I have to *think* about everything? The reason is that when you're in math class, you're not just learning math. You're learning how to solve problems. Solving problems requires thinking. If we get lazy and stop thinking, we make more mistakes. Isn't it really irritating when you get a test back and discover that you knew the concepts and equations... but your calculations were wrong because you forgot a negative sign? Being more careful about your math improves your marks, but you can only catch obvious mistakes if you're thinking. So what can you do to help yourself get better at the simple math?

THE SANITY CHECK

Even on a question where you can't tell what the answer is just by looking, you can often get an idea of how big the answer is, or whether you expect the answer to be positive or negative. Comparing the answer you get from a problem to your expectations of the answer is sometimes called a **sanity check**.

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