

Close Enough

When we learned math in school we really learned it backward. Our mathematics education—particularly our arithmetic education—began with the least important numbers and worked through the years to get us to the more important ones. I guess that follows the theory of having to learn to walk before you can run and defers to the lower capacity of the young child's mind to grasp more complex models. Historically, mankind probably began to be concerned with numbers when the idea of ownership of livestock began, or maybe even while we were still hunters and gatherers. The first three numbers were probably designated by one finger for 1, two fingers for 2, and a whole hand's worth of fingers for many, to designate how many woolly mammoths were ambling into hunting range. I can't conceive of a need for a more specific greater number than **many**—at least before we became herders and needed to keep track of our sheep and goats.

It's the Big Ones That Count

The fact of the matter is that the larger numbers are more important than the smaller ones. If you were about to buy a car that cost \$23,472.87, would you reject the deal if the sales manager said, "Whoops, we have to raise the price to \$23,472.89"? I don't think so. On the other hand if that raise of 1 were in the ten thousand dollars column rather than in the pennies column, you might stop and reconsider whether the car is really worth \$33,472.87, not to mention whether you can afford it. I've often wondered why they even bother with the five right-hand digits when they make up the price tags of automobiles. I don't think I've ever seen a house for sale with a price tag of \$247,362.43. Have you? That house would be priced at \$245,000, or thereabouts.

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The point is, when you're dealing with large numbers, the exact amount really doesn't matter. Who cares if 47,236 people were at Friday night's baseball game, or if there were really 47,186 fans present? There were *about* 47,200 fans at Friday night's game, and that's what we call a **ballpark figure** (pun intended). The *rounded* attendance number for Friday night's game is 47,200. Likewise, when you're trying to figure out how much of a tip to leave for the waitperson at a restaurant, you don't need to compute it based on a check totaling \$29.67. Round the bill to \$30 and compute the tip (we'll have much more about that in Chapter 6).

In case you need a reminder about the "places" in place-value numerals, check out the chart and explanation below.

Thousands			Ones		
h	t	u	h	t	u

Thousands and Ones are the first two periods. Within each period are the hundreds (h), tens (t), and **units** (u) or ones. So, a **digit** (a single-place numeral) written so as to be positioned below the right-hand "t" would have a value of 10 times that digit's name. A digit written so as to be positioned below the left-hand "t" would have a value of 10,000 times that digit's name. If we moved one more period to the left we would be in the Millions period, and any digit would have a value of its name times the place's heading (h, t, or u) times one million. That's how we're able to represent very large numbers using only the ten digits 0 through 9.

Rounding Up or Down

When rounding numbers, there are two key things to remember:

1. Always look one place to the right of the place you're rounding to. (If you're rounding to tens, look in the ones place; rounding to hundreds, look in the tens place; etc.)
2. The key number is 5: 5 or more rounds up; less than 5 rounds down.

Here's how to apply these rules. To round 476 to the nearer 10, look to the ones place (it's underlined). The number in the ones place is a 6. Because 6 is 5 or greater; you **round up**. So 476 to the nearest ten

rounds to 480. That won't be our last round up. This is a concept that can help you through all sorts of mental math calculations.

To round $47\underline{2}8$ to the nearest hundred, look in the tens place (it's underlined). Because 2 is less than 5, we **round down**. Rounding 4728 down to the nearest hundred gives you 4700.

You may have noticed that we didn't use a comma in any of the thousands numbers in the preceding paragraph. But we did when we talked about "ballpark figures." That's because it is now conventional to not place a comma until we get into the 10,000s. If you're more comfortable writing "4,728" feel free to keep doing it your way. The one sure thing is you won't be entering any commas on your calculator.

Pop Quiz

1. Bill needs 339 shingles to repair his roof. Shingles are sold in boxes of 100. How many hundred shingles should Bill buy?
2. Barbara needs to withdraw \$15,623 from her brokerage account to pay for a kitchen remodeling job. She is required by the account's terms to withdraw only multiples of \$1000. How much does she have to withdraw?
3. Frank figures that he'll need about 550 pounds of concrete for the patio he's putting in. To get the best price on the concrete, he needs to buy it in hundred pound sacks. How many hundred pound sacks should he buy?
4. Reese is buying a slightly used car with a sticker price of \$9398. After some haggling, the seller agrees to accept a price rounded to the nearer thousand. What should Reese pay for the car?

Answers

1. If this were just a math problem we'd be looking for the nearest hundred, so the only digit we'd pay attention to is the 3 in the tens place. Because 3 is less than 5, we'd round down to 300, but that would leave us short by 39 shingles. That would let a lot of rain come in. Bill will need to buy 400, and he'll have some spares around for emergencies.
2. Here, we're looking for the nearer thousand dollars. That's the digit to the left of the comma. The only digit we are concerned with is the 6 (in the hundreds place). It is greater than or equal to 5, so we round up to \$16,000.

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3. Though it seems to be in the middle, 550 rounds up to 600, because the tens digit is 5 or greater. I'm sure Frank will find a use for the extra 50 pounds of concrete.
 4. Did you pay any attention to the 9 or 8 in question 4? You shouldn't have. Only the 3 in the hundreds place need concern you. That makes it round down to \$9000, so Reese saved some money.
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