Approaches

The two most common approaches that you can use to solve guesstimate questions is Top-Down and Bottom-Up/ Ground-Up. In some cases, you may even end up using both approaches. Let's have a look at them:

Top-Down Approach

This approach is often used in questions that involve starting from the very top level. For example, solving the guesstimate problem by starting with using the population figure of a country and then breaking it down into smaller components until you arrive at the final answer.

Consider the following question:
"Calculate the number of school teachers in New York."

A simple way to approach this question would be to start with the population of New York. In the second step, you may estimate what percentage of New York's population is students. Then, estimate the number of students per class. Using this, you would arrive at an estimate of the number of school teachers, because generally at any given time there is exactly one teacher per class. Remember that you can always go that extra mile to demonstrate that you are a detail-oriented person by taking into account the retired and substitute teachers as well.

In guesstimate cases, starting with the population figure is very common. This population figure could be a country's population, a city's population etc. Many a times, you will need to segment the population figure. For example, in the case of number of school teachers in New York, we needed to calculate the percentage of population that was school-going. In other words, we required a segmentation of the population on the basis of age.
Remember that the same population figure can also be segmented in a number of other ways depending on what strategy you have chosen to solve the guesstimate question. Using a Top-Down approach, **segmentation** is often done on the basis of:

- Gender (What percentage of the population is male/female?)
- Age (What percentage of the population are senior citizens?)
- Geography (What percentage of the Canadian population resides in British Columbia and Ontario?)
- Income & assets (What percentage of the population is below poverty line?)

Bottom-Up/ Ground-Up Approach

While using this approach to solve guesstimate questions, you often start from the grass root level rather than the top level with a high-level figure such as the population of a country. This could mean using some low-level statistic, such as cost per product, and build your way up to the final answer.

Consider the following question:
"Calculate the monthly revenue of a hair salon in New York"

In such a question, you may calculate the revenue made in one day and multiply it by 30. Or, you could also estimate the weekly revenue and multiply it by 4. An assumption can be made for the average price per client visit, and then the weekly volume can be calculated by assuming the number of chairs in the salon, the number of hours it is open per week, and the average number of clients chair per hour.

Remember that you can always show your skills of creativity and thorough analysis by taking into account the revenue earned by selling hair products at the salon as well. Further on, you may take into consideration the fact that generally female clients spend longer time and more money at hair salons compared to male clients in one visit.

Keep in mind that most of the times, the same question can be solved using any one of the approaches. As long as you are backing it up with the right logic, you will be able to derive to the correct answer.

Estimation

Once you have broken down the bigger problem into smaller, more manageable components, it's time to feed numbers into your structure. This means estimating each piece using mathematics and background knowledge. Remember that you have a limited time to solve guesstimate questions during an interview. Therefore, it's very important that you be able to do quick math. This does not mean that you need to have a math degree to have the right level of mental math skills. But you do need to know what is expected of you and you do need to practice mental math a lot.

Mental Math v/s Academic Math

The biggest difference between Mental Math and Academic Math is that in the latter, you are expected to deliver accurate results whereas in the former, answers are often required to be close enough to guide towards the ballpark answer, versus being 100% accurate. Since the use of calculators is not allowed during interviews, it is crucial to practice and be ready to handle numbers fast, accurately, and without a calculator.

- Rounding numbers

  Rounding numbers is always a good idea during guesstimates as it makes your calculations much simpler and faster.

  For example:

  Approximately 62 million population of the United Kingdom becomes 60 million. Remember to round the numbers in such a way that doing so does not distort the final answer too much. A good guideline to follow is not to round by more than 10%. It is also helpful to round both up and down as you are working through the problem, so the effects, to some degree, cancel each other out. In the end, also make sure you check if your answer actually makes sense.

  Look at another example:

  If an answer involves multiplying 44 by 5,300, you will get a more accurate answer with 50 × 5,000 = 250,000 (one rounded up, and the other rounded down) than 40 × 5,000 = 200,000 (both rounded down). (The exact answer is 233,200).

- Dealing with large numbers

It is often cumbersome to deal with large numbers. One strategy to simplify things is to remove all zeros and add them back later. You can also use symbols such as K, M, B to keep track of large numbers.

For example, 300 million can be re-written as 300M and 400,000 can be re-written as 400K. And 20 billion will become 20B. 3 x 50M becomes 3 x 5 = 15 with 7 zeros.

- Break down into smaller parts

  Numbers can be broken down into smaller parts for simpler calculations.

  For example, 13 x 7 = (10 x 7) + (3 x 7) = 91.

- Subtracting from numbers with 1 followed by zeros

  This is also an effective strategy for faster math. For example, 1000-365 becomes 999-365+1 = 634 + 1 = 635.

- Group numbers into multiple of 10 (addition)

  This is another effective strategy for faster math. For example, 3+7 + 4 + 6 +13 +7 +21 becomes 10 + 10 + 20 + 21 = 61.

Tips for Better Mental Math

- Don't forget to seek the interviewer's permission before rounding up numbers. Almost always you will have his/her permission and that will make mental math calculations much easier and faster.
- Don't do calculations in haste. Remember that if you make a mistake, it will take you even longer to fix it. Of course, there is a lot of time pressure during interviews so do not take any longer than you need. You need to find a good balance. This comes with a lot of practice.
- Don't hesitate to use pen and paper if you want to. Just make sure that what you write is legible enough for the interviewer to read and understand. The advantage of doing so is that the interviewer might even correct you if your calculations are off or if you are going down the wrong track. But that's the interviewer's discretion!
- Keep your writing organized. Let say you are estimating how many cars will be purchased in the United Kingdom in 2030. As you are putting down numbers for each element of your

equation, keep it neat and organized so you don't get confused and it will also help you avoid silly mistakes.

- Refresh key math topics like ratios, fractions, percentages, averages, and probability as a part of your preparation.

Once you are confident that you have calculated the values of all components, it's only a matter of carefully integrating the sub-parts and reach the final answer.