edX

QQ2
QQ2

0 points possible (ungraded)
Lets try a quick estimation problem. How many disposable diapers for children are sold in the United States each year? Assume population of the United States is 320 million. Enter your answer in two parts: digits and then the exponent. Remember, if your answer is 23 million, you would enter 2.3 as the digits and 7 as the exponent.

What is the digit? Only use one decimal place.

| 3.2 | ✔ **Answer:** 1.6 |

3.2

What is the exponent? This is an integer.

| 8 | ✖ **Answer:** 10 |

8

Explanation
OK, here is how I thought about this. I will use the notation 2.3e4 to indicate 23000, that is, 2.3 are the digits and 4 is the exponent in scientific notation.
- There are 320 million people in the United States
- Life expectancy is 80 years and lets assume an equal distribution by age
- Babies wear diapers for the first three years of their lives
- On average, there are 4 to 6 diaper changings per day, lets use 5
- 75% of market uses disposable diapers - others use cloth
Number of disposable diaper wearers = (3.2e8 ppl)(3/80 or 3.8e-2 share of diaper wearers) (7.5e-1) = 9.1e6 diaper wearers (that is, 9.1 million)
Number of diapers used each = (5 changes/day)(365 days/year) = 1.8e3 diapers per year per baby

Diapers per year = (9e6 diaper users)(1.8e3 diapers/user) = 1.6e10 diapers per year, that is 16 billion diapers a year.

In 2014, the revenue from disposable diapers in the US was 6 billion dollars at about 40 cents each for an estimate of 15 billion diapers. (source: statista.com). Wow! closer than I thought I'd get!

Note - we totally ignored the adult diaper market which is growing faster than the traditional market!

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ℹ️ Answers are displayed within the problem

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Approximate the right numbers.

discussion posted 2 days ago by **VandanaPai**

As this is approximation, and we assume a lot of figures, there can be lot of answers quite close to the right answer , but not the exact required answers. In that case, how can I come to assume the right numbers? for eg: i took average number of diaper used per day is 4 and number of diaper wearers is 30%

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2 responses

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salmanahmad12   ⊞
a day ago   ⋯

My assumption was 1% pf total population is between age 0-4 requiring 3 diapers per
child per day.

@salmanahmad12: 1% as an estimate of the percentage of total population aged 0-4   ⋯
seems too small to me (the actual number is closer to 6%).

posted about 22 hours ago by **Leshiy**

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Leshiy   ⊞
about 22 hours ago   ⋯

@VandanaPai: Your estimate for the number of diaper wearers is 30% of what? Of the
total population / kids only / people using any kind of waste products
absorbers/containers?

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