

### Exercise 1.39

In the year 2013, an estimated amount of 36 billion metric tons (1 metric ton = 1000 kg) of carbon dioxide (CO<sub>2</sub>) was emitted worldwide due to fossil fuel combustion and cement production. Express this mass of CO<sub>2</sub> in grams without exponential notation, using an appropriate metric prefix.

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#### Solution

Use dimensional analysis, starting with the given number.

$$36 \times 10^9 \text{ metric tons} \times \frac{1000 \text{ kg}}{1 \text{ metric ton}} \times \frac{1000 \text{ g}}{1 \text{ kg}} = 36 \times 10^{9+3+3} \text{ g} = 36 \times 10^{15} \text{ g}$$

The metric prefixes are listed on page 18. This is 36 petagrams (36 Pg).