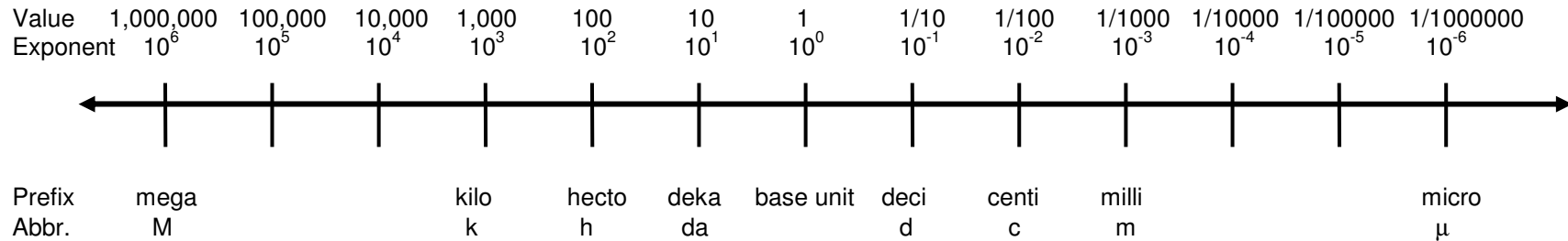


## Metric Units and Conversions



### Working with quantities that are not in Scientific Notation

1. Find the prefix with which you are beginning. If the unit has no prefix attached, you are beginning with the “base unit” at  $10^0$ .
2. Find the prefix for the answer you are seeking. If the unit has no prefix attached, you are converting to the “base unit” at  $10^0$ .
3. Count the number of places on the number line to get from where you are starting to where you are finishing.
4. Now, move the decimal in the number you are converting that same number of places, and in the same direction that you moved on the number line above (if you moved left three spaces, you move the decimal left three spaces to complete the conversion).

Example: Convert 0.035 decimeters (dm) to millimeters (mm)

Solution: The prefix “milli” is two places (two powers of ten) to the right of the prefix “deci.” Move the decimal two places to the right.

Answer: 0.035 dm = 3.5 mm

### Working with numbers that are in Scientific Notation

1. Find the prefix with which you are beginning. If the unit has no prefix attached, you are beginning with the “base unit” at  $10^0$ .
2. Find the prefix for the answer you are seeking. If the unit has no prefix attached, you are converting to the “base unit” at  $10^0$ .
3. Count the number of places on the number line to get from where you are starting to where you are finishing.
4. If you moved to the right on the line, add the number of spaces to the exponent on 10.
5. If you moved to the left, subtract the number of spaces from the exponent on 10.

Example: Convert  $1.35 \times 10^2$  centigrams (cg) to kilograms (kg)

Solution: The prefix “kilo” is five places (five powers of ten) to the left of the prefix “centi.” Subtract five from the exponent.

Answer:  $1.35 \times 10^2$  centigrams =  $1.35 \times 10^{2-5}$  kilograms =  $1.35 \times 10^{-3}$  kg