IO4: MEASUREMENT (UU/NL)

What is 1,5 meter?

STEMkey

## Teaching standard STEM topics with a key competence approach

AIMS OF THE MODULE

Develop student teachers' competence in teaching measurement for the digital society of the future. This competence is a combination of:

- KNOWLEDGE: e.g. difference between qualitative and quantitative measures (for acid, wind, ...), limitations of staircase models
- SKILLS: e.g. methods for teaching measurement in societal contexts, using your cell phone for measurement
- ATTITUDES: e.g. willingness to look for and use personal reference points for measurement, confidence in one's ability to use drawings for calculations and unit conversions
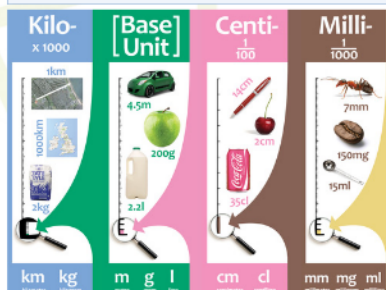
The pH Scale

$$pH = -\log[H+]$$
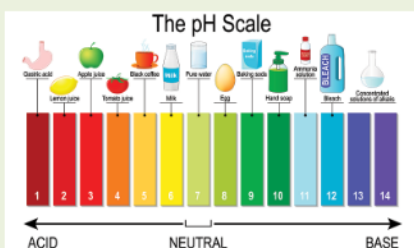
Learn to use different scales and conversions
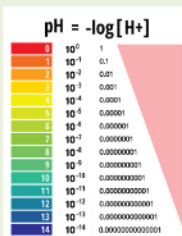
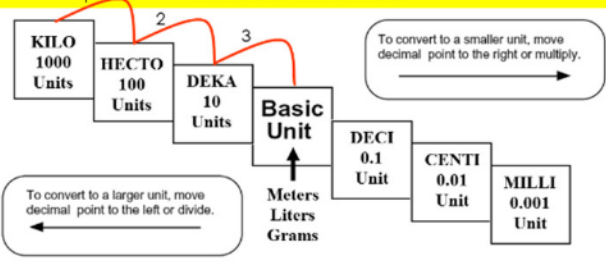### Some sense of measuring tools is indispensable in daily life

Some sense of measurement is indispensable in daily life

The Ever Given is almost as long as Manhattan's Empire State Building is high. The ship has the capacity to carry 20,000 shipping containers

Ladder Method

KILO 1000 Units — HECTO 100 Units — DEKA 10 Units — Basic Unit — DECI 0.1 Unit — CENTI 0.01 Unit — MILLI 0.001 Unit

Meters Liters Grams

To convert to a smaller unit, move decimal point to the right or multiply.

To convert to a larger unit, move decimal point to the left or divide.

How do you use the "ladder" method?

1st – Determine your starting point.

2nd – Count the "jumps" to your ending point.

3rd – Move the decimal the same number of jumps in the same direction.

4 km = _____ m

Starting Point   Ending Point

How many jumps does it take?

4. _._._. = 4000 m

Activity L2.3 Discuss alternatives for the metric ladder

The visual representations in the figure below help to develop and reconstruct relations between measures. Explain how a sketch of a cubic meter can be used to explain the factor of 1 million when converting from cubic meters to cubic centimeters.

Area

$1\ m^2$

$1\ m^2 = 10.000\ cm^2$

Length

$1\ km = 10 \times 100\ m$

$1\ km = 1.000\ m$

Volume