

Score (first try): \_\_\_\_\_  
 Score (with corrections): \_\_\_\_\_

Name: \_\_\_\_\_

### Metric Measure

Scientists, computer technologists, engineers, and mathematicians measure all sorts of things, from the rings around planets like Saturn to microscopic chemicals in a fruit fly's brain and tiny particles of gold.

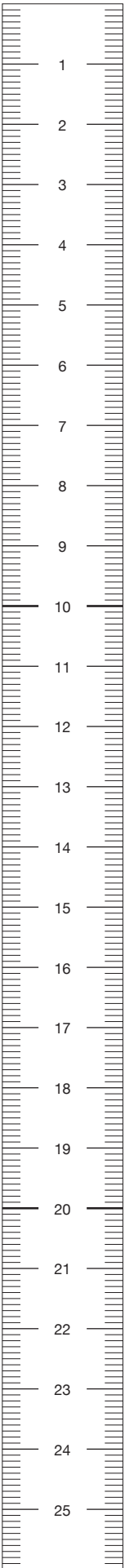
1. Talk with a partner about what **you** measure — at home, at school, at work, etc. List at least six things you've measured. For each one, explain why you measured it and list the units of measure you used (e.g. cm, inches, ml, ounces, lbs, mg, etc.).

What we measured	How and why we measured it	Units we used

2. Many people in the United States use “customary” or “standard” units of measure, like inches, miles, gallons, and pounds. But most scientists around the world use **the metric system**. [Bioengineer Derek West](#), for instance, uses particles of gold about a nanometer in diameter to kill cancer cells. Complete the following chart to explore both systems:

**Metric (M) or Customary?** Label each unit and then describe its size using the other units listed in that row.

M or C?	Unit	Unit (full name)	Equal to:	Equal to:	Equal to:
	nm	1 nanometer	_____ mm	_____ cm	_____ m
	km	1 _____	_____ dm	_____ cm	_____ mm
	ft / '	1 foot	_____ in	_____ 1/4"	_____ 1/16"
	l / L	1 liter	_____ ml	_____ µl	_____ nl
	pL/ pl	1 picoliter	_____ nl	_____ ml	_____ l
	mi	1 _____	_____ yd	_____ ft	_____ in
	gal	1 _____	_____ qt	_____ pt	_____ oz
	lb	1 _____	_____ oz	_____ tons	
	kg	1 _____	_____ tg	_____ g	_____ mg
	sq mi	1 square mile	_____ acres	_____ sq yd	_____ sq ft
	ha	1 hectare	_____ sq m	_____ sq cm	_____ sq km



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The metric system and our number system use powers of 10. Complete this chart and remember to apply each prefix to help you understand units from nanometers to terabytes.

Prefix	Meaning	Power of 10	Decimal	Fraction	Example
<i>pico-</i>					
<i>nano-</i>	billionth	$10^{-9}$		1/1,000,000,000	nanometer (nm)
<i>micro-</i>					micrometer ( $\mu\text{m}$ )
<i>milli-</i>	thousandth				milliliter (ml)
<i>centi-</i>					centigram (cg)
<i>deci-</i>	tenth				decimeter (dm)
<i>deka-</i>	ten				dekavolt (daV)
<i>hecto-</i>	hundred				hectopascal (hPa)
<i>kilo-</i>	thousand		1,000.0	1,000/1	kilogram (kg)
<i>mega-</i>	million				megaliter (Ml)
<i>giga-</i>	billion				gigohms (G $\Omega$ )
<i>tera-</i>	trillion	$10^{12}$			terabyte (TB)

**Extra Credit:**

What's a kibibyte and why does it exist? Do some research to find out what *kibi-*, *mebi-*, *tebi-* and *gibibytes* are and explain why they're used. Write a paragraph about this below or on a separate sheet.