# N1 - Chemistry Math Review

- Follow formatting requirements written on WS #1 given to you for homework!
- Take NOTES don't copy word for word! Do *not* ask me "can you go back a slide?" The answer is no. If you need more detail add it at home – notes will be on class website. You need to get FAST at note taking! Use abbreviations, shorthand, pictures etc!

**YOU ARE A NOTE TAKER, NOT A PHOTOCOPY MACHINE!**

- This "should" be review…we review it quickly to refresh your memory. If you need extra help then come see me!
- We will add "KCQ Boxes" to the end of your notes in class together the next day – it is a note taking technique to help process and retain the information you take notes on. You do not have to do this tonight for homework!

# N1 - Chemistry Math Review

**Target: I can use scientific notation and the metric system this year in my chemistry class.**

# Tired of really big or really small numbers???

- Use scientific notation!
- Move your decimal and rewrite it in "scientific notation format"

"x 10 EXPONENT" is the same a

E

$3.54E^2$

$3.54 \times 10^2$

One # | . | Rest of the #s | x | 10 | Exponent

*(telling how many times to move the decimal, and which way to move it!)*

# Nature of Measurement

- Measurement - *quantitative* observation
- Consisting of 2 parts
  - Part 1 – number
  - Part 2 – scale (unit)

Example: 20 grams

We will be using a lot of scientific notation for our numbers

We will be using the metric system for our units

# Why the Metric System?

- We all need to speak the same "math language."
- Everyone else uses it!
- It is easier!

**The British: Hey guys, we developed this thing called the metric system…**

**Americans:**

**Adult deer are as tall as a bicycle. They weigh as much as 800 hamburgers.**

# How is it easier?

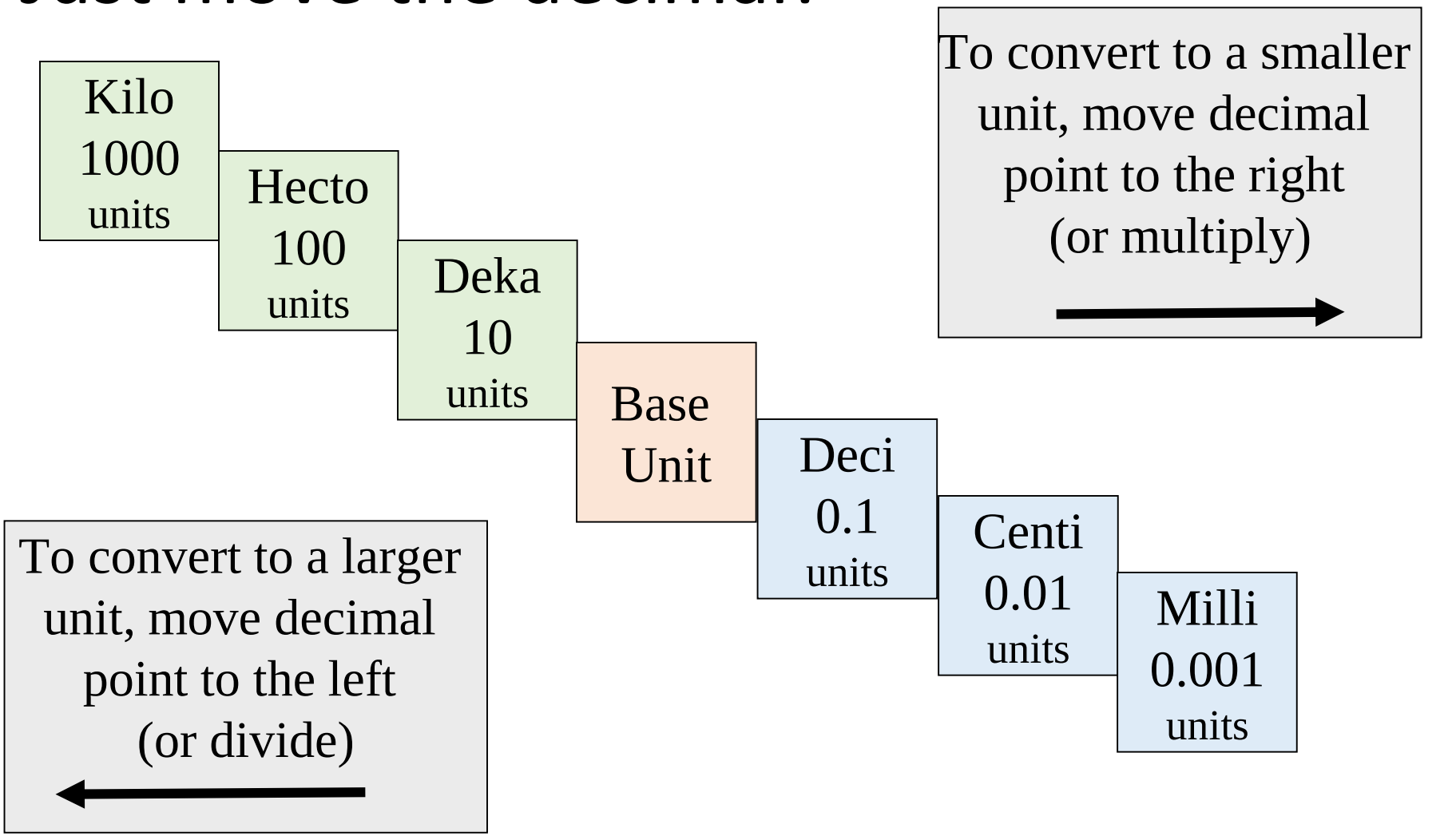
- Metric system works on "BASE TEN"
- Everything is changed by a factor of 10
- English system is totally random!

| Unit | Compared to "base" unit of a meter |
|---|---|
| Meter | 1 |
| Decameter | 10 |
| Hectometer | 100 |
| Kilometer | 1000 |

| Unit | Compared to "base" unit of a foot |
|---|---|
| Foot | 1 |
| Yard | 3 |
| Fathom | 6.0761 |
| Rod | 16.5 |
| Chain | 66 |
| Furlong | 660 |
| Mile | 5,280 |
| Nautical mi. | 6,076.1 |
| League | 15,840 |

# Converting Metric System

- Just move the decimal!



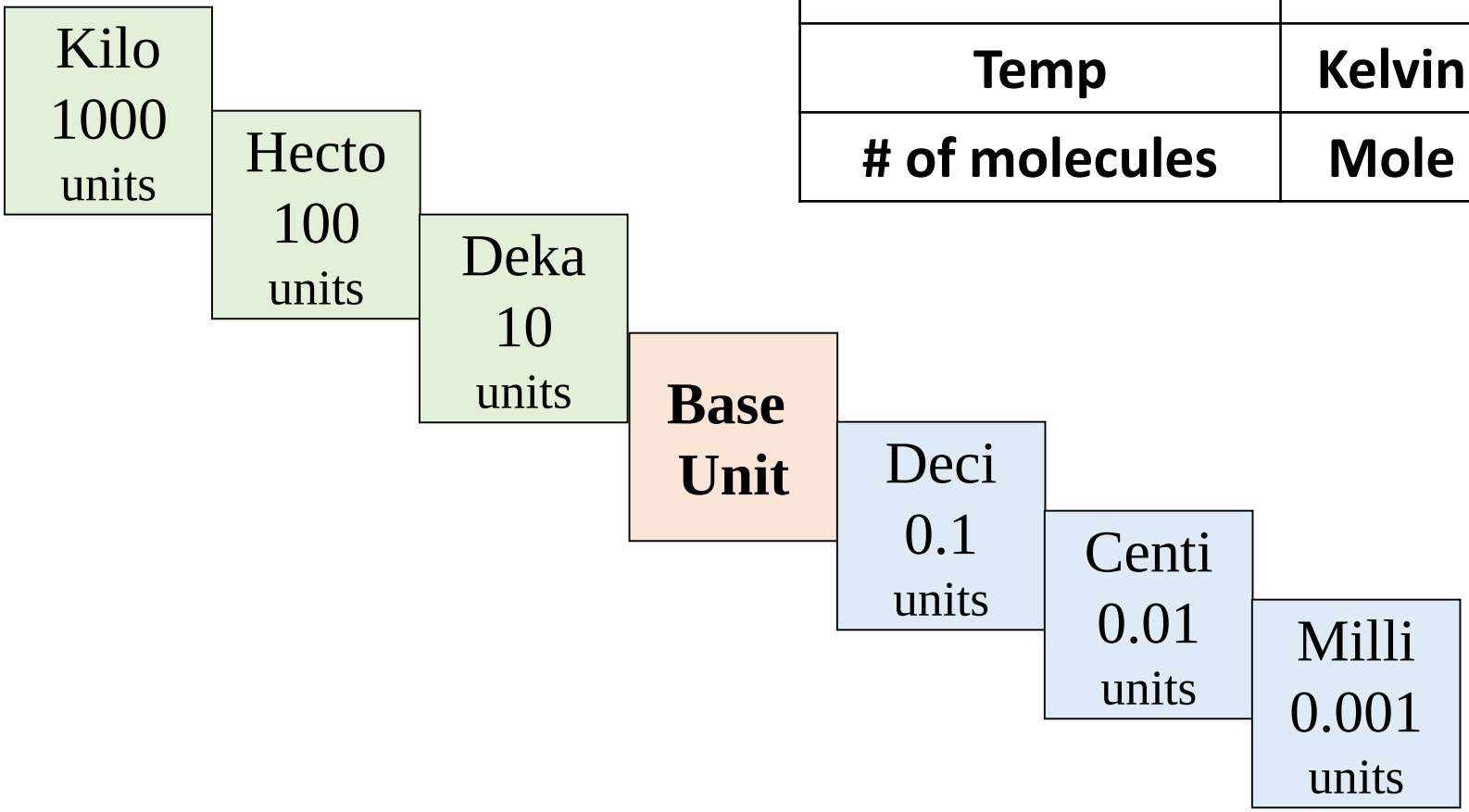
# How do I remember the prefixes?

**K**ing **H**enry **D**ied **B**y **D**rinking **C**hocolate **M**ilk

| | | | | | | |
|---|---|---|---|---|---|---|
| **K** | **H** | **D** | **B** | **D** | **C** | **M** |
| **I** | **E** | **E** | **a** | **E** | **E** | **I** |
| **L** | **C** | **K** | **s** | **C** | **N** | **L** |
| **O** | **T** | **A** | **e** | **I** | **T** | **L** |
| | **O** | | | | **I** | **I** |

# What are the "Base Units?"

| Measuring | Unit |
|---|---|
| Length | Meter |
| Volume | Liter |
| Mass | Gram |
| Time | Second |
| Temp | Kelvin |
| # of molecules | Mole |



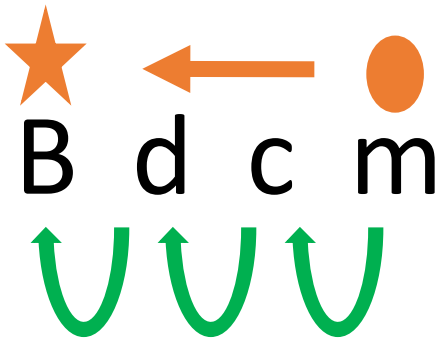
# Guided Practice

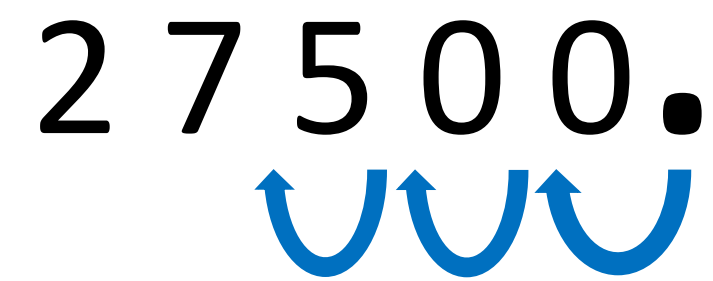
27500 mg → g

**STEP 1**
Are you going up or down the "ladder?"

**STEP 2**
How many steps to get there?

**STEP 3**
Move decimal that many times, in that direction




**27.500 g**

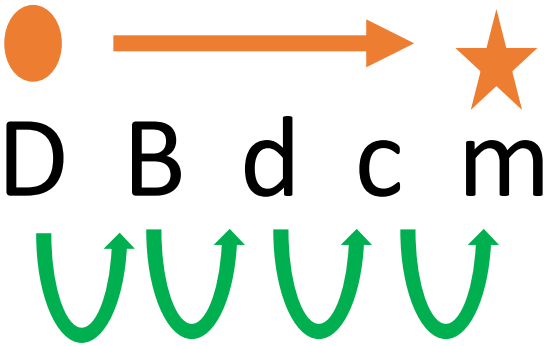
# Guided Practice

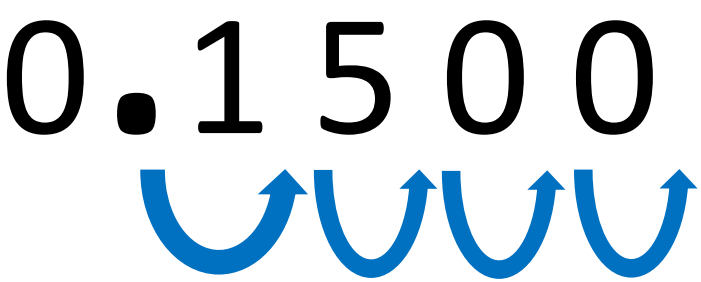
0.15 DL = _____ mL

**STEP 1**
Are you going up or down the "ladder?"

**STEP 2**
How many steps to get there?

**STEP 3**
Move decimal that many times, in that direction




**1500 mL**

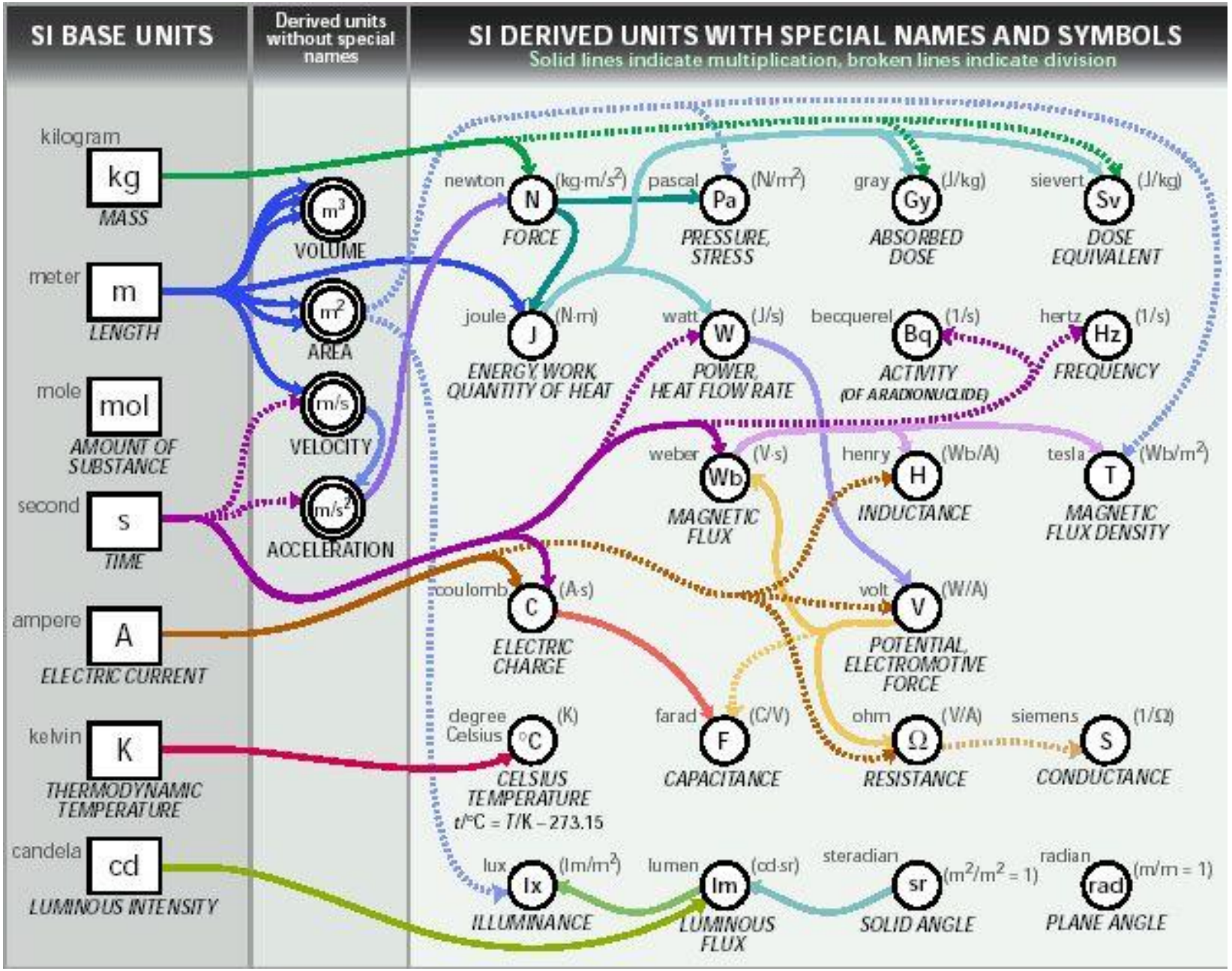
# The Fundamental SI Units
# (le Système International, SI)

| Physical Quantity | Name | Abbrev. |
|---|---|---|
| Mass | kilogram | kg |
| Length | meter | m |
| Time | second | s |
| Temperature | Kelvin | K |
| Electric Current | Ampere | A |
| Amount of Substance | mole | mol |
| Luminous Intensity | candela | cd |

# Derived Units

- Made by combining multiple units together
- Examples:

| | | |
|---|---|---|
| miles/hour | = | speed in our cars in US |
| $cm^3$ | = | volume |
| $m/s^2$ | = | acceleration |
| $kg \cdot m/s^2$ | = | newton (measures force) |


SI BASE UNITS
Derived units without special names
SI DERIVED UNITS WITH SPECIAL NAMES AND SYMBOLS
Solid lines indicate multiplication, broken lines indicate division
kilogram
kg
MASS
meter
m
LENGTH
mole
mol
AMOUNT OF SUBSTANCE
second
s
TIME
ampere
A
ELECTRIC CURRENT
kelvin
K
THERMODYNAMIC TEMPERATURE
candela
cd
LUMINOUS INTENSITY
m³
VOLUME
m²
AREA
m/s
VELOCITY
m/s²
ACCELERATION
newton
N
(kg·m/s²)
FORCE
pascal
Pa
(N/m²)
PRESSURE, STRESS
gray
Gy
(J/kg)
ABSORBED DOSE
sievert
Sv
(J/kg)
DOSE EQUIVALENT
joule
J
(N·m)
ENERGY, WORK, QUANTITY OF HEAT
watt
W
(J/s)
POWER, HEAT FLOW RATE
becquerel
Bq
(1/s)
ACTIVITY (OF A RADIONUCLIDE)
hertz
Hz
(1/s)
FREQUENCY
weber
Wb
(V·s)
MAGNETIC FLUX
henry
H
(Wb/A)
INDUCTANCE
tesla
T
(Wb/m²)
MAGNETIC FLUX DENSITY
coulomb
C
(A·s)
ELECTRIC CHARGE
volt
V
(W/A)
POTENTIAL, ELECTROMOTIVE FORCE
degree Celsius
°C
(K)
CELSIUS TEMPERATURE
t/°C = T/K − 273.15
farad
F
(C/V)
CAPACITANCE
ohm
Ω
(V/A)
RESISTANCE
siemens
S
(1/Ω)
CONDUCTANCE
lux
lx
(lm/m²)
ILLUMINANCE
lumen
lm
(cd·sr)
LUMINOUS FLUX
steradian
sr
(m²/m² = 1)
SOLID ANGLE
radian
rad
(m/m = 1)
PLANE ANGLE

# YouTube Link for this Presentation

- https://youtu.be/IfPJ7xKOfQU