Optical Illusions

https://www.youtube.com/watch?v=rmEgnjaw_08

https://www.youtube.com/watch?v=Jtm0NDqKTb8

https://www.youtube.com/watch?v=dsphUApa8C0

Measurements

- Quantitative observations
- Include numbers *and* units

Metric System

(SI – International System of Units)

- Based on powers of 10
- Uses a base unit for each type of measurement

  Ex: Mass – gram
  Volume – liter
  Length – meter

Examples of SI Units

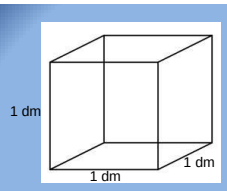
Base quantity	Name	Symbol
energy	joule	J
pressure	pascal	Pa
time	second	s
electric current	ampere	A
temperature	kelvin	K
power	watt	W
luminous intensity	candela	cd

Metric System

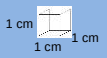
- Uses prefixes attached to the base to indicate the specific power of 10

kilo, k	10^3	micro, μ	10^{-6}
hecto, h	10^2	nano, n	10^{-9}
deka, da	10^1		
BASE	10^0		
deci, d	10^{-1}		
centi, c	10^{-2}		
milli, m	10^{-3}		

King Henry Died By Drinking Chocolate Milk



$1\ dm^3 = 1L \rightarrow 1\ kg\ H_20$



$1\ cm^3 = 1mL \rightarrow 1\ g\ H_20$

Metric Conversions

* Unit gets larger, number gets smaller

$43\ m \times \frac{10^0}{10^3} = 0.043\ km$

$2.6\ cg \times \frac{10^{-2}}{10^2} = 0.00026\ hg$

* Unit gets smaller, number gets larger

$0.068\ kL \times \frac{10^3}{10^{-2}} = 6800\ cL$

$7.92\ hm \times \frac{10^2}{10^0} = 792\ m$

Scientific (Exponential) Notation

Used in science for numbers
that are particularly large or small

Write the number as a value between 1 and <10
With a power of ten

Expanded:	Scientific Notation:
345000	3.45×10^{5}
0.00000088	8.8×10^{-7}

On your calculator:

EE or EXP = "times ten to the"

6.02×10^{23} = 6.02 EE 23 or 6.02 EXP 23