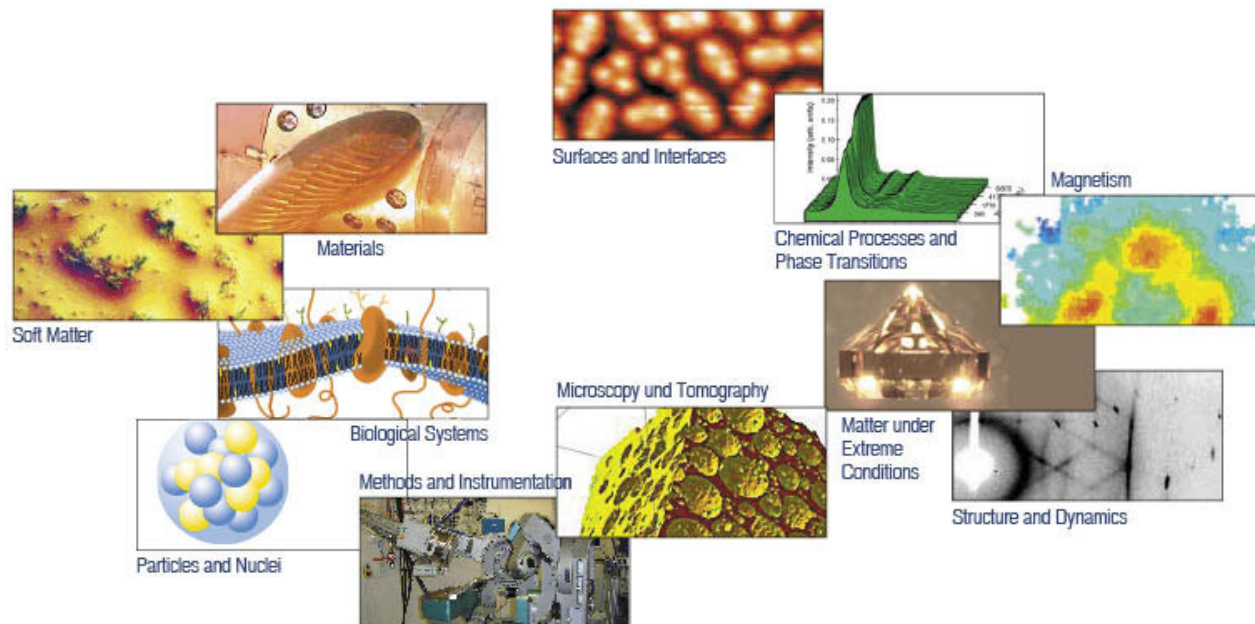


Classifying Matter:



Properties of Materials

OUTCOME QUESTION(S):

S1-2-07

What properties classify elements as metals, nonmetals or metalloids?

S1-2-12

How do you identify physical or chemical change, and how do you know if a chemical reaction has taken place?

Vocabulary & Concepts

State/Phase

Lustre

Ductility

Malleability

Solubility

Conductivity

Reactivity

Combustibility

Toxicity

Precipitate

Corrosion

Oxidation

Law of Conservation of Matter

Pre-Note Questions:

Where do we find metals, nonmetals, and metalloids on the periodic table?

to the right
of SC
NONMETALS

on SC ← METALLOIDS

to the left of SC

METALS

1 H 1.008	2 He 4.0026											13 B 10.81	14 C 12.011	15 N 14.007	16 O 15.999	17 F 18.998	18 Ne 20.180	
3 Li 6.94	4 Be 9.0122											13 Al 26.982	14 Si 28.085	15 P 30.974	16 S 32.06	17 Cl 35.45	18 Ar 39.948	
11 Na 22.990	12 Mg 24.305	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn 65.38	31 Ga 69.723	32 Ge 72.630	33 As 74.922	34 Se 78.97	35 Br 79.904	36 Kr 83.798	
19 K 39.098	20 Ca 40.07											48 Cd 112.41	49 In 114.82	50 Sn 118.71	51 Sb 121.76	52 Te 127.60	53 I 126.90	54 Xe 131.29
37 Rb 85.468	38 Sr 87.62											80 Hg 200.59	81 Tl 204.38	82 Pb 207.2	83 Bi 208.98	84 Po (209)	85 At 210	86 Rn (222)
55 Cs 132.91	56 Ba 137.33	#	Rf (265)	Db (268)	Sg (271)	Bh (270)	Hs (277)	Mt (276)	Ds (281)	Rg (280)	112 Cn (285)	113 Nh (286)	114 Fl (289)	115 Mc (289)	116 Lv (293)	117 Ts (294)	118 Og (294)	

* Lanthanide series

57 La 138.91	58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm (145)	62 Sm 150.36	63 Eu 151.96	64 Gd 157.25	65 Tb 158.93	66 Dy 162.50	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.05	71 Lu 174.97
--------------------	--------------------	--------------------	--------------------	-------------------	--------------------	--------------------	--------------------	--------------------	--------------------	--------------------	--------------------	--------------------	--------------------	--------------------

Actinide series

89 Ac (227)	90 Th 232.04	91 Pa 231.04	92 U 238.03	93 Np (237)	94 Pu (244)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (251)	99 Es (252)	100 Fm (257)	101 Md (258)	102 No (259)	103 Lr (262)
-------------------	--------------------	--------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	--------------------	--------------------	--------------------	--------------------

Physical properties

- Trait that is observed or measured without changing the composition of matter → atoms stay the same
- Can be qualitative or quantitative
↳ quality ↳ quantities
- Examples

State/phase – solid, liquid or gas (*normally*)

Hardness – how easy it is to *scratch or dent*

Viscosity – how easy it *flows*

Melting point – *unique temperature* needed to change from *solid into liquid*

Boiling point – *unique temperature* needed to change from *liquid into gas*

Other examples of Physical Properties:

Lustre – *shiny or dull*

Malleability – how easy to *bend or flatten*
(*opposite – brittle*)

Ductility – how easy to *pull into a wire*

Solubility – does it *dissolve in water*

Conductivity – does it *transfer heat/electricity*

